Alan Bogner: I, again, am Alan Bogner, the hearings officer for this public hearing. This evening, we are conducting a hearing on the draft permits for four Atlantic salmon net pen aquaculture facilities. Let the record show that it is 7:18 on February 5, 2019 and this hearing is being held at the Anacortes Library, 1220 10th Street, Anacortes, Washington. I have to read some legal notices. Notices of the hearing were emailed on two occasions to 1,189 interested people. A news release announcing the comment period was issued on December 27, 2018. And notice of the applications were published in the Kitsap Sun and the Skagit Valley Herald on October 25, 2018. I will now be calling people to provide testimony based on order that you raise your hand. Once everyone who has indicated that they would like to testify has had the opportunity, I will open it up for others. Remember, comments should be about four minutes. At the three and a half minute mark, I will alert you so that you have 30 seconds left. And this is your cue to wrap up your comments so that the next person can testify. When we call your name, it will be your turn to testify. Please come down here, take a seat, state your name for the record. And if you haven't given us your contact information, please do so. You can also provide this information after the hearing. Please speak clearly and not too fast so that we can get a good recording of your testimony. So we're going to begin with the first person that raises their hand that wants to testify. Sir?

Brian Wetcher: I'm Brian Wetcher, 814 26th Street in Anacortes. I would urge that the permit only be continued for the length of time for the fish that are existing in the pens now mature and that after that, the permit only be continued for proper closure procedures. Thank you very much.

Alan Bogner: Than you, Brian. Sir, come on down. Hey, what's your name?

Tom Glade: My name is Tom Glade. I am representing Evergreen Analysis this evening. And we are concerned primarily with the survivability of Chinook salmon fingerlings that come out of Skagit Bay and pass by the Hope Island Fish Farm and that they can track some sort of disease or parasite in their passage. And ultimately, we are concerned with the survival of the southern resident killer whales who depend on the Chinook. So we will be submitting more detailed comments before the comment period ends. Thank you.

Alan Bogner: Thank you. Anyone else like to comment? Yes, sir. Come on down.

Burt Suwade: My name is Burt Suwade, 908 31st Street Anacortes, Washington. And I'm disappointed that it took a disaster at Cyprus Island to initiate improved restrictions. But I am glad to see what the Department of Ecology has come up with and I approve of what they're doing. Thank you.

Alan Bogner: Thank you for your comments. Is there anyone else who wishes to provide testimony? Okay, I will repeat one more time, if you would like to send written comments, please remember, gotta have 'em by midnight February 25, 2019. You can send them via US mail postmarked by that same date, 2/25/19 or

online as Laurie showed you using our ecomment form. Please remember to give us your contact information if you want to receive updates on the process. All testimony received will be part of the official hearing record for this proposal. This includes testimony at the webinar hearing last week, tonight's public hearing, and the one this Thursday on Bainbridge Island, along with all written comments received by midnight February 25. Ecology will send a notice about the response to comments publication to everyone who provided written comments or oral testimony on these draft permits and submitted contact information. Everyone who sent a mailing or email address to staff will also receive the response to comments as will other interested parties currently on the agency's mailing list for these draft permits. The response to comments document will contain the agency's response to questions and issues of concern that were submitted during the public comment period. If you would like to receive a copy but did not give us your information, please contact Lori or Rich. And finally, after the comment period, the next step is to review the comments and make a determination whether to reissue the permit. Ecology Southwest Regional Water Quality Manager Rich Doenges will consider the permit documentation, staff recommendations, and will make a decision about issuing the permit. Permit reissuance is currently scheduled for spring of this year. If we can be of further assistance, please do not hesitate to ask. You can contact Laurie or Rich if you have any other questions. Again, on behalf of the Washington State Department of Ecology, thank you for participating. I greatly appreciate your cooperation and your courtesy. Let the record show that this hearing is adjourned at 7:24 pm, February 5, 2019.

[end of file]

Alan Bogner: Again, I am Alan Bogner, the hearings officer for this public hearing. This evening, we are conducting a hearing on the draft permits for four Atlantic Salmon net pen aquaculture facilities. Let the record show it is 7:46pm on February 7th, 2019. And this hearing is being held at the Bainbridge High School. Notices of the hearing were emailed on two occasions to 1,189 interested people. A news release announcing the comment period was issued on December 27th, 2018 and notice of the applications were published in the Kitsap Sun and the Skagit Valley Herald on October 25th, 2018. I will now be calling people to provide testimony based on the order your name appears on the sign in sheet. Once everyone who has indicated that they would like to testify has the opportunity, I will open it up for others. Remember, oral comments should be about three minutes. At the two and a half minute mark, I will kind of whisper to you, "30 seconds" to alert you have 30 seconds left. That is your cue to wrap up your comments so that the next person can testify. When we call your name, it will be your turn to testify. Please come down here, take a seat, state your name for the record, and if you haven't given us your contact information, please do so. You can also provide this information after the hearing. Please speak clearly and not too fast so we can get a good recording of your testimony. We will begin with Brenda Berry followed by Stephanie Ross. Brenda Berry, come on down.

Brenda Berry: I've said enough. I'll write it and I'll pass and move on to Stephanie.

Alan Bogner: Okay, great. Stephanie, come on down.

Stephanie Ross: All right. Can I look at them and talk? Can you hear me appropriately? All right. My name is Stephanie Ross. I am appearing as a citizen in a non-representational capacity. I'm here to state that the pollutants that are the subject matter of this permit are in direct opposition to federal law, the governor's policy, the stated concerns about the orcas, and that the permits should be denied in full. I would like to start by submitting to the record a letter which was sent to congress by 130 different fishing organizations and fishermen representing thousands of people, which is a direct opposition to all marine fin fish aquaculture in US waters. I have 100 copies of those over there if anybody's interested so we have some kind of perspective about jobs here. I was authorized to do this by the Pacific Coast Federation of Fishermen's Association. So that's in the record. And I would like to just go over a few points in this very briefly. The people who submitted this in December 2018 said, "We depend on a healthy marine ecosystem to supply quality, abundant wild fish stocks. Marine fin fish aquaculture pollutes the natural ecosystem, degrades and threatens wild fish stocks, and challenges the economic stability of commercial fishermen, American commercial fishing, and marine fin fish aquaculture cannot coexist. And they go into, in some detail, the questions about pollutants. I would also like to submit into the record specifically even though you can find it on the side if you really dig what the pollutants are that are supposed to be going into the water, irrespective of PRV, irrespective of the fish carrying the PRV. These are the pollutants, all right? That was, I think, actually Cooke did a great job of honestly and accurately submitting their application in 2017. It's too bad it

took over a year for it to be processed. Okay, so here's just a few of the pollutants that are going to be going into: canthaxanthin, astaxanthin, antioxidants, [indecipherable], terramycin, finquel --

Alan Bogner: 30 seconds.

Stephanie Ross: Yes. Left? 30 seconds left? Okay. The laws that this is in violation of is that the NPDES must take into consideration the endangered species act. There are endangered species of southern resident ponds that are entirely dependent upon the Chinook salmon. And I'd also like to enter into the record the 2015 WDFW study about pollutants' effects on the Chinook Salmon. I do not believe that the state of Washington has the right to introduce more pollutants into the Puget Sound. And, in fact, they have a duty to deny the permit. Thank you.

Alan Bogner: Okay, thank you. Remember, you can come back.

Stephanie Ross: Thank you.

Alan Bogner: Okay. That is all we have on the sign up list. Is there anyone who has changed their mind and would like to now testify? Sure, come on up, Kevin.

Kevin Bright: Hi, my name's Kevin Bright. I work with Cooke Aquaculture. I've got a marine biology degree and have been in this business for way too long, 20-some odd years growing salmon. I'll just give you a quick -- Atlantic Salmon have been raised in net pens in Puget Sound for nearly 40 years. Atlantic Salmon have never successfully established themselves outside of their native range of the Atlantic Ocean. There's been no self-reproducing runs of Atlantic Salmon ever found in Washington State. Unfortunately, I think our legislature made a decision that was based more on emotion than it was on science or historical experience. The fish that we raise come from domesticated stocks that have been bred in captivity for over 40 years. The ability of these fish to survive outside of the net pen environment and have food delivered to them is greatly diminished. We go to great lengths to keep the fish healthy. We are famers. Like I said, we don't want our fish to get diseases. We screen for diseases. We watch the fish. We dive the pens and we keep track of mortality rates so that we know if -- and we do fish health screening. We look for any signs of disease. And if we see a disease, we will treat it with antibiotics. The amount of antibiotics we use is extremely low. It's much less than land-based agriculture. I understand that salmon farming's been -- it's a very controversial issue. It always has been and it always probably will be. Unfortunately, I think aquaculture is where we're going to get our seafood for the future. The UN projects another two billion people on this planet in the next 30 years. Those people will need some source of protein. Wild capture fisheries are at their maximum level and they will not be able to sustain that kind of pressure and demand on that natural resource. Aquaculture is going to be where we need to look to produce a protein that is essential for feeding a growing population.

Alan Bogner: 30 seconds.

Kevin Bright. As I stated, the UN, FAO says that aquaculture's our best chance to increase global protein. Several environmental organizations are starting to come to that same conclusion, such as the World Wildlife Foundation. Yeah. I think we need these facilities and I appreciate Ecology's work on this. Thank you.

Alan Bogner: Okay. You can come back up if other people have a chance. Anyone else? Brenda? I like how I know all your names already.

Brenda Berry: I know. We're getting to be friends. Rich is my friend now too. I guess what I just want to say is I really do understand that people need jobs, corporations need to make money. But at what cost and at what cost to our endangered native wildlife and at what cost to the marine ecosystem? So we do know and Department of Ecology's publications themselves state that the fish in the pens are a pollutant. They state that what's going into the water is a pollutant. The permit under question is an international corporation asking the state of Washington for permission and the privilege of polluting our water in order for them to make money and run their business. My question for the state of Washington is what's the greater good? What is the obligation to this corporation that you branded a lease versus the obligation to the people, the marine life who rely on a clean marine environment? Because there is no level of aquaculture that does not, in fact, degrade the marine environment. And I was on the ferryboat a couple weeks ago. We were coming home and little kids, we all spotted the J Pod in the water. And I don't know if you have kids but you know when they scream and it's somewhere between a cry and a shout and a yell because they see a big mammal that's wild in the water, there's nothing like that. And they were clapping and people were crying. And the reality is, that J Pod, it's doomed. Like, it's probably already doomed. It's starving. And it's starving to death because there are not enough Chinook salmon in our water to feed that. And there are a lot of pressures on wild salmon. There are a lot of pressures on Chinook salmon. But this is an additional pressure. So why give that privilege, why say -- these endangered salmon have been here for 10,000 years and are amazing, why would you say, "Someone's ability to make money is more important than those fish and those orcas." And those kids that got to see that, their children won't get to see it. My grandchildren probably won't get to see it. and so I'm encouraging you to deny the permit and err on the side of protecting our precious marine environment. The end. Did I make it under time?

Woman: Only two minutes, 20 seconds.

Brenda Berry: My name was Brenda Berry and I'm a concerned citizen. Okay. How was that.

Alan Bogner: Good. Anyone else? Yes. Remember to state your name.

Jamie Becktell: Yep.. I'm Jamie Becktell and I am a concerned citizen and I was happily going to walk out the door and understand that different citizens and different stakeholders have a different vested interest in Puget Sound. But the gentleman from Cooke Farms started citing UN and FAO data. And he's correct that we will be required to feed the population of the planet with aquaculture. There's no doubt about that. But that aquaculture absolutely will have to be sustainable in order to be successful. And this is not a sustainable aquaculture endeavor. It may be, but one of the most important criteria at this point in time for sustainable aquaculture would be nitrogen and eutrophication and we're not monitoring that in this case. And I don't understand that. Recent studies for the Puget Sound indicate that nitrogen, a little bit of phosphorous, and eutrophication are one of the primary impacts in the Sound. So I'd like to know from the state why we're not monitoring that. I think that's an oversight. Brenda eluded to the precautionary principle, which is an international standard by which we should -- must and should hold ourselves accountable. So we are trading short-term vested interest of a corporation for the long-term benefit of our children and future stakeholders. That's egregious. That's all I have to say. Thank you.

Alan Bogner: Lady in the back? Remember to state your name, please.

Mary Brown: Good evening. My name is Mary Brown and I speak as an individual, private citizen. And I just want to remind everyone that Chief Seattle once said that we don't make the web of life that we're just a strand in it. And whatever we do to any strand of life, we do to ourselves. And so it is my understanding that the fish farm fish are fed herring and that means less herring in the waters for the wild salmon. And because they have less herring to eat, they are starving. And because the orcas have less salmon to eat that they are starving too. So I just want us to think more about the overall web of life in which we are participants. Thank you.

Alan Bogner: Stephanie, come on up.

Stephanie Ross: Thank you.

Alan Bogner: Welcome back.

Stephanie Ross: Thank you.

Alan Bogner: State your name again.

Stephanie Ross: Yes, Stephanie Ross. I'm appearing as a private citizen and I would just like to state for the record the conclusion that was reached of WDFW in their extensive study about the survival rate of Chinook in the Puget Sound. And they said the conclusion is "a significant portion of Puget Sound Chinook salmon are at risk for some type of health impairment due to contaminant." Why in the world would the state authorize any more contaminants? I just want everybody to think about that. Why would they do that? I would also like to state that there is another federal

law that's implicated in all this and that's the treaties and the protection of the habitat and the state is required to consider the treaties and they're required to follow that. And now they're required to consider the habitat of the wild salmon. And that was in US versus Washington, which the state lost in the last year, so I think that's an important consideration. And I'd like to encourage anyone to come up and get these handouts please. And thank you very much, Ecology. And I hope that you will listen to what the governor said when he said our orcas and our wild fish come first. Either it was true or it wasn't. Ecology's an executive agency. So let's see which one wins. Thank you very much for your time.

Alan Bogner: Anyone else? All right. Remember, if you would like to send written comments, we have to receive them by midnight on February 25th unless you put them in the US mail and then they must be postmarked by the 25th or you can submit online comments with our ecomment form. Again, please remember to give us your contact information if you want to receive updates on this process. You can email a physical address or an email address to staff after the hearing today. All testimony received will be part of the official hearing record for this proposal. This includes testimony at the webinar hearing, during the two public hearings here today and the one on February 5th in Anacortes, along with all written ecomments received by midnight on February 25th. Ecology will send a notice about the response to comments publication to everyone that provided written comments or oral testimony on these draft permits and submitted us their contact information also to everyone who sent a mailing or email address to staff and other interested parties currently on the agency mailing list for these types of draft permits. The response to comments document will contain the agency's response to questions and issues of concern that were submitted during the public comment period. If you would like to receive a copy but did not give us your information, please contact Laurie or Rich. They have business cards on the table over there. And finally, after the comment period, the next step is to review the comments and make a determination whether to reissue the permit. Ecology Southwest Regional Water Quality Program Manager Rich Doenges will consider the permit documentation, staff recommendations, and will make a decision about issuing the permit. Permit reissuance is currently scheduled for spring of this year. If we can be of further assistance, please do not hesitate to ask. You can contact Laurie or Rich if you have any other questions. On behalf of the Washington State Department of Ecology and myself, thank you for participating and I greatly appreciate your courtesy and cooperation. Let the record show that this hearing is adjourned at 8:06 pm, February 7th, 2019.

[end of file]

Kevin Bright

UPDATE TO THE BIOLOGICAL EVALUATION SUBMITTED APRIL 17 AND AUGUST 6, 2008, REGARDING EPA ACTION ON WASHINGTON'S MARINE FINFISH REARING FACILITY PROVISION CONTAINED IN THE SEDIMENT MANAGEMENT STANDARDS
PREPARED FOR:
NATIONAL MARINE FISHERIES SERVICE
PREPARED BY:
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 SIXTH AVENUE, SUITE 900
SEATTLE, WA 98101
December 13, 2010

6.A. ANALYSIS OF EFFECTS FINDINGS

This analysis assumes there will not be a large increase in the number of netpen facilities in Puget Sound, that Atlantic salmon is the fish species reared in those netpen facilities, and that the regulatory structure remains intact. EPA's approval and ESA determinations are based on the following six key findings along with information contained within the recovery plans.

- The designated uses of Puget Sound are protected.
- Netpen facilities have an insignificant impact on aquatic life in Puget Sound.
- The existing regulatory framework for netpens provides protection to surrounding habitat and other species.
- The effects on the benthic community are accounted for and monitored.
- The closure procedures of netpen facilities ensure the aquatic environment is restored to baseline levels.
- The indirect effects of netpen facilities carry a low risk.

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December 13, 2010

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PREFACE

In the Biological Evaluation of April 17, 2008 and supplement of August 6, 2008 (2008 BE),[1] EPA concluded that the approval of certain new and revised water quality standards in WAC 173-204 were likely to adversely affect listed fish species or marine mammals since the effects of such approval would be insignificant. The 2008 BE made the following findings:

- NOAA technical memoranda[2] indicate beneficial effects and low potential for negative effects.
- The designated uses of Puget Sound are protected.
- Netpen facilities have an insignificant impact on aquatic life in Puget Sound.
- The existing regulatory framework for netpens provides protection to surrounding habitat and other species.
- The effects on the benthic community are accounted for and monitored.
- The closure procedures of netpen facilities ensure the aquatic environment is restored to baseline levels.
- The indirect effects of netpen facilities carry a low risk.

In accordance with the April 28, 2010 Order of the U.S. District Court for the Western District of Washington, EPA has reconsidered whether approval of the new and revised water quality standards in WAC 173-204 may affect listed fish species or marine mammals, or their critical habitat. Along with the data in the original 2008 BE, and other updates to its information and analysis, EPA reviewed the following recovery plans:

> 1. National Marine Fisheries Service. 2007. Puget Sound Salmon Recovery Plan. Shared Strategy for Puget Sound adopted by National Marine Fisheries Service. Volumes I and II.[3]
>
> 2. National Marine Fisheries Service. 2008. Recovery Plan for Southern Resident Killer Whales *(Orcinus orca)*. National Marine Fisheries Service, Northwest Region, Seattle, Washington.[4]

The Puget Sound Salmon Recovery Plan (for chinook salmon, chum salmon and bull trout) and the Recovery Plan for Southern Resident Killer Whales offer only a limited discussion of the impact of netpens on these species. The primary potential threats from

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[1] U.S. EPA Region 10. *Biological Evaluation of Washington's Marine Finfish Rearing Facility Provision Contained in the Sediment Management Standards.* Prepared for U.S. Fish & Wildlife Service and National Marine Fisheries Service. April 17, 2008. Supplemented August 6, 2008.

[2] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001. Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. NFMFS-NWFSC-53. 2002. Rensel, J.E. and J.R.M. Forster. Prepared for NOAA National Marine Fisheries Service. NOAA Award # NA04OAR4170130. July 22, 2007.

[3] Available online at: http://www.nwr.noaa.gov/Salmon-Recovery-Planning/Recovery-Domains/Puget-Sound/PS-Recovery-Plan.cfm

[4] Available online at: http://www.nwr.noaa.gov/Marine-Mammals/Whales-Dolphins-Porpoise/Killer-Whales/ESA-Status/upload/SRKW-Recov-Plan.pdf

netpen operations highlighted in these limited discussions are water quality impacts and escape of farmed salmon. The recovery plans do not make any findings that current netpen operations cause impacts to water quality or result in farmed salmon escape; rather, the plans speculate about the *potential* effects of poor aquaculture practices on listed species.

Following a review of the recovery plans, EPA determined that although netpen operation in accordance with WAC 173-204 may affect ESA listed species or their critical habitat, the effect is NLAA the three species of salmonids and the southern resident killer whale. For each instance that netpen operations is mentioned in the recovery plans, the rationale for these NLAA determinations is provided below.

For the reasons detailed in this document, EPA is reaffirming the NLAA determinations contained in the 2008 BE. EPA is also reaffirming its no effect determinations that were made in the 2008 BE.

EPA has also provided an analysis for the three newly listed species of rockfish in Puget Sound: boccacio, canary, and yelloweye rockfish. EPA has determined its action is NLAA these species or their critical habitat.

1. BACKGROUND

In 1991, EPA approved Washington's Sediment Management Standards (SMS), WAC 173-204. Washington's SMS address three primary areas: (1) standards for assessing the nature and extent of sediment contamination, (2) procedures for cleanup of historical sediment contamination, and (3) procedures for preventing future sediment contamination from discharges.[5]

On June 3, 1996, the Washington State Department of Ecology (Ecology) submitted revisions to WAC 173-204, which included minor revisions to the sediment testing methodology provisions and a new section for marine finfish rearing facilities, WAC-173-204-412. These revisions were subject to the Alaska Rule since they were adopted by Washington prior to May 30, 2000 and EPA took no action prior to that date. Therefore, Washington's 1996 sediment management standard revisions went into effect for Clean Water Act purposes as soon as they were effective under state law since they were submitted to EPA for review prior to May 30, 2000, according to 40 CFR 131.21(c)(1).

The addition of the marine finfish fearing facility section exempts netpen facilities in Puget Sound from portions of Washington's sediment management standards. The section also states that sediment quality compliance and monitoring requirements of netpen facilities are addressed through NPDES permitting. The section allows for a sediment impact zone within 100 feet from the outer edge of netpen facilities; consequently, such facilities are exempt from: marine sediment quality standards, sediment impact zone maximum criteria, and sediment impact zone standards. The section also allows Ecology to authorize sediment impact zones beyond 100 feet via NPDES permits or administrative actions, subject to increased monitoring. There are no exemptions from meeting Washington's water quality standards for netpen facilities.

Currently, there are eight Atlantic salmon netpen facilities in Puget Sound, which produce over 10 million pounds of salmon annually.[6] Ecology issued NPDES permits for all eight facilities. The Washington State Department of Natural Resources (WDNR) issued a site license for each facility; and the Washington Department of Fish and Wildlife (WDFW) regulates disease control and escape management at each facility.

[5] Washington State Department of Ecology. "Sediment Cleanup Status Report." June 2005. Publication Number 05-09-092. <http://www.ecy.wa.gov/pubs/0509092.pdf>

[6] Washington State Department of Ecology. NPDES Permit Factsheets for American Gold Seafoods, Inc. 2007. < http://www.ecy.wa.gov/programs/wq/permits/northwest_permits.html>

2. DESCRIPTION OF THE ACTION

This Biological Evaluation (BE) is limited to those new and revised water quality standards which can affect aquatic life. Additionally, the analysis of the effects of the new and revised water quality standards provisions assumes that ESA-listed species and their habitat are exposed to waters meeting Washington's water quality standards. The following is a list of the new provisions which could affect aquatic life, and will be addressed specifically in this BE.

- WAC 173-204-200 (13): Definition of "Marine finfish rearing facilities."
- *WAC 173-204-315(1)(b)(ii)*
- *WAC 173-204-315(2)(b)*
- *WAC 173-204-315 (2)(d)*
- *WAC 173-204-320 (3)(d)*
- WAC 173-204-412 (2): Applicability of marine finfish rearing facilities.
- WAC 173-204-412 (3): Sediment monitoring requirements of marine finfish rearing facilities.
- WAC 173-204-412 (4): Sediment impact zones for marine finfish rearing facilities.
- *WAC 173-204-420 (3)(c)(iv)*
- *WAC 173-204-520 (3)(d)(iv)*

The definition of marine finfish rearing facilities is evaluated in the context of the SMS. Washington revised several other provisions in their SMS, but those provisions are not part of EPA's proposed action or this consultation because they (1) are a non-substantive or formatting change, (2) are a minor editorial change that does not alter the water quality standards that EPA previously approved, or (3) are not a water quality standard which does not require EPA action.

Notes:

(A) The entire new language of the "marine finfish rearing facility" provision, WAC 173-204-412, is included in *Appendix 11.A.*

(B) WAC 173-204-200 (13) is a new definition for "marine finfish rearing facilities" as follows:

> "Marine finfish rearing facilities" shall mean those private and public facilities located within state waters where finfish are fed, nurtured, held, maintained, or reared to reach the size of release or for market sale.

(C) Several revisions to WAC 173-204 (in italics above) relate to sediment testing methodology. They were described in EPA's August 6, 2008 supplement to the 2008 BE. EPA reevaluated its conclusions in the August 6, 2008 supplement based upon any new information and has not modified these conclusions since the provisions relate only

to sediment testing methodology. The changes to these provisions are provided in *Appendix 11.B*. EPA's analysis of these revisions is provided in Section 9 of this BE.

3. DESCRIPTION OF THE ACTION AREA

The sediment management standards for marine finfish rearing facilities are applicable to all eight Atlantic salmon rearing facilities in Puget Sound. Pacific salmon hatcheries are not evaluated in this Biological Evaluation since their primary function is to sustain populations of Pacific salmon. EPA's approval action does not apply to, and thus the action area does not include, any waters within Indian Country (i.e., Native American reservations, Indian communities, and trust lands).

Puget Sound is defined in the SMS in WAC-173-204-200(20): "Puget Sound basin" or "Puget Sound" means: (a) Puget Sound south of Admiralty Inlet, including Hood Canal and Saratoga Passage; (b) The waters north to the Canadian border, including portions of the Strait of Georgia; (c) The Strait of Juan de Fuca south of the Canadian border; and (d) All the lands draining into these waters as mapped in water resources inventory areas numbers 1 through 19, set forth in water resources management program established pursuant to the Water Resources Act of 1971, chapter 173-500 WAC.

Puget Sound contains 2,800 square miles of inland waters and 2,500 miles of shoreline. The Sound is composed of underwater valleys and ridges and has an average depth of 450 feet. Puget Sound is a partially enclosed estuary where saltwater mixes with freshwater from the surrounding watersheds. Ten main rivers drain into Puget Sound making up 85% of the basin's annual surface water runoff: the Nooksack, Skagit, Snohomish, Stillaguamish, Cedar/Lake Washington Canal, Green/Duwamish, Puyallup, Nisqually, Skokomish and Elwha.

The Puget Sound Action Team (PSAT) describes the basins of Puget Sound as follows: "A relatively shallow sill at Admiralty Inlet separates the waters of the Strait of Juan de Fuca from the waters of Puget Sound proper. South of Admiralty Inlet, Puget Sound proper consists of four interconnected basins. The largest and deepest of these, the Main Basin, consists of two sub-basins and extends some 60 miles from Admiralty Inlet to the Tacoma Narrows. Around the Tacoma Narrows, a shallow sill separates the Main Basin from the Southern Basin. To the north and east of the Main Basin (but not separated by a sill) is the Whidbey Basin. This basin is located to the east of Whidbey Island and includes the waters of Possession Sound, Port Susan, Saratoga Passage and Skagit Bay. The smallest of the four basins, in terms of area, is the Hood Canal Basin on the western side of the Sound. This long, narrow channel branches from the Main Basin south of Admiralty Inlet and extends about 80 miles south, between the Olympic Mountains and the Kitsap Peninsula." The nearshore habitat of Puget Sound encompasses the tidal and shallow subtidal areas close to the shoreline. Sunlight and vegetation are defining characteristic of nearshore habitat which differs from the deeper habitats which support benthic communities.[7]

[7] Section on Puget Sound from Puget Sound Action Team. Definition of Puget Sound. Accessed online March 7, 2008. <http://www.psat.wa.gov/About_Sound/Define.htm>

4. SPECIES STATUS AND LIFE HISTORY

The complete list of the federally listed, threatened and endangered species under the jurisdiction of NOAA that are known or suspected to occur in Washington State are listed in the *Table 3-1* and *Table 3-2*. This list was obtained from the USFWS Threatened and Endangered Species System (TESS).[8]

Table 3-1: NOAA listed fish species known or suspected to occur in Washington.

Status	Salmonid Species – Evolutionarily Significant Units
Chinook Salmon (Oncorhynchus tshawytscha)	
T	Puget Sound
T	Snake River Fall Run
T	Lower Columbia River
E	Upper Columbia River Spring Run
T	Snake River Spring/Summer Run
Chum Salmon (Oncorhynchus keta)	
T	Columbia River
T	Hood Canal Summer Run
Coho Salmon (Oncorhynchus kisutch)	
T	Lower Columbia River*
Sockeye Salmon (Oncorhynchus nerka)	
T	Ozette Lake
Steelhead (Oncorhynchus mykiss)	
T	Puget Sound
T	Snake River Basin
T	Lower Columbia River
T	Upper Columbia River Basin
T	Middle Columbia River*
E	Bocaccio *(Sebastes paucispinis)*
T	Canary Rockfish *(Sebastes pinniger)*
T	Yelloweye Rockfish *(Sebastes ruberrimus)*

***** According to the USFWS TESS website this species is listed for the state but does not occur in the state.

Table 3-2: Federally listed non-fish species known or suspected to occur in Washington.

Status	Non-fish Species
Marine Mammals	
E	Humpback Whale (*Megaptera novaeagliae*)
E	Killer Whale, southern resident (*Orcinus orca*)
T	Southern Sea Otter (*Enhydra lutris neries*)*
T	Steller Sea Lion, eastern population (*Eumetpoias jubatus*)**
Marine Turtles	
T	Green Sea Turtle (*Chelonia mydas*)
E	Leatherback Sea Turtle (*Dermochelys coriacea*)

***** According to the USFWS TESS website this species is listed for the state but does not occur in the state.
** Western population is also listed but does not occur in the state.

[8] U.S Fish and Wildlife Service. USFWS Threatened and Endangered Species System (TESS). Washington State. Accessed online August 17, 2010. <http://ecos.fws.gov/tess_public/StateListingAndOccurrence.do?state=WA>

4.A. SPECIES ASSESSED FOR EFFECTS

The primary actions that are evaluated in this Biological Evaluation are the changes to provisions of Washington's sediment management standards regarding benthic communities by marine finfish rearing facilities in Puget Sound. Thus, the species that could be affected by these actions, either directly or indirectly must have at least some portion of their range within the Puget Sound aquatic system. For this reason, the following species are considered to not be affected by the actions that will be evaluated in this BE.

The following **fish species** do not use aquatic habitats in Puget Sound during any portion of their life history, and therefore, receive a **NO EFFECT** determination and will not be addressed further in this BE:

Chinook Salmon (Oncorhynchus tshawytscha)
- Snake River Fall Run
- Lower Columbia River
- Upper Columbia River Spring Run
- Snake River Spring/Summer Run

Chum Salmon (Oncorhynchus keta)
- Columbia River

Coho Salmon (Oncorhynchus kisutch)
- Lower Columbia River (does not occur in state)

Sockeye Salmon (Oncorhynchus nerka)
- Ozette Lake

Steelhead (Oncorhynchus mykiss)
- Snake River Basin
- Lower Columbia River
- Upper Columbia River Basin
- Middle Columbia River (does not occur in state)

There are two listed species, noted in *Table 3-2*, which may possibly occur in Washington but have not been document to occur: **Southern Sea Otter and Steller Sea Lion (western population).** Since these species are not known to occur in Washington during any portion of their life history, the actions described in this BE will have **NO EFFECT** and will not be addressed further in this BE.

The **two turtle species**, leatherback sea turtles and green sea turtles are distributed in marine waters.[9] They are rarely found off Washington's coast and neither species nests on Washington's coast. Since these turtle species do not inhabit Puget Sound or nest on the shores of Puget Sound, they will not be affected by sediment quality standards and the quality of benthic communities in Puget Sound. Therefore, these actions will have **NO EFFECT** on the turtle species.

[9] NOAA Fisheries. Office of Protected Resources. Leatherback Turtle Information webpage. Accessed online March 5, 2008. <http://www.nmfs.noaa.gov/pr/species/turtles/leatherback.htm>

This BE will assess the effects of the proposed action to four salmonid evolutionarily significant units (ESUs) and three marine mammals that occur on the Federal Threatened and Endangered species list and may potentially be affected by this action. *Table 3-3* lists these species, their current status, and the Federal Register (FR) final rule notice for each species. *Table 3-4* provides the FR final rule notice for critical habitat designation for each of these species. Maps of the existing netpen facilities in Puget Sound and the designated critical habitat for the species assessed in this BE can be found in *Appendix 11.C*.

Table 3-3: Status of ESA-listed species assessed in this BE.

Species	ESU/DPS/Population	Present Status	FR Notice of Listing	
Chinook Salmon (*Oncorhynchus tshawytscha*)	Puget Sound ESU	Threatened	64 FR 14308	3/24/99
Chum Salmon (*Oncorhynchus keta*)	Hood Canal summer-run ESU	Threatened	64 FR 14528	3/25/99
Steelhead (*Oncorhynchus mykiss*)	Puget Sound, DPS	Threatened	72 FR 26722	5/11/07
Steller Sea Lion (*Eumetpoias jubatus*)	Pacific Coast, eastern pop.	Threatened	N/A	N/A
Humpback Whale (*Megaptera novaeangliae*)	Pacific Coast	Endangered	35 FR 8491	6/2/70
Killer Whale (*Orinus orca*)	Southern Resident, DPS	Endangered	70 FR 69903 72 FR 16284 (update)	11/18/05 4/4/07
Bocaccio (*Sebastes paucispinis*)	N/A	Endangered	75 FR 22276	4/28/10
Canary Rockfish (*Sebastes pinniger*)	N/A	Threatened	75 FR 22276	4/28/10
Yelloweye Rockfish (*Sebastes ruberrimus*)	N/A	Threatened	75 FR 22276	4/28/10

Table 3-4 Critical Habitat Designations of ESA-listed species assessed in this BE.

Species	ESU/DPS/Population	Present Status	FR Notice of Critical Habitat	
Chinook Salmon (*Oncorhynchus tshawytscha*)	Puget Sound ESU	Final Rule	70 FR 52630	9/2/05
Chum Salmon (*Oncorhynchus keta*)	Hood Canal summer-run ESU	Final Rule	70 FR 52630	9/2/05
Steelhead (*Oncorhynchus mykiss*)	Puget Sound, DPS	Under development	N/A	N/A
Steller Sea Lion (*Eumetpoias jubatus*)	Pacific Coast, eastern pop.	Not assigned in Washington	N/A	N/A
Humpback Whale (*Megaptera novaeangliae*)	Pacific Coast	Not assigned	N/A	N/A
Killer Whale (*Orinus orca*)	Southern Resident, DPS	Final Rule	50 CFR 226	11/29/06

Bocaccio (*Sebastes paucispinis*)	n/a	Not assigned	N/A	N/A
Canary Rockfish (*Sebastes pinniger*)	n/a	Not assigned	N/A	N/A
Yelloweye Rockfish (*Sebastes ruberrimus*)	n/a	Not assigned	N/A	N/A

4.B. LIFE HISTORY OF FISH SPECIES ASSESSED[10]

This section provides status and life history information for the four salmonid species and three rockfish species listed under the Endangered Species Act that are assessed in this BE.

4.B.1. Chinook salmon

Chinook salmon are easily distinguished from other *Oncorhynchus* species by their large size. Adults weighing over 120 pounds have been caught in North American waters. Chinook salmon are very similar to coho salmon in appearance while at sea (blue-green back with silver flanks), except for their large size, small black spots on both lobes of the tail, and black pigment along the base of the teeth. Chinook salmon are anadromous and semelparous. This means that as adults, they migrate from a marine environment into the freshwater streams and rivers of their birth (anadromous) where they spawn and die (semelparous). Adult female Chinook will prepare a spawning bed, called a redd, in a stream area with suitable gravel composition, water depth and velocity. Redds will vary widely in size and in location within the stream or river. The adult female Chinook may deposit eggs in four to five "nesting pockets" within a single redd. After laying eggs in a redd, adult Chinook will guard the redd from four to twenty-five days before dying. Chinook salmon eggs will hatch, depending upon water temperatures, between 90 to 150 days after deposition. Sufficient intergravel dissolved oxygen levels during the incubation period are critical to development of salmon eggs. Stream flow, gravel quality, and silt load all significantly influence the survival of developing Chinook salmon eggs as they influence intergravel dissolved oxygen levels. Juvenile Chinook may spend from three months to two years in freshwater after emergence and before migrating to estuarine areas as smolts, and then into the ocean to feed and mature.

Among Chinook salmon two distinct races have evolved. One race, described as a "stream-type" Chinook, is found most commonly in headwater streams. Stream-type Chinook salmon have a longer freshwater residency, and undertake extensive offshore migrations before returning to their natal streams in the spring or summer months. The second race is called the "ocean-type" Chinook, which is commonly found in coastal streams in North America. Ocean-type Chinook typically migrate to sea within the first

[10] Life History information for the salmonid species and marine mammals in this section is from the Washington BE for the 2003/2006 WQS Revisions, April 10, 2007. Please see that document for more information on the references cited within this section. The sources cited in this section are not included in the Reference section of this BE.

three months of emergence, but they may spend up to a year in freshwater prior to emigration. They also spend their ocean life in coastal waters. Ocean-type Chinook salmon return to their natal streams or rivers as spring, winter, fall, summer, and late-fall runs, but summer and fall runs predominate. The difference between these life history types is also physical, with both genetic and morphological foundations.

Juvenile stream- and ocean-type Chinook salmon have adapted to different ecological niches. Ocean-type Chinook salmon tend to utilize estuaries and coastal areas more extensively for juvenile rearing. The brackish water areas in estuaries also moderate physiological stress during parr-smolt transition. The development of the ocean-type life history strategy may have been a response to the limited carrying capacity of smaller stream systems and glacially scoured, unproductive, watersheds, or a means of avoiding the impact of seasonal floods in the lower portion of may watersheds.

Stream-type juveniles are much more dependent on freshwater stream ecosystems because of their extended residence in these areas. A stream-type life history may be adapted to those watersheds, or parts of watersheds, that are more consistently productive and less susceptible to dramatic changes in water flow, or which have environmental conditions that would severely limit the success of sub-yearling smolts (FR 63 11482, Montgomery et al. 1999). At the time of saltwater entry, stream-type (yearling) smolts are much larger, averaging 73-134 mm depending on the river system, than their ocean-type (sub-yearling) counterparts, and therefore, are able to move offshore relatively quickly.

Coast-wide, Chinook salmon remain at sea for one to six years (more common, two to four years), with the exception of a small proportion of yearling males, called jack salmon, which mature in freshwater or return after two or three months in salt water. Ocean- and stream-type Chinook salmon in coastal and mid-ocean fisheries likely have divergent migratory routes. Ocean-type Chinook salmon tend to migrate along the coast, while stream-type Chinook salmon are found far from the coast in the central North Pacific. Differences in the ocean distribution of specific stocks may be indicative of resource partitioning and may be important to the success of the species as a whole.

There is a significant genetic influence to the freshwater component of the returning adult migratory process. A number of studies show that Chinook salmon return to their natal streams with a high degree of fidelity. Salmon may have evolved this trait as a method of ensuring an adequate incubation and rearing habitat. It also provides a mechanism for reproductive isolation and local adaptation. Conversely, returning to a stream other than that of one's origin is important in colonizing new areas and responding to unfavorable or perturbed conditions at the natal stream.

Chinook salmon stocks exhibit considerable variability in size and age of maturation, and at least some portion of this variation is genetically determined. The relationship between size and length of migration may also reflect the earlier timing of river entry and the cessation of feeding for Chinook salmon stocks that migrate to the upper reaches of river systems. Body size, which is correlated with age, may be an important factor in

migration and redd construction success. Under high density conditions on the spawning ground, natural selection may produce stocks with exceptionally large-sized returning adults.

Temporal "runs" or modes in the migration of Chinook salmon from the ocean to freshwater are well known (Wydoski and Whitney 2003). Freshwater entry and spawning timing are believed to be related to local temperature and water flow regimes. Seasonal "runs" (i.e., spring, summer, fall, or winter) have been identified on the basis of when adult Chinook salmon enter freshwater to begin their spawning migration. However, distinct runs also differ in the degree of maturation at the time of river entry, the thermal regime and flow characteristics of their spawning site, and their actual spawning. The timing of egg deposition must occur to ensure that fry emerge during the following spring when the river or estuary productivity is sufficient for juvenile survival and growth.

Pathogen resistance is another locally adapted trait. Chinook salmon from the Columbia River drainage were less susceptible to *Ceratomyxa shasta*, an endemic pathogen, then stocks from coastal rivers where the disease is not know to occur (FR 63 11482). Alaskan and Columbia River stocks of Chinook salmon exhibit different levels of susceptibility to the infectious hematopoietic necrosis virus (IHNV).

The preferred temperature range for Chinook salmon has been variously described as 12.2-13.9 degrees Celsius. (Brett 1952), 10-15.6 degrees Celsius. (Burrows, 1963), or 13-18 degrees Celsius. Temperatures for optimal egg incubation are 5.0-14.4 degrees Celsius. (Bell, 1984). The upper lethal temperature limit is 25.1 degrees Celsius. (Brett, 1952), but may be lower depending on other water quality factors (Ebel et al. 1971). Variability in temperature tolerance between populations is likely due to selection for local conditions; however, there is little information on the genetic basis of this trait.

The EPA (1986) recommends 8.0 mg/L intergravel DO for successful salmonid egg incubation. Freshwater juveniles avoid water with dissolved oxygen concentrations below 4.5 mg/l at 20 degrees Celsius. (Whitmore et al. 1960). Migrating adults will pass through water with dissolved oxygen levels as low as 3.5-4.0 mg/l (Alabaster 1988, 1989).

Puget Sound Chinook salmon

Geographic Boundaries and Spatial Distribution

The boundaries of this salmon ESU correspond with the Puget Lowland Ecoregion. This ESU encompasses all runs of Chinook salmon in the Puget Sound region from the North Fork Nooksack River to the Elwha River on the Olympic Peninsula, including Hood Canal. Chinook salmon in this area all exhibit an ocean-type life history. Although some spring-run Chinook salmon populations in the Puget Sound ESU have a high proportion of yearling smolt emigrants, the proportion varies substantially from year to year and appears to be environmentally mediated rather than genetically determined. Puget Sound stocks all tend to mature at ages 3 and 4 and exhibit similar, coastally-oriented, ocean migration patterns (Meyers et al.1998).

Hatchery fish are known to spawn in the wild in the Elwha and Dungeness river basins and are not considered discrete stocks from the wild fish (WDFW and WWTIT 1994). Adult Chinook begin to enter the Elwha River in June and continue through early October. The timing for entry into the Dungeness is unknown. Spawning in both rivers takes place between August and October (WDFW and WWTIT 1994). Out-migration of Chinook smolts in the Elwha and Dungeness basins occurs between March and mid-July (Williams et al. 1975).

Critical Habitat

On April 30, 2002, the US District Court for the District of Columbia approved a NMFS consent decree withdrawing a February 2000 critical-habitat designation for this and 18 other evolutionary significant units (ESUs) (NMFS 2002). Critical habitat consists of the water, substrate, and the adjacent riparian zone of accessible estuarine and riverine reaches. The February 2000 critical-habitat designation included Puget Sound marine areas, including the south sound, Hood Canal, and north sound to the international boundary at the outer extent of the Strait of Georgia, Haro Strait, and the Strait of Juan de Fuca to a straight line extending north from the west end of Freshwater Bay, inclusive. Critical habitat designation for this ESU was finalized 09/02/05 (70 FR 52630).

Historical Information

Chinook salmon were abundant in Washington State near the turn of the century, when estimates based on peak cannery pack suggested peak runs of near one million fish in the Oregon Coast, Washington Coast, and Puget Sound ESUs. However, Chinook salmon in this region has been strongly affected by losses and alterations of freshwater habitat. Timber harvesting and associated road building have occurred throughout this region. Agriculture is also widespread in the lower portions of river basins and has resulted in widespread removal of riparian vegetation, rerouting of streams, degradation of streambanks, and summer water withdrawals. Urban development has substantially altered watershed hydrodynamics and affected stream channel structure in many parts of Puget Sound.

The peak recorded harvest in Puget Sound occurred in 1908, when 95,210 cases of canned Chinook salmon were packed. This corresponds to a run-size of approximately 690,000 Chinook salmon at a time when both ocean harvest and hatchery production were negligible. This estimate, as with other historical estimates, needs to be viewed cautiously; Puget Sound cannery pack probably included a portion of fish landed at Puget Sound ports but originating in adjacent areas, and the estimates of exploitation rates used in run-size expansions are not based on precise data. Recent mean spawning escapements totaling 71,000 correspond to a run entering Puget Sound of approximately 160,000 fish. Based on an exploitation rate of one-third in intercepting ocean fisheries, the recent average potential run-size would be 240,000 Chinook salmon (ACOE 2000a).

Life History

Chinook salmon prefer to spawn and rear in the mainstem of rivers and larger streams (Williams et al. 1975, Healey 1991). Although the incubation period is determined by water temperatures, fry typically hatch in about eight weeks (Wydoski and Whitney

1979, Healey 1991). After emergence, Puget Sound juvenile Chinook salmon migrate to the marine environment during their first year.

Rearing and development to adulthood occurs primarily in estuarine and coastal waters (NMFS 1998). The amount of time juvenile Chinook spend in estuarine areas depends upon their size at downstream migration and rate of growth. While residing in upper estuaries, juvenile prey mainly on benthic and epibenthic organisms such as amphipods, mysids, and cumaceans. Juveniles typically move into deeper waters when they reach approximately 65-75 mm in fork length. As the juveniles grow and move to deeper waters with higher salinities, their main prey changes to pelagic organisms such as decapod larvae, larval and juvenile fish, drift insects, and euphausids (Simenstad et al. 1977).

Hatchery Influence

By 1908 there were state-run and federally-run Chinook hatcheries operating in this ESU. Transfers of Chinook salmon eggs to Puget Sound from other regions especially the Lower Columbia River were common practices of early hatcheries (Meyers et al., 1998). By the 1920's several million Chinook salmon had been released into Puget Sound tributaries (Cobb, 1930). Recently, stock integrity and genetic diversity have become important objectives. New policies have been initiated to reduce the impact of hatchery fish on natural populations (WDF 1991, WDF et al.1993). The abundance of Chinook salmon in watersheds throughout this ESU has been closely related to hatchery efforts (Meyers et al. 1998).

WDFW classified 11 out of 29 stocks in this ESU as being sustained, in part, through artificial propagation. Nearly 2 billion fish have been released into Puget Sound tributaries since the 1950s. The vast majority of these have been derived from local returning fall-run adults. Returns to hatcheries have accounted for 57 percent of the total spawning escapement, although the hatchery contribution to spawner escapement is probably much higher than that, due to hatchery-derived strays on the spawning grounds (ACOE 2000a).

Population Trends and Risks

The abundance of Chinook salmon in this ESU has declined since historic levels. Widespread stream blockages have reduced available spawning habitat. Widespread release of hatchery fish from limited stocks, has increased the risks of loss of genetic diversity and fitness to natural populations. In addition the large numbers of hatchery releases masks natural population trends and making it difficult to determine their sustainability. Forestry practices, farming and urbanization have blocked or degraded fresh water habitat (Meyers et al., 1998).

4.B.2. Chum salmon

Chum salmon have the widest natural geographic distribution of all Pacific salmon species, ranging in Asia from Korea to the Russian Arctic coast and west to the Lena River, and in North America from Monterey, California, to the Arctic coast and east to the Mackenzie River (Beaufort Sea). Historically, they may have constituted up to 50

percent of the annual biomass of the seven species of Pacific salmon in the North Pacific Ocean (Salo 2003).

Chum salmon spawn successfully in streams of various sizes, and the fry migrate directly to the sea soon after emergence. The immature chum distribute themselves widely over the North Pacific Ocean, and maturing adults return to the home streams at various ages, usually at two through five years, and in some cases up to seven years (Salo 2003). Common to virtually every region of the chum salmon's area of distribution is the occurrence of early and late returning stocks to the natal stream. In North America the only true summer chum salmon may be in the Yukon River, where summer chum have the distinguishing characteristics of the Asian summer chum. From western Alaska south to British Columbia and Washington, there are runs referred to as "summer" chum, which spawn from June to early September; these chum are characterized by large body size, older age composition, and high fecundity, and are probably early autumn chum (Salo 2003).

In general, early-run chum spawn in mainstems of streams, while late spawners seek out spring water that has more favorable temperatures through the winter. The timing of the runs varies from north to south, as does age at maturity and absolute (and, probably, relative) fecundity (Salo 2003).

Hood Canal Summer Run Chum Salmon

The Hood Canal (HC) summer run chum salmon ESU was listed as threatened on August 2, 1999.

Geographic Boundaries and Spatial Distribution
This ESU includes summer-run chum salmon populations in Hood Canal in Puget Sound and in Discovery and Sequim Bays on the Strait of Juan de Fuca. It may also include summer-run fish in the Dungeness River, but the existence of that run is uncertain. Distinctive life-history and genetic traits were the most important factors in identifying this ESU. Hood Canal summer-run chum salmon are defined as fish that spawn from mid-September to mid-October in the mainstems of rivers (Johnson et al.1997).

Critical Habitat
Critical habitat for the Hood Canal chum salmon was first designated February 16, 2000. On April 30, 2002, the US District Court for the District of Columbia approved a NMFS consent decree withdrawing a February 2000 critical-habitat designation for this and 18 other evolutionary significant units (ESUs) (NMFS 2002). The final critical habitat was designated 09/02/05 (70 FR 52630). Current netpen locations do not overlap with the designated critical habitat of the Hood Canal chum salmon.

Historical Information
Hood Canal summer-run chum salmon are defined in SASSI (WDF et al. 1993) as fish that spawn from mid-September to mid-October. Fall-run chum salmon are defined as fish that spawn from November through December or January. Run-timing data from as

early as 1913 indicated temporal separation between summer and fall chum salmon in Hood Canal (Johnson et al.1997).

Life History
Chum salmon in Hood Canal have been classified as summer- and fall- returning stocks. Most Hood Canal summer-run chum spawn in early September to mid-October. The Union River summer chum run is an exception as they have an earlier spawning timing (September – early October). Fry emerge from February to June. In Washington, chum may reside in freshwater for as long as a month before migration to estuarine habitats where they remain for about a month before migrating to deeper water (Johnson et al.1997).

Hatchery Influence
Very few summer-run chum salmon have been artificially propagated in Hood Canal, and the only releases in recent years have been from newly established restoration programs. These recent releases totaled about 241,000 chum salmon fry into Hood Canal in 1993 and 1994 and about 85,000 fry into Discovery Bay on the Strait of Juan de Fuca in 1992. There has been little artificial propagation of summer chum salmon from the Strait of Juan de Fuca east of the Elwha River. Since 1992 a restoration egg box program has produced about 85,000 fry annually in Salmon Creek, a tributary to Discovery Bay. There are no records of summer-run chum salmon fry plants into other streams that enter the Strait of Juan de Fuca, including Jimmycomelately and Snow Creeks, or the Dungeness River (Johnson et al.1997).

Population Trends and Risks
This ESU is in danger of extinction. Of 12 streams in Hood Canal identified as recently supporting spawning populations of summer chum salmon, five may already have become extinct, six of the remaining seven showed strong downward trends in abundance, and all were at low levels of abundance. The populations in Discovery Bay and Sequim Bay were also at low levels of abundance with declining trends. Threats to the continued existence of these populations include degradation of spawning habitat, low water flows, and incidental harvest in salmon fisheries in the Strait of Juan de Fuca and Coho salmon fisheries in Hood Canal (Johnson et al. 1997).

4.B.3. Steelhead

The steelhead is the anadromous form of the rainbow trout (*O. mykiss*), which occurs in two subspecies, *O. mykiss irideus* and *O. mykiss gaidneri*. Whereas stream-resident rainbow trout may complete their life cycle in a limited area of a small stream and attain a length of only 8 inches or so, steelhead may spend half their lives at sea, roaming for thousands of miles in the North Pacific Ocean. Steelhead return to spawn at sizes ranging from about 24 inches and 5 pounds to about 36 to 40 inches or more and 20 pounds or more (Behnke 2002).

Biologically, steelhead can be divided into two reproductive ecotypes, based on their state of sexual maturity at the time of river entry. These two ecotypes are termed "stream-maturing" and "ocean-maturing". Stream-maturing steelhead enter fresh water in

a sexually immature condition and require from several months to a year to mature and spawn. These fish are often referred to as "summer run" steelhead. Ocean-maturing steelhead enter fresh water with well-developed gonads and spawn shortly after river entry. These fish are commonly referred to as "winter-run" steelhead. In the Columbia River basin, essentially all steelhead that return to streams east of the Cascade Mountains are stream maturing. Ocean-maturing fish are the predominate ecotype in coastal streams and lower Columbia River tributaries (ACOE 2000b).

All but one of the *O. m. gairdneri* steelhead populations migrating east of the Cascade Range are characterized as summer-run steelhead (entering the Columbia River from May into the early fall in October); the one exception is a winter-run steelhead spawning in Fifteenmile Creek, which drains the eastern side of the Cascades in Oregon. The genetic traits of Fifteenmile Creel steelhead make it intermediate between the subspecies *irideus* and *gairdneri*. Steelhead of the subspecies *irideus* are mainly winter-run fish, but *irideus* also has summer runs. Considering the entire range of *irideus* from California to Alaska, steelhead can be found entering one river or another in every month of the year (Behnke 2002).

Native steelhead in California generally spawn earlier than those to the north with spawning beginning in December. Washington populations begin spawning in February or March. Native steelhead spawning in Oregon and Idaho is not well documented. In the Clackamas River in Oregon, winter-run steelhead spawning begins in April and continues into June. In the Washougal River, Washington, summer-run steelhead spawn from March into June whereas summer run fish in the Kalama River, Washington spawn from January through April. Among inland steelhead, Columbia River populations from tributaries upstream of the Yakima River spawn later than most downstream populations.

Depending on water temperature, fertilized steelhead eggs may incubate in redds for 1.5 to 4 months before hatching as "alevins". Following yolk sac absorption, young juveniles or "fry" emerge from the gravel and begin active feeding. Juveniles rear in fresh water for 1 to 4 years, then migrate to the ocean as smolts. Downstream migration of wild steelhead smolts in the lower Columbia River begins in April, peaks in mid-May and is essentially complete by the end of June (ACOE 2000b). Previous studies of the timing and duration of steelhead downstream migration indicate that they typically move quickly through the lower Columbia River estuary with an average daily movement of about 21 kilometers (ACOE 2000b).

Juvenile steelhead generally spend two years in freshwater before smolting and migrating to the ocean at lengths of about 6 to 8 inches. Most steelhead return to their natal rivers to spawn after spending 15 to 30 months in the ocean. Unlike Pacific salmon, steelhead do not all die soon after spawning, but the rate of survival to repeat spawning is generally low - about 10 percent (Behnke 2002).

Puget Sound Steelhead ESU

The Puget Sound steelhead ESU was found to not warrant listing on August 9, 1996. On March 29, 2006 in response to a petition, NOAA Fisheries Service announced that it was

proposing to list this Distinct Population Segment (DPS) as "threatened". The Puget Sound steelhead ESU was officially listed as "threatened" on March 11, 2007. The following summary is taken from NMFS (2005).

Geographic Boundaries and Spatial Distribution
The Puget Sound steelhead DPS includes all naturally spawned anadromous winter-run and summerrun *O. mykiss* (steelhead) populations in streams of the Strait of Juan de Fuca, Puget Sound, and Hood Canal, basins. This area is bounded to the west by the Elwha River (inclusive) and to the north by the Nooksack River and Dakota Creek (inclusive), as well as the Green River natural and Hamma Hamma winter-run steelhead hatchery stocks.

Critical Habitat
The Puget Sound steelhead DPS critical habitat is currently under development due to its recent status as "threatened".

Historical Information
The analysis of catch records from 1889 indicate a catch peak of 163,796 steelhead in 1895. Using estimates of harvest rate of 30-50%, the estimated peak run size ranged from 327,592-545,987 steelhead for the Puget Sound at that time. A survey of the Puget Sound in 1929 and 1930 identified steelhead in every major basin except the Deschutes River. By the late 1920s, steelhead abundance had already undergone significant declines and many marginal or ephemeral populations may have already disappeared. Steelhead were a target species for harvest as the winter run occurred during the months of the year when salmon fisheries were at seasonal lows. By 1898, the Washington State Fish Commissioner considered Puget Sound Steelhead to be "greatly depreciated" and catches continued to decline from 1900 through the 1920s. In 1925, steelhead were classified by Washington State as a sportfish and in 1932 the State prohibited the commercial catch of steelhead. All further run-size estimates were based on sportfish catch records and spawning surveys.

In the 1980s, the Puget Sound steelhead run size was estimated as 100,000 winter-run and 20,000 summer-run. In the 1990s, the total run size for major stocks in this ESU was greater than 45,000 with natural escapement estimates of 22,000 steelhead.

Habitat and Hydrology
Habitat utilization by steelhead has been most dramatically affected by a number of large dams in Puget Sound basins. Besides eliminating access to habitat, dams affect habitat quality by changing river hydrology, temperature profiles, gravel recruitment, and large woody debris movement and stability. Urban development and suburbanization have resulted in the loss of historical land cover, often replacing it with imperious surface. Combined with loss of wetland/riparian habitat, hydrology of many urban streams has changed dramatically. Flood frequency and peak flow during storm events has increased and groundwater derived summer flows have decreased. Land development for agriculture has also altered historical land cover. Because much of this type of development took place in river floodplains, direct impacts to river morphology have resulted. Diking, riprapping of banks, and channelization have resulted in river

constriction which increases gravel scour, decreases habitat complexity, and alters amplitude of high flow events.

Hatchery Influence
Releases of hatchery propagated steelhead into Puget Sound waters began in the 1900s and by the 1940s, extensive hatchery rearing programs were developed. Hatchery fish were widespread, spawning naturally throughout the region, and were largely derived from a single stock (Chambers Creek). In the 1980s, the hatchery portion of the population based on ocean catches was 70%. Over the last two decades, release levels of hatchery steelhead have remained relatively constant. Hatchery–produced winter steelhead have been released in nearly every basin in the ESU, except for the Cedar River and some smaller tributaries.

The risk posed by artificial production programs to natural production in the Puget Sound steelhead ESU is not clear as definitive information is not available. However, the genetic and life-history relationships between the Chambers Creek Hatchery and Skamania Hatchery and the naturally-spawning populations indicate that these hatchery effects could be substantially detrimental.

Population Trends and Risks
NMFS concluded that the Puget Sound steelhead DPS is not presently in danger of extinction, nor is it likely to become endangered in the foreseeable future. Despite this conclusion, NMFS has several concerns about the overall health of this DPS and about the status of certain stocks within the DPS. Recent trends in stock abundance are predominantly downward, although this may be largely due to recent climate conditions. Trends in the two largest stocks (Skagit and Snohomish rivers) have been upward. The status of certain stocks within the DPS is also of concern, especially the depressed status of most stocks in the Hood Canal area and the steep declines of Lake Washington winter steelhead and Deer Creek summer steelhead. Habitat loss, hatchery steelhead introgression, and harvest are the major contributors to the decline of steelhead in this ESU.

4.B.4. Bocaccio[11]

Species Description
Bocaccio are large Pacific coast rockfish that reach up to 3 feet (1 m) in length. They have a distinctively long jaw extending to at least the eye socket. Their body ranges in color from olive to burnt orange or brown as adults. Young bocaccio are light bronze in color and have small brown spots on their sides.

Rockfishes are unusual among the bony fishes in that fertilization and embryo development is internal, and female rockfish give birth to live larval young. Larvae are found in surface waters, and may be distributed over a wide area extending several hundred miles offshore. Fecundity in female bocaccio ranges from 20,000 to over two

[11] NOAA Fisheries. Office of Protected Resources. Bocaccio *(Sebastes paucispinis).* http://www.nmfs.noaa.gov/pr/species/fish/bocaccio.htm

million eggs, considerably more than many other rockfish species. Larvae and small juvenile rockfish may remain in open waters for several months, being passively dispersed by ocean currents.

Larval rockfish feed on diatoms, dinoflagellates, tintinnids, and cladocerans, and juveniles consume copepods and euphausiids of all life stages. Adults eat demersal invertebrates and small fishes, including other species of rockfish, associated with kelp beds, rocky reefs, pinnacles, and sharp dropoffs. Approximately 50 percent of adult bocaccio mature in 4 to 6 years. Bocaccio are difficult to age but are suspected to live as long as 50 years.

Habitat
Bocaccio are most common between 160 and 820 feet (50-250 m) depth, but may be found as deep as 1,560 feet (475m). Adults generally move into deeper water as they increase in size and age but usually exhibit strong site fidelity to rocky bottoms and outcrops. Juveniles and subadults may be more common than adults in shallower water, and are associated with rocky reefs, kelp canopies, and artificial structures, such as piers and oil platforms.

Distribution
Bocaccio range from Punta Blanca, Baja California, to the Gulf of Alaska off Krozoff and Kodiak Islands. They are most common between Oregon and northern Baja California. In Puget Sound, most bocaccio are found south of Tacoma Narrows.

Population Trends
Recreational catch and effort data spanning 12 years from the mid-1970s to mid-1990s suggests possible declines in abundance in Washington. Additional data over this period show the number of angler trips increased substantially and the average number of rockfish caught per trip declined. Taken together, these data suggest declines in the population over time. Currently there are no survey data being taken for this species, but few of these fish are caught by fishermen and none have been caught by Washington state biological surveys in 20 years, suggesting a very low population abundance. They are thought to be at an abundance that is less than 10% of their unfished abundance.

A 2005 stock assessment by NOAA Fisheries suggests bocaccio there have higher populations than was thought to be the case.

Threats
Bocaccio are fished directly and are often caught as bycatch in other fisheries, including those for salmon. Adverse environmental factors led to recruitment failures in the early- to mid-1990s.

Conservation Efforts
Various state restrictions on fishing have been put in place over the years. Current regulations in the state of Washington, where the species is most at risk, limit the daily rockfish catch to three rockfish total (of any species). Because this species is so slow-

growing, late to mature, and long-lived, recovery from the above threats will take many years, even if the threats are no longer affecting the species.

4.B.5. Canary Rockfish[12]

Species Description
Canary rockfish are large rockfish that reach up to 2.5 feet (77 cm) in length and 10 pounds (4 kg) in weight. Adults have bright yellow to orange mottling over gray, 3 orange stripes across the head, and orange fins. Animals less than 14 inches long have dark markings on the posterior part of the spiny dorsal fin and gray along the lateral line. Rockfishes are unusual among the bony fishes in that fertilization and embryo development is internal and female rockfish give birth to live larval young. Larvae are found in surface waters and may be distributed over a wide area extending several hundred miles offshore. Fecundity in female canary rockfish ranges from 260,000 to 1.9 million eggs, considerably more than many other rockfish species. Larvae and small juvenile rockfish may remain in open waters for several months, being passively dispersed by ocean currents.

Larval rockfish feed on diatoms, dinoflagellates, tintinnids, and cladocerans, and juveniles consume copepods and euphausiids of all life stages. Adults eat demersal invertebrates and small fishes, including other species of rockfish, associated with kelp beds, rocky reefs, pinnacles, and sharp dropoffs. Approximately 50 percent of adult canary rockfish are mature at 14 inches (36 cm) total length (about 5 to 6 years of age). Canary rockfish can live to be 75 years old.

Habitat
Canary rockfish primarily inhabit waters 160 to 820 feet (50 to 250 m) deep but may be found to 1400 feet (425 m). Juveniles and subadults tend to be more common than adults in shallow water and are associated with rocky reefs, kelp canopies, and artificial structures, such as piers and oil platforms. Adults generally move into deeper water as they increase in size and age but usually exhibit strong site fidelity to rocky bottoms and outcrops where they hover in loose groups just above the bottom.

Distribution
Canary rockfish range between Punta Colnett, Baja California, and the Western Gulf of Alaska. Within this range, canary rockfish are most common off the coast of central Oregon.

Population Trends
Recreational catch and effort data spanning 12 years from the mid-1970s to mid-1990s suggests possible declines in abundance. While catch data are generally constant over this time period, the number of angler trips increased substantially, and the average number of canary rockfish caught per trip declined. Taken together, these data suggest declines in the population over time. Currently there are no survey data being taken for

[12] NOAA Fisheries. Office of Protected Resources. Canary Rockfish *(Sebastes pinniger).* http://www.nmfs.noaa.gov/pr/species/fish/canaryrockfish.htm

this species, but few of these fish are currently caught by fishermen, suggesting a low population abundance. Canary rockfish used to be one of the three principal species caught in Puget Sound in the 1960s.

Threats
Canary rockfish are fished directly and are often caught as bycatch in other fisheries, including those for salmon. Adverse environmental factors led to recruitment failures in the early- to mid-1990s.

Conservation Efforts
Various state restrictions on fishing have been put in place over the years, including banning retention of canary rockfish in Washington in 2003. Because this species is slow growing, late to mature, and long-lived, recovery from these threats will take many years, even if the threats are no longer affecting the species.

4.B.6. Yelloweye Rockfish[13]

Species Description
Yelloweye rockfish are very large rockfish that reach up to 3.5 feet (~1 m) in length and 39 pounds (18 kg) in weight. They are orange-red to orange-yellow in color and may have black on their fin tips. Their eyes are bright yellow. Adults usually have a light to white stripe on the lateral line; juveniles have 2 light stripes, one on the lateral line and a shorter one below the lateral line.

Rockfishes are unusual among the bony fishes in that fertilization and embryo development is internal and female rockfish give birth to live larval young. Larvae are found in surface waters and may be distributed over a wide area extending several hundred miles offshore. Fecundity in female yelloweye rockfish ranges from 1.2 to 2.7 million eggs, considerably more than many other rockfish species. Larvae and small juvenile rockfish may remain in open waters for several months being passively dispersed by ocean currents.

Larval rockfish feed on diatoms, dinoflagellates, tintinnids, and cladocerans, and juveniles consume copepods and euphausiids of all life stages. Adults eat demersal invertebrates and small fishes, including other species of rockfish, associated with kelp beds, rocky reefs, pinnacles, and sharp dropoffs. Approximately 50 percent of adult yelloweye rockfish are mature by 16 inches (41 cm) total length (about 6 years of age). Yelloweye rockfish are among the longest lived of rockfishes, living up to 118 years old.

Habitat
Juveniles and subadults tend to be more common than adults in shallower water, and are associated with rocky reefs, kelp canopies, and artificial structures such as piers and oil platforms. Adults generally move into deeper water as they increase in size and age, but usually exhibit strong site fidelity to rocky bottoms and outcrops. Yelloweye rockfish

[13] NOAA Fisheries. Office of Protected Resources. Yelloweye Rockfish *(Sebastes ruberrimus).* http://www.nmfs.noaa.gov/pr/species/fish/yelloweyerockfish.htm

occur in waters 80 to 1560 feet (25 to 475 m) deep, but are most commonly found between 300 to 590 feet (91 to 180 m).

Distribution
Yelloweye rockfish range from northern Baja California to the Aleutian Islands, Alaska, but are most common from central California northward to the Gulf of Alaska.

Population Trends
Recreational catch and effort data spanning 12 years from the mid-1970s to mid-1990s suggests possible declines in abundance. While catch data are generally constant over time, the number of angler trips increased substantially, and there was a decline in the average number of rockfish caught per trip. Taken together, these data suggest declines in the population over time. Currently there are no survey data being taken for this species, but few of these fish are caught by fishermen, suggesting a low population abundance.

Threats
Yelloweye rockfish are fished directly and are often caught as bycatch in other fisheries, including those for salmon. Adverse environmental factors led to recruitment failures in the early- to mid-1990s.

Conservation Efforts
Various state restrictions on fishing have been put in place over the years leading to the current ban on retention of yelloweye rockfish in Washington in 2003. Because this species is slow growing, late to mature, and long-lived, recovery from these threats will take many years, even if the threats are no longer affecting the species.

4.C. LIFE HISTORY OF MARINE MAMMAL ASSESSED[14]

Life history, status, and other pertinent information for the three marine mammals assessed in this BE are presented in this section.

4.C.1. Steller sea lion (eastern population)

Status
The Steller sea lion was listed as a threatened species under emergency rule by NMFS in April 1990; final listing for the species became effective in December 1990.

Geographic Range and Spatial Distribution
Steller sea lions are polygamous and use traditional territorial sites for breeding and resting. Breeding sites, also known as rookeries, occur on both sides of the north Pacific, but the Gulf of Alaska and Aleutian Islands contain most of the large rookeries. Adults congregate for purposes other than breeding in areas known as haulouts (USEPA 2002b). The following are steller sea lion haulout sites in Puget Sound: Bangor Naval Base; east

[14] Life History information in this section is from the Washington BE for the 2003/2006 WQS Revisions, April 10, 2007. Please see that document for more information on the references cited within this section. The sources cited in this section are not included in the Reference section of this BE.

of Marrowstone Island; Toliva Shoals Buoy; Docks on Saltair Marina; Navigation Buoys and Netpen Floats near Orchard Rocks/NMFS Manchester; Old Shipwreck on North Side of Nisqually River Delta; and Navigation Buoys between Point Wilson and Point No Point.[15] In addition, as many as 20 Steller sea lions have been observed hauled out on American Gold Seafoods equipment storage barges near the existing netpen facilities in Rich Passage.[16]

In 1997, NMFS classified Steller sea lions into two distinct population segments divided by the 144°W latitude. The eastern population segment occupies habitat including southeastern Alaska and Admiralty Island. Currently, NMFS has classified the western population segment as endangered, while classifying the eastern population segment as threatened (62FR24345). Although the Steller sea lion population has declined steadily for the last 30 years, scientists have yet to identify the cause of the decline (USEPA 2002b).

Steller sea lions may be observed in Puget Sound year-round, but they are most abundant during the fall and winter months. Three major haulout areas exist on the Washington outer coast and one major haulout area is located at the Columbia River south jetty.

No breeding rookeries have been identified in Washington waters (NMFS 1992).

Critical Habitat

Steller sea lion critical habitat has been designated in Alaska, California, and Oregon and includes a 20-nautical-mile buffer around all major haulouts and rookeries, as well as associated terrestrial, air, and aquatic zones, and three large offshore foraging areas. No critical habitat has been designated in Washington.

Life History

Steller sea lion habitat includes both marine and terrestrial areas that are used for a variety of purposes. Terrestrial areas (e.g., beaches) are used as rookeries for pupping and breeding. Rookeries usually occur on beaches with substrates that include sand, gravel, cobble, boulder, and bedrock (NMFS 1992). Haul-out areas are used other than during the breeding and pupping season. Sites used as rookeries may be used as haul-out areas during other times of the year. When Steller sea lions are not using rookery or haul-out areas, they occur in nearshore waters and out over the continental shelf. Some individuals may enter rivers in pursuit of prey (Jameson and Kenyon 1977).

Steller sea lions are opportunistic feeders and consume a variety of fishes such as flatfish cod, and rockfish; and invertebrates such as squid and octopus. Demersal and off-bottom schooling fishes predominate (Jones 1981). Steller sea lions along the coasts of Oregon and California have eaten rockfish, bake, flatfish, cusk-eel, squid, and octopus (Fiscus and Baines 1966, Jones 1981, Treacy 1985); rockfish and hake are considered to be

[15] Personal communication between Matthew Szelag, EPA and Teresa Mongillo, NOAA. September 22, 2010. Provided information from Jeffries et al. 2000: Navy; WDFW; NMML.

[16] March 16, 2010. Letter from Barry A. Thom, Acting Regional Administrator, Northwest Region, NMFS to Michelle Walker, Chief, Seattle Regulatory Branch, U.S. Army Corps of Engineers Re: ESA and EFH Consultation for American Gold Seafoods Net-Pen Array Relocation.

consistently important prey items (NMFS 1992). Feeding on lamprey in estuaries and river mouths has also been documented at sites in Oregon and California (Jones 1981, Treacy 1985). Spalding (1964) and Otesiku et al. (1990) have documented Steller sea lions feeding on salmon, but they are not considered to be a major prey item (Osborne 1988).

The breeding range of Steller sea lions extends from southern California to the Bearing Sea (Osborne 1988). Breeding colonies consisting of small numbers of sea lions also exist on the outer coasts of Oregon and British Columbia. There are currently no breeding colonies in Washington State (NMFS 1992), although three major haul-out areas exist on the Washington outer coast and one major haul-out area is located at the Columbia River south jetty (NMFS 1992). None of these haul-out areas are located within the action area of Puget Sound for this action. Jagged Island and Spit Rock are used as summer haul-outs, and Umatilla Reef is used during the winter (National Marine Mammal Laboratory, unpublished data). Other rocks, reefs, and beaches as well as floating docks, navigational aids, jetties, and breakwaters are also used as haul-out areas (NMFS 1992).

Population Trends and Risks
The worldwide Steller sea lion population is estimated at just under 200,000, with the majority occurring in Alaska. The range of the Steller sea lion extends around the North Pacific Ocean rim from northern Japan, the Kuril Islands and Okhotsk Sea, through the Aleutian Islands and Bering Sea, along Alaska's southern coast, and south to California (Kenyon and Rice 1961, Loughlin et al. 1984).

Responses to various types of human-induced disturbances have not been specifically studied. Close approach by humans, boats, or aircraft will cause hauled-out sea lions to go into the water. Disturbances that cause stampeeds on rookeries may cause trampling and abandonment of pups (Lewis 1987). Areas subjected to repeated disturbance may be permanently abandoned (Kenyon 1962), and/or the repeated disturbance may negatively affect the condition or survival of pups through interruption of normal nursing cycles. Low levels of occasional disturbance may have little long-term effect (NMFS 1992).

4.C.2. Humpback whale

Status
Humpback whales are listed as endangered throughout their entire range under the Endangered Species act on June 2, 1970 (35 FR 8491).

Geographic Boundaries and Spatial Distribution
Surveys indicate that humpbacks occupy habitats around the world, with three major distinct populations: the north Atlantic, the north Pacific, and the southern oceans. These three populations do not interbreed. Humpbacks generally feed for 6-9 months of the year on their feeding grounds in Arctic and Antarctic waters. The animals then fast and live off their fat layer for the winter period while on the tropical breeding grounds (USEPA 2002b). The north Pacific herd of humpback whales that typically occupies southeastern Alaska waters also migrates to Hawaii and Mexico in the winter months for breeding. Humpback whales in the North Pacific are seasonal migrants feeding on

zooplankton, and small schooling fish in coastal waters off the coastal waters of the western United States, Canada (NMFS 2002).

Humpback whales are not expected to be routinely present in Washington waters or the waters potentially affected by this action.

Critical Habitat
There is no designated critical habitat for the humpback whale.

Historical Information
Whaling took large numbers of humpbacks from the late 1800s through the early 20th century. Even though the International Whaling Commission provided protection to the species in the early 1960s, the Soviet Union has recently revealed massive illegal and unreported kills that occurred up until 1970 in the southern oceans.

Population Trends and Risks
The humpback whale population is listed as "depleted" under the Marine Mammal Protection Act. As a result, the Central North Pacific population of humpback whale is classified as a strategic stock. The Central North Pacific population has increased in abundance between the early 1980s and early 1990s; but the status of this population relative to its optimum sustainable population size is unknown (NMFS 2002).

The largest threats to their survival include entanglements in fishing gear, collisions with ship traffic, and pollution of their coastal habitat from human settlements (USEPA 2002b).

4.C.3. Killer whale

Status
NOAA Fisheries Service received a petition in 2001 to list Killer Whales under the Endangered Species Act. In May 2003 the species was determined to be depleted under the Marine Mammal Protection Act which began the process to identify site specific measures to address the potential factors for decline. The proposal to list the Southern Resident killer whale distinct population segment (DPS) as threatened under the ESA was announced December 16, 2004. The final listing of this DPS as endangered was November 18, 2005 (70 FR 69903).

Life History
Killer whales grow to considerable size. The males can reach lengths of 25 feet or more and weigh five tons, females are typically a little smaller. This species ranges world wide including the Atlantic Ocean as far north as Iceland south to Antarctica. Killer whales are primarily piscivores. Based on a study that included both Northern and Southern DPS whales, salmon were found to represent over 96% of the prey during summer and fall. Chinook salmon were the preferred prey species comprising 70% of the species taken despite the relatively low abundance of Chinook in these areas compared to other species. Chum salmon were consumed extensively in the fall. Other prey species of Southern Resident killer whales include flatfish, lingcod, greenling, and squid.

Geographic Boundaries and Spatial Distribution
Resident killer whales in U.S. waters are distributed from Alaska to California, with four distinct communities recognized: Southern, Northern, Southern Alaska, and Western Alaska. The Southern Resident DPS consists of three pods named J, K, and L. These pods reside for part of the year in the inland waterways of Washington State and British Columbia (Strait of Georgia, Strait of Juan de Fuca, and Puget Sound), principally during late spring, summer, and fall. Pods visit coastal sites off Washington and Vancouver Island. Offshore movements and distribution are largely unknown for this DPS.

Critical Habitat
Critical habitat was proposed for the Southern Resident DPS of killer whales on 06/15/06 (50 FR 34571) and the final Critical habitat Rule was issued 11/29/06 (50 CFR Part 226). Killer whale habitat is not believed to be constrained by water depth, temperature or salinity. Three specific areas are designation: the summer core area in Haro Strait and waters around the San Juan Islands; Puget Sound; and the Strait of Juan de Fuca, spanning a total of 2560 square miles. Excluded are 18 military sites for national security purposes, comprising approximately 112 square miles.

Population Trends and Risks
Based on information collected mainly in summer seasons, the number of Southern Resident killer whales has never been large, numbering between 100 and 200 prior to 1960. Annual censuses of this DPS began in 1973. At that time live captures of these whales for the marine parks, reduced their numbers to fewer than 70 animals. All three of the pods were affected by this activity.

There are large differences in the survival rates of Southern Residents among different age and sex categories. Reproductive age females had the highest survival rate, followed by juveniles, post-reproductive age females, and young males. Calves and old males had the lowest survival rates.

The Southern Resident population has fluctuated considerably over the 30 years that it has been studied. In 1974 it comprised 71 whales, peaked at 97 animals in 1996, and then declined to 79 in 2001. The population now numbers in the high 80s.

The Southern Resident population is at risk for both incremental small-scale impacts over time (e.g. reduced fecundity or subadult survivorship) or to major catastrophe (e.g. oil spill or disease outbreak). The small size of this DPS makes it potentially vulnerable to allele effects (e.g. inbreeding depression) that could cause decline.

There are limited numbers of reproductive-age Southern Resident males and several females of reproductive age are not having calves. The factors causing the decline of Southern Residents are not well known. Some of the possible causes of decline are: reduced quantity and quality of prey; persistent pollutants that could cause immune or reproductive system dysfunction; oil spills; and noise and disturbance from vessels.

4.D. BIOLOGICAL REQUIREMENTS IN THE ACTION AREA[17]

The biological requirements of the Action Area related to listed species are those physical or biological features that are essential to conservation of the species. An accurate description of these features is best derived from the NMFS-FWS regulations for listed species and designated critical habitat which states that the agencies must consider those physical and biological features that are essential to the conservation of a given species (FR vol.71, no.229, 69060). These features are called Primary Constituent Elements (PCE) are described by NMFS-FWS for each listed fish species. The requirements related to PCEs include: 1) space for growth and normal behavior; 2) food, water, air, light necessary for physiological requirements; 3) cover/shelter; 4) sites for breeding, reproduction, and rearing; 5) habitats that are protected from disturbance or represent ecological distribution of species.

The PCEs for listed salmon species are similar among species and NMFS lists the same ones for the 12 ESU of west coast salmon and steelhead in Washington, Idaho, and Oregon (70 FR 52630 vol. 70 No. 170). The six PCEs for salmon are: 1) freshwater spawning sites with water quantity and quality conditions and substrate to support spawning, incubation, and larval development, 2) Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions; water quality and forage, and natural cover such as shade, large wood, side channels all necessary for juveniles to forage, grow and develop behaviors for survival; 3) freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover to support juvenile and adult mobility and survival; 4) estuarine areas free of obstructions with water quantity and quality and salinity to support both adult and juvenile physiological transition between fresh and salt water environments, cover, and forage; 5) nearshore marine areas free of obstruction with water quality and quantity conditions, forage, and cover; 6) Off shore marine areas with water quality conditions and forage.

There are no PCEs for the three rockfish species.

For Steller sea lion the habitat requirements are breeding rookeries, haulout sites, feeding areas, and nutritional requirements. Also terrestrial habitats adjacent to rookeries are important. FR (55 FR 49204).

There are no PCEs for the humpback whale.

For the killer whale, the PCEs are: 1) water quality to support growth and development, 2) sufficient quality and quantity of prey species, 3) sound levels that do not exceed thresholds that inhibit communication, 4) passage conditions to support migration and foraging (FR vol.71, No. 115 pg 34573).

[17] Life History information in this section is from the Washington BE for the 2003/2006 WQS Revisions, April 10, 2007. Please see that document for more information on the references cited within this section. The sources cited in this section are not included in the Reference section of this BE.

5. ENVIRONMENTAL BASELINE

Puget Sound is the action area for EPA's approval discussed in this Biological Evaluation. In 2000, approximately four million people lived in the Puget Sound region and this number is expected to grow to five million by 2020. Rapid urbanization has increased the human impact on Puget Sound, contributing to water pollution, sediments with toxic pollutants, declines in native species populations and their habitats, and closure of shellfish beds.[18] The environmental impacts of contamination from point sources (such as wastewater treatment facility discharges), and, increasingly, nonpoint sources (such as stormwater runoff) has adversely affected the water quality of Puget Sound.

Atlantic salmon rearing began in the 1970s; however, commercial facilities became prevalent between the mid 1980s to the mid 1990s in Puget Sound.[19] Ten commercial facilities were present in 2002 and eight currently exist. Puget Sound facilities appear to be in decline. Consolidation to a few large companies has been a characteristic of the finfish rearing industry which has been evidenced by all eight netpen facilities now owned by Icicle Acquisition Subsidiary, LLC. Similar consolidation has been occurring worldwide. Since the marine finfish rearing facility provision has been in Washington's SMS since 1996, and was in effect for CWA purposes after the Alaska Rule in 2000, EPA's approval is not likely to create a significant increase in facilities. In 2001, approximately 10 million pounds of Atlantic salmon were produced in Washington, in ten netpens. In British Columbia, where fish farms are more prevalent, 100 million pounds were produced in about 85 netpens of which 80% were Atlantic salmon.[20]

The primary habitat feature that may be affected by the proposed action is impact to the benthic community in Puget Sound directly under licensed marine finfish rearing facility and their sediment impact zones, which typically extend 100 feet outward from the facilities in each direction in compliance with WAC 173-204-412. These facilities may have an environmental effect on the seafloor due to the accumulation of nutrient-rich solids (e.g., uneaten food and fish feces). While sediment impacts are expected in these areas, no exceedances of the Washington's water quality standards are allowed, and therefore, no water column affects are expected or allowed. Water and sediment quality standards are important mechanisms to control pollutants in the action area to protect species dependent upon the aquatic environment. In this case, sediment quality standards related to marine finfish rearing facilities are evaluated as a point source permitted under the National Pollutant Discharge Elimination System (NPDES) and licensed/sited under Washington Department of Natural Resources (WDNR) regulations. EPA is proposing to approve the sediment standards applicable to marine finfish rearing facilities.

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[18] Puget Sound Action Team. About Puget Sound. Accessed online March 7, 2008. <http://www.psat.wa.gov/About_Sound/AboutPS.htm>

[19] Washington Department of Natural Resources. "Potential Offshore Finfish Aquaculture in the State of Washington." Technical Report, Aquatic Resources Division. May 1999. <http://www.fao.org/fi/gisfish/cds_upload/1142847098523_Ladenburg___Sturges_1999_210.pdf>

[20] Washington State Department of Fish and Wildlife. "Atlantic Salmon in Washington State." Fact Sheet. August 2001. <http://wdfw.wa.gov/factshts/atlanticsalmon.htm>

Water quality standards enhance the effectiveness of many of the state, local, and federal water quality programs, including point source permit programs, nonpoint source control programs, development of total maximum daily load limitations (TMDLs), and ecological protection efforts. Data acquired during chemical, physical, and biological monitoring studies is utilized in evaluating the quality of the State's waters and designing appropriate water quality controls. Waters identified as "water quality limited" are included on the 303(d) list, submitted to EPA biennially. None of the areas under currently sited for netpens are listed as impaired waters on Ecology's most recent 303(d) list.

More information is available at:
http://www.ecy.wa.gov/programs/wq/303d/2002/2004_documents/contam_sed_listings-2004.pdf

The 2004 Water Quality Assessment Category 5 Sediment Listings can be found at:
http://www.ecy.wa.gov/programs/wq/303d/2002/2004_documents/sediment_pdfs1105/sediment-110205-cat5.pdf

There are many Puget Sound monitoring reports and assessments related to sediment quality. Examples include:

"Puget Sound Ambient Monitoring Program 1992: Marine Sediment Monitoring Task"
Washington State Department of Ecology
http://www.ecy.wa.gov/pubs/9387.pdf

"Recommended Protocols for Sampling and Analyzing Subtidal Benthic Macroinvertebrate Assemblages in Puget Sound"
1987, EPA Region 10 and Puget Sound Water Quality Authority
http://www.psat.wa.gov/Publications/protocols/protocol_pdfs/benthos.pdf

"Sediment Quality in Puget Sound"
2002, Washington State Department of Ecology and NOAA
http://www.ecy.wa.gov/pubs/0203033.pdf

6. ANALYSIS OF EFFECTS

Implementing regulations (50 CFR 402.02) for the ESA Section 7 define "effects of the action" as:

> The direct and indirect effects of an action on the species or critical habitat together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR 402.02).

EPA's approval of Washington's revised sediment management standards and in particular the marine finfish rearing facility provision WAC 173-204-412, will not change the environmental baseline or directly affect ESA listed or proposed species. However, there are potential indirect effects to ESA listed or proposed species through NPDES permitting that includes the revised SMS provisions. Therefore, the effects analysis below describes the potential indirect effects from EPA's approval action.

There are three possible determinations of effects under the ESA (USFWS and NMFS 1998). The determinations and their definitions are:

- **No Effect (NE)** – the appropriate conclusion when the action agency determines its proposed action will not affect listed species or critical habitat.

- **May affect, but is not likely to adversely affect (NLAA)** – the appropriate conclusion when effects on listed species are expected to be discountable, or insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

- **May affect, likely to adversely affect (LAA)** – the appropriate conclusion if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. In the event the overall effect of the proposed action is beneficial to the listed species, but also is likely to cause any adverse effects, then the proposed action "is likely to adversely affect" the listed

species. An "is likely to adversely affect" determination requires formal section 7 consultation.

6.A. ANALYSIS OF EFFECTS FINDINGS

This analysis assumes there will not be a large increase in the number of netpen facilities in Puget Sound, that Atlantic salmon is the fish species reared in those netpen facilities, and that the regulatory structure remains intact. EPA's approval and ESA determinations are based on the following six key findings along with information contained within the recovery plans.

- The designated uses of Puget Sound are protected.
- Netpen facilities have an insignificant impact on aquatic life in Puget Sound.
- The existing regulatory framework for netpens provides protection to surrounding habitat and other species.
- The effects on the benthic community are accounted for and monitored.
- The closure procedures of netpen facilities ensure the aquatic environment is restored to baseline levels.
- The indirect effects of netpen facilities carry a low risk.

These six findings, described in further detail below, are supported by information contained in the following three documents:

1) "Beneficial Environmental Effects of Marine Finfish Mariculture" J.E. Rensel and J.R.M. Forster. July 2007.

This report discusses the findings of a NOAA survey that was conducted from 2004-2006 at a commercial netpen farm in northern Puget Sound. The study found that netpens in Puget Sound provide a beneficial effect since they provide enhanced habitat for diverse populations of invertebrates and seaweeds. Therefore, the biofouling associated with netpens can be considered "beneficial" to species diversity and richly-populated marine food webs. The study also found that vaccines are typically used in place of antibiotics, sea lice problems do not exist due to natural salinity levels and facility location accounts for depth and current conditions that distribute netpens wastes over large areas where it may be incorporated into the food web.

2) "Review of Potential Impacts of Atlantic Salmon Culture on Puget Sound Chinook Salmon and Hood Canal Summer-Run Chum Salmon Evolutionarily Significant Units" F. William Waknitz. June 2002.

This NOAA technical memorandum examines the impacts of Atlantic salmon netpens on threatened salmon species found in Puget Sound. The report finds that escaped Atlantic salmon present a low risk to infect wild salmon, a low risk to compete with wild salmon for food or habitat, and a low risk to adversely impact Essential Fish Habitat. The study also finds there to be little risk regarding: hybridization between Atlantic and Pacific salmon; colonization of wild salmon habitat; Atlantic salmon feeding on Pacific salmon;

pathogen transmission from Atlantic salmon to wild salmon; and, antibiotic-resistant bacteria development as a result of Atlantic salmon farming.

3) "The Net-pen Salmon Farming Industry in the Pacific Northwest" Colin Nash. September 2001.

This NOAA technical memorandum evaluates the risks associated with salmon netpen farming in the Pacific Northwest. This analysis finds the following issues carry the most risk: the impact of bio-deposits from farm operations on the environment beneath the netpens, the impact on benthic communities by the accumulation of heavy metals, and the impact on non-target organisms by the use of therapeutic compounds. Several of these issues have been addressed by Puget Sound facilities since this report was written in 2001. This memorandum finds several issues which carry a low risk: the physiological effect of low dissolved oxygen levels, the toxic effect of hydrogen sulfide and ammonia from netpen bio-deposits, the toxic effect of algal blooms, changes in the epifaunal community caused by the organic waste accumulation in sediments, the proliferation of human pathogens in the aquatic environment, the proliferation of fish and shellfish pathogens in the aquatic environment and the increased incidences of disease among wild fish. The technical memorandum also finds the escape of Atlantic salmon and the impact of antibiotic-resistant bacteria on native salmonids to carry very little or no risk.

6.A.1. The Designated Uses of Puget Sound are Protected

EPA's approval of the marine finfish rearing facility provision protects the designated uses of Puget Sound as a whole. Netpen facilities must meet Washington's water quality standards because no mixing area is permitted in the water column. These standards include Washington's narrative water quality criteria for toxic, radioactive, or other deleterious material concentrations that have the potential to adversely affect designated water uses, cause acute or chronic toxicity to biota, impair aesthetic values and adversely affect human health. (WAC 173-201A-260(2))

Refer to WAC 173-201A-210 for Marine water designated uses and criteria. (page 16)
Refer to WAC 173-201A-612 for Use designations for marine waters (pages 111-113)
http://www.ecy.wa.gov/pubs/0610091.pdf

In 1997, several environmental groups challenged Washington's Pollution Control Hearings Board (PCHB) issuance of marine finfish rearing facility NPDES permits for compliance with the CWA and the State Environmental Policy Act (SEPA). At the time, PCHB found that the

> Permittees' facilities do not create unresolved conflicts with alternative uses of Puget Sound resources as contemplated by RCW 43.32C.030(2)(e). The existence of commercial salmon farms as permitted uses does not preclude other beneficial uses in Puget Sound, such as shellfish harvesting, commercial or sport fishing, navigation or recreational boating. Likewise, the existence of the salmon farms does not operate to the exclusion of available resources, such as native salmon runs, sediment and water quality, or marine mammals. In short, salmon farming

> in Puget Sound does not present the citizens of the State of Washington with an 'either/or' choice with respect to other beneficial uses and important resources.[21]

This decision was upheld in a PCHB final ruling in November 1998.

In addition, EPA's approval of WAC 173-204-412(4)(b), allows Ecology to issue administrative orders and to issue permits that describe the establishment, maintenance and closure requirements of marine finfish rearing facilities. WAC 173-204-412 authorizes Ecology to increase the stringency of netpen requirements if the department discovers designated uses are not protected.

6.A.2. Netpen Facilities have an Insignificant Impact on Aquatic Life in Puget Sound

EPA's approval of the marine finfish rearing facility provision is expected to have an insignificant impact on the aquatic community of Puget Sound. The number of netpen facilities in Puget Sound total 0.061 square miles (including the 100-foot sediment impact zones) in size. When compared to the total size of Puget Sound – 2,800 square miles – the geographic impact of indirect effects from netpen facilities is expected to be low; i.e., less than 1% of Puget Sound.

The following is an excerpt regarding the total area currently permitted,

> In Washington now about 67.5 total hectares (ha) are leased by companies for commercial salmon net-pens, although not all the leased area is being used (WDNR 2001). The leased area extends to the perimeter of the anchoring system, so the actual area covered by floating structures is much less. The 10 commercial sites currently operational in Puget Sound have a total of 53 ha under lease from the State (ranging in size from 0.8 to 9.7 ha per site), with a total of 8.7 ha permitted for internal pen structures for all Puget Sound salmon farms combined.[22]

The sizes of the eight facilities are listed below in *Table 6-1*.

[21] Washington State Department of Ecology. NPDES Permit Factsheets for American Gold Seafoods, Inc. 2007.

[22] Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. "Review of Potential Impacts of Atlantic Salmon Culture on Puget Sound Chinook Salmon and Hood Canal Summer-Run Chum Salmon Evolutionarily Significant Units." NFMFS-NWFSC-53. June 2002. <http://www.nwfsc.noaa.gov/publications/techmemos/tm53/tm53.pdf>

Table 6-1 Permitted Atlantic Salmon Netpen Facilities in Puget Sound.

Facility *	Netpen Area (in feet)	Square Feet	Square Feet of Netpen Area plus 100 foot SIZ	Minimum Water Depth at Site ^
Clam Bay	990 x 185	183,150	310,650	63 feet
Fort Ward	650 x 185	120,250	213,750	35 feet
Orchard Rocks	900 x 185	166,500	285,000	40 feet
Deepwater Bay #1	352 x 190	66,880	131,080	55 feet
Deepwater Bay #2	440 x 190	83,600	156,600	55 feet
Deepwater Bay #3	540 x 190	102,600	185,600	95 feet
Hope Island	440 x 120	52,800	118,800	60 feet
Ediz Hook	900 x 190	171,000	290,000	65 feet
Total		946,780 (8.79 hectares)	1,691,480 (15.7 hectares)	

^ Depths are given at Mean Lower Low Water (MLLW). MLLW is defined as the average height of the lower low waters over a 19-year period. (Ecology)

All facilities owned by Icicle Acquisition Subsidiary, LLC.
Areas determined from Washington State Department of Ecology. NPDES Permit Factsheets for American Gold Seafoods, Inc. 2007. (Modified to change ownership to Icicle Acquisition Subsidiary, LLC).

Total area of Puget Sound: 2,800 square miles[23] or 725,197 hectares.

Total area of netpens with sediment impact zone: 0.061 square miles.

Note: The following types of facilities are not covered by this action: 1) 'Short term' Tribal salmon rearing facilities. These facilities are hatcheries that raise Pacific salmon for three to four months than release them into the wild. There are approximately ten of these facilities. 2) Pacific salmon hatcheries. In 2005, there were 72 of these facilities operated by WDFW and 12 by private industry.[24]

The regulation allows for a 100 foot (approximately 30 meters) sediment impact zone allowed in each direction of the netpen facility. This is consistent with what is allowed in British Columbia and Maine. Similar to a mixing zone, within the SIZ the benthic infaunal criteria is unlikely to be met. An EPA issued NPDES permit in 2002 for Acadia Aquaculture, Inc. in Maine calculated a 30 meter impact zone based on the site's average water depth, average current velocity, prevailing current directions and an established settling rate of feed pellets. Washington NPDES permits for netpen facilities accounted for similar factors in determining the 100 foot sediment impact zone. In addition, NOAA studies indicate that statistically significant increases of nitrogen in the water column do not extend beyond 30 meters from salmon farms in Puget Sound.

[23] Puget Sound Action Team. About Puget Sound. Accessed online March 7, 2008. <http://www.psat.wa.gov/About_Sound/AboutPS.htm>
[24] Washington State Department of Ecology. "Upland Fin-Fish Hatching and Rearing NPDES General Permit Fact Sheet." June 1, 2005. <http://www.ecy.wa.gov/programs/wq/permits/permit_pdfs/upland_fin_fish/FinFishHatchery_Factsheet.pdf>

Therefore, due to the limited geographical scope of the netpen operations, the designated uses of Puget Sound are protected as a whole.

6.A.3. The Existing Regulatory Framework for Netpen Facilities Provides Protection to Surrounding Habitat and Other Species

EPA's approval of the marine finfish rearing facility provision is based on the understanding that implementation of the sediment quality standards will be conducted through the NPDES permit process. The NPDES permits provide an extensive evaluation to ensure aquatic life in Puget Sound is protected. Ecology reviews and reissues NPDES permits every five years. The current NPDES permits for marine finfish rearing facilities in Puget Sound cover a variety of requirements including the following:[25]

- Monitoring requirements
  - Monitoring schedule
  - Sediment sampling and analysis plan
  - Exceedance monitoring
  - Enhanced sediment quality monitoring
  - Dissolved oxygen profile (in summer)
  - Underwater photographic survey
  - Antibiotic resistance monitoring
- Reporting/Recordkeeping requirements
- Sediment impact zone closure requirements
- Operating requirements
  - General operating requirements
  - Disease control chemical use requirements
- Pollution prevention plan
- Fish release prevention and monitoring plan
- Accidental fish release response plan

In addition to the NPDES permits, several other state and local agencies play an important role in regulating the industry. Washington Department of Fish and Wildlife (WDFW) manages the disease control, salmon stocks and escape risks. WDNR covers the permitting procedures for netpen siting.[26] WDNR requires extensive data, a thorough cost analysis and site specific information to evaluate a location's feasibility as an offshore farm. Although these important regulations do not appear in the marine finfish rearing facility provision itself, they are part of the comprehensive structure that regulates netpens in Washington State.

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[25] Washington State Department of Ecology. NPDES Permits for American Gold Seafoods, Inc. 2007. <http://www.ecy.wa.gov/programs/wq/permits/northwest_permits.html>

[26] Washington State Department of Natural Resources. Aquaculture Leasing Statutory and Regulatory Framework. Revised Code of Washington (RCW). Accessed online March 10, 2008. <http://www.dnr.wa.gov/Publications/aqr_aqua_rcw_wacs.pdf>

A brief overview of the regulatory structure for marine finfish rearing facilities follows: [27]

- *Washington State Department of Fish and Wildlife (WDFW)*: manages regulatory authority for commercial aquaculture disease control, escapment and stocks of fish reared in netpens.
- *Washington State Department of Agriculture*: develops regulations with WDFW for commercial aquaculture.
- *Washington State Department of Ecology*: regulates discharges from netpens by issuing NPDES permits that contain operational conditions to protect water quality and sediment standards.
- *Environmental Protection Agency*: approves or disapproves Ecology's water quality and sediment standards.
- *Washington State Department of Natural Resources*: leases aquatic lands for netpen facilities.
- *Counties in Washington State (and sometimes local jurisdictions)*: issues shoreline permits.
- *Tribes of Washington State*: co-manages natural resources in Washington State and have input into aquaculture disease control regulations adopted by WDFW.
- *National Marine Fisheries Service (NMFS)*: administers Endangered Species Act for anadromous salmonids and marine mammals.
- *U.S. Department of Fish and Wildlife (USFWS)*: administers Endangered Species Act for bull trout in Puget Sound.
- *Army Corps of Engineers*: requires netpens to have a Section 404 navigation permit.

In conclusion, there is an extensive multiagency structure to ensure that netpen operations in Puget Sound meet appropriate regulations from site location to site closure.

6.A.4. The Affects on Benthic Communities are Accounted for and Monitored

The marine finfish rearing facility provision focuses primarily on the affects of these facilities on the benthic community in Puget Sound. WAC 173-204-412 grants netpen facilities a sediment impact zone (SIZ) where the sediment quality standards can be exceeded for the size of the facility plus 100 feet on each side of the netpen. The impact of bio-deposits (i.e. fish feces and uneaten food) from netpen operations on benthic communities was identified as a potential risk by NOAA.[28] The risk to the health of benthic communities in Puget Sound near netpen facilities is required to be monitored in WAC 173-204-412. The health of benthic communities near netpen facilities is heavily influenced by the amount of food that settles to the sea floor below netpens and the density of fish in the netpens.

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[27] Washington State Department of Ecology. NPDES Permit Factsheets for American Gold Seafoods, Inc. 2007.

[28] Nash, C.E. NOAA Fisheries Technical Memorandum. "The Net-pen Salmon Farming Industry in the Pacific Northwest." NFS-NWFSC-49. September 2001. <http://www.nwfsc.noaa.gov/publications/techmemos/tm49/tm49.pdf>

Feeding is typically monitored by facility operations and the NPDES permits state that fish must be feed in a manner which maximizes ingestion, accounts for fish size and digestibility. Rearing density in Washington netpen facilities are from 1 to 1.5 pounds of fish per cubic foot.[29] This density average is about one-half to two-thirds less than typical Atlantic salmon farms.[30]

As a result, benthic monitoring is an appropriate indicator to determine the environmental impact of netpen facilities and NPDES permit compliance. In accordance with WAC 173-204-412(3)(a), new facilities must determine a baseline of benthic infaunal abundance, total organic carbon (TOC) and grain size which is essential for protecting designated uses when a new netpen facility is permitted. Existing facility sediment quality monitoring data must be within a statistically significant range to the reference values for total organic carbon in Puget Sound or the baseline established when the facility was first permitted. These TOC values are listed in Table 1 of WAC173-204-412(3)(b) and appear to based on Ecology's "Puget Sound Ambient Monitoring Program 1992: Marine Sediment Monitoring Task." WDNR required sediment monitoring under the aquatic land leases from 1987 to 1996 and concluded that sediment grain size and water depth were primary in determining an undisturbed benthic infaunal community. In addition, they found that the "redox potential and health of the infaunal community associated with a particular sediment grain size distribution appears well correlated with the level of TOC in the sediments (Striplin Environmental Associates 1996, Goyette and Brooks, 1999)."[31] As a result, TOC reference values appear to be an accurate and applicable manner to monitor benthic infaunal abundance. This is emphasized by NOAA, which states that "TOC is important because fish feces and wasted fish feed contain carbon that demand oxygen during bacterial and food web respiration and assimilation."[32]

The impact on the benthic community can be significantly lowered through facility siting regulations. The major factors that affect solids accumulation are the water current, water depth, loading density, feeding rates, and the length of yearly operations – all of which are accounted for in the NPDES permits. Deep water sites and well-flushed sites can affect the accumulation of organic wastes in the sediment that can alter benthic abundance and diversity.[33] [34] At well-flushed sites with high current, the abundance and

[29] Washington State Department of Ecology. NPDES Permit Factsheets for American Gold Seafoods, Inc. 2007.
[30] American Gold Seafoods, Inc. Accessed online March 4, 2008. <http://www.americangoldseafoods.com/index.html>
[31] Washington State Department of Ecology. "Response to Comments for the 2007 Draft Marine Salmon Netpen NPDES Permits for American Gold Seafoods, Inc." Northwest Regional Office. October 22, 2007. <http://www.ecy.wa.gov/programs/wq/permits/permit_pdfs/american_gold/clam_bay/AmGoldSea_ResponsivenessSummary.pdf>
[32] Rensel, J.E. and J.R.M. Forster. "Beneficial Environmental Effects of Marine Finfish Mariculture." NOAA. 2007.
[33] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001.
[34] Washington Department of Natural Resources. Technical Report. 1999.

diversity of benthic organisms is positively correlated with organic carbon, which suggests netpen facilities could even stimulate benthic communities.[35]

If netpen facilities do not meet the baseline or reference values, additional source control and NPDES permitting addresses non-compliance. WAC 173-204-412(4)(a) makes the requirements more stringent for facilities that are authorized a sediment impact zone beyond 100 feet by applying additional criteria for benthic abundance. The benthic abundance criteria, WAC 173-204-420 (3)(c)(iii), requires that sediment impact zone maximum biological effects level are established as that level below which any two of the biological tests in any combination exceed the criteria of WAC 173-204-320(3), or one of the following biological test determinations is made:

- the test sediment has less than 50% of the reference sediment mean abundance of any two of the following major taxa: Class Crustacea, Phylum Mollusca or Class Polychaeta; or
- the test sediment abundances are statistically different (t test, $p \leq 0.05$) from the reference sediment abundances.

As explained above, benthic abundance monitoring is the appropriate method for determining the impact of sediment quality by netpen facilities. Extensive monitoring is required in NPDES permits for netpen facilities to ensure benthic impacts do not extend beyond the authorized sediment impact zone.

Finally, there is no evidence available that allowing impact to small areas of benthic communities adversely affects any of the listed or threatened species in this Biological Evaluation. In two NOAA technical memorandums[36] assessing the risks of Atlantic salmon rearing facilities on the aquatic environment of Puget Sound, no mention is made of the potential of benthic infaunal abundance to be a risk to endangered species, including Pacific salmon. NOAA assigned the possibility of changes in the epifaunal community as carrying a low risk, stating that epifuanal communities have been studied in detail and one study that was conducted for ten years revealed significant numbers of fish, shrimp, and other megafuana habituated the site.[37] In addition, NOAA claims elsewhere that there may be beneficial environmental effects associated with netpen farming in Puget Sound. For example, a NOAA study from 2004-2006 found that netpens in Puget Sound support a diverse group of over 100 species of seaweeds and invertebrates, which are important for the local food web and can be considered a beneficial effect of fish farming.[38]

[35] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001.
[36] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001. Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. NFMFS-NWFSC-53. 2002.
[37] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001.
[38] Rensel, J.E. and J.R.M. Forster. "Beneficial Environmental Effects of Marine Finfish Mariculture." Prepared for NOAA National Marine Fisheries Service. NOAA Award # NA04OAR4170130. July 22, 2007.

6.A.5. The Closure Procedures of Netpen Facilities Ensure the Aquatic Environment is Restored to Baseline Levels

The goal of closure requirements is to return the sediment quality to baseline levels prior to a netpen facility's operation at a given location.[39] Closure requirements under WAC 173-204-412(3)(e) mitigate for sediment impacts after a netpen facility is no longer operational. Finfish rearing facilities typically do not have a toxic impact on sediments since the main sediment impact is caused by organic materials from uneaten fish food and fish feces. As a result, sediment quality standards for netpen facilities are based on total organic carbon values, which are an appropriate measurement to determine effects of the accumulation of organic materials on benthic infaunal abundance. These values are found in Table 1 at WAC 173-204-412(3)(b).

There are two main concerns that could affect closure regarding heavy metals in the sediment below netpens, copper, which is used in marine anti-fouling compounds and zinc from fish feed.[40] Regarding copper, WDNR noted that chemical anti-fouling agents were not used in Washington, eliminating the associated risk related to copper.[41] Zinc is considered an essential mineral element for salmon nutrition. However, its concentration in dry fish feed is routinely tested and the results have been negative for metals.[42] Furthermore, monitoring required by a NDPES permit for the Ediz Hook location (which is representative of all facilities) found all copper and zinc data were below cleanup screening levels and sediment quality standards.[43] Therefore, closure and cleanup is generally straightforward since toxics are not typically present in the sediment below the facilities.

6.A.6. The Indirect Effects of Netpen Facilities Carry a Low Risk

There are several other indirect effects which have been identified and commonly associated with netpen facilities. Although these indirect effects are admittedly problems in other areas of the world, they cannot be readily applied to Washington's situation due to the regulatory framework, site location restrictions, small quantity of netpen facilities, and geographical features of Puget Sound. While these could be considered outside the scope of WAC 173-204-412, reports have indicated these indirect effects have a low risk and are therefore addressed. The indirect effects include:

Dissolved oxygen / Phytoplankton blooms

Dissolved oxygen monitoring is required in the NPDES permit for marine netpen facilities. NOAA assigned low risk to the physiological effect of low dissolved oxygen on other biota in the water column. Since salmon are sensitive to dissolved oxygen, a localized dissolved oxygen effect would first show up in the farmed salmon.[44] Another

[39] Washington State Department of Ecology. NPDES Permit Factsheets for American Gold Seafoods, Inc. 2007.
[40] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001.
[41] Washington Department of Natural Resources. Technical Report. 1999.
[42] Washington State Department of Ecology. Response to Comments for the 2007 Netpen Draft NPDES Permits. 2007.
[43] Washington State Department of Ecology. NPDES Permit Factsheets for American Gold Seafoods, Inc. 2007.
[44] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001.

common concern related to netpen facilities is nitrate induced organic enrichment which may result in excessive phytoplankton growths or blooms in nutrient sensitive waters. In 1986, Ecology rated all subareas of Puget Sound for nutrient sensitivity and none of the commercial netpens are located in these waters.[45] There is no evidence of netpen facilities causing blooms in the Puget Sound area.[46] Furthermore, several studies have concluded that there is no measurable effect of phytoplankton production near salmon farms in Puget Sound.[47] NOAA states the likelihood of the enhancement of a harmful algal bloom caused by the inorganic nutrients discharged from netpen facilities in Puget Sound to be highly unlikely due the natural atmospheric and geographical parameters, such as limited light availability due to the higher latitudes of the Pacific Northwest.[48]

Disease transmission /Antibacterial usage / Sea Lice

The increased incidence of disease among wild fish is considered a low risk by NOAA and there have been few documented cases of this actually occurring. NOAA states, "the specific diseases and their prevalence in Atlantic salmon stocks cultured in net pens in Puget Sound are not shown to be any different than those of the more numerous cultured stocks of Pacific salmon in hatcheries, which in turn are not known to have a high risk for infecting wild salmonids."[49] Furthermore, WDFW requires fish growers to report the presence of certain listed pathogens, permits the transfer of fish into netpens and requires review of the stock disease history.[50] Also, WDNR states that there is no risk of farmed fish transferring disease to shellfish since fish pathogens are distinct from invertebrate pathogens.[51] NOAA also states that there is little risk that existing Atlantic salmon stocks will be a vector for the introduction of an exotic pathogen to Puget Sound.[52]

Antibiotic usage in netpen facilities is regulated by the US Food and Drug Administration (USFDA) and WDFW. Antibacterial usage has been decreasing according to monitoring required by the NPDES permits.[53] NOAA notes that "there is little risk that the development of an antibiotic-resistant bacteria in netpen salmon farms or Atlantic salmon freshwater hatcheries will impact native salmonids, as similar antibiotic resistance often observed in Pacific salmon hatcheries has not shown to have a negative impact on wild salmon." Some of these compounds have been used in Washington for 40 years without adverse impacts.[54] In addition, "case studies show that some of these compounds can be detected in sediments close to the perimeter of netpen farms, but the levels resulting from

[45] Washington State Department of Ecology. NPDES Permit Factsheets for American Gold Seafoods, Inc. 2007.
[46] Washington Department of Natural Resources. Technical Report. 1999.
[47] Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. NFMFS-NWFSC-53. 2002.
[48] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001.
[49] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001.
[50] Washington State Department of Ecology. Response to Comments for the 2007 Netpen Draft NPDES Permits. 2007.
[51] Washington Department of Natural Resources. Technical Report. 1999.
[52] Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. NFMFS-NWFSC-53. 2002.
[53] Washington State Department of Ecology. Response to Comments for the 2007 Netpen Draft NPDES Permits. 2007.
[54] Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. NFMFS-NWFSC-53. 2002.

their authorized use do not show significant widespread adverse affects on either pelagic or benthic resources."[55]

Sea lice refer to several species of parasitic copepods found in marine environments. The most common species of sea lice reported on wild and farmed salmon are *Lepeophtheirus salmonis*, which infects salmonids only, and *Caligus clemensi* or *Caligus elongatus*, which infects a broad range of fish species including salmonids.[56] The role of Atlantic salmon reared in netpens as a source of infective sea lice to wild salmon has been studied for decades in Europe with significant disagreement in research findings.[57]

In general, there is little agreement about the factors that influence sea lice propagation and transmission from netpen operations to wild salmon. Studies in Ireland[58] and in British Columbia[59] have attempted to link higher infestation rates of wild salmonids to areas where farmed salmon are present. Others have challenged the conclusions in these reports through additional research.[60] Many risk factors potentially influence sea lice abundance. These risk factors, which contribute variability to sea lice incidence and lethality, include geographic location, channel morphology and currents, salinity and temperature, presence of large and healthy runs, and the size of wild salmon populations.[61] In addition, the density of fish in the netpens may also be a contributing factor to sea lice infestation. For example, one study found that fewer Atlantic salmon resulted in lower abundance and prevalence of *L. salmonis* on juvenile pink salmon and chum near salmon farms.[62]

Temperature and salinity have been the topic of extensive research as they relate to sea lice life stages which, in turn, determine abundance. Most research indicates that sea lice infections increase in years where temperatures of seawater are higher and salinity is higher.[63] However, studies looking at sea lice abundance and salinity/temperature

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[55] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001.
[56] Undated. "Sea Lice Fact Sheet." Aquaculture Association of Canada. http://www.aquacultureassociation.ca/sites/default/files/Sea%20Lice%20Fact%20Sheet.pdf
[57] Brooks, Kenneth M. "An Assessment of the Threat to Pink Salmon (*Oncorhynchus gorbuscha*) Runs in the Broughton Archipelago of British Columbia, Canada Posed by Sea Lice (*Lepeophtheirus salmonis*) Infections Originating on Cultured Atlantic Salmon (*Salmo salar*)." Aquatic Environmental Sciences. June 1, 2003.
[58] Tully, O., Gargan, P., Poole, W.R., and Whelan, K.F. 1999. "Spatial and temporal variation in the infestation of sea trout (*Salmo trutta* L.) by the Caligid Copepod *Lepeophtheirus salmonis* (Kroyer) in relation to sources of infection in Ireland." Parasitology 119:41
[59] Krkosek, M., Ford, J.S., Morton, A., Lele, S., Myers, R.A., and Lewis, M.A. 2007. "Declining Wild salmon populations in relation to parasites from farm salmon." Science. 318: 1772-1775
[60] Brooks, K.M., and Jones, S.R.M. 2008. "Perspectives on pink salmon and sea lice: scientific evidence fails to support the extinction hypothesis." Reviews in Fisheries Science. 16(4): 403-412
[61] Gallaugher, Patricia, Jennifer Penikett and Laurie Wood. "Scientists' Roundtable on Sea Lice and Salmon in the Broughton Archipelago Area of British Columbia." Conveners Report. November 18, 2004.
[62] Orr, Craig. "Estimated Sea Louse Egg Production from Marine Harvest Canada Farmed Atlantic Salmon in the Broughton Archipelago, British Columbia, 2003-2004." North American Journal of Fisheries Management 2007. Vol. 27; p. 187-197.
[63] Brooks, Kenneth M. "A Comparison of Some Environmental Costs Associated with Netpen Culture of Fish with Some Other Forms of Food Production." Aquatic Environmental Sciences. <http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5064654>

interactions have found varying results. On the one hand, Saksida found that factors such as the age of the salmon populations, location of farms and time of year had a significant effect on abundance, while temperature and salinity did not.[64] On the other hand, Boxaspen found geographical influences on the prevalence of sea lice to be unclear, but presumed temperature and salinity to be important factors.[65] A study done off the Norwegian Skagerrak coast found that salinity was statistically related to the presence of *C. elongates* and *L. salmonis*, but temperature appeared to be less important for the abundance of lice.[66] Brooks concluded that Krkosek failed to adequately account for salinity and temperature in drawing relationships between sea lice transmission and farmed fish in British Columbia.[67] [68]

Salinity in particular has often been linked to sea lice survival and abundance. Brooks recaps the commonly cited literature: "Wadsworth (1999) summarized information indicating that adults die rapidly at salinities less than 12 parts per thousand and that while eggs hatch successfully at salinities as low as 15 parts per thousand, survival was nil. Survival improved at 20-25 parts per thousand, but that development to the copepodid stage was negligible. Complete development to the copepodid stage was only achieved at salinities greater than 30 parts per thousand and even then it varied greatly." This is consistent with findings by Bricknell et al., which found that survival of free-swimming copepodids is severely reduced below 29 parts per thousand.[69] Brooks asserts that the research done in the Broughton Archipelago may be associated with salinity fluctuations and their relationship with rainfall/snowmelt in the spring and glacier melt in the summer and fall.[70] In a recent concurrence letter, NMFS stated that although the salinity levels of Puget Sound vary, the upper surface layers of Puget Sound are well below 25 parts per thousand during most of the year due to the many rivers and streams entering this large estuary.[71] NMFS believes this explains why the levels of sea lice have

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[64] Saksida, S, et al. "Differences in *Lepeophtheirus salmonis* Abundance Levels on Atlantic Salmon Farms in the Broughton Archipelago, British Columbia, Canada. Journal of Fish Diseases 2007. Vol. 30; p. 357-366.

[65] Boxaspen, Karin. "A Review of the Biology and Genetics of Sea Lice." ICES Journal of Marine Science 2006. Vol. 63; p. 1304-1316.

[66] Heuch, P.A. et al. "Salinity and Temperature Effects on Sea Lice Over-Wintering on Sea Trout (*Salmo trutta*) in Coastal Areas of the Skagerrak." Journal of the Marine Biological Association of the UK 2002. Vol 82; p. 887-892.

[67] Brooks, K.M. 2005. "The effects of water temperature, salinity, and currents on the survival and distribution of the infective copepod stage of sea lice (*Lepeophtheirus salmonis*) originating on Atlantic salmon farms in the Broughton Archipelago of British Columbia, Canada." Reviews in Fisheries Science 13:177-204

[68] Brooks, K.M. and Stucchi, D.J. 2006. "The effects of water temperature, salinity and currents on the survival and distribution of the infective copepodid stage of the salmon louse (*Lepeophtheirus salmonis*) origination on the Atlantic salmon farms in the Broughton Archipelago, British Columbia, Canada (Brooks, 2005) – a response to the rebuttal of Krkosek at al. (2005)." Reviews in Fisheries Science 14:13-23

[69] Bricknell, I.R., Dalesman, S.J., O'Shea, B.O, Pert, C.C., Luntz, A.J.M., 2006. "Effect of Environmental salinity on sea lice *Lepeophtheirus salmonis* settlement success," Diseases of Aquatic Organisms 71:201-212.

[70] Brooks, Kenneth M. Aquatic Environmental Sciences. June 1, 2003.

[71] March 16, 2010. Letter from Barry A. Thom, Acting Regional Administrator, Northwest Region, NMFS to Michelle Walker, Chief, Seattle Regulatory Branch, U.S. Army Corps of Engineers Re: ESA and EFH Consultation for American Gold Seafoods Net-Pen Array Relocation.

been much lower in Puget Sound compared to other regions of the world.[72] Areas outside of Puget Sound with high concentrations of netpens typically have higher salinity levels.

Despite the large amount of research on the variables that cause sea lice outbreaks, uncertainty remains about the relationship between temperature, salinity, and the abundance of sea lice. As evidenced by the research summarized above, temperature and salinity are likely influencing factors but many other variables may also affect the abundance of sea lice. Considered in isolation from other variables, historical temperature and salinity data from EPA's STORET database[73] suggest that Puget Sound may be capable of supporting sea lice. However, the temperature and salinity conditions of Puget Sound, combined with other factors that may affect sea lice abundance (e.g., geography, currents, population size, etc.) appear to have allowed Puget Sound to avoid the sea lice issues that other parts of the world with netpen operations have experienced. This conclusion is supported by the observation that sea lice have not been a significant problem in Puget Sound, even during drought years when salinity has been higher.[74] In general, the wide range of data and research appear to be inconclusive in developing detailed and definitive trends among the many potential variables that can contribute to sea lice outbreaks. Most importantly, there is no empirical evidence that sea lice have been a problem in Puget Sound and therefore any effects on listed species would be discountable. NMFS confirms this by stating that there have been no known episodes of sea lice outbreaks in Puget Sound affecting wild Pacific salmon populations indigenous to Puget Sound.[75]

To ensure sea lice does not become problematic in Puget Sound, the implementation procedures required by Ecology for NPDES permitting account for sea lice. In writing the permits, Ecology conducted literature reviews and consulted with WDFW to confirm that the sea lice problems occurring in British Columbia are not occurring in Puget Sound. Ecology will follow recently funded studies on sea lice monitoring in the Broughton Archipelago; and Ecology will also collaborate with WDFW to monitor sea lice at the currently located netpen facilities as required by the NPDES permits.[76] Personal communication between EPA and Ecology staff confirmed that the facilities Ecology inspected had current sea lice monitoring logs which are designed to record any increase in occurrence, infestations, outbreaks or situations where sea lice appear to be impacting fish health. Upon inspection, these logs did not indicate increases above

[72] Communication with Kevin Amos, NOAA Fisheries, National Aquatic Animal Health Coordinator. 2009. (Cited in NMFS concurrence letter dated March 16, 2010.)
[73] September 5, 2008. Amended Complaint Document. Exhibits E and F. *Wild Fish Conservancy v. U.S. EPA*, 08-cv-00156 (W.D. Wash).
[74] Washington State Department of Ecology. "Response to Comments for the 2007 Draft Marine Salmon Netpen NPDES Permits for American Gold Seafoods, Inc." Northwest Regional Office. October 22, 2007.
[75] Communication with Kevin Amos, NOAA Fisheries, National Aquatic Animal Health Coordinator. 2009. (Cited in NMFS concurrence letter dated March 16, 2010.)
[76] Ibid.

normal levels of sea lice which would trigger NPDES permit requirements to report these findings to Ecology and WDFW within one week.[77]
EPA staff also conducted a review of 217 publications relating to marine finfish rearing, collected by the Wild Fish Conservancy ("WFC") and submitted to NMFS on June 12, 2008.[78] EPA found that the large majority of the publications were not specifically relevant to marine finfish rearing in Puget Sound. In fact, one of the few publications specific to Washington state, is consistent with the information provided in this BE supporting EPA's determinations.[79] None of the information presented in the publications clearly documented that biotic effects of netpens on benthic sediments have the potential to adversely affect salmonids or other threatened and endangered species in Puget Sound.[80]

EPA staff also reviewed additional materials that were submitted by WFC (certain legal exhibits) and NMFS (discussion of exhibits by a staff scientist) in the course of prior litigation relating to the SMS.[81] The exhibits submitted by WFC included photographs of fish with sea lice and a chart that WFC obtained from WDFW, apparently documenting sea lice incidence at an Atlantic salmon fish processing plant. After reviewing the exhibits and associated NMFS discussion, EPA does not find these exhibits supply relevant scientific information linking sea lice and netpen operations in Puget Sound. Specifically, the NMFS discussion noted that the photos do not constitute scientific evidence of sea lice incidence or transmission in Puget Sound. Furthermore, and consistent with NMFS' discussion, EPA does not find that the submitted chart documents an elevated incidence of sea lice in farmed salmon.

Escape / Hybridization / Competition
Since 2000, there has been only one escapement event in Puget Sound since best management practices have helped prevent the unintentional release of Atlantic salmon from netpens. During the last permit cycle, all eight netpen sites in Puget Sound installed fish containment nets with a heavier nylon material. Therefore, the potential for another escape event has been greatly reduced by the actions of the permittee.[82]

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[77] Personal communication between Matthew Szelag, EPA and Lori Levander, Department of Ecology, November 21, 2008.
[78] NMFS notified EPA of this letter and provided them the CD with the list of publications on June 12, 2008. Personal communication between Matthew Szelag, EPA and Matt Longenbaugh, NMFS, June 12, 2008.
[79] Rensel. Jack. J.E. Undated powerpoint slides. "Water Quality and Sediment Impact Management of Finfish Net Pens in Washington State."
[80] This analysis is provided in the following document and enclosure summarizing each publication. September 17, 2008. Memorandum from Matthew Szelag, EPA, to the Record, Re: Analysis of Additional Publications Provided by Wild Fish Conservancy (WFC) to National Marine Fisheries Service and U.S. Fish and Wildlife Service (the Services) on June 12, 2008.
[81] Exhibits filed with "Plaintiff's Motion to Complete and Supplement the Administrative Record," July 2, 2009. Declaration of Kevin H. Amos, filed with "Federal Defendants' Opposition to Plaintiff's Motion to Supplement the Administrative Record," August 21, 2009. Both documents filed in *Wild Fish Conservancy v. U.S. EPA*, 08-cv-00156 (W.D. Wash).
[82] Washington State Department of Ecology. Response to Comments for the 2007 Netpen Draft NPDES Permits. 2007.

NOAA has found that there is little risk that escaped Atlantic salmon will hybridize with Pacific salmon.[83] In addition, there is no evidence of Atlantic salmon - Pacific salmon hybrids in nature.[84] WDFW states that if such a rare event should occur in the wild, the offspring would be incapable of reproduction.[85]

With regard to competition between escaped Atlantic salmon to native wild salmon, NOAA has determined low to little risk for the following: [86] [87]

- The risk that escaped Atlantic salmon will compete with wild salmon for food or habitat is low, considering their well-known inability to succeed away from their historic range.
- There is little risk that Atlantic salmon will colonize habitats in the Puget Sound Chinook salmon and Hood Canal summer-run chum salmon ESUs.
- There is little risk that escaped Atlantic salmon will prey on Pacific salmon.

These findings of low risk are also similarly supported by WDFW.[88]

6.A.7. Puget Sound Salmon Recovery Plan

Volume I. (page 366)
Volume I of the Puget Sound Salmon Recovery Plan contains the following statement about netpen operations.

"Concerns associated with the net pens are the potential release of non-native species and water quality impacts." (pg. 366)

This statement summarizes a potential issue with netpens. EPA is aware of these issues and has addressed them in this BE. Release of non-native species was addressed in this BE, in section 6.A.6. EPA has also reviewed several sources that address escape of farmed salmon, including NOAA's technical memorandums, which determine that escape is a low risk to wild salmon.[89] The Salmon Recovery Plan does not document any adverse effect on chinook salmon resulting from escaped Atlantic salmon in Washington or elsewhere.[90] Water quality impacts, such as those to aquatic life and benthic species, are addressed throughout the BE since these are the primary rationale for developing sediment management standards and the associated regulatory language concerning marine finfish operations within those standards. These are discussed in further detail in section 6.A.2. and 6.A.4 along with indirect effects to water quality such as dissolved oxygen and phytoplankton blooms in section 6.A.6.

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[83] Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. NFMFS-NWFSC-53. 2002.
[84] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001.
[85] Washington State Department of Fish and Wildlife. Fact Sheet. 2001.
[86] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001.
[87] Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. NFMFS-NWFSC-53. 2002.
[88] Washington State Department of Fish and Wildlife. Fact Sheet. 2001.
[89] Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. NFMFS-NWFSC-53. 2002. pages 65-66.
[90] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001. page 90.

Volume II. Nearshore chapter. June 28, 2005. (page 4-28, 4-30)
The nearshore chapter of the recovery plan states that commercial netpen salmon farms are a possible activity that may contribute to the alteration of biological populations and communities.

"Stressor: alteration of biological populations, communities
Examples of activities contributing to this stressor: aquaculture (net pens)

Working hypotheses
1. poor finfish aquaculture practices can negatively affect juvenile salmon through increased water quality degradation and introduction of diseases to wild populations.
…
4. poor aquaculture practices can negatively affect juvenile salmon through introduction of new aquatic nuisance species and increased competition for a limited prey base in the case of escapes from net pens."

Table on page 4-34: Effects of alteration of biological populations and communities on ecosystems and salmon and bull trout functions

Activities	*Effects on nearshore and marine ecosystem processes and habitats*	*Hypothesized effects on salmon and bull trout functions*
Aquaculture (net pens)	• *introduction of diseases* • *introduction of non-native species* • *possible increased nutrient loading contributing to eutrophication*	• *increased susceptibility to disease mortality* • *increased competition from escaped Atlantic salmon for breeding and rearing habitat* • *potential for localized hypoxia mortality*

The nearshore chapter discusses some of the potential stressors to listed salmon from poor aquaculture practice. The nearshore chapter also states general concerns from poor aquaculture practices, including water quality, disease, competition and escapement. As discussed in this BE in section 6.A.3., multiple agencies regulate netpens in Puget Sound. The potential effects listed in this section of the recovery plan are also addressed in the NPDES permits and discussed throughout this BE. While the Salmon Recovery Plan speculates as to the potential effects of poor aquaculture practices on listed species, there is no evidence in the Salmon Recovery Plan or elsewhere that these effects are occurring in Puget Sound.

In addition, there is a reference in nearshore chapter on page 4-30 to accidental release of fish from a netpen in 1997 and a discharge of visible solids in 1997.

"Fish can escape from aquaculture facilities and become an ecological problem. In the case of salmon farms, fish can escape in small numbers from "operational leakage," and in large numbers from damage to pens due to storms, human error, and so on. Examples

of big escapes include an episode of 300,000 salmon escape from a Washington farm in an accident in 1997. (Center for Health and the Global Environment).

Four salmon net pens in the state of Washington in 1997 discharged 93 percent of the total amount of visible solids into Puget Sound. (Center for Health and the Global Environment). Discharges from salmon farms can also contain antibiotics and other chemicals that are used to kill salmon parasites."

EPA addresses these concerns in more detail in section 6.A.6. of this BE which provides details on recent improvements which lower the risk of escape and increase regulatory monitoring. During the last permit cycle, all eight netpen sites in Puget Sound installed fish containment nets with a heavier nylon material. Therefore, the potential for another escape event has been greatly reduced by the actions of the permittee.[91] Escape is also addressed in the NOAA technical memorandums, which determine that escape is a low risk to wild salmon.[92] There is no documented adverse effect on chinook salmon resulting from escaped Atlantic salmon in Washington or elsewhere.[93]

Regarding the statement that "*in 1997 discharged 93 percent of the total amount of visible solids into Puget Sound,*" Ecology addresses this assertion on page 31 of their response to comments document.[94] Peer reviewed documents, such as those by Waknitz F.W., et al., have stated that netpen operations present a low risk to water quality due to facility siting at appropriate depths with the necessary flushing capacity. The quotation above is from a non-peer reviewed, personal communication that draws inferences between netpen waste and sewage treatment plans with a focus on total suspended solids, not settleable solids which the sediment management standards are designed to regulate.

In addition, there have been improvements in fish feed and feeding technologies which are now commonly used to monitor feeding behavior in efforts to minimize losses of uneaten feed from netpens. These practices have reduced the loss of feed to the environment to 5% or less, a figure significantly lower than the 20-30% loss estimated in some aquaculture models.[95] Waknitz, F.W., et al. state that these organic discharges from Puget Sound netpens do not seem likely to adversely affect threatened salmonids.[96] In addition, the major factors that affect solids accumulation are water current, water depth, fish density, feeding rates, and the length of yearly operations – all of which are accounted for in the NPDES permits. Therefore, these potential effects were found to be insignificant and discountable.

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[91] Washington State Department of Ecology. Response to Comments for the 2007 Netpen Draft NPDES Permits. 2007.
[92] Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. NFMFS-NWFSC-53. 2002. pages 65-66.
[93] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001. page 90.
[94] Washington State Department of Ecology. Response to Comments for the 2007 Netpen Draft NPDES Permits. 2007.
[95] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001. page 37.
[96] Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. NFMFS-NWFSC-53. 2002. pages 52-53.

Volume II. East Kitsap Watershed Chapter. 2005. (page 78)
The chapter on the east Kitsap watershed makes the following statement regarding netpen facilities:

"Netpen facilities: There are salmonid netpen facilities at several locations, including Manchester and at the southern end of Bainbridge Island. Netpen installations are known to affect sediment quality due to shading, and due to accumulation of excess food and fish feces that accumulate on the bottom in the vicinity of the netpen."

This statement discusses the sediment impacts from netpens in general, and does not establish that existing netpen operations in Puget Sound are likely to adversely affect listed salmonids. See the last paragraph above which explains that these potential effects were found to be insignificant and discountable.

6.A.8. Southern Resident Killer Whale Recovery Plan

The following three paragraphs (on pages II-84 and II-85) in the southern resident killer whale recovery pan discuss Atlantic salmon aquaculture.

"Aquaculture of Atlantic salmon. The intensive commercial farming of Atlantic salmon (Salmo salar) and smaller amounts of Chinook and coho salmon in marine netpens in British Columbia and Washington represents an additional potential, but highly debated, threat to wild Pacific salmon (Gallagher and Orr 2000, Gardner and Peterson 2003). The region's industry has grown dramatically in the past several decades and produces an estimated 50 million kg of salmon annually, about 90 percent of which comes from British Columbia (Amos and Appleby 1999). Licensed net-pen operations currently occur at about 126 sites in British Columbia and eight sites in Washington (A. Thomson, pers. comm.; J. Kerwin, pers. comm.). Concerns center primarily over 1) marine net-penned Atlantic salmon transmitting infectious diseases to adjoining wild salmon populations and 2) escaped Atlantic salmon becoming established in the wild and competing with, preying on, or interbreeding with wild Pacific salmon. Current evidence suggests that these concerns are largely unfounded in Washington and that Atlantic salmon aquaculture poses minimal risk to wild salmon stocks there (Nash 2001, Waknitz et al. 2002; J. Kerwin, pers. comm.). Escapes of penned Atlantic salmon exceeded 100,000 fish per year in the late 1990s in Washington (Amos and Appleby 1999), but improved management of salmon farms since then has greatly reduced this problem, resulting in far fewer free-ranging Atlantic salmon in the state's waters (WDFW 2003). The situation in British Columbia is far more uncertain because of the larger size of the industry (Gardner and Peterson 2003), which has resulted in larger numbers of escapes (mean = 47,150 fish per year from 1994-2002) and regular capture of free-ranging fish (mean = 1,713 fish reported per year from 1992-2002)(Morton and Volpe 2002, DFO 2003). Small numbers of naturally produced juvenile Atlantic salmon have been recorded in three rivers on Vancouver Island (e.g., Volpe 2000), but self-sustaining populations are not known to occur anywhere in the province (A. Thomson, pers. comm.). However, limitations in stream monitoring make it difficult to rule out the absence of additional populations (Gardner and Peterson 2003).

There is compelling evidence that sea lice (Lepeophtheirus salmonis) are transmitted from salmon farms to wild salmon (Krkošek et al. 2005), but the severity of impacts to wild fish remains uncertain (Gardner and Peterson 2003). Sea lice from farms have been linked to a decline of wild pink salmon populations in British Columbia's Broughton Archipelago (Morton et al. 2004), although this finding has been disputed and may simply reflect a normal downward fluctuation in the populations.

Salmon farms in British Columbia are concentrated along the central coast and on west-central Vancouver Island, and are projected to continue expanding in number in the future. The eight farms in Washington are located at Ediz Hook (Clallam County), Cypress and Hope islands (Skagit County), and off southern Bainbridge Island (Kitsap County)."

The southern resident killer whale recovery plan summarizes several issues that have already been addressed in this BE, primarily in section 6.A.6., with support from the NOAA technical memorandums.[97] These include disease transfer, escape and the overall size of netpen operations. In writing the permits, Ecology conducted literature reviews and consulted with WDFW to confirm that the sea lice problems occurring in British Columbia are not occurring in Puget Sound. During the last permit cycle, all eight netpen sites in Puget Sound installed fish containment nets with a heavier nylon material. Therefore, the potential for another escape event has been greatly reduced by the actions of the permittee.[98] In addition, the scope of netpen operations in Washington is far less than British Columbia. The recovery plan differentiates between the circumstances in Puget Sound and British Columbia, and the plan itself concludes that Washington operations have improved fish-farming techniques. The recovery plan indicates that Atlantic salmon aquaculture poses "minimal risk to wild salmon stocks" in Washington and that comparisons by analogy to British Columbia are "largely unfounded."

6.B. ANALYSIS OF EFFECTS ON FISH SPECIES

Salmon Evaluation

Based on the above rationale, EPA has concluded its approval of WAC 173-204-412 would not adversely affect listed fish species since the effects are considered insignificant. This includes the analysis in this BE that determines:

- NOAA technical memorandums determine beneficial affects and low potential for negative affects.
- The designated uses of Puget Sound are protected.
- Netpen facilities have an insignificant impact on aquatic life in Puget Sound.
- The existing regulatory framework for netpens provides protection to surrounding habitat and other species.
- The effects on the benthic community are accounted for and monitored.

[97] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001. Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. NFMFS-NWFSC-53. 2002.

[98] Washington State Department of Ecology. Response to Comments for the 2007 Netpen Draft NPDES Permits. 2007.

- The closure procedures of netpen facilities ensure the aquatic environment is restored to baseline levels.
- The indirect effects of netpen facilities carry a low risk.

Insignificant effects relate to the size of the impact and do not reach a scale where take occurs.[99] EPA recognizes that a small amount of individual listed fish in the vicinity of netpen facilities may be affected. Therefore, EPA's action may have an insignificant impact on the following:

- *Sub-adult salmonid consumption of benthic organisms near netpen facilities.* This impact is expected to be insignificant since facility siting by WDNR is restricted to deeper waters to limit negative impact on benthic communities. In addition, when comparing the impact of Puget Sound netpen facilities to seafood processing waste in Alaska, NOAA states that "the markedly smaller organic discharges from Puget Sound salmon farms do not seem likely to adversely affect threatened salmonids in Puget Sound."[100]

- *Juvenile nearshore habitat.* Since sites permitted for Atlantic salmon farms are restricted to deeper waters to minimize benthic community impacts, the effects on juvenile nearshore habitat are also expected to be insignificant. For example, current netpen locations do not overlap with the designated critical habitat of the Hood Canal chum salmon.

- *Migration corridors of listed salmonids.* This impact is considered to be low since the number and size of netpens in Puget Sound is insignificant. NOAA technical memorandums do not mention any migration concerns related to the location of netpen facilities.

The analysis in this BE with the support of NOAA technical memorandums, provides that the marine finfish rearing facility provision is protective of designated uses, including those related to wild salmon in Puget Sound, and netpen facilities carry an insignificant risk of negatively affecting wild salmon. As a result, EPA has concluded that its approval of WAC 173-204-412 **may affect, but is not likely to adversely affect** the following listed species:

Oncorhynchus tshawytscha	Chinook Salmon (Puget Sound ESU)
Oncorhynchus keta	Chum Salmon (Hood Canal summer-run ESU)
Oncorhynchus mykiss	Steelhead (Puget Sound, DPS)

Rockfish Evaluation

On April 27, 2010, NMFS listed the boccacio rockfish as endangered, the canary rockfish

[99] U.S. Fish and Wildlife Service and National Marine Fisheries. "Consultation Handbook: *Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act*." March 1998. <http://www.fws.gov/endangered/pdfs/Sec7/handbook/CH1-3.PDF>

[100] Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. NFMFS-NWFSC-53. 2002.

as threatened and the yelloweye rockfish as threatened. These listings took effect on July 27, 2010.[101]

In general, the three rockfish species inhabit very deep waters with rocky bottoms in deep benthic habitats.[102] Yelloweye, canary and bocaccio rockfish utilize deepwater habitats primarily around the San Juan Islands, Haro Strait, a few isolated outcroppings and ridges in the Strait of Juan de Fuca, and a few locations in the South Sound.[103] Juveniles are generally found in the shallower end of these ranges. The netpens in Puget Sound are not located at areas with such water depths and there is little overlap between these specific locations and the existing netpen operations. Although the water depth varies under the area of each individual netpen, the table below contains the estimated maximum water depth below each netpen. The maximum depth below any of the netpens is approximately 162 feet at the Ediz Hook netpen site. The remaining seven netpens are located over shallower water depths. Since the three rockfish species are deepwater species, they primarily inhabit water depths of 160 feet (bocaccio, canary) or 300 feet (yelloweye) and deeper. Thus, there is expected to be little overlap between the existing netpen facilities and primary rockfish habitat.

Depths and Netpen Sizes[104] [105]

Facility	Estimated Maximum Water Depth Below Netpen	Length of Aggregate Netpen Rearing Area	Width of Aggregate Netpen Rearing Area
Clam Bay	91 feet	990 feet	185 feet
Fort Ward[106]	41 feet	650 feet	185 feet
Orchard Rocks	74 feet	900 feet	185 feet
Deepwater Bay #1	96 feet	352 feet	190 feet
Deepwater Bay #2	84 feet	440 feet	190 feet
Deepwater Bay #3	102 feet	540 feet	190 feet
Hope Island	90 feet	440 feet	120 feet
Ediz Hook	162 feet	900 feet	190 feet

Bocaccio is a deepwater rockfish fish species typically found at depths between 160-820 feet,[107] which is deeper, overall, than the waters under the netpens. In addition, bocaccio

[101] National Marine Fisheries Service. Northwest Regional Office. Puget Sound Rockfish Endangered Species Act Listing. http://www.nwr.noaa.gov/Other-Marine-Species/Puget-Sound-Marine-Fishes/ESA-PS-Rockfish.cfm

[102] Palsson, Wayne A. et al. "The Biology and Assessment of Rockfishes in Puget Sound." Washington Department of Fish and Wildlife. September 2009. http://wdfw.wa.gov/publications/00926/wdfw00926.pdf

[103] Palsson, Wayne A. et al. "The Biology and Assessment of Rockfishes in Puget Sound." Washington Department of Fish and Wildlife. September 2009. http://wdfw.wa.gov/publications/00926/wdfw00926.pdf

[104] Netpen area determined from Washington State Department of Ecology. NPDES Permit Factsheets for Icicle Acquisition Subsidiary LLC. http://www.ecy.wa.gov/programs/wq/permits/northwest_permits.html#I

[105] NOAA Office of Coast Survey. Pacific Coast Nautical Chart On-Line Viewer. http://www.charts.noaa.gov/OnLineViewer/PacificCoastViewerTable.shtml

[106] On May 27, 2010, the Kitsap County Hearing approved a request for a Shoreline Substantial Development Permit and Shoreline Conditional Use Permit to relocate the Fort Ward netpen structure to a new location in Clam Bay. http://www.kitsapgov.com/dcd/lu_env/he/decisions/cy2010/he-rd-100408-007.pdf

found in Puget Sound are usually located south of the Tacoma Narrows where no netpens are located.[108]

The canary rockfish is a deepwater rockfish species which inhabits waters at depths between 160-820 feet.[109] These depths are deeper, overall, than the waters under the netpens.

Yelloweye rockfish occur in waters 80 to 1560 feet deep, most commonly between 300 feet to 590 feet, with juveniles.[110] Yelloweye rockfish are often found in high relief rocky habitats near steep slopes and are more common in the North Sound.[111] Based on their common distribution, the existing netpen operations are not located in areas where yelloweye rockfish typically would inhabit.

Primary stressors to rockfish populations include fishery removals, derelict fishing gear, hypoxia and food web interactions.[112] Bioaccumulative chemical contamination is also a moderate risk to rockfish species, in which netpens are not a source. Due to the deficiency of scientific evidence that the existing salmon netpen facilities in Puget Sound harm rockfish species through escape, disease transfer, and other indirect effects; the overall lack of an overlap between the existing netpen facilities and primary rockfish habitat; and the small quantity of netpen operations in Puget Sound, EPA has concluded the existing netpen facilities carry an insignificant risk of negatively affecting rockfish.

Therefore, EPA has concluded that its approval of WAC 173-204-412 **may affect, but is not likely to adversely affect** the following listed species:

Sebastes paucispinis	Bocaccio
Sebastes pinniger	Canary Rockfish
Sebastes ruberrimus	Yelloweye Rockfish

Critical habitat has not yet been designated for these three species of rockfish. Essential features of designated critical habitat include substrate, water quality, water quantity, water temperature, food, riparian vegetation, access, water velocity, space and safe passage. Any effects to listed species may also have an effect to critical habitat whereas they affect substrate, food and habitat. EPA believes that since its action are NLAA

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[107] NOAA Fisheries. Office of Protected Resources. Bocaccio *(Sebastes paucispinis).* http://www.nmfs.noaa.gov/pr/species/fish/bocaccio.htm

[108] NOAA Fisheries. Office of Protected Resources. Bocaccio *(Sebastes paucispinis).* http://www.nmfs.noaa.gov/pr/species/fish/bocaccio.htm

[109] NOAA Fisheries. Office of Protected Resources. Canary Rockfish *(Sebastes pinniger).* http://www.nmfs.noaa.gov/pr/species/fish/canaryrockfish.htm

[110] NOAA Fisheries. Office of Protected Resources. Yelloweye Rockfish *(Sebastes ruberrimus).* http://www.nmfs.noaa.gov/pr/species/fish/yelloweyerockfish.htm

[111] Palsson, Wayne A. et al. "The Biology and Assessment of Rockfishes in Puget Sound." Washington Department of Fish and Wildlife. September 2009. http://wdfw.wa.gov/publications/00926/wdfw00926.pdf

[112] Palsson, Wayne A. et al. "The Biology and Assessment of Rockfishes in Puget Sound." Washington Department of Fish and Wildlife. September 2009. http://wdfw.wa.gov/publications/00926/wdfw00926.pdf

listed rockfish species based on minimal overlap of common habitat, any effects on designated critical habitat in the future would be even more inconsequential.

6.C. ANALYSIS OF EFFECTS ON MARINE MAMMALS

Based on the above rationale, EPA has concluded its approval of WAC 173-204-412 would not adversely affect individual listed marine mammals since the effects are considered insignificant. Insignificant effects relate to the size of the impact and do not reach a scale where take occurs.[113] The main route of exposure to marine mammals from netpens would be negative effects to the prey base. This BE estimates that affects to prey will be insignificant or discountable. This includes the analysis that determines:

- NOAA technical memorandums determine beneficial affects and low potential for negative affects.
- The designated uses of Puget Sound are protected.
- Netpen facilities have an insignificant impact on aquatic life in Puget Sound.
- The existing regulatory framework for netpens provides protection to surrounding habitat and other species.
- The effects on the benthic community are accounted for and monitored.
- The closure procedures of netpen facilities ensure the aquatic environment is restored to baseline levels.
- The indirect effects of netpen facilities carry a low risk.

The Steller sea lion occurs in Washington but there are no breeding rookeries in the state. The most important habitat requirements for the Steller sea lion are Alaskan beaches used as rookeries for breeding and pupping. Steller sea lions have been observed on netpen equipment storage barges in Rich Passage. Deterrence methods have been proposed by the netpen facilities to address this issue so that Steller sea lions are not adversely affected. These methods include predator barrier nets and passive barrier fences where the sea lions have been observed hauled out. In addition, several of the storage floats will be removed by the facility to limit haulout availability. Vessels servicing the facility may cause short-term and localized disturbances, but they are not expected to have any lasting effects. There is adequate space to accommodate passage around the existing netpen facilities so any effects on passage are expected to be insignificant.[114] The Steller sea lion typically feeds on fish and large invertebrates such as squid and octopus, so effects to benthic environment exposure are considered minimal to the Steller sea lion prey base. EPA expects its approval of the marine finfish rearing facility provision to have an insignificant effect on Steller sea lion rookery habitat or prey base.

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[113] U.S Fish and Wildlife Service and National Marine Fisheries. "Consultation Handbook: *Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act*." 1998.

[114] March 16, 2010. Letter from Barry A. Thom, Acting Regional Administrator, Northwest Region, NMFS to Michelle Walker, Chief, Seattle Regulatory Branch, U.S. Army Corps of Engineers Re: ESA and EFH Consultation for American Gold Seafoods Net-Pen Array Relocation.

The Humpback Whale is not often found in Washington, especially within Puget Sound. There were 30 sightings of humpback whales in Puget Sound in 2004.[115] Humpback Whales are more common off the pacific coast of Washington, which is a primary migratory corridor. The marine finfish rearing facility does not impact the major migratory corridor of Humpback Whales since there are no facilities on Washington's pacific coast. In addition, humpback whales do not rely heavily on benthic feeding, so effects to the benthic environment are considered minimal. Therefore, EPA expects its approval of the marine finfish rearing facility provision to have an insignificant effect on the Humpback Whale.

Southern resident Killer Whales are regular inhabitants of Puget Sound. Marine netpens are insignificant in their overall size and are therefore not expected to impact Killer Whale habitat. Vessels servicing the facility may cause short-term and localized disturbances but are not expected to have any lasting effects. There is adequate space to accommodate passage around the existing netpen facilities so any effects on passage are expected to be insignificant.[116] Since a NLAA determination was supported for listed salmonids in Puget Sound, Killer Whales also are not likely to be adversely affected since salmonids are a primary prey base. As a result, EPA expects its approval of the marine finfish rearing facility provision to have an insignificant effect on the Killer Whale.

Other than limited and non-lethal predator control permitted by National Marine Fisheries Service (NMFS), the technical memorandums do not state any concerns of adverse effects to marine mammals in Puget Sound in relation to Atlantic salmon rearing facilities.[117] Furthermore, Washington's PCHB specifically noted in its 1997 ruling that the operation of netpen facilities in Puget Sound does not have a negative impact on marine mammals. [118] EPA has concluded that its approval of WAC 173-204-412 **may affect, but is not likely to adversely affect** the following listed species:

Eumetpoias jubatus	Steller Sea Lion (Pacific Coast, eastern population)
Megaptera novaeangliae	Humpback Whale (Pacific Coast)
Orinus orca	Killer Whale (Southern Resident, DPS)

6.D. EFFECTS OF THE ACTION ON CRITICAL HABITAT

The listed species with designated critical habitat analyzed in the Biological Evaluation are Chinook salmon (Puget Sound ESU), Chum salmon (Hood Canal summer-run ESU), and Killer Whale (Southern Resident, DPS).

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[115] Falcone, Erin et. al. "Humpback Whales in the Puget Sound/Georgia Strait Region." 2005 Puget Sound/Georgia Basin Research Conference.
<http://www.engr.washington.edu/epp/psgb/2005psgb/2005proceedings/papers/A2_FALCO.pdf>

[116] March 16, 2010. Letter from Barry A. Thom, Acting Regional Administrator, Northwest Region, NMFS to Michelle Walker, Chief, Seattle Regulatory Branch, U.S. Army Corps of Engineers Re: ESA and EFH Consultation for American Gold Seafoods Net-Pen Array Relocation.

[117] Nash, C.E. NOAA Fisheries Technical Memorandum. NFS-NWFSC-49. 2001. Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. NFMFS-NWFSC-53. 2002.

[118] Washington State Department of Ecology. NPDES Permit Factsheets for American Gold Seafoods, Inc. 2007.

NOAA and USFWS designate critical habitat based on physical and biological features that are essential to listed species. Essential features of designated critical habitat include substrate, water quality, water quantity, water temperature, food, riparian vegetation, access, water velocity, space and safe passage. In the Analysis of Effects section above, the effects to the listed species from EPA's approval of the marine finfish rearing facility provision are examined. Any effects to listed species may also have an effect to critical habitat whereas they affect substrate, food and habitat. This BE determined that EPA's approval of these standards are NLAA listed species, therefore, any affects on critical habitat would be even more inconsequential. As a result, the effects for critical habitat are NLAA for the species analyzed in this Biological Evaluation that have been assigned a critical habitat.

7. CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local, or private action on endangered or threatened species or critical habitat that are reasonably certain to occur in the action area considered in this biological evaluation. Further federal actions or actions on federal lands that are not related to the proposed action are not considered in this section.

Future anticipated nonfederal actions that may occur in or near Puget Sound include agriculture, urban development, commercial fishing, recreation, transportation, nonpoint source pollution and other human interactions. In addition, sewage treatment plants and marinas have effects on the Puget Sound aquatic environment similar to netpen facilities, although netpen impact is much less than these sources.[119] These nonfederal actions are likely to continue having adverse effects on the endangered and threatened species, and their habitat. There are also nonfederal actions likely to occur in or near Puget Sound that are likely to have beneficial effects on the endangered and threatened species. These include best management practices associated with a variety of human activities, such as urban development and recreational activities.

Interdependent actions are defined as actions with no independent use apart from the proposed action. Interrelated actions include those that are part of a larger action and depend on the larger action for justification. There are no interdependent or interrelated actions expected as a result of approval of these water quality provisions.

[119] Waknitz, F.W., et al. NOAA Fisheries Technical Memorandum. NFMFS-NWFSC-53. 2002.

8. SUMMARY OF FINDINGS

Table 8-1 summarizes EPA's determination of NLAA for ESA-listed species, under NOAA jurisdiction, analyzed for EPA's approval of Washington's marine finfish rearing facility provision, WAC 173-204-412.

Table 8-1 NLAA Summary of Findings.

Species	ESU/DPS/Population	Effects Determination for EPA's Approval of WAC 173-204-412
Chinook Salmon (*Oncorhynchus tshawytscha*)	Puget Sound ESU	NLAA
Chum Salmon (*Oncorhynchus keta*)	Hood Canal summer-run ESU	NLAA
Steelhead (*Oncorhynchus mykiss*)	Puget Sound, DPS	NLAA
Steller Sea Lion (*Eumetpoias jubatus*)	Pacific Coast, eastern pop.	NLAA
Humpback Whale (*Megaptera novaeangliae*)	Pacific Coast	NLAA
Killer Whale (*Orinus orca*)	Southern Resident, DPS	NLAA
Bocaccio (*Sebastes paucispinis*)	N/A	NLAA
Canary Rockfish (*Sebastes pinniger*)	N/A	NLAA
Yelloweye Rockfish (*Sebastes ruberrimus*)	N/A	NLAA

NLAA – Not likely to adversely affect

Table 8-2 summarizes EPA's determination of NE for ESA-listed species, under NOAA jurisdiction, analyzed for EPA's approval of Washington's marine finfish rearing facility provision, WAC 173-204-412.

Table 8-2 NE Summary of Findings.

Species	ESU/DPS/Population	Effects Determination for EPA's Approval of WAC 173-204-412
Chinook Salmon *(Oncorhynchus tshawytscha)*	Snake River Fall Run Lower Columbia River Upper Columbia River Spring Run Snake River Spring/Summer Run	NE
Chum Salmon *(Oncorhynchus keta)*	Columbia River	NE
Coho Salmon *(Oncorhynchus kisutch)*	Lower Columbia River	NE
Sockeye Salmon *(Oncorhynchus nerka)*	Ozette Lake	NE

Species	ESU/DPS/Population	Effects Determination for EPA's Approval of WAC 173-204-412
Steelhead *(Oncorhynchus mykiss)*	Snake River Basin Lower Columbia River Upper Columbia River Basin Middle Columbia River	NE
Southern Sea Otter (*Enhydra lutris neries*)		NE
Steller Sea Lion (*Eumetpoias jubatus*)	Western population	NE
Green Sea Turtle (*Chelonia mydas*)		NE
Leatherback Sea Turtle (*Dermochelys coriacea*)		NE

NE – No effect

9. SEDIMENT TESTING METHODOLOGY PROVISIONS

Several revisions to WAC 173-204, listed below, relate to sediment testing methodology, were described in EPA's August 6, 2008 supplement to the 2008 BE. EPA has reevaluated its conclusions in the August 6, 2008 supplement based upon any new information and is reaffirming these conclusions in this BE as these provisions relate only to sediment testing methodology. The changes to these provisions are provided in *Appendix 11.B.*

EPA has determined that its proposed approval action of the following changes to Washington's SMS may affect, but is not likely to adversely affect any federally listed endangered or threatened species or their designated critical habitat:

- WAC 173-204-315(1)(b)(ii): Juvenile polychaete chronic effects tests;
- WAC 173-204-315(2)(b): Larval performance standards for control and reference sediment biological test results;
- WAC 173-204-315(2)(d): Juvenile polychaete performance standards for control and reference sediment biological test results;
- WAC 173-204-320(3)(d): Juvenile polychaete biological effects criteria;
- WAC 173-204-430(3)(c)(iv): Juvenile polychaete Puget Sound marine sediment impact zone maximum biological effects criteria; and
- WAC 173-204-520(3)(d)(iv): Juvenile polychaete Puget Sound marine sediment cleanup screening levels and minimum cleanup level biological criteria.

Below is a summary of the revised provisions. Since four of the provisions have repetitive changes, these have been grouped together. The full text of these revised provisions is included in strikethrough language in *Appendix 11.B.*

WAC 173-204-315(1)(b)(ii), WAC 173-204-320(3)(d), WAC 173-204-430(3)(c)(iv), WAC 173-204-520(3)(d)(iv)

These four provisions have been changed to replace biomass with mean individual growth rate. The purpose of this revised endpoint is to improve sediment testing of juvenile polychaete in order to determine and monitor sediment quality. This is accomplished by comparing biological responses to exposure to test sediment to biological response to exposure to a reference sediment. After Ecology's adoption of the SMS in 1991, the Puget Sound Dredged Disposal Analysis (PSDDA) and Puget Sound Estuary Program (PSEP) implemented this revised endpoint determination and bioassay test procedure.[120] This revision is an updated metric to measure change in juvenile polychaete size to determine if sediment quality has inhibited growth.

[120] Betts, Brett. Washington State Department of Ecology Triennial Review of Sediment Management Standards (SMS) Rule. Chapter 173-204 WAC. "Review of New Scientific Information and Proposed Modification to the SMS Rule – Juvenile Polychaete Bioassay." May 1995.

WAC 173-204-315(2)(b)
This provision establishes acceptable survivorship for larval bivalve seawater control and reference sediment biological samples. As such, this revision modifies the seawater control sample for larval normal survivorship from 50% to 70%. The change in larval survivorship is more stringent and consistent with protocols and recommendations by PSDDA in 1994 and PSEP in 1986, which are based on best available science.[121]

WAC 173-204-315 (2)(d)
The provision specifies a mean individual growth rate of ≥ 0.72 mg/ind/day for the juvenile polychaete control sediment, replacing biomass as the measurement endpoint. This revision ensures the growth of juvenile polychaete in control samples have not been inhibited, and thus serve as a more accurate basis for comparison to tested samples. The mean individual growth rate of ≥ 0.72 mg/ind/day is consistent with best available scientific recommendations by PSDDA in 1995 and the U.S. Army Corps of Engineers Waterways Experiment Station in 1993.[122]

NLAA Analysis
The revised provisions update several of the metrics used for juvenile polychaete growth and larval bivalve survivorship for control and reference sediment biological test results based on best available science. The provisions adjust the sediment test methods to improve the accuracy and precision of test measurements and to help ensure that control samples indicate valid test results. As such, they represent minor revisions to the established criteria that serve to improve the reliability of test results. Because the test results serve as the protective criteria, these are new or revised water quality standards as the binding requirements for biological test performance collectively define the level of protection and expectation for ambient conditions. All activities subject to the SMS regulation are also subject to these revised provisions, including marine finfish rearing facilities.

Although these revisions may improve the ability to discern whether the condition of the benthic community is different from reference conditions, these changes are not reasonably expected to have any adverse affect on listed or threatened fish species, bird species, marine mammals or their critical habitat. The criteria at issue serve to protect the benthic (i.e., bottom dwelling) community from the adverse effects of pollutants. Listed or threatened species in the marine waters of Washington are members of the pelagic (i.e., open water) community. Interactions between the communities can lead to indirect effects of two types: 1) indirect effects of pollutants accumulating in benthic tissue and transferred to pelagic species via the food chain, and 2) indirect effects of loss of benthic community food sources through mortality. In either instance, the minor revisions to the criteria may affect, but are not likely to adversely affect listed species. For pollutant

[121] Sparks-McConkey, Pamela. Washington State Department of Ecology Triennial Review of Sediment Management Standards (SMS) Rule. Chapter 173-204 WAC. "Review of New Scientific Information and Proposed Modifications to the SMS Rule – Larval Bioassay." May 1995.
[122] Betts, Brett. Washington State Department of Ecology Triennial Review of Sediment Management Standards (SMS) Rule. Chapter 173-204 WAC. "Review of New Scientific Information and Proposed Modification to the SMS Rule – Juvenile Polychaete Bioassay." May 1995.

exposure via the food chain, the specific tests do not measure bioaccumulation or address that route of exposure in any way; the effects tested are solely direct lethal and sub-lethal effects to representative members of the benthic community. For loss of food source, the overall allocation of sediment impact zones in Puget Sound that could result from implementation of the SMS is an exceedingly small fraction of the feeding area for species that any listed or threatened species might, in part, rely on, and is thus of no adverse consequence in terms of effect. Furthermore, the small changes (i.e., reductions) of sediment impact zone size that could result from application of these revisions represent an even smaller fractional size than originally considered insignificant as stated above. The revisions are solely directed at protecting benthic species habitat for their own sake, not for their ability to serve as a safe and meaningful food source to pelagic fish species, bird species or marine mammals that have a large foraging area.

Because these revisions are solely focused on the quality of the control and reference sediment samples for juvenile polychaete growth and larval bivalve survivorship that serve to improve the reliability of test results for benthic community protection, EPA concludes this action **may affect, but is not likely to adversely affect** endangered or threatened species or designated critical habitat for the following species:

Oncorhynchus tshawytscha	Chinook Salmon (Puget Sound ESU, Snake River Fall Run, Lower Columbia River, Upper Columbia River Spring Run, Snake River Spring/Summer Run)
Oncorhynchus keta	Chum Salmon (Hood Canal summer-run ESU, Columbia River)
Oncorhynchus nerka	Sockeye Salmon (Ozette Lake)
Oncorhynchus mykiss	Steelhead (Puget Sound DPS, Snake River Basin, Lower Columbia River, Upper Columbia River Basin)
Eumetpoias jubatus	Steller Sea Lion (Pacific Coast, eastern population)
Megaptera novaeangliae	Humpback Whale (Pacific Coast)
Orinus orca	Killer Whale (Southern Resident, DPS)
Sebastes paucispinis	Bocaccio
Sebastes pinniger	Canary Rockfish
Sebastes ruberrimus	Yelloweye Rockfish

EPA contemplated a no effect determination since any possible effects would be extremely minor, but EPA was unclear of the threshold between a no effect and a not likely to adversely affect determination. Therefore, EPA chose to be cautious and make a not likely to adversely affect determination for these species.

EPA has determined its approval of these revised provisions will have **no effect** (NE) on the remaining listed species in Washington[123] since they either do not inhabit the marine aquatic system of Washington and therefore would not be exposed to any possible effects from these action or the only possibility for exposure to the effects of these standard changes would be alterations to the prey base of the benthic community, which is not the case for these species.

Effects of the Action on Critical Habitat

The listed species with designated critical habitat analyzed in the Biological Evaluation are Chinook salmon (Puget Sound ESU), Chum salmon (Hood Canal summer-run ESU), and Killer Whale (Southern Resident, DPS).

NOAA designates critical habitat based on physical and biological features that are essential to listed species. Essential features of designated critical habitat include substrate, water quality, water quantity, water temperature, food, riparian vegetation, access, water velocity, space and safe passage. In the Analysis of Effects section above, the effects to the listed species from EPA's approval of the marine finfish rearing facility provision are examined. Any effects to listed species may also have an effect to critical habitat whereas they affect substrate, food and habitat. This BE determined that EPA's approval of these standards are NLAA listed species, therefore, any affects on critical habitat would be even more inconsequential. As a result, the effects for critical habitat are NLAA for the species analyzed in this Biological Evaluation that have been assigned a critical habitat.

[123] U.S Fish and Wildlife Service. USFWS Threatened and Endangered Species System (TESS). Washington State. Accessed online August 17, 2010. <http://ecos.fws.gov/tess_public/StateListingAndOccurrence.do?state=WA>

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11. APPENDICES

11.A. MARINE FINFISH REARING FACILITY PROVISION

WAC 173-204-412 Marine finfish rearing facilities. [124]

(1) Purpose. This section sets forth the applicability of this chapter to marine finfish rearing facilities only. This section also identifies marine finfish rearing facility siting, operation, closure and monitoring requirements to meet the intent of this chapter, as applicable.

(2) Applicability. Marine finfish rearing facilities and their associated discharges are not subject to the authority and purpose standards of WAC 173-204-100 (3) and (7), and the marine sediment quality standards of WAC 173-204-320 and the sediment impact zone maximum criteria of WAC 173-204-420, within and including the distance of one hundred feet from the outer edge of the marine finfish rearing facility structure. Marine finfish rearing facilities are not subject to the sediment impact zone standards of WAC 173-204-415.

(3) Sediment monitoring. Sediment quality compliance and monitoring requirements for marine finfish rearing facilities shall be addressed through National Pollutant Discharge Elimination System or other permits issued by the department for facility operation. Marine finfish rearing facilities shall meet the following sediment quality monitoring requirements:

(a) Any person with a new facility shall identify a baseline sediment quality prior to facility operation for benthic infaunal abundance, total organic carbon and grain size in the location of the proposed operation and downcurrent areas that may be potentially impacted by the facility discharge;

(b) Any person with an existing operating facility shall monitor sediment quality for total organic carbon levels and identify the location of any sediments in the area of the facility statistically different (t test, $p \leq 0.05$) from the total organic carbon levels identified as facility baseline levels or statistically different from the applicable total organic carbon levels as identified in Table 1:

TABLE 1 - Puget Sound Reference Total Organic Carbon Values

Silt-Clay Particles (percent Dry Weight)	Total Organic Carbon (percent Dry Weight)
0-20	0.5
20-50	1.7
50-80	3.2
80-100	2.6

(c) The locations and frequency of monitoring for total organic carbon, benthic infaunal abundance and other parameters shall be determined by the department and identified in the applicable National Pollutant Discharge Elimination System permit;

(d) Antibacterials. Reserved: The department shall determine on a case-by-case basis the methods, procedure, locations, and frequency for monitoring antibacterials associated with the

[124] http://apps.leg.wa.gov/WAC/default.aspx?cite=173-204-412

discharge from a marine finfish rearing facility;

(e) Closure. All permitted marine finfish rearing facilities shall monitor sediments impacted during facility operation to document recovery of sediment quality to background levels. The department shall determine on a case-by-case basis the methods, procedure, locations, and frequency for monitoring sediments after facility closure.

(4) Sediment impact zones. Marine finfish rearing facilities and their associated discharges that are permitted under a National Pollutant Discharge Elimination System permit are hereby provided a sediment impact zone by rule for any sediment quality impacts and biological effects within and including the distance of one hundred feet from the outer edge of the marine finfish rearing facility structure.

(a) The department may authorize an individual marine finfish rearing facility sediment impact zone for any sediments beyond a distance of one hundred feet from the facility perimeter via National Pollutant Discharge Elimination System permits or administrative actions. The authorized sediment impact zone shall meet the benthic infaunal abundance requirements of the sediment impact zone maximum criteria, WAC 173-204-420 (3)(c)(iii). Marine finfish rearing facilities that exceed the sediment quality conditions of subsection (3)(b) of this section beyond a distance of one hundred feet from the facility perimeter shall:

(i) Begin an enhanced sediment quality monitoring program to include benthic infaunal abundance consistent with the requirements of the National Pollutant Discharge Elimination System permit. The sediment quality monitoring program shall include a benthic infaunal abundance reference sediment sample as required in subsection (3)(a) of this section or a benthic infaunal abundance reference sediment sample in compliance with WAC 173-204-200(21); and

(ii) Be consistent with the sediment source control general considerations of WAC 173-204-400 and the sediment quality goal and sediment impact zone applicability requirements of WAC 173-204-410, apply for a sediment impact zone as determined necessary by the department.

(b) Administrative orders or permits establishing sediment impact zones for marine finfish rearing facilities shall describe establishment, maintenance, and closure requirements as determined necessary by the department.

11.B. SEDIMENT TESTING METHODOLOGY PROVISIONS

WAC 173-204-315(1)(b)(ii) Juvenile polychaete: *Twenty-day ((~~biomass~~)) growth rate of the juvenile polychaete Neanthes arenaceodentata; or*

WAC 173-204-315(2)(b) Larval: *The seawater control sample shall have less than ((~~fifty~~)) thirty percent combined abnormality and mortality (i.e., a ((~~fifty~~)) seventy percent normal survivorship at time-final).*

WAC 173-204-315 (2)(d) Juvenile polychaete: *The control sediment shall have less than ten percent mortality and mean individual growth of ≥ 0.72 mg/ind/day per dry weight basis. The reference sediment shall have a mean ((~~biomass~~)) individual growth rate which is at least eighty percent of the mean ((~~biomass~~)) individual growth rate found in the control sediment. Control sediments exhibiting growth below 0.72 mg/ind/day may be approved by the department on a case-by-case basis.*

WAC 173-204-320 (3)(d) Juvenile polychaete: *The test sediment has a mean ((~~biomass~~)) individual growth rate of less than seventy percent of the reference sediment mean ((~~biomass~~)) individual growth rate and the test sediment ((~~biomass~~)) mean individual growth rate is statistically different (t test, $p \leq 0.05$) from the reference sediment ((~~biomass~~)) mean individual growth rate.*

WAC 173-204-420 (3)(c)(iv) Juvenile polychaete: *The test sediment has a mean ((~~biomass~~)) individual growth rate of less than seventy percent of the reference sediment mean ((~~biomass~~)) individual growth rate and the test sediment ((~~biomass~~)) mean individual growth rate is statistically different (t test, $p \leq 0.05$) from the reference sediment ((~~biomass~~)) mean individual growth rate.*

WAC 173-204-520 (3)(d)(iv) Juvenile polychaete: *The test sediment has a mean ((~~biomass~~)) individual growth rate of less than fifty percent of the reference sediment mean ((~~biomass~~)) individual growth rate and the test sediment ((~~biomass~~)) mean individual growth rate is statistically different (t test, $p \leq 0.05$) from the reference sediment ((~~biomass~~)) mean individual growth rate.*

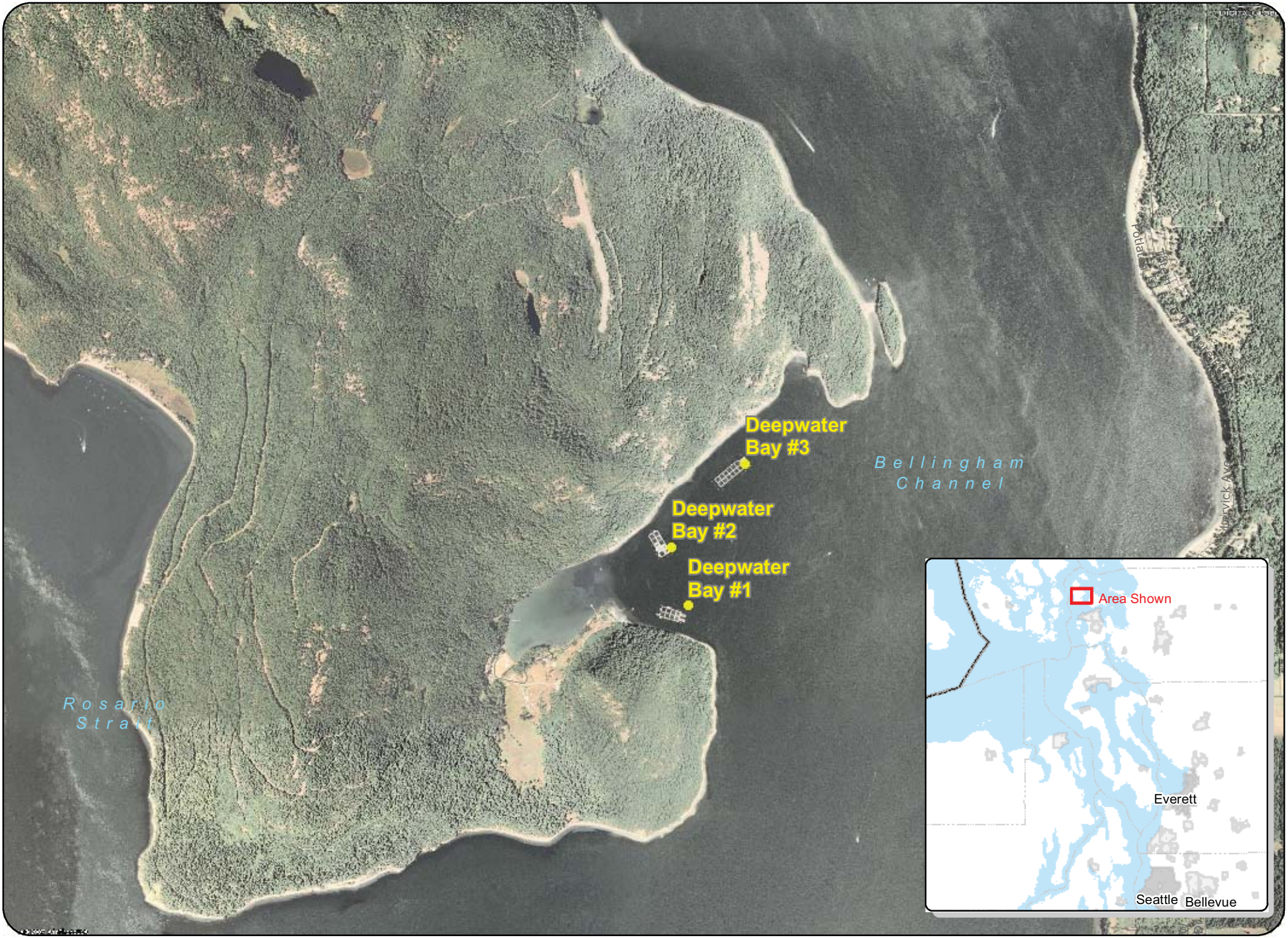
11.C. MAPS OF NETPEN FACILITIES

Table 11-1 Latitude and Longitude of Netpen Facilities.

Facility	Latitude	Longitude
Clam Bay	47° 34’ 15" N	122° 32’ 25" W
Fort Ward*	47° 34’ 30" N	122° 31’ 30" W
Orchard Rocks	47° 34’ 30" N	122° 31’ 50" W
Deepwater Bay #1	48° 33’ 15.6" N	122° 41’ 01" W
Deepwater Bay #2	48° 33’ 25.6" N	122° 41’ 05" W
Deepwater Bay #3	48° 33’ 39.8" N	122° 40’ 46" W
Hope Island	48° 24’ 28" N	122° 33’ 32" W
Port Angeles - Ediz Hook	48° 08’ 23" N	123° 25’ 07" W

* On May 27, 2010, the Kitsap County Hearing approved a request for a Shoreline Substantial Development Permit and Shoreline Conditional Use Permit to relocate the Fort Ward netpen structure to a new location adjacent to the existing Clam Bay netpen facility, 800 feet off the west shore of Rich Passage. http://www.kitsapgov.com/dcd/lu_env/he/decisions/cy2010/he-rd-100408-007.pdf.

Net Pens: South of Bainbridge Island



Net Pens: North of Anacortes, WA

0 175 350 700 1,050 1,400 1,750
Meters

Net Pens: Hope Island, WA

0 100 200 400 600 800 1,000 Meters

TS Oct 2010

Net Pens: Port Angeles

0 462.5 925 1,850 2,775 3,700 4,625 Meters

TR April 2008

February 25, 2019

Ms. Laurie Niewolny
Ecology Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

VIA USPS AND EMAIL

Re: Cooke Aquaculture Pacific Comments on Draft Fact Sheets and NPDES Permits for the Cooke Aquaculture Fort Ward, Clam Bay, Orchard Rock and Hope Island Net Pen Facilities

Dear Ms. Niewolny,

Thank you for providing the drafts of the above referenced Fact Sheets and NPDES permits. We appreciate the Department of Ecology's work on this permit and offer these corrections and comments with the intent of ensuring that this permit, once issued, is factually correct and robust. Our specific comments are as follows.

Sediment Monitoring Frequency:

Sediment monitoring of benthic impacts is carried out around a 100-foot perimeter from the farm sites. WAC 173-204-412(2). Sediment monitoring standards for net pens were established to monitor for sediment organic enrichment coming from either uneaten fish feed pellets and/or excess fish feces. Impact limits are set for the organic enrichment of sediments to distinct threshold values at the 100-foot perimeter around the pens. WAC 173-204-412(3). Mandatory mitigation and additional sediment monitoring are required if sediment standards are not being met. WAC 173-204-412(4)(a). Mitigation and monitoring continue until the sediment quality meets sediment management standards.

The TOC threshold trigger levels were designed to identify any prolonged impacts to the benthic environment, if they occur. If the assimilative capacity of the marine environment is overloaded with excess nutrients, those effects do not disappear rapidly. A program of annual sediment monitoring is capable of determining whether a facility is operating within the physical and biologic capacity of the surrounding environment and allows regulators and operators to identify if any operational changes are necessary to meet the standards.

The Hope Island, Clam Bay, Fort Ward and Orchard Rocks net pen sites have been operating in their present locations for well over 30 years now. During this entire time they have been conducting routine sediment monitoring adjacent to the facilities. The results of these studies, as documented in the past NPDES monitoring reports submitted to Ecology, demonstrate these sites consistently meet the sediment management standards, and are incorporated by reference in these comments. In other words, these farms have a history of being properly managed with respect to their biological production strategies and their feed management practices and have demonstrated a minimal impact to the surrounding benthic environment. Given the progress made by fish farmers in minimizing feed wastage, transitioning to single generation farms, and

improving environmental practices over the past three decades, there is no reason to believe the data collected over the past thirty years for these facilities is not representative of ongoing conditions at the facilities.

Increased Monitoring Frequency:

Cooke has specific concerns with the description in the draft Fact Sheet and permits regarding Sediment Monitoring Frequency. The Fact Sheet and permit both suggest that monitoring will occur not only between August 15th and September 30th each year, but also during an additional sediment monitoring period that is to occur in the same year based around the facility's harvest cycle. See the below excerpts from Fact Sheet and permits:

- *"This permit increases the frequency of sediment sampling from twice per permit cycle to annually between August 15 and September 30, and to conduct additional sediment monitoring within two weeks before or after each fish harvesting."*

- *"The frequency of monitoring has been increased to annually between August 15 and September 30, and during the period of fish harvesting for each generation of fish."*

- *"Annually, between August 15th and September 30th, AND within two weeks before or after each fish harvesting[c], if different." [c. In addition to the annual sediment monitoring between August 15 and September 30, the permittee shall conduct additional sediment monitoring with each fish harvesting in any calendar year in accordance with the schedule specified, if the fish harvesting period is not between August 15 and September 30.]*

Cooke has several concerns with this condition if Ecology's intent is to increase sediment monitoring to two times per year depending upon the harvest cycle of the facility. First, this type of increase and the costs associated with it are not justified by the prior history of these facilities in meeting the sediment management standards. As discussed above, there is a large amount of data in Ecology's files in the form of past sediment monitoring reports that all demonstrate no adverse impacts to sediments associated with these facilities. These data represent the "latest scientific knowledge" regarding the operation of these facilities and should not be ignored by Ecology in developing these permits. Increasing sediment monitoring to twice per year would be an unnecessary financial burden for the permittee and is not supported by scientific evidence.

Additionally, the terminology in the sentence *"within two weeks before or after each harvesting of fish"* seems to imply that sediment sampling is to occur around *"each fish harvesting"*. This condition could be misconstrued to imply that before or after each fish harvesting event (each individual fish harvest), sediment sampling is to occur. Cooke does not believe this to be Ecology's intent, but the language leaves room for interpretation and may lead to confusion as explained below.

There are multiple harvesting of fish events that occur once a cohort begins to reach harvestable sizes. Sediment sampling before or after each harvesting of fish would be impossible to comply with for Cooke. Once harvesting begins on a cohort of fish at the site, it can be started and stopped several times over the period of many months. There can be from 20 to 60+ individual harvest events from a farm site depending on the number of harvestable fish at the site, seafood

market conditions and production strategies. Additionally, periodic breaks in the harvest cycle occur for multiple reasons such as allowing the remaining fish more time to grow to larger sizes.

We do not see any scientific reason for Ecology to require routine sediment monitoring *"within two weeks before or after each harvesting of fish"* or for Ecology to increase the frequency of routine sediment monitoring to more than once per year. As noted above, these facilities all have a history of passing the TOC criteria and meeting sediment standards after thousands of samples and over 30 years of continual operation. Increasing the frequency of sediment monitoring to twice per year is excessive and would result in an unnecessary and substantial increases in monitoring costs. Also, limiting the time period to a six week period from August 15th to September 30th as proposed by the draft permits limits the ability for the permittee to obtain sufficient outside resources to conduct this sampling, an issue that is particularly acute if the harvest timing sampling is also required.

Cooke suggests removing the condition requiring an additional sediment sampling event that is based on a period of time around the harvesting of fish. Cooke supports the concept of increasing the sediment monitoring frequency from every other year to annually, but suggests maintaining the summer sampling period from July 1st to September 30th as has been the prior requirement for these permits since they were first issued in 1996. There are specific reasons this time period has been carried forward through all the iterations of the net pen NPDES permits since they were first developed in 1996. Ecology applies temporal standards to their own long term sediment monitoring programs for quality assurance. "Annual collection of benthos must occur at the same time of year, in this case, early to mid-June, so that the population is in similar growth and reproductive condition." (Puget Sound Assessment and Monitoring Program., Dutch, M., Ecology publication 2009). This controls for the natural seasonal variability that occurs in sediment chemistry and benthic species populations and allows for long term comparison to previously collected historical benthic data.

Assemblages of marine benthic invertebrates can vary both seasonally and annually in the Pacific Northwest region as demonstrated by multiple year studies by leading benthic experts. Lie (1968, 1974) reported seasonal variations in the abundance of species, with the maxima taking place during July-August, and the minima occurring in January to February. More recent benthic infauna monitoring data collected for a variety of purposes include very few winter-timed collections. The draft permit's proposed harvest cycle sampling condition would result in sediment sample collection occurring at random times of the year and make year on year performance comparisons difficult if not impossible. The marine net pen sediment management standards are set up in a step wise approach to monitor for excess organic nutrient buildup outside of the sediment impact zone. If TOC limits are exceeded, then additional follow up monitoring is required to look for biological effects. Those effects are analyzed through comparisons of the benthic infauna abundance to reference sediment stations. Collecting sediment samples outside of the summer sampling months of July through September, which has been the protocol since these net pen sediment monitoring standards were first established by Ecology, could unfairly affect the outcome of benthic infauna abundance analysis if it is ever required.

Cooke suggests increasing the sampling frequency to once per year, but continuing with the summer sampling period (from July 1st to September 30th). We believe this will effectively monitor the long term health of the surrounding sediments and the performance of the marine net pen facilities.

Anderson, E.A. 1996. Benthic recovery following salmon farming. Prepared for B.C. Ministry of Environment, Lands and Parks. Edward Anderson Marine Science Ltd. P.O. Box 2125, Sidney, B.C. Volume 1 and 2.

Dutch, M. 2009. Washington Dept. of Ecology Publication No. 09-13-121. The Puget Sound Assessment and Monitoring Program: Sediment Monitoring Component. Quality Assurance Project Plan. August 2009.

Lie, U. 1968. A quantitative study of benthic infauna in Puget Sound, Washington, USA, in 1963-1964. Fiskeridirektoratets Skrifter (Serie Havunders.) 14:235-556.

Partridge, V., S. Weakland, M Dutch, D. Burgess, and A. Eagleston. 2018. Sediment Quality in Puget Sound: Changes in chemical contaminants and invertebrate communities at 10 sentinel stations, 1989–2015. Washington Department of Ecology Technical Report 18-03-005 and appendices.

Weston, D.P. 1990. Quantitative examination of macrobenthic community changes along an organic enrichment gradient. Mar. Ecol. Prog. Ser. 61:233–244

Comments on Draft Fact Sheets for NPDES Permits:

- **Page 7:** Cooke disagrees with the statements regarding the Cypress Island incident from August 2017, and these should be struck from the draft net pen Fact Sheets for each individual NPDES permit. Cooke also disagrees with the statement in the Fact Sheet about Ecology's intent in 2007 with regard to accidental fish escapement when the permits were re-issued. These comments appear to be post-hoc rationalizations to support ongoing litigation against Cooke regarding permit interpretation, and it is worth noting that, to-date, Ecology has provided no documentary evidence in response to discovery requests that support this statement of intent in the draft Fact Sheet.

  The 2007 NPDES permits and accompanying Fact Sheet reiterates the landmark decision by the Pollution Control Hearings Board (PCHB) with regard to Atlantic salmon net pen aquaculture that *"the Permittees' facilities do not create unresolved conflicts with alternative uses of Puget Sound resources as contemplated in RCW 43.32C.030(2)(e). The existence of commercial salmon farms as permitted uses does not preclude other beneficial uses in Puget Sound, such as shellfish harvesting, commercial or sport fishing, navigation or recreational boating. Likewise, the existence of the salmon farms does not operate to the exclusion of available resources, such as native salmon runs, sediment and water quality, or marine mammals. In short, salmon farming in Puget Sound does not present the citizens of the State of Washington with an "either/or" choice with respect to the other beneficial uses and important resources."* In November 1998, the PCHB made its final ruling that, *"The escapement of Atlantic salmon from the Permittees' facilities absent large regular releases in the future does not pose an unacceptable risk to native Pacific salmon in terms of competition, predation, disease transmission, hybridization or colonization."* The Pollution Control Hearings Board defined what constituted a significant fish escapement and Ecology incorporated those legal findings into the current (2007) and previous versions of these permits. Cooke has found nothing in the prior permits that suggests each single fish is a separate permit violation.

  Previous permit language subjected the permittee to violations of the permit for the intentional or negligent release of fish. By eliminating that important distinction in the proposed draft permits, Ecology creates undue risk for the permit holder. As Ecology is well-aware, the Cypress Island collapse caused significant harm to Cooke in the form of

lost fish, reputational damage, and, ultimately the phase-out of Atlantic salmon aquaculture in Washington. There is no deterrent effect for making a single release of one fish, regardless of cause, a permit violation. As Ecology is also aware, Cooke facilities have been vandalized and broken into since the Cypress Island collapse. Making a single fish release a strict liability issue for Cooke raises the possibility of this happening in the future. Finally, in addition to this condition being contrary to PCHB precedent, it is worth noting that the new conditions in S1 were late additions, apparently in response to ongoing litigation between Cooke and Ecology, and wielding its regulatory functions as a sword in pending litigation is neither a good precedent or fair use of Ecology's regulatory authority.

- **Page 14:** The reference to BMPs *"effectively addressing DO during the critical period"* is unclear. To what BMPs is this referring, and what is Ecology's definition of the "critical period?"

- **Page 15:** Cooke disagrees with the additional requirement that the net pen Structural Integrity Assessment Report be carried out only *"when net pens are fallow"*. This requirement could create unnecessary delays in the timing of these inspections. Engineering firms are more than capable of performing this type of inspection when there are nets installed at the facility and there are fish in the pens. The ability to perform the inspection at any time during the 2 year period after the permit issuance date, and not just when the pens are fallowed, will assist Cooke carrying out this new requirement. Cooke suggests that this unnecessary condition be removed from the draft permit language.

<u>Comments on Draft NPDES Permits:</u>

- **Page 6:**
  As noted above, the S1 discharge limitations have been changed significantly. The prior permits, following PCHB decisions, prohibited the negligent or intentional discharge of Atlantic salmon. This requirement needs to be reinstated to be consistent with prior PCHB findings of fact and legal decisions. Cooke strongly objects to Ecology's post-hoc rationalizations and changes to the draft permit language to support Ecology's ongoing litigation positions against Cooke. We request that this condition be changed to be fair, consistent with PCHB precedent, and the prior permit language around this subject.

- **Page 6-7: S2.A.**
  As discussed above with regard to Monitoring Frequency, Cooke suggests the requirement of additional monitoring to occur around "each fish harvesting" be removed from the draft permit language. This additional requirement is confusing, unnecessary and would be financially burdensome to the permittee for the previously discussed reasons. If the harvest condition is removed, Cooke is willing to incur the additional monitoring expenses for an annual routine summer sediment sampling cycle, instead of the current every other year sample cycle it is presently carrying out.

- **Page 6-7: S2.A. Table.**
  The Sample Locations refers to Appendix B. This should be Appendix C which shows the sediment sampling station locations.

- **Page 8: S2.C.**
  As discussed above, Cooke suggests removal of the requirement for additional sediment sampling to occur that is based on the harvesting of the fish population.

- **Page 9: Comment on Table 1. Puget Sound TOC Reference Values**
  Cooke continues to express their concern regarding the Total Organic Carbon (TOC) threshold level in the 0-20% Silt-Clay Particle category. The 0-20% Silt-Clay category is designated at the 0.5% TOC level. The initial TOC criterion and sediment grain size categories for marine net pens came from a study that was prepared several decades ago that had a limited representative sample size for geographic areas of Puget Sound. Cooke believes the 0.5 TOC threshold value to be set unnaturally low for the marine sediments in parts of the Puget Sound and the Strait of Georgia. Briefly reviewing Ecology's 2016 Puget Sound Long Term Sediment Monitoring Summary Report, it is apparent that TOC levels for normal <20% silt/clay sediments vary significantly from year to year and periodically exceed 0.5% TOC. For example, the over 25 years of sample data taken from an un-impacted sampling site near Anderson Island has TOC levels that bounce above the 0.5% TOC in this particle size category. Environmental consultants hired by Cooke Aquaculture's predecessor in the past have also found that pristine reference area sediments in the 0-20% silt clay category often can't even meet the 0.5 TOC criteria. Cooke believes Ecology should review the information used to establish the TOC criteria for marine net pen sediment management standards and consider updating or modifying the 0-20% silt-clay TOC criterion. Such a review is mandated by the Sediment Management Standard's requirement to use methods that "accurately reflect the latest scientific knowledge" in administering the SMS. WAC 173-204-130.

- **Page 13: S3.A. Discharge Monitoring Reports**
  Number 6. -Current: The Permittee must report the daily max and average current on the monthly DMR.
  Cooke believes this item was erroneously included in the draft NPDES permits by Ecology and believes the condition should be removed from the final permits. Cooke is unaware of any technologically available equipment to collect year round real time daily max and average current data and compliance with this condition would be impossible. As Ecology is aware, Cooke has gathered Doppler current data for all of its sites, and is using those data to do further mooring analysis and engineering.

- **Page 14-15: S3.A. Discharge Monitoring Reports**
  Numbers 13 through 18 in this section appear to be boilerplate language originating from other types of discharge permits issued by Ecology. These conditions do not appear to be applicable to marine net pen NPDES permits. Cooke suggests that these conditions be removed from the final permits to avoid confusion.

- **Page 16: S3.E. Additional Monitoring by the Permittee**
  This section discusses the reporting of any additional monitoring to Ecology. Cooke general understanding of the intent of this condition is regarding compliance sampling and monitoring. Previous permits included the additional monitoring reporting language only for any additional sediment compliance monitoring that was carried out by the permittee of the SIZ stations and adjacent sediments. Cooke disagrees with the inclusion of the very broad term *"water quality monitoring"* into this condition of the draft permit language for several reasons.

  By adding "water quality monitoring" to the provision, it could require Cooke to record and report any instance that an employee uses a dissolved oxygen meter, temperature probe, or performs a routine plankton count. Marine net pen aquaculture operators are almost always looking at various water quality parameters, not for reporting purposes, but for the daily management of the health and welfare of the fish stocks they raise. Cooke employees use multiple types of dissolved oxygen, salinity and temperature probes at their farm sites and, there can be several different types being used at the same time at a single farm site. These probes and meters are used as tools for the day to day welfare and feeding of the fish stocks contained in the pens. The probes are not research grade, nor are they calibrated to water quality compliance monitoring or reporting standards. The probes and meters are used only to give the employees a relative idea of what the ambient dissolved oxygen, temperature and salinity are currently doing so they can make real time management decisions with regard to the feeding and rearing of the fish stocks. Readings from the meters are not always recorded; they are rather just observed and reacted to by staff as they perform the daily activities of fish cultivation. Employees also routinely take water samples and observe them for harmful plankton species during the spring, summer and fall months. While these employees are trained in identifying plankton species, this type of water quality information is again gathered for aquatic husbandry practices, not water quality compliance procedures.

  By including the term *"water quality monitoring"* in the condition of reporting any additional monitoring, Cooke is concerned that all of this superfluous daily information would have to be collected, compiled and reported to Ecology as part of the condition of compliance reporting. As discussed above, this condition makes sense in the permits for any additional sediment monitoring of the SIZ which has a set performance based standard, but becomes nearly impossible to comply with if the facilities are required to record and report a number each time they use a DO meter or temperature probe. Reporting each and every time a DO meter or temperature probe is used by each and every employee during the daily fish growing operations for each farm site would be overly burdensome, generate a large amount of useless data, and be logistically impossible to comply with. Including this condition in proposed draft permits sets litigation traps for Cooke and exposes it to enforcement or citizen suits simply because it failed to report every single piece of water quality data gathered in its farming operations, an impossible task, and one that in no way will advance the purposes of the permits. Cooke suggests this section needs either further clarification or that reporting of any additional water quality monitoring be completely removed from it. Cooke requires some assurance this additional reporting requirement only applies to compliance type of monitoring and not the routine daily observations of ambient water quality conditions.

- **Page 18: S4. Operation and Maintenance:**
  Language in this section discusses the requirement for back up or auxiliary systems. *"This provision of the permit requires the Permittee to operate backup or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of this permit."* Cooke is unaware of any way to operate a backup or auxiliary facility for each net pen site and believes this language does not apply to marine net pen permits. Cooke suggests removing it from the final permit to avoid confusion.

- **Page 22: Condition S.7 Structural Integrity Assessment Report**
  Cooke supports the imposition of new requirements regarding structural assessments and is committed to bringing the facilities it acquired up to modern standards. But, these requirements need to be ones that are pragmatic and workable. As discussed above, requiring an engineering inspection within two years of issuance of the permit but only during a period when the site is fallow could significantly restrict the ability to accomplish this requirement in a timely manner. As there does not appear to be any benefit to this added language Cooke suggests removing the term *"when the pens are fallow"* in this condition.

Thank you for your consideration of our comments and concerns. We look forward to working with you on making these permits factually based and scientifically sound.

Very truly yours,

Kevin Bright, Permit Coordinator
Cooke Aquaculture Pacific, LLC

Cc: Jim Parsons-General Manager, Cooke Aquaculture Pacific

Kevin Bright

I encourage Ecology to use the best available science in setting regulations and conditions of the NPDES permits for aquaculture.

The 2010 BE updated EPA's data and analysis; however, its conclusions are unchanged from those articulated in the 2008 BE. After reconsidering the 2008 BE along with additional analysis and the best available scientific information, EPA concluded that its proposed approval of the revised SMS provisions is NLAA listed fish species or marine mammals or their critical habitat. As mentioned above, this second round of ESA consultation reached the same conclusions as the previous consultation, but includes additional analysis {i.e., best available science), such as the following two recovery plans:

1. National Marine Fisheries Service. 2007. Puget Sound Salmon Recovery Plan. Shared Strategy for Puget Sound adopted by National Marine Fisheries Service. Volumes I and II.

2. National Marine Fisheries Service. 2008. Recovery Plan for Southern Resident Killer Whales (Orcinus orca). National Marine Fisheries Service, Northwest Region, Seattle, Washington.

EPA also provided an analysis for the three newly listed species of rockfish in Puget.
Sound: boccacio, canary, and yellow-eye rockfish.
EPA determined its approval of the new and revised portions of Washington's WAC 173-204 is not likely to adversely affect these newly listed rockfish species or their critical habitat.
After reviewing EPA's analysis in the 2010 BE, NMFS did not conclude that formal consultation was required. Rather, on April 8, 2011, NMFS concurred with EPA's determination that the proposed approval action may affect, but is not likely to adversely affect listed fish species or marine mammals or their critical habitat in Puget Sound.
Analysis included additional review of the best available science and new technical information.
ESA consultation concluded when NMFS concurred with EPA's NLAA determination.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

APR 22 2011

OFFICE OF
WATER AND WATERSHEDS

Mr. Kelly Susewind
Washington Department of Ecology
Water Quality Program Manager
PO Box 47600
Olympia, Washington 98504-7600

Mr. Jim Pendowski
Washington Department of Ecology
Toxics Cleanup Program Manager
PO Box 47600
Olympia, Washington 98504-7600

Re: EPA's Re-Approval of Washington's Revised Sediment Management Standards (WAC 173-204) including the Marine Finfish Rearing Facility Provision, as submitted on June 3, 1996.

Dear Mr. Susewind & Mr. Pendowski:

On April 28, 2010, the U.S. District Court for the Western District of Washington set aside the U.S. Environmental Protection Agency's (EPA's) September 18, 2008, approval of revisions to Washington's Sediment Management Standards (SMS).[1] The Court ordered EPA and the National Marine Fisheries Service (NMFS) to reconsider whether formal consultation under the Endangered Species Act (ESA) is required in approving Washington's proposed SMS revisions. On reconsideration, EPA reached the same conclusion that the SMS revisions are not likely to adversely affect endangered or listed species or their designated critical habitat. NMFS concurred with EPA's conclusion and did not require formal consultation. Therefore, in accordance with its Clean Water Act (CWA) authority, 33 U.S.C § 1313(c)(3) and 40 C.F.R. part 131, EPA is reiterating its approval of Washington's 1996 revisions to the SMS consistent with the enclosed September 18, 2008 action document.

BACKGROUND

The SMS, a portion of Washington's water quality standards (WQS), are codified at WAC 173-204 *et. seq.* Under Sections 303(a)-(c) of the CWA, 33 U.S.C § 1313(a)-(c), states are required to establish water quality standards and submit them to EPA for approval or disapproval. Likewise, revisions to a state's water quality standards must also be submitted to EPA for approval or disapproval.

[1] Wild Fish Conservancy v. U.S. EPA, No. 08-0156 (W.D. Wash. 2010)

Water quality standards describe the desired condition of a waterbody and consist of three principle elements: (1) the "designated uses" of the state's waters, such as public water supply, recreation, propagation of fish, or navigation; (2) "criteria" specifying the amounts of various pollutants, in either numeric or narrative form, that may be present in those waters without impairing the designated uses; and (3) antidegradation requirements, providing for protection of existing water uses and limitations on degradation of high quality waters. EPA's regulations at 40 C.F.R. Part 131 describe the minimum requirements for each of these three elements of water quality standards.

In 1991, EPA approved Washington's SMS, which address three primary areas: (1) standards for assessing the nature and extent of sediment contamination, (2) procedures for cleanup of historical sediment contamination, and (3) procedures for preventing future sediment contamination from discharges.[2]

On June 3, 1996, the Washington State Department of Ecology (Ecology) submitted to EPA revisions to WAC 173-204, which included minor revisions and the addition of a new section for Marine Finfish Rearing Facilities, WAC 173-204-412. Since EPA took no action on the SMS revisions by May 30, 2000, Washington's SMS were subject to 40 CFR 131.21 (the Alaska Rule of 2000) since they were adopted by and effective under Washington State law prior to that date.[3]

Among the SMS revisions submitted to EPA were the addition of WAC 173-204-412, "Marine Finfish Rearing Facility" (Section 412). Section 412 allows exemptions from sections of the SMS for salmon netpen facilities located in Washington's marine waters. The eight existing netpen facilities are all located in Puget Sound. The sediment quality compliance and monitoring requirements of these facilities are addressed through National Pollutant Discharge Elimination System (NPDES) permitting. The revision allows for a sediment impact zone within 100 feet from the outer edge of a marine finfish rearing facility, thereby exempting the facilities from: marine sediment quality standards, sediment impact zone maximum criteria, and sediment impact zone standards within that zone. The revision also allows Ecology to authorize sediment impact zones beyond 100 feet via NPDES permits or administrative actions, subject to increased monitoring. Section 412 does not exempt netpen facilities from meeting Washington's water quality standards found in WAC 173-201A.

On September 18, 2008, EPA approved the 1996 revisions to the SMS which were considered water quality standards under section 303(c) of the CWA. The revisions included the addition of a new definition, WAC 173-204-200(13); a new section, WAC 173-204-412; and several other revisions to existing provisions contained in WAC 173-204. EPA reviewed and only took action on those sections of WAC 173-204 that are water quality standards which were

[2] Washington State Department of Ecology. "Sediment Cleanup Status Report." June 2005. Publication Number 05-09-092. <http://www.ecy.wa.gov/pubs/0509092.pdf>

[3] 40 C.F.R. § 131.21.

revised and submitted on June 3, 1996. EPA did not review any unrevised provisions in the SMS.

ESA CONSULTATION

On April 28, 2010, the U.S. District Court for the Western District of Washington set aside the EPA and NMFS' not likely to adversely affect (NLAA) determinations and informal consultation regarding EPA's September 18, 2008 approval of the revisions to Washington's SMS. The Court ordered EPA and NMFS to reconsider, based on the best available science, whether formal consultation on the SMS was needed under section 7 of the Endangered Species Act. In accordance with the April 28, 2010 court order, EPA reconsidered whether approval of the new and revised water quality standards in the SMS at WAC 173-204 may affect listed fish species or marine mammals or their critical habitat.

EPA submitted a revised Biological Evaluation to NMFS on December 13, 2010 ("2010 BE").[4] In accordance with ESA Section 7(a)(2), EPA requested concurrence from NMFS on its NLAA determination for its proposed approval of the new and revised portions of WAC 173-204. Details regarding the provisions within the SMS that were revised and EPA's effect determinations for listed species and their critical habitat in Washington were described in a previous Biological Evaluation ("2008 BE") provided on April 17, 2008 and supplemented on August 6, 2008 to address six revised sediment testing methodology provisions. NMFS concurred with the conclusions of the 2008 BE on June 9, 2008 and the supplemental information on August 13, 2008.

The 2010 BE updated EPA's data and analysis; however, its conclusions are unchanged from those articulated in the 2008 BE. After reconsidering the 2008 BE along with additional analysis and the best available scientific information, EPA concluded that its proposed approval of the revised SMS provisions is NLAA listed fish species or marine mammals or their critical habitat. As mentioned above, this second round of ESA consultation reached the same conclusions as the previous consultation, but includes additional analysis (i.e., best available science), such as the following two recovery plans:

1. National Marine Fisheries Service. 2007. Puget Sound Salmon Recovery Plan. Shared Strategy for Puget Sound adopted by National Marine Fisheries Service. Volumes I and II.[5]

[4] December 13, 2010. US EPA Region 10. *Update to the Biological Evaluation Submitted April 17 and August 6, 2008, Regarding EPA Action on Washington's Marine Finfish Rearing Facility Provision Contained in the Sediment Management Standards.*

[5] Available online at: http://www.nwr.noaa.gov/Salmon-Recovery-Planning/Recovery-Domains/Puget-Sound/PS-Recovery-Plan.cfm

2. National Marine Fisheries Service. 2008. Recovery Plan for Southern Resident Killer Whales *(Orcinus orca)*. National Marine Fisheries Service, Northwest Region, Seattle, Washington.[6]

EPA also provided an analysis for the three newly listed species of rockfish in Puget Sound: boccacio, canary, and yelloweye rockfish. EPA determined its approval of the new and revised portions of Washington's WAC 173-204 is not likely to adversely affect these newly listed rockfish species or their critical habitat.

After reviewing EPA's analysis in the 2010 BE, NMFS did not conclude that formal consultation was required. Rather, on April 8, 2011, NMFS concurred with EPA's determination that the proposed approval action may affect, but is not likely to adversely affect listed fish species or marine mammals or their critical habitat in Puget Sound.[7] NMFS' analysis included additional review of the best available science and new technical information. ESA consultation concluded when NMFS concurred with EPA's NLAA determination.

CONCLUSION

Thank you for your patience as we have worked to satisfy the court's order regarding ESA consultation on this CWA action. If you have questions concerning this letter, please feel free to contact me at (206) 553-4198 or have your staff contact Jannine Jennings at (206) 553-2724.

Sincerely,

Michael A. Bussell
Director
Office of Water and Watersheds

Enclosure

cc: Ms. Melissa Gildersleeve, Ecology
Ms. Susan Braley, Ecology
Ms. Elaine Spencer, Graham & Dunn
Mr. Brian Knutsen, Smith & Lowney

[6] Available online at: http://www.nwr.noaa.gov/Marine-Mammals/Whales-Dolphins-Porpoise/Killer-Whales/ESA-Status/upload/SRKW-Recov-Plan.pdf

[7] April 8, 2011. Letter from NMFS to EPA Region 10, Re: Endangered Species Act Section 7 Informal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Proposed Approval of Finfish Rearing Facility Provision Contained in the Sediment Management Standards Rule Promulgated by the Washington State Department of Ecology. (HUC 17110019, Puget Sound).

Tracy McCallum

I am opposed to any and all fish net pen operations in Washington State and any and all waters off the Pacific coast of Washington, or in the tributaries leading to the Pacific Ocean, such as Puget Sound, Strait of Juan de Fuca, Columbia River and Basin, anywhere in the Salish Sea, or similar waters in British Columbia or the State of Oregon for the following reasons:

1. The existence of active net pen operations threatens the health and welfare of wild Salmon and Steelhead populations in such waters. This threat includes infestations of Sea Lice, diseases and other infections.

2. The inability of the Operators of such net pens to control the fish in them causes said fish to escape and move up into the spawning beds of native and wild Salmon and Steelhead, thereby preventing said Salmon and Steelhead from successfully spawning and perpetuating their populations.

Dan Maul

While I am by no means an expert on the issue of fish farms, I do feel well enough informed about both sides of the issue from reading, media coverage and discussions with people who have more experience to make these comments. I won't belabor the fine points, pro or con but simply say -

I agree with Director Maia Bellon. The tougher the regulations, the more protections we have to minimize any potential consequences to the environment, the better. Cooke had their chance and proved on multiple occasions that they were not able or willing to comply with current regulations and proved them selves not trustworthy on multiple occasions.

Lance Magnuson

Dear Ladies and Gentlemen-

I am a born and raised Washingtonian for 60 years. My father commercially fished for salmon in the San Juan Islands. An activity that fed and clothed our family during my youth. I have recently retired from the seafood industry having marketed North Pacific wild caught seafood internationally for 34 years.

Cooke's response to their "toxic" spill of non- native salmon was anemic at best. At worst, they attempted to hide behind eclipse induced tides, rather than admit malfeasance in maintaining equipment.

These escaped fish ended up in local rivers. While I understand that the risk of these fish spawning is nil, my concern is the transmission of salmonid specific disease into local watersheds.

We are already fighting a battle to rebuild salmon runs in Puget Sound. Cooke's malfeasance in allowing these non-native into our watersheds is unacceptable and must be stopped.

Until the moratorium in enacted and these farm sites are shutdown, Cooke's actions must be closely monitored and verified. They have already proven an inability at self policing.

Best regards,

Lance Magnuson

Wendy Sampson

Please do not allow any Atlantic fish farming to take place here.

Annalee Depositario

Please don't endanger our wild and hatchery salmon. There is plenty of farm raised salmon farms let's not put our lucrative salmon fisheries in jeopardy. We have already seen the damage they can cause.

Laurie Watt

Here in the Canadian province of British Columbia our provincial and federal governments allow open net-cage Atlantic salmon feedlots. We congratulate Washington State for joining all other US Pacific coast states in banning this industry due to the damage it causes to wild fish and marine mammals. Since your wild salmon migrate past the feedlots along the BC coast, please ask your state and federal government to apply pressure to Canadian and British Columbia governments to complete a Pacific coast-wide ban on this dangerous industry. Thank you!

Sharon Fleming

I am opposed to allowing net pen farming, The damage which has already been caused by allowing net pen farming of non-native species should be enough cause to deny any future applications.

Vanessa Castle

The net pens for farmed Atlantic salmon are devistating the heath and safety of our waters. Atlantic Salmon carry many diseases and excrete these diseases into our waterways that our local native salmon populations swim through. Our salmon in the Pacific Northwest are suffering from the sea lice and diseases that these Atlantic salmon have brought to the region, devistating the populations of healthy salmon runs when they return to our rivers, creeks and streams. The risk does not outweigh the reward. There are options for on land salmon farms that could be explored rather than putting these diseases fish and chemicals used to grow them (antibiotics and growth hormones) in our waters. Our native salmon are a keystone species here and the runs are already dwindling. There is no reason to give them another obstacle to survive. Say no to Atlantic Salmon net pens in our waters!

Heather Nicholson

I am requesting Additional protective measures be added o the permit to include:
• Increasing underwater video monitoring of net pens.
• Conducting inspections to assess structural integrity of the net pens and submit inspection reports certified by a qualified marine engineer to Ecology.
• Improving net cleaning and maintenance procedures to prevent fish escape.
• Requiring development of site specific response plans in the event of a fish release, and conducting preparedness training.
• Requiring improved maintenance of the net pens.
• Maintaining contact information to notify area tribes in the event of a fish release
* Regularly occurring testing of fish in open net pens for anything of concern including PRV.

Tara Doran

"To WA Department of Ecology: Regarding the renewed permit for Cooke Aquaculture, I am requesting Additional protective measures be added o the permit to include:

• Increasing underwater video monitoring of net pens.

• Conducting inspections to assess structural integrity of the net pens and submit inspection reports certified by a qualified marine engineer to Ecology.

• Improving net cleaning and maintenance procedures to prevent fish escape.

• Requiring development of site specific response plans in the event of a fish release, and conducting preparedness training.

• Requiring improved maintenance of the net pens.

• Maintaining contact information to notify area tribes in the event of a fish release"

Eleanor Mattice

Please do not allow salmon farms in the Puget Sound or in the ocean. They spread disease that kills our native stocks. Keep fish farms inland far away from our native salmon. Our salmon are already at risk for extinction and we certainly don't need farmed raised salmon threatening them even further. Thank you.

Forest Shomer

I support Ecology's rules to govern net-pen operations during the interim period--before the ban becomes operational in 2022.
Had Cooke operated in an open manner, instead of behind barbed-wire fences for many years, it's possible that observant neighbors and visitors could have helped avert the catastrophic failure that occurred at Cypress Island.
Washington's waters (and shorelines) benefit from easy and open access to the public. Alert citizens should be seen as part of the community of awareness of important environmental events on, in, and adjacent to saltwater.

Hans Flockoi

Please don't issue these permits. Everything on the planet relies on clean water and food, these fish are neither. I know the research is out there to support both sides, please use your own heart and listen, it will tell you it's a mistake to allow Atlantic salmon.

Jim Thomson

I am against aquaculture involving Atlantic Salmon or any salmon in salt water locations in Washington State. I believe the risks related to pollution, disease as well as the consequences of accidental release should not be undertaken. I further believe that the industry has demonstrated bad faith in following the letter and spirit of the law and regulations and that the state cannot afford to spend the funds that would be required to police the industry as a whole, not just the recent violator.

Bill Bryden

I see no reference to pathogen and parasite limits and enforceable repercussions. Also no limits on neurotoxin and antibiotics usage rates and amounts per treatment. These are serious oversights. Please correct this.

Julie Rabeau

"To WA Department of Ecology: Regarding the renewed permit for Cooke Aquaculture, I am requesting Additional protective measures be added o the permit to include:

• Increasing underwater video monitoring of net pens.

• Conducting inspections to assess structural integrity of the net pens and submit inspection reports certified by a qualified marine engineer to Ecology.

• Improving net cleaning and maintenance procedures to prevent fish escape.

• Requiring development of site specific response plans in the event of a fish release, and conducting preparedness training.

• Requiring improved maintenance of the net pens.

• Maintaining contact information to notify area tribes in the event of a fish release"

Daniel Swecker

Atlantic salmon are the best species to raise in net pens in Puget Sound and Washington State. An ideal species would:

Not establish runs in WA waters
Not cross breed with local populations
Not eat local fish
Not eat the feed that local fish populations eat
Not introduce new diseases to our state

On these issues Atlantic salmon have proven to be ideal.

Not establish runs in WA waters - During the middle part of the 20th century public fishies agencies attempted to establish runs of Atlantic salmon in Washington and on the west coast. None of these were ever successful. Fish escapes from net pens in Washington over the last 40 years have never resulted in the establishment of runs.

Not cross breed with local populations - No local populations can or have ever bred with Atlantic salmon.

Not eat local fish - Examination of the stomachs of escaped Atlantic salmon have found that they are almost always empty. These fish are conditioned to eat feed pellets and simply starve to death if they are not available.

Not eat the feed that local fish populations eat - Once again, examination of the stomachs of escaped Atlantic salmon have found that they are almost always empty. These fish are conditioned to eat feed pellets and simply starve to death if they are not available.

Not introduce new diseases to our state - Atlantic salmon are raised in quarantined hatcheries that use recirculating water and are disease free. The only diseases that Atlantic salmon exhibit in net pens are those they encounter once they reach salt water that are common to our state. Vaccinations and modern rearing techniques have made the treatment of diseases in net pens almost unnecessary and very rare.

No other commonly reared cold water species can claim all these advantages. Atlantic salmon are the ideal species of fish to raise in net pens in Washington State.

Maureen Hayden

Please make absolutely sure to increase all net monitoring, water quality issues and effect measures to decrease irresponsible and irreversible damage that Atlantic Salmon farms are doing in the Salish Sea. The demonstrated incompetance of Cooke Industries should stand as enough evidence to shut this industry down in our waters before it is too late. It is difficult to fathom that a law was enacted to allow this industry to continue until 2022. So much damage will be done in those 3-4 years. We have reached the critical stage with Pacific salmon runs crashing, Orca whales becoming extinct fast, and if you look at the travesty of BC Fish farming, you'll see that the writing is on the wall. Let us be prudent and wise now to fully monitor the farms from every angle and require farms to submit regular data to demonstrate best practices. We should not delay to make it difficult for this industry to continue to damage the Salish Sea.
Efforts to bar further farms from opening should be mandatory. Let's be smart and ethical about this. Mistakes have already been made. We don't need to make anymore. Thanks for your efforts to staunch the flow of attacks on our environment.

John Dentler

The USDA recommends at least two servings of seafood per week. It is clear that U.S. consumers are not eating sufficient quantities of seafood. Seafood, including fish, are comprised of protein, minerals, vitamins and many complex fatty acids essential for robust human health (brain development and cardiovascular health). Wild fish populations are harvested at their maximum levels and cannot be expected to meet the growing need for animal protein as the human population continues to grow. Further, consumers of modest means and those below the poverty level should be able to afford seafood. Currently the U.S imports billions of dollars worth of salmon and trout each year. While nothing is wrong per se with imports, nearly all this salmon and trout could and should be grown in the U.S. where the regulatory requirements are robust. Moreover, in many rural environments good paying jobs are rare. Aquaculture production of salmon, trout and other species should be promoted in Washington marine waters. The NPDES permit system is merely a means to institute reasonable limits and controls of pollutants in the environment. The Department of Ecology should continue to issues NPDES Permits for rearing salmon, trout and other species including Atlantic salmon. All animal protein production systems (chickens, turkeys, cattle, pigs) result in impacts to the environment.

My Concern to Atlantic fish Farms in Puget Sounds . That scientists warn that PRV (Piscine reovirus) is a threat to Pacific Salmon. The PRV virus in turn becomes HSMI (Heart, Skeleton,Muscle ,Infection),which when wild Salmon come in contact with these viruses enable them to have the strength to make it home to there spawning grounds. PRV is know to flow freely through the currents of Salish Sea.

At this time Kenneth Warheit with the WDFW is testing for PRV in our local rivers. This is the recent E-mail sent to me by Ken

Warheit, Kenneth I (DFW) Fri, Dec 14, 2018, 2:36 PM

Mr. Pope – thanks for your email, and my apologies for a delayed response. Since last April we have collected from seven hatchery facilities in the Lower Columbia, and six hatchery facilities in Puget Sound a total of 508 samples to be tested for PRV (123 samples from juveniles or fry, and 385 samples from adults).We will begin laboratory testing after sample collections are complete (including steelhead sampling, with early runs starting now), and we have validated our molecular assays. Hopefully, we will have results available by early to mid-March.Let me know if you have any questions.Respectfully, Ken Warheit

I believe this Issue is global (Salish Sea), meaning that Canada is experiencing the same issues with there Atlantic fish Farm. This is a recent letter written By Alexandra Morton.

Dear Minister of Fisheries - Accept First Nation help

Jan 9, 2019

Dear Minister of Fisheries Jonathan Wilkinson,

Many British Columbians, myself included, felt hopeful when Prime Minister Trudeau appointed a Minister of Fisheries from British Columbia.

When you accepted the position, you inherited a highly compromising lawsuit from the departing Minister LeBlanc. In September 2018, your lawyers argued to allow Marine Harvest and Cermaq to ignore the law and continue transferring Atlantic salmon infected with the viral “disease agent” PRV into the territory of the Namgis First Nations (decision pending).

Marine Harvest has made it clear that your position benefits them. However, your scientists warn that PRV is a threat to Pacific salmon. The escalating COSEWIC listings of Pacific salmon stocks in critical decline means whatever your department is doing, is not working and change is required. Allowing a highly contagious virus, known to harm Pacific salmon, to flow out of most of the salmon farms on this coast is indefensible, especially when it violates the law.

Then on January 7, Chief Bob Chamberlin told CBC that DFO has denied the First Nations of the Broughton Archipelago access a DFO lab, after they had reached an agreement with the Province of BC giving them the authority to test farm salmon. You were present at the announcement of this agreement.

I have faced the salmon farming industry for 30 years and I know that the fish farm companies that are doing business in BC will to do everything they can to exert control over First Nation testing of the fish in their farms and hatcheries.

I accept you are in a difficult position. You were sworn in just as your office was defending the transfer of PRV-infected farm fish into Namgis territory, even though your own scientists report PRV causes Chinook salmon red blood cells to rupture and 50% of Chinook salmon exposed to salmon farmed waters are in rapid decline. Now as the world is watching in horror as 2 more southern resident orca starve to death for lack of Chinook salmon, you are obstructing First Nations, who are testing farm salmon for a virus known to kill Chinook salmon, from using their lab of choice. The optics of this are disastrous.

After reading 1,000s of emails between DFO, the Provincial Ministry of Agriculture and the salmon farming industry I know the backstory on PRV. I hope someone is making you are aware that the extraordinary effort by these three parties to suppress the impact of the PRV virus on this coast has failed. The Province of BC has stepped away from this in an impressive act of reconciliation and good sense, which leaves just you and the salmon farmers downplaying the impact of their virus.

Minister Wilkinson, I would like to offer that the solution is simple. Demonstrate respect to First Nations, open your labs to them, split the samples and send a set to the lab of your choice. This virus is leaking out of fish farms all along this coast, Washington State has prohibited PRV-infected farm salmon in their farms since early last year and some of us are tracking the different PRV strains from Norway and Iceland that are circulating on this coast. The science has gotten away from those who sought to downplay the impact of PRV. What is known is not going to be unknown.

All the Ministers who permitted the controversial growth of the salmon farming industry in Canada have moved on, leaving your government on very unstable ground, presiding over terrible extinctions and disregard for our laws. Canada's chief scientist recommends 3rd party oversight of your science and federal regulators slammed DFO's failure protect wild salmon from salmon farms.

I am sure that you recognize that the request by First Nations to use a DFO lab to test farm salmon is perhaps the only honourable path out of this highly compromising situation. I am sure that you recognize that the request by First Nations to use a DFO lab to test farm salmon is perhaps the only honourable path out of this highly compromising situation. I would suggest not allowing the bureaucrats who got you into this mess to make this decision.

Respectfully,

Alexandra Morton

I Darryl Pope have been a life long citizen of Washington State . I'm a commercial fisherman, I'm a sport fisherman. I believe these two viruses, Have caused the decline of our wild salmon fisheries. Starting in 1996 with the importing of Atlantic salmon eggs to Washington State .Again I have attached a letter explaining this theory, written by Alexandra Morton.

testimony at the Cohen Inquiry into ISA virus »

Atlantic Salmon - how did this happen to British Columbia?

There were large Atlantic salmon imports to BC from eastern Canada decades ago in a deeply misguided venture to establish Atlantic salmon among healthy Pacific salmon stocks. They did not survive for long, but could have left a legacy of pathogens.

This blog reports on a series of excerpts from provincial and federal documents chronicling the conversations around the more recent Atlantic salmon egg imports into BC waters for the purpose of

salmon farming. Since the 1980s, people in government have voiced serious biological concerns, trying to defend BC. Most recently today Dr. Sally Goldes who worked for the Province of BC in fish health came forward, Times Colonist article. Despite their efforts the threat of trade sanctions appears to have dominated decision making. The source of eggs changes, suggesting problems, and each time it is preceded by industry pressure. The biology caved to the demands of commerce. But the irony is that the pristine, oxygenated, nutrient-rich waters of British Columbia - that the industry so desperately craves - has become the casualty. All our lines of defence against viral activity in salmon farms were removed one-by-one. There are some heroes in government who really tried and are still trying to protect BC wild salmon.

1982 – Canadian government and Norwegian and Canadian business interests meet:

• "*have requested consideration of alternative approaches to inspection and certification of salmon culture facilities*" (Tim Carey, DFO, Senior Program Advisor, Aquaculture and Fish Health, letter to Pritchard, DFO* Aquaculture & Resource Development re: importation of Atlantic salmon from Norway)

1984 – Fisheries and Oceans Canada (DFO) approves limited importation of Atlantic salmon, although this is not made public.

1985 – Draft Importation of Salmonids Policy states:
• Imports will cease March 1989
• Source hatcheries must meet Canadian Fish Health Protection Regulations
• 12 month quarantine
• 300,000 eggs per hatchery to maintain reasonable security

• "*I am getting increasingly anxious about our importing of Atlantic eggs. My concern is shared by many of my colleagues in both provincial and federal agencies…The fish health measures agree-to jointly by DFO and ourselves in the fall of 1984 are not foolproof. They are based on statistical sampling, so we are taking a risk when it comes to the introductions of virus. That means a risk to the nearly one-billion-dollar wild salmonid fisheries of British Columbia*" (Dave Narver, MOE* to Anthony ADM, MOE, Feb 26)

130,000 Atlantic salmon eggs imported from Scotland

1986 – Import policy remains unsigned and is not public

• "*…We are deeply concerned with the fact that the risk of exotic diseases is dependent on both the number of imports and their size… Government has made a commitment to support aquaculture, but surely not at the risk of a nearly $1 billion resource in the wild salmon fisheries of British Columbia. The direction the aquaculture industry wants us to go will insure that we import unwanted diseases that can impact on government hatcheries and wild stocks*" (Narver, MOE to Gunn, Pacific Aqua Foods, Nov 6).

• "*…Imported fish could be more susceptible to local pathogens than native stocks. An outbreak of disease in an imported stock due to a local pathogen, as well as causing losses to that stock could result in a dramatic increase in the pathogen loads in the system to a level which otherwise refractory native fish may not be able to withstand*." (CFSAC Advisory Document 1986) This is an extremely important observation, the unnatural salmon farm environment can cause local pathogens to become dangerous to local stocks.

• "*To start with a general comment, I am disappointed with what appears to be the prevailing attitude of a number for companies, that fish health regulations to protect wild stocks are great, but … If we continue the way the aquaculture industry seems to dictate, we can expect to introduce new diseases*." (Dave Narver, MOE to Dale Blackburn, Stolt Sea Farm Canada Inc.)

1,144,000 eggs imported from Scotland

1987 - Federal-Provincial Policy for the Importation of Live Salmonids was signed, but restrictions were lowered.

• quarantine reduced to 120 days to reduce industry cost of dealing with waste water
• suggestion egg imports continue until 1990 (Davis, DFO to Chamut, DFO, Jul 23)
• "If challenged in court over denial of any imports, what is the legal likelihood we would be successful in denying imports?" (Chamut, DFO to Davis, DFO, June 27)

1,281,000 eggs imported from Scotland / Washington State

1988 – Davis, DFO's Regional Director of Science for the Pacific Region suggests extension of egg import to 1991

2,700,000 eggs from Scotland / Washington State

1990 - U.S. salmon farmers claim Canada import restrictions are a trade barrier.

• "*Continued large-scale introductions from areas of the world including Washington State, Scotland, Norway and even eastern Canada would eventually result in the introduction of exotic disease agents of which the potential impact on both cultured and wild salmonids in BC could be both biologically damaging to the resource and economically devastating to its user groups*" (Chamut former ADM, DFO, to Sarna, Director of Pacific Rim & Trade, Policy Division, International Directories, DFO, 1990)

1991 – The threat of a "Free Trade Ruling" remains, fish farm industry pushes for use of known diseased stocks.

• "*I am very concerned about the discussion which took place about the egg import policy and proposed changes… I think [they] have gone too far… The proposed revisions not only open the window indefinitely but essentially allow for unlimited numbers of eggs. I know your Department argues that this has to done to avoid a Free Trade ruling…*" (Narver, MOE to Chamut, DFO, Sept 30)

• "*As we have no other disease-free source available [other than Iceland] anywhere in the world, I am requesting that you reconsider your position, particularly in the light of the expected change in the DFO regulations*" (Needham, Director Aquaculture, BC Packers, to Hoskins, DFO, Dec 3)

• "*DFO and MOE are responsible for the protection of wild and cultured salmonid stocks in British Columbia. Both…agencies firmly believe that repeated large scale shipments of salmonid eggs…expose BC's wild and farm salmonid stocks to unnecessary disease risk.*" (Ginetz, DFO to BC Trout & Char Producers, Jan 16)

• Document titled, The Need for Restrictions on the Importation of Atlantic Salmon into B.C. Atlantic salmon eggs "*clearly carry the risk of the inadvertent introduction of exotic disease, or exotic strains of indigenous agents*." (Gary Hoskins, Scientist, DFO memo, Jul 13)

• "*Perhaps most important is the fact that new diseases are continually surfacing – their dynamics…are totally unknown. To suggest therefore that vertical transmission should not be a concern would be irresponsible*" (Chamut, DFO to Emberley, Director General, Inspection Services Directorate, Jun 11)

• "*The proposed revisions not only open the window indefinitely but essentially allow for unlimited*

numbers of eggs. I know your Department argues that this has to done to avoid a Free Trade ruling." (Narver, MOE to Chamut, DFO Sep 30)

• "*I have the distinct feeling that the seriousness of the interaction between wild/farmed fish has been downplayed by some of your staf*f" (Narver, MOE to Chamut, DFO Sep 30)

• "*I want to therefore emphasize that despite allegations that restrictions were introduced to limit trade for the benefit of BC producers, our foremost and only concern was to protect our wild and cultured stocks from exotic disease… There are a host of examples including cases in the US… where new diseases were accidentally introduced due to inadequate regard for fish health, resulting in significant economic losses to commercial and sport fisheries and more recently the salmon farming community.*" (Chamut, DFO to Barrows, Free Trade Coordination Divisions, External Affairs & International Trade, Jan 23)

• "*strongly urg[ing] DFO and BCMOE to modify existing policies to provide greater access to larger commercial quantities of Atlantic salmon eggs*." (BC Salmon Farmers Association to Chamut, DFO Jul 15).

735,000 eggs imported from New Brunswick / Ireland / Washington State

<u>1992</u> – Importation Policy redrafted – signed by Pat Chamut

• No limit on number of eggs per license,
• quarantine reduced from 12 mos., to 120 days or body weight of 3g.

• BC Salmon Farmers Association: "*imported fertilized eggs would be more competitive with domestically produced eggs if hatchlings did not have to be raised under quarantine conditions.*"

640,000 eggs New Brunswick / Washington State

<u>1993</u> – The Provincial and Federal government agencies (DFO, MAL*, MOE) Wild/Farmed Salmonid Interactions. Despite all the discusion above and no literature cited it reads:

• "*There is also no evidence that wild fish in BC are placed at serious risk from disease occurrence in farmed fish*." (Apr 6).

• Washington State exports 47 million salmon eggs worldwide (10% to BC)

1,447,000 eggs from New Brunswick / Ireland / Washington State

<u>1995</u> – Pressure from US for BC to relax egg/smolt import regulations

• "*Major salmon egg exporters from Washington State agreed that there would be great market potential for their Atlantic salmon eggs in British Columbia if existing import restrictions were removed." (International Trade – Canada's Restriction on Certain Salmon Imports, Report to U.S. Senate Slade Gordon, April 1995, GAO/GGD-95-117)*

775,000 eggs imported from Washington State / Ireland

<u>1996</u>

1,500,000 eggs imported from Washington State

1997

1,600,000 eggs imported from Washington State

1998

2,400,000 eggs imported from Washington State

1999

2,400,000 eggs imported from Washington State

2000

2,500,000 eggs imported from Washington State

2001

800,000 eggs from Washington State

2002

0 eggs imported

2003 – Dr. Laura Richards Director General, Science, Pacific Region (DFO) petitions John Davis Regional Director, DFO to simply waive the Canadian Fish Health Protection Regulations so Atlantic salmon eggs can come from a hatchery in Iceland that does not meet Canadian protection standard (Oct 2, Cohen Commission, Exhibit)

• **"***Two BC salmon farming companies wish to import Atlantic salmon eggs from…Icelandic company which is not certified under the Canadian Fish Health Protection regulations (FHPR)*
• *Failure to provide permission for egg importation may trigger a trade challenge under the World Trade Organization…*
• *Additionally, DFO could also be viewed as causing a competitive disadvantage of the aquaculture industry by denying them access to alternate strains.***"**

0 eggs imported

2004

4,700,000 eggs from Iceland

2005

80,000 eggs from Iceland (reported on DFO website), however import permit 05-PBS-1 Jan, 17, 2005 reports 150,000 eggs imported from Iceland that hatched and were destroyed April 19, 2005

2006

0 Eggs imported

2007

1,750,000 eggs from Iceland

2008

800,000 eggs from Iceland

2009

600,000 eggs from Iceland

The PRV virus was carried by the egg from the importation from these countries to the Salish Sea .At this time First Nation of Canada is preparing to do some PRV testing, DFO Canada is testing and WDFW is testing, the results of the WDFW aren't going to be known until as possible

as late March..Before any permits should be granted ,all results from both countries should be available. My personal belief is that if these Atlantic Salmon fish farms are to be shut down in 2022, there should be no NPDES permit issued , along continuation releasing of Atlantic salmon smolts into there fish pens. These pens are particularly one of the many causes of destruction of the Salish Sea ecosystems

Thank You,

Darryl Pope

Wolfgang Rain

No net pen operations for non-native salmon species can be deemed "safe" for our beleaguered salmon populations. Concentrating salmon in net pens creates toxic centers of pollution, lice and potential vector sites for deadly viruses. There are good reasons to ban salmon farming in Puget Sound immediately and not to wait until 2022, and Cooke Aquaculture has proven their inability to operate safely, time and again. It is a no-brainer to deny permits to this toxic industry.

Brian Muldoon

Dear Board Members, Please do not issue any more licences to Cooke Aquaculture. They have a terrible record, more accidents will happen.
Open Pen Fish Farms should be on land, don't destroy your environment.
Thank You,
Brian

Larry Demmert

This shouldn't be allowed as Farmed salmon are a major pollutant and they are a major detriment to Orca whales! I am totally against any aquaculture permits!

Janise and Steve Hawes

We own a beach cabin on Guemes Island directly across Bellingham Channel from the Cypress Island fish pens. We have fished for hatchery silver salmon, casting from the beach, every summer for the past 20 years. We have caught escaped Atlantic salmon often. The first time we wondered "What the heck is this?" With the help of a Canadian fish identification poster, we discovered it was an Atlantic salmon. This species has been escaping their pens and invading our waters for a long time. In the days following the pen collapse our coastline was churning with lost fish.
It is time to be rid of fish farming pens in WA state waters and reclaim a natural Deepwater Bay off Cypress Island.
Thank you, Janise and Steve Hawes

Larry Franks

I am opposed to renewing the net pen permits under consideration. Governor Inslee's intent was clear, to remove the risks of net pen rearing of Atlantic salmon in the waters of Washington State, respecting current laws and existing permits. The proposed "improvements" (inspections, etc.) are not sufficient to meet that requirement. Enforcement of existing inspections and restrictions has been inadequate, and cannot be expected to improve radically. Let all existing permits terminate, as Governor Inslee intends and good science suggests.
Larry Franks
BS Fisheries, UW 1979

Norb Ziegler

I am strongly opposed to issuing any additional permits to Cooke Aquaculture for their Atlantic salmon net pens. Based on their past performance, which put our native salmon (wild and hatchery raised) and other marine life at risk, they should not be rewarded with additional permits. In my opinion, they cannot be trusted. The priority should be to eliminate all risks in protecting our native salmon.

Steve Miller

I strongly oppose issuing permits of any kind to Cooke Aquaculture for any additional efforts to re-start their Atlantic salmon pen activities. I have actively followed Cooke's performance for some time, including speaking to neighbors who live near the pens and listening to Cooke's sales pitch to the WDFW Commission. I have been consistently appalled by their disrespectful attitude towards the environment, the humans who live near the pens, state government and the general public.

jean groesbeck

I feel that farm-raised salmon should not be allowed in open pens. In Canada, they are raising some in closed in a swimming pool like facilities. PLEASE!!! Keep the pollution and dyes out of our waters!!!!

PAUL E groesbeck

Keep fish farms out of the NW!

Emily Mansfield

I am strongly in favor of a complete ban on fish farming in the waters of the State of Washington as soon as possible and sooner than 2022. I have spent a good bit of my 50 years of Washington residence on the waters of the Salish Sea kayaking, sailing and fishing as well as working for Tribes in this state whose members depend on wild salmon for livelihood, subsistence and ceremonial purposes. The Atlantic salmon in the fish farms are a major threat to our native runs of salmon as well as a threat to the life ways of the Native American people in this area. The profits of a few individuals who have a proven track record of disregard for the environment cannot outweigh the right of treaty tribes and the salmon they depend upon. Please ban fish farms right away.
Thank you, Emily Mansfield

Bruce Freet

The onus to prove no harm on natural resources should be upon the permittee or applicant, not on WDOE to devise monitoring protocols. Based upon research on salmon farms worldwide, they contribute significantly to local water pollution such as reduced oxygen levels and increase nutrients, added antibiotics, and increases in fish-borne parasites and diseases. I suspect that the Hope Island facility has contributed to the decline of the Skagit River Chum salmon population because Chum smolts are very susceptible to lice predation leading to Chum mortality. This is just one example. The revoking of permits should have applied to all fin fish farms, not just Cypress Island and Port Angeles (Cooke Aquaculture).

Nikolas Mardesich

Open-Net Pen Atlantic Salmon aquaculture should have no business in our waters. This practice has proven time and time again to be degrading and detrimental to our regions water quality and way of life. Any new applications for renewals of salmon farm permits should be denied. I have witnessed first hand on several occasions escape events and these and many other issues surrounding this practice make it unacceptable in our waters. We as citizens do not benefit from these farms and they are a blemish on our waters and should have never been allowed in the first place. I have attached a picture of some Atlatic salmon I caught during a commercial gillnet opening in August 2017. I was there and watched a woefully inadequate response by State agencies to handle this. I was not compensated for my efforts to remove these fish and was one of the first to do so. This breaks my heart to see how money and greed has taken a precedence over the well being of our environment.

Marlene Finley

After reviewing the information on the Department of Ecology website and attending the presentation in Anacortes, I am remain concerned about the possible transfer of diseases and parasites from farmed salmon held in pens and wild salmon. I fear for the future of the Southern Resident Orcas which depend on the wild chinook salmon. I am also concerned about the proper removal of the net pens and other infrastructure and waste at the time these permits terminate. The State of Washington, both Department of Ecology and Department of Natural Resources will need to be diligent in administering these permits and willing to take enforcement action should any terms or conditions be violated.

Improved maintenance of pens so that farmed salmon do not escape is appreciated in the new permit. More oversight of the operations in the form of more frequent inspections and reporting is a plus. Improved response plans in the event of farmed fish escape is a plus.

Thank you for providing the public with so much information about the background, process of permitting, and the changes proposed in the new permits.

Martha Hall

Thank you for the opportunity to submit comments. Thank you also for the informational meeting and hearing in Anacortes.

I am submitting comments because I am concerned about risks involved in this action which will continue fish farming until 2022. I appreciate the fact that the new state law will mean a phase out of these 4 sites with Atlantic salmon net pen, but between now and then, what are the risks of continuing this until 2022 - with the proposed and hopefully better safe guards? Please explain these risks to our Salish Sea and its native salmon species
and other wildlife and ecosystems. Risk assessment is difficult at best. What were the perceived risks before the collapse of the net pen on Cypress Island and how much will these
risks be reduced in the new permits with the additional requirements? What is the risk of another small or major release of Atlantic salmon into our waters as happened at Cypress Island? What is the risk of the Atlantic salmon in these pens coming down with a disease that might need to be treated and which might be transmitted to native fish? What is the risk of having to use antibiotics and what is the risk of putting these antibiotics into the ecosystems and wildlife in the Salish Sea? When all of these risks are combined, is it worth
it to continue allowing these 4 sites to operate? Is the possibility of and cost of litigation if the permits are not issued - are these factors being considered as these
permits are being renewed? How much money would be spent on this litigation before 2022 if the permits were denied as compared to the risks of issuing new permits?

I also question why the permits do not include an estimation of the amount of pollution that they will allow as if often the case in permits for pollution? It seems like the permit should include the total amount of pollution that is being allowed in Puget Sound, including all parts of the operation such as the pounds of Atlantic salmon themselves, the amount of their feces, the amount of the food that is fed to the salmon, both consumed and not consumed, amount of expected antibiotics and other chemicals that might be added, the amount of added feces and other pollutants added when the fish nets are cleaned and serviced, etc.
Shouldn't each of these be addressed and quantified in the permit and disclosed?

Shouldn't the permits also identify the areas in the Puget Sound and possibly beyond that might be impacted by this point source of various forms of pollution from each facility?
How far does each travel and what native species and ecosystems will come into contact with these pollutants? Shouldn't factors like nearness to especially rich or important habitats
be considered, when assessing the impacts of these pollutants? For instance, a fish farm location that will impact major estuaries, such as the one near the mouth of the Skagit River, or near eelgrass beds might be unacceptable because of esp. high risks to native salmon and other native species.

Many of us, from experience, have learned that sometimes the consultants and workers that are hired by companies like fish farms are not totally objective and honest in identifying and reporting problems. Yet, some of the safe guards being used in these permits depend on
people and consultants hired by the owners, not hired by the State of Washington. These people have a vested interest that is very different from the interests of the public in our native salmon and in our marine resources. How can this problem be addressed so we, the public, are not having to depend on monitoring and reporting done by those employed by the owners of the fish nets? Is

there a way to assess fees to pay a "third party" to do this monitoring and reporting, someone with no vested interest? However, shouldn't fish nets be cleaned on land to reduce the amount of pollution into the water which is far more serious? Might this be required in the new permits?

We learned a lot from the collapse of the pens at Cypress Island, and unfortunately, one thing we learned was that we could not believe everything we were told by the owner and operator of the fish pens that collapsed. This should result in much tighter regulations that are monitored and reported on by "third parties" with no vested interest. Is it true
that even after the company said the area had been totally cleaned up after removal of the fish farm, that this was not true when the area was checked by WA State?

Because the pens are to be phased in 2022, what incentive is there for the company to invest a lot of money in improved facilities? How motivated are they to uphold the highest standards? It seems like this situation increases the need for third party monitoring and reporting.

When will the NMFS and EPA complete their formal consultation under Section 7 of the ESA on EPA's approval of Ecology's sediment management standards for marine fish farms? Why doesn't it make sense to wait until those standards are finalized before acting on these new permits? Is there any reason not to wait for these standards? Is it possible to not allow use of these 4 sites until those standards can be considered before finalizing these permits? Could you explain whether WA State has the right to with-hold use of these 4 pens until that time and when those standards are expected to be finalized? Is there any chance that new and better ideas and standards will come out of that process, standards that should be part of this process?

Related to that consultation, is the State of WA legally allowed to write new permits BEFORE that consultation is completed since it is expected sometime in the next 6 months? Weighing the risks involved, is NOT waiting a good choice for DNR and our state?

Do the new permits adequately address air pollution? Anacortes, as well as other neighbors, have learned that the netting becomes very foul and net cleaning and storage creates a huge amount of air pollution. Who is responsible for these and how are these to be limited to a standard that is acceptable? Will this be monitored and if so, by who? Will the new permits also address lighting and how that will be limited and monitored so it is acceptable and does not increase predation of native salmon stocks in adjacent areas? What is known about the predation of native salmon and other native fish near fish pens, fish that may have been attracted by the fish pens over what might be normal predation by gulls, herons,seals, etc?

Could you explain the extent that fish farm nets attract native salmon species and other native fish species and other native species, through food, etc. and how much this might contribute to predation on these native species? How much of a factor is this in the areas where these 4 facilities are located? One is located near the estuary of one of our most important rivers, the Skagit River, where we have spent millions of dollars to improve salmon habitat. Let's hope we have many native salmon migrating through and using this area at different times of the year. Please explain how lighting impacts this predation. How could these impacts be mitigated? What studies have been done to show how many and what species of native fish and wildlife are attracted to these fish farms, how much time they spend near and, when possible, in the net pens, and what the impact is on these species?
Doesn't the current disperse the feed in fish pens over a wide area which would attract other fish and wildlife from a wide area? How wide an area is effected at these 4 sites?
At the presentation in Anacortes, we heard about studies of areas directly below the pens to see

recovery times and rates, but doesn't the impact spread much farther and do these studies capture the data when the net pens are being used? It seems not.

How is harvesting of the fish monitored? If native fish including salmon do enter the pens, are they too harvested? What studies have been done to show if this is a problem and if so, how serious is it? Are injuries and deaths reported? If so, what have they been in past operations? Could that information be shared? If these fish, dead or injured, are discarded, how has this monitored and reported in the past? Is there an unintentional take of endangered salmon and of other native fish species that is allowed?

When pharmaceuticals and other chemicals are used in fish farms, how much of these are consumed by native fish near and in the pens? Is it known if the level is safe for human consumption if these fish are caught within a few days and eaten by humans and other species such as seals and herons? Have these been tested for safe levels on all species consuming these pharmaceuticals and chemicals? Do we know how far other species and fish who consume these substances are traveling? Is the public warned to not consume fish caught in the area during this time? Are any of these substances ones that are contributing to the increasing problem we are having with the effectiveness of our standard antibiotics in humans and other animals? Should this pollution from pharmaceuuticals and other chemicals be added to the amount of these substances that is entering Puget Sound from stormwater and from water treatment plants where these are not removed? How much of a problem do these substances present to the health of our marine waters and the wildlife that live in these waters? Have the levels of these substances been tested in native fish near net pens when these substances are being used and afterwards? Is it higher than areas where there are no fish farms?

Is the discharge of pathogens found in farmed fish in fish farms considered a hazardous waste? Should it be? How likely is it that native salmon and other species would be infected? What is the infection rate found in studies when there have been outbreaks?
The threshold explain at the meeting seemed far too low before treatment and before total removal of the fish. Are the pathogens found in farmed fish in fish farms more common in fish farms than in our native species? If so, this seems like a risk that may not be acceptable. Congregating many animals in a small area always increases the risk of disease and creates the need to use antibiotics. If native salmon and other species also congregate in higher numbers around fish farms, this too needs to be considered when calculating risks of fish farms infecting our native fish.

Finally, I support requiring large bonds from the owners, up front, that will adequately cover any need at any time to remove pens, in 2022 or before, as part of the permits, if permits are issued. What did full removal and clean-up at Cypress Island cost? How much of this was paid by the State of WA and our tax payers, costs such as monitoring, etc. ?

Thank you again for allowing me to comment. Like many, I see no way to safely farm fish in net pens floating in our marine waters. So much has been learned since the original permits were approved. So much more has not yet been learned. Is it worth the risks to continue this practice until 2022? What would it cost to NOT issue new permits for discharge of pollutants? Maybe paying the legal costs makes sense.

I hope the Department of Natural Resources, the Department of Ecology, and the WA Department of Fish and Game will begin to consider the value of natural ecosystems that are left to be natural, that are not rented out, leased, or otherwise disturbed. Many of our state's lands might have far more value if they were not leased out for cattle or sheep grazing - values that result

from healthier streams and riparian areas, more forage for wildlife, and far more value as recreational areas. The same might be true of some of our state's forest lands. Natural ecosystems provide many services that have not been adequately identified and quantified. It is time for us to do this so we will understand their value.

Martha Hall
Anacortes, WA
pondfrog.mh@gmail.com

Polly Derr

I am strongly against any net pens in the Salish Sea area because of various kinds of contamination. Net pens are not naturally promoting wild salmon or other natural wild fish, but fatty, less desirable and less nutritious fish. They also allow for possible disease to expand to our wild fish as well as weakening the physical systems of wild fish should the penned fish escape. If companies wish to farm fish of different kinds, it should be done in waters NOT within the boundaries of the Puget Sound or Salish Sea! Saltwater ponds can be created FAR from the coast or rivers where they would cause harm to our wild fish. I urge you to refuse any net pond aquaculture developments within the Puget Sound/Salish Sea and river areas anytime.

Kari Koski

It is irresponsible of Washington State to renew a lease to Cooke Aquaculture after such catastrophic failures of their facilities endangered wild salmon in both Washington State and British Columbia Canada. Enough concern regarding such operations prompted the upcoming 2022 WA State ban on Atlantic salmon marine net pens. Why extend these dangerous leases with a company that has demonstrated continued bad practices? End the lease now and start taking wild salmon protections more seriously.
If WA State decides to renew, requiring National Pollutant Discharge Elimination System (NPDES) permits for each facility is a good idea.

Howard Emery

I strongly encourage reduction and elimination of pollutants, antibiotics, parasites into the waters of Puget Sound. Timing is critical as these factors further stress the wild salmon in these waters along with all of the other related life forms that are affected.

May 19, 1792 George Vancouver, describing the Puget Sound off of the current site of Seattle, wrote of "the abundant fertility that unassisted nature puts forth. We have, of course, already lost much of that abundance of species and numbers of sea life, birds, salmon, and whales that are interrelated.

We must choose what balance we would live with. To preserve the last remnants of life in our waters we must choose to do everything we an to protect these waters while their is still life to protect. Immediate closure of all non native salmon fish pens would be ideal. The minimum would be to approve the proposed draft for NPDES permits.

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Sherri Stair

I am deeply concerned about the impact on non-native finfish farms in the Salish Sea as negligence by Cooke has caused a massive release of a diseased invasive species into our water, putting at risk native fish. Infected and chemically polluted discharge from the farms damages already dwindling salmon and other marine life. I support the recommended measures to reduce harm until the pens are phased out: specifically:

— Increasing underwater video monitoring

— Submitting structural integrity inspection reports certified by a qualified marine engineer to Ecology

— Improving net cleaning and maintenance procedures

— Site-specific response plans and preparedness trainings

— Maintaining contact information to notify area tribes in the event of a fish release

Coleman Byrnes

The Atlantic Net Pen industry has proven to be dishonest and unconcerned about the health of the Salish Sea. Do not issue any permits unless Cooke Industries the involved facilities will be monitored for compliance. Coleman Byrnes.

Lynda Cole

There is no place in Washington waters for these stinking pens. We could not live in the house we were renting when the pens were brought nearby. By allowing Atlantic Salmon you are killing the future of the Natural runs of salmon Washington State has been blessed with. What blatant mismanagement of a resource. What's wrong with keeping Washington waters & habitat pristine? You have the choice to feed "the world" with the natural resource you're trying to kill. Look what Alaska's done to enhance their natural resources. How could any right-thinking person choose to desecrate?

Debra Kaukol

For the Concern of our waters:
Throw those pens away. When does Big corporations rule over our beloved waters. For their big money, they pollute, ruin our environment and destabilize our salmon environment. THROW THEM OUT....they do not belong here. Period.
Thank you,
Deb Kaukol

Lynn Murphy

I oppose the renewal of Cooke Aquacultures petition as it takes away the natural food souce supporting the Orca whale population.
Herring from the Salish Sea are used to make food pellets for the FARMED Atlantic Salmon. THose herring in nature feed the wild salmon that feed the ORCA. Those wild salmon are now depleted resulting in starvation of the remaining ORCA.

Please stop the depletion -- let nature be nature.

Caroline Armon

No, no, no! Please do not issue permits as Cooke Aquaculture fish farms have already disregarded permit regulations causing damaging impacts to endangered species and the Salish Sea ecosystem, as numerous incidents and science shows, and why the 2022 ban. Based on Cooke Aquaculture fish farms history, eliminating risks to endangered and threatened salmon and endangered Southern Resident Killer Whales are the priority.

SUSAN SWEETWATER

I urge the DOE to deny permitting for fish farms in Puget Sound. Native salmon and Orcas deserve protection over profits.

Howard Garrett

Please revoke all permits for net pen salmon farms. Sea lice. Viruses. Pesticides. Over harvest of food fish. Predator deterrents. Invasive escapes. Etc.

Annabelle Fox

Cooke Aquaculture's history of disregard for the maintenance of their pens should lead WDFW to revoke the rest of their permits now and monitor the removal of pens. Our Pacific salmon recovery is the priority, not Cooke.

Ruth Adams

I live in the Puget Sound area and know what an amazing and fragile resourse we have. Cooke Aquaculture really doesn't care. Their response to the latest spill was "oh gosh it wasn't our fault and we sure won't let that happen again". We know for a fact that more spills will occur and that feel lots endanger wild salmon and other marine life.

I urge you not to allow more net pens and that leases not be renewed. Cooke Aquaculture has proven they are not trust worthy and that the only bottom line is money.

Bonnie Gretz

Please stop Atlantic net pen fish farms as soon as possible. And please do not authorize anymore. The science is clear that the current methods of fish farming are very detrimental to the habitat of the Salish Sea and affects all living beings here. I am a very concerned citizen.

Marie Gallagher

I have lived in Alaska for 40 years and moved here recently. Introducing Atlantic salmon or any farmed fish into our waters has devastating effects on natural stocks. Why take that chance.I don't believe net pens should be allowed at all in our already polluted waters. Let's strive to clean up our oceans in as many ways as we can.

Susan Marie Anderson

Until non-native fish, such as Atlantic salmon are complety phased out in Washington's marine waters we must protect our waters by requiring all companies, and especially the notorious Cooke Aquaculture, to operate under the strongest water quality protections we can put in place.

These measures must include:
Increasing underwater video monitoring of net pens
Conducting inspections to assess structural integrity of the net pens and submit inspection reports certified by a qualified marine engineer to Ecology
Improving net cleaning and maintenance procedures to prevent fish escape
Requiring the permittee to develop site specific response plans in the event of a fish release, and to conduct and participate in preparedness trainings
Requiring improved maintenance of the net pens
Maintaining contact information to notify area tribes in the event of a fish release

Thank you

Warren Carr

I feel strongly that no additional permits should be issued due to the high likelihood of endangerment to native salmon. Non native salmon should be raised in an environment where they cannot escape or transmit potential diseases to the native salmon. Thank you.

Maya Green

Do not grant Cooke a new permit! Please do not let the Puget Sound be freely polluted with no external oversight. With a history of diseased fish and excessive use of harmful pesticides, they cannot be trusted not to do the same again.

Bill R.

DOE should grant Cooke Aquaculture the NPDES as well as all other necessary permits on their end required to operate the net pens. We need aquaculture! The state of our oceans and our food supply around the world depend on its sustainability!

The one sided SAVE OUR SALMON and SAVE THE ORCA and LET NATURE BE NATURE speeches that seem, as of late, to almost immediately place blame for these current problems on net pens are far fetched to say the least!

Do people actually believe that net pens are part of the cause of salmon and in turn orca decline? It sure seems that way to me.

REALITY CHECK!

The resident orcas are starving because the native salmon are being and have been over fished, and the climate is changing thus furthering the declining salmon problem!
If we let nature be nature all the salmon would be GONE!!! Most of the salmon these days are hatchery raised anyway (Guess what! That's not natural!)!!!!

And the Orcas, well if they're hungry enough they'll eat something else like maybe a seal! There's an overabundance of those! Or any other fish in the sea!! If not, well...We will LET NATURE BE NATURE, and guess what, only the strong and adaptable survive in nature!

This state dumps billions into saving the salmon and the orcas and has it helped at all? NO! The ORCAS ARE STILL STARVING and there are STILL LESS AND LESS NATIVE SALMON returning each year!

Waters are getting warmer and sport and commercial fishing continue to deplete the resources! BUT OH NO! THAT COULDN'T BE THE PROBLEM!

If people really want to help the native salmon population and resident orcas, they'll push for a minimum 5-year moratorium on chinook salmon fishing. For that matter put a moratorium on all salmon fishing and watch the result!

So, here's my POINT! - Unless your peeling bark off a tree for dinner or your afternoon snack is some berries you foraged in a field somewhere, your food was raised on a FARM! And that farm, no matter what is being grown on it, has an impact on the environment! You as a person are having an impact on the environment! EVERYTHING has an impact on the environment!!!!

AQUACULTURE IS SUSTAINABLE, GOOD FOR AND NECESSARY FOR FUTURE GENERATIONS!!!

Phyllis Starr

I am in favor of stricter requirements. I don't believe the regulations go far enough to protect native salmon, other marine life and water conditions. The broken pens in our waters have caused and continue to cause widespread problems. I don't want any pens in this area (or anywhere) and do not eat any farmed fish. We need to do everything we can to protect the wild fish populations and ecosystems that are already suffering due to so many unnatural influences.

Jill Hein

Please revoke all permits for net pen salmon farms. Atlantic salmon are an invasive species, they should never have been allowed in our waters in the first place. Just some of the problems with this invasive species is sea lice, viruses, the use of pesticides, escapes, and causing major problems to our wild salmon, which are hurting as you well know. Even having to wait until 2022 to be rid of these fish farms is too long, and as you well know, Cooke Aquaculture is not a responsible owner/operator
Please revoke all permits as soon as possible, thank you.

Carol Bordin

I am opposed to the raising of "non-native fish" in net pens in the Waters of the State of Washington. The reason is that the fish are not native to Washington State and pose several problems including: water quality problems; pose viral infectious diseases to various native fish and salmon; when pens break the non-native fish cause problems as competitors for food, space, spawning, health, ecosystem problems we still don't know about in our waters.

I believe that if any such "net pen fish" are allowed to be raised in net pens in the Waters of Washington State they should be of Wild Chinook Salmon stocks ONLY, and they should be made available ONLY for the Endangered Southern Resident Orca Whales for food, IMMEDIATELY for five years, and additional years if necessary! Only 10% of reared native Chinook salmon should be made available for sale.

The net pens should then be mandated to follow all the necessary requirements of a strict NPDES permit and compliance with said permit(s); require daily monitoring of water quality and compliance/reporting by third party to Washington Department of Ecology; require daily monitoring of health of native Chinook Salmon (physical characteristics) of size/length, weight, parasites, etc.; monitor proper feed and feeding of the salmon within non-crowded conditions/pens--all reported by third party to Washington State Dept. of Ecology and State Dept. of Fish and Wildlife, and Puget Sound Partnership; require daily monitoring/reporting of the physical structure of all net pens for possible failures to WSDOE.

The Washington State Department of Ecology should require that any net pens utilized for rearing salmon should be of native Chinook stock only, and be allowed for the next 5 years to help the Southern Resident Orca Whales as a food source in the Waters of Washington State. The entire pilot project should be monitored closely for compliance; fish release upon reaching maturity into the waters of San Juan Islands (with no permitted recreational, sport, commercial, or tribal fishing seasons of these fish) for five years, and, monitoring and reporting annually; should pilot project show success in terms of restoring and increasing the numbers of the Southern Resident Orca Whale populations, project may continue in succeeding years, if necessary, to further the efforts to recover the population of Southern Resident Orca Whales.

I am, at this time, asking that you please share my comments with Gov. Jay Inslee in an effort to provide possibly some new ideas to help him and the Southern Resident Orca Whale Task Force with the efforts to restore and increase the Southern Resident Orca Whale population in the Samish Sea/Waters of Washington State.

Respectfully,

Carol Bordin

Martha and James Doane

Please get rid of the net pen salmon farms.

Bert Clay

Any non-native fish, run a continuous potential risk of damage to the historical balance nature created.

Ecology has a responsibility to support the natural balance that was created and minimize damage by unnatural change.

Kathy Bailey

There should absolutely be stricter restrictions and regulations on farm pens but why are we waiting until 2022 to ban them completely? Even with more perceived protections, there is still no guarantee we won't experience another farm pen collapse like the devasting Cypress Island tragedy.

Marty Crowley

I am a member of the Orca Network and very concerned regarding the pollution of wild salmon by the Atlantic salmon which should have never been introduced in our waters. I am respectfully requesting that your agency stop any and all permits for Net Pen Salmon farming. The diseases that are documented with farmed salmon are threatening our wild stocks and can only continue to do more harm.

Thank you,

Marty Crowley

Joyce Berry

To the DOE. I am against the issuing of the NPDES permit for the following reasons:
1. I don't believe any government body has the moral right to allow a corporation to pollute our public water and marine resources for material gain. Why should the state let an outside company make a lot of money by ruining our marine environment? That is horrible.
2. Clearly, there is a dead zone under the farms so many worms, and other creatures are also being killed off.
3. It is awful and irresponsible to pour large amounts of antibiotics into open water and into these fish. What have you learned from other factory farming and indiscriminate use of antibiotics? Antibiotic resistance threatens all of us. It is hugely irresponsible.
4. These sick fish need to be tested in the pens to find out why they are dying. They are loaded with lice and other problems then sold as food. 5. our wild fish are threatened already and it's very short-sighted to keep pressuring them. You should deny the permit.

I strongly urge you to deny the NPDES permit to Cooke Aquaculture for the following reasons: It's clear that our local wild salmon and resident orca populations are severely threatened. Our Chinook population has crashed and our J Pod will likely starve to death in a matter of a few years. In light of the current science and the ***fact that we know that factory farming fin fish in our open waters places an additional burden on the marine ecosystem*** it is unconscionable to allow a foreign corporation to knowingly pollute our waters in order to protect their profit margin!

A sustainable native fishery as protected by treaty, a sustainable recreational fishery and a sustainable commercial fishery - which should all be far bigger responsibilities (morally and economically) to the Washington State Dept of Ecology - are incompatible with open pen finfish farming.

The permit is about granting permission to add known pollutants to our waters. These pollutants, which include large amounts of antibiotics and other chemicals are detrimental to our marine ecosystem and human health. The areas underneath the fish pens are complete dead zones due to pollutants, excess nitrogen, eutrophication, etc. We don't even know the extent of the damage done to the various other creatures beyond the salmon and orcas.

I am curious as to why this permit application does not even follow best practices for fish farming - no mention of nitrogen monitoring? Also, why are DOE and Fisheries not testing the adult fish in the pens for picene reovirus? What is the cause of mortality? It's an unhealthy system and even DOE states as much in your own literature.

It may be the path of least resistance for DOE to grant the permit and let the clock run until 2022, but I don't believe our marine ecosystem and our wild fish have the luxury of time. Do the right thing, put our WA waters, our wild salmon, our local orcas and the marine environment in front of the almighty dollar and deny the permit.

Maggie Santos

I would like to see strict regulations on these facilities. They have shown what weak regulations can lead to. In fact I would like to not see them at all. But if you must then best practices for the environment and ecology should be our foremost concern and these concerns should be the guide to strict regulations and oversight.

Heather Nicholson

Net pens must go now, for too many reasons to list. Please remove this danger from our waters immediately.

Bruce Kreider

Hello.

I have been a stakeholder in the property above the fish pens on Cypress Island for over 25 years. Initially, the pen occupants were good neighbors....quiet, and respectful of the environment. However, over the past 10-15 years, the commercialism and exploitation of the environment has been witnessed not only by me, but the other property owners on Cypress.

First it was the expansion of the pens, and then the incorporation of modern techniques to enhance the pen yields, inclusive of automatic feeding pipes which produced a high shrill, generators that broke the peace of the Island 24/7, what appeared to be underwater lights at night, fork trucks with back up alarms, and of course, the several breakage of pens with their Atlantic salmon released into the Bellingham Straights. Not once, but twice during my personal observation and tenure.

I was really surprised that the pens were allowed to escalate their commercialism in an arena that was deemed 'environmentally sensitive'. For those of us that have been part time residents, the demise of the sea kelp and grasses in the local bay, as well as the depletion of the oyster beds, the environmental impact was very evident. Most of all, we lost our solitude in what had been our weekend and Summer sanctuary.

Since the pens have been fallow in the past year, we have celebrated as the quiet has returned. So have the eagles and otters. We have our 'church' back after all these years.

I implore you to please rid the waters off Cypress of the commercial fish pens, and eliminate the risk to the local waters and environment that have already been exploited in such a negative light.

No permits, please.

Sincerely,

Bruce Kreider
Issaquah, Washington
Stakeholder at the Cliff House on Cypress Island.

Jeanne Kreider

I am the owner of the Cliff House along with Dr. Carl Jelstrup on Cypress Island ,Mexican Bay. We are situated above the fish pens. We arrived to the Cliff House 34 years ago when wildlife was abundant and the bay was fiilled with lots of life, fish,crabs,oysters,flour essence, grasses and kelp. With one pen we were all able to sustain quiet waters and no increase of pollution.

We witnessed the fish pen break in the 90,s and again last August with the growth of one pen to three larger pens with an excess totalling over 400,000 Atlantic salmon escape.

The pollution caused by the fish pens has made Mexican Bay a desert of no life, slimed grasses and slimed kelp whatever is left. All from the sewage created by the fish farms. There are no fish, oysters etc. to be had.

In short when we arrived to Cypress there was a rich beautiful bay full of life. Last year even before the devastating break in the pens we were looking at a dead bay with no life. All destroyed by the fish farms.

It should also be noted that parts of this area of the island has been designated as pristine area for protection by the DNR.

We want no permits for the pens because of the autrocities these pens have created on the immediate environment.

In addition to this is the extreme noise pollution the pens created as well

So in short pristine nature supposedly protected by DNR has turned into an industrial site with far reaching pollution in the entire area.

Dr. Carl Jelstrup and Jeanne Kreider

Jim Loring

Rich Doenges
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504 In

25 February 2019

RE: NPDES Draft Permits on net pen aquaculture

Dear Mr. Doenges

Thank you for this opportunity to comment on the Washington Department of Ecology's proposed permits pertaining to net pen aquaculture. Having had the chance to review the documents resulting from the state's investigation of the collapse of Cooke Aquaculture's Cypress Island Atlantic salmon net pen #2 [1] and the company's response of 29 January 2018, I feel the four draft permits - Clam Bay (WA0031526), Fort Ward (WA0031534), Orchard Rocks (WA0031542), Hope Island (WA0031593) – adequately address the factors contributing to the catastrophic failure and Atlantic salmon release of 19 August 2017.

The state's investigation determined determined that the probable cause of both the preceding July incident and the August collapse was the failure of Cooke to adequately clean the nets containing the fish. Biofouling of the containment nets in essence made the structure unstable. The draft permit requirements address this at several points in an attempt to prevent similar events in the future.

Of major concern is animal health and aquaculture practices which are only in part addressed in the draft permits. Monitoring for sea lice and antibiotic use are both identified as conditions for permitting, and in particular – under Sec L on p. 12 – that new information on the environmental impacts of antibiotics be taken into account over the duration of the permits and that unusually high usage levels of antibiotics be disclosed by the permit holder. Subtherapeutic antibiotic use in agriculture to increase animal growth is coming under increasing scrutiny, the cumulative effects on the environment potentially disastrous. Heighten use of antibiotics to treat acute infection is a good proxy for overall fish health, as is the required reporting of sea lice infestations.

Sec. G12. ADDITIONAL MONITORING
Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification

PRV (Piscine Reovirus) and HSMI (Heart and Skeletal Muscle Inflammation) are of great concern on the Pacific Coast. PRV was not considered harmful until it was determined that it may cause HSMI. Resent study indicates that in Chinook salmon, PRV causes red blood cells to rupture resulting in anemia and potentially lethal kidney and liver disease. [2]

Further, WDFW denied a recent transport permit after samples taken from the Atlantic salmon hatchery in Washington state tested positive for an "Icelandic form" of piscine reovirus (PRV). WDFW determined that introducing an exotic strain of PRV into Washington's marine waters would represent an unknown and unacceptable risk of disease transmission.[3]

The use / overuse of antibiotics and monitoring for sea lice are the only aspects of fish health

specifically identified as a condition of net pen permitting. Other aspects of animal health, such as the monitoring for piscine orthoreovirus (PRV), should be required as a condition of Ecology's NDPES permit, as it is with other state agency permits necessary in net pen aquaculture in Washington

Thank you for your time and consideration of these concerns.

Regards – Jim

Jim Loring
1815 153rd Ave. S.E.
Bellevue, WA 98007-6141

Jim Loring

Rich Doenges
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504 In

25 February 2019

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Thank you for your time and consideration of these concerns.

Regards – Jim

Jim Loring
1815 153rd Ave. S.E.
Bellevue, WA 98007-6141

[1] D Clark, K Lee, K Murphy, A Windrope. 2017 Cypress Island Atlantic Salmon Net Pen Failure: An Investigation and Review. Washington Department of Natural Resources, Olympia, WA.

[2] Di Cicco, Emiliano et.al.. "The same strain of Piscine orthoreovirus (PRV-1) is involved with the development of different, but related, diseases in Atlantic and Pacific Salmon in British Columbia, Facets, 23 April 2018, DOI 10.1139/facets-2018-0008

[3] WDFW denies permit for company to place 800,000 Atlantic salmon into Puget Sound net pens." Washington Department of Fish and Wildliife, 17 May 2018. (https://wdfw.wa.gov/news/may1718c/)

Scott Veirs

Please revoke all permits for net pen salmon farms! In Washington and beyond, we can't afford their many costs: sea lice; viruses; pesticides; over-harvest of food fish; predator deterrents; invasive escapes; etc. Just say no, now; it's too risky to try to mitigate through more-constraining permits as we phase them out over a few years.

204 S. 5th
Mt. Vernon, WA 98274

07 JAN 2019 PM 3 L

POSTCARD | USA

Melinda Wilson
Ecology Southwest Regional Off.
P.O. Box 47775
Olympia, WA 98504-7775

RECEIVED

JAN 14 2019

WA State Department
of Ecology (SWRO)

Dear Ms. Wilson,

I am in <u>total</u> <u>support</u> of DOE's prosoal to strengthen water quality requirements for Atlantic salmon farms.

The collapse of the net pen operation, run by Cooke Aquaculture, in Aug. 2017, illustrates the importance of protecting the waters of Puget Sound.

Sincerely,
Melinda Randles

Marlene S. Hansen
1318 Bernice St
Mt. Vernon, WA
98274

SEATTLE WA 980
JAN 2019 PM 3 L

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JAN 14 2019

WA State Department of Ecology (SWRO)

Melina Wilson
Ecology S.W. Regional Off.
P.O. Box 47775
Olympia, WA
98504-7775

Dear Ms. Wilson

Writing to support
the D.O.E.'s proposal to
strengthen water quality
requirements for Atlantic
salmon farms.

Marlene S. Hansen

Karen Gardiner
726 N 14th St
Mount Vernon, WA 98273

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07 JAN 2019 PM 3 L

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JAN 14 2019

WA State Department of Ecology (SWRO)

Melinda Wilson
Ecology SW Regional office
PO Box 47775
Olympia WA 98504-7775

98504-7775

Dear Melinda Wilson
I am totally in support of DOE's proposal to strengthen water quality requirements for Atlantic Salmon farms.
The collapse of the net pen in 2017 run by Cooke Aquaculture shows us the importance of protecting our Puget Sound
Karen B

Ms. Carol Sullivan
1400 Lindsay Loop Unit 5F
Mount Vernon, WA 98274

07 JAN 2019 PM 4 L

POSTCARD | USA

Ms. Melinda Wilson
Ecology SW Regional office
PO Box 47775
Olympia, WA
98504-7775

RECEIVED
JAN 11 2019
WA State Department
of Ecology (SWRO)

Dear Ms. Wilson—

I support DOE's proposal to **strengthen WATER quality** requirements for Atlantic Salmon farms.

The need for stronger regulation was clearly illustrated in Aug. 2017!

Carol Sullivan
Mount Vernon, WA
98274

SEATTLE WA 980

07 JAN 2019 PM 4 L

Melinda Wilson
Ecology Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

RECEIVED
JAN 09 2019
WA State Department of Ecology (SWRO)

Dear Ms. Wilson,

I am in total support of DOE's proposal to strengthen water quality requirements for Atlantic salmon farms. The collapse of the net pen operation run by Cooke Aquaculture in August 2017 illustrates the importance of protecting Puget Sound waters.

Sally Steen

J. Baker
1504 Alpine View Pl
Mt. Vernon, WA 98274

SEATTLE WA 980
07 JAN 2019 PM 2 L

Melinda Wilson,
Ecology Southwest Regional Office.
P.O. Box 47775
Olympia WA 98504-7775

RECEIVED
JAN 09 2019
WA State Department
of Ecology (SWRO)

1-7-19

Dear Ms. Wilson,

I am in total support of DOE's proposal to strengthen water quality requirements for Atlantic salmon farms. The collapse of the net pen operation, run by Cooke Aquaculture, in August 2017, illustrates the importance of protecting the waters of Puget Sound.

Judith R. Baker

Mt. Vernon,

WA 98274

DEPARTMENT OF ECOLOGY
State of Washington

Please Write Clearly or Go Online:
http://ws.ecology.commentinput.com/?id=7kdj4

Public Comment Form

1 Comment → 2 Review → 3 Your Copy

NPDES Draft Permits on net pen aquaculture for public comment

To raise fish in net pens, Ecology requires individual NPDES permits for each facility. The permit is the tool that requires Best Management Practices, monitoring, and reporting to ensure water quality standards are met. Updating these permits will regulate Atlantic salmon farming until the 2022 ban.

Please note that this comment form is for the purpose of submitting a comment to the Washington State Department of Ecology. Contact information is necessary if you want to receive future notices or responses related to this topic.

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FEB 28 2019
WA State Department of Ecology (SWRO)

Contact Information

All fields are optional unless otherwise indicated.

Submitted by: (Check one and write name)

- [x] Individual
- [ ] Organization: _____
- [ ] Agency: _____
- [ ] Tribal Government/Agency: _____
- [ ] Business: _____
- [ ] Other _____

First Name: Ernie & Ellen

Last Name: Williams

Address: 5083 Taylor Ave NE

City/Town: Bainbridge Is.

Country: U.S.A

State/Province: WA

ZIP: 98110

Email: ewilliams2010@hotmail.com

Please write comment clearly on other side:

Public Comment Form

1 Comment | 2 Review | 3 Your Copy

Your Comment

Comments are due by Feb. 25, 2019
To make a comment, please enter comment(s) in the text area. To submit attachments, visit the online version of this comment form at http://ws.ecology.commentinput.com/?id=7kdj

Next Steps: We will review and consider all comments and respond in a responsiveness summary document. If you would like a copy of the response either leave your email in the field above or join our Water Quality Information email list. (http://listserv.ecology.wa.gov/scripts/wa-ECOLOGY.exe?A0=ECOLOGY-WATER-QUALITY-INFO)

Any information (e.g., personal or contact) you provide on this comment form or in an attachment may be publicly disclosed and posted on the Internet.

We attended the public hearing by the Dept. of Ecology regarding Atlantic Salmon net pen facilities operated by Cooke Aquaculture on Thursday, Feb. 7th 6:00 pm in the library at Bainbridge High School. Given the fragile state of the waters of Puget Sound, which includes the declining local Orca population, and after re-reading the comment by Maia Bellon, "we must protect our waters and native salmon until Atlantic salmon farming ends in WA waters, we are requiring these companies operate under the strongest water quality protections we can put in place." And the State Legislature passed & the governor signed House Bill 1295 in early 2018. It seems to me that the 2022 date is totally out of line with the urgency that is apparent locally & what some climate scientists say may be too late & irreversible. We cannot continue to put large quantities of known pollutants & potential carcinogens directly into the open waters of Puget Sound, including Rich Passage. For the sake of the Sound, our local Orcas in the J-pod, our wild native Chinook salmon and the folks young & old who enjoy the water off our island, We respectfully request the NPDES permit be denied.

Ellen M Williams & Ernie L. Williams

Ellen M Williams

DEPARTMENT OF ECOLOGY
State of Washington

Laurie Niewolny, Washington State Department of Ecology

360-407-6329

Laurie.niewolny@ecy.wa.gov

Accessibility: https://ecology.wa.gov/About-us/Accountability-transparency/Our-website/Accessibility

SEATTLE WA 980
22 FEB 2019 PM 7 L

Ecology Southwest Regional Office
PO Box 47775
Olympia, WA
98504-7775

Ellen M. Williams and Ernie Williams
5083 Taylor Ave NE
Bainbridge Island, WA 98110-3188

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Organization: _____

Tribal Government/Agency: _____

Other _____

Name
Williams

Town
Bainbridge Is.

98110

Email
ewilliams2010@hotmail.com

Please write comment clearly on other side:

DEPARTMENT OF ECOLOGY
State of Washington

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Submitted by: (Check one and write name)

- [X] Individual
- [ ] Organization: _____
- [ ] Agency: _____
- [ ] Tribal Government/Agency: _____
- [ ] Business: _____
- [ ] Other _____

First Name: Mary Karen

Last Name: Brown

Address: 234 Wood SW, Apt 310

City/Town: Bainbridge Island

Country: USA

State/Province: WA

ZIP: 98110

Email: maryKarenbrown524@gmail.com

Please write comment clearly on other side:

Public Comment Form

1 Comment | 2 Review | 3 Your Copy

Your Comment

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I would not want to eat salmon that have been given antibiotics to keep them healthy, just as I don't want to eat chickens that have been given antibiotics to keep them healthy & fat.

Apart from my personal preferences, I am against the renewal of the fish farm permit to Cooke Aquaculture because of the impact these Atlantic salmon fish farms have on the species in the Salish Sea. For instance, pushing for rearing to make food pellets for the Atlantic salmon in these fish farms, reduces the food for the wild salmon in the Sound, which reduces the number of salmon for the orcas to eat, which is one of the factors the orcas are starving! I urge the Dept of Ecology commissioners to consider the impact on the entire web of life when they make their decision on whether or not to renew this petition. Finally, consider the effect of the reduction of wild salmon in the Sound for the livelihood of commercial fisherman in the Sound.

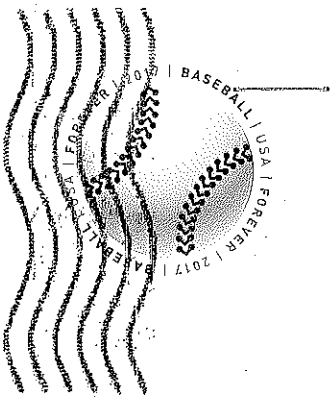
Thank you.

Mary Karen Dyson

DEPARTMENT OF ECOLOGY
State of Washington

Laurie Niewolny, Washington State Department of Ecology
360-407-6329
Laurie.niewolny@ecy.wa.gov

Accessibility: https://ecology.wa.gov/About-us/Accountability-transparency/Our-website/Accessibility



SEATTLE WA 980

25 FEB 2019 PM 2 1

Dept. of Ecology
P.O. Box 47775
Olympia, WA 98504
ATTN: Melinda Wilson

98504-

Clearly or Go Online:

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1 Comment | 2 Review | 3 Your Copy

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necessary if you want to receive future notices or

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FEB 28 2019
WA State Department
of Ecology (SWRO)

☐ Organization: _____

☐ Tribal Government/Agency: _____

☐ Other _____

Last Name

Brown

City/Town

Bainbridge Island

ZIP

98110

Mary Brown
234 Wood Ave SW Apt 310
Bainbridge Is., WA 98110

Email

marybarenbrown524@gmail.com

Please write comment clearly on other side:

Niewolny, Laurie (ECY)

From: Doenges, Rich (ECY)
Sent: Monday, February 11, 2019 1:04 PM
To: Niewolny, Laurie (ECY)
Subject: Fwd: Fish pens on Bainbridge Island

Follow Up Flag: Follow up
Flag Status: Flagged

Please add the forwarded email to comments received for the net pen permit

Thanks

Sent from my iPhone

Begin forwarded message:

> **From:** Don Heppenstall <dheppenstall@earthlink.net>
> **Date:** February 11, 2019 at 11:38:34 AM PST
> **To:** rich.doenges@ecy.wa.gov
> **Subject: Fish pens on Bainbridge Island**
>
> Hello and thank you for taking my message,
>
> I was born in Seattle and have lived on Bainbridge Island for more than 4 decades. During this time I have been an active boater, kayaker, sailor, and fisherman and have been sailing all over the Salish Sea for most of my adult life. I have been around salmon and experience Orcas first hand hundreds of times. The pens that contain the Atlantic salmon pollute more than mid size cities. The disease they bring to other salmon have helped to devastate native runs. There have been numerous examples of the pens failing and hundreds of thousands of Atlantic salmon escaping into our rivers.
>
> I encourage you put a stop to this by eliminating all salmon farms in the State of Washington and lobbying to eliminate them in British Columbia as well.
>
> Sincerely,
> Don Heppenstall
> 14396 Madison Ave. NE
> Bainbridge Island WA 98110
> dheppenstall@earthlink.net

Niewolny, Laurie (ECY)

From: Doenges, Rich (ECY)
Sent: Tuesday, February 26, 2019 7:45 AM
To: Bartlett, Heather (ECY); Clifford, Denise (ECY)
Cc: Niewolny, Laurie (ECY); Keltz, Colleen (ECY)
Subject: Fwd: DOE and WSDOT

FYI.

Sent from my iPhone

Begin forwarded message:

> **From:** Brenda Berry <bberrygreen@gmail.com>
> **Date:** February 25, 2019 at 9:39:11 PM PST
> **To:** "Rolfes, Sen. Christine" <Christine.Rolfes@leg.wa.gov>, "Owens, Linda" <Linda.Owens@leg.wa.gov>, "Doenges, Rich (ECY)" <rdoe461@ecy.wa.gov>
> **Subject: DOE and WSDOT**
>
> Dear Senator Rolfes,
>
> I have just submitted my comments to the DOE urging them to deny the NPDES permit to Cooke Aquaculture. My expectation is that they will likely go ahead, but if so, I hope that there will be pressure brought to bear to bring the farm up to best practice standards - and I hope they will close in 2022 and not simply switch species.
>
> Rich, can you tell us why nitrogen monitoring and eutrophication were not addressed in this permit?
>
> **The other thing I wanted to bring to your attention is the total disconnect between WA DOE and WSDOT efforts.** I attended an information session held by the Tribes and the League of Women Voters. The purpose was to educate us about road and culvert work that would be undertaken to restore natural access to wild salmon streams. This is mandated by treaty with the tribes and will cost many millions of dollars that is not currently in the budget (sounds like a McCleary situation). The great news is that they had some film that showed many of these projects as successful and salmon returning to spawn! The bad news is that these same wild fish have to run the gauntlet of swimming past the fish farms on their way back out to sea when they are most vulnerable to lice and disease.
>
> I find it very disheartening that one agency, WSDOT would be spending many millions of taxpayer dollars to restore native salmon runs, while at the same time another agency, DOE would be granting a permit to allow a foreign corporation to work at exact cross purposes, the add pollutants that contribute to the demise of our local salmon. This seems grossly irresponsible.
>
> Perhaps you can consider this and perhaps someone can pass this along to our Governor and the rest of the WA state legislative body.

With all due respect for all your efforts,

Brenda Berry
10403 Seaborn Road
Bainbridge Island WA
206- 491 -1202

--
Brenda Berry

WhatsApp
Instagram: Bberryphoto
www.anewcourse.org

Niewolny, Laurie (ECY)

From: Doenges, Rich (ECY)
Sent: Monday, February 25, 2019 8:22 AM
To: Niewolny, Laurie (ECY)
Cc: Galleher, Stacy (ECY)
Subject: FW: COOKE NPDES: Commercial fishermen's associations "opposition to marine finfish aquaculture in U.S. waters"
Attachments: SC75419022211420.pdf

Laurie,

Please include Stephanie's email and attachment with the other permit comments.

Thanks,

Rich

From: Stephanie Ross [mailto:srossonda@gmail.com]
Sent: Friday, February 22, 2019 6:37 PM
To: Doenges, Rich (ECY) <rdoe461@ECY.WA.GOV>
Cc: Rolfes, Christine <Christine.Rolfes@leg.wa.gov>; Owens, Linda <linda.owens@leg.wa.gov>; srossonda@gmail.com
Subject: COOKE NPDES: Commercial fishermen's associations "opposition to marine finfish aquaculture in U.S. waters"

Dear Mr. Doenges,

Please accept this submission, which is a duplicate of the submission at the Bainbridge Island hearing on the Cooke NPDES application. This, as authorized by Pacific Coast Federation of Fishermen's Association and Institute for Fisheries Resources, is submitted to support UNCONDITIONAL AND FULL DENIAL of any and all NPDES permitting non-native finfish open net pen aquaculture in Washington State.

Regards,

Stephanie Ross

Sent from my iPhone

Hand delivered - Stephanie Ross
Bainbridge Public Mtg 2/7/19
L. Niewolny Received

December 4, 2018

To: Members of the United States House of Representatives
Members of the United State Senate

Re: Opposition to marine finfish aquaculture in U.S. waters

Dear Senators and Representatives:

We the undersigned owners/operators of American commercial fishing vessels and representatives of American fishing organizations and communities write to collectively express our opposition to industrial ocean finfish farming in the U.S. Exclusive Economic Zone, whether through the Advancing the Quality and Understanding of American Aquaculture (AQUAA) Act, S. 3138/H.R. 6966, or any other legislative vehicle. This emerging industrial practice is incompatible with the sustainable commercial fishing practices embraced by our nation for generations and contravenes our vision for environmentally sound management of our oceans.

Industrial ocean fish farming – also known as open ocean, offshore, or marine finfish aquaculture – is the concentrated cultivation of captive finfish in the ocean, in net pens, pods, cages, or other devices. These operations are essentially underwater factory farms relying on natural currents to advect their waste and detritus to other parts of the ocean. The presence of finfish aquaculture in marine ecosystems poses significant challenges to the prosecution of domestic wild capture fisheries. As commercial fishermen, our livelihoods depend on good stewardship and science-based marine conservation to preserve sustainable fisheries for generations to come. The ocean currently provides a healthy and reliable food source and good jobs for many otherwise underserved coastal communities. We depend on a healthy marine ecosystem to supply quality, abundant wild fish stocks. Marine finfish aquaculture pollutes the natural ecosystem, degrades and threatens wild fish stocks, and challenges the economic viability of commercial fishing. **American commercial fishing and marine finfish aquaculture cannot coexist.**

We are concerned about the **economic burdens** that aquaculture, an emerging industry, poses to our long-established industry, America's oldest. The presence of a single marine finfish farm could bar access to hundreds of acres of marine space, which would no longer be available for us to navigate or fish. Finfish aquaculture pens also act as 'fish aggregating devices', subjecting wild fish stocks to excessive fishing pressure from recreational fisheries in areas that are inaccessible to many commercial gear types. Marine finfish aquaculture facilities aim to produce large amounts of fish at the lowest cost possible, which places downward pressure on seafood prices, harming our wild capture seafood markets. Flooding the market with cheap, low quality farmed seafood reduces the price that consumers are willing to pay for wild and sustainable seafood products, which directly impacts our well-being as sustainable seafood producers and the overall coastal economy. It also harms associated industries and workers who rely on a supply of high value product. Additionally, aquaculture is not dependent on seasonal accessibility, further driving consumers and the marketplace away from the natural seasonality of wild capture

fisheries. Simply put, industrial seafood farms threaten the integrity of the wild fish populations that are key to our industry's success, and the coastal communities we support.

Aquaculture harms the accessibility and quality of the wild fish stocks we depend on. Industrial ocean fish farming inevitably results in **farmed fish escapes** that can adversely impact wild fish stocks. Escaped aquaculture fish compete with wild fish and other species for food, habitat, and spawning areas. The culture of non-native fish brings attendant risks of introduction and invasion, while interbreeding of escaped aquaculture fish with wild stocks – a substantiated risk even with limiting cultivated species to "virtually" sterile or all-female native stocks – can lead to the modification and dilution of wild stocks' genetic integrity. Escapees can also spread a number of lethal diseases and parasites, such as sea lice and piscine reovirus. Escape events can limit fishermen's access to wild stocks and degrade the quality of wild fish available, reducing both the catch amount and the value. For these reasons, the potential for escapes by itself is reason enough to preclude open ocean aquaculture of any species, native or not.

Another important concern with large finfish aquaculture operations is the **marine pollution** caused by excess feed, untreated fish waste, antibiotics, and antifoulants. Such pollution alters the surrounding ecosystem and harms wild stocks. The release of excess nutrients degrades the marine ecosystem, leading to fish kills and impacting the seabed and water column. Ocean currents, no matter how strong, are not reliable methods for diluting net pen fish farm effluent. Often the ocean simply does not have the capacity to process this concentration and quantity of waste quickly enough, impacting wild fish stocks and their habitat. Fish farmers often disperse antibiotics and other chemicals within fish pens in an attempt to destroy pathogens. These toxins are harmful to the surrounding environment and marine life. Net pens also have high rates of deadly epizootic diseases, some of which can spread to wild fish stocks and cause a devastating loss to biodiversity and commercial fisheries. These impacts both degrade the environment and result in the loss of commercial catch.

Federal permitting and environmental review processes must thoroughly consider socioeconomic and environmental impacts, both in the National Environmental Policy Act (NEPA) process in other permitting processes. To date, such analyses have been inadequate. The NEPA process also requires consideration of alternatives including no action, closed-system fish culture approaches, and other actions that minimize adverse economic and ecological impacts posed by permitting these operations. We believe these adverse impacts are far too significant to justify permitting aquaculture activities in the EEZ.

Due to the extensive and well documented environmental harm caused by marine finfish aquaculture in the United States and elsewhere, this emerging industry should not be permitted. Neither the technology nor the knowledge is in place to sufficiently understand its environmental and socio-economic harms and satisfy federally-mandated environmental review and consultation processes. The legislation introduced by Senator Roger Wicker and Representative Steven Palazzo, the Advancing the Quality and

Understanding of American Aquaculture (AQUAA) Act (S. 3138/H.R. 6966), would hand regulatory authority over aquaculture to the National Oceanic and Atmospheric Administration under a radically permissive framework that ignores the severe consequences of aquaculture operations. But the AQUAA Act is not the only threat on the horizon – there is the possibility that an amendment to permit industrial ocean fish farms could be tacked onto a Magnuson-Stevens Act reauthorization package. Regardless of the legislative avenue, permitting this new industry would devastate ours.

Please protect our wild-capture fishing industry and the marine ecosystem by opposing any attempts to legitimize open net pen finfish aquaculture in our oceans.

Sincerely,

Noah Oppenheim
Pacific Coast Federation of Fishermen's Associations & Institute for Fisheries Resources
San Francisco, CA

Mike McCorkle
Southern California Trawlers Association
Santa Barbara, CA

Jeremy Brown
Coastal Trollers Association
Seattle, WA

Steve Bodnar
Coos Bay Trawlers Association
Coos Bay, OR

Beth Casoni
Massachusetts Lobstermen's Association
Scituate, MA

Brett Tolley
Northwest Atlantic Marine Alliance
Gloucester, MA

Avery Bates
Organized Seafood Association of Alabama
Bayou La Batre, AL

Bonnie Brady
Long Island Commercial Fishing Association
Montauk, NY

Lisa Griffith
National Family Farm Coalition
Washington, DC

Johnny Foss
Wild Salmon Nation
King Salmon, AK

Marsh Skeele
Sitka Salmon Shares Inc.
Sitka, AK

Rob Seitz
South Bay Wild Inc.
Astoria, OR

Kevin Kondysar
Ocean Grown Inc.
Bodega Bay, Ca

Elizabeth Wiegand
NC Catch Inc.
Raleigh, NC

Annette Ernst
Sustainably Caught Inc.
Newport, OR

Craig Putnam Sr.
Slayers Guide Service, Inc.
Cheshire, OR

Mary Ellon Balance & William T. Balance
Creative Ballance, Inc.
Hatteras, NC

Norman Pillen
Sea Lion Fisheries, LLC
Sitka, AK

Sharon Peele Kennedy
What's for Supper? Inc.
Hatteras, NC

Daniel J Farnham
Silver Dollar Seafood
New Bedford, MA

Joseph Conchelos
Conchelos Family Fisheries Inc.
Newport, OR

Kat Jones
Ventura Fresh Fish Inc.
Ventura, CA

Janis Angelini
Pac West Embroidery Inc.
Seattle, WA

Sean Barrett
Dock to Dish Community Supported Fisheries Inc.
New York, NY

Scott Bertelsen
F/V Carina
Bodega Bay, CA

Erik Peterson
F/V Kingfisher
Pelican Alaska

Ken Clark
F/V Genki
Halfmoon Bay, CA

Aaron Longton
F/V Goldeneye
Port Orford, OR

Melissa Stringfield
Private citizen
Coos Bay, OR

Ramona Butters
Private citizen
Port Orford, OR

Aaron Ashdown
F/V Misty
Port Orford, OR

Lance Nacio
F/V Anna Marie & F/V Marisa Jolie
Montegut, LA

Aaron weinzinger
F/V Regina Marie / CalPac Fisheries
Noyo, CA

Scott Wintermute
F/V Grasshopper
Astoria, OR

Rick Metheny
F/V Joie Lynn
Trinidad, CA

Robert Johnstone
F/V Jeanne Arain
Garibaldi, OR

Linda Behnken
F/V Woodstock
Sitka, AK

Melissa Turvey
F/V The Shadow
Sitka, AK

Richard Nelson
F/V Pescadero
Friendship, ME

Matt Munkres
F/V Salish Sea
Gig Harbor, WA

Susan west
F/V Hollyhock Run
Outer Banks, NC

Rob West
F/V Lucy B.
Buxton, NC

Claudia Peele
Private citizen
Hatteras, NC

Carolyn Nichols
Commercial fisherman
Sitka, AK

Chris & Lisa Ystad
F/V Ocean Cape
Sitka, AK

Shannon oneal
F/V Shannon D
Hatteras, NC

David Oen
F/V Endurance
Sitka Alaska

Patrick S. Dixon
Dixon Photography
Olympia, WA

William Markowitz
F/V Canvasback
Cordova, Alaska

Jesse Remund
F/V Faithful
Sitka, AK

Joel Natterstad
F/V Swingin Lady
Ridgefield, WA

Robert C. Tillitz
F/V Ann
Crescent City, CA

Acey Hines
Commercial fisherman
Kitty Hawk, NC

Marty Remund
F/V Teasha
Port Alexander, AK

Bryson Jeff Cooper
Cooper Marine Inc.
Hertford, NC

Laura Luciano
Slow Food New York
Hampton Bays, NY

Wesley Peterson
F/V 2 Sea Sons
Montauk NY

Hope Stanger
Private citizen
Stamford, CT

Stefanie Sacks
Red Beets, LLC
Montauk, NY

Paul Farnham
Montauk Fish Dock Inc.
Montauk NY

Amy Tagliaferri
Slow Food South Shore
Oakdale, NY

David ONeal
David O'Neal
Wanchese, NC

James Seitz
F/V Wrangler/ North Bay Fisheries
Chinook, WA

Ronald Borjeson
F/V Angenette
Plymouth, MA

Dr Pennie Schwartz
Slow Foods East End
Southold, NY

Roxanne
Slow Food North Shore
Bayport, NY

Howard Miller
Kolossal Inc.
Venice, CA

Chris Miller
F/V Sea Spearit
Montauk, NY

Eric Hodge
F/V Rough Draft
Santa Barbara, CA

Ryan Speckman
Locals Seafood LLC
Raleigh, NC

Brett Houston
F/V BigDaddy
Wanchese, NC

Diane Wilson
F/V SeaBee
Seadrift, TX

Tom Joseph
F/V Sara Bella
Halfmoon Bay, CA

Jane & Ralph Pratt
Michael Kevin inc.
Marshfield, MA

Rob Odlin
Diving Adventures Inc.
Portland, ME

Jerry Rosell
F/V Good News
Hatteras, NC

Dan Strickland
F/V Little Sole
Washington, NC

Ananda Bossard
Otolith Sustainable Seafood
Sitka, AK

Alecia Moore
Private citizen
Westhampton Beach, NY

Robert Ingels
F/V Queen of Hearts
Halfmoon Bay, CA

Leesa Cobb
Port Orford Ocean Resource Team
Port Orford, OR

Richard Vergili
Slow Food Hudson Valley
Kingston, NY

Marc James
Marc James &Company
Kill Devil Hills, NC

Megan Spencer
Private citizen
Swan Quarter, NC

Sharon Feuer Gruber
Wide Net Project
Silver Spring, MD

Sam L Demmert
F/V Ocean Rambler
Yakutat, AK

Brian Chadwick
Chadwick Oysters Inc.
Marshallberg, NC

Ira Miller
F/V John V. Miller, Inc.
Tenants Harbor, ME

Richard Voliva
Commercial fisherman
Pamlico Beach, MD

Bill Telepan
Oceana Restaurant
New York, NY

Bill Hitchcock
Hitchcock Realty
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Robert Bryant
Bryant and Barnes Marine LLC
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Chad Hatten
F/V Acrive ll
Humboldt Bay, CA

Becky Duta
Commercial fisherman
Seattle, WA

Elizabeth Figus
Private individual/fisherman
Anchorage, AK

Lauren Mitchell
Commercial fisherman
Sitka, AK

James Palmer
F/V Night Winds
Port Orchard, WA

Brian Love
F/V Orca Roar
Brush Prairie, WA

Allan Richardson
F/V Saint Jude
Saint Jude

Pete Lastowski
Private citizen
Seattle, WA

Pete Lastowski
F/V Kathleen K
Seattle, WA

Nick Joseph
F/V Valiant Lady
Bellingham, WA

Susanne Ashland
Private citizen
Seattle, WA

Brian Johnson
Ocean Bay Marine
Seattle, WA

Giacomo Damato
F/V Giusy
Channel Islands, CA

John Norton
JD Concrete Inc.
Newport, OR

Marine Bannister
Viekoda LLC
Newport, OR

Suzanne McMillin
Private Citizen
Albany, OR

Dorothy Nagle
M/V DavidEllis
Sebastopol, CA

Eric Marxmiller
Sunset Salmon Co.
San Francisco, CA

Jim Marxmiller
F/V Mocha
Dillingham, AK

John Myking
F/V Marie M
Honolulu, HI

Mili Lundgren
Bristol Legacy Salmon Inc.
Bristol Bay, AK

Michael Lundgren
Bristol Legacy Salmon Inc.
Bristol Bay, AK

David Sandvik
F/V Ingolf
Dillingham, AK

Celeste Beck-Goodell
FV Dirty Deeds
Kodiak, AK

Steve Fosso
F/V Miss Lauren
Anacortes, WA

Mark Meadows
F/V Ruth M
Valdez, AK

Sandra Earle
Bird Rock Fishery Inc.
Kodiak, AK

Nan Thompson
F/V Navigator
Moose Pass, AK

Giovanni Pennisi
F/V Irene's Way
Monterey, CA

Chuck Ridley
Seattle's Best Fish Inc.
Edmonds, WA

Michael Corl
F/V Renegade
Petersberg, AK

Stephen Hochberg
Private citizen
Seattle, WA

Paul Schuyler
Flyer Commercial Fisheries Inc.
Morro Bay, CA

George Bradshaw
F/V Swan
Crescent City

Mike Johnson
F/V South Sea
Ilwaco, WA

Cathy Anello
Anello Family Crab and Seafood Inc.
Bodega Bay, CA

Tyson Fick
Taku River Reds Inc. & F/V Heather Anne
Juneau, AK

Cody Chase
F/V Monde Uni
Newport, OR

Colin Duncan
Forever Wild Seafood Inc.
Portland, OR

Ari Georgakopoulos
Deschutes Lobster Co.
Bend, OR

Dori Olsen
F/V Independence
Kodiak, AK

Hailey Thompson
The Knotty Crew Inc.
Kodiak, AK

Ryan Keating
F/V Sea Hag
Dillingham, AK

Matt Gillman
F/V Martin
Westport, WA

Jody Pope
Wefish Inc.
Westport, WA

Robert Seitz
Artech Engineering Inc.
Kodiak, AK

Heather Jackson
Private citizen
Seattle, WA

Hand delivered - Stephanie Ross
Bainbridge Public Mtg 2/7/19
L. Nieuwsma Received

Attachment A

2017 Cooke Aquaculture Pacific
WDOE NPDES Net Pen Permit Renewal Application Additional Information

3.7) Feed additives, disease control chemicals and medications that may be used at the net pen facilities include the following;

Feed Additives-

Canthaxanthin and/or Astaxanthin - Natural and/or synthetically produced compounds of the two types of carotenoid pigments may be added to the fish feed in levels ranging from 30 ppm to 70 ppm. Both canthaxanthin and astaxanthin are approved by the USFDA for use in fish feeds to enhance the pink to orange/red coloration of salmonid flesh. In the animal kingdom, carotenoids are heavily utilized as a source for pigmentation, a vitamin A precursor, for improving intercellular communication, enhancing immune responses, and as antioxidants in vivo [1, 2]. Salmonid fish species achieve physiological benefits from storing pigments in their tissues.

Antioxidants - Antioxidants are added to the fish feed mixture to stabilize the vitamin supplements and increase the shelf life of the feed. Antioxidants that are used in the fish feeds are Ethoxyquin (in the fish meal), BHA (in the fish oil), and Vitamin E.

Antibiotic Medicated Feed-
Medicated feed may be periodically used to treat bacterial disease at the marine net pen sites. The use of medicated feeds is infrequent and used only to treat specific disease events.

Romet 30 (Sulfadimethozine-ormetoprim) - Romet 30 is the trade name for an aquatic animal premix containing a sulfadimethozine-ormetroprim antibiotic that is used to treat bacterial disease. When medicated feed is prescribed, the premix is added by the feed manufacturer during the feed milling process. Romet 30 is used to treat Furunculosis, Vibrio, Myxobacterial and other bacterial pathogens if they occur in the cultivated fish stocks. When a disease treatment is prescribed by a veterinarian, the Romet 30 medicated feed is manufactured at a concentration of 2.27 grams of active ingredient per one (1) pound of fish feed. The medicated feed is then fed to the fish to achieve a dosage rate of 50mg of active ingredients per one (1) kilogram of fish per day, for a treatment period of five (5) consecutive days.

Terramycin TM 200 (Oxytetracycline HCL) – TM 200 is the trade name of for an aquatic animal antibiotic premix that is used to treat Furunculosis, Vibrio, Myxobacteria and other bacterial diseases. The TM 200 pre-mix is added to the feed by the manufacturer when prescribed by the veterinarian to treat specific disease events. TM 200 is mixed to achieve a concentration of 5 grams of active ingredient per one (1) pound of fish feed. The medicated feed treatment is fed to achieve a dosage rate of 75mg active ingredient per one (1) kilogram of fish per day, for a period of ten (10) consecutive days.

3.7 cont.,)

Aquaflor- (Florfenicol) – Aquaflor is the trade name for the premix containing the antibiotic Florfenicol, and is approved by the USFDA for use in freshwater food fish to treat bacterial disease. In marine finfish aquaculture, Aquaflor can be used under the Investigational New Animal Drug (INAD) system administered by the USFWS and USFDA. When prescribed, Aquaflor medicated feed is used to treat bacterial disease and is mixed into the feed by the feed manufacturer at the active ingredient concentration rate of 0.302 grams per one (1) pound of fish feed. Aquaflor medicated feed is fed to the fish to achieve a dosage of 10 mg of active ingredients per one (1) kilogram of fish per day, for a period of ten (10) consecutive days.

Disease Control Chemicals- Other disease control chemicals that may be used at the farm sites are Finquel MS 222, Iodophor disinfectants and sodium hypochlorite (chlorine bleach) disinfectant solutions.

Finquel MS222 – Finquel (MS222) is a USFDA approved fish anesthetic that is periodically used when the fish are sampled for weight and condition factors. A small number of fish are periodically captured by dip net from a pen and then immersed in a tote of seawater with a small amount of MS222 mixed in. The MS 222 anesthetizes the fish so that they can be safely handled, inspected, weighed and then returned unharmed back to the fish pen. The fish quickly recover from the anesthetic when returned to ambient seawater.

Chlorine Bleach Solution and/or Argentyne Iodophor Solution – These surface disinfectants are used as a bio-security measure in footbaths at the farm sites and to periodically sterilize any shared equipment between the sites. Argentine Iodophor solutions are used in foot baths at the farm sites during the entire year. Estimated average annual consumption rates for each farming area of Iodophor solutions at the Bainbridge Island, Cypress Island, Hope Island and Port Angeles farm sites is approximately 55 gallons per facility. The use of sodium hypochlorite or chlorine bleach solutions at the net pen sites is infrequent.

3.8) Clean nets significantly reduce the drag loads exerted on the net pen structures and the netting materials themselves which in turn reduces the risks of tidal or storm damage causing a breach in the nets and fish escapement. Keeping nets clean also maintains a healthy growing environment for the fish by maintaining sufficient water flow through the net wall. Over the past several years, new netting materials have been developed by the industry that repels the accumulation of bio-fouling growth on the netting materials. The net pen industry has moved from using the older nylon blended net manufacturing materials to these newer polypropylene types of materials as they have been improved. The newer polypropylene net twines are tightly woven during the manufacturing process and have a hydrophobic property that helps to prevent the attachment of many bio-fouling organisms. This technological advancement has allowed the industry to reduce or completely eliminate the use of anti-foulant paint treatments on the netting material.

3.8 cont.,)

Beginning in 2012, the Cooke Aquaculture marine net pen sites eliminated the use of the Flex-Guard anti-foulant treatment on all of their nets. Over the past five years, the company has replaced nearly 100% of their net inventory with these newer polypropylene nets. At the same time, the company switched to a single stocking production plan that allows ample time for the containment nets to be removed from the farms and transported to an upland net washing facility for complete cleaning and repairs.

Fish containment nets are typically pulled to the surface once per year and net changes can occur during the 14 to 18 month production cycle as needed. Cleaned fish containment nets can be rotated into service during the growing period to minimize the amount of marine fouling growth on the nets. During the growing period, nets can be rinsed in-situ with pressurized seawater as needed to minimize active bio-fouling growth. At the end of the production cycle as the fish are harvested out, the fish containment nets are pulled to the surface and transported to the upland support facility. The nets are then trucked to an approved upland net cleaning facility specifically designed for handling these nets. Materials washed from the nets are captured and disposed of properly at this washing facility. The cleaned and repaired nets are then shipped back to the farm for installation and in preparation for the next generation of fish to be stocked at the site.

3.9) The Cooke Aquaculture Pacific Spill Prevention Control and Response Plans (Attachment B) contain an updated list of chemicals and petroleum products that may be used at the site and the approximate quantity kept in inventory. Disease control chemicals that may be used at the facilities are briefly described below.

Iodophor solution and chlorine bleach. Disinfectant used in footbaths and to disinfect farm equipment. Small quantities are used through out the year.

Finquel MS222. A fish anesthetic used occasionally during size sampling of juvenile fish during the production cycle.

Medicated Fish Feeds-
Romet 30- Sulfadimethozine-ormetoprim. (Described in previous answer above)
Terramycin TM 200 (Oxytetracycline HCL) (Described in previous answer above)
Aquaflor- (Florfenicol) (Described in previous answer above)

3.10) Solid waste disposal practices for the facility include the handling and proper disposal and/or recycling of fish mortalities, sanitary waste and operational debris generated by the facilities. The Cooke Aquaculture Pacific- Pollution Prevention Plans (Attachment C) contain further detail on solid waste handling and pollution control plans.

Fish Mortalities- Fish mortalities are collected from each pen a minimum of three (3) times per week. The frequency of fish mortality collection is increased as needed, dependent on the experienced mortality levels at the farm sites. The fish mortalities

3.10 cont.,)

(morts) are routinely collected by divers and brought to the surface in dive nets. The fish mortalities are put into large plastic fish totes which also have a single use, plastic tote liner placed inside of them. The tote liners are an additional barrier against leakage and also facilitate the cleaning and sanitation process after the contents are disposed of. The totes containing fish mortalities are frequently removed from the net pen sites and transported to the land based support facility where they are picked up and transported by truck to either a soil composting facility or a rendering facility. The fish totes are emptied at the receiving facility, the plastic liner is removed and disposed of, and the totes are steam rinsed and disinfected. Cleaned totes are then returned to their designated facilities for eventual reuse. The average monthly weight of fish mortalities removed from a site varies at different times of the year depending on what part of the growing cycle the fish population are in (new smolts or harvest size fish) and other factors that can increase the mortality rates such a harmful plankton bloom or disease event. Estimated average amounts of fish mortality biomass for a single generation of fish grown at the sites is given below.

Cypress Sites 1, 2 and 3-	Approx.	10,000 lbs. /month
Hope Island Site 4-	Approx.	3,000 lbs. /month
Port Angeles Site-	Approx.	6,000 lbs. /month
Bainbridge Island Sites-	Approx.	15,000 lbs. /month

Sanitary Waste and Operational Debris- The farm sites use chemical toilets (Port-a-Potties) for their employees and the proper disposal of sanitary wastes. The rented chemical toilets are routinely serviced by the company which provides them. Operational waste products generated by the net pen facilities are collected, stored in appropriate containment and then routinely transported to the shore side support facilities for appropriate disposal. Waste collection and recycling collection services are provided at the following land based support facilities:

- Port Angeles shore facility (Port Angeles net pens).
- Fort Ward dock facility (Fort Ward, Orchard Rocks, Clam Bay net pens).
- Anacortes dock facility (Cypress Is. Sites and Hope Is. Site).

The volume of solid refuse collected from each of these three locations is approximately 10 to 15 cubic yards per month.

Fish feed is transported to the site in large one (1) ton nylon bulk container bags. After the feed is removed from the nylon bags the bags are compiled and taken back to the land based support facility to be picked up for recycling.

Used oil and other hazardous materials are collected and transported to the associated upland support facility for eventual pickup and proper disposal by Emerald Services.

4) Environmental Monitoring

Site characterization and baseline studies were completed at the sites at the time of the original permitting process for the substantial development/shoreline conditional use permits/ Army Corps of Engineers Permits/ WDFW Hydraulic Permits/ and other related and necessary construction and operational permits. This application is for the renewal of existing NPDES permits for the company's marine net pen facilities. The original NPDES/Waste Discharge Permits for the facilities was issued in 1996. Cooke Aquaculture Pacific and the previous owners utilize the services of a third party consultant to conduct the required benthic monitoring and analysis. The required reports have been submitted to Ecology and WDNR as required by the conditions of the NPDES permits. Cooke Aquaculture Pacific can provide additional copies of specific past reports upon request.

Citations:

1. Goodwin TW: Metabolism, Nutrition, and Function of Carotenoids. Annu Rev Nutr. 1986, 6: 273-297.

2. Deming DM, Erdman JW: Mammalian carotenoid absorption and metabolism. Pure Appl Chem. 1999, 71: 2213-2225

December 4, 2018

To: Members of the United States House of Representatives
Members of the United State Senate

Re: Opposition to marine finfish aquaculture in U.S. waters

Dear Senators and Representatives:

We the undersigned owners/operators of American commercial fishing vessels and representatives of American fishing organizations and communities write to collectively express our opposition to industrial ocean finfish farming in the U.S. Exclusive Economic Zone, whether through the Advancing the Quality and Understanding of American Aquaculture (AQUAA) Act, S. 3138/H.R. 6966, or any other legislative vehicle. This emerging industrial practice is incompatible with the sustainable commercial fishing practices embraced by our nation for generations and contravenes our vision for environmentally sound management of our oceans.

Industrial ocean fish farming – also known as open ocean, offshore, or marine finfish aquaculture – is the concentrated cultivation of captive finfish in the ocean, in net pens, pods, cages, or other devices. These operations are essentially underwater factory farms relying on natural currents to advect their waste and detritus to other parts of the ocean. The presence of finfish aquaculture in marine ecosystems poses significant challenges to the prosecution of domestic wild capture fisheries. As commercial fishermen, our livelihoods depend on good stewardship and science-based marine conservation to preserve sustainable fisheries for generations to come. The ocean currently provides a healthy and reliable food source and good jobs for many otherwise underserved coastal communities. We depend on a healthy marine ecosystem to supply quality, abundant wild fish stocks. Marine finfish aquaculture pollutes the natural ecosystem, degrades and threatens wild fish stocks, and challenges the economic viability of commercial fishing. **American commercial fishing and marine finfish aquaculture cannot coexist.**

We are concerned about the **economic burdens** that aquaculture, an emerging industry, poses to our long-established industry, America's oldest. The presence of a single marine finfish farm could bar access to hundreds of acres of marine space, which would no longer be available for us to navigate or fish. Finfish aquaculture pens also act as 'fish aggregating devices', subjecting wild fish stocks to excessive fishing pressure from recreational fisheries in areas that are inaccessible to many commercial gear types. Marine finfish aquaculture facilities aim to produce large amounts of fish at the lowest cost possible, which places downward pressure on seafood prices, harming our wild capture seafood markets. Flooding the market with cheap, low quality farmed seafood reduces the price that consumers are willing to pay for wild and sustainable seafood products, which directly impacts our well-being as sustainable seafood producers and the overall coastal economy. It also harms associated industries and workers who rely on a supply of high value product. Additionally, aquaculture is not dependent on seasonal accessibility, further driving consumers and the marketplace away from the natural seasonality of wild capture

fisheries. Simply put, industrial seafood farms threaten the integrity of the wild fish populations that are key to our industry's success, and the coastal communities we support.

Aquaculture harms the accessibility and quality of the wild fish stocks we depend on. Industrial ocean fish farming inevitably results in **farmed fish escapes** that can adversely impact wild fish stocks. Escaped aquaculture fish compete with wild fish and other species for food, habitat, and spawning areas. The culture of non-native fish brings attendant risks of introduction and invasion, while interbreeding of escaped aquaculture fish with wild stocks – a substantiated risk even with limiting cultivated species to "virtually" sterile or all-female native stocks – can lead to the modification and dilution of wild stocks' genetic integrity. Escapees can also spread a number of lethal diseases and parasites, such as sea lice and piscine reovirus. Escape events can limit fishermen's access to wild stocks and degrade the quality of wild fish available, reducing both the catch amount and the value. For these reasons, the potential for escapes by itself is reason enough to preclude open ocean aquaculture of any species, native or not.

Another important concern with large finfish aquaculture operations is the **marine pollution** caused by excess feed, untreated fish waste, antibiotics, and antifoulants. Such pollution alters the surrounding ecosystem and harms wild stocks. The release of excess nutrients degrades the marine ecosystem, leading to fish kills and impacting the seabed and water column. Ocean currents, no matter how strong, are not reliable methods for diluting net pen fish farm effluent. Often the ocean simply does not have the capacity to process this concentration and quantity of waste quickly enough, impacting wild fish stocks and their habitat. Fish farmers often disperse antibiotics and other chemicals within fish pens in an attempt to destroy pathogens. These toxins are harmful to the surrounding environment and marine life. Net pens also have high rates of deadly epizootic diseases, some of which can spread to wild fish stocks and cause a devastating loss to biodiversity and commercial fisheries. These impacts both degrade the environment and result in the loss of commercial catch.

Federal permitting and environmental review processes must thoroughly consider socioeconomic and environmental impacts, both in the National Environmental Policy Act (NEPA) process in other permitting processes. To date, such analyses have been inadequate. The NEPA process also requires consideration of alternatives including no action, closed-system fish culture approaches, and other actions that minimize adverse economic and ecological impacts posed by permitting these operations. We believe these adverse impacts are far too significant to justify permitting aquaculture activities in the EEZ.

Due to the extensive and well documented environmental harm caused by marine finfish aquaculture in the United States and elsewhere, this emerging industry should not be permitted. Neither the technology nor the knowledge is in place to sufficiently understand its environmental and socio-economic harms and satisfy federally-mandated environmental review and consultation processes. The legislation introduced by Senator Roger Wicker and Representative Steven Palazzo, the Advancing the Quality and

Understanding of American Aquaculture (AQUAA) Act (S. 3138/H.R. 6966), would hand regulatory authority over aquaculture to the National Oceanic and Atmospheric Administration under a radically permissive framework that ignores the severe consequences of aquaculture operations. But the AQUAA Act is not the only threat on the horizon – there is the possibility that an amendment to permit industrial ocean fish farms could be tacked onto a Magnuson-Stevens Act reauthorization package. Regardless of the legislative avenue, permitting this new industry would devastate ours.

Please protect our wild-capture fishing industry and the marine ecosystem by opposing any attempts to legitimize open net pen finfish aquaculture in our oceans.

Sincerely,

Noah Oppenheim
Pacific Coast Federation of Fishermen's Associations & Institute for Fisheries Resources
San Francisco, CA

Mike McCorkle
Southern California Trawlers Association
Santa Barbara, CA

Jeremy Brown
Coastal Trollers Association
Seattle, WA

Steve Bodnar
Coos Bay Trawlers Association
Coos Bay, OR

Beth Casoni
Massachusetts Lobstermen's Association
Scituate, MA

Brett Tolley
Northwest Atlantic Marine Alliance
Gloucester, MA

Avery Bates
Organized Seafood Association of Alabama
Bayou La Batre, AL

Bonnie Brady
Long Island Commercial Fishing Association
Montauk, NY

Lisa Griffith
National Family Farm Coalition
Washington, DC

Johnny Foss
Wild Salmon Nation
King Salmon, AK

Marsh Skeele
Sitka Salmon Shares Inc.
Sitka, AK

Rob Seitz
South Bay Wild Inc.
Astoria, OR

Kevin Kondysar
Ocean Grown Inc.
Bodega Bay, Ca

Elizabeth Wiegand
NC Catch Inc.
Raleigh, NC

Annette Ernst
Sustainably Caught Inc.
Newport, OR

Craig Putnam Sr.
Slayers Guide Service, Inc.
Cheshire, OR

Mary Ellon Balance & William T. Balance
Creative Ballance, Inc.
Hatteras, NC

Norman Pillen
Sea Lion Fisheries, LLC
Sitka, AK

Sharon Peele Kennedy
What's for Supper? Inc.
Hatteras, NC

Daniel J Farnham
Silver Dollar Seafood
New Bedford, MA

Joseph Conchelos
Conchelos Family Fisheries Inc.
Newport, OR

Kat Jones
Ventura Fresh Fish Inc.
Ventura, CA

Janis Angelini
Pac West Embroidery Inc.
Seattle, WA

Sean Barrett
Dock to Dish Community Supported Fisheries Inc.
New York, NY

Scott Bertelsen
F/V Carina
Bodega Bay, CA

Erik Peterson
F/V Kingfisher
Pelican Alaska

Ken Clark
F/V Genki
Halfmoon Bay, CA

Aaron Longton
F/V Goldeneye
Port Orford, OR

Melissa Stringfield
Private citizen
Coos Bay, OR

Ramona Butters
Private citizen
Port Orford, OR

Aaron Ashdown
F/V Misty
Port Orford, OR

Lance Nacio
F/V Anna Marie & F/V Marisa Jolie
Montegut, LA

Aaron weinzinger
F/V Regina Marie / CalPac Fisheries
Noyo, CA

Scott Wintermute
F/V Grasshopper
Astoria, OR

Rick Metheny
F/V Joie Lynn
Trinidad, CA

Robert Johnstone
F/V Jeanne Arain
Garibaldi, OR

Linda Behnken
F/V Woodstock
Sitka, AK

Melissa Turvey
F/V The Shadow
Sitka, AK

Richard Nelson
F/V Pescadero
Friendship, ME

Matt Munkres
F/V Salish Sea
Gig Harbor, WA

Susan west
F/V Hollyhock Run
Outer Banks, NC

Rob West
F/V Lucy B.
Buxton, NC

Claudia Peele
Private citizen
Hatteras, NC

Carolyn Nichols
Commercial fisherman
Sitka, AK

Chris & Lisa Ystad
F/V Ocean Cape
Sitka, AK

Shannon oneal
F/V Shannon D
Hatteras, NC

David Oen
F/V Endurance
Sitka Alaska

Patrick S. Dixon
Dixon Photography
Olympia, WA

William Markowitz
F/V Canvasback
Cordova, Alaska

Jesse Remund
F/V Faithful
Sitka, AK

Joel Natterstad
F/V Swingin Lady
Ridgefield, WA

Robert C. Tillitz
F/V Ann
Crescent City, CA

Acey Hines
Commercial fisherman
Kitty Hawk, NC

Marty Remund
F/V Teasha
Port Alexander, AK

Bryson Jeff Cooper
Cooper Marine Inc.
Hertford, NC

Laura Luciano
Slow Food New York
Hampton Bays, NY

Wesley Peterson
F/V 2 Sea Sons
Montauk NY

Hope Stanger
Private citizen
Stamford, CT

Stefanie Sacks
Red Beets, LLC
Montauk, NY

Paul Farnham
Montauk Fish Dock Inc.
Montauk NY

Amy Tagliaferri
Slow Food South Shore
Oakdale, NY

David ONeal
David O'Neal
Wanchese, NC

James Seitz
F/V Wrangler/ North Bay Fisheries
Chinook, WA

Ronald Borjeson
F/V Angenette
Plymouth, MA

Dr Pennie Schwartz
Slow Foods East End
Southold, NY

Roxanne
Slow Food North Shore
Bayport, NY

Howard Miller
Kolossal Inc.
Venice, CA

Chris Miller
F/V Sea Spearit
Montauk, NY

Eric Hodge
F/V Rough Draft
Santa Barbara, CA

Ryan Speckman
Locals Seafood LLC
Raleigh, NC

Brett Houston
F/V BigDaddy
Wanchese, NC

Diane Wilson
F/V SeaBee
Seadrift, TX

Tom Joseph
F/V Sara Bella
Halfmoon Bay, CA

Jane & Ralph Pratt
Michael Kevin inc.
Marshfield, MA

Rob Odlin
Diving Adventures Inc.
Portland, ME

Jerry Rosell
F/V Good News
Hatteras, NC

Dan Strickland
F/V Little Sole
Washington, NC

Ananda Bossard
Otolith Sustainable Seafood
Sitka, AK

Alecia Moore
Private citizen
Westhampton Beach, NY

Robert Ingels
F/V Queen of Hearts
Halfmoon Bay, CA

Leesa Cobb
Port Orford Ocean Resource Team
Port Orford, OR

Richard Vergili
Slow Food Hudson Valley
Kingston, NY

Marc James
Marc James &Company
Kill Devil Hills, NC

Megan Spencer
Private citizen
Swan Quarter, NC

Sharon Feuer Gruber
Wide Net Project
Silver Spring, MD

Sam L Demmert
F/V Ocean Rambler
Yakutat, AK

Brian Chadwick
Chadwick Oysters Inc.
Marshallberg, NC

Ira Miller
F/V John V. Miller, Inc.
Tenants Harbor, ME

Richard Voliva
Commercial fisherman
Pamlico Beach, MD

Bill Telepan
Oceana Restaurant
New York, NY

Bill Hitchcock
Hitchcock Realty
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Chad Hatten
F/V Acrive ll
Humboldt Bay, CA

Becky Duta
Commercial fisherman
Seattle, WA

Elizabeth Figus
Private individual/fisherman
Anchorage, AK

Lauren Mitchell
Commercial fisherman
Sitka, AK

James Palmer
F/V Night Winds
Port Orchard, WA

Brian Love
F/V Orca Roar
Brush Prairie, WA

Allan Richardson
F/V Saint Jude
Saint Jude

Pete Lastowski
Private citizen
Seattle, WA

Pete Lastowski
F/V Kathleen K
Seattle, WA

Nick Joseph
F/V Valiant Lady
Bellingham, WA

Susanne Ashland
Private citizen
Seattle, WA

Brian Johnson
Ocean Bay Marine
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Giacomo Damato
F/V Giusy
Channel Islands, CA

John Norton
JD Concrete Inc.
Newport, OR

Marine Bannister
Viekoda LLC
Newport, OR

Suzanne McMillin
Private Citizen
Albany, OR

Dorothy Nagle
M/V DavidEllis
Sebastopol, CA

Eric Marxmiller
Sunset Salmon Co.
San Francisco, CA

Jim Marxmiller
F/V Mocha
Dillingham, AK

John Myking
F/V Marie M
Honolulu, HI

Mili Lundgren
Bristol Legacy Salmon Inc.
Bristol Bay, AK

Michael Lundgren
Bristol Legacy Salmon Inc.
Bristol Bay, AK

David Sandvik
F/V Ingolf
Dillingham, AK

Celeste Beck-Goodell
FV Dirty Deeds
Kodiak, AK

Steve Fosso
F/V Miss Lauren
Anacortes, WA

Mark Meadows
F/V Ruth M
Valdez, AK

Sandra Earle
Bird Rock Fishery Inc.
Kodiak, AK

Nan Thompson
F/V Navigator
Moose Pass, AK

Giovanni Pennisi
F/V Irene's Way
Monterey, CA

Chuck Ridley
Seattle's Best Fish Inc.
Edmonds, WA

Michael Corl
F/V Renegade
Petersberg, AK

Stephen Hochberg
Private citizen
Seattle, WA

Paul Schuyler
Flyer Commercial Fisheries Inc.
Morro Bay, CA

George Bradshaw
F/V Swan
Crescent City

Mike Johnson
F/V South Sea
Ilwaco, WA

Cathy Anello
Anello Family Crab and Seafood Inc.
Bodega Bay, CA

Tyson Fick
Taku River Reds Inc. & F/V Heather Anne
Juneau, AK

Cody Chase
F/V Monde Uni
Newport, OR

Colin Duncan
Forever Wild Seafood Inc.
Portland, OR

Ari Georgakopoulos
Deschutes Lobster Co.
Bend, OR

Dori Olsen
F/V Independence
Kodiak, AK

Hailey Thompson
The Knotty Crew Inc.
Kodiak, AK

Ryan Keating
F/V Sea Hag
Dillingham, AK

Matt Gillman
F/V Martin
Westport, WA

Jody Pope
Wefish Inc.
Westport, WA

Robert Seitz
Artech Engineering Inc.
Kodiak, AK

Heather Jackson
Private citizen
Seattle, WA

Sea Shepherd Seattle

To WA Department of Ecology: Regarding the renewed permit for Cooke Aquaculture, We believe that NO PERMIT be renewed, but understand it has been, so we are requesting additional protective measures be added on the permit to include:

• Increasing underwater video monitoring of net pens.

• Conducting inspections to assess structural integrity of the net pens and submit inspection reports certified by a qualified marine engineer to Ecology.

• Improving net cleaning and maintenance procedures to prevent fish escape.

• Requiring development of site specific response plans in the event of a fish release, and conducting preparedness training.

• Requiring improved maintenance of the net pens.

• Maintaining contact information to notify area tribes in the event of a fish release

Respectfully Submitted,

Christopher Joyce
Field Operations Coordinator
Seattle Chapter of the Sea Shepherd Conservation Society


SEA SHEPHERD
OPERATION VIRUS HUNTER

Whidbey Environmental Action Network

Please see Whidbey Environmental Action Network's attached comments.

Whidbey Environmental Action Network
Restoration Education Preservation
Box 53, Langley, WA USA 98260
(360) 579-4202 wean@whidbey.net

Dedicated to the preservation and restoration of the native biological diversity of Whidbey Island and the Pacific Northwest

Feb. 24, 2019
TO: **Washington Dept. of Ecology**
FROM: **Steve Erickson, Litigation Coordinator**
RE: **Cooke Aquaculture Marine Finfish Feedlots**
NPDES Draft Permits:
WA0031526,
WA0031534
WA0031542
WA0031593

On behalf of Whidbey Environmental Action Network, I submit the following comments regarding the renewal/re-issuance of these NPDES permits.

1. WEAN is a member of Our Sound Our Salmon (OSOS) and we include by reference the comments submitted by that coalition.

2. Ecology must apply "all known available and reasonable methods" (AKART) to the introduction and discharge of contagious pathogens which may infect native aquatic life, particularly salmonids.

As discussed in the OSOS submission, net pens provide an ideal situation for amplification of contagious pathogens once inevitable (because of the unhealthy crowded conditions occurring in confined feedlots) disease outbreaks occur. Those pathogens are biological pollutants and as such are regulated under the Clean Water Act. In the conditions attendant in the feedlots, the pollutant pathogens are discharged to regulated waters in at least four ways as discussed below.

a. First, they are directly discharged when the pens are stocked with diseased fish. While the Pollution Control Hearings Board (PCHB) has found that the non-native Atlantic Salmon do not become biological pollutants until they are outside the net pens, disease organisms they are carrying have no such allowance. Introduction of the pathogens into any waters of the state constitutes discharge of a pollutant. When diseased fish are placed in the feedlots, the pathogen has been discharged into regulated waters. As such, it is subject to the requirements for use of AKART to eliminate the pollutant.

b. Second, the polluting pathogens may be discharged when native fish that are small enough to pass through the net mesh come into direct or close enough contact with the diseased

fish for transfer of the pathogen. The now infected fish can then exit the pens and act as long distance vectors for further pathogen dispersal into regulated waters.

c. Third, "leakage" and escape of the diseased fish themselves can also function as a mechanism for the long distance dispersal and discharge of pathogens. Even without obvious escape events, there is "leakage" of fish from the feedlots. When diseased Atlantic Salmon are outside the feedlots, it is an additional discharge of pollutants in addition to the escaped Atlantic Salmon themselves (per the PCHB's finding that once out of the feedlots the net pen fish are themselves biological pollutants).

d. Fourth, these marine feedlots provide ideal situations for amplification of disease outbreaks; that is, diseases become epidemic and the load of the pathogens in that environment becomes greatly amplified. When pathogens are shed by the infected fish and dispersed in the water in and outside of the feedlots, there is discharge of these pollutants to regulated waters.

Ecology must address this problem by requiring use of AKART. The use of "all known available and reasonable methods" to prevent and control pollution is required by Chapters 90.48, 90.52, and 90.54 RCW. In this situation, the correct AKART is zero discharge of pathogens contagious to native organisms. This can be nearly achieved by conditioning the NPDES as follows:

i. Juvenile fish proposed for stocking must be tested multiple times for the presence of any pathogen potentially contagious to native aquatic organisms. The testing must be done in a statistically robust manner sufficient to determine with a high confidence (i.e. 99%) that no such pathogens are present. If such pathogens are detected, the polluted fish may not be introduced into regulated waters.

ii. The fish in the net pens must be similarly tested on a monthly basis. If potentially contagious pathogens are detected, the infected feedlot must be promptly (i.e. in < 1 week) emptied and disinfected. The situation after the Bainbridge feedlot outbreak in 2012 when over a month was taken to remove the diseased fish is simply unacceptable. The applicant must have demonstrated capacity to achieve rapid removal of all the fish in infected pens and post a bond sufficient to allow the State to act immediately if infected pens where disease is present are not completely emptied within a week.

iii. All testing (including taking of samples) must be conducted by third parties chosen by Ecology with all costs borne by the applicant.

We urge Ecology to condition these NPDES permits as discussed above.

Friends of the Earth

Please accept the two pdf attachments containing comments on the draft NPDES permits for Cooke Aquaculture, on behalf of Friends of the Earth-US and 1,257 of our members and activists in Washington State.

Submitted Online via the E-Comment Form.

February 25, 2019

Rich Doenges
Washington State Department of Ecology
PO Box 47600
Olympia, WA 98504
rich.doenges@ecy.wa.gov
(360) 407-6271

Re: Comments on water quality permits for existing Atlantic salmon farming operations in Puget Sound

Dear Mr. Doenges,

Thank you for the opportunity to comment on the Department of Ecology's (DOE) draft National Pollutant Discharge Elimination System (NPDES) permits for four of Cooke Aquaculture's existing Atlantic salmon facilities in Puget Sound.[1] We submit these comments on behalf of Friends of the Earth to indicate our support for the proposed, tougher requirements in the draft permits, but want to take the opportunity to indicate specific areas in which the permits should be improved upon.[2]

Friends of the Earth fights to protect our environment and create a healthy and just world by promoting clean energy and solutions to climate change, keeping toxic and risky technologies out of the food we eat and products we use, and protecting marine ecosystems and the people who live and work near them. Friends of the Earth's sustainable aquaculture campaign specifically focuses on highlighting the dangers of industrial ocean fish farming and supporting sustainable seafood production alternatives. We are nearly 1.7 million members and activists across all 50 states – including over 61,000 in Washington – working to make these visions a reality. We are part of the Friends of the Earth International federation, a network in 74 countries working for social and environmental justice.

Industrial ocean fish farming – also known as marine finfish or offshore aquaculture – is the mass cultivation of finfish in the ocean, in net pens, pods, and cages. These are essentially underwater factory farms in our ocean, with devastating environmental and socio-economic

[1] State of Washington Department of Ecology, *Atlantic Salmon net pen individual permit* (last visited Feb. 25, 2019), https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Water-Quality-individual-permits/Net-pens#documents.

[2] In addition to this comment letter, Friends of the Earth is submitting individual comments from 1257 Friends of the Earth members and activists residing in Washington State. Friends of the Earth has also joined a group comment letter from the Our Sound, Our Salmon campaign that discusses the draft permits.

impacts. As detailed below, these underwater factory farms impose a significant risk to Washington's public waterways and native wildlife, including direct harm to its endangered salmon populations.[3]

In March 2018, spurred by Cooke Aquaculture's catastrophic spill of more than 263,000 non-native Atlantic salmon into Puget Sound, the Washington State Legislature passed House Bill 2957, which phases out marine aquaculture for non-native finfish species. Thankfully, by 2022, this law will end the farming of Atlantic salmon along Washington's coastline.[4] In the meantime, we are pleased to see DOE's proposal to impose more stringent restrictions on Cooke Aquaculture's operations through updated NPDES permits. However, as detailed below, the harms from these facilities simply cannot be mitigated or avoided – the only way to truly protect against harm is to remove these operations entirely. Therefore, as detailed below we urge DOE to unequivocally incorporate into each of the final permits its intention to terminate the permit for any noncompliance issue.[5]

Industrial ocean fish farming causes significant, unavoidable harm to coastal and marine resources or uses.

The environmental and public health problems associated with industrial ocean fish farming are extensive. These impacts are varied and widespread, including significant environmental harm that simply cannot be mitigated or avoided.

These practices routinely result in a massive number of farmed fish escapes that adversely affect wild fish stocks. As DOE is well aware, in August 2017 Cooke Aquaculture spilled more than 263,000 farmed Atlantic salmon into Puget Sound. Long after the escape, *many of these non-native, farmed fish continued to thrive and swim free* – some were even documented as far north

[3] *See generally* Friends of the Earth, The Dangers of Industrial Ocean Fish Farming (2018), *available at* http://foe.org/IOFFreport (providing an overview of the many harms and disruptions from industrial ocean fish farming, including links to additional peer-reviewed studies).

[4] After the phase-out is complete, Washington State will still allow industrial ocean fish farming of native finfish in its waters, and will be the only state along the Pacific Coast to do so. We continue to urge DOE to join Washington's neighboring states in banning all industrial ocean fish farms in its waters. Washington State is also home to a number of tribal nations who are improving the health and stability native, wild fish populations through the use of net pen facilities. These tribal facilities are raising native fish species, and are conducted harmoniously with the surrounding environment. Any minimal impacts caused by these facilities are far outweighed by the benefits. These tribal facilities are not industrial ocean fish farms, and our comments and request for a ban do not encompass those activities.

[5] We make this call to action in addition to the recommendations in the comment letter from Our Sound, Our Salmon (which Friends of the Earth joined): (1) refrain from issuing the permits until the National Marine Fisheries Service and the U.S. Environmental Protection Agency have completed requisite formal consultation under Section 7 of the Endangered Species Act; and (2) address and include in the final permits conditions on discharge of various pollutants that affect the designated uses of receiving waters and land adjacent to the four facilities.

as Vancouver Island and the west end of the Strait of Juan de Fuca and as far south as Tacoma, at least as far as 100 miles from the farm.[6]
Escaped fish increase competition with wildlife for food, habitat and spawning areas. Reliance on the sterility of farmed fish is *never* 100% guaranteed; consequently, the "long-term consequences of continued farmed salmon escapes and subsequent interbreeding . . . include a loss of genetic diversity."[7]

Another vital concern is the discharge of excess food, feces, antibiotics, and antifoulants associated with industrial ocean fish farms. Releasing such excess nutrients negatively impacts water quality surrounding the farm and threatens surrounding plants and animals. These underwater factory farms also physically impact the seafloor by creating dead zones, and change marine ecology by attracting predators and other species to congregate around fish cages. These predators – such as birds, seals, and sharks – can easily become entangled in net pens, harassed by acoustic deterrents, and hunted. Indeed, an industrial ocean fish farm caused the death of an endangered monk seal in Hawaii, which was found entangled in the net.[8]

Large populations of farmed fish require an incredible amount of feed. Most industrially farmed finfish, like salmon, are carnivorous and need protein in their feed. This often consists of lower-trophic level "forage fish," which are at the brink of extinction. Lately, aquaculture facilities are relying more on genetically-engineered ingredients such as corn, soy, and algae as substitute protein sources, which do not naturally exist in a fish's diet. Use of these ingredients means more environmental degradation and a less nutritious fish for consumers.

There is no way to avoid and minimize these adverse environmental, social and economic impacts.

As described above, industrial ocean fish farms inherently harm the environment, society, and the economy – these harms cannot be avoided or minimized. Cooke has proven as recently as August 2017 that fish spills will happen, and in massive numbers. Containing massive quantities

[6] Lynda V. Mapes, SEATTLE TIMES, Despite agency assurances, tribes catch more escaped Atlantic salmon in Skagit River (Dec. 1, 2017), *available at* https://www.seattletimes.com/seattle-news/environment/despite-agency-assurances-tribes-catch-more-escaped-atlantic-salmon-in-skagit-river/.
[7] Fisheries and Oceans Canada, Newfoundland and Labrador Region, Stock Assessment of Newfoundland and Labrador Atlantic Salmon (2016), *available at* http://waves-vagues.dfo-mpo.gc.ca/Library/40619655.pdf ("Genetic analysis of juvenile Atlantic Salmon from southern Newfoundland revealed that hybridization between wild and farmed salmon was extensive throughout Fortune Bay and Bay d'Espoir (17 of 18 locations), with one-third of all juvenile salmon sampled being of hybrid ancestry."); *see also* Mark Quinn, CBC News, *DFO study confirms 'widespread' mating of farmed, wild salmon in N.L.* (Sept. 21, 2016) https://www.cbc.ca/news/canada/newfoundland-labrador/farmed-salmon-mating-with-wild-in-nl-dfo-study-1.3770864.
[8] Caleb Jones, USA Today, *Rare Monk Seal Dies in Fish Farm off Hawaii* (Mar. 17 2017), *available at* https://www.usatoday.com/story/news/nation/2017/03/17/rare-monk-seal-dies-fish-farm-off-hawaii/99295396/.

of animals requires the use of veterinary drugs, such as antibiotics, to control pests and disease. Moreover, because these facilities are sited in open-water, they directly discharge into the water untreated fish waste, excess fish feed, and other toxins. No amount of regulation will effectively protect against these harms.

In conclusion, we believe DOE's updates to the NPDES permits for Cooke's four facilities are well-intentioned. Although the draft permits include some improvements, it is important to note that marine finfish aquaculture facilities cannot operate without releasing toxins directly into the water. The new requirements in the draft permits cannot minimize or avoid the harms that are simply inherent with underwater factory farms. The only way to truly avoid and minimize adverse impacts is to not allow marine finfish farming in open water. Therefore, in addition to the suggested improvements in the joint comment letter from Our Sound, Our Salmon, we urge DOE to include in the final permits its intention to utilize rigorous enforcement powers, including swift permit termination for any noncompliance issue.

Thank you for the opportunity to submit these comments.

Sincerely,

Hallie Templeton
Senior Oceans Campaigner
Friends of the Earth

Dear Mr. Doenges:

Industrial ocean fish farming has been polluting our waters and harming our wild, native salmon for far too long. I am excited to see that Washington officials have taken a stronger stand against these harmful facilities until their eventual phase-out in 2022.

I was pleased to see recent decision in May 2018 to deny Cooke's requests to import diseased, juvenile fish into the State for farming, as well as the December 2017 revocation of an operating permit for Cooke's facility in Port Angeles. Thank you taking those actions, and for proposing increased restrictions in renewed NPDES permits for Cooke Aquaculture's facilities in Clam Bay, Fort Ward, Orchard Rocks, and Hope Island.

I support the proposed, tougher requirements wholeheartedly, but want to take the opportunity to remind you that most of the harms from these facilities cannot be mitigated or avoided. The only way to truly protect our coastline and wildlife from the harms of industrial ocean fish farming is to remove the operations from our waters entirely.

It's clear from recent history that Cooke has no intention of operating in accordance with our environmental conservation and protection laws and regulations. Therefore, tougher restrictions – although well-intended – are simply not enough. Cooke's destructive facilities have no place in our waters.

We hope you continue to undertake stringent oversight and swift enforcement actions – including revocation of operating permits– against Cooke for any violations. Please do all you can to end these incredibly harmful practices in our waterways as soon as possible.

Sincerely,

First name	Last name	Postcode
Claire	Aiello	981072253
Sally	Benardo	98382
Ky	Parker	983709784
Robert	Curry	990041437
Kyle	Kennedy	981181647
Tom	Gray	993375426
Linda	Freitag	983829264
Steve	Shapiro	981445517
Rebecca	Bartlett	982211525
Summer	Spinks Marasco	980367231
Leslie	Spurling	981336209
Diane	Weinstein	980297524
Joanne	Jensen	992043306
f	t	983609449
Grace	Deluz	980775872
Rebecca	Cook	98250
Raymond	Couture	981680953
Allen	Elliott	98257
Mary	McNaughton	981442169
David	Hollingsworth	980424818
Teri	Scheuer	980197912
ElsaMarie	Butler	981104619
S	Te	98422
Joel	Johnson	98661
Nick	Szumlas	983808734
thomas	Kaufmann	983623290
Mary	Quackenbush	981263732
Robert	Rice	980526556
Judae M	Bost'n	98506
Klaudia	Nowak	98345
Richard	Ress	981333966
Joe	Nichols	982909315
Donald	Wilson	983706417
Roy	Farrant	981053602
Kristine	Gaffney	98841
Carol	Cole	981782504
Kurt	McInnes	98125
Ronna	Loerch	98247
Jennifer	Durrie	981225064
Carol	Ellis	981163725
Sybille	Vital	98597-9173
Mary	Solum	982297846

Frederick	Stone	982087515
james	rechetnick	982011114
Terrie	Ward	981254487
scott	selby	980280413
Susan	Wood	980284316
Michael	Symonds	993501403
Marilyn	Lowry	980124299
Sarah	Bauman	982296920
Shirley	Gazori	980121306
Julia	McLaughlin	985799588
Elaine	Packard	981226316
John	Miller	982252839
Jude	Green	982252625
Emily	Raymond	981037654
Fred	Reinman	98333-9761
Steven	Monahan	980284754
Melissa	Thirloway	980335316
Marc	Daniel	982732913
Sean	Edmison	980522785
Selim	Uzuner	980140750
George	Lawrence	982265598
Carol	Stanley	980521974
Raeann	Scott	982649542
Priscilla	Martinez	980117608
Linda	Avinger	982269510
JoAnn	Riley	980283348
Eleanor	Dowson	980124817
Carolyn	Marshall	98133
Laura	Goldberg	982238677
Norm	Conrad	982744758
Mike	Conlan	980524588
Mark	Porter	982958309
Gary	Albright	982967857
Teresa	Allen	982449513
Miguel	Ramos	982489249
Thomas	Cox	980343445
Julie	Holtzman	982902053
Lyn	Meyerding	982949739
Mark	Beringer	980218660
Sarah	Sanford	980338016
Brandie	Deal	980218353
Stephen Craig	Rolston	982737129
Steven	Bouchard	982268712

Lisa	Agard	982745103
Deborah	Gandolfo	980335522
Kimberly	Crane	982901734
Shawn	O'Grady	98223
Karen	Fisher	982489650
MICHAEL	HUBER	982906701
MERRYL	WOODARD	980121636
Marjorie	Ostle	980338081
Sara	Bhakti	980334239
debbie	thorn	980334818
Ravinder	Bajwa	980526841
Sharon	Buck	980725308
Brandon	Adams	982732666
Joseph A.	Yencich	980116829
Lilia	Wood	980128243
Robert	Seaman	982649402
Randy	Guthrie	982905815
Cornelia	Teed	982488995
Dennis	Bahr	982968436
Kylie	Loynd	981023246
Bruce	White	980345845
Oleg	Varanitsa	980524063
joANNE	BEESON	982305110
Suzanne	Hamer	980726611
Gloria	McClintock	982748761
Kathlene	Croasdale	980523406
Janet	Moore	980335731
Jean	Mattke	980535627
Dore	Richman	980280494
Andrew	Harper	982965246
Sheila	Bradley	982419438
Linda	Thompsen	980522945
Sierra	Sanchez	980334826
Richard	Yust	982239413
Matthew	Boguske	980523495
Erika	Somm	980337726
Doreen	Harwood	980218514
Nick	Barcott	980872029
Paula	Shafransky	982848586
Marianne	Edain	982600053
Richard	Johnson	982273138
Barbara	Lamb	982609208
Sue	Stoeckel	982034584

Gail	Buchanan	982218543
Erik	LaRue	982339670
Margaret	Mills	982430191
Jean	Richardson	982251057
Carol	Papworth	982045773
Jack	Stansfield	982928981
Joanne	Romann	982828441
Margie	Jensen	98223
Corinne	Salcedo	982213287
Colleen	Curtis	982298900
James	Whitefield	982218210
Felicia	Dale	982719135
Tracy	Ouellette	982329246
william	davison	982047881
Dianna	MacLeod	982609621
Deborah	Parker	982297949
Sammy	Low	982927843
Virgene	Link-New	982210249
Kathryn	Alexandra	982218581
James	Hipp	982261745
Barbara	Wallesz	982298952
Kim	Mcdonald	982718618
Carol	Hedlin	982571089
Jenny	england	982292574
Alec and Sandy	McDougall	98273-8135
Jerry	Kessinger	980871867
John	Primrose	982256562
Donna	Davis	982298975
Marcia	Guderian	982271569
Bill	Bowman	982579530
Sandra	Wilson	982502309
Joe	Wiederhold	982295714
Susan	Sargis	982508943
Roberta	Hutton-Pieti	982211982
Angie	Dixon	982369622
Daniele	Rubcic	980875433
John	Thompson	982717300
Joyce	Lewis	982828226
Heather	Haverfield	982600964
Susan	Shouse	982012546
Bhavana	Lymworth	982600459
James	Tandoo	980264002

Janet C. and Richard	Wright	982508966
Kristina	Rohder	982920806
Dora	Weyer	98204
June	Chaus	98036
Dennis	Sullivan	982774556
Mike	Betz	982253505
John	Springer	982827215
Elsie	Wattson Lamb	982255815
Vanessa	Jamison	982708067
Richard	Bergner	982218754
Wayne	Ellis	982254839
Ursula	Mass	982578927
Matt	Shaffer	982268219
Peter	Sakura	982252337
Karen	Hattman	982618034
Charles	Gustafson	98232
Annette	F	982237891
Jennifer	Stone	982275055
Kelley	Coleman-Slack	982293246
Marilyn	Missimer	982213879
Gina	Schneider	982368409
David	Neevel	982257706
Enid	Braun	982369700
Karen	Hiller	982800333
Susan	Arndt	982737202
Cristina	Wenzl	980872126
Mara	Price	982707935
Donna	Davis	982219568
Jennifer	Kardiak	98107
Jane	Volland	982256406
Selene	Russo	981162074
Janet	Wynne	982298976
John	Lund	982252402
Anne	Hall	982618589
Sandra	Gehri-Bergman	983724150
Wilfred	Collins	982608413
Denise	Sparks	982826525
Margaret	Woll	982255414
Lisa	Ehle	982509023
Rico Mark	Urtula	980433604
Tom	Strawman	982218350
Susan	Hampel	982458544

Diane	Sullivan	982774556
Sally	Hodson	982790409
Noreene	Ignelzi	982618003
Sallie Rose	Madrone	982609313
David	Walseth	986835148
Robert	Lindberg	986623328
Susan	Kiplinger	986831804
Sue	Nickerson	986044824
MICHAEL	STATHATOS	986717659
Susanne	Weil	985700787
Ken	Loehlein	986659534
Wesley	Banks	986820067
Stephen	Pew	98683
Jim & Margie	Crossley	986828574
Julia	Russell	986845913
Lori	Stefano	985979086
Houman	Alayan	986823566
Mark	Frey	985979345
Cathy	Allen	986847915
Cheri	Hill	986720480
jerry	miller	986838914
Claire	Morency	986826300
Florence	Harty	986728901
Adrian	Farnsworth	986042104
Sharon	Miller	986646413
Cheryl	Speer	981156655
Tina	Tierson	986626325
Tom	Rarey	985969662
Gloria	Lionz	986715196
Gail	Atkins	985779492
Sam	MacKenzie	986613502
J	Chu	986616202
Linda	Feletar	986644122
Linda	Leighton	986642620
Becky	Johnson	986049441
Sandra	Maloff	986835145
Renee	Bourgea	98686-5772
Berinda	Van Cleave	986049707
Steven	Woolpert	986350001
Sue	Jarrard	986119671
Merriann	Bell	986359509
ROBIN	STARZMAN	986657568
Laura	Walters	98665

Valentina	Mazza	986612638
SHARMAYNE	BUSHER	986621881
Emily	van Alyne	993537405
Judy	Palmer	988550705
Gail	Barton	989379419
Maureen	Parriott	988442267
Jesse	Mallory	993373927
Richard	Grassl	993014121
Steven	Gregory	98802
Steven	Knoll	993541845
Stephen	Pacios	993389362
Mary Jo	Wilkins	993374614
Daves	Schiesl	988559454
Marguerite	Winkel	992015465
Marilyn	Smith	994032733
Jennifer	Gindt	992231264
Penny	Derleth	990060421
MIKE	LYMAN	991142005
Lyn	Lukich	992181515
Michelle	Guilford	992025103
Don	Thomsen	992024278
Aileen	Taylor	992160485
Doug	Brown	990279108
Nancy	Hayden	992179788
Jan	Thorne	992015872
Andrea	Gunning	992031726
D	Bell	990370345
Nancy	White	992160202
Patrick	Gray	992031060
Melissa	Rees	992123083
Roseanne	Rohrer	992084033
Joseph	Barreca	991419632
Fay	Payton	993241842
Lynne	Cooper	991309750
Desiree	Nagyfy	990068352
George	Bedirian	991632513
Mont	Livermore	994032629
Therese	Nielsen	992031761
Lanie	Cox	992248242
Patricia	Cackowski	992236575
Nancy Enz	Lill	992015078
Margie	Heller	990048512
Carrie	Anderson	992032062

Darla	Austerman	990269248
Ron	Kaufman	992236577
Teresa	Abel	994032466
Susan	Wallace	992084400
MaryJo	Fontenot	993622141
Sada	Showell	992013627
Holly	Hewitt	99362
Terri	Chambers	991569658
John	Burrows	992015408
JILL	STOKES	992232203
Elizabeth	Taylor	98368
Lyssa	deHart	981102281
Kindy	Kemp	983689686
Pam	Ives	985208408
Marty	Crowley	983682226
Maxine	Clark	983819749
S	Brassel	981102859
Chris	Guillory	983622803
Sally	Radford	984094007
Michael	Holzman	98563
Carole	Henry	98380
Carole	H	983681044
June	MacArthur	983663830
dolores	darst	983628429
Ernest	Bennett	985632804
Amy	Heyneman	981104189
Jan	Ellis	983668673
Tamara	Saarinen	983351802
Steve	Bear	983688833
Katherine	Masotti	983620006
Joyce	Wilkerson	983684305
Liane	Benson	985699544
Carol	Whitehurst	984065520
erik	johnson	985288503
Linda	Hiser	983339753
Kevin	Clark	983683605
C	Lenihan	983050004
Michael	Felber	983688746
Joseph	Piecuch	983707827
Ellen	Cupp	983128505
Dorothy	Powter	985845050
John	Eddy	984061015
Eleanor	Morris	985469721

James	Giles	983760640
Lori	McKenna	983420459
lawrence	gaspar	985847027
James	Bartley	981101611
David	Hand	981104216
Dori	Bailey	983685058
Sandy	Lynch	983119523
Lawrence	Magliola	983829310
Ann	Sextro	983829422
MaryAnn	Seward	983686213
MICHAEL	HEDT	983220531
James	Feit	983686132
Roger	Delmar	983689553
Linda	Wasserman	984068114
Ciela	Meyer	983685906
Bruce	Gundersen	983709210
Janice	Jack	981103359
Pamela	Bendix	981104216
Michael	Siptroth	985289546
Linda	Engelbrecht	983823488
Robin	Hordon	983469549
Peter	Walchenbach	983823444
Lauren	Sewell	981026208
Alfred	Ferraris	983684824
Sandra	Pitts	983689567
Billie	Mann	985699652
Toni	Schwellinger	983677440
Nadine	Wallace	984076338
THOMAS	HAMMOND	981152340
Lorraine	Johnson	981252603
debbi	pratt	981992110
Elizabeth	Cunningham	981073016
Victoria	Urias	981253705
Jeffrey	Nosbaum	981211181
Dean	Webb	981991154
Arlene	Roth	981263237
Judith	Hance	981156108
Lianne	Lindeke	981157140
Laurette	Culbert	981073410
Thomas	Trescone	981211662
Kevin	Chiu	981153913
ADAM	LEVINE	981124682
Thomas	Libbey	981223916

Tracy	Wang	981074107
Lois	Fenstemaker	981073745
Lynn	Brevig	981256936
Carey	Durgin	981062109
Eric	Fosburgh	98112
Paul	Parker	981338152
Bronwen	Evans	981042211
Madeleine	Sosin-Rocha	981361905
Sara	Eldridge	981152350
Donna	Rowland	981264135
Robert	Bamford	981122611
Michelle	Pavcovich	981256553
Vivian	Sovran	981073414
Scott	Species	981011329
Brian	Venable	981336869
Heather	Davidson	981072555
tika	bordelon	981011965
Laura	Huddlestone	981061549
Bruce	Shilling	981035110
Laura	Boss	981062958
Marian	Bauman	981155642
Mary	Sebek	981034617
Ruth	Darden	981157810
Giles	Sydnor	981074107
Monica	Miklova	981162175
Alice	Tobias	982608033
TK	Hansen	988310359
A	R	981172804
matthew	anderson	981337739
Alyce	Fritch	981257624
Larry	Karns	981556443
Patriciai	Warming	981092878
Paul	Weiss	981056650
Stevenl	Trevallee	981024676
Barbara	Wight	980268616
John	Kenny	980203060
Kjersten	Gmeiner	981255019
Scott	Tallman	981037720
Donna	Leavitt	980268214
Lisa	Wathne	981551415
constance	lee	98177
Maren	Culter	981255921
Myrna	Lipman	981335671

Lloyd	Johnston	981254307
William	Wilson	981461603
Diana	Nielsen	98020
Kristin	Otto	981663925
Sanja	Futterman	981152331
Candace	Davis	981054833
Sharon	Holt	981033115
Shawn	Tuthill	981072213
Jennifer	Wyatt	981775143
Hoa	Pantastico	98031
arvia	morris	981054841
Anita	Woodruff	981482763
Holger	Mathews	981342135
Shannon	Markley	981772723
karen	dahmer	98177
Greg	Goodwin	981253419
James	Bates	981157543
Percy	Hilo	98111
Ellen	Kendall-Eyre	98125
Alex	Berger	981034240
Deborah	Wolf	981263295
Steve	Hamlin	981552214
Yvonne	Hoar	981551295
Jonny	Hahn	981011056
Millie	Magner	981991441
Louise	Stonington	98112
Jean	Fee	981074345
Rosemary	Perisich	98112
Emerson	Pirot	981037729
Karl	Scholze	981024262
JoAnn	Een	981023438
Larry	La Caille	981253625
Susan	Seniuk	981256553
Ginger	Goldman	981163532
edie	lackland	981123809
Mark	Hennon	981090755
Sheldon	Burkhalter	981157224
Barbara	Hirsch	981063330
Sandi	Repetowski	981163946
Barb	Drake	981338838
Tom	Melancon	981023606
Ben	Wildman	981023553
A	Barile	981012284

Nancy	Mattson	981164915
Pamela	Benjamin	981193360
Linda	Wright	981211250
Anna	Nikolaeva	981773625
Diane	Lang	981255904
James	Livingston	980746409
t	h	983638647
Lloyd	Daniels	980025858
Brenda	Michaels	983683058
Michael and Barbara	Hill	98355
Carolyn	Vaughan	980297649
Brenda	Lewis	988168609
Sara	Wallick	980226842
Jo	Harvey	980471222
Kathryn	DeWees	984054208
Jeffrey	Watson	980277352
Laura	Zerr	980929289
Aida	Bound	98801
MARY	ONUFER	980278341
Renee	Lashua	988019062
Jason	Scribner	989263520
Ryan	Carrasco	988261111
Ann	May	983549729
Roy	Conner	983743729
Shirley	Graves	98391
Russ	Bradford	983608489
Victoria	Holman	980021816
Douglas	Taylor	983918453
Claire	Berkwitt	980297206
Katherine	Wolf	988269426
Gina	Abernathy	980757441
Jeff	Laik	980426826
Suzanne	Paterson	980273314
Mayellen	Henry	98008
Dave	Baine	980232405
Sara	DuBois	985313425
Michael	Rosen	980402453
J.	Justice	980035646
Shelley	Young	980064723
Susan	Wilson	980311394
Susan	Pynchon	980593984
Del E	Domke	980082711

Michael	Lampi	980085516
phili[p	Chanen	981445632
Linda	Dodson	981042049
Marsha	Shaiman	981225004
Sandra	Smith	98125
Vicky	Matsui	981225739
Jessi	Berkelhammer	981442824
Judith	Schwab	980403147
Nina	French	981782415
Sarah	Dallosto	981888031
Cecilia	Alvarez	981443005
Lin	Provost	981447205
Gene	Wolery	980313668
Randal	Jeter	981182344
helene	steinhardt	980404813
Karen	Sauve	980582890
casaundra	robinson	980325767
Tom	Cashman	98198
Stacia	Haley	981083070
Patti	Rader	980033659
Rebecca	Brooks	981782866
Noel	Barnes	980583838
Larisa	Moore	981224707
Taen	Scherer	981184115
Ellen	Zarter	980083323
m	cartwright	980311878
Jennifer	Fairchild	981181516
CARRIE	KENNER	981081918
George	Summers	981443463
Carrie	Heron	981182763
Lisa	Halpern	981182558
Liza	Martin	980082124
Clayton	Jones	981684451
kate	o'brien	981182035
Sherry	Williams	980564076
Steve	Uyenishi	981156009
Asphodel	Denning	981043709
Donald	Lee	980044958
Joanne	Klein	98118
Katherine Alice	Tylczak	980036956
Elaine	Woo	980051517
sarah	shields	981182045
JOHN	STEENSON	981185818

Marietta	Bobba	981782541
Dan	Wheetman	981184242
A ROBERT	CORPUS	980080457
Scott	Bishop	985024734
Robert	Brown	984666640
Susan	McRae	985063382
Nancy	Breckenridge	985122158
Glen	Anderson	985032723
Holly	Gadbaw	985012228
Carolyn	Treadway	985032561
S	JACKY	983882707
Andrea	Speed	984452443
Carol	Else	984981151
TOM	DEVINE	985012827
Barbara	Scavezze	985015942
Gina	McGroarty	985033768
Stephen	Nichols	985979212
Emily	Trinkaus	985121927
William	Persky	985013050
Candice	Cassato	985029690
L	Wayn	985063605
Nicole	Enslow	984963618
KATHY	MALLALIEU	985069638
Marsha	Adams	985841668
Thomas D	Hendrickson	984662032
Robin	Miller	985122306
Nancy	Kilgore	985011056
Kathleen	Lee	985032164
Mary	O'Connell	985062932
Jeff	Freels	985036927
stephen	curry	985021433
Danielle	McKinney	983902807
Valli	Hale	984983221
Lorena	Eaton	985033465
Mary Ann	Murphy	985029457
Ruth	King	985033025
James	Pierson	985018304
Yonit	Yogev	985022619
William	Golding	984024802
Rose	vawter	984986060
Judith	Johnson	984992514
Donna	Arbaugh	984443739
Heather	Pens	98506

SUSKA	DAVIS	985061929
Ginelle	Walker-Ward	985580283
Charlene	Lauzon	980366224
Ann E.	Wales	982269204
David	Randall	992031714
Johanna	Daggett	986321504
Terri	Jones	981174539
Kevin	Hughes	982211935
Julie	Taylor	980434438
Consuelo	Larrabee	992031035
Florie	Rothenberg	981262949
Richard	Frichette	983823608
Sally	Harrison	981024301
Mary	Upshaw	991565196
Daniel	Brant	983686417
Roger	Schmidt	992010141
Lee	Pesochin	V5L 4A1
Dennis	Lengel	982218783
Katalin	KÃ³nya-Jakus	200023325
Karla	Everett	986827146
Judith	Hedstrom	980268252
Gregg	Orr	981181604
Jill	Blaisdell	982904505
S	Anderson	85351
Sarah	Bakker	985799327
Hunter	Reed	982041581
K	Hughes	32063
Rachel	Nostrom	982608216
Marie	Colvin	993372560
Ally	Jones	98112
Ric	Kuecks	981263636
T	Terry	14427
Carla	D'Amato	986388600
Eric	Zimdars	980121394
Karen	Genest	982736037
Linda	Gruer	98584
Anne	Jorstad	980083214
Samantha	Wilk	982748082
Glenna	Johnson	98052
Marianne	Roberts	982011322
Bruce	Oldemeyer	982779130
Kimberly	Lynn	98225
JacqueLyn	Lobelle	986853746

Claudia Lee	Miller	988449329
Suzanne	Ellis	992021273
Kathleen	Bentley	983319402
Kristin	Gearin	981154728
Zachary	Nelson	981338966
Stephanie	Hagen	98391
Leila	Hover	985036907
Catherine	LEGRAND	95380
p	r	983350664
Shannon	Baker	985843234
Trudy	Zimmerman	982330166
Keri	Skari	98620-2437
Bobette	Jones	981156655
Tobey	Nelson	982369532
Pat	Siggs	981125259
d	robinson	991180151
Stephanie	Edwards	980202942
David	Starke	986855598
Jay	Spearman P.E.	983122505
Sandi	Aldrich	980198109
Debi	Grotzinger	986826489
Greg	Gleason	981162421
Kevin	Milam	981172901
Sherry	Martinez	98290
Linda	Franzenbach	986823634
Bonniek	Bingle	986650903
Barbara	Seavy	98380
Judith	Beaver	983823047
Sheri	Strite	982295372
Judy	VanderMaten	986120193
Karla	Taylor	985021126
William	Justis	985129410
Kristin	Felix	985029501
Dianne	Hurst	985166645
Marta	Kosaly	981254224
James	Terry	985016892
Laurence	Severtson	985070646
Crystal	Schaffer	985037136
Wendy	Bowman	985033694
Rose Marie	Balch	985062436
Karen	Verrill	985011037
Barb	Kuchno	985842459
Susan	Thiel	983877630

Teresa	Dix	982748902
Joanna	Stiehl	985011350
Karen	Williams	982293238
Michiko	Tanaka	981194730
Liisa	Wale	982269095
Jeanene	Lorey	980219242
Marsha	Robinson	982369206
Jill	Goetsch	980336581
Rick	Wagner	980343971
Mark	Evans	980727950
Ann	Bradshaw	982583791
Debby	Mayberry Jensen	980341714
Dorothy	Jordan	982649401
randall	potts	982266865
Amanda	Dise	980345721
David	Kerbs	980830636
Kate	Butt	980523779
Dawn	Wojciechowski	980341006
joseph	franetic	982508188
Tamela	Roberson	982033830
Pamela Z	Hill	982390665
Erika	Thorsen	982255725
Jeanene	Lorey	980219242
roger	schmidt	992010141
Derek	Benedict	980368606
Patrick	Hook	980873117
S.F.	Brown	983823912
Karen	Williams	982293238
Deborah	Francis	982779630
Lynne	Oulman	982256304
Patrice	Linton	982848148
Bobbi	Miller	982778590
Lou	Merzario	982212906
Sue	Paro	980378208
Carol	Scott	982267600
Peggy	Page	982926268
Judith	Richards	986519232
Penny	Giering	986659147
Elizabeth	Johnson	986480707
Kelly and Ralph	Hochendoner	986720361
Laurie	Chinn	986631060
George	Morgan	986717283
Annette	Garner	986715194

Cindy	Ambrosius	986742625
Winifred	Lowsma	98612
Enid	Cox	986836258
Beverly	Vonfeld	989089522
Robert	Boy	993382123
Cheryn	zimmer	989082721
Timothy	Roehl	985139458
linlda	schuyler	993206520
v	Mangum	992064731
Jan	Mickelson	993628905
Jackie Warren	Demijohn	991010144
James	Rueckel	992033152
Tom	Hemken	992016477
Karol	Long	992161663
Jacqueline	Son	993628448
Anita	Stovall	992022746
Rose	Fanger	992052766
Treven	Gee	98366
William	Insley	984111461
Pat	Pearson	98365
Teri	Tomasek	983469629
Dominica	Lord-Wood	983681044
Marie	Alexander	983598571
Janet	Phelps	985501013
Carol	Meyer	98368
Jeanne	Skow	983620330
Annette	Smith	983321046
Mary	Adams	983650223
Myrna	Eden	981092511
Mark	Wirth	981025656
Peggy	McKasy	981161639
susan	wollett	993624163
Dee	Grady	11111
Terence	Cadby	BA140PS
Dan	Schneider	981154217
Erin	Mahan	981036565
L.	MacKrell	981211700
Gavin	Tierney	981035024
Patsy	Shuler	981256514
Lori	Bellamy	981174125
Susan	Froeschner	981034320
Lisa	Harris	981038305
Oleksii	Bilous	980387830

Sophia	Keller	981463124
Gad	Levy	98125
Janet	Upjohn	981193831
Gema	Baldwin	981061943
Jean	Leed	981122006
Miriam	Stone	981122613
Monika	Holm	981026127
Wendy	Blair	980708327
Howard	Mizuta DDS	981362036
Randi	Eicher	981037273
Richard	Weiss	981774424
Pam	Pinkston	980296911
Leonard	Obert	980596006
Barbara	Stevenson	980278335
Leonard	Elliott	980023046
Kathleen	White	983240130
Pam	Howland	983280465
Ruth	Zulas	983914910
Laura	Messbauer	980308293
Jeffrey	Cook	980383219
Thomas	Frenock	980744212
Virginia	Kimball	981184253
Margaret	Singh	980061592
Sharleen	Mehemed	981882742
Jerry	Legas	980586108
Patrick	Conn	980319669
Audrey	Meade	981181324
C. David	Cook	981081505
Judy	Brennan	980063730
Kyle	Stevenson	980025835
Diane	Bisset	980561207
Rebecca	Nimmons	980064807
David	Chambers	980594366
Steve	Ardire	985842985
Gary	Brooks	98342
larry	mahlis	981152205
Jane	Metcalfe	981053733
Nadine	LaVonne	98107
Nanalee	Gage	980026666
Beryl	Cochran	983677125
Sandra	Adams	983121116
Manya	Pickard	982509304
Kathy	Goldstein	980044280

Lindsay	Hood	98107
Hannah	Sundquist	980205241
Patricia	Fuller	983123450
Sharon	Belk-Krebs	982268621
MILLARD	Martin	983409774
Hap	Enzi	993629278
Diane	Smith	982296927
Corinne	Powley	980083810
Pamela	Roebuck	98498
Faye	Bartlett	982265697
Stephen	Green	982333824
Barb	Andersen	981334114
Harrie	Kessler	980344245
Marilyn	Heuser	982902016
David	Middleton	981174302
Lakota	Crystal	985808503
Tim	Durnell	991679745
Linda	Castell	982327505
Mary	Kennedy	986324219
FRANCES	BLAIR	983881028
Kelly	Keefer	984672229
Judy	Knold	984073323
Penelope	Frey	98034
Stephanie	Davenhall	980435829
Edwyna	Spiegel	982744680
Patty	Aylen	980217318
Ralph	Myer	981463416
Cornelia	Shearer	98092-7284
Chloe	Key	98802
Barbara	Bryce	98040
Anthony	Mann	980708712
stella	Allen	983823934
Miriam	Danu	982297615
Amy	Baron Hatch	984076035
Dan	Schotter	983824304
Stanley	Willard	98103
Brianna	Kohlenberg	983902623
Stephanie	Breiding	980082502
Cathy	Cleghorn	988262228
Diane	Kaczmarcyk	98105
Steve	Biggio	982293765
Yolanda	Sayles	980065315
kurtis	ehlert	98264

Andrea	Penski	980217625
Becky	Hage	982292766
Christina	McCluskey	980308758
stephen	schafer	980377638
Darlene	Baker	980755980
Julia	Larsen	981052703
Kimberly	Green	980041729
Mary Lou	Sumioka	980235208
Patricia D.	Wilson	985281918
Susan	Olson	981332719
Robert	Ulrich	980278328
Lori	Lustig	993364155
fred	karlson	982489369
Abigail Ann	Fanestil	983823788
Alona	Steinke	986820052
Angela	Kelly	985012943
A.	Bailor	992234936
Beverly	Gilyeart	982084603
David	Mayer	985024930
Carolina	Hood	986839235
Dorothy	Wendler	98104-2060
Diana	Flannery	985122106
Adina	Parsley	982927843
Diane	Shaughnessy	984061379
Ed	Bennett	98660
Lynne	Roberson	983639776
Grace	Padelford	980335113
Jean	Slocum	981224104
Julie	Glover	982368814
Linda	Carroll	992053178
Lindy A	Von Dohlen	993014638
Ricki	Walsh	985699725
Lindsay	Ward	980366200
Katherine	Nelson	980313166
Phillip E	Crawford	986484213
jeff	lane	980345902
Robert	Blumenthal	981157221
r	wood	98105
Ronlyn	Schwartz	982609584
Sharon	Steinhart	980428035
Shelley	Simcox	983129614
susan	janelle	993621311
Sheryl	Sparling	982649121

T J	Thompson	983353178
Vanassa	Lundheim	982033144
Ying	Cooper	980046877
Christine	Klunder	982254844
JoAnn	Landis	986078237
Brian	Baltin	981025183
David and Ann	Cordero	986323529
Deborah	Kaye	982309005
Denee	Scribner	989263520
Linda	Hoff	983357110
Jan	Jasper	985699329
Kerry	Knight	982729387
L. S.	Strange	98281
Nancy	Ellingham	980403104
randy	cofer	992021254
Robin	Zahler	982905613
Suzann	Finch	982254102
Julie	Hord	980920906
Sandra	Russell	991632233
Ron	Huden	981157110
Laura	Reigel	981104049
Elizabeth	Sherer	94610
Barbara	Rosenkotter	982430136
Glen	Zorn	980388457
Share	Jolliffe	981054007
Susan	Wood	98028
christiane	heinemann	988560548
Bartholda	Manderville	981986318
Thom	Lufkin	985012928
William	Meyer	98282
Bonnir	Rimawi	98034
sue	downs	98115
Carlene	Cole-Embree	981463074
Felix	Lee	981124839
Julia	Mirsberger	980297530
John	Cykler	98229
Nancy	McMahon	985015900
Paul	von Szalay	980126553
Sean	O'Dell	980563540
STEPHEN	WUNDERLICH	981023648
Thomas	Willms	981447511
Gerald	Thompson	982033873
Lisa	Adolf	982047912

Kaylouise	cook	981253735
Janet	Needler	982257807
Stephen	Garratt	981552815
David	Sparling	983880637
Ernetta	Skerlec	984992345
T	Heck	980562435
Phyllis	Dolph	98368
C.	Kelley	98032
Leslie	Quenell	982618140
Virginia	Ramey	982329356
Jan	Aszman	986203017
Toni	Howard	980586710
Joanne	Parrent	986632161
Linda	Maki	981263336
Thomas	Robinette	98064
Helen	Meeker	980706421
Steven	Lovelace	983960245
Lauren	Baker	993541656
Stephen	Zettel	983827391
Doris	Raspa	986623131
James	Griener	986070683
Celeste	Maris	985017512
A	Hughes	98110
Maria	Kjaerulff	983353685
Jill	Prevendar	986855241
Judith	Brockmann	985929703
Diane	Berger	982360832
Tom	McCulloch	983623504
Alanna	Boynton	981185561
Angela	Perstein	981226456
Bill	Kildall	98362
Erin	Cox	985323924
Lucinda	Moeglein	982628624
Vanessa	Ruelas	981256220
Charlotte	Davidson	981153656
Kenlee	Ducoing	981162531
i.	Pechenkov	98103
Glenn	Swanson	982704079
Katie	Klahn	980457916
Joan	Kurtz	982753733
Cynthia	Lachance	980555621
Mary	Easton	985370311
Benjamin	Tromly	98126

Sandra	Perkins	981254627
Jeannie	Oliver	981362538
kevin	orme	981034302
Kathleen	Rodriguez	984431506
Michael	McCool	983823054
Alice	Flegel	985791178
Elizabeth	Goulet	988160183
William	Looney	983833845
Madeleine	Anthony	981446535
Betsy	Pendergast	983684434
James	Bracher	980041703
Dennis	Rice	986711232
nando	ab	981987570
LoAnn	Hallum	981551642
Jasmine	Ligenza-posante	984072666
Chris	Nolasco	980872401
Jared	Leavitt	980268214
Cyle	Nielsen	988372135
Sylvia	Provan	982754867
Laura	Delmas	980336045
linda	chu	981038317
Jacob	Salzer	986833512
Jessica	Zickefoose	985022751
Kim	Larsen	98115
Walt	Denson	986720048
Anthony	Buch	981157314
Magdalene	Bumford	985128595
Suzanne	Holden	986854207
Mark	Scott	981338906
Nancy	Hathaway	992033220
Emily	Willoughby	981883250
ELIZABETH	WHITE	980706327
Mary	Guard	982505613
Phillip	Wood	981335015
Roberta R	Czarnecki	982048614
Joe	Ginsburg	981337729
Katherine	Bos	983357306
Getald	Hermes	982390697
C.	DeMaris	985072344
Judy	Silverstein	992231856
Pam	Jenkins	982790168
Patti	Wright	982294405
Judith	Dobkevich	983684066

Catherine	Adams	981084319
Sherry	Perkins	981784405
Lee	Johnston	986370032
D	Munro	98368
Peter	Rimbos	980388926
pamela	bouchard	983688913
Joanie	Merritt	983620330
Farnoush	Katouzian	984652055
Vanessa	Skantze	981341466
Debra	Hoyt	982848129
Mark	Weiss	981092831
Sallie	Shippen	980206612
Jared	Widman	98366
marylee	chamberlain	982570522
Doreen	Abrams	981052912
Monica	German	992083766
Leslie	Martin	981255105
John	Miller	982251421
Joyce	Permen	982649405
Dave	Pierot	98296
Brenda	Michaels	983689269
Seth	Farmer	992162789
Suong	Huynh	980344110
Tom	Wiitala	981461708
BRETT	BURRIS	980500473
Jessica	Ostfeld	980114144
Nancy	Bradbee	986140121
Tim	Hickey	983828711
Lisa M.	Mintz Kavas	980876057
Duncan	Bond	982609798
D.	Hubenthal	992057334
Michael	Hightower	986071107
Carol	Stevens	985979062
Margaret	Anderson	980334687
Brian	Bogart	982265679
Sarah	Salter	980365015
Victor	Villasenor	988339709
Bruce	Gerhard	983828521
Michael	Saunders	985025322
Sharie	Todd	981075642
Gordon	Norris	980125903
Fred	Greef	985019766
KENNETH	JONES	982450934

Gary	Bennett	98229
Ron & Marci	Moore	986329770
Monte	Swenson	990059478
Lee	Zahniser	992030255
Gene	McConnachie	981772506
PETER	SEIDMAN	985162376
Barbara	Rehman	98665
Bradley	Stevens	98117
Judith	Oswood	98801
Frances	Allen	982257625
Tom	Hughes	984031506
Ronald	Metz	982031531
Ben	Bechtold	981556241
Kassie	Wheeler	990068514
Anna	Bechtel	980116474
Bonnie	Bledsoe	981256725
Debbie	Bremner	981556301
Susan	Palmen	981185059
Elizabeth	Milligan	983119653
David	Hopkinson	982254976
Kim	Howard-Lloyd	980369322
Michael	Meagher	981338823
Diane	Allen	98264
Sherry	Bupp	98052-0000
Twyla	Olney	989019706
Ryan	Scheffer	982708935
Rocklin	Perrott	985128903
H	Terry	14427
B	Travis	32095
M	McClellan	23188
F	Terry	44256
Paul	Sisson	988620598
Jennifer	Straniti Schmolz	98926
Kathryn	Wilham	983920648
Noel	Orr	981552334
vana	spear	980367906
tim	nelsen	980706111
Jennifer	Mazuca	981164325
Edward	Mills	980084221
Kevin	Davis	980381145
Lou	Orr	981552334
Duane	Niatum	981072512
Linda	Story	980061326

Norma	Versakos	981445058
Mary	Michael	981362205
Lawrence	Heiner	982216450
David and Julie	Peha	980536277
Patricia	Shore	986839408
Eleanor	Israel	985769404
Sarah	Sloane	98640
Fran	Holme	982967814
Betty	Dickinson	989025264
Pamela	Raya-Carlton	984185009
Lynn	Moser	981122701
pamela	hill	982390665
James	Adams	985023013
Dynold	Senter	986615820
Marilee	Seymour	980065152
Andrea	Gruszecki	980575803
Landis	Helie	983708429
Chuck	Watson	90682
Anita	Montgomery	985128515
CATHLEEN	BURNS	982502934
T	Hogan	98370
Valerie	Hubbard	993369405
Elaine	Goodrich	98221
Kristen	Klooster	981024066
Lawrence	Stocks	984993626
Wendell	Pollock	98422
Leta	Rosetree	981256323
Nicola	Robinson	980582824
Abbie	Carrasco	983358135
Christopher	Page	981223219
Diane	Rudnick	980267226
Annette	McDonald	98002
Bruce	Fish	980278455
Jeanne	Large	980336192
Rose	O'Brien-Ochs	981773231
Dorene	Robinson	981156655
Jim	Mathrusse	980047116
David	Ramsey	98466
Shirley	Chinn	98115
Roger	Nystrom	980263515
Heather	Kreeck	982967089
Lynne	Treat	985322124
debra	Kalahan	980589556

Agnes	Wocken	981013618
Mary	O'Brien	98075
martin	pittman	20774
steve	harrington	981338234
Ambre	Lane	981182549
Chris	Maniates	981992102
Albert	Wagner	983659668
Christine	Brokaw	984667010
Alisha	Douglas	983659741
Mary	Parmenter	98310
Chris	Gammon	981194477
Diana	Moore	985024914
Lise	Morgan	98501
Ed	Robertson	982255835
Amelia	McGee	98115
John	Guros	981987153
Julie R	Sutter	981091276
John	Blindauer	983668351
Bob	Schuessler	981182721
Sharon	Fetter	983710054
Patricia	Levan	983668701
Lyle	Collins	989081308
Karen	Curry	991632848
David	Hall	983915489
Christopher	Lawrence	992032651
Carol Ann	Hiller	981443448
Karen	Cook	985134181
Victoria	Castle	982600816
rose	boyette	980366539
Pete	Compton	98292
Angela	Maeda	980338101
Ai	Mahoney	981025183
Jane	Larson	985135605
Lucas	Naylor	982272517
Craig	Britton	983686610
Jeanne	Young	983823488
Lisa	Onuma	980112335
Megan	Burns	980929334
JJ	Morris	992245381
Nicholas	Heyer	981181521
Mary Kay	Garttmeier	980523697
Lisa	Read	986721946
Jamie	Dampier	983122907

Mandy	Weeks-Green	985128518
Jamie	Kitson	982704143
Mary	Walter	986863159
Tyler	Johnson	98065
Dennis	Merz	985029687
JOAN	HUNT	980268101
Barbara	Vigars	980206680
Keith	Kumnick	981033115
Judy	Jensen	980703605
Gabriel	Kennedy-Gibbens	992182307
Dan	McClure	982012771
Kate	Blessing	98116-1910
Pepper	Gamroth	98382
fayth	jonathan	984032011
Eilene	Glasgow	984052608
Rebecca	Deardorff	981038305
Bryan	Williams	71459
Janet	Riordan	981774231
Bianca	Reich	980875367
Melissa	Roberts	980321856
Camille	Pedersen	985169117
margaret	hazard	986100934
James	Davis	98801
Jean	Davis	98550
Andreas	Niesen	983689009
Kathy	Sparks	980278323
Coral	Shaffer	981156622
Christopher	Buckley	981157247
Ginger	Taylor	982230003
Peter	Holcomb	982269536
Mark	Bradley	983827714
Carol	Satterlee	981263236
Cynthia	Patereau	982369526
Steven	Fenwick	985023619
Judi	Hoffman	980335948
Elizabeth	Rosenthal	981334026
patricia	Anderson	986129591
SUSANA	SERNA	986863226
Jenny	Kizziar	986129669
David	Salter	985699242
Ashley	Howisey	98125
Thomas	Swoffer	98051
Michael	Shaw	986651159

Natalie	Chapin	98225
Allison	Phares	981031832
Olivia	LacklandHenry	982251519
Samantha	Ngy	980423014
Donna	Valdez	980659675
Devon	Greyerbiehl	992044113
Sue	Herbrand	98403
Connie	Marsh	98027
Marla	Munson	98270
Michael	Wayte	98225
Becky	Kennard	990038684
Philip	Fischer	989379515
Alexa	Allamano	98260
David	Arntson	98012

Orca Conservancy

Thank you for the opportunity to comment on decisions regarding Washington's Department of Ecolo-gy's (Ecology) efforts in developing Draft National Pollutant Discharge Elimination (NPDES) Permits on Atlantic Salmon Net Pen Aquaculture. Please accept the following as the official filing from Orca Con-servancy and our 20,000 members and supporters.

February 23, 2018

Rich Doenges
Washington State Department of Ecology
PO Box 47600
Olympia, WA 98504

RE: Draft National Pollutant Discharge Elimination (NPDES) and State Waste Discharge (SWD) on Water Quality Individual Permits

Dear Mr. Doenges,

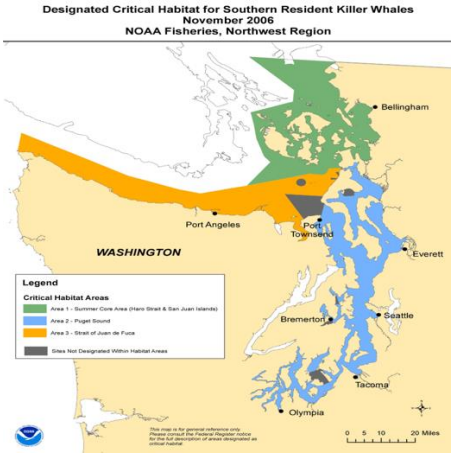
Thank you for the opportunity to comment on decisions regarding Washington's Department of Ecology's (Ecology) efforts in developing Draft National Pollutant Discharge Elimination (NPDES) Permits on Atlantic Salmon Net Pen Aquaculture. Please accept the following as the official filing from Orca Conservancy and our 20,000+ members and supporters.

Orca Conservancy is a 501c3 Washington State nonprofit working on behalf of *Orcinus orca* the killer whale, and protecting the wild places on which it depends. Our urgent attention is on the 75 remaining critically endangered Southern Resident killer whales (SRKWs) that inhabit the inland waters of Washington State and rely on healthy, wild Chinook salmon populations for their survival. Orca Conservancy continues its work towards increasing prey resources, reducing the accumulation of marine toxins, and the destruction of salmon spawning and nearshore habitats; nurseries of the Salish Sea.

We know Congress passed the Clean Water Act to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters," 33 U. S. C. §1251(a); see also PUD No. 1, 511 U. S., 700, 714, the "national goal" being to achieve "water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water." 33 U. S. C. §1251(a)(2).

Existing guidelines clearly state that open net fish farms should not be sited within 300 feet of habitat for threatened or endangered species. Puget Sound Chinook and steelhead, both endangered species, regularly swim through existing salmon net pens without separation. That is defined as an unaccounted for 'take' under the Endangered Species Act. Furthermore, all four existing open net fish farms are within endangered Southern Resident critical habitat, specifically Area 2 – Puget Sound. (see image A).

Image A:



Joint NMFS/FWS regulations for listing Endangered and Threatened species and designating Critical Habitat at Section 50 CFR 424.12(b) state that the agencies *"shall consider those physical and biological features that are essential to the conservation of a given species and that may require special management considerations or protection. Pursuant to the regulations, such requirements include, but are not limited to, the following: (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and generally; (5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.*[1] Killer whales frequent a variety of marine habitats that do not appear to be constrained by water depth, temp*erature, or salinity.*[2] *Observations of killer whales suggest that the resident pods (J, K, and L) can be spread over hundreds of kilometers at any given point, require open waterways that are free from obstruction to move between important habitat areas, find prey and fulfill other life history requirements. Individual knowledge of productive feeding areas and other special habitats is probably an important determinant in the selection of locations visited and is likely a learned tradition passed from one generation to the next.*[3]

Existing guidelines recommend that large facilities, in this case Cooke Aquaculture, are subjected to environmental monitoring on a regular basis so impacts are at the forefront. Given the potential impact on ESA-listed species and state trust resources, the core planning team needs agency staff responsible for the protection of ESA-listed species from both federal and state agencies. This should include scientists knowledgeable in juvenile salmonid use of nearshore habitat, scientists with expertise in marine mammal protection, sea bird ecologists, and scientist with expertise in shellfish resource protection[4]. Existing

[1] NMFS (National Marine Fisheries Service). 2006. Designation of Critical Habitat for Southern Resident Killer Whales. Biological Report. Available from: http://www.nwr.noaa.gov/publications/protected_species/marine_mammals/cetaceans/killer_whales/esa_status/srkw- ch-bio-rpt.pdf

[2] Baird, R. W. 2000. The Killer Whale: foraging specializations and group hunting. Pages 127-153 in J. Mann, R.C. Connor, P.L. Tyack, and H. Whitehead, editors. Cetacean societies: field studies of dolphins and whales. [4] Ford, J.K.B., G.M. Ellis, L.G. Barrett-Lennard, A.B. Morton, R.S. Palm, and K.C. Balcomb III. 1998. Dietary specialization in two sympatric populations of killer whales (Orcinus orca) in coastal British Columbia and adjacent waters. Canadian Journal of Zoology 76:1456-1471.

[3] Ford, J.K.B., G.M. Ellis, L.G. Barrett-Lennard, A.B. Morton, R.S. Palm, and K.C. Balcomb III. 1998. Dietary specialization in two sympatric populations of killer whales (Orcinus orca) in coastal British Columbia and adjacent waters. Canadian Journal of Zoology 76:1456-1471.

[4] Wild Fish Conservancy, 2017

guidelines also recommend only antibiotics licensed by the FDA for 'fish food' be used. That said, *emamectin benzoate* (SLICE) was used at the Port Angeles facility to 'control' an outbreak but had not been approved by the FDA at the time. Use of *emamectin benzoate* in nearshore and offshore finfish aquaculture is a best, questionable, and can be highly toxic if swallowed. While *emamectin benzoate* is the only product in the U.S. labeled for treatment of sea lice infestation, there is documented evidence of sea lice that are resistant to this treatment.[5] Animal studies have also shown that the ingestion of *emamectin benzoate* can result in acute oral toxicity or death and release toxic byproducts that make the surrounding environment toxic.

While additional 'objective' monitoring of existing Atlantic salmon finfish pens in Puget Sound are imperative for restoration, until we take bold action towards strong, enforceable regulations, not only with the permit process, but also the potential existence and until the complete phase out in 2022, we risk even further detrimental impacts to our waterways and the ecosystems within them.

Sincerely,

Shari L. Tarantino
President
Orca Conservancy

[5] F. Lees, M. Baillie, G. Gettinby, and C. W. Revie, "The efficacy of emamectin benzoate against infestations of Lepeophtheirus salmonis on Farmed Atlantic Salmon (Salmo salar L) in Scotland, 2002-2006," PLoS One, vol. 3, no. 2, pp. 2002–2006, 2008. This study focuses on the known treatment of sea lice, Emamectin Benzoate (SLICE) on Lepeophtherius salmonis (a species of sea lice) over the years 2002- 2006 in Scotland. The study shows that treatments of Lepophtheirus salmonis with SLICE was not always effective and the authors have indicated that there was reduced efficacy of SLICE over time. [29] S. M. Aaen, K. O. Helgesen, M. J. Bakke, K. Kaur, and T. E. Horsberg, "Drug resistance in sea lice: a threat to salmonid aquaculture," Trends Parasitol., vol. 31, no. 2, pp. 72–81, Feb. 2015. This study describes compounds used to treat sea lice and the species of sea lice that are significant within the aquaculture industry. The study shows side-byside layouts of treatment options and the mechanisms of action. The authors also show trends of resistance within sea lice populations and discuss available treatment options. [30] A. W. Bateman et al., "Recent failure to control sea louse outbreaks on salmon in the Broughton Archipelago, British Columbia," Can. J. Fish. Aquat. Sci., vol. 73, no. 8, pp. 1164–1172, Aug. 2016. This study describes increasing populations of sea lice following largely successful control efforts over the previous decade. Resistance to treatment regimens was noted within juvenile pink and chum salmon in the Broughton Archipelago in British Columbia. The authors believe that the outbreak of resistant sea lice may be due to the following reasons: 1. Poor timing of treatment 2. Evolution of resistance 3. "anomalous environmental conditions" that propagated sea lice growth or 4. High number of wild pink salmon returns.

RESOURCES FOR SUSTAINABLE COMMUNITIES
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2309 Meridian Street
Bellingham, WA 98225
(360) 733-8307 • re-sources.org

To: Rich Doenges
Washington State Department of Ecology
PO Box 47600
Olympia, WA 98504
Submitted online via online form: http://ws.ecology.commentinput.com/?id=7kdj4

February 25, 2019

RE: Atlantic Salmon Net Pen Updated Water Quality Individual Permits

Dear Rich Doenges,

Thank you for taking the time to consider our comment on the updates to the individual Atlantic salmon net pen water quality permits. While these 4 net pens are scheduled to phase out in our state by 2022, it is important to still protect water quality and to ensure that no further damages are caused by these operations.

RE Sources for Sustainable Communities is a local organization in northwest Washington, founded in 1982. RE Sources works to build sustainable communities and protect the health of northwest Washington's people and ecosystems through the application of science, education, advocacy, and action. Our North Sound Baykeeper program is dedicated to protecting and enhancing the marine and nearshore habitats of northern Puget Sound and the Georgia Strait. Our chief focus is on preventing pollution from entering the North Sound and Strait, while helping our local citizenry better understand the complex connections between prosperity, society, environmental health, and individual wellbeing. Our North Sound Baykeeper is the 43rd member of the Waterkeeper Alliance, with over 300 organizations in 34 countries around the world that promote fishable, swimmable, drinkable water. RE Sources has over 20,000 members in Whatcom, Skagit, and San Juan counties, and we submit these comments on their behalf.

A threat to native species:

As we write this comment letter there are bills in both the House and Senate (1579 and 5580, respectively) that are working to increase Chinook salmon and forage fish abundance to address the alarmingly low populations of the Southern Resident Orca Whale. Net pens have the potential to have adverse effects on the orca food chain including ESA listed Chinook and forage fish. The high density of Atlantic salmon in the net pens leads to the emergence of diseases and parasites that can spread to native fishes.[1,2] In addition, escaped Atlantic salmon could potentially compete with Chinook salmon for forage fish (over 180,000 Atlantic salmon remained unaccounted for from the Cyprus Island Net Pen collapse of 2017)[3]. One of the quickest ways we can help our dwindling Southern Resident Orca Whales is to remove this potential threat to their primary food base.

Uncontrolled pollutants contaminating our ocean:

We are also concerned with the pollutants that are associated with the net pens. The fact sheets provided for the 4 net pen permits list the following as potential pollutants: uneaten fish food, fish feces, disease control chemicals administered in food, marine fouling organisms displaced from the nets during net cleaning, and escaped fish. Specifically, Romet® 30 and Oxytetracycline are listed as disease control agents that are used to treat bacterial infections in these salmon. These drugs have a 30-70 day withdrawal period,[4] meaning the salmon are unsafe to consume for up to 70 days after the drugs are administered. There is no guarantee that all of the drug infused food will be ingested by the net pen fish which therefore, exposes our native fish to these drugs and potentially to people who may eat such fish. The only way to truly control all of the harmful pollutants associated with net pens is to remove them from our oceans and construct the facilities inland.

Additionally, pollutants can have impacts on other important water quality parameters, such as dissolved oxygen (DO). In late summer when water temperatures are warmer, or other times when DO requirements are harder to meet, there should be a threshold included in the permit that would cause implementation of mitigation and/or corrective action measures for the permit holder. This appears to be left out of the current permit and should be included to ensure the surrounding aquatic organisms are protected.

Unreliable technologies:

It was also noted in the fact sheets that the Pollution Control Hearing Board heard testimony on 3 alternative technologies to marine net pens prior to reissuance of the 2002 permit. The Board "ruled that none of the technologies constituted AKART because they were not technologically reliable and/or economically feasible, and dismissed with prejudice all AKART issues relating to all structural alternatives to net pens." We interpret this to mean that the current net pen technologies being used in these 4 net pen operations may not be technologically reliable to prevent or control waste discharges to the waters of the sate as mandated by Washington State's Waste Discharge Permit Program, WAC 173-216-020(1). Furthermore, "Ecology concludes requiring any major changes to net pen siting [it] is not feasible in the limited time the pens can continue to operate." Because all Atlantic Salmon net pen facilities will be closed by 2022 in Washington State, in lieu of requiring upgrades or changes to the current technology, Ecology will rely on "lessons learned" from the net pen failure of 2017 to construct this permit. While we agree that increased monitoring of sediment, dissolved oxygen, velocity, and the net pet itself is really important we are not convinced that it is enough to prevent irreparable damage to the sound given the unavoidable pollutants being discharged from the net pens coupled with the less-than-perfect track record demonstrated by Cooke Aquaculture.

Questionable record from Cooke Aquaculture:

An investigation following the Cypress Island net pen collapse in August 2017 highlights the failures of Cooke Aquaculture to prevent the catastrophic collapse[3]. Emergency measures or special monitoring was not put in place when the net pens began to fail in July. They also did not properly report the July failings, therefore, government agencies were not aware of the extent of damage that was beginning to occur. Inadequate inspection and maintenance of the nets in conjunction with the failure and unreliability of net washing systems most likely contributed to the collapse. Following the collapse, Cooke Aquaculture was slow to respond and underreported the amount of fish that escaped by nearly half and then during the cleanup phase, post-collapse, they did not provide all of the documents that the investigative team requested. In addition, Cooke Aquaculture has not yet paid their fines for the net pen collapse as they have appealed the court's decision.

Meanwhile, down south at the Fort Ward net pet operation there were another series of violations occurring from August to December 2017. Ecology staff sent 2 separate notices and called multiple times regarding illicit discharges coming from the facility with no response from Cooke. Cooke Aquaculture was fined $8,000 for this infraction.

The behavior from Cooke Aquaculture during these 2 instances makes us skeptical that they will be good stewards of their net pens and the environment in which they are housed. The NPDES permit relies on a self-monitoring program and history shows that Cooke Aquaculture may not be reliable to adequately monitor and maintain the health of these 4 net pens. If you decide to issue these permits despite the potential environmental risks we strongly encourage you to require a 3rd party to regularly monitor the net pens for both effluent limitations and structural integrity. This goes for the cleanup process as well that will commence in 2022.

For the reasons listed above, our recommendation is to close the Cooke Aquaculture net pens as quickly as possible without wasting any of the fish that are currently being raised in the pens. Deconstructing and cleaning up after the pens are removed will take time to complete, therefore, the sooner we start the deconstruction process the better it will be for the Puget Sound and all the organisms that depend on it for their survival. Furthermore, we recommend that Cooke Aquaculture be held accountable for the cleanup procedures and associated costs. Thank-you for your time and consideration.

Sincerely,

Kirsten McDade
Pollution Prevention Specialist

Eleanor Hines
North Sound Baykeeper, Lead Scientist

<u>Resources</u>

[1]Walker, Peter & R Winton, James. (2010). Emerging Viral Diseases of Fish and Shrimp. Veterinary research. 41. 51. 10.1051/vetres/2010022.

[2]Bateman, Andrew W, and S.J. Peacock, B. Connors, Z. Polk, D. Berg, M. Krkosek and A. Morton. 2016 Recent Failure to Control Sea Louse Outbreak on Salmon in the Broughton Archipelago. Canadian Journal of Fisheries and Aquatic Sciences

[3]Lee, Kessina, Windrope, Amy, & Murphy, Kyle 2018. 2017 Cypress Island Atlantic Salmon Net Pen Failure: An Investigation and Review. Retrieved from: https://www.dnr.wa.gov/sites/default/files/publications/aqr_cypress_investigation_report.pdf?vdqi7rk&exb4gd

[4]Guide to using Drugs, Biologics, and Other Chemicals in Aquaculture. (2016). American Fisheries Society Fish Culture Section. Retrieved from: https://www.syndel.com/downloads/dl/file/id/112/

OUR SOUND, OUR SALMON

Comments on Washington Department of Ecology Draft National Pollution Discharge Elimination System Waste Discharge Elimination Permits for Cooke Aquaculture Atlantic Salmon Net Pen Facilities Fort Ward, Clam Bay, Orchard Rocks, and Hope Island.

Our Sound, Our Salmon
02/25/19

On behalf of the undersigned members of Our Sound, Our Salmon, we appreciate the opportunity to provide comments on the content of the four draft permits. We limit our comments to two points: (1) Washington Department of Ecology (DOE, Ecology) should refrain from issuing the permits until the National Marine Fisheries Service (NMFS) and the U.S. Environmental Protection Agency (EPA) have completed formal consultation under Section 7 of the Endangered Species Act (ESA) on EPA's approval of Ecology's sediment management standards for marine finfish rearing facilities, and (2)Ecology must address and include conditions on discharge of various pollutants that affect the designated uses of receiving waters and land adjacent to the four facilities that are not included in the current drafts.

Ecology's Section 7(d) Obligations During ESA Consultation

Under Section 7(d) of the ESA, Ecology should defer issuing the permits until EPA and NMFS complete the ESA consultation on EPA's approval of Ecology's sediment management standards for marine finfish rearing facilities.

ESA consultation on EPA's approval of Ecology's sediment management standards for marine finfish rearing facilities has been contested for several years. Most recently, in 2015, Wild Fish Conservancy (WFC) sued EPA and NMFS for violations of the ESA associated with EPA's approval. As a result of that lawsuit, on October 3, 2018, EPA and NMFS reinitiated formal consultation on EPA's approval. The agencies expect to complete formal consultation by July 11, 2019. This consultation could—and hopefully will—result in recommended alternatives, mitigation measures, or other suggestions regarding the operation of marine finfish rearing facilities that could be incorporated or included in the permits.

Because EPA and NMFS are currently in consultation, Section 7(d) of the ESA applies and prevents Ecology from issuing the permits. Section 7(d) provides:

> After initiation of consultation under subsection (a)(2), the Federal agency and the permit or license applicant shall not make any irreversible or irretrievable commitment of resources with respect to the agency action which has the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures which would not violate subsection (a)(2) of this section.

16 U.S.C. § 1536(d). Ecology, as the applicant for EPA's approval of sediment standards, is subject to Section 7(d) and cannot irreversibly or irretrievably commit resources until EPA and NMFS complete formal consultation. Issuing the permits or otherwise entering into contracts during consultation constitutes an irreversible or irretrievable commitment of resources in violation of Section 7(d). *Pac. Rivers Council v. Thomas*, 30 F.3d 1050, 1056 (9th Cir. 1994); *Nat. Res. Def. Council v. Houston*, 146 F.3d 1118, 1127–28 (9th Cir. 1998). This is true even if the permits are subject to revision. WAC 173-220-190; WAC 173-220-150(1)(d); *see Nat. Res. Def. Council*, 146 F.3d at 1128 (finding violation of Section 7(d) even though water contract had a savings clause to allow for modifications to comply with federal law). Accordingly, Our Sound, Our Salmon requests that Ecology defer issuing the permits until formal consultation is complete, expected by July 11, 2019, so that Ecology can incorporate any reasonable and prudent alternative measures that result from the consultation.

Air and Noise Pollution Impacts to Adjacent Lands

The permits need to address and place limitations on the fouling of the air during net de-fouling and cleaning operations. Residents on shoreline properties near the Fort Ward facility, for example, cannot conduct normal outdoor activities, particularly during warm months, during net cleaning operations due to the foul smell of the air that directly results from the operations. This air pollution causes severe depression of local residential property values, apart from human respiratory impacts. DOE needs to determine appropriate maximum levels of airborne particulates and odor-causing chemicals and require facility operations to monitor and maintain the responsible airborne pollutants below maximum levels.

In addition, light from the net pen operations impairs uses of residential properties as does noise from the operations (e.g. generators for lights and pumps).

To this end, DOE should commission an appropriate sociological survey of resident households within one-half mile of the shorelines of the locations of each of the four farms. The survey should interview residents to assess the degree and frequency (times of day, times of year) that normal and desired residential activities (e.g., outdoor family activities and social events such as dinner parties) are disrupted and/or prevented by each of the three pollutants.

Light Pollution Impacts to the Nearshore Environment + ESA-Listed Species

Light pollution from the lighting of the net pens between the hours of dusk and dawn is a credible threat to ESA-listed salmonids and other native salmonid and non-salmonid fishes, as it acts as an attractant to migrating juvenile and returning adult salmonids such as ESA-listed Chinook salmon, bull trout, and steelhead. It can also increase the risks of predation on juvenile salmon rearing in adjacent nearshore environments by attracting them to the food and feeding fish (rearing farmed Atlantic salmon and others in the net pens) where fish, avian, and marine mammal predators congregate.

Apart from the predation risk, the lighting of the pens at night can delay migration thus impairing normal migratory behaviors, including timely migration through Puget Sound and resting and less energetically demanding night-time migration due to lower predation risk. DOE should restrict and, if necessary, ban the use of lighting of net pens in order to reduce the false attraction and associated risks of night-time lighting.

Feed Discharge Impacts to Native Fishes

Open water Atlantic salmon net pens routinely disperse large volumes of feed into public waters within the boundaries of the net pens as sustenance for their farmed Atlantic salmon. Some portion of the feed dispersed may not be consumed by Atlantic salmon in the pens, and thus makes its way into, and have an impact upon, the surrounding marine environment. The high-energy tidal zones in which many Atlantic salmon net pens are located may cause wide dispersal of unconsumed feed. This dispersal of feed into public waters represents a continuous and constant act of "chumming", and attracts native fish species.

Physically small fish species, such as baitfish species and outmigrating and rearing salmonids (including ESA-listed Chinook and steelhead), may be attracted by net pen feed to the point where they physically enter a net pen facility and are vulnerable to predation from farmed Atlantic salmon in the pens. The constant dispersal of feed may also cause disruptions in the natural migratory patterns of native salmonids, as the pens provide a constant and unnatural food source that may cause salmonids to occupy a single location for a longer period of time than is typical, and deter rearing or migrating salmonids from developing key feeding strategies which are critical to their early growth and development. This constant source of broadcast feeding, otherwise known as "chumming" is also likely to draw native species (including ESA-listed Chinook and steelhead) from their protective shallow nearshore habitats to net pen

locations located in deep water, increasing their exposure to both avian and aquatic predators within and outside the pens.

Additionally, feed dispersed by the Atlantic salmon net pen industry may have detrimental nutritional impacts on native fish species, as fish competing for survival in the wild may have distinct nutritional requirements from those being grown in an isolated facility.

Attraction, Entrainment, and Discharge of Native Fishes

All native fishes, including but not limited to bait fishes such as Pacific herring and potentially migrating or rearing juvenile salmon (including ESA-listed Chinook salmon and steelhead), may be attracted to the net pens due to the presence of feed and odor of rearing Atlantic salmon. Native fish that have entered the pens attracted by the large volumes of feed may then be entrained in the suction harvest machinery during the harvest of adult farmed Atlantic salmon. There are (at least) two issues that DOE needs to address with regard to this issue in the permits:

1. A comprehensive accounting of species composition as well as total numbers of non-Atlantic salmon fishes entrained during each net pen harvest period in which adult farmed salmon harvest occurs. This is required, among other reasons, in order that any take of ESA-listed salmon and steelhead may be accounted. All harassment injuries and mortalities of all individuals entrained in the vacuum pump harvesting equipment including but not limited to direct mortalities of ESA-listed individuals must be accurately determined and reported to DOE and NOAA and avai,lable for public review.

2. All non-Atlantic salmon entrained (sucked up) by the harvest operations are commonly "disposed of" by being thrown from the upper deck of the harvester ship back into the water on the outside of the nets. The volume of native fish is often so extensive it requires the harvester staff to use snow shovels to scoop them up from the landing area on board the harvest vessel. Pinnipeds and gulls are routinely observed in the water and air adjacent to the net pens, feeding on the native fish as they are being discarded. There are three additional issues here that DOE needs to address in the permits:

    - Indirect predation on ESA-listed juvenile Chinook salmon and steelhead (take).
    - The illegal feeding of pinnipeds, which provides an additional attraction for the pinnipeds that increases the likelihood of their predating on ESA-listed Chinook salmon and steelhead in the vicinity of the pens.
    - The operator of the Atlantic salmon net pen operations must obtain a fishing license or permit that would allow them to harvest native fish as described above. If such a permit is already in place, we have not been able to confirm its existence.

Discharge of Chemical and Pharmaceutical Pollutants

In order to treat specific diseases of fungal occurrences or to prevent infection, chemicals and pharmaceuticals are often applied by the industry to the fish, water, or feed in the net pens. Among the potential and likely harmful impacts to designated uses of surrounding water is the use of these chemical or pharmaceuticals for treating infections, parasites or diseases such as "yellow mouth" where the U.S. Food and Drug Administration (FDA) requires a 30 day waiting period before treated fish may be approved for human consumption. Native fishes in the immediate vicinity of the treated pens may also be exposed to or consume the very same chemicals and pharmaceutical treatments (including fish that may enter the pens attracted by the presence of feed and fish odors). These fish may then be caught in recreational or commercial fisheries and unknowingly be consumed by the public within FDA's required 30 day waiting period.

Similarly, the net pen industry's annual reports acknowledge that Atlantic salmon net pen escapes can and do occur. These escapes have been known to range from a few fish to thousands. The public may also be exposed to health risks any time Atlantic salmon escape the net pens due to the fact that these escapees may have recently, or were in the process of, receiving pharmaceutical or chemical treatments. The fact that the net pen industry has proven that it is unable to prevent such escapes puts the public's health and safety at risk.

Amplification and Discharge of Pathogens and Parasites

Pathogens present in Atlantic salmon net pens may infect native fishes, particularly salmonids, in the vicinity of the facilities. There are many pathogens that can be amplified in the marine environment by net pen facilities. Some notable examples include piscine reovirus (PRV), infectious hematopoietic necrosis virus (IHNv), and viral hemorrhagic necrosis virus (VHNv).

The physical and biological nature of all commercial net pens, including Atlantic salmon net pens, create an environment highly suitable for the spread and amplification of native or exotic parasites and viruses due to the large density of animals in small confined locations for extended periods of time.

Parasites and viruses can be spread from one animal to another through physical contact or through waterborne transport. While it is not uncommon for wild fish to contract harmful native viruses and parasites, infected wild fish are subject to natural selection and are therefore often consumed by predators that seek out fish with diminished physical or behavioral capacities. This exposure to predators (natural selection) significantly helps control the spread of infection to large numbers of fish in the wild. On the other hand, fish infected within the confines of a net pen are not subject to natural predation of any sort, which allows for parasites and viral pathogens to spread rapidly to large numbers of fish within the pen. This scenario can create an environment where the volume and distribution of viruses or parasites within and outside the pens can far exceed natural background levels. Such an environment can exceed nature's ability to suppress viral or parasitic outbreaks and can lead to epidemic conditions.

This amplification can be further exacerbated through waterborne tidal transport or by physical contact with native fish small enough to enter in and out of the net pens through the netting. These factors can create amplification scenarios that far exceed natural background levels and create a harmful discharge zone extending significant distances beyond the parameters of the physical pen.

The amplification of parasites or pathogens as we have described in this matter should be considered a dangerous discharge.

Fish Flesh Discharge

Atlantic salmon net pens chronically discharge particles of decaying fish flesh that are often consumed by native fish and birds. These particles may be contaminated with pathogens, parasites, pharmaceuticals or chemicals that may be ingested by native fishes, including salmonids. Studies have shown that these particles are potential vectors for pathogens such as PRV.

Discharge Pollution from Improper Net Cleaning Practices

DOE should require that net cleaning operations take place on land where removed waste materials and a multitude of aquatic organisms can be removed and properly disposed of on land (including the application of appropriate pre-disposal treatment of wastes). Net cleaning operations currently occur via high-pressure remote power-washing in/under the water (i.e., *in situ*) which occurs without any appropriate state or federal permitting and thus violates state and federal law.

Revised Pollutant Reporting Requirements

Currently, the monthly NPDES Reports provide data for the following:

- Total biomass of fish in the pens (in lbs. and kg.), total feed fed (lbs., kg.), regular feed (lbs., kg.).

In order to calculate the discharge of organic pollutants such as phosphorus and nitrogen from feeding operations, the following data should additionally be provided in monthly NPDES reports:

- Food conversion ratio (FCR), each month, including data and method(s) used to estimate FCR, separately for each pen.

- Food composition of feed fed; including protein, lipid, and carbohydrate content of the feed. Minimally, %phosphorus and %protein in the feed.

- Monthly fish loss (numbers and lbs./kg.) and estimated monthly mortality rate

- Daily Water temperature data

DOE must require the information needed to obtain a full understanding of the likely patterns of distribution of chemical, pathogen, and organic wastes (both solid and liquid) from occurrence in the net pens to the surrounding ("downstream") environment via patterns of current circulation. DOE thus needs to employ one or more currently available tidal circulation models that are capable of estimating with high precision the distribution of particles of various sizes and specific gravities. This is essential to determining the habitats outside of the net pens and their limited benthic boundaries that are likely to receive doses of harmful pathogens, parasites, pharmaceuticals, chemical, and organic nutrient wastes discharged from the farm operations.

Transition to Closed-Containment

Several of the pollution discharges listed above are difficult, if not impossible, to address from a regulatory framework perspective. Many of the described discharges are not currently required to be reported under NPDES reporting guidelines. To rightfully address these discharges, all of which present credible and substantial risks to the health of the marine environment in Puget Sound, substantial resources would need to be dedicated. Most of these discharges, even if attempts at mitigation are made, are impossible to fully eliminate due to the fundamental operational nature of open-water Atlantic salmon net pens. Discharges that can never be reliably fully eradicated include:

- the amplification of pathogens and parasites

- dispersed feed impacts to native fishes

- the attraction, entrainment, and discharge of native fishes

- nuisance attraction

- chemical and pharmaceutical pollutants

OUR SOUND, OUR SALMON

A transition of the industry to land-based closed-containment operations is the only way to fully eliminate these discharges. Land-based closed-containment facilities, by definition, would not allow for the marine environment to be impacted by the discharges listed above. Until such a transition is made, discharges from open-water Atlantic salmon net pens will continue to negatively impact Puget Sound and its native species.

These comments are supported by the undersigned members of Our Sound, Our Salmon:

Audubon Washington

Center for Biological Diversity — Because life is good.

Friends of the Earth

Friends of the San Juans — Celebrating 40 Years

Olympic Environmental Council

Olympic Forest Coalition

ORCA Conservancy — Est. 1996

Puget Soundkeeper

Surfrider Foundation

WDC Whale and Dolphin Conservation

Whale Scout

Whidbey Environmental Action

Wild Fish Conservancy

Our Sound, Our Salmon is coordinated by Wild Fish Conservancy

February 8, 2019

Rich Doenges
Washington State Department of Ecology
PO Box 47600
Olympia, WA 98504

Dear Mr. Doenges,

Thank you for the opportunity to provide testimony regarding the reissuance of Cooke Aquaculture's NPDES permits and for Ecology's input at the recent public meeting here on Bainbridge. The residents of Rich Passage Estates Homeowners' Association are well aware of the need to establish strict measures and controls to protect water quality.

The attached letter, that we wish to enter into testimony, identifies specific areas of improvement that are critical to the reissuance of Cooke's NPDES permit. We address:

- net washing practices
- the handling of operational debris
- solid waste storage and disposal
- inspections of mooring points
- the need for training.

We support the additional protective measures that were outlined at the public meeting. Further, we ask that any proposed introduction of native fish be viewed as a substantial modification. Finally, there is general agreement that Ecology should not renew NPDES permits at the expiration of current leases. Please confirm receipt of our testimony via the email shown below.

Sincerely,

Kathleen Hansen

Kathleen Hansen

Director
Rich Passage Estates HOA
PO Box 11683
Bainbridge Island, WA 98110
206-201-3414
kathy.hansen206@gmail.com

Thank you to the Department of Ecology for its work in recognizing some of the short-comings at the Bainbridge Cooke Facility and placing measures to protect water quality by prohibiting the over-water cleaning of equipment and power washing that increased with Cooke ownership.

FACT SHEET FOR NPDES PERMIT WA0031534
COOKE AQUACULTURE PACIFIC, LLC
FORT WARD SALTWATER II
On December 12, 2017, after multiple conversations, email correspondence, warning letters, and a Notice of Violation regarding Cooke staff illicit discharges at the Bainbridge Island service dock for the three facilities in Rich Passage, Ecology issued Cooke a penalty of $8,000 for violations of RCW 90.48. Though the service dock was not included in the NPDES permits for the facilities, this reissuance of the permit requires, as part of the pollution prevention plan, that Cooke include procedures for conducting routine maintenance of the facility and supporting structures (including barges and docks) and equipment in such a way as to prevent pollutants from entering state waters in violation of RCW 90.48.

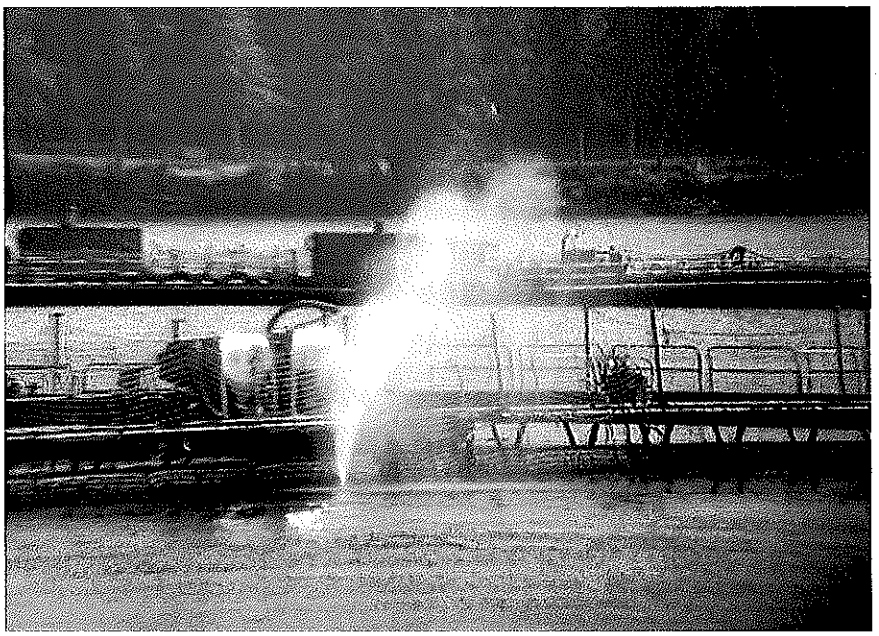
Recommendation: Both the NPDES permit and Pollution Prevention Plan should be comprised of strict controls (not guidelines) that are specific and measurable...Here are examples where more strict controls are needed:

From Cooke's Pollution Prevention Plan:

NETWASHING PRACTICES

4. At the end of the growing cycle after the fish have been harvested out, the nets are removed from the water and transported to a land based cleaning and repair facility.

Like thousands of others, we are well aware of the dangers of poor net-maintenance as demonstrated by the failures and mismanagement at Cypress Island. Last summer, at the end of the growing cycle, instead of predator nets being removed from the Fort Ward Pens here on Bainbridge, nets were cleaned by divers using power washers...the spray shooting many feet into the air.



The response from Ecology was:

"I spoke to Kevin Bright with Cooke regarding this activity. Kevin indicated that all the nets were removed from the Orchard Rocks site, but only the stock nets had been removed from the Fort Ward site. The reason was that Cooke anticipated approval of a transfer permit from DFW to re-stock the Fort Ward site. The permit was eventually was denied due to problems with the fish they were going to stock. Cooke has procured new smolts to stock the Fort Ward pens and timing will not allow for removal of the predator net. Ecology is not overly concerned that the predator net was not removed (even though it is not in complete compliance with the Pollution Prevention Plan), and that it is being pressure washed in place. In situ pressure washing is in compliance with Cooke's Pollution Prevention Plan. Net biofouling is not contingent on the presence of fish in the pens. Mussels and other marine organisms will accumulate regardless, especially during the summer months. So if nets are present, diligent washing of the nets is considered a BMP. A greater concern for Cooke could be the transfer of any legacy fish health problems from the previous stocking being transferred to the next crop of fish from the uncleaned net. However even if the nets were removed there could still be transfer from the floating structure itself. "

Ecology appears to acknowledge that:

1. Cooke was not in complete compliance with its own Pollution Prevention Plan
2. No matter what cleaning methods are employed (in situ or net removal) there still could be transfer of fish health problems from the structure itself

Additionally, a warning letter to Cooke from Ecology for unpermitted net washing was issued August 25, 2016 for discharges. This warning letter followed a month-long incident of power washing stock nets into State waters. Cooke explained this activity as a cost saving measure that was approved by management. Prior net pens owners were known to transport nets at the end of the growing season by truck which left foul discharges on Bainbridge roads. The previous Cooke GM communicated that nets would be shipped away from the pens by barge.

In Attachment A, Cooke states that in 2012, it switched company-wide to a "single stocking production plan that allows ample time for the containment nets to be removed from the farms and transported to an upland net washing facility for complete cleaning and repairs". These upland facilities are designed to handle the nets and dispose of materials properly. Cooke's practices during the last two production cycles are inconsistent with their pollution prevention plan or best practices as described in Attachment A. On paper, Cooke's recommendations seem reasonable. Actual practice, however, seems to favor actions that are expedient and cost efficient. A lack of specificity in permits makes it difficult for State agencies to ensure that the proper practices are being followed.

To date, no fish have been stocked in the Fort Ward Pens. The operator should not have the option of short-cutting the net cleaning process at the end of the growing cycle

Recommendation: Strict adherence to the removal of all stock and predator nets for cleaning *by barge* from the pens at the end of the growing cycle to ensure proper net cleaning and testing of the structures themselves to ensure fish health. The NPDES Permit and the Cooke Pollution Prevention plan should be amended to state the following:

- **At the end of the growing cycle all stock and predator nets *"must"* be removed from the facility by barge and transferred to an upland facility for complete cleaning and repair**
- **In-situ washing of nets with pressurized seawater may *"only"* be used during the growing cycle to minimize bio-fouling.**

Other Concerns:

1. **During in-situ washing how are portions of the net pen structure itself not affected by underwater washing as referenced in Section 2. O&M Manual Components, Subsection s? "The Permittee may not pressure wash any portion of the net pen structure or any equipment..."**
2. **During potential net rotations, how are possible escapements monitored, reported, and prevented?**

FACT SHEET FOR NPDES PERMIT WA0031534 COOKE AQUACULTURE PACIFIC, LLC FORT WARD SALTWATER II 12/24/18 Page 6
The Permittee is required to handle and dispose of all solid waste material in such a manner as to prevent its entry into state waters. Solid wastes of concern for marine salmon net pens include fish mortalities under normal operations, fish mortalities due to a fish kill involving more than five percent of the fish, blood and waste from harvesting operations, and sanitary waste and operational debris. The Permittee is required to develop a pollution prevention plan that addresses how solid and biological wastes are collected, stored, and ultimately disposed of at an upland facility.

Last year beginning in February, Cooke began hammering on nearby pens. Residents complained to the City of Bainbridge in May with what they believed were noise issues. In August, as many as three workers hammered for at least eight hours daily for a period of several weeks. Residents reported seeing workers pounding below the catwalks. Cooke confirmed that they were chipping off rust and painting.

Ecology responded to concerns in August with the explanation below that they received from Cooke's permit coordinator at that time:

"I spoke with our people down there yesterday and they are using tarps and plastic sheeting to keep material from entering the water. Collected materials are taken in to the pier and put into the dumpster for proper disposal. I will re-emphasis the importance of this with the project manager."

Ecology told an area resident in August that:
"Absent direct evidence of the discharge Ecology cannot impose Penalties or Administrative Orders."

Fair enough then that the public has to supply evidence that an infraction has taken place but, the net pen operator has no responsibility to provide evidence that containment measures are in place. Residents were left wondering how containment measures could take place below the catwalks in the swift moving waters of Rich Passage. To our knowledge, no inspection took place by Ecology to verify that proper containment measures were actually in place for activity that spanned from February to September. The permit coordinator seemed to have no advanced knowledge of the process until being contacted in August.

Recommendation: Notification to both Ecology and Cooke's permit coordinator when activities or maintenance by the net pen operator can affect water quality. Inspection or on-site verification of containment measures. Alternatively, video confirmation of processes could be utilized to demonstrate containment measures.

Other Concerns:

Why are fish mortalities pegged at 5%?

This brings to mind the IHN Virus that occurred in May 2012 that resulted in a million pounds of fish being destroyed. This event was never reported to the Department of Ecology but was widely reported by local newspapers and TV stations. The quote below from the Kitsap Sun illustrates our concern:

"We are concerned about the virus amplification that is occurring from the affected pens, and the length of time the amplifying event is occurring over," said Bruce Stewart, fish health program manager for the Northwest Indian Fisheries Commission. "American Gold reported increased mortalities starting in April. We now are at end of May and infected fish are still in those pens shedding virus."

Fish mortalities are reported to the Department of Ecology. It would appear that better monitoring or a different threshold is needed to protect water quality.

From Cooke's Pollution Prevention Plan:

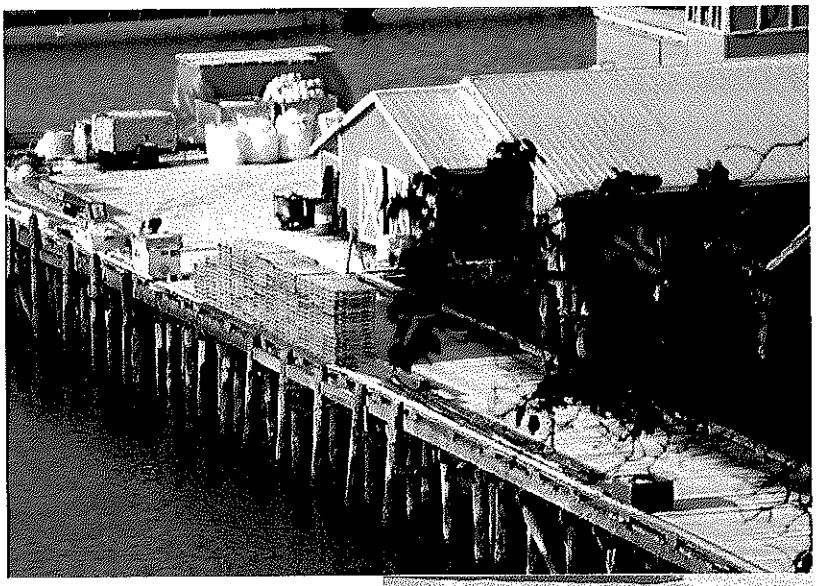
SOLID AND BIOLOGICAL WASTE COLLECTION, STORAGE AND DISPOSAL (Cont.,)

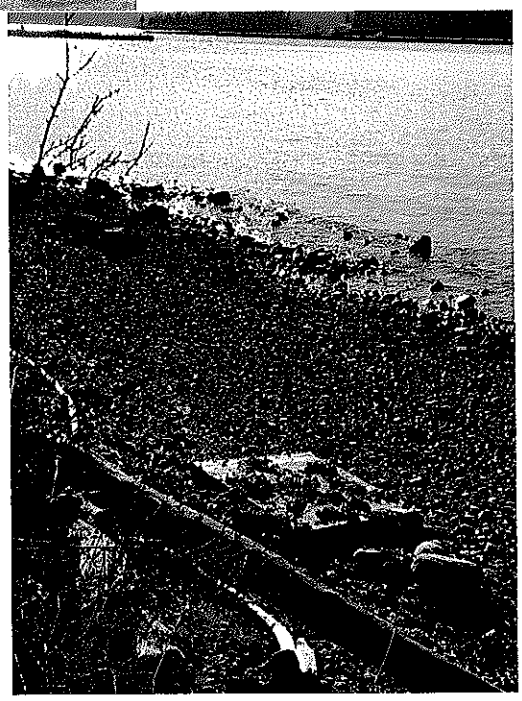
5. Solid wastes generated by the daily operation of the sites such as feed bags, wooden pallets and household wastes are to be routinely removed from the sites and transported to the land based support facilities for proper disposal and/or recycling. Proper containment, handling and storage of these waste materials are to be priority of all employees to ensure these materials do not enter the water.

From Ecology's Draft O&M Manual Components:

> *t. The Permittee must keep items associated with the operation of the net pens secured on the net pen structures and associated service areas, such as docks and barges, in order to prevent debris from entering the water.*
> *u. The Permittee must recover floating debris which enters the receiving water as soon as it is safe to do so.*

The problem with the word "routinely" in the draft Pollution Prevention Plan is that the industry defines what is routine instead of the Department of Ecology. At present, that is an increment of **at least** 220 pallets. The current frequency for removal is three to four-plus weeks. On collection day, there have often been more pallets than will fit in that eighteen-wheeler. (A full eighteen wheeler contains 380 pallets.) Unsecured pallets which are stacked over eight feet high have been known to enter the water during windstorms, washing up on the beaches of residential homes and the nearby Fort Ward Park.





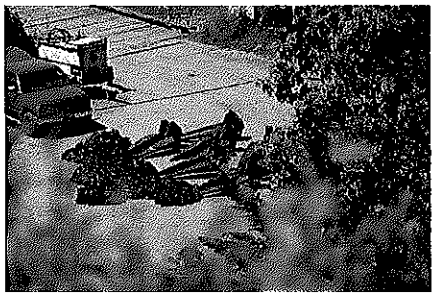
Recommendation: Define the increment for removal of these items as weekly or alternatively, a maximum of 220 pallets instead of "routinely" in both the Pollution Prevention Plan and O&M Manual. This could be facilitated by any of the almost daily eighteen-wheelers delivering food. Implementation at the farm of measures to secure recyclables prior to impending storms and inspection after a storm to be sure these types of materials have not entered the water as stated in both the Pollution Prevention Plan and O&M Manual.

Also from Cooke's Pollution Prevention Plan:
Routine Visual Inspections of Mooring Points

1. *The Site Managers and site personnel are to routinely inspect exposed mooring components for signs of excessive wear. Any defective components are to be replaced promptly.*
2. *Below water mooring components are to be inspected and/or replaced periodically in order to maintain them in the best condition practical.*

On the evening of May 25, 2017, farm workers brought in emergency equipment via a flatbed eighteen-wheeler for what we were told was an "equipment failure" here on Bainbridge. A farm manager confirmed to us that a boat held the pens in place while repairs were underway. This equipment failure was not reported to the Department of Natural Resources by Cooke nor the Department of Ecology to our knowledge.

New chains and anchors were delivered to the farm on May 28, 2017. DNR explained in an email that, "According to Cooke Aquaculture, the new anchors and chain that were delivered to Rich Passage will be used for routine maintenance and replacement of existing mooring equipment at the Fort Ward and Orchard Rock Facilities." **No mention was made of the Clam Bay facility where the equipment failure is believed to have occurred.**



Recommendation that the words "routinely" "promptly", and "periodically", be replaced with more specific language related to the inspections of mooring components both above and below the water. The net pen operator should report any failures of the mooring points and anchor structures to Ecology which could reveal a pattern of deficiencies. Manufacturer recommendations for suggested maintenance were found for the Cypress Island pens, for example, in the Appendix 1: Cypress Island Net Pen Failure Engineering Review (December 29, 2017)
https://www.dnr.wa.gov/sites/default/files/publications/aqr_cypress_investigation_appendices.pdf?bpxze&g0ewylow29

The Department of Ecology should play a strong role in defining "routine" maintenance to ensure that all pollution prevention and containment measures are applied and verified.

These recommendations correlate with the S9. Fish Escapement Plan in your NPDES draft

E. Specific description of what constitutes routine repairs and major or emergency repairs

F. Procedure for notification of Ecology and/or other state agencies of major repairs or mechanical or structural issues.

Our group is supportive of additional protective measures that include:

- Increasing underwater video monitoring of net pens
- Conducting inspections to assess structural integrity of the net pens and submit inspection reports certified by a qualified marine engineer to Ecology
- Improving net cleaning and maintenance procedures to prevent fish escape
- Requiring the Permitee to develop site specific response plans in the event of a fish release, and the conduct and participate in preparedness trainings
- Requiring improved maintenance of the net pens
- Maintaining and contact information to notify tribes in the event of a fish release
- Improved DO monitoring and reporting
- Improved training and documentation

Our concerns related to the above items:

1. Cooke often runs generators to address Dissolved Oxygen levels outside the reportable August 15th to September 30th period. Why aren't they be required to monitor and report whenever they are running their generators to address DO?
2. How will Ecology ensure that refresher training does in fact occur and that new employees are trained in a timely manner? An employee once admitted that he didn't know there was a Plan of Operations as part of their DNR lease for example.

We look to the Department of Ecology to provide safeguards along with other state agencies. As one Bainbridge city planner explained,

"The aquaculture facility predates the City, so there is no conditional use permit. They are essentially "grandfathered" and many of the City's SMP do not apply to the facility."

According to Cooke's application materials, the shoreline permit in place was issued by the Kitsap County Department of Community Relations (Permit 503) on 6/13/88...**over thirty years ago.**

2.5 Has a shoreline permit been issued for this project? [x] yes [ ] no

If **yes**, what is the permit number? 503 Date of permit? 06/13/88

Shoreline permit issuing agency: Kitsap County Dept. of Community Development

Despite the accolades that you might read about Cooke on their webpage, residents here agree that Cooke is the worst operator ever beginning with their introduction to the neighborhood with three weeks of unpermitted power washing of stock nets and discharges into the waters of Rich Passage and subsequent hand slap of a warning letter from Ecology. This was followed by an anchor failure that no one, not even DNR seems to acknowledge, and a year or more of cleaning equipment, power washing and scraping boats over Washington's waters.

With this in mind, we must re-emphasize the need for Ecology to establish strict controls instead of guidelines to ensure that Cooke follows an updated pollution prevention plan and complies with their NPDES permits. Unlike the game of Monopoly, there should be no more get out of jail free cards.

The Pollution Prevention Plan that is included in the application is dated April 2017, before Cypress Island and the inspections that followed of other net pen facilities. We are asking that the Pollution Prevention Plan be updated to include the requirements in Ecology's NPDES Permit Draft and to include the recommendations that we outlined here that impact water quality.

FACT SHEET FOR NPDES PERMIT WA0031534
COOKE AQUACULTURE PACIFIC, LLC
FORT WARD SALTWATER II
The descriptions and requirements of this permit are intended to solely address commercial rearing of Atlantic salmon in marine net pens.

We are also recommending that any future consideration related to the rearing of native fish be viewed as a substantial modification to the NPDES permit. WDFW stated in testimony last year that they are much more concerned about the escapement of native fish and its effects on wild populations.

Finally, we understand that the purpose of this comment period is to gain input for Cooke's NPDES permit. Like other commenters however, we wish to add that marine pen industry has demonstrated, with a long history of fish escapes, viruses and pollution that it cannot and should not be allowed to operate in the waters of the State of Washington at the expiration of their current leases.

CERTIFIED MAIL

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Jeanne McKnight

The United States currently ranks 16th in the world in terms of aquaculture production. Today, we import billions of dollars of high-value species such as salmon and trout from countries such as Norway, Canada, and Chile. Shouldn't we be growing more "local" products in our own waters? We have the ideal growing conditions for salmon and other finfish species. Why not look at aquaculture as a way to bring more local "Grown in Washington" seafood to the table?

Having worked in the seafood industry for more than 25 years, I have seen the continual advances being made in aquaculture technology, from underwater cameras and sensors to the development of better feed to advances in husbandry, disease prevention, and animal welfare. This is a young industry but it is also continually evolving for the better.

We believe the Department of Ecology should continue offering NPDES Permits for the rearing of salmon (both Atlantic and Pacific species), trout, and other finfish species. Aquaculture should be regarded as an important means to achieve food security. We see the NPDES permit system as a way to help set reasonable limits to and controls of pollutants in the environment.

Northwest Aquaculture Alliance

WHO WE ARE

The Washington State-based Northwest Aquaculture Alliance (NWAA) represents aquaculture producers and support-related businesses in Washington, Oregon Idaho, Montana, British Columbia—and beyond.

Alliance members share a vision of raising high-quality, sustainably produced, nutritious fish and shellfish, farmed in marine waters, freshwater, or in land-based operations that we can offer to local, regional, and global markets.

WHY AQUACULTURE?

The United States currently ranks 16th in the world in aquaculture production. The Northwest region, with its abundant supply of natural resources, know-how, and hard-working people, can—and should—produce enough farmed seafood to help the U.S. compete with imports from other aquaculture-producing countries.

Aquaculture currently provides more than half of the seafood consumed worldwide—and that percentage is increasing as global demand for seafood continues to rise and wild fisheries are fully exploited. Aquaculture is important for many reasons:

FOR OUR HEALTH

- Americans today consume just a little over 15 pounds of heart-healthy seafood (finfish and shellfish) per person annually, a number that falls significantly short of USDA dietary recommendations.
- Public health experts encourage people to eat seafood at least twice a week for optimal health. Currently, an estimated 84,000 premature deaths occur in the U.S. due to the failure to eat enough seafood.
- Aquaculture helps make healthy, nutritious seafood more widely available *and* affordable.

FOR THE ENVIRONMENT

- Aquaculture production (finfish, shellfish) produces the lowest carbon footprint of any kind of animal protein production and requires less space and feed.
- The global aquaculture community has embraced the challenge of reducing the use of fishmeal in feed, substituting algae oils and other non-fishmeal sources. The feed conversion ratio for farmed fish today is 1:1, compared with 1:7 for broiler chickens, 2:9 for hogs, and 6:8 for cattle.
- If we are concerned about reducing the environmental impacts of animal production, then we should promote aquaculture.

FOR A STRONG ECONOMY

- Currently, more than 90 percent of the seafood consumed in the United States is imported.
- These seafood imports contribute yearly to a massive trade deficit.
- In 2018 alone, the United States imported an estimated $4 billion worth of salmon.
- Approximately 60 percent of imported seafood products (salmonids, tilapia, shrimp/shellfish) are farm-raised in countries such as Norway, Scotland, Chile, Vietnam, Thailand, and China.
- Aquaculture gives us the opportunity to participate in this global trend toward farming the seas and inland waters and to do so to the benefit of our region's economy family-wage jobs.
- If we do not promote and foster aquaculture in the United States, other countries will continue to reap the benefit of meeting global demand--including family-wage jobs, business growth, economic stimulation, and the improvement and evolution of know-how and technology.

FOR MORE INFORMATION:

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