OUR SOUND, OUR SALMON

RE: Comments on Draft Cooke Aquaculture permit modifications to raise steelhead

Our Sound, Our Salmon

October 26, 2020

Drafted and Submitted by:
Wild Fish Conservancy

Our Sound, Our Salmon is a campaign coordinated and overseen by the Wild Fish Conservancy
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OUR SOUND, OUR SALMON

Ms. Laurie Niewolny,

Wild Fish Conservancy (WFC) and a coalition of groups operating under the banner of Our Sound, Our Salmon (OSOS) have long raised serious concerns about the environmental impacts commercial open water net pen aquaculture poses to water quality, species listed under the Endangered Species Act (ESA), and the greater ecosystem of Puget Sound.

These concerns are based firmly in the ever-growing scientific and evidentiary record in the Pacific Northwest and around the world that continues to document and demonstrate the environmental risks and consequences of rearing high-densities of highly-domesticated fish in marine open water net pens. In Puget Sound, we have seen these well-documented risks inherent to open water net pens can and do materialize, endangering the health of Washington's waters which support our culture, economy, wild salmon, and killer whales.

In February 2019 and June 2020, Our Sound, Our Salmon submitted comments during the National Pollutant Discharge Elimination System (NPDES) permit review process of Cooke Aquaculture's (Cooke) Puget Sound net pens (Attachment 1). After reviewing the Department of Ecology's (Ecology) modifications to the existing NPDES permits, several major risk factors continue to be absent or inadequately addressed in these permits. The modified permits fail to account for changes in risk assessment imposed by HB2957 and fail to "eliminate commercial marine net pen escapement" and "eliminate negative impacts to water quality and native fish, shellfish, and wildlife" as intended by the Washington state legislature in passing this law. As such, Ecology is incorrect to treat this new project as an extension of an existing practice.

Furthermore, Ecology relies on a failed, faith-based and retroactive approach to enforce the NPDES permits. Relying on any industry to self-monitor and self-report violations that are likely to result in economic penalties or loss is irresponsible and further increases the likelihood environmental harm and catastrophic events will occur. Under this regulatory framework, Cooke has demonstrated a history and pattern of NPDES permit and Clean Water Act violations in Puget Sound; have failed to correct violations when instructed by Ecology and other agencies; and habitually appeal punitive fines and enforcement actions by regulatory agencies. This pattern of violating environmental statutes and reluctance to comply with agency enforcement is consistent with Cooke's record around the world. Ecology has not provided sufficient evidence that the permits can be effectively enforced to prevent catastrophic events before they occur, let alone "eliminate" risks as the legislature intended.

Ecology's decision to conduct the NPDES permitting process and move toward finalizing the modified permits while foundational review processes that provide the legal and scientific basis for the NPDES permits are under review and subject to change is overtly premature with the potential to violate the State Environmental Policy Act (SEPA). We strongly recommend that Ecology delay the permitting process and not issue final permits while the underlying SEPA review of Cooke's new project is being legally challenged, and while federal ESA consultation of the impacts of Puget Sound net pens pose to ESA-listed species is ongoing. Both of these procedures are likely to conclude in the coming months and the results are likely to identify new water quality risks and environmental impacts to ESA-listed species that need to be analyzed and considered by Ecology in the NPDES permitting process. It would be reckless to issue

permits that could allow the planting of steelhead in Puget Sound net pens when Ecology is well-aware of the ongoing legal and scientific reviews and their potential to unveil new environmental impacts to water quality and the marine ecosystem.

Lastly, we reiterate from our previous comments, that the modified NPDES permit review should not occur without thorough consultation with local, state, federal, and tribal governments.

The NPDES Permitting Process Should be Delayed

The Underlying SEPA Review is Being Legally Challenged

Ecology is violating SEPA by relying on the Department of Fish and Wildlife's (WDFW) legally deficient SEPA analysis. WDFW decided to issue a Mitigated Determination of Nonsignificance (MDNS) in its SEPA review and issue a 5-Year Marine Aquaculture Permit to Cooke without complying with SEPA procedural requirements, without considering alternatives, and without fully analyzing and considering the potential significant environmental consequences of this new net pen aquaculture project, particularly when compared to baseline conditions in Puget Sound. WDFW's decision is currently being legally challenged in Washington Superior Court with a dispositive ruling pending from the judge hearing the case. See Wild Fish Conservancy, et al. v. Washington Department of Fish & Wildlife, et al.; King Cty. Superior Ct., No. 20-2-03704-4 SEA. That ruling is expected at any time. Given the magnitude of new scientific evidence and potential environmental impacts to ESA-listed species WDFW failed to consider during the review, it is possible that the Court will find WDFW violated SEPA, invalidating the MDNS and the permit granted to Cooke. In doing so, the Court may require WDFW and/or agencies with jurisdiction (which includes Ecology) to reinitiate the SEPA environmental review process and conduct additional environmental review (environmental impact statement or EIS) before determining if the scientific record supports this new project moving forward.

As Ecology is a jurisdictional agency in that SEPA review, the Court's decision will directly impact whether or not the NPDES permits can move forward. As such, Ecology will violate SEPA if it authorizes the NPDES permits or finalizes the permitting process by relying on WDFW's flawed SEPA analysis and determination. Comprehensive review of the environmental impacts posed by Puget Sound net pens, as required by SEPA, has not occurred since the 1990 EIS which never fully considered the environmental impacts of rearing native species or partially-sterile (triploid) fish in open water marine net pens. An EIS based on the current scientific record is likely to unveil significant pollution and water quality risks and harms posed by net pen aquaculture that Ecology will need to address and thoroughly review.

We expect this will require Ecology to initiate either an entirely new NPDES permitting process or to expand the scope of the current review, as the EIS or additional SEPA analysis will investigate environmental impacts associated with rearing steelhead as well as impacts associated with the practice of net pen aquaculture in general.

It would violate SEPA to move forward with the authorization of Cooke's modified NPDES permits by relying on WDFW's deficient SEPA analysis and determination. Our Sound, Our Salmon therefore fully incorporates herein the attached Our Sound, Our Salmon and Wild Fish

Conservancy comments that explain why WDFW's SEPA analysis is deficient—these comments apply equally to Ecology (Attachment 2).

Federal ESA Consultation on Puget Sound Net Pens is Ongoing

Ecology is violating Section 7(d) of the Endangered Species Act (ESA) by issuing Cooke's NPDES permits before the U.S. Environmental Protection Agency (EPA) and the National Marine Fisheries Service (NMFS) conclude their reinitiation of consultation under Section 7 of the ESA on EPA's approval of Ecology's sediment management standards for marine finfish rearing facilities. On May 29, 2020, EPA released a new analysis of the impacts Puget Sound marine finfish net pens pose to ESA-listed species and critical habitats (Attachment 3). This new analysis came after the EPA considered new information that had not previously been considered in the 2008 and 2010 Biological Evaluations, including:

- Disease transfer from Atlantic salmon net pen fish to Pacific salmon, primarily relying on a letter from NMFS dated January 12, 2016, and accompanying memo.

- An escapement event that occurred on or around August 19, 2017, at Cooke Aquaculture's Site 2 net pen off Cypress Island and the follow up and the associated response actions.

- Updated National Pollutant Discharge Elimination System permitting actions by the Department of Ecology to minimize escapement risk and covers the planned transition at existing commercial net pens facilities to raise steelhead instead of Atlantic salmon, which must be phased out by 2022 per Washington state law.

- The EPA NPDES general permit which currently covers tribal enhancement net pen facilities and the reissuance of the general permit in late 2020. The EPA plans to expand the scope of the general permit to include federal research facilities and to allow for the marginal expansion of tribal enhancement facilities. The tribal enhancement facilities raise and release native salmonids and the federal research facilities will raise native fish (Pacific salmon, sablefish, etc.).

After reviewing this new information, the EPA made an initial species effects determination that Puget Sound's marine finfish net pens *"are likely to adversely affect"* the following ESA-listed fish populations:

- Chinook salmon (Puget Sound ESU)
- Chum Salmon (Hood Canal summer-run ESU)
- Steelhead (Puget Sound DPS)
- Boccaccio (Puget Sound/ Georgia Basin DPS)
- Yelloweye Rockfish (Puget sound/ Georgia Basin DPS)

As a result, NMFS reinitiated formal consultation and is currently preparing a Biological Opinion to analyze and expand upon this initial determination.

Because EPA and NMFS are currently in consultation, Section 7(d) of the ESA applies and prevents Ecology from issuing Cooke's NPDES 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, is subject to Section 7(d) and cannot irreversibly or irretrievably commit resources until EPA and NMFS complete formal consultation. Issuing Cooke's updated NPDES 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, we request that Ecology defer issuing Cooke's NPDES permits until formal consultation is complete so that Ecology can incorporate any reasonable and prudent alternative measures that result from the consultation.

The Modified NPDES Permits Fail to Account for Changes in Risk Assessment Imposed by New Law

As stated in the June 8, 2020 Our Sound, Our Salmon NPDES permit comments, we continue to urge Ecology to acknowledge and address that the passage of HB 2957 created a new and stricter regulatory regime for marine net pen aquaculture and that the law would have ended net pen aquaculture and all the risks they pose in Puget Sound by December 2022. While the law does not prohibit native fish from being reared in open water net pens, the law does impose a series of other requirements, and establishes the legislature's clear intent that future marine net pen aquaculture be subjected to greater scrutiny. That intent is clear in Section 5 of the engrossed bill, which requires agencies to "continue the existing effort to update guidance and informational resources to industry and governments for planning and permitting commercial marine net pen aquaculture," and mandating: "The guidance must be designed to eliminate commercial marine net pen escapement and to eliminate negative impacts to water quality and native fish, shellfish, and wildlife."

In finding that "marine finfish aquaculture in general may pose unacceptable risks" and mandating guidance to "eliminate" those risks, the legislature overturned the 1990 EIS's determination that Atlantic salmon aquaculture posed acceptable risks, and in doing so, imposed a stricter standard than existed previously. It is clear that the legislature intended to alter the risk assessment framework used for marine finfish aquaculture in general from the status quo.

The decision for the underlying 2020 SEPA review and associated net pen aquaculture permits to rely on the outdated 1990 EIS and risk assessment (based on best available science thirty years ago) without acknowledging the significant shift in risk assessment mandated by the 2018 law (based on best available science today) is scientifically indefensible.

We continue to urge that the NPDES permits conform with this current law and share the policy's objective to *eliminate*— not mitigate— commercial marine net pen escapement and negative impacts to water quality, native fish, shellfish, and wildlife.

The EPA's acknowledgment that Puget Sound net pens are likely to adversely affect ESA-listed species is based largely on risks associated with escapes events and is just one of the clear indicators that open water net pens are incompatible with the state's objective of eliminating the risks associated with escapes.

In light of these new legal mandates, and the different risk profile presented by rearing a domesticated and partially-sterile (triploid) form of a native species, this permit application should not be considered an extension of past practices, but should rather be addressed as if the proposed replacement of Atlantic salmon with domesticated, partially-sterile steelhead is a new project. HB 2957's new standards require re-examining past decisions, and holding Cooke to that higher standard of eliminating risks.

Many local governments and even state agencies have enacted stricter laws and statutes over the past thirty years since these net pens were grandfathered in that would not allow for new commercial net pen aquaculture projects in 2020. By considering Cooke's new project as an extension of past practices, Ecology is not only failing to meet the new standard set by HB2957, but is directly enabling Cooke to continue benefiting from environmental exemptions that for three decades have protected the commercial net pen industry from complying with local statutes, state conservation plans, and other environmental laws put in place to protect Puget Sound's most sensitive species, habitats, and ecosystems since the early 1990's.

When Cooke's leases expire for these sites in 2022, the Department of Natural Resources (DNR) will not consider the applications as renewals of their previous leases, but brand-new lease agreements that will need to adhere to today's environmental standards.

We encourage Ecology to take a similar approach as DNR to the NPDES permits that correctly assess Cooke's applications as a new project and adhere to the risk assessment imposed by the new law to eliminate escapes, water quality risks, and other environmental harm.

The draft NPDES permits must be enforceable.

Ecology lacks the regulatory authority sufficient to enforce the proposed modified NPDES permits. The regulatory environment described in the modified NPDES permits (and previous NPDES permits) relies almost entirely on the permittee to self-report and self-monitor their own NPDES permit violations. As violations are likely to result in economic loss or penalties, industries have little incentive to report violations, increasing the likelihood environmental harm and catastrophic events will occur.

While operating in Washington's public waters, Cooke has demonstrated a pattern of unscrupulous behavior, violating their NPDES permits, the Clean Water Act, the terms of their

leases, and other local statues. Given this history in Puget Sound, Ecology has not provided sufficient evidence that the modified NPDES permits are enforceable to a level necessary to prevent significant environmental impacts to water quality, ecosystem health, and threatened and endangered species before they occur.

The failure of past NPDES permits to address this fundamental regulatory flaw has not only resulted in catastrophic events, but shifts the burden of monitoring and reporting violations onto local landowners, environmental organizations, Tribal Nations, and other members of the public. On two occasions Cooke issued cease and desist letters to members of the public in an attempt to silence environmental advocates.

Examples that this regulatory environment is insufficient include:

- The Cypress Island collapse in August 2017 that resulted in the release of over 250,000 non-native Atlantic salmon into Puget Sound. The collapse was first reported to state officials by a citizen, not Cooke, and the emergency response plan fell largely on the shoulders of Tribal Nations, commercial fishers, recreational fishers, and other members of the public. A multi-agency investigation determined Cooke's failure to adequately maintain and clean their nets and insufficient attention to engineering were responsible. Cooke knowingly underreported the cause of the collapse and the number of fish that escaped in an attempt to mislead the public and agency officials, and to minimize potential fines or penalties.

- Viral testing of escaped fish conducted by nonprofit organization Wild Fish Conservancy and published in Virology Journal (Kibenge et al. 2019; https://doi.org/10.1186/s12985-019-1148-2) demonstrated nearly 100% of the Atlantic salmon that escaped from Cypress Island were infected with an exotic virus (Piscine Reovirus or PRV) originating from Iceland where Cooke sourced their Atlantic salmon eggs. Prior to the collapse, this virus was never reported by Cooke or discovered by state agencies. As all other Puget Sound net pens were planted with fish from the same egg supplier in Iceland where the virus originated there is a high likelihood other net pens were also infected. However, due to existing monitoring and regulatory rules, state agencies were prohibited from testing fish withing the pens without Cooke Aquaculture's permission or without the company first self-reporting the presence of the virus. As a result, agency officials could not intervene even when the reasonable likelihood of a large-scale threat existed, therefore leaving hundreds of thousands of potentially contaminated fish in Puget Sound for months before they were harvested.

- Wild Fish Conservancy sued Cooke for violations of the CWA following the Cypress Island collapse. The lawsuit settled for $2.75 million, exposed CWA violations never investigated or discovered by Washington state agencies. This included federal rulings that 2012, 2015, April 2017, and October 2017 Pollution Prevention Plans required under the NPDES permits and approved by agencies were deficient and that Cooke's Fish Release Prevention Plan did not include required procedures for tracking the number of fish in the salmon farms and those lost to predation and escapement.

- From 2018-2020 local landowners have submitted to Ecology video footage of Cooke employees disposing of wild bycatch into Puget Sound during harvest operations. In one video, Cooke employees can be seen using a snow shovel to dispose of bycatch from the harvest vessel into Puget Sound. Cooke reports they have never experienced bycatch during harvest. Disposing of bycatch or any biological material into Puget Sound is a violation of their NPDES permits and has never been enforced by Ecology.

- Citizen complaints in April 2017 reported Cooke was committing water quality violations at a dock near its Bainbridge Island net pens. Over the next 8 months, violations continued to occur despite Cooke receiving two letters from Ecology, a notice of violation, and requests on several occasions from the agency that the violations be fixed. The violations included:

    - Unlawfully discharging polluting matter into state waters
    - Pressure washing equipment, nets, and vehicles over the water and allowing wastewater to enter Puget Sound
    - Changing boat engine oil over the water
    - Failing to put safeguards in place to protect water quality
    - **Failing to correct water quality violations when directed**

- On October 19, 2019, local landowners and off-duty WDFW employees visiting Bainbridge Island were the first to report the partial sinking of the Orchards Rocks net pen in Rich Passage. Records from the incident show Cooke's emergency response was inadequate despite new regulations in place after the Cypress Island collapse and occurred during the SEPA review of Cooke's new project to rear steelhead. If the net pen was stocked at the time this event likely would have resulted in the escape of fish, reconfirming the NDPES permits are not sufficient to eliminate the risk of escapes.

It is worth nothing, this record is not unique to Puget Sound. For example, in 2012, Cooke pleaded guilty to illegally dumping the pesticide cypermethrin at their Bay of Fundy net pen facilities in Canada, endangering nearby lobsters and resulting in one of the largest fines ever levied under Canada's Fisheries Act. In 2019, the U.S. federal government considered a moratorium on the Chesapeake Bay's menhaden fishery after Omega Protein/ Cooke failed to comply with catch limits.

In addition to a pattern of behavior that suggests a disregard for environmental laws, Cooke frequently uses litigation to avoid regulatory enforcement and to influence decision-making. While operating in Puget Sound, Cooke threatened during legislative testimony to sue Washington state under NAFTA if a bill passed banning nonnative commercial marine net pen finfish aquaculture; appealed the State's decision to terminate their Cypress Island lease; appealed the State's decision to terminate their Port Angeles lease and appealed again after a State Court upheld the termination; appealed Ecology's fine holding the company accountable for the Cypress Island collapse until the agency agreed in settlement they could select how a portion of the funds would be used; and used cease and desist letters on multiple occasions in an attempt to silence local environmental advocates, including during the SEPA review public comment period that determined the future of their new project to commercially-propagate steelhead. This habitual use of litigation to avoid accountability for violating environmental laws

and to influence the decision-making process of legislators, government officials, and members of the public is further evidence self-monitoring and self-reporting is not an appropriate regulatory environment for this company.

Ecology has modified the NPDES permits to avoid catastrophic escape events in the future including clarifying that any fish reared in Cooke's net pens are prohibited from release; adding requirements and details about actions Cooke must take to notify state agencies of events that could potentially lead to fish escape; and adding requirements about how nets must be maintained. Given Cooke's history of failing to self-report and self-monitor violations, failure to correct violations when instructed, and reluctance to comply with enforcement actions are strong indicators that these faith-based standards are insufficient to prevent other large-scale escape or viral outbreaks from occurring; again, inconsistent with HB 2957 and the legislature's intent to eliminate the risk of escapes from marine net pens.

In order to prevent potential adverse impacts to public resources from pollutant and water quality impacts at the operations of each net pen, Ecology must have the authority and capacity to conduct regular and unannounced site visits and to conduct any biological sampling and testing deemed advisable to assure the public that no adverse impacts are occurring. This should include requiring the presence of independent observers on-site during each harvest operation to quantify and describe the species and life stages of all by-caught species.

A history of NPDES permit and CWA violations must be considered in this process so permits are drafted to ensure violations are detected before catastrophic events occur. As long as the permits continue to largely depend on industry self-monitoring and self-reporting, both known and unknown violations are likely to occur with retroactive, punitive fines as the only regulatory control— an ineffective method of protecting water quality and ESA-listed species from harm.

We strongly believe that operating and profiting in public waters is a privilege. If the permits are not enforceable and Ecology cannot provide the public with sufficient evidence that catastrophic events are likely to be prevented before they occur, the permits should not be granted.

NPDES Permits Need to Consider Toxic Pollutants

The modified NPDES permits must consider and address the risk of toxic pollutants including viruses and diseases. Ecology continues to exclude this significant environmental risk factor from the NPDES permits despite Wild Fish Conservancy raising this issue since 2013. Ecology has argued that pathogens like viruses and bacteria do not fall into Ecology's regulatory oversight, however disease-causing agents are defined by the EPA as toxic pollutants and WDFW does not have the authority to issue CWA fines or violations related to the unlawful discharge of toxic pollutants. Monitoring and reporting of sea lice are already included in the NDPES permits and it is far past time that the NPDES permit review consider toxic pollutants as well. The permits must ensure that Cooke's final Pollution Prevention Plan and Fish Escape Plans will eliminate the risk disease-causing agents pose to the Puget Sound ecosystem and the biological integrity of its wildlife, especially ESA-listed species.

Like any high-density confined animal feeding operations, commercial net pens are known to amplify and spread endemic and exotic viruses, bacteria, diseases, and parasites into the marine environment in large numbers. In 2017, a British Columbia study documented a strong

correlational connection between disease prevalence in net pens and disease transfer to wild fish populations (Morton et al., 2017; https://doi.org/10.1371/journal.pone.0188793). Recent research in British Columbia found novel viruses in endangered salmon, and found evidence that these novel viral infections may originate from farmed salmonids (Mordecai et al., 2019; https://doi.org/10.7554/eLife.47615).

A study published in Virology Journal in 2019 (Kibenge et al. 2019; https://doi.org/10.1186/s12985-019-1148-2) revealed that nearly 100% of the 250,000 Atlantic salmon that escaped the Cypress Island collapse were infected with an exotic virus originating in Iceland where Cooke purchases their Atlantic salmon eggs. Further, a new paper forthcoming in the peer-reviewed journal Virus Evolution, confirms that the Piscine Reovirus (PRV) found in the fish that escaped during the 2017 Cypress Island collapse and elsewhere in the eastern Pacific is not a native virus, but rather is one whose origin is in the north Atlantic basin. (Siah et al. 2020 Genomes Reveal Genetic Diversity of Piscine Orthoreovirus in Farmed and Free-ranging Salmonids from Canada and USA. Accepted manuscript, Virus Evolution).

At present state agencies do not stipulate minimum distances between the pens and do not take factors like tidal flow (affecting pathogen plumes emitted from the pens) and proximity to salmon bearing streams into consideration, despite decades of work (and catastrophic disease outbreaks costing billions of dollars in the Norwegian and Chilean Atlantic salmon farming industries) that led to the development of guidelines to reduce disease transmission. While international (OIE) guidelines suggest a minimum of 5km between pens, a study in Chile (Mardones et al. 2011; https://doi.org/10.1016/j.prevetmed.2011.07.005) suggested that 10km between pens might be a safer guideline (note that there are no native salmon in Chile; this guideline was meant only to protect one salmon farm from infection by an adjacent farm). In those countries, the guidelines were put in place to limit the spread of disease between farms or between farms and wild fish, and were developed to assist the salmon farming industry in protecting their investments.

Under the existing regulatory system in place, the only time WDFW has access to monitor net pen fish for viruses, diseases, or parasites is prior to their release into the net pen environment. During the grow out period (roughly 18 months), state agency officials do not have authority to randomly monitor or conduct agency sampling or testing for disease-causing agents in farmed fish within net pens and must rely on the net pen operator's self-monitoring and reporting to notify state officials if an outbreak or infection has occurred. Even in these instances, state officials must receive permission from the net pen operator before having access to the facilities. As a result of this fundamental breakdown in the regulatory oversight of this industry, known outbreaks or suspected risks of viral infections have been allowed to amplify and spread in Puget Sound net pens with agency officials unable to intervene despite being aware of the threat.

Examples include:

- In 2012, an outbreak of Infectious Hematopoietic Necrosis virus (IHNV) occurred in one of the net pens located in Rich Passage near Bainbridge Island. Despite the net pen operator declaring "quarantine" of the infected pens (which does nothing to prevent the virus being shed from infected Atlantic salmon into the water flushing through the pens), the virus quickly spread to open water facilities at two other locations in Rich Passage, including one withing the Orchard Parks Aquatic Reserve. This outbreak occurred in

April and May when outmigration of juvenile salmon was at its peak. WDFW's Fish Health Supervisor at the time requested access to the net pens to conduct testing and place sentinel cages to monitor viral exposures but was refused access throughout the duration of the outbreak by American Gold, the owner at the time. Under public disclosure, there is no agency record of this event nor was it disclosed in American Gold's annual report to the state, leaving no evidence for the public that an outbreak occurred, let alone what the impacts of the outbreak may have been. This lack of transparency highlights another key issue related to the monitoring and recordkeeping of agencies and the industry around viruses and diseases that needs to be corrected and accounted for.

- Following the Cypress Island collapse viral-testing and genetic sequencing of escaped fish conducted by Wild Fish Conservancy demonstrated that nearly 100% of the over 250,000 fish that escaped were infected with an exotic virus originating from Iceland where Cooke purchased their Atlantic salmon eggs. Cooke never reported an outbreak of PRV. As all other Puget Sound net pens were planted with fish from the same egg supplier in Iceland where the virus originated, there is a high likelihood other net pens were also infected. However, state agencies were prohibited from testing fish withing the pens and hundreds of thousands of potentially contaminated fish remained in Puget Sound for months before they were harvested.

It is both reckless and unacceptable for WDFW and Ecology to issue permits that allow for steelhead to be planted in Puget Sound while this fundamental regulatory inadequacy exists. Ecology must rectify this gap in regulatory oversight in the modified NDPES permits. If Ecology does not feel they have the regulatory authority to test for and monitor disease-causing agents, Ecology and WDFW must work together to incorporate monitoring and reporting requirements for disease-causing agents in net pen aquaculture regulatory permits. Agency staff must be authorized to randomly inspect net pens for disease-causing pathogens or any other potential violation. This monitoring should be funded by the industry.

Measures to reduce the amplification and spread of viruses are particularly important as Cooke's new project will rear native steelhead which increases the likelihood that pathogens can be transferred between farmed steelhead and conspecifics in the wild. With Puget Sound's native steelhead ESA-listed and on the brink of extinction, this should be a major concern to Ecology.

Given the frequent presence of marine mammals, birds, and other wildlife falsely attracted to the pens during harvest operations and recent video of orcas swimming nearby as well, it is all the more important to identify pollutants, including antibiotic resistant bacteria, pharmaceuticals, and other emissions, that might do harm to these protected species.

Bycatch During Harvest Operations and in Puget Sound Net Pens Needs to be Monitored

Native fishes—including but not limited to forage fishes such as Pacific herring and potentially migrating or rearing juvenile salmon may be attracted to the net pens due to the presence of feed and the presence of lower trophic taxa drawn to the feed and waste emanating from the

pens. 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 steelhead.

Ecology's modified NPDES permits currently do not address bycatch of native fish despite Wild Fish Conservancy and local landowners submitting video and photographic evidence of bycatch as early as 2018 and through 2020. These photos and videos document bycatch of non-target fish during Cooke harvesting operations in Puget Sound after being entrained (sucked up) by the harvest operations. In these videos staff can be seen discarding bycatch from the harvest back into the water on the outside of the nets. In one case, the volume of native fish was so extensive an employee uses a snow shovel to scoop bycatch from the landing area on board the harvest vessel and back into Puget Sound. Pinnipeds and birds are routinely observed adjacent to the net pens during the harvest, feeding on the wild fish as they are being discarded, a violation of state and federal laws prohibiting the feeding of pinnipeds and marine mammals.

In response to this evidence, Ecology has continually taken a dismissive approach claiming it cannot be known for sure that the material being discharged by Cooke employees are in fact wild fish and that even if they were, the degree to which bycatch is occurring is "de minimis" (too trivial or minor to merit consideration). Instead Ecology assumes that the materials being discharged are other biological materials resulting from the harvest process, which is a violation of Cooke's NPDES permits and has never been enforced while continuing to be documented. This is another prime example that the NPDES permits are not enforceable. Ecology has never monitored or regulated bycatch and Cooke has never reported bycatch occurs during harvest. For Ecology to consider harvest of native fish that may be ESA-listed as "de minimis" with no data to support that claim is reckless. The NPDES permits must be updated to require comprehensive accounting of the species composition, number of fish, condition of the fish (alive or dead), origin (hatchery or wild), and the age structure of nontarget fishes entrained during each net pen harvest period in which adult farmed steelhead harvest occurs. This data should be collected by independent observers on-site during each harvest operation and should be funded by the net pen industry.

This is required, among other reasons, to account for the potential take of ESA-listed salmon and steelhead. All harassment injuries and mortalities of 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 state agencies and NMFS and available for public review.

It is not surprising that there would be such bycatch, and it is likely that it includes endangered and threatened species. British Columbia requires reporting of bycatch (or what they term "incidental catch") at aquaculture facilities. A complete record of the species captured since 2011 is available from the Canadian Department of Fisheries and Oceans (https://open.canada.ca/data/en/dataset/0bf04c4e-d2b0-4188-9053-08dc4a7a2b03). In that dataset, salmon species are recorded for every year on file. In some cases, hundreds of thousands of fish are recorded as incidental catch as part of a rapid depopulation of the pens to control a disease outbreak. Even excluding those incidents, an average of over 35,000 incidental catches in net pens per year are recorded in British Columbia. It is likely that a proportionate amount of bycatch occurs in Puget Sound, and could have serious effects on the Sound's sensitive ecology. Because Cooke has not reported bycatch, the state does not monitor

their efforts, and because independent observers are not able to view the harvest process in detail, we cannot fully measure the harm this bycatch causes.

Surveys of aquatic diversity at sites near these net pens indicate substantial numbers of threatened and endangered juvenile salmonids, and forage fish. State-funded surveys including "West Sound Nearshore Fish Utilization & Assessment (SRFB Grant: 07-1898)" (2010), "Cypress Island Aquatic Reserve Pilot Nearshore Fish Use Assessment" (2011), "West Whidbey Nearshore Fish Use Assessment" (2007), and the ongoing "Hood Canal Nearshore Juvenile Fish Use Assessment" find substantial populations of threatened coho, Chinook, pink, and chum salmon in near-shore waters at sites near and similar to those where net pens operate.

Those surveys also demonstrate substantial variation in total species diversity and population sizes from site to site (e.g. Figure 3), and between surveys at the same site over time. Salmonid populations could vary by orders of magnitude from month to month, and between years. This highlights the difficulty of monitoring and predicting the potential bycatch that might occur in these pens without active, independent monitoring.

In addition to harvest operations, additional issues related to bycatch that need to be addressed include:

- Indirect predation by net pen steelhead on ESA-listed juvenile salmonids

- Net pens which rear high-densities of farmed fish act as an unnatural false attraction for both wild fish and marine mammals. Disposing of bycatch during harvest further exacerbates this dynamic that may result in unnatural levels of predation of ESA-listed fish populations by marine mammals attracted to the pens and bycatch. This false attraction also increases the likelihood that marine mammals and fish will be exposed to harmful pathogens amplified and spread by net pens; that wild fish and marine mammals will ingest feed or farmed fish treated with chemicals, medicines, or pharmaceuticals; and that marine mammals (especially ESA-listed species) may experience boat strikes, harassment, or entanglement.

- The harvester crew and/or net pen operator must obtain a fishing license or permit that would allow them to harvest native fish as described above.

Change in Species

Without an EIS, Ecology's analysis that transitioning from Atlantic salmon to steelhead "is not likely to change the effect to water quality" is only an assumption. This was a major concern raised by DNR (another jurisdictional agency to the SEPA review) in their comments to WDFW which concluded the SEPA materials "did not adequately address how the proposal from Cooke might impact the already declining population of Puget Sound steelhead." This is a major argument in the pending lawsuit over the underlying SEPA review.

The escape of partially-sterile (triploid) steelhead from any of the Puget Sound aquaculture facilities, whether from small scale leakage or catastrophic facility failure, constitute pollutants

under the CWA and may pose significant environmental impacts to native salmonids rearing in nearshore marine habitats and rivers due to competition for food and foraging space, spread of disease-causing pathogens, and genetic introgression.

Competition for resources will be particularly true in the case of triploid individuals because, as noted in Cooke's materials, they will have appetites that are likely to be considerably greater than wild juvenile salmon and steelhead due to the faster inherent growth rate of these triploid fish. This means escapees may outcompete wild steelhead, or indeed predate upon them.

Our attached SEPA comments provide a detailed analysis of the risks to the genetic integrity of threatened Puget Sound steelhead stocks in the event of an escape. While the limited data from Troutlodge indicates an average triploidy failure rate of 0.17%, the true rate may be substantially different, and higher. Furthermore, a random sample of several hundred thousand fish may contain a larger proportion of fertile females by random chance. In the event of an escape on the scale of Cypress Island, that could mean thousands of fertile females entering Puget Sound, potentially diluting the genetics of threatened wild populations, and competing with wild females for redds.

Our attached SEPA comments detail methods of assessing those risks that allows an assessment of not only median-case scenarios, but the worst-case scenarios demanded by WAC 197-11-080.

An additional related concern is the absence of specific details regarding how the replacement steelhead stock is to be marked so as to distinguish an aquaculture-raised steelhead from conventional hatchery-raised steelhead and from wild, natural-origin, steelhead. It is critical that aquaculture-raised steelhead be provided with an externally visible mark that is distinct from the adipose clip used to identify conventional hatchery-reared steelhead. This is necessary in order that recovered escaped aquaculture-raised fish can be distinguished from hatchery and wild steelhead, in order to assure that such fish are removed from public waters and that native steelhead (with an intact adipose fin) not be killed due to suspicion that such a fish captured following an escape is one of the escapees.

The prior permitting for these pens and their operations all addressed risks associated with a non-native species. In dealing with partially-sterile (triploid), domesticated O. mykiss and Puget Sound's federally-listed steelhead population, different risks apply, and standards laid out in the 1990 EIS have not been met for these purposes.

In particular, "a minimum distance of separation between farms and river mouths" has never been considered and adopted in state policy, as section 5.7.2.2 of the 1990 EIS would require for aquaculture involving native fish (and as is required in other nations). Since escapes, and their risks to threatened conspecifics, constitute pollution and are within the scope of Ecology's review, this guidance and an analysis of the proximity of pens to steelhead spawning rivers should be included in Ecology's review of these modified NPDES permits. In addition, the assessment of risks from pollution (including toxic pollutants, i.e. viruses) should account for the migration corridors in areas like Rich Passage, which may concentrate wild salmon near the pens.

Furthermore, the behavioral response of wild steelhead to a large aggregation of conspecifics may be different than it was to Atlantic salmon. If wild schools are attracted to the captive domesticated steelhead in pens as are other native fish, the pollution from the pens may do greater harm to recreationally- and commercially-important hatchery-reared steelhead and to threatened wild Puget Sound steelhead.

Eliminate negative impacts to water quality

Several significant environmental impacts previously raised in the attached 2019 and June 2020 NPDES permit comments by Our Sound, Our Salmon are not addressed by the modified NPDES permits. Decades of experience show real effects on water, which the modified NPDES permits do not eliminate. We encourage Ecology to reconsider the following concerns:

- Daily untreated Phosphorous (P) and Nitrogen (N) emissions discharged into Puget Sound by open water net pens far exceed what is legal for any other industry in Washington. In 2017, WFC estimated the total discharge of N and P waste from Atlantic salmon net pen aquaculture farms when each was at estimated maximum production based on Cooke's NPDES reports to Ecology. These numbers were updated in 2020 based on the most recent reports as P and N pollution is likely to be similar for steelhead (Attachment 4). For the Bainbridge Island and Hope Island net pens currently under consideration in these modified NPDES permits, these permits allow an estimated 2,334 lbs of untreated N and 492 lbs of untreated P to be discharged into Puget Sound every day. If Cooke Aquaculture is successful in obtaining valid leases for Port Angeles and Cypress Island as well, the NPDES permits will allow an estimated 4,326 lbs of untreated N to be discharged daily, roughly equivalent to the N treated by the cities of Bellingham, Everett, Port Angeles, and Tacoma combined. For P, the pens will discharge 924 lbs daily roughly equivalent to the P discharged and treated by the city of Tacoma every day.

- Open-air salmonid net pens chronically discharge particles of decaying fish flesh that are often consumed by native fish, birds, and other wildlife. These particles may be contaminated with pathogens, parasites, pharmaceuticals or chemicals that may be ingested by native fishes, including conspecific steelhead and other salmonids. Studies have shown that these particles are potential vectors for pathogens. While Cooke now is required to recover dead fish and transport them upland for disposal, there is currently no mandate that those mortalities be submitted to the state for testing before disposal.

- There is no mechanism to prevent antibiotics, pharmaceuticals, and other medicines applied in feed from being consumed by native fish in the immediate vicinity of the treated pens (including fish that may enter the pens attracted by the presence of feed and fish odors). In addition to the potential adverse impacts of medicines on wild fish, the public may unknowingly consume chemicals that are not safe for consumption if native fish that have consumed treated feed are caught in recreational or commercial fisheries. For example, the U.S. Food and Drug Administration requires a 28-day waiting period before farmed fish treated for "yellow mouth" are approved and considered safe for

human consumption. This risk to the public, wild fish, and other wildlife has not been addressed in the modified NPDES permits.

- In the SEPA checklist submitted by Cooke, they refer to the use of unspecified probiotic supplements. These unspecified introduced microbes are likely to colonize the microbiome of native fish and the environment near net pens. Given the growing scientific appreciation of the role of the microbiome in health and development of fish and other animals and plants, these supplements should be detailed, and a plan for monitoring surrounding areas and fish populations for colonization or excess growth of these bacteria should be required. This monitoring should also test for growth of antibiotic resistance in nearby areas, and in wildlife found in and near the pens.

- Ecology should not limit the scope of monitoring impacts of discharged pollutants to the area directly below and surrounding the net pens as this is not consistent with tidal physics. These net pens are all located in high-energy areas and therefore to adequately determine the scale and scope of the ecosystem impacted by pollutants, Ecology must consider how pollutants of varying size and buoyancy travel under different tidal energies. The Salish Sea Model (https://www.pnnl.gov/projects/salish-sea-model) was developed by the Pacific Northwest National Laboratory in collaboration with scientists within Ecology to simulate hydodynamic and water quality processes. This model can be used to effectively assess how discharged pollutants flow and are distributed through Puget Sound. This is critical to effectively assessing how pollutants discharged from net pens affect sensitive habitats and areas designated as critical habitat for Southern Resident killer whales, salmon, and other threatened and endangered species. These assessments need to also include disease-causing agents/ toxic pollutants when known outbreaks occur.

Conclusion

It is obvious that the current NPES permit process must be delayed until the Court issues a ruling in the lawsuit challenging the underlying SEPA review as an EIS may be required and would need to be considered in order to comply with SEPA. Similarly, Ecology should delay the permitting process until federal ESA consultation of the impacts Puget Sound net pens pose to ESA-listed species is complete and Ecology can incorporate any reasonable and prudent alternative measures that result from the consultation.

The modified permits fail to account for changes in risk assessment imposed by HB2957 and to “eliminate commercial marine net pen escapement” and “eliminate negative impacts to water quality and native fish, shellfish, and wildlife” as intended by the Washington legislature in passing this law. In adhering to this standard, we continue to encourage Ecology to treat Cooke’s applications as a new project, not an extension of an existing practice.

Lastly, the faith-based and retroactive regulatory framework currently used to enforce the NPDES permits cannot be effectively enforced to prevent catastrophic events before they occur and must be addressed before the permits are granted. Ecology must have the authority and

capacity to conduct regular and unannounced site visits and to conduct any biological sampling and testing deemed advisable to assure the public that no adverse impacts are occurring.

Attachments

Submitted as separate files with this document via Ecology online comment portal (http://wq.ecology.commentinput.com/?id=HEdBM)

Attachment 1: Comments on Cooke Aquaculture's NPDES Application to rear Oncorhynchus mykiss in Puget Sound open water net pens, Submitted by Our Sound, Our Salmon June 8, 2020 with original attachments.

Attachment 2: Comments on Washington Department of Fish and Wildlife State Environmental Protection Act Review of Cooke Aquaculture Proposal to Commercially Propagate and Harvest Oncorhynchus mykiss in Puget Sound net pens: SEPA #19056, submitted by Wild Fish Conservancy November 11, 2019

Attachment 3: May 29, 2020 Letter from the U.S. Environmental Protection Agency to the National Marine Fisheries Service which includes the Addendum to the Updated Biological Evaluation (December 13, 2010), A Clean Water Act Action on Washington's Marine Finfish Rearing Facility Provisions Contained in Sediment Management Standards at Washington Administrative Code 173-204-412

Attachment 4: Estimated municipal equivalent daily Nitrogen and Phosphorus discharge from all 7 Puget Sound salmon farms at maximum production, Wild Fish Conservancy, 2020

Our Sound, Our Salmon

The attached comments and documents were joined by 35 organizations and businesses, raising important material that must be addressed in the NPDES permit review.

OUR SOUND, OUR SALMON

Comments on Cooke Aquaculture's NPDES Application to rear *Oncorhynchus mykiss* in Puget Sound open water net pens

Our Sound, Our Salmon
June 8, 2020

Drafted and Submitted by:

Wild Fish Conservancy

Our Sound,Our Salmon is a campaign coordinated and overseen by the Wild Fish Conservancy

www.oursound-oursalmon.org

These comments are joined by the following 35 organizations and businesses, and 10 individuals:

Organizations and Businesses

Bainbridge Beach Naturalists, Bainbridge Island Watershed Council Coastal Watershed Institute, The Conservation Angler, Duke's Seafood, EGM Real Estate, Environment Washington, Exploration Charters, Fly Fishers International, Friends of the Earth, Friends of the San Juans, Global Alliance Against Industrial Aquaculture, Legal Rights for the Salish Sea, Living Oceans Society, Lummi Island Wild, Native Fish Society, North Cascades Audubon Society, North Sound Trout Unlimited, Northwest Watershed Institute, Olympic Environmental Council, Olympic Forest Coalition, Orca Conservancy, Paul J Allen MD PLLC, Project SeaWolf Coastal Protection, Protect the Peninsula's Future, Salish Center for Sustainable Fishing Methods, San Juan Excursions, Sea Shepherd, Sea Shepherd Seattle, Spirit of Orca, Trust Olympus Pest Control and Prevention, Watershed Watch Salmon Society, Whale and Dolphin Conservation, Wild Fish Conservancy, Whidbey Environmental Action Network

Independent

Justin Boucher, Kristine Collins, Rick Doden, Michelle Meyer, Amy Nesler, Mary Rawlins, Thierry Rautureau (The Chef in the Hat), Denny Redman (Writer), Kerrie Tuck, William Williams

OUR SOUND, OUR SALMON

OUR SOUND, OUR SALMON

Ms Niewolny:

Wild Fish Conservancy (WFC) and the coalition of groups operating under the banner of Our Sound, Our Salmon (OSOS) have long raised serious concerns about the risks posed by open water net pen aquaculture in Puget Sound. The catastrophic collapse of Cooke Aquaculture's Cypress Island pen in 2017 bore out many of those fears. In response, the state legislature passed legislation which phases out Atlantic salmon aquaculture by 2020. That legislation also charges the Department of Ecology and other agencies regulating these pens: "to eliminate commercial marine net pen escapement and to eliminate negative impacts to water quality and native fish, shellfish, and wildlife" and to implement new rules and standards for achieving that goal. The legislature passed the legislation with language emphasizing that "evidence [has] emerged that marine finfish aquaculture in general may pose unacceptable risks not only to Washington's native salmonid populations but also to the broader health of Washington's marine environment." While that section of the law was vetoed by the Governor, it is clear that the people's representatives have grave concerns about the safety of marine finfish aquaculture, and set a clear expectation that ongoing operation of these pens should be subject to heightened scrutiny.

The passage of HB 2957 created a new and stricter regulatory regime for marine net pen aquaculture. In reviewing Cooke's submissions and other materials submitted through this public process, we urge that the standard of review be specifically on whether the policies in place achieve the state's goal to "eliminate…escapement and to eliminate negative impacts to water quality and native fish, shellfish, and wildlife."

In light of those new legal mandates, and the different risk profile presented by rearing a domesticated and biologically-altered form of a native species as opposed to a non-native species, this permit application should be considered not as an extension of past practices, but as if these pens were starting anew. HB 2957's new standards require re-examining past decisions, and holding Cooke Aquaculture to that higher standard of eliminating risks.

Ensuring compliance is crucial

In the wake of the Cypress Island collapse, Wild Fish Conservancy sued under the Clean Water Act (CWA). That suit resulted in rulings that Cooke Aquaculture had violated the terms of its permits, including by failing to conduct required inspections of net pen moorings and anchors, to accurately monitor and report the number of fish escaping from pens, to develop operational plans that include necessary procedures for inspecting cages, storing chemicals, disposing of harvest blood, and to track the number of fish in its cages and lost to predation. Cooke's history of CWA violations is important to consider in this process, if nothing else to ensure that the permits are drafted to ensure that violations are detected before catastrophe ensues.

Incidents like the partial sinking of the Orchard Rocks pen in October, 2019 demonstrate that the risks of additional escapes are very real, given the state of the existing pen structures. The response to that incident was conducted by the Department of Ecology, Department of Natural

Resources (DNR), and Department of Fish and Wildlife (WDFW), and the records from that incident and state agencies' documentation of Cooke's inadequate emergency response should be included in this record to ensure that emergency plans incorporate lessons learned, and acknowledge the degraded state of the surviving pens as identified by state inspectors and Cooke's own contractors.

New concerns from the change in species

The change in species poses new and different risks, in addition to the harms open water net pen aquaculture has caused for decades. Some policies which may have been permitted for Atlantic salmon under the pre-2018 status quo, pose additional risks with the proposal to introduce domesticated, biologically-altered, steelhead/rainbow trout. The differences in this circumstance were considered as far back as 1990, when the last comprehensive Environmental Impact Statement (EIS) was drafted. The prior permitting for these pens and their operations all addressed risks associated with a non-native species. In dealing with biologically-altered, domesticated *O. mykiss* and Puget Sound's federally-listed steelhead population, different risks apply, and standards laid out in the 1990 EIS have not been met for these purposes.

In particular, "a minimum distance of separation between farms and river mouths" has never been considered and adopted in state policy, as section 5.7.2.2 of the 1990 EIS would require for aquaculture involving native fish (and as is required in other nations). Since escapes, and their risks to threatened conspecifics, constitute pollution and are within the scope of Ecology's review, this guidance and an analysis of the proximity of pens to steelhead spawning rivers should be included in Ecology's review of these NPDES permits. In addition, the assessment of risks from pollution (including diseases) should account for the migration corridors in areas like Rich Passage, which may concentrate wild salmon near the pens.

Furthermore, the behavioral response of wild steelhead to a large aggregation of conspecifics may be different than it was to Atlantic salmon. If wild schools are attracted to the captive domesticated steelhead in pens, the pollution from the pens may do greater harm to recreationally- and commercially-important hatchery-reared steelhead and to threatened wild Puget Sound steelhead.

New material to review

During the emergency response to the Orchard Rocks partial sinking, Cooke told DNR that they planned to replace some existing net pens in Puget Sound. If indeed that plan is under way, the NPDES review should include engineering data on the new pen structures in order to assess the adequacy of those pens for Puget Sound's dynamic conditions, and the escape risk and other risks the new pens might pose to Puget Sound.

The Mitigated Determination of Nonsignificance (MDNS) issued by WDFW in January 2020, requires Cooke to prepare and submit a plan for marking steelhead in ways that will distinguish

fish from their pens from hatchery-raised fish swimming freely in Puget Sound. That plan is not part of this record, and review of the NPDES permit application should await that filing.

The MDNS also requires Cooke to submit a plan for a “no-recovery response” to escapes. That plan is not part of the escape plan submitted in Cooke’s application, and it is impossible to assess the adequacy of Cooke’s pollution prevention plan until that plan is included in the application.

The State Environmental Policy Act (SEPA) review led by WDFW which produced the MDNS is currently being appealed. That challenge is likely to generate new information pertinent to the NPDES review, and it would be appropriate to delay drafting any NPDES permit until the evidentiary record and ruling can be incorporated into this review.

Eliminate negative impacts to water quality

Decades of experience shows real effects on water quality in a plume around the net pens, which the terms of Cooke’s current permit application does not eliminate. This NPDES review should re-examine existing data on effluents from industrial products, medicines, feed, fish waste, and dead and rotting fish to assess whether the current plans eliminate all of those risks. It should also examine new data on antibiotic resistance in protected marine mammals (research discussed in this recent report from High Country News). These risks were discussed in the SEPA comments submitted by WFC and the Our Sound, Our Salmon coalition in 2019, and comments to the previous Atlantic salmon NPDES review. We have attached both documents for reference, and summarize the major concerns below. The review should also draw on the Pacific Northwest National Laboratory’s Salish Sea Model (https://salish-sea.pnnl.gov/) to assess how effluents will flow through Puget Sound and affect sensitive habitats and areas designated as critical habitat for Southern Resident killer whales, salmon, and other threatened and endangered species.

Food effluent

Open water finfish net pens routinely disperse large volumes of feed into public waters within the boundaries of the net pens. Some portion of the feed may not be consumed by penned fish, and thus makes its way into, and has an impact upon, the surrounding marine environment. The high-energy tidal zones in which net pens are located may drive broad dispersal of unconsumed feed and other dietary supplements, including medicines. This dispersal of feed into public waters represents a continuous and constant act of chumming, which attracts native fish species and other wildlife. Divers near net pens have observed large schools of fish swimming in and out of the pens, and reports from British Columbia on bycatch and incidental take of wild species during harvest operations indicate that many native species enter the pens, likely because of the food attraction.

Physically small fish species, such as baitfish and out-migrating 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 food is also likely to draw native species (including ESA-listed Chinook and steelhead) from their protective shallow nearshore habitats to net pens.

Surveys of aquatic diversity at sites near these net pens indicate substantial numbers of threatened and endangered juvenile salmonids, and forage fish. State-funded surveys including "West Sound Nearshore Fish Utilization & Assessment (SRFB Grant: 07-1898)" (2010), "Cypress Island Aquatic Reserve Pilot Nearshore Fish Use Assessment" (2011), "West Whidbey Nearshore Fish Use Assessment" (2007), and the ongoing "Hood Canal Nearshore Juvenile Fish Use Assessment" find substantial populations of threatened coho, Chinook, pink, and chum salmon in near-shore waters at sites near and similar to those where net pens operate. Those surveys also demonstrate substantial variation in total species diversity and population sizes from site to site, and between surveys at the same site over time. Salmonid populations could vary by orders of magnitude from month to month, and between years. This highlights the difficulty of monitoring and predicting what species will be attracted to the pens as a food source, and how pollutants in and near the pens will affect Puget Sound's ecology.

Fish waste

Fish waste, excess food, dead fish, and tissue sloughed off of live fish, all flow from net pens into surrounding waters. This nutrient imbalance in the vicinity of pens can be harmful to some wild species, and can cause unhealthy growth of other species, including algal blooms.

On November 15, marine aquaculture net pens in Clayoquot Bay began seeing die-offs due to a bloom of diatomaceous algae (https://thetyee.ca/News/2019/11/20/Algal-Blooms-Tofino/). The concentration of fecal material, excess food, and fish flesh near pens may exacerbate these blooms, and the resulting fish deaths then produce additional pollution as they cannot be extracted from the nets quickly enough. Observers near the recent die-offs report that the waters near the pens turned "a dark brown muddy river-like colour," due to the rotting flesh.

These die-offs are likely to be more frequent in the future, since these algal blooms "have expanded their range and frequency as climate change has warmed, acidified and robbed coastal waters of normal oxygen levels." The inability to quickly empty the pens in the event of massive deaths or a disease outbreak poses significant risks to Puget Sound at large. One such risk is that the weight of the dead fish itself can add stresses to the pens' structure, making a collapse more likely during those emergency operations, and when the contents of the pens pose the greatest risk to the environment.

WFC modeled the additional phosphorus and nitrogen emissions resulting from net pens (https://wildfishconservancy.org/estimation-of-total-phosphorus-and-nitrogen-waste-during-a-20-month-grow-out-period-for-puget-sound-atlantic-salmon-net-pen-aquaculture-facilities-1). The additional pollution is more than the permitted emissions from large communities, and without any of the waste treatment requirements placed on human populations or land-based feedlots.

Open-air salmonid 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 conspecific steelhead and other salmonids. Studies have shown that these particles are potential vectors for pathogens. While Cooke now is required to recover dead fish and transport them upland for disposal, there is currently no mandate that those mortalities be submitted to the state for testing before disposal.

Antibiotic/medical effluent

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. This risk to the public and to wild fish must be addressed in the NPDES review.

The SEPA checklist submitted by Cooke Aquaculture and included in this record refers to the use of unspecified probiotic supplements. These unspecified introduced microbes are likely to colonize the microbiome of native fish and the environment near net pens. Given the growing scientific appreciation of the role of the microbiome in health and development of fish and other animals and plants, these supplements should be detailed, and a plan for monitoring surrounding areas and fish populations for colonization or excess growth of these bacteria should be required. This monitoring should also test for growth of antibiotic resistance in nearby areas, and in wildlife found in and near the pens.

Eliminate negative impacts to native fish, shellfish, and wildlife

Concentrated populations raised in what are effectively aquatic animal feedlots face greater risk of disease, parasitic, and viral amplification than free-ranging, especially wild, populations. When viral, bacterial, fungal, or parasitic diseases break out in net pens, the disease-causing

organisms are rapidly amplified in number and leaked to the surrounding aquatic environment in large numbers. Because their conspecifics (and other salmonids of concern, including coho salmon, ESA-listed Chinook salmon and bull trout and as required by WAC 197-11-080) will be swimming in close proximity to the pens, there is likely to be a spread of disease to endangered wild steelhead and other salmonids. In 2017, a British Columbia study documented a strong correlational connection between disease prevalence in net pens and disease transfer to wild fish populations (Morton et al., 2017 DOI:10.1371/journal.pone.0188793). Recent research in British Columbia found novel viruses in endangered salmon, and found evidence that these novel viral infections may originate from farmed salmonids (Mordecai et al., 2019 eLife 2019;8:e47615).

Such pathogens fall within the definition of pollutants, and the NPDES permit review should ensure that Cooke's plans will eliminate the risk of these pollutants harming the integrity of the Sound ecosystem and the biological integrity of its wild species. Given the frequent presence of marine mammals near the pens, including seals and sea lions aggregating near the pens during harvest operations, and recent video of orcas swimming nearby as well, it is all the more important to identify pollutants, including antibiotic resistant bacteria, pharmaceuticals, and other emissions, that might do harm to these protected species.

Eliminate commercial marine net pen escapement

Our SEPA comments (attached) provide a detailed analysis of the risks to the genetic integrity of threatened Puget Sound steelhead stocks in the event of an escape. While the limited data from Troutlodge indicates an average triploidy failure rate of 0.17%, the true rate may be substantially different. Furthermore, a random sample of several hundred thousand fish may contain a larger proportion of fertile females by random chance. In the event of an escape on the scale of Cypress Island, that could mean thousands of fertile females entering Puget Sound, potentially diluting the genetics of threatened wild populations, and competing with wild females for redds. Our attached SEPA comments detail method of assessing those risks that allows an assessment of not only median-case scenarios, but the worst-case scenarios demanded by WAC 197-11-080.

The escape of rainbow/steelhead from any of the Puget Sound aquaculture facilities, whether from small scale leakage or catastrophic facility failure, will pose risks to native salmonids rearing in nearshore marine habitats and rivers due to competition for food and foraging space. This will be particularly true in the case of triploid individuals because, as noted in Cooke's materials, they will have appetites that are likely to be considerably greater than wild juvenile salmon and steelhead due to the faster inherent growth rate of these triploid fish. This means escapees may outcompete wild steelhead, or indeed predate upon them.

Since escapees would constitute pollutants under the Clean Water Act, escape prevention and the adequacy of Cooke's escape prevention and escape response plans must be carefully considered in this permit process. The SEPA MDNS requires Cooke to develop a "no-recovery" option to be added to their escape response plan, which is not included in these NPDES

application materials. The NPDES review must be based on their full escape plan, not this incomplete record. The MDNS also required Cooke to develop a plan for marking their domesticated stock to distinguish them from free-swimming wild and hatchery steelhead. That marking plan is not included in these NPDES materials, but is an important aspect of escape recovery.

Conclusion

Given the new legal standard established by HB 2957, the pending legal challenge to the MDNS issued in January 2020, the large amount of new information that Cooke's application adds to the public record (including fish mortality data, a new fish escape prevention plan which may be further amended to add a "no recovery" option, and a new escape reporting and response plan which may be similarly amended), and the other new information described above that has come out recently, is expected in the near future, or that ought to be added to the record, and the substantial concerns that arise from when raising a native species as opposed to a non-native species, it would be appropriate to initiate SEPA review of this NPDES application, and potentially draft a new EIS after making a determination of significance.

Ecology's NPDES permit review should not begin until there has been thorough consultation with local, state, federal, and tribal governments. Many tribal nations submitted comments to the SEPA review requesting a full EIS, and initiated government-to-government consultations to express their grave concerns about the harm these pens do to the Sound. In addition, many counties and municipalities have established new rules since the net pens were installed, which would prohibit the construction of new net pens in their waters. While the existing pens are grandfathered in, these communities and nations should have a full and open opportunity to air their concerns and ensure that the continued operation of net pens in Puget Sound honors the concerns and needs of their neighbors.

OUR SOUND, OUR SALMON

Attachments:

Our Sound, Our Salmon, 2/25/19. *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, 11/22/19. *Comments on Washington Department of Fish and Wildlife State Environmental Protection Act Review of Cooke Aquaculture Proposal to Commercially Propagate and Harvest Oncorhynchus mykiss in Puget Sound net pens: SEPA #19056*

Order on Plaintiff's Motions for Summary Judgement, April 17, 2019. *Wild Fish Conservancy v. Cooke Aquaculture*. 2:17-cv-01708-JCC

Order on Plaintiff's and Defense's Motions for Summary Judgement, November 25, 2019. *Wild Fish Conservancy v. Cooke Aquaculture*. 2:17-cv-01708-JCC

OUR SOUND, OUR SALMON

Comments on Washington Department of Fish and Wildlife State Environmental Protection Act Review of Cooke Aquaculture Proposal to Commercially Propagate and Harvest *Oncorhynchus mykiss* in Puget Sound net pens: SEPA #19056

Our Sound, Our Salmon

Submitted 11/22/19

Drafted and Submitted by:

Wild Fish Conservancy

Our Sound,Our Salmon is a campaign coordinated and overseen by the Wild Fish Conservancy

www.oursound-oursalmon.org

Signed by:

Wild Fish Conservancy, Center for Biological Diversity, Surfrider Foundation, Friends of the Earth, The Conservation Angler, Friends of the San Juans, Orca Conservancy, Environment Washington, Native Fish Society, Food & Water Watch, Watershed Watch Salmon Society, Wild Orca, North Cascades Audubon Society, Whale and Dolphin Conservation, Seawolf Coastal Portection, Whale Scout, Recirculating Farms Coalition, Olympic Environmental Council, Duke's Chowder and Seafood, Protect the Peninsula's Future, Moldy Chum, Reel Pure Radio, San Juan Excursions, Friends of Miller Peninsula State Park, Far Away Fly Fishing, Green Justice, Washington Sierra Club Chapter Water and Salmon Committee

OUR SOUND, OUR SALMON

Wild Fish Conservancy NORTHWEST

CENTER for BIOLOGICAL DIVERSITY
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Overarching Comments:

In addition to and as explained by the detailed technical comments below, the groups listed above—under the banner of the Our Sound, Our Salmon campaign—provides these overarching comments to highlight that the State's mDNS and SEPA process is legally flawed in many respects, including but not limited the following:

- The State improperly relinquished its SEPA duties by delegating its primary responsibilities for evaluating the environmental impacts of Cooke's proposed net pens farms to Cooke. Cooke is clearly biased in favor of allowing its proposal, and all analysis and documents that Cooke or its consultants prepared are therefore unreliable.
- The net pens will have significant adverse impacts on the environment, and the State failed to prepare an environmental impact statement to fully consider and evaluate reasonably foreseeable consequences from these impacts. For example, and as detailed in these technical comments, escaped steelhead from the net pens will adversely affect wild salmonids by competing for food and forage space with native salmonids and by amplifying and transmitting diseases and parasites. The State did not fully consider this, instead relying on an outdated EIS and a paragraph from Cooke that incorrectly minimizes impacts on wild salmonids without citing any support for its assertion.
- A new EIS is required because there are significant adverse effects that are not addressed in the prior EIS and because there is substantial new information and changed circumstances. For example, the outdated EIS relied upon by the State addressed rearing of a different species—Atlantic salmon—and not the steelhead currently proposed for Puget Sound net pens and was prepared before the listing of various species in Puget Sound under the Endangered Species Act, including Puget Sound steelhead, Puget Sound Chinook, and the Southern Resident Killer Whale. Further, there is an abundance of new science informing the risks net pens pose to

the environment since the 1990 EIS. The cursory additional information and analysis is insufficient to update an entirely stale EIS. These comments detail some of the many ways the EIS and checklist fail to consider best available science that has come out in the last 30 years.

- The SEPA documents are neither complete nor accurate, failing to disclose many risks and harms associated with the net pens. Relatedly, the State failed to gather necessary additional information and failed to consider reasonably foreseeable consequences. For example, the State has not supplemented the decision documents with information from the recent Orchard Rocks incident. Regardless of whether the State considers the incident, the State has not provided the public with an evaluation of this incident and an opportunity to comment on the reasonably foreseeable risks posed by pen sinking.
- The State failed to disclose and consider all direct, indirect, and cumulative impacts of the net pens, and accordingly failed to provide an accurate and complete analysis.
- The State narrowed the project scope, improperly limiting its effects analysis and failing to consider many impacts posed by net pen farming in the State of Washington.
- The State failed to articulate and analyze updated objectives or purposes, making it impossible to consider and evaluate reasonable alternatives. The 1990 EIS articulates an objection/purpose of assisting in resolution of conflict by evaluating the environmental impacts of fish farms on the biological and build (human) impacts. This objective/purpose is clearly outdated and based on the political climate at the time. The update in Attachment D does not provide any updated objectives/purposes, but simply states a "proposed action" of permitting steelhead/rainbow farming. This failure to articulate objectives or a purpose makes it impossible for the public to understand what reasonable alternatives are available that the State failed to consider.

- The State failed to consider and evaluate reasonable, safer alternatives to raising the rainbow trout/steelhead at existing marine net pen sites in Puget Sound. For example, the State should have considered an alternative requiring all salmon farms to be self-contained land-based facilities. As another example, the State should have considered an alternative regulation that restricts the number of steelhead/rainbow that may be farmed in the pens. These alternatives would significantly lessen the risks and impacts of salmon farming on the environment while still allowing Cooke to run a profitable salmon farming business.
- The no action alternative in the 1990 EIS is outdated and does not make sense because the "existing regulations and guidelines," as well as the laws of the State of Washington related to net pens, that would form the basis for a no action alternative have changed in the last 30 years.
- The State must prepare an EIS because of the significant negative environmental and health impacts from the net pens, examples of which are detailed in these comments.
- The mitigation measures included in the decision documents are unenforceable; fail to address all significant adverse impacts on the environment; will not reduce impacts to a nonsignificant level; and otherwise do not comply with SEPA.
- The regulatory agencies lack sufficient regulatory controls to allow the proposed action to go forward. As demonstrated by disease outbreaks—like the 2012 outbreak of IHNv and the PRV outbreaks—as well as equipment failure—like the 2019 Orchard Rocks incident and the collapse of Cypress Site 2 and its aftermath—the regulatory agencies are ill-equipped to mitigate any adverse impacts.

Under the State Environmental Protection Act (SEPA), this review requires a threshold determination of whether an action is likely to have a "significant adverse environmental impact." The State's current threshold determination of Mitigated Determination of Non-Significance (mDNS) is inadequate as an environmental review and fails to address many well-documented risks associated with farming salmonids in these exact pens. Industrial-scale,

open-water finfish aquaculture poses significant environmental risks, and the transition from Atlantic salmon aquaculture to rainbow/steelhead trout aquaculture adds significant risks that cannot be adequately mitigated. The State has violated SEPA by not preparing a new Environmental Impact Statement (EIS). Below, we detail some but not all of the significant environmental impacts that compel a determination that this proposal poses significant adverse environmental impacts, and reasons why the mitigations proposed are not reasonably certain to address those risks. In evaluating the proposed actions, the State failed to properly consider all available alternatives, or the cumulative impacts of the many risks posed by this proposed action.

The State should withdraw the Mitigated Determination of Non-Significance (mDNS), issue a Determination of Significance, and draft an EIS to assess the full impacts of this transition. Furthermore, that EIS should incorporate into its no-action alternative the cessation of operation of the pens (and cessation of any environmental risk) after the legislative non-native aquaculture phaseout takes effect in 2022.

The public comment period was flawed

The initial 21-day comment period was too short to allow adequate public comment. That period was first extended by 10 days, and again by 21 days. These extensions were announced near the end of each comment period, meaning that commenters could not budget their time to conduct the depth of analysis and consideration that might have been possible had the comment period been announced at full length to begin with.

When first announced, the comment period ended before the deadline for a legislatively-mandated report from state agencies to the legislature regarding best practices on aquaculture licensing and practices. That report was mandated by HB 2957, the law which also phased out Atlantic salmon aquaculture and mandated stricter regulations of marine net pen aquaculture in general, and was supposed to be filed on November 1. The first extension of this comment period ended on that same day. Unfortunately, that report has still not been filed as we

complete these comments, meaning the public has not been able to draw on the guidance of State agencies on how "to eliminate commercial marine net pen escapement and to eliminate negative impacts to water quality and native fish, shellfish, and wildlife." Proceeding with review of this proposal before completing the mandated report to the legislature puts the cart before the horse, and makes it likely that the clear will of the legislature and voters will not be reflected in the State's response to Cooke's request.

Even with the extensions the State has granted, there is a great deal for the public to evaluate. The filing covers over 400 pages, including a lengthy bibliography that requires review and in some cases rebuttal, as well has hundreds of references within the text to review. In addition, it references and discusses material developed by two sources who are expert witnesses for Cooke Aquaculture currently preparing to testify in ongoing litigation regarding these net pens. Understanding their statements here requires consideration of expert testimony rebutting their claims from that ongoing litigation. Furthermore, the 1990 EIS (Environmental Impact Statement) on which the State is relying is woefully outdated, and addressing the environmental effects of this policy requires the public to integrate decades of new information regarding Puget Sound, wild salmonids and other native fish in the Sound, its endangered marine mammals, the physics of tides and currents and tsunamis in the Sound, and the effects of net pens and industrial finfish aquaculture on the Sound.

The submission includes a 76-page document authored by Cooke Aquaculture staff and contractors, which purports to serve as a supplement to the 1990 Programmatic EIS. This self-interested document cannot stand on its own as a supplement to the state's EIS, and the document largely omits discussion of the specific environmental impacts of the net pens on the threatened and endangered species under discussion, including effects on the conspecific Puget Sound steelhead which are listed as threatened under the Endangered Species Act.

That there is so much additional information accumulated in those intervening decades—including multiple new federal and state listings of endangered and threatened species, newly-

designated critical habitat, and substantial new evidence of the effects and risks posed by open-water salmonid aquaculture in Puget Sound—is a strong argument of the need for the appropriate state agencies to conduct a full EIS. Washington Department of Fish and Wildlife (WDFW) is the appropriate agency that should write such a supplement, and in view of Cooke's active defense in litigation over its ESA and CWA violations and the considerable controversy surrounding Cooke Aquaculture in general, the proposal at issue in particular, and the widespread public consensus supporting the complete elimination of open net pen finfish aquaculture in Puget Sound, WDFW should provide a period for public comment on that EIS once it is issued. Allowing the petitioner to write its own supplement to the 1990 Programmatic EIS rather than having the state to perform its own due diligence and impartial analysis, and offer the public the statutory amount of time for comment, represents a dangerous end run around key environmental protections.

During the comment period, new information became available that the public deserves an opportunity to understand and comment on. This includes the partial sinking of a net pen at the Orchard Rocks site, and Cooke Aquaculture's efforts to intimidate Wild Fish Conservancy and prevent us, our members, and our partners in the Our Sound, Our Salmon coalition from exercising First Amendment rights to comment on this matter of public interest.

Orchard Rocks, 2019

In the 2019 Orchard Rocks incident, neighbors on shore observed the pen sinking as early as October 15, and reported their concerns to Cooke. Initially, Cooke staff told these neighbors that the apparent sinking was simply a result of normal tidal movement, and neighbors observed no repairs and it appeared that the pen was operating as if nothing was wrong. On October 18, the corner of the pen was fully under water, and emails obtained through public records requests indicate that the initial emergency alert came not from Cooke's personnel, but from state employees visiting family near the pens during their off-hours. In response to these calls from WDFW staff, coordinating with staff at the Department of Natural Resources, the US Coast Guard mounted an emergency response and created a security cordon, while

Cooke and DNR divers surveyed the damage and began repairs. According to a DNR spokesperson, fish could have escaped had the sinking pen been stocked at the time.

Emails obtained through public records requests show that state regulators did not feel Cooke followed the emergency protocols that they had agreed to through previous permits. It is unclear why it took several days to begin repairs, or whether Cooke staff intentionally misled concerned members of the public during that delay. It appears that the public and agency staff initiated the emergency response, not Cooke or its staff. The public and state agencies cannot adequately evaluate Cooke's emergency response—a central component of the risk mitigation proposed in the mDNS—without clarity on those matters, and a clearer understanding of Cooke's monitoring and preventative maintenance. In emails obtained through public records requests, state agencies appear to be planning an internal investigation of this incident, and our records request remains open. Estimated times to complete the records search extend beyond the end of this comment period. As we complete these comments, no results have been announced from the agencies' investigation of this incident.

Silencing public comment

On October 3, 2019, less than two full days after the public comment period began and the day after Wild Fish Conservancy issued a press release informing the press and public about this comment period, Cooke Aquaculture issued a "cease and desist" notice to WFC. This letter instructed WFC (a group that convened and coordinates the Our Sound, Our Salmon coalition) to "cease and desist" from expressing opinions about the risks posed by Cooke's net pens in Puget Sound, opinions derived in part from and citing an engineering report prepared and submitted as part of ongoing litigation. Cooke's letter warned "If these statements result in delay in issuance of those permits…Cooke will seek recovery of damages against WFC and [WFC executive director] Mr. Beardslee personally, in addition to injunctive relief."

Describing evidence and opinions derived from that evidence, especially as part of a petition to a government agency for redress of grievances, is the epitome of First Amendment-

protected free speech. The First Amendment protects the rights of citizens to make such fair comment on matters of public interest and public controversy. Washington State is one of the first states to legislatively shield reports like this from threats like Cooke's, declaring in 1989: "The legislature finds that the threat of a civil action for damages can act as a deterrent to citizens who wish to report information to federal, state, or local agencies" (RCW 4.24.500).

Cooke's letter to WFC, and any similar letters sent to members of Our Sound, Our Salmon and other individuals or advocacy groups, may have chilled or otherwise limited the public's participation in this important process. To correct any such chilling effect, the State should take measures to ensure that the public should feel no barrier to making their opinions heard. This might include asking the Attorney General to review existing laws and regulations to ensure that the State's anti-SLAPP laws are sufficient to protect the integrity of the public comment process, and to investigate this incident and its harm to the integrity of the State's public comment process.

Effects of escaped steelhead on wild steelhead genetics

The mitigated Determination of Non-Significance (mDNS) rightly treats the possibility of escape, both small- and large-scale, as a real and serious threat that must be addressed before planting fish in the net pens. Escaped fish pose a range of risks to endangered wild salmonids, and to the ecology of Puget Sound and its watersheds. The recovery efforts following the 2017 collapse demonstrated inadequacies of the existing escape plan even for non-native species (see comments below regarding inadequacies of the escape plan in the mDNS).

As DFW notes in the mDNS and their exchanges with Cooke in Attachment B, under this proposal, an escape on the scale of 2017 would have released a number of fertile female steelhead that "would have exceeded the number of wild steelhead returning to spawn in

many rivers in Puget Sound." DFW's exchange with Cooke states that the use of eggs treated to induce triploid sterility "would reduce, but not eliminate the risk."

We note in the section on failure of triploidy-induction below that monitoring of escapes of farmed Atlantic salmon in Norway (where the salmon are farmed in regions with wild conspecifics) demonstrates that escaped farmed salmonids do survive and feed and grow in marine feeding areas at rates similar to wild Atlantic salmon, and survive to mature and return to Norwegian rivers to interbreed in significant numbers with wild Atlantic salmon, with known adverse population level impacts to the affected wild populations (Disreud et al. 2019, Glover et al. 2019, Karlsson et al. 2016, Skilbrei et al. 2015). Importantly, Cooke's existing net pen sites are less than 20 kilometers (12.5 miles) by water from important wild steelhead rivers, including: the Elwha, Dungeness, Samish, Skagit, Stillaguamish, Cedar, and Green rivers (Map).

Table 1 shows the average wild steelhead population abundances in rivers nearest to the existing net pen facilities. State guidelines generally regard the risk of genetic harm as too high when wild fish are less than 95% of the spawners in a stream (5% hatchery-origin). Science would argue for a much lower threshold than 5% when the hatchery fish are as significantly domesticated as those proposed to be used by Cooke. Simulations of escape and survival scenarios (Appendix) indicate high likelihood that an escape on the scale of Cypress 2017 could cause the proportion of fertile farmed rainbow/steelhead trout spawning in streams to exceed 5%, or in some scenarios could exceed the entire wild population in streams.

A full understanding of the genetic risks posed would require more detailed information on the genotypes of the broodstock for the farmed salmon, and reportedly the egg supplier will not supply those data. While WDFW officials have offered assurances that they would require such information before authorizing a finfish transfer permit, the mDNS does not specify what standards would be applied in such a review. WAC 197-11-080 requires a worst case analysis and a discussion of the likelihood of that worst case. Rather a worst case scenario, the mDNS discussion adds a scenario that is less of a worst case than the proposal offered by Cooke.

In 2018, WDFW's fish health specialist—Dr. Ken Warheit—testified before the state legislature that raising native fish in these pens would actually represent "a greater risk to the state's native wild and hatchery salmonid populations, than is Atlantic salmon marine aquaculture." That risk should be considered through a full EIS.

Effects of escaped steelhead on wild salmonids' prey and habitat

The escape of rainbow/steelhead from any of the Puget Sound aquaculture facilities, whether from small scale leakage or catastrophic facility failure, will pose risks to native salmonids rearing in nearshore marine habitats and rivers due to competition for food and foraging space.

This will be particularly true in the case of triploid individuals because, as noted in the SEPA checklist, they will have appetites that are likely to be considerably greater than rearing wild juvenile salmon and steelhead due to the faster inherent growth rate of these triploid fish.

Diploid individuals that result from the failure of triploid induction will pose a significant risk of becoming sexually mature and interbreeding and/or competing with native rainbow and steelhead on the spawning grounds of native fish. The effects of recurrent, annual low level escapes on wild Atlantic salmon Norway is well documented, and similar impacts on native rainbow and steelhead in Puget Sound are to be expected (Diserud et al. 2019, Glover et al. 2019). Research in escapes of farmed Norwegian Atlantic salmon has also shown that escaped salmon survive to rear in the ocean for one or two years and return as mature fish to spawn in rivers of wild salmon (Olsen et al 2013, Karlson et al. 2016). Further, analysis of monitoring of escapes of farmed Atlantic salmon in Norway has shown that the actual number of escaped farmed salmon is two to four times greater than the officially reported annual number of escapes (Diserud et al. 2019, Skilbei et al. 2015). Of course, these potential risks will be greater the greater the magnitude of an escape and the greater the frequency of small-scale leakage

events. But, as is the case for wild Atlantic salmon in Norway and the north Atlantic in general, the risks posed by low level escapes can not be discounted.

A full EIS would allow for updated analyses that incorporate this and other new research on the effects of salmonid aquaculture, rather than relying on the prospective analysis conducted nearly 30 years ago, in 1990.

Effects of escaped steelhead on wild salmonids' predators

Various operations at the net pens can attract threatened, endangered, and otherwise protected predator species to the vicinity, creating risks that those birds and mammals would be harassed, experience ship strikes, or become dangerously accustomed to human proximity. The process of feeding farmed rainbow/steelhead trout attracts juvenile and adult wild fish (including ESA-listed salmonids), which in turn aggregates predator species. Predators will also be attracted by the outflow of shed skin and other parts from the penned rainbow/steelhead, and could be exposed to diseases and parasites through that proximity. The harvest process results in the release of bycatch fish, blood, and other fish parts from harvested fish, which has been shown to attract marine mammals to close proximity to the pens and boats (as in this video: https://drive.google.com/file/d/1TWXLMTcdG4s4QEvd3BM65-GpD1IEdaRJ/view?usp=sharing). A comprehensive EIS should examine the risks to these protected species from raising steelhead/rainbow trout in these net pens, and develop appropriate mitigation measures in consultation with federal, tribal, and international co-managers.

Farmed steelhead diseases could harm wild salmonids

Raising native salmonid species, and rainbow/steelhead trout in particular, in open Puget Sound net pens likely increases the risk of disease transmission from farmed to wild native salmonids and other fish species. Rainbow/steelhead trout are susceptible to native, endemic, Pacific salmon viruses, bacteria and parasites as well as non-native, introduced pathogens including piscene orthoreovirus (PRV). Rainbow/steelhead trout are vulnerable to a deadly form of infectious hematopoietic necrosis virus that can spread to and kill wild steelhead. While vaccination and state monitoring can limit this risk, it remains a greater risk than existed with Atlantic salmon.

The experience from a 2012 outbreak of the Atlantic salmon-specific strain of IHN indicates the danger of an outbreak in farmed rainbow/steelhead trout. While response plans call for rapid culling of infected fish to prevent the spread of disease, in 2012 the culling dragged on for months, with the Northwest Indian Fisheries Commission's fish health specialist noting the pen owner "reported increased mortalities starting in April. We now are at end of May and infected fish are still in those pens shedding virus." (https://nwifc.org/ihn-virus-detected-in-atlantic-salmon-farm-near-bainbridge-island/) The effect of such a delay if farmed rainbow/steelhead trout were infected with the strain shared with wild steelhead would be catastrophic.

Concentrated populations raised in what are effectively aquatic animal feedlots, face greater risk of disease, parasitic, and viral amplification than free-ranging, especially wild, populations. When viral, bacterial, fungal, or parasitic diseases break out in net pens, the disease-causing organisms are rapidly amplified in number and leaked to the surrounding aquatic environment in large numbers. Because their conspecifics (and other salmonids of concern, including coho salmon, ESA-listed Chinook salmon and bull trout and as required by WAC 197-11-080) will be swimming in close proximity to the pens, there is likely to be a spread of disease to endangered wild steelhead and other salmonids. In 2017, a B.C. study documented a strong

correlational connection between disease prevalence in net pens and disease transfer to wild fish populations (Morton et al., 2017). Recent research in British Columbia found novel viruses in endangered salmon, and found evidence that these novel viral infections may originate from farmed salmonids (Mordecai et al., 2019).

As with terrestrial feedlots, the diseases that spread in and from net pens are likely to include the spread of antibiotic- and fungicide-resistant pathogens to wild steelhead and hatchery steelhead, which poses additional risk to hatcheries and the humans and wild species that feed on steelhead and other Puget Sound salmonids (discussed further below, along with other risks of pollution from net pens). As the *Seattle Times* reported in October: "The risk is low, but consequences could be severe." (https://www.seattletimes.com/seattle-news/environment/cooke-aquaculture-seeks-to-farm-native-steelhead-in-puget-sound-after-2017-atlantic-salmon-escape/)

A comprehensive EIS should examine the risks to these protected species from raising biologically-engineered steelhead/rainbow trout in these net pens, and develop appropriate mitigation measures in consultation with federal, tribal, and international co-managers. That analysis should include an assessment of disease transmission to predator species, as well as the effects of these diseases on wild fish, and the potential for transmission of resistant strains to hatcheries.

Fertility of steelhead eggs treated for triploid sterility

The mDNS Summary (and Attachment A to Cooke's SEPA checklist) notes that the induction of triploidy in fertilized eggs at Cooke's hatcheries is imperfect. The likely adverse effects on native rainbow and steelhead from the escape of fertile aquaculture rainbow highlights the importance of providing firm risk-averse quantitative criteria and associated procedures regarding the estimation of the rate of triploid failure in each lot of eggs intended for

production of smolts for outplanting to Cooke's marine net pen facilities. WDFW's Summary notes some concerns with the procedure Cooke employs to estimate the triploidy failure rate ("failure rate", Cf. Attachment B, Cooke's response to WDFW question C2, pp. B-25,26). We believe WDFW's concerns are valid but that their recommendations do not go far enough to adequately reduce the risk posed by the presence of diploid (fertile) rainbow/steelhead in net pens in Puget Sound.

First, we note that the assertion by Cooke on page B-25 that the results of sampling to test triploid induction presented in Attachment A "are additive" is erroneous. The data in Appendix A show results from samples of 60 to 100 fertilized eggs from 36 separate lots sampled between 2013 and 2018. These samples can legitimately be pooled only if all 36 samples were obtained from a single lot (cohort) of eggs. This is clearly not the case. Further, Attachment A contains no data on the total number of eggs in each lot from which each sample was obtained. This missing information is critical to determining the adequacy of the sample sizes for estimating the triploid failure rate of each lot.

A Bayesian assessment of the data in Attachment A (modeling 36 separate draws of the same sizes observed, drawn from a hypergeometric distribution with unknown rate of diploidy) provides a 95% Highest Posterior Density Interval for the rate of diploidy of 0.06%-0.35%, and an 80% HPDI of 0.09%-0.28%. A worst case assessment as required by WAC 197-11-080 should consider not just the average triploidy rate in these samples, but the likely range of scenarios, and should attempt to cap the risk.

We recommend an alternative approach described in the following. The details in the approach we suggest also illustrate a robust general approach to risk assessment, particular in contexts of endangered species.

There are two basic issues in regard to the risk posed by the failure of triploid induction:

1. the failure rate itself (i.e., how many diploids will be reared and released into each net pen per batch of fertilized eggs in the hatchery that have been subjected to the triploid-induction treatment)?
2. The total number of diploids in a pen that would escape either via low level leakage or catastrophic failure.

The first (failure rate) in conjunction with the size (number) of fertile eggs subjected to the triploidy-induction procedure is relevant to determining the minimum sample size of eggs from each lot that should be tested for triploid failure in order to assure an appropriate low risk of diploids being released into the pens. The second determines the probability or likelihood that escapes – especially under conditions of a catastrophic failure – would survive in sufficient numbers to pose a significant threat to wild rainbow or steelhead. Here, we assume that 'significant threat' is one that would amount to a take of a threatened or endangered salmon, steelhead, and bull trout under the ESA. Determination of this number, therefore, requires an appropriate determination by National Marine Fisheries Service (NMFS) and issuance from NMFS of an appropriate Endangered Species Act (ESA) Incidental Take Statement (ITS).

Determining a risk-averse failure rate (issue 1) is dependent on determining the risk-averse probability that escapes under a catastrophic failure of a net pen would pose a 'significant threat' to ESA-listed salmonids from surviving escaped diploid rainbow/steelhead. This, in turn, requires, a determination of the maximum allowable number of diploids per total number of individuals out-planted to each farm facility. We follow WDFW in expressing this number per-million eggs tested.

On page 6 of the Summary, WDFW conducts a rough illustrative exercise estimating the numbers of diploids surviving to potentially interact with wild rainbow or steelhead on the spawning grounds. WDFW provides a lower estimate of 63 mature diploid fertile fish from a catastrophic escape from a pen initially planted with 1,000,000 smolts, given a variety of assumptions about intermediate rates leading from the initial escape to the presence of

surviving diploids on the spawning grounds. WDFW calculates that there would be a total of 63 such fertile escaped rainbow/steelhead, under a presumed "low survival" scenario and 316 under a "high survival" scenario.

In order to be very risk-averse (in keeping with the high priority placed on protecting ESA-listed salmon, steelhead, and bull trout), suppose we adopt a maximum of 50 fertile diploid escapees from a total net pen failure of 1,000,000 rainbow/steelhead. Under the assumptions of the WDFW "low survival" scenario 1,000,000 rainbow/steelhead net pen rearing primarily sterile triploid fish would have to consist of a maximum of 1560 fish in which triploid-induction had failed (Table 2). 1560 escaped diploids would result in no more than 50 surviving with the potential to reach the spawning grounds of wild steelhead or rainbow, given the assumptions used in WDFW's low-estimate scenario, which we adopt here for the sake of illustration.

In a total population of 1,000,000, 1560 diploids yields a point estimate of the triploid-induction failure rate of 0.00156. To be risk-averse with respect to ESA-listed fish, we argue that the number of fertilized eggs post-triploidy induction sampled and tested for triploid failure should be large enough to assure a probability of 0.95 (95%) or greater that the total number of diploids in the lot of 1,000,000 eggs is no greater than 1560. This requires a sample of approximately 3000 randomly selected eggs (per million eggs). The standard would require a random sample of at least 3000 be tested from each lot of one million fertilized eggs (or hatched fry) and result in no more than 1 triploid failure (figures 1 & 2). A lower-cost alternative protocol with the same effect would be to test consecutive lots of 100 eggs from each batch of 1,000,000 fertilized eggs, and to continue testing lots until either one or more diploids is detected from the current lot or until a total of 3500 eggs has been tested and no more than one diploid has been found. The occurrence of one (or more) diploid eggs in a total number of eggs fewer than 3500 would result in a distribution of the total number of diploids in the one million egg lot being tested in which the 95^{th} percentile of the cumulative probability distribution exceeds the critical value of 1560.

It is also of interest that if the total of 2950 samples tested for failure of triploid induction (diploidy) listed in Attachment A of Cooke's SEPA Checklist, of which 5 diploids were found, were obtained from a single lot of 1,000,000 fertile eggs, the mean number of diploid in the entire lot of 1,000,000 eggs would be more than 2000, the median number would be 1900, and there would be a probability of just over 5% that the true number was greater than 3500 (Figure 2). Each of these quantities is clearly greater than the hypothetical maximum of 1560 described above.

In summary, the risk standard should be stated as a high probability that the outcome of a specified quantitative sampling protocol not exceed a specified quantitative upper bound judged sufficient to assure that an adverse outcome of management concern will not occur. Here, the quantitative upper bound is the number of triploid failures per 3000 random samples tested (here 1), which corresponds to a corresponding high probability that no more than some total number of triploid failures (here 1560) occur per batch of million fertile eggs or fry sampled. The latter maximum number (1560) is in turn derived from an appropriate estimation of the distributions of the quantities (parameters) required to estimate (with appropriately high probability) the total number of fertile escaped diploid farmed rainbow/steelhead that would survive following a catastrophic net pen failure, where the total number of surviving fertile escaped diploids is itself determined on the basis a similar assessment of the risk posed to ESA-listed steelhead by the presence of escaped diploid farmed rainbow/steelhead on the spawning grounds of wild steelhead. The determination of such a risk standard requires that full probability distributions of the relevant quantities of interest be calculated (estimated) so that risk-averse probabilities of attainment of a risk-averse standard can be specified as a probability from the relevant tails of the distributions. Picking a point estimate, such as the mean of a sample, as in the WDFW summary (picking the mean triploidy-failure rate of 0.0017 (0.17%) from Cooke's sampling data (Attachment A to Cooke's SEPA checklist) is inappropriate and very likely to be insufficiently risk averse.

This analysis is necessarily limited given the short comment window. The State must develop and "document…its worst case analysis and the likelihood of occurrence" as required by WAC 197-11-080. A fuller analysis of the genetic risks posed by escaped non-triploid rainbow/steelhead, and measures that might mitigate those risks, would be possible with a longer comment period, and should properly be undertaken as part of a comprehensive EIS.

The proposed escape recovery plan is clearly insufficient

It appears that Cooke's recovery plans are no different from the ones employed to address the catastrophic 2017 net pen failure and escape at Cypress Island. In Appendix B, they state:

> Upon receiving authorization from WDFW, the company will commence recovery of escaped fish through one or more of the following actions: (1) use of company skiffs and seine nets; (2) contacting the Northwest Indians Fishery Commission and nearby tribal Natural Resource managers to help facilitate the recapture of escaped fish; (3) contacting and engaging the services of local commercial fishing boat operators to facilitate the recapture escaped fish.

This approach was inadequate in 2017, resulting in substantial unrecovered escapees. It is far less adequate for this proposal. Here, the escaped fish may school with threatened wild salmonids and conspecifics. While non-specialists might reasonably have been expected to make quick distinctions between a recovered Atlantic salmon and a wild salmonid, those distinctions will be much harder in this case. A captured steelhead might be a threatened wild steelhead that must be immediately released, or a hatchery-raised steelhead subject to catch limits, or a farm-raised steelhead that must be retained. This distinction may be difficult for non-specialists to make under emergency conditions. As a result, escapees are likely to be harder to recover than were Atlantic salmon.

A recent comprehensive review of efforts to recapture escaped fish from marine aquaculture (including open net pen farmed Atlantic salmon and rainbow trout) demonstrates that such efforts are largely unsuccessful (Dempster et al. 2018). This review casts considerable doubt that escaped farmed salmon and steelhead that escape during either persistent low-level "leakage" or less frequent catastrophic failures such as the one that occurred at Cypress Island in August 2017 cannot be recaptured in ecologically significant numbers.

In passing HB 2957, the state legislature tasked state agencies "to eliminate commercial marine net pen escapement." Using the same escape plan that failed dramatically in 2017 does not fulfill that statutory language, or the high standard that the legislature and the people of Washington demanded of the marine aquaculture industry. WAC 197-11-080 requires an analysis of the worst case scenario and its likelihood, which are not adequately discussed.

A full EIS would allow WDFW and other agencies and co-managers to consider a range of alternatives to better mitigate this risk.

The "no-recovery" option for escapes as an unmitigated environmental risk requiring SEPA review

SEPA review requires a threshold determination of whether an action is likely to have a "significant adverse environmental impact." As the Department of Ecology SEPA FAQ notes, "An impact may be significant if its chance of occurrence is not great, but the resulting environmental impact would be severe." The FAQ explains further that an agency may issue a "mitigated DNS in lieu of preparing an EIS when there is assurance that specific enforceable mitigation will successfully reduce impacts to a nonsignificant level."

In this case, one of the forms of mitigation required by the DNS seems to acknowledge that there are risks that cannot reduce impacts to a nonsignificant level. Regarding escape recovery plans, including scenarios for recovery after a catastrophic failure of the pens, the mDNS states:

It is conceivable that an attempt to recover fish after an escape event may negatively affect native Pacific salmonids more than no attempt to recover fish. Cooke is required to work with WDFW, Ecology, and DNR to include a no-recovery option in the 2020 Fish Escape Prevention, Response, and Reporting Plan, to be finalized December 2019. This option should include when, where, and under what conditions a recovery effort should not be attempted. A no-recovery option would be triggered by the state, in consultation with co-managers and federal agencies for the purpose of protecting native Pacific salmonids. A no-recovery option can be triggered by Cooke if the attempted recovery would put the health and safety of its employees at risk.

This scenario exceeds the scope of an mDNS and demonstrates the need for a finding of significance and an environmental impact statement.

The mDNS rightly treats the possibility of escape as a real and serious threat that must be addressed before planting fish in the net pens. Escaped fish pose a range of risks to endangered wild salmonids, and to the ecology of Puget Sound and its watersheds. The recovery efforts following the 2017 collapse demonstrated inadequacies of the existing escape plan even for non-native species. As DFW notes in the mDNS and their exchanges with Cooke in Attachment B, an escape on the scale of 2017 would have released a number of fertile female steelhead that "would have exceeded the number of wild steelhead returning to spawn in many rivers in Puget Sound." DFW's exchange with Cooke states that the use of eggs treated to induce triploid sterility "would reduce, but not eliminate the risk."

To mitigate that risk, DFW requires Cooke to prepare an escape recovery plan. That escape recover plan itself could pose environmental risks. DFW recognizes that significant risk and imposes a further mitigation, one in which no recovery is attempted. This option could be

triggered by the state in consultation with federal and tribal partners, but also can be triggered by Cooke based on its assessment of risk to its crew.

This creates a risk that there would be no mitigating effort taken to address the adverse environmental impacts of an escape. DFW's own arguments in the mDNS lead to the conclusion that this impact cannot be mitigated, and that it is inappropriate to proceed with a mitigated Determination of Non-Significance. To assess the risks of this projects requires a full EIS.

The pens' structure is likely to be unsafe for prevailing conditions in Puget Sound

The joint DFW/DOE/DNR investigation of the Cypress Island net pen collapse of 2017 identified failures of maintenance and engineering which resulted in the collapse of that ten-cage net pen and the release of hundreds of thousands of farmed fish. In the course of ongoing litigation resulting from that collapse, Wild Fish Conservancy contracted an independent marine engineer to provide expert testimony evaluating the collapsed pen and assessing the risks posed by the surviving pens.

Like the state's own investigation, Dr. Tobias Dewhurst's assessment found evidence that the net pen had not been adequately cleaned, and that there had been a persistent failure to confirm the soundness of the pens and their anchoring systems, despite those cleanings and inspections being required by permits and industry best practices prevailing before 2017. In addition, Dr. Dewhurst compared manufacturers' ratings for the surviving pens with conditions at the sites where they are currently deployed, and found "conditions at each of its eight sites exceeded the maximum rated conditions specified by the net pen manufacturer. Based on Cooke's documentation that I have reviewed to date, these issues persist at many of the remaining net pen sites. Thus, the remaining net pen systems may be at risk of partial or

catastrophic failure during instances of extreme environmental loading, which could result in fish escapement."

He concluded: "As a result of excessive loads on the net pen system created by:

- currents and net sizes exceeding those specified by the net pen manufacturer,
- biofouling levels potentially exceeding design values, and
- mooring system installations that deviate from manufacturer recommendations and were not approved by a marine engineer, pens and cages operated by Cooke were at risk of complete failure. One pen, Cypress Site 2, did experience a catastrophic failure."

DFW and its partner agencies should not regard it as sufficient mitigation of risk to permit these pens to transition to rainbow trout/steelhead without new engineering plans in place. The current mitigation proposal would allow these pens to operate without "engineered mooring and anchoring plans and site-specific engineered drawings stamped by a structural engineer" until 2021, and would allow them to operate without a third-party inspection for periods as long as two years.

Given the history of these net pens, the consequences of the mismatch between their manufacturers' ratings and conditions in Puget Sound, and the inadequate maintenance and inspection preceding the 2017 collapse, these pens should be required to have adequately-engineered structures before transitioning to rainbow trout/steelhead. The engineering plans should be incorporated into a full EIS, allowing independent engineers to review the plans and assess the risks posed by the re-engineered pens and anchoring systems. The analysis should incorporate worst case scenarios and their likelihood, as required by WAC 197-11-080. Without that information, how can DFW and its partner agencies, or the voting public and elected leaders who reacted with outrage to the 2017 collapse, assess the risk and sufficiency of this current proposal?

The pens' structure is unsafe for foreseeable conditions in Puget Sound

Puget Sound is a seismically active area, with structures facing threats of significant damage from shaking in an earthquake, and from tsunamis caused by local earthquakes and those traveling from more distant quakes up and down the coast. A substantial tsunami is likely to occur during the life of these pens, and much state policy has been directed in recent years to make high-risk structures safe from seismic risks. While the exact time of such a tsunami is not predictable, there is a substantial likelihood of such a tsunami in the foreseeable future, and much attention and policymaking effort has been dedicated to incorporating that risk into planning.

Unlikely as that risk might be, it is necessary to consider here because, as noted in the Depart of Ecology SEPA FAQ: "An impact may be significant if its chance of occurrence is not great, but the resulting environmental impact would be severe." Since there is evidence that the net pens are already operating at or past their engineered limits, and since the people of Washington State have seen the tremendous harm done when these pens fail, understanding low-probability/high-risk events that threaten further collapses is critical in addressing the pens' full environmental impact.

Modeling by Washington's Department of Natural Resources and NOAA recently examined consequences of tsunamis for Puget Sound. Tsunami waves in some ways simply amplify the existing concerns about the structural soundness of the net pens, and add to the likelihood of a partial or complete collapse of one or more pens already considered as part of Dr. Dewhurst's engineering study. The forces generated by tsunami waves may differ in more than just intensity from routine tidal flow, in part due to the intense oscillation and the rebound of waves off of nearby shores. This risk deserves additional concern and scrutiny as part of a comprehensive EIS. A full-blown analysis of these forces is impractical given the limited time available for public comment.

To help understand the consequences of tsunamis, we requested simulated wave amplitudes and current velocities for the net pen sites. The DNR/NOAA simulations show significant added risk to all of the sites in the event of a tsunami within Puget Sound. The Fort Ward and Clam Bay sites see modeled wave heights nearly 20 feet high, as does the Port Angeles site, while the Cypress Island sites would face a wave over 10 feet high. The Skagit Bay site and Fort Ward site would face variable currents, with current speeds as high as 14 knots and rapid changes in direction and intensity. This oscillation in the course of a tsunami seems likely to generate forces outside those in normal engineering assumptions, and call for further consideration of anchoring systems and structural integrity.

There is no reason that a seismic catastrophe should be allowed to place Puget Sound's wildlife at needless risk due to inadequate planning and preparation. WAC 197-11-080 requires a consideration of worst case scenarios, and state law requires other facilities, such as hazardous waste storage sites, to be evaluated for seismic risks. These aquaculture net pens should be subjected to a full EIS that includes consideration of the seismic risks that they uniquely face as semi-permanent, in-water structures containing farmed fish whose escape would cause significant environmental risks.

Water withdrawal and discharge into Puget Sound

The SEPA checklist states "No surface water withdrawals or diversions are required to implement the species change proposal, or to continue operations at existing floating net pen facilities." This is incorrect, since routine operations—including harvest—entail drawing water out of the pens, extracting the fish on board the harvest ship, and then allowing the water to flow back into the Sound after sluicing across the ship. This process adds pollutants including fish blood, damaged fish parts, and injured bycatch fish to the water before it returns to the Sound. A full EIS would consider the environmental impacts of that removal and addition of water to the Sound.

Pollution from the pens would be harmful to the plants and animals in nearby waters, including to endangered and threatened species

Open water net pens raising salmonids routinely disperse large volumes of feed into public waters within the boundaries of the net pens as sustenance for their farmed fish. Some portion of the feed dispersed may not be consumed by fish 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 these 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 into or near the pens.

Physically small fish species, such as baitfish species and out-migrating 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 rainbow trout/steelhead 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 these rainbow trout/steelhead net pens 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.

In order to treat specific diseases or 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 where the U.S. Food and Drug Administration (FDA) requires a 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 waiting period. A full EIS would assess the risks posed to wild fish and their human and non-human consumers by outflows of food or medicine, and from exposures of native fish entering the pens.

An additional concern with antibiotic-treated feed and treatments to fish or water is the facilitation of the development of antibacterial resistant bacteria in the sediments (Heuer et al 2009, Cabello et al. 2013, Hu 2019). This issue needs to be explicitly addressed, including the provision of data pertaining to any monitoring of the sediments below each of the extant net pens in Puget Sound that may be available, if any.

In the SEPA checklist, Cooke refers in passing to the use of unspecified probiotics in net pens. These unspecified introduced microbes are likely to colonize the microbiome of native fish and the environment near net pens. Given the growing scientific appreciation of the role of the microbiome in health and development of fish and other animals and plants, this practice deserves greater scrutiny than is practical in the limited comment period available.

The pens are also subject to, and possibly causes of, lethal algal blooms. On November 15, marine aquaculture net pens in Clayoquot Bay began seeing die-offs due to a bloom of diatomaceous algae (https://thetyee.ca/News/2019/11/20/Algal-Blooms-Tofino/). The concentration of fecal material, excess food, and fish flesh near pens may exacerbate these blooms, and the resulting fish deaths then produce additional pollution as they cannot be extracted from the nets quickly enough. Observers near the recent die-offs report that the waters near the pens turned "a dark brown muddy river-like colour," due to the rotting flesh.

These die-offs are likely to be more frequent in the future, since reporters observe these algae and their large blooms "have expanded their range and frequency as climate change has warmed, acidified and robbed coastal waters of normal oxygen levels." As discussed below, the inability to quickly empty the pens in the event of massive deaths or a disease outbreak poses significant risks to Puget Sound at large. One such risk is that the weight of the dead fish itself can add stresses to the pens' structure, making a collapse more likely during those emergency operations, and when the contents of the pens pose the greatest risk to the environment.

In passing HB 2957, the state legislature tasked state agencies "to eliminate negative impacts to water quality and native fish, shellfish, and wildlife." Allowing these pens to continue emitting this pollution fails to comply with that statutory language and the high standard that the legislature and the people of Washington demanded of the marine aquaculture industry.

A full EIS would assess all of these risks, including the risks posed by artificial probiotics to the microbial biodiversity of the Sound and its wild denizens, and benthic effects near pens.

Bycatch of fish entering pens or in harvesting and escape recovery efforts

Native fishes—including but not limited to forage fishes such as Pacific herring and potentially migrating or rearing juvenile salmon (including ESA-listed Chinook and chum salmon,

steelhead, and bull trout)—may be attracted to the net pens due to the presence of feed and the presence of lower trophic taxa drawn to the feed and waste emanating from the pens.. 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 rainbow trout/steelhead. There are (at least) two issues that DFW and its partner agencies must address with regard to this issue in the permits as part of a full EIS:

1. A comprehensive accounting of species composition as well as total numbers of non-target fishes entrained during each net pen harvest period in which adult farmed rainbow trout/steelhead 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 state agencies and NOAA and available for public review.
2. As documented during Cooke harvesting operations in Puget Sound, all non-target fish 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 adjacent to the net pens during the harvest, feeding on the native fish as they are being discarded in violation of state and federal laws prohibiting the feeding of pinnipeds.

It is not surprising that there would be such bycatch, and it is likely that it includes endangered and threatened species. British Columbia requires reporting of bycatch (or what they term "incidental catch") at aquaculture facilities. A complete record of the species captured since 2011 is available from the Canadian Department of Fisheries and Oceans (https://open.canada.ca/data/en/dataset/0bf04c4e-d2b0-4188-9053-08dc4a7a2b03). In that

dataset, salmon species are recorded for every year on file. In some cases, hundreds of thousands of fish are recorded as incidental catch as part of a rapid depopulation of the pens to control a disease outbreak. Even excluding those incidents, an average of over 35,000 incidental catches in net pens per year are recorded in British Columbia. It is likely that a proportionate amount of bycatch occurs in Puget Sound, and could have serious effects on the Sound's sensitive ecology. Because Cooke does not report that bycatch, the state does not monitor their efforts, and independent observers are not able to view the harvest process in detail, we cannot fully measure the harm this bycatch causes.

Surveys of aquatic diversity at sites near these net pens indicate substantial numbers of threatened and endangered juvenile salmonids, and forage fish. State-funded surveys including "West Sound Nearshore Fish Utilization & Assessment (SRFB Grant: 07-1898)" (2010), "Cypress Island Aquatic Reserve Pilot Nearshore Fish Use Assessment" (2011), "West Whidbey Nearshore Fish Use Assessment" (2007), and the ongoing "Hood Canal Nearshore Juvenile Fish Use Assessment" find substantial populations of threatened coho, Chinook, pink, and chum salmon in near-shore waters at sites near and similar to those where net pens operate. Those surveys also demonstrate substantial variation in total species diversity and population sizes from site to site (e.g. Figure 3), and between surveys at the same site over time. Salmonid populations could vary by orders of magnitude from month to month, and between years. This highlights the difficulty of monitoring and predicting the potential bycatch that might occur in these pens without active, independent monitoring.

There are three additional issues here that DFW and partner agencies must address as part of a full EIS:

- Indirect predation by net pen steelhead on ESA-listed juvenile Chinook salmon, steelhead, and bull trout (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, steelhead, and bull trout in the vicinity of the pens.
- The harvester crew and/or net pen operator must obtain a fishing license or permit that would allow them to harvest native fish as described above.

Further, addressing this and other issues concerning potential adverse impacts to public resources from the operations of each net pen requires that WDFW as the primary regulatory agency have the authority to conduct regular and unannounced site visits and to conduct any biological sampling and testing deemed advisable to assure the public that no adverse impacts are occurring. At the very least, mitigation should require the presence of independent observers on-site during each harvest operation to quantify and describe the species and life stages of all by-caught species. A full EIS would allow analysis of the effects of bycatch on Puget Sound ecosystems and recovery plans for ESA-listed species, and the proper regulatory frameworks to apply for monitoring and limiting bycatch, and due consideration of various alternatives for mitigation.

Air and noise pollution impacts to adjacent lands

Net de-fouling and cleaning operations have been found to cause fouling of the air and significant noise. 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 and the loud noises associated with generators, pumps, and other industrial equipment. This air and noise pollution causes severe depression of local residential property values, apart from human respiratory impacts. A full EIS would allow DFW and partner agencies to determine appropriate maximum levels of airborne particulates, odor-causing chemicals, and noise levels, and require facility operations to monitor and maintain appropriate airborne pollutant and sound levels.

As part of a full EIS, DFW and partner agencies should commission an appropriate sociological survey of resident households within one-half mile of the shorelines of the locations of each net pen facility. 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 air and noise pollution.

Fish flesh discharge

Open-air salmonid 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 conspecific steelhead and other salmonids. Studies have shown that these particles are potential vectors for pathogens.

This fish flesh also serves as an attractant for protected marine mammals and birds, and a full EIS should be undertaken to assess the harm this may do to those protected species.

A NMFS-approved Hatchery Genetic Management Plan (HGMP) is required

In view of the several issues of potential concern to public waters and ESA-listed native salmonids posed by the proposed open water net pen operations, a NMFS-approved Hatchery Genetic Management Plan (HGMP) for each of Cooke's freshwater hatcheries hatching rainbow/steelhead eggs, rearing fry and smolts, and outplanting smolts to open water net pens is required. This is the required ESA Section 4 Incidental Take Permit required of any artificial production facility producing any species of finfish that may have an adverse impact on ESA-listed salmonids. It is clear that open water marine salmonid net pen operations, including

those currently operated by Cooke and those proposed to be operated using "triploid" rainbow/steelhead pose risks to native ESA-listed steelhead, Chinook salmon, and bull trout.

Further, since evaluation and approval of an HGMP is clearly a federal action, NEPA likely applies and a NMFS evaluation of any such HGMP would therefore require a full NEPA analysis, including preparation of an EIS.

Need for a thorough economic cost-benefit analysis of the proposed action and alternatives

Regardless of the biological concerns posed by the proposed action, no credible evaluation of the possible benefits of the proposed action can be considered complete without a full cost-benefit analysis of the proposed action and reasonable alternative uses of the locations currently leased by Washington Department of Natural Resources (WDNR) to Cooke Aquaculture. The public and the public servants charged with making the decision on the proposed action cannot adequately evaluate the possible benefits of the proposed action in the absence of an understanding of what the presumed benefits to the public from the proposed action are and what benefits from reasonable alternative uses of the locations are or may be. It bears reminding that the locations at which the current net pens are located, including the bottom lands and the water in and surrounding each net pen belong to the public. The public needs to be presented with a complete and clear analysis of the economic costs and benefits of the proposed action and alternative uses of these resources. This can only be achieved by a thorough economic cost-benefit analysis embedded in a bona fide alternatives analysis through a full EIS.

The proposed mitigations are inadequate and not reasonably certain to address the risks

While a full EIS would be a more appropriate way to identify and evaluate methods for mitigating the risks of introducing steelhead into net pens, there are several important mitigations that are absent from the current proposal, or that must be strengthened before the proposal moves forward. As it stands, these mitigations are not reasonably certain to address the risks that the state acknowledges, and thus do not satisfy the requirements of SEPA.

While not comprehensive, these are some suggested changes to the proposed mitigations:

- As discussed above, the harvest process must be monitored by independent observers to assess bycatch and to ensure that blood, fish parts, or other waste is not discharged into public waters.
- WDFW and other regulators must have clear authority to conduct unannounced visits and inspections of facilities. They must have authority to review maintenance logs and to examine the structures, fish, feed, medicine, mort tanks, and other regulated components of the facility to ensure that Cooke is fulfilling all obligations under its permits and the required mitigations here.
- Independent inspections of the facilities should be required on an annual basis, not biennially.
- Reports from the independent engineer, and all other reports required from Cooke as part of this mitigation, must be clearly recognized as public records and made available to the public immediately through a publicly-accessible website.
- As discussed above, the mitigation should not merely establish a consistent means of estimating triploidy error rate, but should set a maximum acceptable error rate, and a sampling regime sufficient to assure that the error rate is estimated probabilistically and with high precision. A minimum number of total random samples for a specific, fixed

number of fertile eggs from each egg cohort should be specified to assure that the total number of diploids in a specific total number of eggs from each cohort does not exceed a specified maximum threshold number T with high probability P (95% or greater) The attainment standard would be a probability of less than (1-P) that the number of diploids is not greater than the threshold number T. This error rate cap should be derived based on maximum number of fertile females that might escape from a pen.

- All forms of PRV should be reportable. In addition to screening eggs and smolts, WDFW inspectors should inspect the tanks to assess the rate at which net pens are amplifying pathogens, and act to address pathogen levels that might pose significant risks to wild species attracted to the pens' vicinity.
- All farmed fish should be clearly identifiable in the event of an escape. There is no basis for allowing any of these biologically-altered domestic rainbow/steelhead trout to be introduced without a clear and approved plan in place for visually distinguishing them from any other fish in Puget Sound.

The proposal is deficient by the standards of the 1990 EIS

As stated above, we disagree with the choice to rely on the 1990 EIS for analysis of the current SEPA review. Substantial changes in the list of endangered and threatened species in Puget Sound, improved understanding of the risks posed by industrial net pens and industrial aquaculture, and changes in state law all make a compelling demand for a new EIS. But since the EIS relies on that dated document, any failure to implement its guidelines should be ground to refuse to allow the proposed action or to compel a full environmental review of the effects of that deviation.

The 1990 EIS recognizes that aquaculture with native fish (such as the rainbow/steelhead trout at issue here) pose different, and in some cases greater, risks than non-native fish like Atlantic

salmon. As such there are some guidelines which were not applied in planning and approving the siting and construction of the existing net pens for use with Atlantic salmon which must now be applied in evaluating the pens' use for rainbow/steelhead trout.

On pages 69-70 of the 1990 EIS, section 5.7.2.2 reads in full:

> It is recommended that the following guidelines be used by WDF when reviewing fish farm proposals:
>
> - When Pacific salmon stocks are proposed for farms in areas where WDF determines there is a risk to indigenous species, WDF should only approve those stocks with the greatest similarity to local stocks near the farm site.
> - In areas where WDF determines there is a risk of significant interbreeding or establishment of harmful self-sustaining populations, WDF should only approve the farming of sterile or monosexual individuals, or genetically incompatible species.
> - In areas where WDF determines that wild populations could be vulnerable to genetic degradation, WDF should establish a minimum distance of separation between farms and river mouths.

In the following section, "Mitigation Measures and Unavoidable Significant Adverse Impacts," the EIS states: "WDF and other local experts agree that the potential for significant genetic impacts resulting from farm escapees interbreeding with wild stocks is low. Existing regulations and the use of the guidelines indicated in the Preferred Alternative are adequate to avoid any significant adverse impacts and additional mitigation measures are not necessary."

Unfortunately, there is no evidence that the guidelines indicated in the Preferred Alternative have been applied. We can locate no record of any policy regulating the distance of net pens to the mouths of rivers, and WDFW staff confirmed that they are also unaware of any policies addressing the distance of net pens to river mouths. This guideline only applied to proposals

for native fish aquaculture, so would have been unnecessary under the 1990 EIS until now. WDFW staff queried about this guideline cited the use of monosexual and partially sterile stock in this proposal as adequate mitigation, but the plain language of the 1990 EIS requires both, not one or the other.

This issue is crucial in considering the risks of a farmed domestic fish in waters populated with a threatened wild conspecific, as with wild steelhead and rainbow/steelhead trout. Farmed fish that escape near a river mouth could rapidly migrate upriver and interbreed with wild fish. As noted above, the wild steelhead populations in many rivers could be swamped by the number of fertile females if an escape on the scale of 2017 occurred. But the threatened state of the wild species is so dire that population estimates for some rivers—according to the National Marine Fisheries Service steelhead recovery plan (NMFS 2018)—are as low as 5 individuals in some rivers. Even a single fertile female breeding in such a river could destroy the wild genetics.

As shown in the attached map, the existing seven net pen farm sites are less than 20 kilometers (12.5 miles) by water from important wild steelhead rivers, including the Elwha, Dungeness, Samish, Skagit, Stillaguamish, Cedar, and Green rivers. Other nations restrict net pen farm sites from being as near as 10 km from river mouths, and distances of under 1 km clearly pose serious risk that escapees could breed before recovery.

It should be noted that even the discussion of risks from escapees on breeding grounds rely on dubious assumptions, discussed in detail above. The analysis ignores the loss of breeding opportunities when wild males attempt to mate with escapees (even if those matings are not successful), and the loss of mating opportunities if escapees are able to outcompete wild females for redd sites. Even if the reproductive fitness for escaped females was exactly zero, those effects mean there would still be harm to fragile wild populations. Furthermore, the analysis of reproductive success considers only a point estimate of reproductive success rate, and doesn't address the full distribution of this or other rates, and thus systematically under-

estimates the number of offspring that might result from escapes and the long-term harm to wild steelhead genetics. There is no worst case analysis or discussion of that worst case's likelihood, as required by WAC 197-11-080.

In the absence of established guidelines, and with no discussion in the SEPA checklist or associated documents assessing the risk of releasing these potentially-fertile fish in proximity to river mouths, the conditions set by the 1990 EIS have not been fulfilled, and the proposed actions must be deemed to carry too high a risk of environmental harm. The mDNS should be withdrawn and a full EIS should be conducted assessing the risks associated with each of the existing net pen sites and its neighboring rivers.

The SEPA analysis failed to account for changes in risk assessment imposed by new law

After the 2017 collapse, the Washington Legislature acted deliberately and overwhelmingly to limit open-water marine net pen aquaculture, and the Governor signed the new law enthusiastically. In addition to phasing out Atlantic salmon farming by 2022, the new law imposed a series of other requirements, and established its clear intent that future marine net pen aquaculture be subjected to greater scrutiny. Section 1 of the legislation passed by both houses states:

> Recent developments have thrown into stark relief the threat that nonnative marine finfish aquaculture may pose to Washington's native salmon populations. But just as evidence has emerged that nonnative marine finfish aquaculture may endanger Washington's native salmon populations, so too has evidence emerged that marine finfish aquaculture in general may pose unacceptable risks not only to Washington's native salmon populations but also to the broader health of Washington's marine environment. Given this evidence, the legislature intends to phase out nonnative finfish

> aquaculture in Washington's marine waters. Because the state of the science and engineering with regard to marine finfish aquaculture may be evolving, the legislature further intends to study this issue in greater depth, and to revisit the issue of marine finfish aquaculture once additional research becomes available.

This language was vetoed as the Governor signed the law, but demonstrates the legislature's intent. That intent is also shown in Section 5 of the engrossed bill, which requires agencies to "continue the existing effort to update guidance and informational resources to industry and governments for planning and permitting commercial marine net pen aquaculture," and mandating: "The guidance must be designed to eliminate commercial marine net pen escapement and to eliminate negative impacts to water quality and native fish, shellfish, and wildlife."

In finding that "marine finfish aquaculture in general may pose unacceptable risks" and mandating guidance to "eliminate" those risks the legislature overturned the 1990 EIS's determination that Atlantic salmon aquaculture posed acceptable risks and imposed a stricter standard than existed previously. It is clear that the legislature intended to alter the risk assessment framework used for marine finfish aquaculture in general from the status quo. Relying on the 1990 EIS without acknowledging the significant shift in risk assessment mandated by this law is clearly unwarranted and contrary to the law passed in response to the 2017 catastrophe.

The legislature clearly understood that its actions would not only affect Atlantic salmon farming. In addition to the explicit statement to that effect in Section 1, they heard this testimony from Dr. Ken Warheit, supervisor of WDFW's fish health program:

> We suggest that if the State is going to restrict marine fish aquaculture, it removes authorization also for other nonnative fish. More importantly, it should also remove authorization for native salmonid marine commercial aquaculture which WDFW

> considers to be a greater risk to the State's native wild and hatchery salmonid populations, than is Atlantic salmon marine aquaculture.

The legislation did not forbid the use of biologically-altered rainbow/steelhead trout, but it did establish that the risks of Atlantic salmon aquaculture are too great, and express concern that the same might be true of all marine finfish aquaculture. It urged further study of that risk and raised the bar for future risk assessment.

Unfortunately, the guidance mandated to eliminate these risks has not been issued, even though a report to the legislature regarding its progress was due during this comment period.

In light of that change in state law, it is inappropriate to apply the same risk assessment used in 1990 to a proposal today. In evaluating the risk of marine finfish aquaculture proposals not forbidden under HB 2957, state agencies should conduct an EIS on any proposal that is riskier than the best-case scenario for marine Atlantic salmon aquaculture. Since this proposal does not clear even the guidelines laid out in the 1990 EIS (since no assessment of proximity to river mouths was conducted), and since the farmed fish in this proposal could directly interbreed with a federally-listed steelhead species and degrade its genetics, a new EIS is clearly warranted.

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Tables

River/River system	Population (five year geometric mean, 2010-2014)
Cedar	4
Green	552
Puyallup	277

White	531
Dungeness	141
East Hood Canal Tributaries	60
Sequim/Discovery Bay Tributaries	19
Samish/Bellingham Bay Tributaries	846
Skagit	5123
Stillaguamish	392

Table 1. Estimated wild adult steelhead populations (five year geometric mean, 2010-2014) in rivers within a 12 mile radius of the existing net pens. The highly domesticated fertile net-pen-origin females that are predicted to escape during a net pen failure comparable to that of 2017 would comprise a significant proportion of the spawning population in many Puget Sound rivers.

Number of Fish	1000000
Proportion Diploid	0.00156
Number Diploid Outplanted	1560
Probability of Escape	0.82
Number of Diploid Escapes	1279.2

Probability of Non-Recovery	0.77
Number Diploids Not Recovered	985
Proportion Sexually Mature_High Estimate	0.5
Number Mature Diploids_High Estimate	493
Proportion Sexually Mature_Low Estimate	0.1
Number Mature Diploids_LowEstimate	99
Proportion Fertile Surviving to Spawn	0.5
Number of Mature survivors_High Estimate	247
Number of Mature survivors_Low Estimate	50

Table 2. Estimate of number of the maximum number diploid individuals per million farmed rainbow/steelhead outplanted to a net pen that would result in no more than the number of mature escapees surviving to sexual maturity (bottom row) given the assumptions in WDFW's mDNS Summary, page 6.

Figures

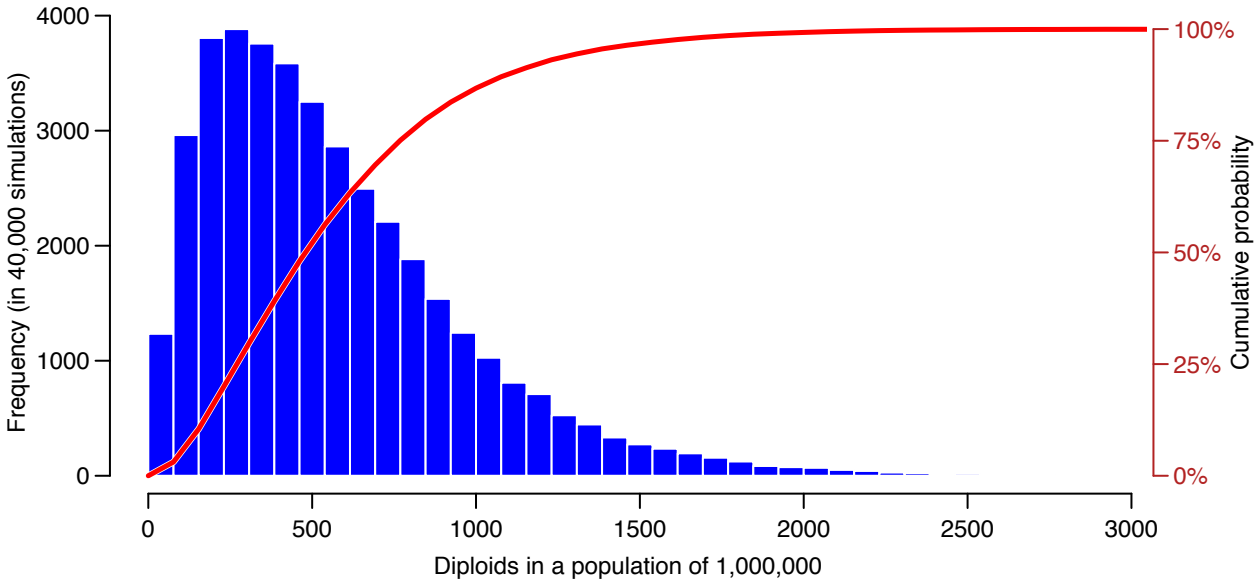


Figure 1. Distribution of the number of diploids (triploid-induction failures) in one million eggs when the number of diploids in a random sample without replacement of 3500 is one. The blue bars show the number of diploids in the interval on the horizontal x-axis (for example, 5000 in the interval between 3000 and 400 shown on the left y-axis). These numbers were computed through a Bayesian analysis that sampled 40,000 probable values (so the probability that the true number of diploids in the population of 1,000,000 is 5,000/40,000 = 0.125 or 12.5%). The red curve is the cumulative probability distribution. The shows the probability that a given value on the x-axis is less than or equal to the corresponding value on the right y-axis. For example, 95% of the distribution is less than 1400 and 97.5% is less than 1600, satisfying a risk-averse criteria that 95% of the distribution of possible values be no greater than 1560 diploid per million eggs or fry. About half the distribution (50%) is less than 500.

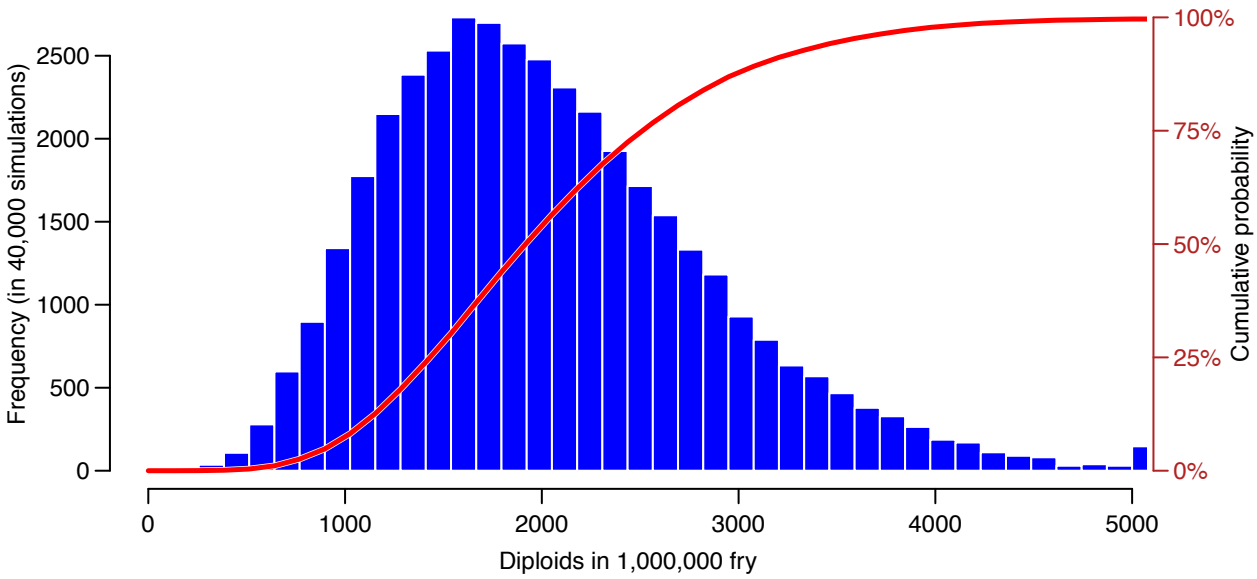


Figure 2. Distribution of the number of diploids (triploid-induction failures) in one million eggs when the number of diploids in a random sample without replacement of 2950 is five (per Attachment A of Cooke's SEPA Checklist). The mean is 2029, the median is 1900. 95% of the distribution is less than 3600. There is a 5% chance that the true number of diploids is between 3500 and 5000.

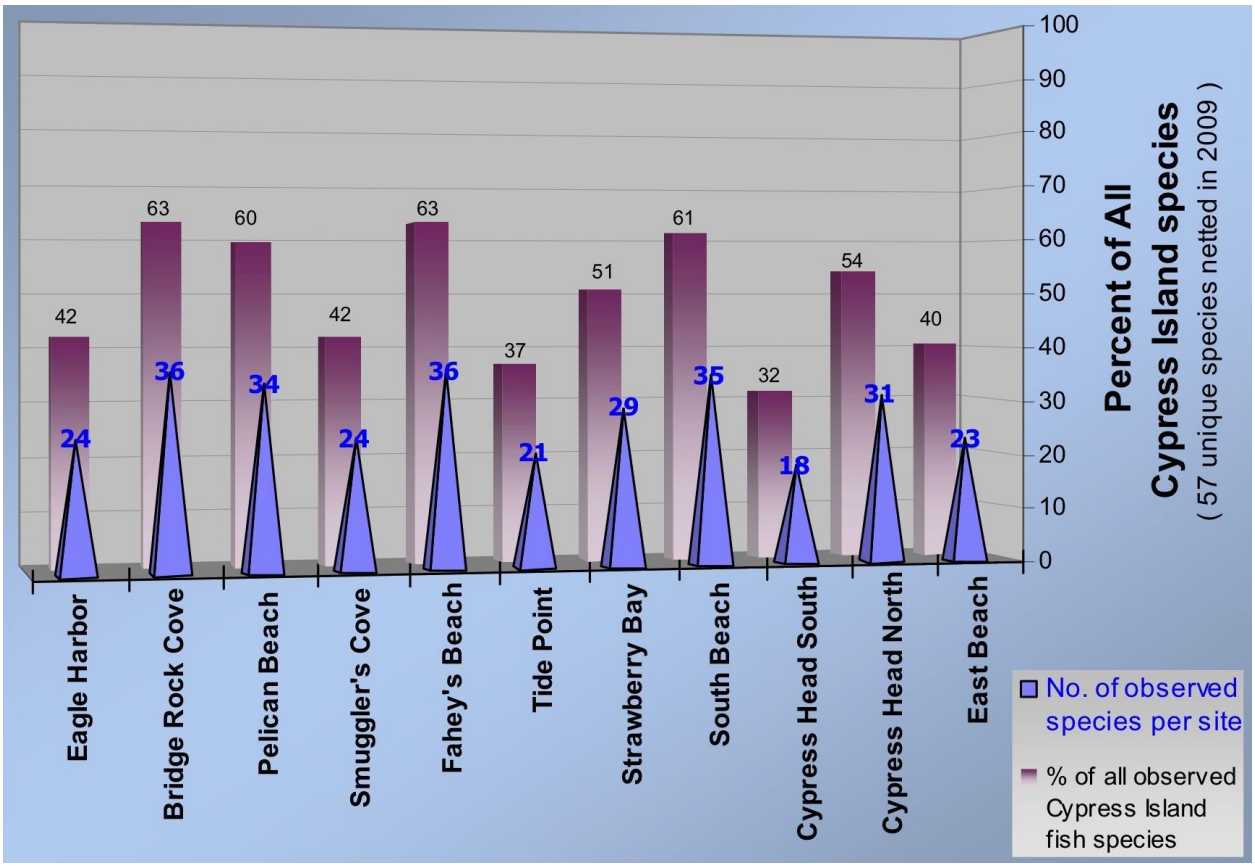
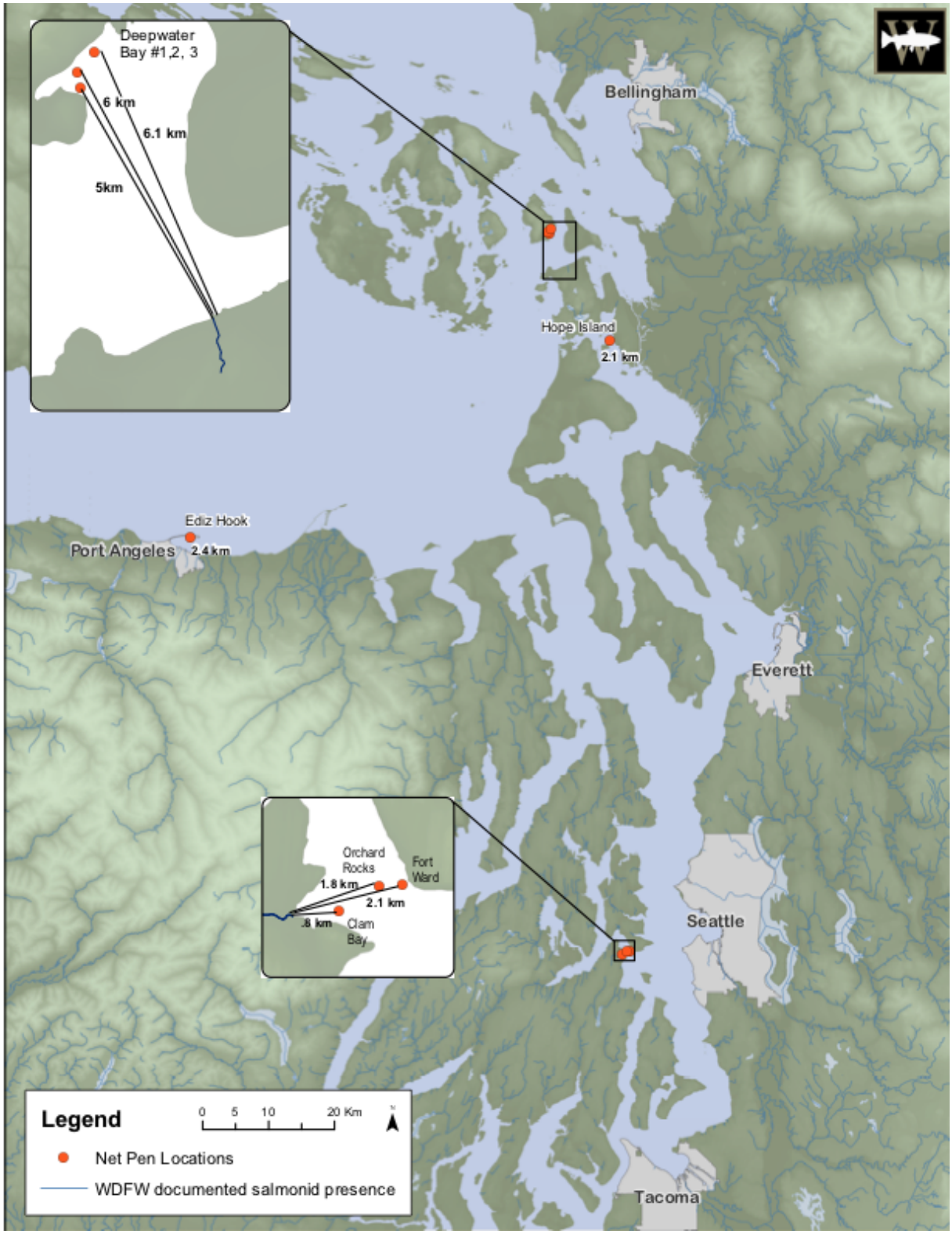


Figure 3. The total number of species encountered at each sample site in a survey of Cypress Island nearshore habitats, as well as the per-site percentage of all species netted from the Cypress nearshore. No single locale had greater than 65% of all species present across the 11 widely dispersed sites. From "Cypress Island Aquatic Reserve Pilot Nearshore Fish Use Assessment" (2011).

Map


Deepwater
Bay #1,2, 3
6 km
6.1 km
5km
Bellingham
Hope Island
2.1 km
Ediz Hook
Port Angeles
2.4 km
Everett
Orchard
Rocks
Fort
Ward
1.8 km
2.1 km
.8 km
Clam
Bay
Seattle
Tacoma
Legend
0 5 10 20 Km
Net Pen Locations
WDFW documented salmonid presence

Appendix

Section A

Extended illustration of the approach for determining a risk-averse standard for the maximum permissible number of diploids released into a new pen seeded with one million ostensibly triploid rainbow trout

We extend the illustrative analysis of the triploid failure rate provided in our comments and summarized in figure 2 to provide a probability distribution of the number of diploids that would survive to spawning grounds of wild steelhead.

Methods

We provide distributions for a) the proportion of fish that escape from a catastrophic failure of a net pen containing one million fish, b) the proportion of the escaped fish that elude recovery efforts, and c) the proportion of diploid fish sexually mature at or after the time of escape that survive to the spawning grounds of wild steelhead. We parameterize each of these three distributions using Beta probability distributions, with parameter values based on the point estimate values used by WDFW in its "Summary of Key issues", pp. 5-6. We then integrate these distributions with the Bayesian estimation of the number of diploids in a lot of 1,000,000 fertilized eggs subjected to triploid induction by extending the model used to generate the data shown in figure 2. All modeling was conducted in Stan running four chains of 20,000 iterations each with a burnin of 20,000 per chain and retaining a total of 40,000 samples from the joint posterior distribution.

We make the simplifying assumption that the total number of 1,000,000 fish growing in the net pen at the time of collapse resulted from plants of surviving fry from lots of 1,000,000 fertilized eggs from each of which 2950 random samples without replacement were obtained and tested

for triploid induction of which a total of 5 individuals were diploid. Given this assumption the probability of the number of diploids in the net pen at the time of failure would follow the distribution shown in figure 2.

Each of the Beta distributions (a, b, and c1 – c3) was parameterized in terms of the mode and coefficient of variation (standard deviation/ mean). We evaluated three cases using different Beta distributions for (c), the proportion of diploid fish sexually mature at or after the time of escape that survive to the spawning grounds of wild steelhead. The parameterizations of the five Beta distributions together with the principal moments are listed in Table 1.

Parameter	Alpha	Beta	Mode	Mean	CV	Central 50%	Central 95%
Beta a	18.86	14.15	0.85	0.80	0.10	[0.77, 0.88]	[0.67, .0.96]
Beta b	22.83	6.46	0.78	0.80	0.10	[0.73, 0.83]	[0.63, 0.92]
Beta c1	90.0	802.1	0.10	0.10	0.10	[0.93, 0.11]	[0.08, 0.12]
Beta c2	70.13	162.3	0.30	0.30	0.10	[0.28, 0.32]	[0.24, 0.36]
Beta c3	50.5	50.5	0.50	0.50	0.10	[0.47, 0.53]	[0.40, 0.60]

Table 1. Parameters of principal moments of the five Beta distributions employed to estimate the number of escaped diploid rainbow/steelhead (RBT) surviving to reach the spawning grounds of wild steelhead.

RESULTS

Convergence of each of the four chains in the stan model run was rapid and the Rhat statistic for all parameters to three digits was 1.000 or 1.001.

Figure A1 (identical to figure 2 in Comments) shows the distribution of the number of diploid RBT in a net pen with a total population of 1,000,000 based on random sampling (without replacement) of 2950 fertile eggs tested for triploidy of which 5 were diploid (i.e., failed the test). This is the principal unknown parameter estimated by the stan model. Figure A2 show the distribution of the number of diploids in the net pen of 1,000,000 RBT (shown in figure A1) that escape from the net pen upon catastrophic failure. This is the result of integrating the distribution shown in figure A1 with the Beta distribution Beta a (Table 1). Figure A3 shows the distribution of the number of escaped diploid RBT that were not recaptured. This is the result of integrating the distribution shown in figure A2 with the Beta distribution Beta b (Table 1). Figures A4, A5, and A6, show the distribution of the number of uncaptured escaped diploid RBT that survive to mature and migrate to the spawning grounds of wild steelhead, given the distribution of survival probabilities Beta c1, Beta c2, and Beta c3, respectively.

Table 2 summarizes some key quantities from each of the distributions in figures A4, A5, and A6.

Parameter	Mean	Std. Dev.	Median	5^{th} %-ile	95^{th} %-ile
Probability of spawning: mode = 0.10 (Beta c1)	131.6	59.0	125	53	242
Probability of spawning: mode = 0.30 (Beta c2)	390.9	172.7	365	160	720
Probability of spawning: mode = 0.50 (Beta c3)	642.9	284.0	600	270	1170

Table 2. Principal moments of the distributions of the numbers of escaped diploids surviving to mature and migrate to the spawning grounds of wild steelhead shown in Figures A4, A5, A6.

We considered three survival scenarios for the survival to maturity and migration to the spawning grounds of wild steelhead in Puget Sound following the catastrophic failure of one of Cooke Aquaculture's net pens containing 1,000,000 RBT. The three scenarios bracket a reasonable range of probabilities, given the uncertainty due to lack of information regarding escaped farm-raised RBT, basic biology and life history of rainbow trout in their native environment, and concern regarding the risk that escaped diploid RBT on the spawning grounds of wild, ESA-listed Puget Sound steelhead may pose to wild steelhead.

The value that society places on protecting ESA-listed Puget Sound steelhead from harm due to escaped non-native (not members of the Puget Sound steelhead Distinct Population Segment) may appropriately be expressed (in part) by how many potential escaped diploids that may be permitted to survive to enter the spawning grounds of wild steelhead and with what probabilities. We argue that a risk-averse, precautionary, approach should be based upon the upper tail of probability distributions of adverse outcomes. In the case at hand, the 95th percentile of the probability distribution of the number of surviving escapes diploids should be the minimum of the upper tail of the distribution considered.

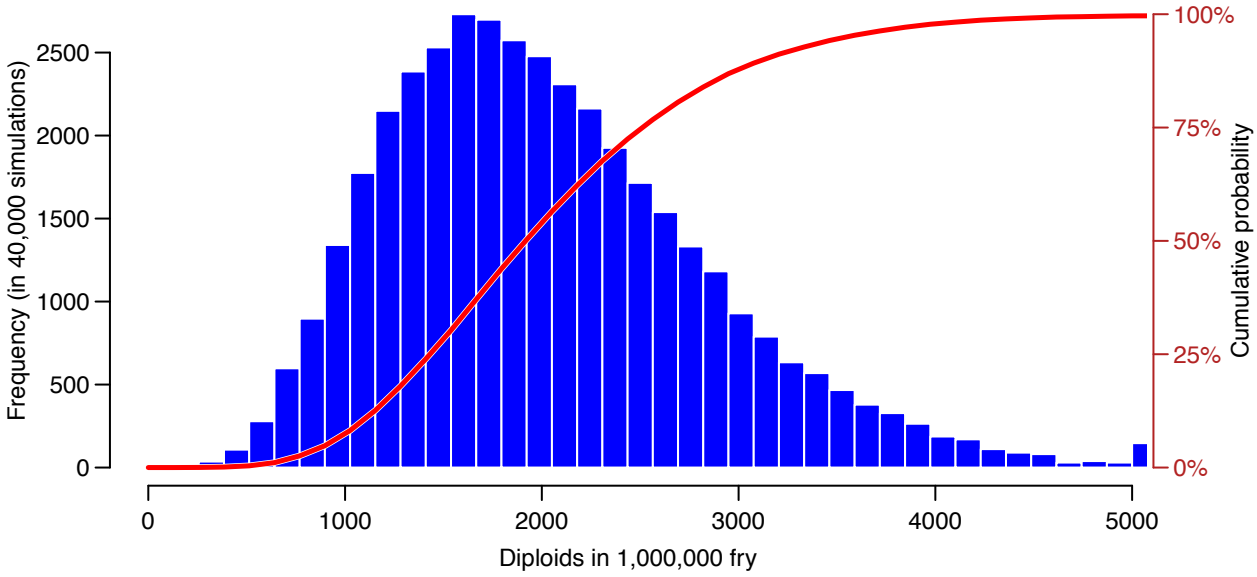
For the three scenarios evaluated the number of surviving escaped diploids at the 95th percentile is 242 for the lowest survival scenario, 720 for the intermediate scenario, and 1170 for the high (50% mean survival) scenario. This mean that there is probability of 0.05 (5%) that in the event of a catastrophic failure of a net pen containing 1,000,000 RBT that the number of surviving escaped diploids reaching the spawning grounds of wild steelhead is at least 242, 720, and 1170, respectively.

From a regulatory, ESA perspective, assuming that the appropriate risk-averse probability level to consider for an adverse outcome of an event such as a v pen is the 95th percentile (where the standard is to not allow an adverse outcome of magnitude X or greater to occur with a probability greater than 5 %), the maximum value of X (here, the number of escaped diploids surviving to the wild spawning grounds) needs to be determined. As discussed in the

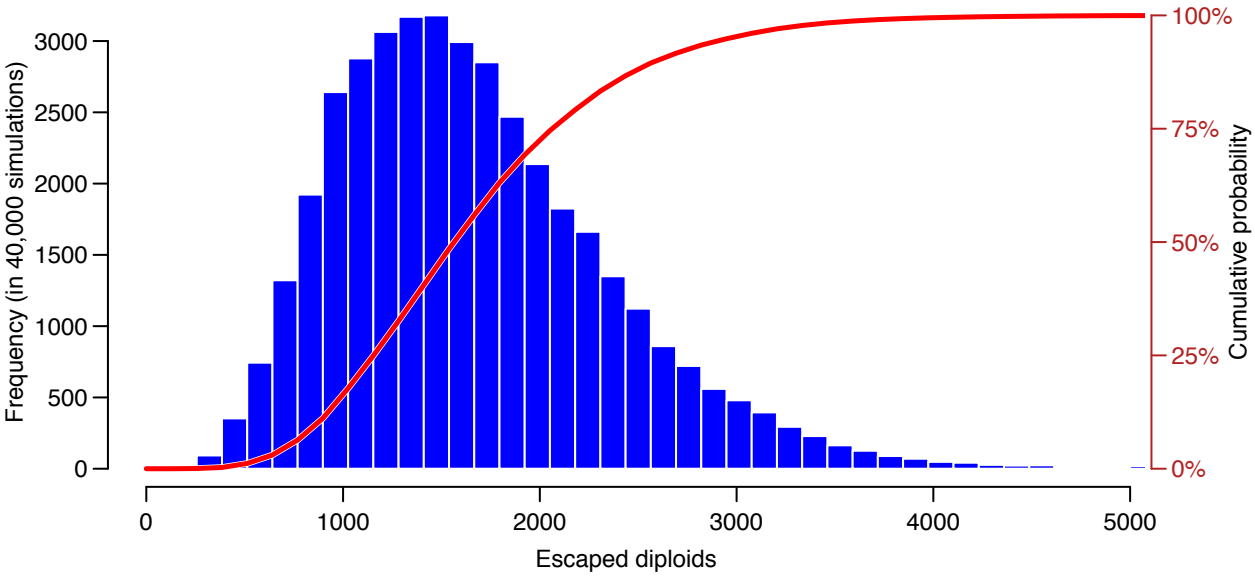
Comments, the choice of the specific maximum acceptable value of X and the maximum permissible probability of X occurring (conditional on a catastrophic failure of a net pen containing 1,000,000) will then determine the maximum allowable triploid-induction failure rate, as well as the appropriate minimum number of samples per million fertile eggs to be tested as well as the maximum number of failures in that number of samples.

We would argue, based on the scenarios described herein, 5 failures (diploids) in a random sample of 2950 from a lot of 1,000,000 fertile eggs yields a distribution with unacceptably high numbers of total diploids in the lot of progeny from those eggs released as molts into any of Cooke's Puget Sound net pens. An appropriate approach to identifying the minimum number of random samples per million eggs and the maximum permissible failures (diploids) in the sample is described in the main body of our Comments.

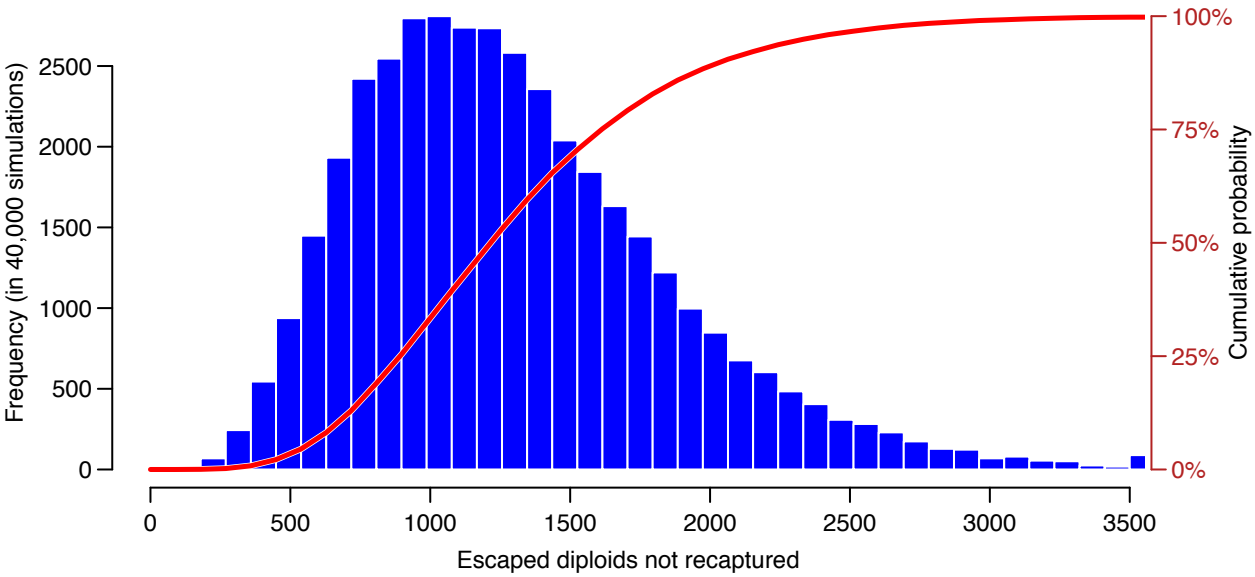
Appendix Figures



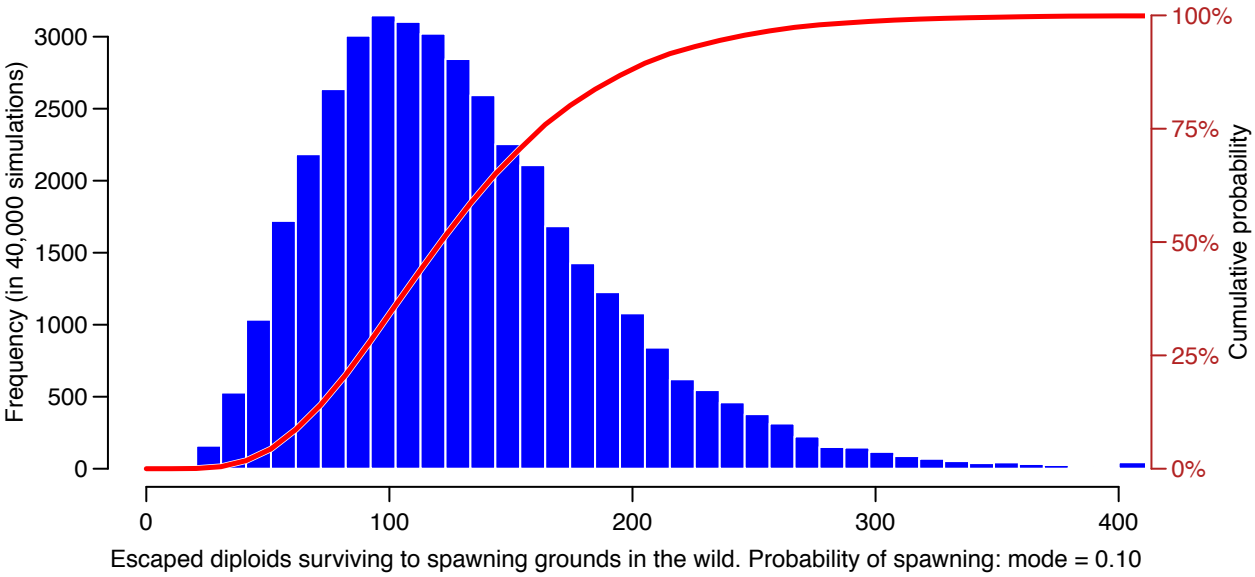
A1 Number of diploid RBT in a net pen of 1000000 RBT (identical to figure 2 above).



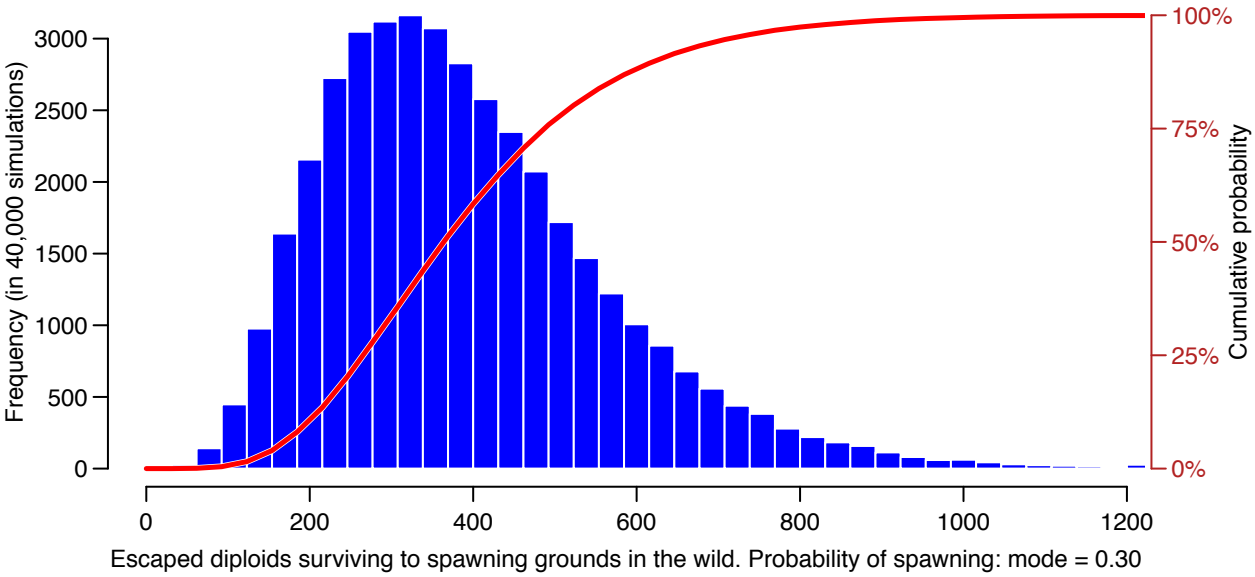
A2. Number of RBT that escape during a catastrophic failure of the net pen.



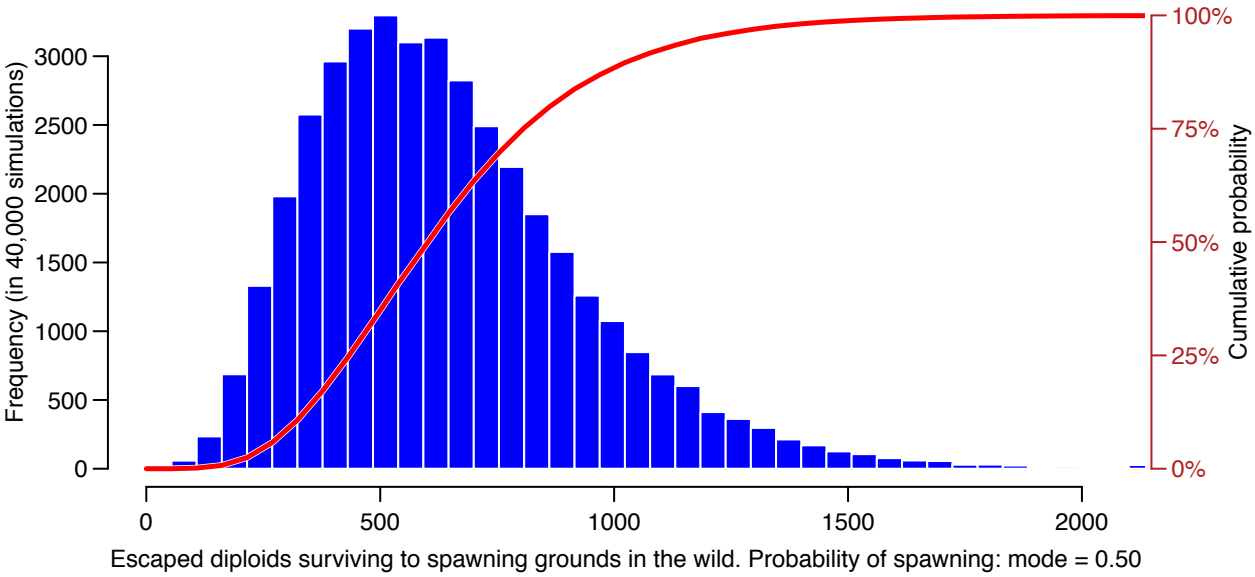
A3. Number of escaped RBT that are not immediately recaptured at the farm site



A4. Number of escaped diploid RBT surviving to spawning grounds in the wild when the modal probability of survival from escape to spawning grounds equals 0.10 (10%).



A5. Number of escaped diploid RBT surviving to spawning grounds in the wild when the modal probability of survival from escape to spawning grounds equals 0.30 (30%).



A6. Number of escaped diploid RBT surviving to spawning grounds in the wild when the modal probability of survival from escape to spawning grounds equals 0.50 (50%). Note the different scale on the X axis compared to figures 4 and 5.

Section B: Petition and signatures

We, the undersigned, have serious concerns over Cooke Aquaculture's new proposal to transition their net pen leases and permits to allow for the commercial propagation and harvest of biologically altered steelhead / rainbow trout in the waters of Puget Sound (https://wdfw.wa.gov/licenses/environmental/sepa/open-comments). These concerns are described in detail in Our Sound, Our Salmon's technical comments (www.oursound-oursalmon.org/osos-sepa-comments).

This proposal is inconsistent with the public's will and seriously undermines the recovery of threatened and endangered wild salmon, steelhead, and Southern Resident killer whales.

We are further concerned at the pace this proposal is moving forward under the State Environmental Protection Act (SEPA) in the absence of a thorough and current environmental assessment.

The State's decision to rely on an outdated, 30 year old Environmental Impact Statement (EIS) completed in 1990, as well as a supplemental environmental review completed by Cooke Aquaculture themselves, erodes the public's trust in the process. Currently, this review fundamentally ignores three decades of well-established science and evidence demonstrating the serious and compounding ecological risks to native fish, water quality, and the overall health of Puget Sound.

This is the same evidence that moved the Washington State legislature to pass bipartisan legislation banning Puget Sound's industrial Atlantic salmon net pens by 2022, an action overwhelmingly supported and celebrated by the public at large.

Given that biologically altered steelhead / rainbow trout have never been reared at the proposed industrial scale in Puget Sound and therefore pose new and unknown risks, and given the public distrust in Cooke Aquaculture to act in the public's best interest, the State

should uphold their responsibility to the public and approach this proposal with current, precautionary, and rigorous environmental review.

We, the undersigned, urge the Washington Department of Fish and Wildlife to withdraw the current SEPA threshold determination and draft a new, comprehensive Environmental Impact Statement that adequately reviews this issue of critical importance to the public.

This petition was signed and supported by the following 1,842 individuals on the following 35 pages.

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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

THE HONORABLE JOHN C. COUGHENOUR

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON
AT SEATTLE

WILD FISH CONSERVANCY, Plaintiff, v. COOKE AQUACULTURE PACIFIC LLC, Defendant.	CASE NO. C17-1708-JCC ORDER

This matter comes before the Court on Plaintiff's motion for partial summary judgment (Dkt. No. 29). Having thoroughly considered the parties' briefing and the relevant record, the Court finds oral argument unnecessary and hereby GRANTS in part and DENIES in part the motion for the reasons explained herein.

I. BACKGROUND

Defendant Cooke Aquaculture farms Atlantic salmon at net pen facilities located throughout Puget Sound. (*See* Dkt. No. 15 at 2.) The Clean Water Act ("CWA") requires any entity that discharges pollutants into the waters of the United States to hold and comply with the terms of a National Pollutant Discharge Elimination System ("NPDES") permit. 33 U.S.C. § 1342. Pursuant to the CWA, authorized state agencies may issue NPDES permits; in Washington, the Department of Ecology performs the functions necessary to "meet the requirements" of the CWA, including issuing permits. *See* 33 § U.S.C. 1342(b); Wash. Rev.

Code. § 90.48.260. A NPDES permit holder must prepare and implement certain plans to minimize and monitor the release of pollutants. *Id.* at § 1342(a)(2). Defendant operates its facilities pursuant to NPDES permits, which require, among other things, the preparation of a Pollution Prevention Plan and a Release Prevention and Monitoring Plan ("Release Prevention Plan") (together, "the plans") that satisfy the conditions of its permits. (*See* Dkt. No. 29-2 at 11–12.)

Defendant operated eight net pen facilities across Puget Sound until the collapse of its Cypress Site 2 ("Cypress 2") facility on or about August 20, 2017. (*See* Dkt. No. 1 at 9–10.) The collapse resulted in the release of thousands of Atlantic salmon into Puget Sound. (*Id.*) While Cypress 2 is no longer operational, Defendant continues to operate its other seven net pen facilities under its NPDES permits.[1] On August 24, 2017, Plaintiff sent Defendant a "Notice of Intent to Sue Under the Clean Water Act" letter ("notice letter") and sent a supplemental notice letter on September 6, 2017. (*Id.* at 22, 30.) On November 13, 2017, Plaintiff filed a complaint against Defendant asserting several CWA violations, including that Defendant's plans are facially noncompliant with their respective permits. (*See id.* at 2.) Plaintiff's motion for partial summary judgment asks the Court to find that Defendant's plans violated Conditions S6 and S7 of their NPDES permits. (Dkt. No. 29 at 5–6.)

II. DISCUSSION

A. Legal Standards

1. Summary Judgment

"The court shall grant summary judgment if the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." Fed. R.

[1] The Court does not address whether Cypress 2's plans violated the conditions of its permit in this order. Defendant asserts in its cross-motion for partial summary judgment that Plaintiff's alleged violations with respect to its permit for Cypress 2 are not ongoing or are moot. (*See* Dkt. No. 41 at 4.) In the interest of judicial economy, this order applies to all of Defendant's facilities except Cypress 2, which the Court will discuss in a separate order addressing Defendant's cross-motion for summary judgment.

Civ. P. 56(a). In making such a determination, the Court must view the facts and justifiable inferences to be drawn therefrom in the light most favorable to the nonmoving party. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986). Once a motion for summary judgment is properly made and supported, the opposing party "must come forward with 'specific facts showing that there is a genuine issue for trial.'" *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 587 (1986) (quoting Fed. R. Civ. P. 56(e)). Material facts are those that may affect the outcome of the case, and a dispute about a material fact is genuine if there is sufficient evidence for a reasonable jury to return a verdict for the non-moving party. *Anderson*, 477 U.S. at 248–49. Ultimately, summary judgment is appropriate against a party who "fails to make a showing sufficient to establish the existence of an element essential to that party's case, and on which that party will bear the burden of proof at trial." *Celotex Corp. v. Catrett*, 477 U.S. 317, 324 (1986).

2. Clean Water Act

The CWA's purpose is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251. Private citizens may initiate actions against alleged violators of the CWA's requirements, including violations of permit conditions. *Ass'n to Protect Hammersley, Eld, & Totten Inlets v. Taylor Res., Inc.*, 299 F.3d 1007, 1012 (9th Cir. 2002). In order to bring a CWA citizen suit, a plaintiff must satisfy the procedural requirement of providing notice to: (1) the alleged violator; (2) the Environmental Protection Agency ("EPA"); and (3) the state agency tasked with enforcing the CWA where the alleged violation occurred. *See* 33 U.S.C. § 1365(b). The CWA "authorizes citizens to enforce all permit conditions." *Nw. Envtl. Advocates v. City of Portland*, 56 F.3d 979, 986 (9th Cir. 1995).

As a threshold matter, a plaintiff must have statutory and Article III standing to bring a CWA claim. *Nat. Res. Def. Council v. Sw. Marine, Inc.*, 236 F.3d 985, 998 (9th Cir. 2000). A citizen has statutory standing to bring an enforcement action under the CWA for "ongoing" violations. *Id.* A citizen plaintiff can prove ongoing violations by demonstrating that either the violations continue on or after the complaint is filed, or that a reasonable trier of fact "could find

a continued likelihood of a recurrence in intermittent or sporadic violations." *Id.* To establish Article III standing, a plaintiff must demonstrate that: (1) he or she has suffered a concrete injury; (2) that the injury is fairly traceable to the defendant's conduct; and (3) that the injury can be redressed by prevailing in the case. *See Friends of the Earth, Inc. v. Laidlaw Envtl. Servs. (TOC), Inc.*, 528 U.S. 167, 181 (2000).[2]

B. Sufficiency of Plaintiff's 60-day Notice Letter

Plaintiff asserts that Defendant's Pollution Prevention Plans violate Conditions S6.F, S6.D, and S6.E of its permits, and that its Release Prevention Plans violate Condition S7.6 and the general requirements of Condition S7 of its permits.[3] (*See* Dkt. No. 1 at 23–26). Defendant argues that Plaintiff's notice letter was insufficient with respect to alleged violations of Conditions S6.D, S6.E, and S7, such that the Court lacks jurisdiction over the alleged violations. (Dkt. No. 36 at 18.)[4]

For district courts to have jurisdiction over CWA citizen suits, a plaintiff must provide notice to the alleged violator that contains "sufficient information to permit the recipient to identify the specific standard, limitation, or order alleged to have been violated," and "the activity alleged to constitute a violation." U.S.C. § 1365(b); 40 C.F.R. § 135.3(a). The Ninth Circuit requires that a plaintiff's 60-day notice letter includes "reasonably specific" information, so that the alleged violator will be able to "take corrective actions [to] avert a lawsuit." *Sw.*

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[2] Defendant does not dispute and the Court finds that Plaintiff has representational standing to sue on behalf of its members because: "(a) its members would otherwise have standing to sue in their own right; (b) the interests it seeks to protect are germane to the organization's purposes; and (c) neither the claim asserted nor the relief requested requires the participation of individual members in the lawsuit." *Ecological Rights Found. v. Pac. Lumber Co.*, 230 F.3d 1141, 1147 (9th Cir. 2000) (quoting *Hunt v. Wash. State Apple Advertising Com'n*, 432 U.S. 333, 343 (1977)).

[3] The permits for all of Defendant's seven net pen facilities were substantively identical. (*See* Dkt. No. 29-2 at 7–62.) Therefore, the Court's analysis of Plaintiff's claims applies to all of Defendant's facilities, except for Cypress 2 as previously explained. *See supra*, footnote 1.

[4] Defendant concedes that Plaintiff provided proper notice for alleged violations of Conditions S6.F and S7.6. (*Id.*)

Marine, 236 F.3d at 996; *San Francisco BayKeeper, Inc. v. Tosco Corp.*, 309 F.3d 1153, 1158 (9th Cir. 2002). If a plaintiff fails to provide reasonably specific notice of an alleged violation, then the Court lacks jurisdiction over the claim. *Sw. Marine*, 236 F.3d at 997.

The Ninth Circuit does not require a citizen plaintiff to "list every specific aspect or detail of every violation" in its notice letter, as long as it "is reasonably specific" and gives an alleged violator the "opportunity to correct the problem." *Waterkeepers N. California v. AG Indus. Mfg., Inc.*, 375 F.3d 913, 917 (9th Cir. 2004). "The key language in the notice regulation is the phrase 'sufficient information to permit the recipient to identify' the alleged violations and bring itself into compliance." *Id.* at 916 (citing *Cmty. Ass'n for Restoration of the Env't v. Henry Bosma Dairy*, 305 F.3d 943, 951 (9th Cir. 2002)).

1. Conditions S6.D and S6.E

Plaintiff's notice letter stated that Defendant was in violation of its permits for failing to "prepare a Pollution Prevention Plan for each net pen facility that addresses 'operations, spill prevention, spill response, solid waste, and storm water discharge practices which will prevent or minimize the release of pollutants from the facility to waters of the state.' Condition S6." (Dkt. No. 29-2 at 11.) Condition S6.D requires that Defendant's plans address "practices for the storage and, if necessary, disposal of disease control chemicals." (*Id.*) Condition S6.E requires that Defendant's plans address "how solid and biological wastes are collected, stored, and ultimately disposed. Among the solid wastes of concern are . . . blood from harvesting operations." (*Id.*) Plaintiff alleges that Defendant's plans failed to account for the storage and disposal of medicated feed, iodine, and the anesthetic MS-222, and that its plans contained no mention of the collection, storage, or disposal of harvest blood, in violation of Conditions S6.D and S6.E. (Dkt. No. 29 at 15.) Defendant argues that Plaintiff's notice letter was inadequate because it did not specifically identify Conditions S6.D or S6.E as alleged violations. (Dkt. No. 36 at 13.)

Although plaintiff's notice letter did not specifically list Conditions S6.D and S6.E, it

provided sufficient information for Defendant to identify and correct the alleged violations. Condition S6 requires that Defendant's plans address "solid waste" and practices to "prevent or minimize the release of pollutants from the facility" into the state's waters. (Dkt. No. 29-2 at 11.) By specifically referencing that language, Plaintiff gave Defendant notice that it was allegedly in violation of sub-conditions dealing with the handling of pollutants—disease control chemicals and solid waste from harvest blood. (*See* Dkt. No. 1 at 25.) Condition S6 specifically lists substances which are pollutants, including harvest blood and disease control chemicals. (Dkt. No. 29-2 at 11.) The Plans also identify blood from harvesting operations under the category of "solid wastes of concern." (*Id*.) By reading the language of Condition S6 in conjunction with its sub-conditions, Defendant could have reasonably identified that Plaintiff was alleging violations of Defendant's plans' provisions for disease control chemicals, harvest blood, or other pollutants and solid wastes listed under Condition S6.

Therefore, Plaintiff's notice letter provided reasonably specific notice to allow Defendant to identify alleged violations under Conditions S6.D and S6.E.

2. Condition S7's "Best Management Practices" Requirement

Plaintiff's notice letter alleged that Defendant failed "to identify and implement technology that will minimize fish escapes" under a heading titled "Violations of the Fish Release Prevention & Monitoring Plan." (Dkt. No. 1 at 4–5.) Condition S7 requires, *inter alia*, that Defendant's Release Prevention Plan include "identification and implementation of technology . . . [and] [r]outine procedures and best management practices used" to minimize the risk of fish escapements. (Dkt. No. 29-2 at 12.)

Plaintiff asserts that Defendant's mooring inspection intervals are not best management practices, as required by Condition S7, based on the annual mooring inspection requirement in Condition S6. (*See* Dkt. No. 29 at 19.) Specifically, Plaintiff argues that Defendant's 2012 and 2014 Release Prevention Plans violated its permits' requirements by providing for inspections of the high-current-end moorings every three years and for other moorings to be inspected every six

years. (*Id.*) Plaintiff also asserts that Defendant's 2017 Release Prevention Plan provides for high-current-end moorings inspections every three years and does not address inspection intervals for the other moorings. (*Id.*) Condition S7 does not require specific inspection periods. (*See* Dkt. No. 29-2 at 11.)

Defendant could not have reasonably identified Plaintiff's claim that Defendant was in violation of Condition S7 based on an inspection regime imposed by Condition S6. This section of the notice letter was clearly intended to address the Release Prevention Plans, which are governed by Condition S7, not Condition S6. (*See* Dkt. No. 29-2 at 11–12.) Moreover, Condition S7 does not require specific inspection intervals. (*See id.* at 12.) Plaintiff did not provide notice that would allow Defendant to identify what alleged violation that it needed to cure in order to avoid a lawsuit. As such, the Court cannot exercise jurisdiction over this claim. *See Sw. Marine*, 236 F.3d at 996.

The Court finds that Plaintiff's notice letter did not provide Defendant with sufficient notice as to this claim. Therefore, Plaintiff's motion for partial summary judgment is DENIED as to the alleged permit violations of Condition S7.

C. Permit Requirements and Defendant's Plans

The Court has jurisdiction over Plaintiff's claims regarding Conditions S6.D, S6.E, S6.F, and S7.6.[5] The Court next considers whether Plaintiff has demonstrated that no dispute of material fact exists as to whether Defendant's plans violated these permit conditions.

1. Condition S6.F

Condition S6.F requires that the plans include that Defendant will "[a]t least once per

[5] Plaintiff alleges that the permit violations in Defendant's October 2017 Pollution Prevention Plan and the 2017 Release Prevention Plan are also present in Defendant's prior plans during the five-year statute of limitations period. (Dkt. No. 29 at 7, 12.) Because violations in the prior plans can give rise to daily penalties, this order discusses alleged violations with regard to all of Defendant's plans during the relevant statute of limitations period. *See Borden Ranch P'ship v. U.S. Army Corps of Engineers*, 261 F.3d 810, 817 (9th Cir. 2001), *aff'd*, 537 U.S. 99 (2002).

year, conduct an inspection of the main cage structure and anchoring components above and below the water line." (Dkt. No 29-2 at 11.) Plaintiff alleges that Defendant's Pollution Prevention Plans violate Condition S6.F by failing to include adequate procedures for annual inspections of its main cage structure. (Dkt. No. 29 at 13.) Specifically, Plaintiff asserts that Defendant's 2012, 2015, and April 2017 Pollution Prevention Plans do not contain any main cage inspection requirements and that Defendant's October 2017 plan only requires inspection of the "cage system" as a whole after "a major storm event or any physical accident involving the farm site." (*Id.*; Dkt. No. 29-2 at 131.)

Defendant does not dispute that its plans prior to October 2017 were non-compliant with Condition S6.F, but argues that its updated October 2017 plan provides for, across various sections, at least annual inspections of the components of the main cage structure. (*See* Dkt. No. 36 at 18–21.) Defendant states that the "main cage structure" includes: (1) the cage system's floating walkway; (2) the stock (fish containment) nets; and (3) the predator nets. (*Id.* at 19–20.) Defendant asserts that its "Weekly Surface Inspection Sheet," which is attached to the October 2017 plan, provides for weekly inspection of the floating walkway, in satisfaction of Condition S6.F. (Dkt. No. 29-2 at 131.) The Weekly Surface Inspection Sheet requires Defendant to visually inspect the system mooring points; surface shackles, thimbles, and hardware; mooring lines; surface chain connections; walkway hinge points; and walkway grading condition. (*Id.* at 133.) The Weekly Surface Inspection Sheet does not include inspection of the floatation devices that support the walkway, which Plaintiff argues are part of the "below the water line" main cage structure. (*Id.*; Dkt. No. 29 at 14.)

With respect to the fish and predation nets, Defendant argues that the October 2017 plan's provisions for cleaning and repairing its nets satisfy Condition S6.F. (Dkt. No. 36 at 19.) Defendant's plan states that fish containment nets are "typically pulled to the surface once per year" and that fish containment nets and predator nets are removed at the end of a growing cycle for repair and cleaning. (Dkt. No. 29-2 at 129.) However, the plan's net cleaning procedures,

included under the section titled "Net Washing Practices," do not provide for annual inspection of the fish or predator nets, only that the nets are "to be pulled from the water and transported to a land based cleaning and repair facility" after a growing cycle. (*Id.*) Defendant's plan does not specify how often a growing cycle ends, or whether the cleaning and repair of nets represent the inspection that is required by Condition S6.F. (*See id.*) Facially, it appears that Defendant's net washing provisions are intended to satisfy the permit's requirement to include net cleaning procedures, not for annual "inspection of the main cage structure and anchoring components above and below the water line." (*Id.* at 11.)

The Court finds that Defendant's 2012, 2015, April 2017, and October 2017 Pollution Prevention plans failed to include annual inspection of the main cage system as required by Condition S6.F. Therefore, Plaintiff's motion for partial summary judgment is GRANTED as to Defendant's permit violations of Condition S6.F.

2. Condition S6.D

Condition S6.D requires that the plan address "[p]ractices for storage, and if necessary, disposal of disease control chemicals." (Dkt. No. 29-2 at 11.) Plaintiff argues that Defendant failed to include provisions to store and dispose of disease control chemicals in its 2012, 2015, April 2017, and October 2017 Pollution Prevention Plans. (Dkt. No. 29 at 15–16.) Plaintiff asserts that Defendant used medicated fish feed, iodine, and the anesthetic MS-222 as disease control chemicals, which its plans do not properly address. (*Id.*)

With respect to medicated fish feed, Plaintiff asserts that while Defendant's 2012 and 2015 Pollution Prevention Plans provided that the feed must be stored in leak proof containers, the plans failed to account for the disposal of medicated feed. (*Id.*) Defendant's 2012 and 2015 plans provide that "[a]ny medicated feed will be clearly marked on the label . . . [and] stored in leak-proof containers while at the facility." (Dkt. No. 29-2 at 113, 121.) Defendant's plans do not account for the disposal of medicated feed, which is required by Condition S6.D. (*See id.* at 11, 113, 121.) Defendant's April and October 2017 Pollution Prevention Plans discuss medicated

feed under the section "Disease Control Chemicals." (*See id.* at 125, 130.) Defendant's April and October 2017 plans provide that "any unused medicated feed that remains after the treatment period ends will be removed from the net pen site and transported back to an upland facility for covered storage" and that expired feed "will be disposed of at a solid waste facility." (*Id.*) Defendant's 2017 plans provided for storage of the feed *after* it is no longer at the facility, but do not address how it is stored when it is used to treat the fish at the facility.

Defendant argues that iodine and MS-222 are not disease control chemicals and therefore do not need to be addressed in its plans. (Dkt. No. 36 at 25.) With respect to iodine, Defendant states that "[i]odine is used as a disinfectant, primarily of boots." (*Id.*) Defendant's 2012, 2015, and April 2017, and October 2017 Pollution Prevention Plans list "disinfectants used for footbaths, dive nets, and other equipment" under the heading of "Disease Control Chemicals." (Dkt. No. 29-2 at 113, 121, 125, 130.) In response to an interrogatory asking it to "[d]escribe all efforts to treat, reduce, and/or prevent diseases . . . including the method and/or substances used," Defendant responded by stating, "[a]s with all biosecurity measures at the net pens, the mortality extraction bags used to collect the dead fish are disinfected after each use, using a 24 hour soak in an iodine solution." (*Id.* at 258–261.) Additionally, Defendant listed iodine and MS-222 on the 2016 "Annual Disease Control Chemical Use Report" required by its permits. (*Id.* at 247–55.) None of Defendant's Pollution Prevention Plans include procedures for the storage of iodine. (*See id.* at 113, 121, 125, 130.) Defendant's 2012 and 2015 plans addressed the disposal of iodine, but Defendant's April and October 2017 plans do not. (*See id.*) Defendant's plans do not mention MS-222. (*See id.*)

The Court finds that Defendant failed to address the storage and disposal of disease control chemicals in its 2012, 2015, April 2017, and October 2017 Pollution Prevention Plans. Therefore, Plaintiff's motion for partial summary judgment is GRANTED as to Defendant's permit violations of Condition S6.D.

3. Condition S6.E

Condition S6.E requires that the Pollution Prevention Plans address "[h]ow solid and biological wastes are collected, stored, and ultimately disposed. (Dkt. No. 29-2 at 11.) Plaintiff argues that Defendant's Pollution Prevention Plans fail to account for the collection, storage, and disposal of harvest blood. (Dkt. No. 29 at 16–17.) Defendant claims that its plan "adequately addresses how harvest blood is collected, stored, and disposed" because it does not bleed fish at the facilities. (Dkt. No. 36 at 26.) Defendant's plans do not address how it collects, stores, and disposes of harvest blood. (*See id.* at 113, 121, 125, 130.) Even if Defendant does not bleed fish at its facilities, its plans still had to address procedures for blood generated from harvesting operations. (Dkt. No. 29-2 at 11.) The plans' complete silence on this issue places it in facial violation of the permits. Therefore, Plaintiff's motion for partial summary judgment is GRANTED as to Defendant's permit violations of Condition S6.E.

4. Condition S7.6

Condition S7.6 requires that Defendant's plans include procedures for "routinely tracking the number of fish within the pens, the number of fish lost due to predation and mortality, and the number of fish lost due to escapement." (Dkt. No. 29-2 at 12.) Plaintiff argues that Defendant's plans fail to address procedures to routinely track the number of fish lost to predation or escapement. (Dkt. No. 29 at 17–18.) Defendant argues that its plans provide for routine tracking of mortalities in a variety of systems and that "[p]redation losses are simply a variety of mortalities at the site." (Dkt. No. 36 at 22.)

Defendant's 2012, 2014, and 2017 Release Prevention Plans state under the heading "Procedures for Routinely Tracking the Number of Fish" that fish are observed from the surface and that mortalities are removed and accounted for in a database (2012), log books (2014 plan), or an inventory system (2017 plan) after removal. (Dkt. No. 29-2 at 142, 157, 187.) Even if Defendant does track predation and escapement routinely, its permits state that the plan "must include . . . the following elements . . . "[p]rocedures for routinely tracking . . . the number of fish lost due to predation and mortality and the number of fish lost due to escapement." (*Id.* at

12.) Defendant's Release Prevention Plans fail to provide for such tracking. (*See id.* at 142, 157, 187.) Thus, Defendant's argument is based on what it was allegedly doing in practice, not what was included in the plans.

The Court finds that Defendant's 2012, 2014, and 2017 Release Prevention Plans did not satisfy Condition S7.6 of the permits. Therefore, Plaintiff's motion for partial summary judgment is GRANTED as to Defendant's permit violations of Condition S7.6.

III. CONCLUSION

For the foregoing reasons, Plaintiff's motion for partial summary judgment (Dkt. No. 29) is:

(1) GRANTED as to permit violations relating to Condition S6.F;

(2) GRANTED as to permit violations relating to Condition S6.D for Defendant's 2012, 2015, April 2017, and October 2017 Pollution Prevention Plans;

(3) GRANTED as to permit violations relating to Condition S6.E for Defendant's 2012, 2015, April 2017, and October 2017 Pollution Prevention Plans;

(4) GRANTED as to permit violations relating to Condition S7.6 for Defendant's 2012, 2014, and 2017, and Release Prevention Plans; and

(5) DENIED as to permit violations relating to Condition S7.

DATED this 26th day of April 2019.

John C. Coughenour
UNITED STATES DISTRICT JUDGE

THE HONORABLE JOHN C. COUGHENOUR

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON
AT SEATTLE

WILD FISH CONSERVANCY, Plaintiff, v. COOKE AQUACULTURE PACIFIC LLC, Defendant.	CASE NO. C17-1708-JCC ORDER

This matter comes before the Court on Defendant's motion to exclude expert opinions (Dkt. No. 82), Plaintiff's motion for partial summary judgment (Dkt. No. 79), and Defendant's motion for partial summary judgment (Dkt. No. 84). Having thoroughly considered the parties' briefing and the relevant record, the Court finds oral argument unnecessary and hereby DENIES Defendant's motion to exclude expert opinions (Dkt. No. 82), GRANTS in part and DENIES in part Plaintiff's motion for partial summary judgment (Dkt. No. 79), and DENIES Defendant's motion for partial summary judgment (Dkt. No. 84) for the reasons explained herein.

I. BACKGROUND

This lawsuit arises out of the 2017 collapse of one of Defendant Cooke Aquaculture Pacific LLC's Atlantic salmon net-pen facilities ("Cypress 2") in Deepwater Bay off Cypress Island, Washington. (*See* Dkt. No. 1 at 9–10.) The Clean Water Act ("CWA") prohibits discharges of pollutants into the waters of the United States, except pursuant to a National

Pollutant Discharge Elimination System ("NPDES") permit. 33 U.S.C. § 1342. As provided by the CWA, authorized state agencies may issue NPDES permits and enforce permit requirements. *See* 33 § U.S.C. 1342(b). In Washington, the Department of Ecology ("Ecology") performs the functions necessary to "meet the requirements" of the CWA, including issuing NPDES permits. Wash. Rev. Code. § 90.48.260.

Prior to the collapse of Cypress 2, Defendant operated eight Atlantic salmon net-pen facilities across Puget Sound pursuant to separate NPDES permits issued by Ecology. (*See* Dkt. Nos. 29-2 at 7–62, 44 at 4–33.) The net pens are floating facilities into which Defendant transfers Atlantic salmon smolts from its freshwater hatchery to be reared to a marketable size. (Dkt. No. 15 at 4.) The pens are made of metal walkways from which nets are hung. (Dkt. No. 29-2 at 70–73.) The net pens are held in place by a mooring system comprised of mooring chains or ropes attached to anchors. (*Id.* at 70–71, 87–88.) Defendant's NPDES permits impose numerous requirements for minimizing the discharge of pollutants from the facilities. (*See* Dkt. No. 44 at 8–21.) Defendant's NPDES permit for Cypress 2 was issued in October 2007 and was in force at all times relevant to this lawsuit. (Dkt. Nos. 42 at 5, 14; 44 at 1.)[1] Defendant operates its facilities on lands leased from the Washington State Department of Natural Resources ("DNR"). (*E.g.*, Dkt. No. 52-1 at 37–69.)

On August 19, 2017, Cypress 2 experienced mooring failures during very strong tidal currents. (Dkt. No. 42 at 2.) These mooring failures progressed over the following days and resulted in the facility's collapse and eventual destruction. (*Id.* at 2–3.) The catastrophic collapse of Cypress 2 resulted in the estimated release of more than 200,000 Atlantic salmon into Puget Sound. (Dkt. No. 29-2 at 200.) The collapse also resulted in the release of other debris from the facility into Puget Sound. (*Id.* at 211–12.) On August 24, 2017, Plaintiff sent Defendant a "Notice of Intent to Sue Under the Clean Water Act" letter ("notice letter") and sent a supplemental notice

[1] Although scheduled to expire in 2012, the Cypress 2 permit was administratively extended multiple times. (Dkt. Nos. 42 at 9, 44 at 4.).

letter on September 6, 2017. (Dkt. No. 1 at 22, 30.) On the same dates, Plaintiff mailed copies of the notice letter to the Administrator of the Environmental Protection Agency ("EPA"), the Regional Administrator of Region 10 of the EPA, and the Director of Ecology. (Dkt. No. 1 at 2–3.) On November 13, 2017, Plaintiff filed a complaint against Defendant asserting several CWA violations related to the Cypress 2 collapse, as well as violations at Defendant's seven other Puget Sound net-pen facilities. (*See generally id.*)

On August 25, 2017, DNR notified Defendant that it had defaulted on its obligations under the parties' lease and demanded that Defendant remove all damaged materials from the Cypress 2 site. (Dkt. No. 52-1 at 145.) DNR stated that it may terminate the lease if Defendant did not cure the default by September 24, 2017. (*Id.*) In a letter to DNR dated September 1, 2017, Defendant stated that it had "been implementing its Fish Escape Prevention Plan" and "reserve[d] all rights with respect to the Lease." (*Id.* at 149.) Defendant proceeded to conduct cleanup, salvage, and remediation at and around the Cypress 2 site throughout the rest of 2017 and into 2018. (*See* Dkt. Nos. 42, at 3–4, 29-2 at 210–12.)

On January 30, 2018, Ecology issued a $332,000 administrative penalty against Defendant arising from the Cypress 2 collapse. (Dkt. No. 52-1 at 160–66.) Ecology concluded that Defendant violated its NPDES permit by negligently allowing the release of farmed salmon, failing to inspect anchoring components deeper than 100 feet, and not adequately cleaning the facility's nets. (*Id.* at 163–64.) On March 1, 2018, Defendant appealed Ecology's penalty to the Washington State Pollution Control Hearings Board. (Dkt. Nos. 42 at 4, 52-1 at 169); *see also* Wash. Rev. Code §§ 43.21B.010, 43.21B.110.

On February 2, 2018, DNR terminated Defendant's lease for Cypress 2. (Dkt. No. 42 at 4.) Defendant responded on March 1, 2018, by filing a complaint in Thurston County Superior Court challenging DNR's termination of the lease. (Dkt. No. 52-1 at 11–32.) Among other relief, Defendant sought a declaratory judgment that DNR was not "entitled to withhold its consent to [Defendant's] reconstruction of [Cypress] 2 . . . and that it is entitled to restock [Cypress] 2 as

soon as it has been rebuilt." (*Id.* at 28.)

On March 22, 2018, Washington's governor signed legislation that prohibits DNR from either granting new leases of aquatic lands for non-native finfish aquaculture projects or renewing or extending a lease in existence as of June 7, 2018, that includes non-native finfish aquaculture. *See* Wash. Rev. Code § 79.105.170; *see also* H.B. 2957, 65th Leg., Reg. Sess. (Wash. 2018).

On April 24, 2019, Defendant and Ecology entered a consent decree to resolve Defendant's liability related to the Cypress 2 collapse and the corresponding violations identified by Ecology in its notice of administrative penalty. (*See* Dkt. No. 74-1 at 4–11.) On April 25, 2019, the Pollution Control Board, pursuant to the consent decree, dismissed Defendant's appeal of Ecology's administrative penalty. (*Id.* at 18.) Defendant has not conducted net-pen operations at Cypress 2 since its collapse in August 2017. (Dkt. No. 43 at 3.) In fact, the Cypress 2 facility no longer exists, and its remains were ultimately salvaged and removed from the site following the collapse. (*Id.*; *see* Dkt. No. 29-2 at 210–12.) Defendant states that it has no intention of rebuilding Cypress 2. (Dkt. No. 43 at 3.) On December 21, 2018, Defendant requested that Ecology terminate the permit for Cypress 2. (Dkt. No. 86 at 4.) On August 29, 2019, Ecology informed Defendant that it had completed its closure monitoring of Cypress 2 and that the permit would be terminated as of September 28, 2019. (See Dkt. No. 86 at 6.) Defendant has represented that it has not appealed the decision. (*See* Dkt. No. 84 at 9.) Defendant continues to operate its other seven net pen facilities under its NPDES permits. (*See* Dkt. Nos. 29-2 at 7–62, 44 at 4–33.)

Defendant now moves to exclude Plaintiff's expert opinions on risk of failure (Dkt. No. 82), Plaintiff moves for partial summary judgment on multiple claims (Dkt. No. 79), and Defendant moves for partial summary judgment on the grounds of *res judicata* and mootness (Dkt. No. 84).

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II. DISCUSSION

A. Legal Standards

"The court shall grant summary judgment if the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(a). In making such a determination, the Court must view the facts and justifiable inferences to be drawn therefrom in the light most favorable to the nonmoving party. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986). Once a motion for summary judgment is properly made and supported, the opposing party "must come forward with 'specific facts showing that there is a *genuine issue for trial*.'" *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 587 (1986) (quoting Fed. R. Civ. P. 56(e)). Material facts are those that may affect the outcome of the case, and a dispute about a material fact is genuine if there is sufficient evidence for a reasonable jury to return a verdict for the non-moving party. *Anderson*, 477 U.S. at 248–49. Conclusory, non-specific statements in affidavits are not sufficient, and "missing facts" will not be "presumed." *Lujan v. Nat'l Wildlife Fed'n*, 497 U.S. 871, 888–89 (1990). Ultimately, summary judgment is appropriate against a party who "fails to make a showing sufficient to establish the existence of an element essential to that party's case, and on which that party will bear the burden of proof at trial." *Celotex Corp. v. Catrett*, 477 U.S. 317, 324 (1986).

B. Defendant's *Daubert* Motion to Exclude Dr. Tobias Dewhurst's Expert Opinions Regarding Risk of Failure

The trial court has the "task of ensuring that an expert's testimony both rests on a reliable foundation and is relevant to the task at hand." *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579, 597 (1993). A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if: (1) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (2) the testimony is based on sufficient facts or data; (3) the testimony is the product of reliable principles and methods; and (4) the expert has reliably

applied the principles and methods to the facts of the case. Fed. R. Evid. 702.

In *Daubert*, the Supreme Court rejected the rigid "general acceptance" test for the admissibility of scientific evidence. 509 U.S. at 596. The Court reasoned that "[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence." *Id.* When determining admissibility, the text is "a flexible one," with a focus on principles and methodology. *Id.* at 595. Rule 702 is generally construed liberally. *United States v. Hankey*, 203 F.3d 1160, 1168 (9th Cir. 2000). And in determining the admissibility of expert testimony, "there is less danger that a trial court will be 'unduly impressed by the expert's testimony or opinion' in a bench trial." *FTC v. BurnLounge, Inc.*, 753 F.3d 878, 888 (9th Cir. 2014).

Dr. Tobias Dewhurst is a marine engineering expert retained by Plaintiff to evaluate the safety of Defendant's net pens. (Dkt. No. 83-1 at 6.) To establish predicted environmental conditions at the net pens, Dewhurst used an international standard, the Norwegian Aquaculture Standard 9415 ("NS9415"), to analyze data on local environmental conditions as measured by TerraSond, a company Defendant has retained. (*Id.* at 21–22.) Dewhurst used these predicted conditions to calculate the loading forces exerted on the net pets. (*Id.* at 27–28.) Dewhurst then compared the net pen manufacturer specifications with the predicted environmental conditions for each site. (Dkt. No. 79-3 at 11–12.) Defendant argues that the Court should exclude from trial Dewhurst's opinion that each of Defendant's current net pen facilities are "at risk of failure." (Dkt. No. 82.) Defendant offers three reasons to exclude Dewhurst's testimony as unreliable under Rule 702. (*See id.*)

First, Defendant argues that Dewhurst should have performed analytical modeling to quantify the risk of failure. (*Id.* at 10–12.) This criticism is not an attack on the reliability of the expert's methodology, but instead an argument as to how to weigh the opinion. Thus, it is not a ground to exclude the testimony under *Daubert*. *See* 509 U.S. at 595–96. Defendant cites an out-of-circuit case in which the district court exercised its discretion to exclude an opinion in which

an expert offered an opinion on the degree of risk posed by contamination. (*See* Dkt. No. 82 at 13.) But that court concluded the expert opinion lacked a sufficient basis in facts or data under Rule 702, not that the expert's methodology was unreliable. *See Lewis v. FMC Corp*., 786 F. Supp. 2d 690, 702–03 (W.D.N.Y. 2011) (noting that the expert conceded further investigation was required to determine the extent of the contamination).

Second, Defendant contends that Dewhurst's opinion should be excluded because he equates the net pen manufacturer specifications with the net pen's safe operating limits. Defendant argues that manufacturer specifications are too conservative a basis for determining whether the net pen operations are safe, arguing that a non-compliant net pen could still be shown to be safe based on an engineer's analysis. (Dkt. Nos. 82 at 13–14, 104 at 3–7.) But it is hard to see how Defendant could seriously contend that a manufacturer's product specifications are not at least relevant to the safe operations of a product. Indeed, Defendant's own expert conducted a similar analysis of predicted environmental conditions compared to conditions allowed by the manufacturer. (Dkt. No. 83-1 at 22.) Thus, Defendant's assertion that a non-compliant net pen *might* still be safe likewise goes to the weight, not reliability, of Dewhurst's testimony. *Daubert*. *See* 509 U.S. at 595–96.

Third, Defendant argues that Dewhurst's opinion should be excluded because he does not quantify the degree of risk of failure for each net pen site and has not differentiated as to whether there is a low or high risk of failure for each site. (Dkt. No. 82 at 14–15.) Once again, this is an attack on weight, not reliability, of the expert opinion. *Daubert*. *See* 509 U.S. at 595–96.

Thus, Defendant has not raised any serious challenge to the reliability of the principles or methodology supporting Dewhurst's expert opinion. *See* Fed. R. Evid. 702. Defendant remains free to challenge the expert opinion through "[v]igorous cross-examination" and "presentation of contrary evidence." *See Daubert*, 509 U.S. at 596. Therefore, Defendant's motion to exclude Dewhurst's risk of failure testimony is DENIED on these grounds.

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C. Plaintiff's Motion for Partial Summary Judgment

1. Plaintiff's Request to Strike

In a summary judgment ruling, a trial court may consider only evidence which could be admissible at trial. *See* Fed. R. Civ. P. 56(c); *Nilsson v. City of Mesa*, 503 F.3d 947, 952 n.2 (9th Cir. 2007). Plaintiff requests that the Court strike several items of evidence that Defendant has submitted in opposition to Plaintiff's motion for partial summary judgment. (*See* Dkt. No. 95 at 5–7.) The Court considers each request in turn.

a. *Declarations of Stephen Weatherford and Bill French*

Federal Rule of Civil Procedure 26(a) requires that parties disclose the names of "each individual likely to have discoverable information—along with the subjects of that information—that the disclosing party may use to support its claims or defenses." Fed. R. Civ. P. 26(a)(1)(A)(i). A party must supplement its disclosure "in a timely manner if the party learns that . . . the disclosure . . . is incomplete or incorrect, and if the additional or corrective information has not otherwise been made know to the other parties during the discovery process or in writing." Fed. R. Civ. P 26(e)(1)(A). Where a party fails to disclose its intent to rely on a witness either without substantial justification or where the nondisclosure was not harmless, Rule 37(c)(1) provides that the party is "not allowed to use that information or witness" at trial. Fed. R. Civ. P. 37(c)(1); *Yeti by Molly, Ltd. v. Deckers Outdoor Corp.*, 259 F.3d 1101, 1106 (9th Cir. 2001).

In opposition to Plaintiff's motion for partial summary judgment, Defendant submitted the declarations of Stephen Weatherford and Bill French. (Dkt. Nos. 90, 91.) Their declarations primarily concern the inspections Defendant performed of anchoring components. (*See id.*) Defendant did not previously disclose its intent to rely on these witnesses to Plaintiff. (*See* Dkt. No. 95-1 at 4–7.) Weatherford and French are Defendant's employees, and it appears there is no justification for failing to timely identify these witnesses. This omission is not harmless because Plaintiff has repeatedly sought discovery of information on Defendant's inspections of anchoring

systems. Because the failure to disclose is neither substantially justified nor harmless, Defendants may not introduce these witnesses. *See* Fed. R. Civ. P. 37(c)(1). *Yeti by Molly, Ltd.*, 259 F.3d at 1106. Therefore, the Court GRANTS Plaintiff's request to strike the declarations of Stephen Weatherford and Bill French on this ground.

b. *Sham affidavit rule*

Under the "sham affidavit rule," a party cannot create an issue of fact with an affidavit contradicting prior statements that the party made under oath. *Yeager v. Bowlin*, 693 F.3d 1076, 1079–80 (9th Cir. 2012); *see Miller v. Glenn Miller Prods., Inc.*, 454 F.3d 975, 980 (9th Cir. 2006). The rule applies to "clear and unambiguous" contradictions that cannot be resolved with "a reasonable explanation." *Yeager*, 693 F.3d at 1080–81 (citing *Cleveland v. Policy Mgmt. Sys. Corp.*, 526 U.S. 795, 806–07 (1999)). However, the rule "should be applied with caution because it is in tension with the principle that the court is not to make credibility determinations when granting or denying summary judgment." *Id.* at 1080. "[T]he non-moving party is not precluded from elaborating upon, explaining or clarifying prior testimony elicited by opposing counsel on deposition; minor inconsistencies that result from an honest discrepancy, a mistake, or newly discovered evidence afford no basis for excluding an opposition affidavit. *Messick v. Horizon Indus. Inc.*, 62 F.3d 1227, 1231 (9th Cir. 1995).

Plaintiff requests to strike under the sham affidavit rule portions of declarations by James Parsons and Randy Hodgin that assert Defendant conducted mooring inspections for which records do not exist. (Dkt. No. 95 at 5.) Defendant designated Parsons as its representative for a 30(b)(6) deposition on the topics of Defendant's inspections of the net pen anchoring components, including how the inspections were documented. (*See* Dkt. No. 46-1 at 11, 21, 70.) At his deposition, Parsons stated that he was prepared to testify on these topics. (*See, e.g.*, Dkt. 46-1 at 70.) Parsons repeatedly testified that the information Plaintiff sought is contained in the

records.[2] (Dkt. No. 46-1 at 156–59, 178–79.) For example, in response to Plaintiff's inquiry as to the names of the divers who conducted mooring inspections of Cypress 1 in 2016, Parsons stated, "[i]t would have been any member of the dive team." (*Id.* at 156–57.) And when asked for the dates of when those inspections occurred, Parsons stated, "[t]hey would be available in the dive logs and daily records." (Dkt. No. 46-1 at 156–57.)

In its opposition to Plaintiff's motion to compel a second 30(b)(6) deposition, Defendant represented to the Court that, with respect to "specific details regarding the names, dates, and locations of routinely conducted mooring inspections. . . . [a]ll of the information sought by Plaintiff was contained in the tens of thousands of pages of business records produced to [Plaintiff] before deposition, and all of the information could have been obtained by [Plaintiff] simply by reviewing those documents."[3] (Dkt. No. 49 at 2.) Defendant stated that the records of "which [] employee conducted which inspection on which day at which site—were provided to Plaintiff many times in a variety of ways." (*Id.* at 3.)

The Court allowed Plaintiff to depose Defendant for one additional day. (Dkt. No. 66 at 6.) At that deposition, Parsons testified that it was likely that not all inspections were reflected in the records, (Dkt. No. 79-1 at 215), that just "[b]ecause the records may not exist doesn't mean that it wasn't done," (*id.* at 217), that the daily logs and dive logs are incomplete for Cypress, (*id.* at 220), that "we have good records that [inspections] were occurring at all of the other sites," (*id.* at 220), and that additional information could be obtained from current and former employees, (*e.g.*, *id.* at 132, 258). Thus, Defendant has changed its answer about its practice of recording mooring system inspections: while Defendant initially maintained that all such

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[2] In its order on Plaintiff's motion to compel, the Court evaluated Parson's responses at length and found them evasive. (*See* Dkt. No. 66 at 3–5.) The Court found this evasiveness, combined with Defendant's last-minute disclosure of over 30,000 documents days before deposition, frustrated Plaintiff's ability to develop testimony on the topic of mooring system inspections. (Dkt. No. 66 at 5–6.)

[3] A court has discretion to consider whether a statement of fact contained in a brief may be considered an admission *Am. Title Ins. Co. v. Lacelaw Corp.*, 861 F.2d 224, 227 (9th Cir. 1988).

information was in its records, Defendant now maintains that not all inspections were logged in the records, and further information can be obtained from its employees.

Plaintiff argues that Defendant's change in position amounts to a clear contradiction of its own sworn testimony that *all* of the information on mooring inspections is contained in the records. (Dkt. 95 at 5–6.) Defendant's misleading initial testimony frustrated Plaintiff's ability to develop testimony on the topic of mooring systems inspections. (Dkt. No. 66 at 5–6.) Defendant has not attempted to reconcile the difference in its initial position by explaining the discrepancy as an honest mistake or caused by newly discovered evidence.[4] (*See* Dkt. No. 87 at 19.) But Defendant's new position is arguably an elaboration or clarification of Defendant's prior evasive testimony. *See Messick*, 62 F.3d at 1231. Especially given the Ninth's Circuit caution to avoid credibility determinations at summary judgment, Defendant's discrepancy is not such a clear and unambiguous contradiction as to require striking Parsons's and Hodgin's declarations under the sham affidavit rule. *See Yeager*, 693 F.3d at 1080–81. Therefore, the Court DENIES Plaintiff's request to strike Parsons's and Hodgin's declarations.

c. *Parsons declaration and Defendant's interrogatory responses*

Plaintiff requests that the Court strike portions of the Parsons declaration that Plaintiff asserts lacks foundation and are based on hearsay. (Dkt. No. 95 at 6.) Plaintiff also requests the Court strike Defendant's interrogatory responses attached to the declaration of Douglas Steding. (*See id.* at 7.) The Court recognizes that assertions in conclusory, self-serving affidavits are insufficient, standing alone, to create a genuine issue of material fact. *Nilsson*, 503 F.3d at 952 n.2.

d. *Mott MacDonald Report*

Plaintiff requests that the Court strike the Mott MacDonald reports attached to James

[4] Instead, Defendant blames Plaintiff for failing to conduct fact witness depositions based on Defendant's roster of over 200 employees and its response to Interrogatory No. 5. (*See* Dkt. No. 87 at 19.)

Parsons's declaration. (Dkt. No. 95 at 6.) Plaintiff argues that these unsworn reports constitute inadmissible hearsay and that Parsons is not competent to testify as to the expert opinions the reports contain. (*Id.*) Plaintiff does not dispute the authenticity of these reports that Mott MacDonald prepared for DNR. (*See id.*) Indeed, Plaintiff appears to have submitted at least two of the same reports in support of its motions. (*Compare* Dkt. No. 79-2 at 81, 87, *with* Dkt. No. 94 at 25, 32.) Given the likelihood that the material in the reports could ultimately "be presented in a form that would be admissible in evidence" at trial, the Court declines to strike them. *See* Fed. R. Civ. P. 56(c)(2).

2. Implementation of Technology to Minimize Fish Escapement

Condition S7.1 of the permits requires that Defendant identify and implement technology that will minimize fish escapements. (Dkt. No. 29-2 at 12.) In its enforcement of NPDES permits, Ecology incorporates Washington's "AKART" standard, which requires "all known, available, and reasonable methods of treatment" to minimize water pollution. *See* Wash. Admin. Code § 173-220-130(1)(a); *see also Snohomish County v. Pollution Control Hearings Bd.*, 386 P.3d 1064, 1067 (Wash. 2016).

a. *Pre-suit notice of violation of Condition S7.1*

For district courts to have jurisdiction over CWA citizen suits, a plaintiff must provide notice to the alleged violator that contains "sufficient information to permit the recipient to identify the specific standard, limitation, or order alleged to have been violated," and "the activity alleged to constitute a violation." U.S.C. § 1365(b); 40 C.F.R. § 135.3(a). "The key language in the notice regulation is the phrase 'sufficient information to permit the recipient to identify' the alleged violations and bring itself into compliance." *Waterkeepers N. California v. AG Indus. Mfg., Inc.*, 375 F.3d 913, 916 (9th Cir. 2004) (citing *Cmty. Ass'n for Restoration of the Env't v. Henry Bosma Dairy*, 305 F.3d 943, 951 (9th Cir. 2002)).

Defendant contends that Plaintiff failed to provide notice regarding these claims because its notice letter did not cite NS9415 or specifically allege Plaintiff's contention that Defendant

needs to conduct further engineering analyses of the cages. (Dkt. No. 87 at 17.) Plaintiff's notice letter specifically lists Condition S7.1 and contains the language at issue for this claim. (Dkt. No. 1 at 25–26.) The letter alleged that Defendant violated permit requirements "at all eight of its Puget Sound net pen facilities by failing to identify and implement technology that will minimize fish escapements." (*Id.*) Thus, Defendant could have reasonably identified Plaintiff's claims that Defendant failed to implement technology to minimize fish escapes. Therefore, the Court FINDS that Plaintiff's notice letter provided reasonably specific notice to allow Defendant to identify the alleged violations under Condition S7.1.

b. *Technology necessary to evaluate suitability of salmon farms for their locations*

Plaintiff argues that the Washington's AKART standard for technology requires Defendant to reevaluate whether its salmon farm systems and configurations are suitable for the local environmental conditions at each site. (Dkt. No. 79 at 11–13.) Plaintiff relies on Dewhurst's opinion stating that since 2006, aquaculture standards including NS9415 have been available for conducting a current analysis to determine whether Defendant's net pen systems were suitable for those locations. (*Id.* at 12.) Plaintiff argues that following promulgation of the NS9415 standard, Defendant should have studied its equipment then in use and subsequently installed to determine whether it could withstand the local conditions. (*Id.* at 11–13.) Plaintiff argues Defendant's failure to conduct theses analyses violated Condition S7.1. (*Id.*)

Defendant argues that it has complied with Condition S7.1 by providing Release Prevention Plans that appropriately describe new cage systems as technology that has been or would be implemented. (Dkt. No. 87 at 12.) Defendant argues that it is standard industry practice to make suitability determinations at the time of installation or when making substantial changes to the facility, and thus the standard that Dewhurst cites, NS9415, should not come into play. (Dkt. No. 87 at 13.) It argues that AKART standards for technology are fully addressed during permit issuance. (*Id.* at 14.) Defendant contends that the relevant AKART standard is set forth in a different section of the Washington Administrative Code, § 173- 221A. (*Id.* at 15.) Finally,

Defendant contends that it would not be reasonable under the AKART standard to require replacement of the net pens prior to the end of their useful life. (*Id.*)

Thus, material issues of fact remain as whether Condition S7.1 requires Defendant to undertake a suitability analysis of its net pen systems. Therefore, Plaintiff's motion for summary judgment is DENIED on this ground.

c. *Improvement to net pen structures*

In Defendant's Release Prevention Plans, Defendant has identified improved cage systems to be implemented in the future. (Dkt. No. 29-2 at 136.) Plaintiff argues that these plans required Defendant to undertake replacement of existing net pens. (Dkt. No. 79 at 13–14.) Plaintiff further contends that the current net pens are at risk of failure because they do not comply with manufacturer recommendations and because there has not been adequate independent analysis of the suitability of the systems. (Dkt. No. 79 at 14.). Plaintiff relies on Dewhurst's expert opinions that conclude the systems are at risk of failure. (*Id.*)

Defendant does not contest that its Release Prevention Plans required it to implement new cage systems. (*See* Dkt. No. 87 at 15–17.) However, Defendant argues that its net pens are safe and are not at risk of failure. (*Id.*) Defendant relies on Dean Steinke's expert testimony that the manufacturer ratings are guidelines but do not indicate the true limits of the net pens. (*Id.* at 16–17.) Steinke asserts that the ratings lack detail and cannot be compared to NS9415 values. (Dkt. No. 92 at 4–8.) Steinke also argues that Dewhurst's calculations of drag force are flawed because they fail to account for net deflection that reduces projected surface area. (*Id.*)

Thus, material issues of fact remain as whether Defendant's net pen structures violate Condition S7.1. Therefore, Plaintiff's motion for summary judgment is DENIED on this ground.

3. Annual Inspection of Anchoring Components

Condition S6.F of Defendant's NPDES permit requires the preparation and implementation of a Pollution Prevention Plan that provides for at least annual inspections of the anchoring components above and below the water line. (*See* Dkt. 44 at 19–20.) Plaintiff argues

that Defendant has violated this requirement by failing to annually inspect all underwater mooring components, and Plaintiff further argues that Defendant's violations of this requirement are ongoing because they have recurred since the complaint was filed. (*See* Dkt. No. 79 at 17.)

a. *Cypress Sites 1 and 3 (2013–2016)*

Altogether, Defendant's Cypress sites had a total of 71 anchor lines: Cypress 1 has 25 lines, Cypress 2 had 19 lines, and Cypress 3 has 27 anchoring lines. (Dkt. No. 46-1 at 147, 163, 173.) Defendant's records indicate that in 2013, one dive may have inspected two or three anchor lines and seven additional dives might have involved work on up to 14 anchor lines. (*Id.* at 251–53.) In 2014, one dive may have involved an inspection of a Cypress anchor line, and four dives may have involved work on up to eight Cypress anchor lines. (*Id.* at 236–39.) In 2015, Defendant performed work on two anchor chains at Cypress 2 and three anchor chains at Cypress 3, and some surface inspections occurred. (*Id.* at 223–25, 232.) In 2016, records show Defendant may have inspected the uppermost chain components plus one anchor chain. (Dkt. No. 79-1 at 193, 198–200, 211–13.) Thus, Plaintiff has made a showing that Defendant made spotty inspections of its mooring systems and thus failed to complete the required annual inspections of the 25 mooring lines at Cypress 1 and 27 mooring lines at Cypress 3 in 2013, 2014, 2015, and 2016.

In opposition to Plaintiff's motion, Defendant does not point to a single additional record to demonstrate that it conducted a below-water inspection of these mooring systems. (*See* Dkt. No. 87 at 20–21.) Defendant relies instead on its responses to Interrogatory Topic No. 5 and the Rule 30(b)(6) deposition of Defendant in which Parsons testified. (*Id.* at 18–20.) In the responses and deposition, Defendant stated that it conducted the required annual inspections. (*See* Dkt. Nos. 93 at 24–26, 94 at 301–320.) But self-serving declarations not based upon personal knowledge are insufficient to demonstrate a factual dispute. *Nilsson*, 503 F.3d at 952 n.2.

Parsons testified that he was prepared to testify as to record-keeping practices and that all inspections were in the records. (Dkt. No. 46-1 at 70, 156–59, 178–78.) Parsons later testified at his second deposition that the absence of an inspection record does not necessarily mean that an

inspection did not occur. (Dkt. No. 79-1 at 217.) Defendant has admitted that the records collected in response to Interrogatory No. 5 "mostly only tangentially contained evidence of anchor inspections." (Dkt. No. 87 at 20.) Defendant now argues that "the absence of a non-mandatory record does not entitle [Plaintiff] to an inference that the inspections did not occur." (*Id.* at 17.)

On a summary judgment motion, credibility determinations are not appropriate, and a court must draw all justifiable inferences in the light most favorable to the nonmoving party. *See Liberty Lobby*, 477 U.S. at 255. A reasonable trier of fact could infer that the absence of non-mandatory anchor inspection records does not prove that Defendant failed to make the anchor inspections. Thus, material issues of fact remain as to whether anchor inspections occurred at Cypress 1 and 3 between 2013 and 2016. Therefore, Plaintiff's motion for summary judgment is DENIED on this ground.

b. *Anchoring components deeper than 100 feet*

Five of Defendant's sites have mooring components deeper than 100 feet: Orchard Rocks, Clam Bay, Port Angeles, and Cypress 1 and 3. (Dkt. No. 46-1 at 68, 110–11, 136, 147, 173.) The Permits unambiguously require inspections of the entire mooring components, not only those above 100 feet. (Dkt. 29-2 at 11.) Defendant's employees may not dive deeper than 100 feet. (*See* Dkt. No. 25-1 at 63.) Until 2017, Defendant conducted visual inspections only of the shallower components of these systems, but Defendant contends that it "inspected" the deeper components by examining the condition of the shallower components and by checking line tension or pulling up anchors. (*See* Dkt No. 46-1 at 61, 87 at 22, 89 at 2–3.) Ecology concluded that this form of examination does not meet permit requirements for "inspection." (Dkt. No. 52-1 at 163–64.)

A court shall interpret an NPDES permit like any other contract. *Nat. Res. Def. Council, Inc. v. County of Los Angeles*, 725 F.3d 1194, 1204–05 (9th Cir. 2013). If the language is plain, the court construes its meaning. *Id.* If the language is ambiguous, the court "may turn to extrinsic

evidence to interpret its terms." *Id.* As the agency charged with enforcing NPDES permits, Ecology's interpretation of the ambiguous term "inspection" is entitled to substantial deference. *See Russian River Watershed Prot. Comm. v. City of Santa Rosa*, 142 F.3d 1136, 1141 (9th Cir. 1998) (holding that the district court properly deferred to the agency authorized to enforce NPDES permits); *Nat. Res. Def. Council, Inc.*, 725 F.3d at 1205. Thus, Plaintiff has shown that Defendant violated the permits by not inspecting mooring components deeper than 100 feet at Orchard Rocks, Clam Bay, Port Angeles, and Cypress 1 and 3 in 2012, 2013, 2014, 2015, and 2016. Therefore, Plaintiff's motion for summary judgment is GRANTED on this ground.

c. *Cypress 1 and 3 (2018) and Port Angeles (2017)*

Defendant's Pollution Prevention Plan that went into effect in October 2017 required it to use either a contracted dive service or a remotely operated vehicle to conduct inspections of its moorings below the employee diver depth limit of 100 feet. (Dkt. No. 29-2 at 11, 131.) The plan further required Defendant to document its visual inspection of each anchoring line and identify maintenance concerns. (*Id.* at 131, 134.) The permits require Defendant to operate its facilities in accordance with the plan. (*E.g.*, *id.* at 11.)

As part of DNR's investigation of Defendant following the collapse of Cypress 2, DNR hired Mott MacDonald and its subcontractor Collins Engineers. (Dkt. No. 79-2 at 631–34.) Mott MacDonald evaluated Cypress 1 and 3 in 2018 and Port Angeles in 2017. Defendant relies on the inspections that Mott MacDonald performed to fulfill its anchor inspection requirements for Cypress 1 and 3 in 2018 and Port Angeles in 2017. (Dkt. Nos. 46-1 at 333–34, 89 at 24–25.)

But the report was prepared for use by DNR and other state agencies; it was "limited in scope" and "[d]etailed inspection and physical material sampling were not performed," and the report did not make repair or maintenance recommendations. (Dkt. No. 79-2 at 632.) Defendant reviewed the report's conclusion but did not undertake additional steps to determine whether maintenance work was needed. (*See* Dkt. No. 79-2 at 147–53.) Parsons testified that Defendant's employees did inspect the mooring systems at Port Angeles in 2017, but he admits that the

mooring lines and anchors were not inspected below 100 feet. (*See* Dkt. No. 79-1 at 185–90.) Thus, Plaintiff has demonstrated that Defendant violated the permits by failing to inspect mooring components at Cypress 1 and 3 in 2018 and at Port Angeles in 2017 in the manner required by the permits and the October 2017 Pollution Prevention Plan. Therefore, Plaintiff's motion for summary judgment is GRANTED on this ground.

d. *Completion of inspection forms (2017–2018)*

Defendant's October 2017 Pollution Prevention Plan also required it to complete an Annual Below Surface Visual Inspection form "to record the condition of the mooring components and identify specific maintenance concerns." (Dkt. 29-2 at 131–32, 134.) The form requires a detailed assessment of the mooring system, including an assessment of (1) each component of each mooring line, (2) whether routine or immediate repairs are needed, (3) the dates when repairs were identified and completed, (4) a description of the repair, (5) the name of the person completing the repair, (6) the name of the person completing the inspection form, and (6) the date the form was completed. (*Id.* at 134.) As mentioned above, the permits require Defendant to operate in accordance with the plan. (*E.g.*, Dkt. 29-2 at 11.)

It is undisputed that Defendant completed the form for its Hope Island site in 2017 and 2018. (*See* Dkt. Nos. 79 at 25, 79-1 at 142–45, 274–77.) It is likewise undisputed that Defendant failed to complete the form for the remainder of its sites. (*See generally* Dkt. Nos. 79, 87, 95.)[5] Under the Clean Water Act, Defendant is strictly liable for failure to use the required form. *See Sierra Club v. Union Oil of Cal.*, 813 F.2d 1480, 1490–91 (9th Cir. 1987). Thus, Plaintiff has demonstrated that Defendant violated the permits by failing to complete the required Annual Below Surface Visual Inspection forms for Cypress 1 and 3, Port Angeles, Orchard Rocks, Fort Ward, and Clam Bay in 2017 and 2018. Therefore, Plaintiff's motion for summary judgment is

[5] Defendant observes that the Court has already found that the 2017 Pollution Prevention Plans were deficient, (Dkt. No. 68), and suggests that "if any violation exists here, it is at most a failure to implement a plan that the Court already has determined was insufficient." (Dkt. No. 87.)

GRANTED on this ground.

4. Reporting of Fish Escapement and Tracking Fish Numbers

The permits require Defendant provide in its Release Prevention Plan "[p]rocedures for routinely tracking the number of fish within the pens, the number of fish lost due to predation and mortality, and the number of fish lost due to escapement." (Dkt. No. 29-2 at 12.) The permits further require Defendant to submit an Annual Fish Release Report by January 30 of each year, which "must include, to the extent possible, all fish released or escaped to state waters, including all Significant Fish Releases (see S8)." (*Id*. at 12.) Condition S8 defines a release as "significant" when it involves "1,500 or more fish whose average weight exceeds 1 kilogram (kg) or 3,000 or more fish whose average weight is equal to or less than 1 kg." (*Id.* at 13.) Such releases must be reported within 24 hours. (*Id.*) Thus, the permits require immediate reporting of significant fish escapes and annual reporting of all fish escapes. (*Id.* at 12–13.)

Defendant tracks its fish using a software program called FishTalk. (Dkt. No. 79-1 at 428–29.) First, Defendant uses electronic counters to count the number of fish it places into trucks for transport to its pens. (*Id.* at 296–97, 431.) Then Defendant assumes (without verification) a loss during transport of five percent and enters this revised number into FishTalk. (*Id.* at 297–98, 315.) While fish are rearing in the pens, there may be further losses through mortality or removal for other reasons; Defendant states that these are entered into FishTalk. (*Id.* at 300–01, 429.) Finally, Defendant counts the fish with electronic counters again when they are harvested. (*Id.* at 306–07.) Defendant states that its electronic counters are accurate to plus or minus two percent. (*Id.* at 297, 307.)

Defendant has represented in its Annual Fish Release Reports that it has lost no fish through escapement. (Dkt. No. 79-2 at 584, 589, 593, 597, 601, 604, 609.) From 2012 to 2015, Defendant reported that there were no "significant" fish escapes. (*Id.* at 585, 589, 593, 597.) In the subsequent years, Defendant reported that there were no fish escapes. (*Id.* 601, 604, 609.) However, Defendant's data shows that there have been downward variations every year between

the number of fish it puts in its pens and the number of fish it removes and harvests. (*See id.* at 615–28.) The parties disagree as to whether this data shows that Defendant failed to report fish escapes or whether these discrepancies are within an acceptable range of error.

Plaintiff argues that Defendant's fish inventory data should be evaluated based on variations within each individual pen. (Dkt. No. 79 at 27–29, 95 at 16.) This analysis shows that there were negative deviations of more than four percent and up to 17 percent in numerous pens (called "Units" in the data), including Unit 111 at Cypress 1 in January 2016; Unit F12 at Fort Ward in May 2016, Unit R08 at Orchard Rocks in June 2016, Unit 10 at Hope Island in August 2016, Unit 06 at Port Angeles in December 2016, Units 121 and 124 at Cypress 1 in January 2018, and Units 315 and 324 at Cypress 3 in January 2018. (*See* Dkt. No. 79-2 at 619–25.) Plaintiff contends that because these deviations in 2016 and 2018 were too large to explain by a four percent margin of error, Defendant violated the requirement to report fish escapements. (Dkt. No. 79 at 29.)

In contrast, Defendant argues that its fish inventory data should be evaluated based on variations within each facility, not each pen. (Dkt. Nos. 26–27.) In support of this argument, Defendant points to its expert report by Cormac O'Sullivan. (*Id.*) O'Sullivan states that it is standard industry practice to "look at the entire farm, not the individual pens." (Dkt. No. 88 at 6.) O'Sullivan calculates that, across all eight farms, there was an average site variance of -2.65 percent, which is below the Best Aquaculture Practices Standards ("BAP") of three percent for accuracy of inventory tracking. (*Id.*) O'Sullivan therefore concludes that there is "no indication" of either "large escape events from *any* of the sites or leakage from the sites." (*Id.* at 5–6.) Additionally, O'Sullivan applies the BAP standard to conclude that Defendant's fish tracking practices generally comply with best practices for accurate tracking. (Dkt. No. 88 at 4.)

The language of the NPDES permit is plain that Defendant must report all fish escapes "to the extent possible." It was possible for Defendant to identify in its data that there were downward variations that exceeded three percent per pen in 2016 and 2018. (*See* Dkt. No. 79-2

at 615–28.) Extrinsic evidence of industry standards does not alter the plain meaning of the permit. *Nat. Res. Def. Council*, 725 F.3d at 1204–05. Because the permits also require accurate fish tracking, Defendant cannot avoid this requirement by arguing that human error explains the variation. A failure to accurately track is likewise a violation of the permits. (Dkt. No. 29-2 at 12.) Furthermore, in the years 2012–2015, Defendant reported only whether there were "significant releases." (*See* Dkt. No. 79-1 at 585, 589, 593, 597.) This violates the Permits' requirement to report "all fish releases or escaped," and not only "significant" releases. (*E.g.*, Dkt. No. 29-2 at 12.) Thus, Plaintiff has demonstrated that in 2012–2015, 2016 and 2018, Defendant violated the permit requirement to track the number of fish in its net pens and report all fish escapements. Therefore, Plaintiff's motion for summary judgment is GRANTED on this ground.

D. Defendant's Motion for Partial Summary Judgment

Defendant moves for partial summary judgment on Plaintiff's claims relating to Defendant's Cypress 2 facility, arguing that the S1 claims are barred by *res judicata* and all the Cypress 2 claims are moot. (*See* Dkt. No. 84 at 5.)

1. *Res Judicata and Plaintiff's S1 Claims*

"Congress is understood to legislate against a background of common-law adjudicatory principles." *Astoria Fed. Sav. & Loan Ass'n v. Solimino*, 501 U.S. 104, 108 (1991). The common-law principle of *res judicata*, also known as claim preclusion, is generally presumed to apply to administrative decisions. *See Littlejohn v. United States*, 321 F.3d 915, 921–22 (9th Cir. 2003). Courts, however, do not "have free rein to impose rules of preclusion, as a matter of policy, when the interpretation of a statute is at hand." *Astoria*, 501 U.S. at 108. When "a statutory purpose to the contrary is evident," then the statutory claim preclusion bar applies instead of common law *res judicata*. *See id.*; *Littlejohn*, 321 F.3d at 921–22.

In its 1987 amendments to the Clean Water Act, Congress added a provision that specifies when claims for civil penalties are precluded by state or federal enforcement actions.

See 33 U.S.C. § 1319(g)(6)(A). Claims for civil penalties are barred for any violation

> (i) with respect to which the Administrator or the Secretary has commenced and is diligently prosecuting an action under this subsection,
> (ii) with respect to which a State has commenced and is diligently prosecuting an action under a State law comparable to this subsection, or
> (iii) for which the Administrator, the Secretary, or the State has issued a final order not subject to further judicial review and the violator has paid a penalty assessed under this subsection, or such comparable State law

See 33 U.S.C. § 1319(g)(6)(A).

At the same time, Congress created an exception to the statutory bar for citizen suits in which the plaintiffs, prior to the enforcement action, either (1) filed suit or (2) provided notice to the Environmental Protection Agency or to the state with respect to the alleged violation. *See* 33 U.S.C. § 1319(g)(6)(B); *Black Warrior Riverkeeper, Inc. v. Cherokee Mining, LLC*, 548 F.3d 986, 991 (11th Cir. 2008) (holding that the prior-filed citizen suit exception to the civil penalties bar applies in both state and federal enforcement actions); *Thiebaut v. Colo. Springs Utils.*, 2007 WL 2491853 at *5 (D. Colo. Aug. 29, 2007) (concluding that the prior-commenced exception limits the applicability of *res judicata*), *aff'd*, 455 F. App'x 795 (10th Cir. 2011). Congress's intent to create an exception to the statutory bar is evident in § 1319(g)(6) of the Clean Water Act; for that reason, there is no "legislative default" to common-law claim preclusion principles. *See Astoria*, 501 U.S. at 110. By creating this exception, "Congress reiterated its commitment to citizen suits, which a Senate Report described as 'a proven enforcement tool.'" *Black Warrior Riverkeeper, Inc.*, 548 F.3d at 988 (quoting the legislative record). The Clean Water Act thus alters the ordinary *res judicata* rule to allow a prior-commenced citizen suit to pursue a claim for civil penalties, even after a federal or state enforcement action related to the same violation has been resolved. *See id.*

This prior-commenced exception for citizen suits applies here.[6] On August 24, 2017,

[6] In a prior order, the Court found that the only Clean Water Act statutory bar to citizen suits that "could conceivably apply" to Ecology's enforcement action is § 1319(g)(6)(A)(iii), which bars citizen suits in which a state agency has issued a final order under the Clean Water Act, or comparable state law, and the violator has paid the penalty assessed. (*See* Dkt. No. 76 at 19.)

Plaintiff notified the EPA and Ecology of its intent to sue Defendant, and Plaintiff provided a supplemental notice letter on September 6, 2017. (Dkt. No. 1 at 22, 30.) On November 13, 2017, Plaintiff filed its complaint against Defendant asserting several CWA violations related to the Cypress 2 collapse and violations at Defendant's seven other Puget Sound net-pen facilities. (*See* Dkt. No. 1.) Ecology issued its notice of penalty on January 30, 2018. (Dkt. No. 52-1 at 160–66.) On April 24, 2019, Defendant and Ecology entered into a consent decree regarding the Cypress 2 collapse, and on April 25, 2019, the Pollution Control Board, pursuant to the consent decree, dismissed Defendant's appeal of Ecology's administrative penalty. (*See* Dkt. No. 74-1 at 4–11, 18.) Because Plaintiff commenced its action before Ecology, the entry of the consent decree between Defendant and Ecology cannot preclude its enforcement action. *See* 33 U.S.C. § 1319(g)(6)(A)–(B).

Defendant argues that, notwithstanding § 1319(g)(6), the common-law principle of *res judicata* precludes Plaintiff's S1 claims because there is a final order in Ecology's state enforcement action on the identical CWA violations. (*See* Dkt. No. 103 at 2–4.) Defendant relies on a pre-*Astoria* case in which the Ninth Circuit concluded that the 1972 amendments to the Clean Water Act did not modify "the normal rules of preclusion." (Dkt. No. 103 at 4 (citing *United States v. IIT Rayonier, Inc.*, 627 F.2d 996 (9th Cir. 1980).) But *IIT Rayonier* did not interpret Congress's 1984 amendments to the Clean Water Act, nor did it apply the principles that the Supreme Court announced in *Astoria*. *See IIT Rayonier, Inc.*, 627 F.2d at 1000–02. Defendant also argues that a Ninth Circuit case involving a class action of sport fishers alleging state law violations demonstrates that § 1319(g)(6) did not alter normal claim preclusion rules. (*See* Dkt. No. 103 at 11 (citing *Alaska Sport Fishing Ass'n v. Exxon Corp.*, 34 F.3d 769 (9th Cir. 1994).) But the parties in that case did not argue, and the court of appeals did not consider, that § 1319(g)(6) created a specific statutory preclusion rule for citizen suits. *See Alaska Sport Fishing Ass'n.*, 34 F.3d at 773–74.

Defendant's interpretation would render meaningless the prior-commenced citizen suit

exception. "If the statutory language is plain, [a court] must enforce it according to its terms." *See King v. Burwell*, 135 S. Ct. 2480, 2489 (2015). Accordingly, the Court begins and ends its analysis with the plain language of the statute, which clearly permits prior-commenced citizen suits to proceed notwithstanding a final order in a state-initiated administrative enforcement proceeding. *See Burwell*, 135 S. Ct. at 2489. Thus, Plaintiff's S1 claims are not barred by *res judicata*, and Defendant's motion for partial summary judgment is DENIED on this ground.

2. Mootness

To establish mootness, a defendant must show that the district court cannot order any effective relief. *See City of Erie v. Pap's A.M.*, 529 U.S. 277, 287 (2000); *Sierra Club*, 853 F.2d at 669) ("The burden of proving that the case is moot is on the defendant."). The cessation of illegal conduct following the commencement of a suit "ordinarily does not suffice to moot a case" because civil penalties still serve as a deterrent to future violations. *Friends of the Earth v. Laidlaw*, 528 U.S. 167, 193 (2000) (holding that a citizen suit was not moot where the polluting facility at issue had been "permanently closed, dismantled, and put up for sale, and all discharges from the facility had permanently ceased."). "Only when it is 'absolutely clear that the allegedly wrongful behavior could not reasonably be expected to recur' will events following the commencement of a suit moot a claim for civil penalties." *San Francisco BayKeeper, Inc. v. Tosco Corp.*, 309 F.3d 1153, 1160 (9th Cir. 2002) (quoting *Laidlaw*, 528 U.S. at 189). This is because civil penalties under the Clean Water Act serve "to deter future violations and thereby redress the injuries that prompted a citizen suitor to commence litigation." *Laidlaw*, 528 U.S. at 174. The deterrent effect of civil penalties is no less potent when the defendant no longer operates or owns the polluting facility. *See San Francisco BayKeeper*, 309 F.3d at 1160. "Allowing polluters to escape liability for civil penalties for their past violations by selling their polluting assets would undermine the enforcement mechanisms established by the Clean Water Act." *Id.*

Here, Defendant argues that Plaintiff's claim for civil penalties for violations at Cypress 2

should be dismissed as moot. (Dkt. No. 84 at 17.)[7] Cypress 2 was destroyed and is no longer operational. (*See* Dkt. Nos. 29-2 at 210–212, 43 at 3.) Ecology completed its closure monitoring of the site, and Defendant has represented that the Cypress 2 permit has been terminated as of September 28, 2019. (*See* Dkt. No. 86 at 6.) But in its previous order, the Court found that it could still provide Plaintiff effective relief in the form of civil penalties because it was not absolutely clear whether the site could be rebuilt and because Defendant continued to operate its other seven net-pen facilities in Puget Sound under identical permits. (*See* Dkt. No. 76 at 16.) Now, it seems clear that Cypress 2 is permanently closed, but Defendant continues its operations in Puget Sound. Thus, civil penalties still serve to deter future Clean Water Act violations. *See Laidlaw*, 528 U.S. at 193; *San Francisco BayKeeper*, 309 F.3d at 1160. Therefore, Defendant's motion for partial summary judgment in DENIED on this ground.

III. CONCLUSION

For the foregoing reasons, Defendant's motion to exclude expert opinions (Dkt. No. 82) is DENIED. Plaintiff's motion for partial summary judgment (Dkt. No. 79) GRANTED in part and DENIED in part as follows:

1. Plaintiff's request to strike the declarations of Stephen Weatherford and Bill French is GRANTED, and Plaintiff's request to strike Parsons's and Hodgin's declarations is DENIED;
2. Plaintiff's motion for summary judgment its Condition S7.1 claim is DENIED;
3. Plaintiff's motion for summary judgment on its S6.F claim is:
    a. DENIED as to Cypress 1 and 3 between 2013 and 2016,
    b. GRANTED as to inspections of anchoring components deeper than 100 feet at Orchard Rocks, Clam Bay, Port Angeles, and Cypress 1 and 3 in 2012, 2013, 2014, 2015, and 2016. 2012 to 2016;

[7] The Court previously dismissed as moot Plaintiff's claims for injunctive relief at Cypress 2. (Dkt. No. 76 at 15.)

c. GRANTED as to Cypress Island Sites 1 and 3 (2018) and Port Angeles (2017); and

d. GRANTED as to completion of the Annual Below Surface Visual Inspection forms for Cypress Island Sites 1 and 3, Port Angeles, Orchard Rocks, Fort Ward, and Clam Bay in 2017 and 2018.

4. Plaintiff's motion for summary judgment is GRANTED as to its claim that in 2012–2015, 2016 and 2018, Defendant violated the permit requirement to report all fish escapements and track the number of fish in its net pens.

Defendant's motion for partial summary judgment (Dkt. No. 84) is DENIED.

DATED this 25th day of November 2019.

John C. Coughenour
UNITED STATES DISTRICT JUDGE

Wild Fish Conservancy
NORTHWEST
SCIENCE EDUCATION ADVOCACY

Comments on Washington Department of Fish and Wildlife State Environmental Protection Act Review of Cooke Aquaculture Proposal to Commercially Propagate and Harvest *Oncorhynchus mykiss* in Puget Sound net pens: SEPA #19056

Submitted 11/22/19

Drafted and Submitted by:

Wild Fish Conservancy

Kurt Beardslee, Executive Director

Overarching Comments:

In addition to and as explained by the detailed technical comments below, Wild Fish Conservancy provides these overarching comments to highlight that the State's mDNS and SEPA process is legally flawed in many respects, including but not limited the following:

- The State improperly relinquished its SEPA duties by delegating its primary responsibilities for evaluating the environmental impacts of Cooke's proposed net pens farms to Cooke. Cooke is clearly biased in favor of allowing its proposal, and all analysis and documents that Cooke or its consultants prepared are therefore unreliable.
- The net pens will have significant adverse impacts on the environment, and the State failed to prepare an environmental impact statement to fully consider and evaluate reasonably foreseeable consequences from these impacts. For example, and as detailed in these technical comments, escaped steelhead from the net pens will adversely affect wild salmonids by competing for food and forage space with native salmonids and by amplifying and transmitting diseases and parasites. The State did not fully consider this, instead relying on an outdated EIS and a paragraph from Cooke that incorrectly minimizes impacts on wild salmonids without citing any support for its assertion.
- A new EIS is required because there are significant adverse effects that are not addressed in the prior EIS and because there is substantial new information and changed circumstances. For example, the outdated EIS relied upon by the State addressed rearing of a different species—Atlantic salmon—and not the steelhead currently proposed for Puget Sound net pens and was prepared before the listing of various species in Puget Sound under the Endangered Species Act, including Puget Sound steelhead, Puget Sound Chinook, and the Southern Resident Killer Whale. Further, there is an abundance of new science informing the risks net pens pose to the environment since the 1990 EIS. The cursory additional information and analysis

is insufficient to update an entirely stale EIS. These comments detail some of the many ways the EIS and checklist fail to consider best available science that has come out in the last 30 years.

- The SEPA documents are neither complete nor accurate, failing to disclose many risks and harms associated with the net pens. Relatedly, the State failed to gather necessary additional information and failed to consider reasonably foreseeable consequences. For example, the State has not supplemented the decision documents with information from the recent Orchard Rocks incident. Regardless of whether the State considers the incident, the State has not provided the public with an evaluation of this incident and an opportunity to comment on the reasonably foreseeable risks posed by pen sinking.
- The State failed to disclose and consider all direct, indirect, and cumulative impacts of the net pens, and accordingly failed to provide an accurate and complete analysis.
- The State narrowed the project scope, improperly limiting its effects analysis and failing to consider many impacts posed by net pen farming in the State of Washington.
- The State failed to articulate and analyze updated objectives or purposes, making it impossible to consider and evaluate reasonable alternatives. The 1990 EIS articulates an objection/purpose of assisting in resolution of conflict by evaluating the environmental impacts of fish farms on the biological and build (human) impacts. This objective/purpose is clearly outdated and based on the political climate at the time. The update in Attachment D does not provide any updated objectives/purposes, but simply states a "proposed action" of permitting steelhead/rainbow farming. This failure to articulate objectives or a purpose makes it impossible for the public to understand what reasonable alternatives are available that the State failed to consider.
- The State failed to consider and evaluate reasonable, safer alternatives to raising the rainbow trout/steelhead at existing marine net pen sites in Puget Sound. For

example, the State should have considered an alternative requiring all salmon farms to be self-contained land-based facilities. As another example, the State should have considered an alternative regulation that restricts the number of steelhead/rainbow that may be farmed in the pens. These alternatives would significantly lessen the risks and impacts of salmon farming on the environment while still allowing Cooke to run a profitable salmon farming business.

- The no action alternative in the 1990 EIS is outdated and does not make sense because the "existing regulations and guidelines," as well as the laws of the State of Washington related to net pens, that would form the basis for a no action alternative have changed in the last 30 years.
- The State must prepare an EIS because of the significant negative environmental and health impacts from the net pens, examples of which are detailed in these comments.
- The mitigation measures included in the decision documents are unenforceable; fail to address all significant adverse impacts on the environment; will not reduce impacts to a nonsignificant level; and otherwise do not comply with SEPA.
- The regulatory agencies lack sufficient regulatory controls to allow the proposed action to go forward. As demonstrated by disease outbreaks—like the 2012 outbreak of IHNv and the PRV outbreaks—as well as equipment failure—like the 2019 Orchard Rocks incident and the collapse of Cypress Site 2 and its aftermath—the regulatory agencies are ill-equipped to mitigate any adverse impacts.

Under the State Environmental Protection Act (SEPA), this review requires a threshold determination of whether an action is likely to have a "significant adverse environmental impact." The State's current threshold determination of Mitigated Determination of Non-Significance (mDNS) is inadequate as an environmental review and fails to address many well-documented risks associated with farming salmonids in these exact pens. Industrial-scale, open-water finfish aquaculture poses significant environmental risks, and the transition from Atlantic salmon aquaculture to rainbow/steelhead trout aquaculture adds significant risks that

cannot be adequately mitigated. The State has violated SEPA by not preparing a new Environmental Impact Statement (EIS). Below, we detail some but not all of the significant environmental impacts that compel a determination that this proposal poses significant adverse environmental impacts, and reasons why the mitigations proposed are not reasonably certain to address those risks. In evaluating the proposed actions, the State failed to properly consider all available alternatives, or the cumulative impacts of the many risks posed by this proposed action.

The State should withdraw the Mitigated Determination of Non-Significance (mDNS), issue a Determination of Significance, and draft an EIS to assess the full impacts of this transition. Furthermore, that EIS should incorporate into its no-action alternative the cessation of operation of the pens (and cessation of any environmental risk) after the legislative non-native aquaculture phaseout takes effect in 2022.

The public comment period was flawed

The initial 21-day comment period was too short to allow adequate public comment. That period was first extended by 10 days, and again by 21 days. These extensions were announced near the end of each comment period, meaning that commenters could not budget their time to conduct the depth of analysis and consideration that might have been possible had the comment period been announced at full length to begin with.

When first announced, the comment period ended before the deadline for a legislatively-mandated report from state agencies to the legislature regarding best practices on aquaculture licensing and practices. That report was mandated by HB 2957, the law which also phased out Atlantic salmon aquaculture and mandated stricter regulations of marine net pen aquaculture in general, and was supposed to be filed on November 1. The first extension of this comment period ended on that same day. Unfortunately, that report has still not been filed as we complete these comments, meaning the public has not been able to draw on the guidance of State agencies on how "to eliminate commercial marine net pen escapement and to eliminate

negative impacts to water quality and native fish, shellfish, and wildlife." Proceeding with review of this proposal before completing the mandated report to the legislature puts the cart before the horse, and makes it likely that the clear will of the legislature and voters will not be reflected in the State's response to Cooke's request.

Even with the extensions the State has granted, there is a great deal for the public to evaluate. The filing covers over 400 pages, including a lengthy bibliography that requires review and in some cases rebuttal, as well has hundreds of references within the text to review. In addition, it references and discusses material developed by two sources who are expert witnesses for Cooke Aquaculture currently preparing to testify in ongoing litigation regarding these net pens. Understanding their statements here requires consideration of expert testimony rebutting their claims from that ongoing litigation. Furthermore, the 1990 EIS (Environmental Impact Statement) on which the State is relying is woefully outdated, and addressing the environmental effects of this policy requires the public to integrate decades of new information regarding Puget Sound, wild salmonids and other native fish in the Sound, its endangered marine mammals, the physics of tides and currents and tsunamis in the Sound, and the effects of net pens and industrial finfish aquaculture on the Sound.

The submission includes a 76-page document authored by Cooke Aquaculture staff and contractors, which purports to serve as a supplement to the 1990 Programmatic EIS. This self-interested document cannot stand on its own as a supplement to the state's EIS, and the document largely omits discussion of the specific environmental impacts of the net pens on the threatened and endangered species under discussion, including effects on the conspecific Puget Sound steelhead which are listed as threatened under the Endangered Species Act.

That there is so much additional information accumulated in those intervening decades—including multiple new federal and state listings of endangered and threatened species, newly-designated critical habitat, and substantial new evidence of the effects and risks posed by open-water salmonid aquaculture in Puget Sound—is a strong argument of the need for the

appropriate state agencies to conduct a full EIS. Washington Department of Fish and Wildlife (WDFW) is the appropriate agency that should write such a supplement, and in view of Cooke's active defense in litigation over its ESA and CWA violations and the considerable controversy surrounding Cooke Aquaculture in general, the proposal at issue in particular, and the widespread public consensus supporting the complete elimination of open net pen finfish aquaculture in Puget Sound, WDFW should provide a period for public comment on that EIS once it is issued. Allowing the petitioner to write its own supplement to the 1990 Programmatic EIS rather than having the state to perform its own due diligence and impartial analysis, and offer the public the statutory amount of time for comment, represents a dangerous end run around key environmental protections.

During the comment period, new information became available that the public deserves an opportunity to understand and comment on. This includes the partial sinking of a net pen at the Orchard Rocks site, and Cooke Aquaculture's efforts to intimidate Wild Fish Conservancy and prevent us, our members, and our partners in the Our Sound, Our Salmon coalition from exercising First Amendment rights to comment on this matter of public interest.

Orchard Rocks, 2019

In the 2019 Orchard Rocks incident, neighbors on shore observed the pen sinking as early as October 15, and reported their concerns to Cooke. Initially, Cooke staff told these neighbors that the apparent sinking was simply a result of normal tidal movement, and neighbors observed no repairs and it appeared that the pen was operating as if nothing was wrong. On October 18, the corner of the pen was fully under water, and emails obtained through public records requests indicate that the initial emergency alert came not from Cooke's personnel, but from state employees visiting family near the pens during their off-hours. In response to these calls from WDFW staff, coordinating with staff at the Department of Natural Resources, the US Coast Guard mounted an emergency response and created a security cordon, while Cooke and DNR divers surveyed the damage and began repairs. According to a DNR spokesperson, fish could have escaped had the sinking pen been stocked at the time.

Emails obtained through public records requests show that state regulators did not feel Cooke followed the emergency protocols that they had agreed to through previous permits. It is unclear why it took several days to begin repairs, or whether Cooke staff intentionally misled concerned members of the public during that delay. It appears that the public and agency staff initiated the emergency response, not Cooke or its staff. The public and state agencies cannot adequately evaluate Cooke's emergency response—a central component of the risk mitigation proposed in the mDNS—without clarity on those matters, and a clearer understanding of Cooke's monitoring and preventative maintenance. In emails obtained through public records requests, state agencies appear to be planning an internal investigation of this incident, and our records request remains open. Estimated times to complete the records search extend beyond the end of this comment period. As we complete these comments, no results have been announced from the agencies' investigation of this incident.

Silencing public comment

On October 3, 2019, less than two full days after the public comment period began and the day after Wild Fish Conservancy issued a press release informing the press and public about this comment period, Cooke Aquaculture issued a "cease and desist" notice to WFC. This letter instructed WFC (a group that convened and coordinates the Our Sound, Our Salmon coalition) to "cease and desist" from expressing opinions about the risks posed by Cooke's net pens in Puget Sound, opinions derived in part from and citing an engineering report prepared and submitted as part of ongoing litigation. Cooke's letter warned "If these statements result in delay in issuance of those permits…Cooke will seek recovery of damages against WFC and [WFC executive director] Mr. Beardslee personally, in addition to injunctive relief."

Describing evidence and opinions derived from that evidence, especially as part of a petition to a government agency for redress of grievances, is the epitome of First Amendment-protected free speech. The First Amendment protects the rights of citizens to make such fair comment on matters of public interest and public controversy. Washington State is one of the first states to legislatively shield reports like this from threats like Cooke's, declaring in 1989:

"The legislature finds that the threat of a civil action for damages can act as a deterrent to citizens who wish to report information to federal, state, or local agencies" (RCW 4.24.500).

Cooke's letter to WFC, and any similar letters sent to members of Our Sound, Our Salmon and other individuals or advocacy groups, may have chilled or otherwise limited the public's participation in this important process. To correct any such chilling effect, the State should take measures to ensure that the public should feel no barrier to making their opinions heard. This might include asking the Attorney General to review existing laws and regulations to ensure that the State's anti-SLAPP laws are sufficient to protect the integrity of the public comment process, and to investigate this incident and its harm to the integrity of the State's public comment process.

Effects of escaped steelhead on wild steelhead genetics

The mitigated Determination of Non-Significance (mDNS) rightly treats the possibility of escape, both small- and large-scale, as a real and serious threat that must be addressed before planting fish in the net pens. Escaped fish pose a range of risks to endangered wild salmonids, and to the ecology of Puget Sound and its watersheds. The recovery efforts following the 2017 collapse demonstrated inadequacies of the existing escape plan even for non-native species (see comments below regarding inadequacies of the escape plan in the mDNS).

As DFW notes in the mDNS and their exchanges with Cooke in Attachment B, under this proposal, an escape on the scale of 2017 would have released a number of fertile female steelhead that "would have exceeded the number of wild steelhead returning to spawn in many rivers in Puget Sound." DFW's exchange with Cooke states that the use of eggs treated to induce triploid sterility "would reduce, but not eliminate the risk."

We note in the section on failure of triploidy-induction below that monitoring of escapes of farmed Atlantic salmon in Norway (where the salmon are farmed in regions with wild

conspecifics) demonstrates that escaped farmed salmonids do survive and feed and grow in marine feeding areas at rates similar to wild Atlantic salmon, and survive to mature and return to Norwegian rivers to interbreed in significant numbers with wild Atlantic salmon, with known adverse population level impacts to the affected wild populations (Disreud et al. 2019, Glover et al. 2019, Karlsson et al. 2016, Skilbrei et al. 2015). Importantly, Cooke's existing net pen sites are less than 20 kilometers (12.5 miles) by water from important wild steelhead rivers, including: the Elwha, Dungeness, Samish, Skagit, Stillaguamish, Cedar, and Green rivers (Map).

Table 1 shows the average wild steelhead population abundances in rivers nearest to the existing net pen facilities. State guidelines generally regard the risk of genetic harm as too high when wild fish are less than 95% of the spawners in a stream (5% hatchery-origin). Science would argue for a much lower threshold than 5% when the hatchery fish are as significantly domesticated as those proposed to be used by Cooke. Simulations of escape and survival scenarios (Appendix) indicate high likelihood that an escape on the scale of Cypress 2017 could cause the proportion of fertile farmed rainbow/steelhead trout spawning in streams to exceed 5%, or in some scenarios could exceed the entire wild population in streams.

A full understanding of the genetic risks posed would require more detailed information on the genotypes of the broodstock for the farmed salmon, and reportedly the egg supplier will not supply those data. While WDFW officials have offered assurances that they would require such information before authorizing a finfish transfer permit, the mDNS does not specify what standards would be applied in such a review. WAC 197-11-080 requires a worst case analysis and a discussion of the likelihood of that worst case. Rather a worst case scenario, the mDNS discussion adds a scenario that is less of a worst case than the proposal offered by Cooke.

In 2018, WDFW's fish health specialist—Dr. Ken Warheit—testified before the state legislature that raising native fish in these pens would actually represent "a greater risk to the state's native wild and hatchery salmonid populations, than is Atlantic salmon marine aquaculture." That risk should be considered through a full EIS.

Effects of escaped steelhead on wild salmonids' prey and habitat

The escape of rainbow/steelhead from any of the Puget Sound aquaculture facilities, whether from small scale leakage or catastrophic facility failure, will pose risks to native salmonids rearing in nearshore marine habitats and rivers due to competition for food and foraging space.

This will be particularly true in the case of triploid individuals because, as noted in the SEPA checklist, they will have appetites that are likely to be considerably greater than rearing wild juvenile salmon and steelhead due to the faster inherent growth rate of these triploid fish.

Diploid individuals that result from the failure of triploid induction will pose a significant risk of becoming sexually mature and interbreeding and/or competing with native rainbow and steelhead on the spawning grounds of native fish. The effects of recurrent, annual low level escapes on wild Atlantic salmon Norway is well documented, and similar impacts on native rainbow and steelhead in Puget Sound are to be expected (Diserud et al. 2019, Glover et al. 2019). Research in escapes of farmed Norwegian Atlantic salmon has also shown that escaped salmon survive to rear in the ocean for one or two years and return as mature fish to spawn in rivers of wild salmon (Olsen et al 2013, Karlson et al. 2016). Further, analysis of monitoring of escapes of farmed Atlantic salmon in Norway has shown that the actual number of escaped farmed salmon is two to four times greater than the officially reported annual number of escapes (Diserud et al. 2019, Skilbei et al. 2015). Of course, these potential risks will be greater the greater the magnitude of an escape and the greater the frequency of small-scale leakage events. But, as is the case for wild Atlantic salmon in Norway and the north Atlantic in general, the risks posed by low level escapes can not be discounted.

A full EIS would allow for updated analyses that incorporate this and other new research on the effects of salmonid aquaculture, rather than relying on the prospective analysis conducted nearly 30 years ago, in 1990.

Effects of escaped steelhead on wild salmonids' predators

Various operations at the net pens can attract threatened, endangered, and otherwise protected predator species to the vicinity, creating risks that those birds and mammals would be harassed, experience ship strikes, or become dangerously accustomed to human proximity. The process of feeding farmed rainbow/steelhead trout attracts juvenile and adult wild fish (including ESA-listed salmonids), which in turn aggregates predator species. Predators will also be attracted by the outflow of shed skin and other parts from the penned rainbow/steelhead, and could be exposed to diseases and parasites through that proximity. The harvest process results in the release of bycatch fish, blood, and other fish parts from harvested fish, which has been shown to attract marine mammals to close proximity to the pens and boats (as in this video: https://drive.google.com/file/d/1TWXLMTcdG4s4QEvd3BM65-GpD1IEdaRJ/view?usp=sharing). A comprehensive EIS should examine the risks to these protected species from raising steelhead/rainbow trout in these net pens, and develop appropriate mitigation measures in consultation with federal, tribal, and international co-managers.

Farmed steelhead diseases could harm wild salmonids

Raising native salmonid species, and rainbow/steelhead trout in particular, in open Puget Sound net pens likely increases the risk of disease transmission from farmed to wild native salmonids and other fish species. Rainbow/steelhead trout are susceptible to native, endemic, Pacific salmon viruses, bacteria and parasites as well as non-native, introduced pathogens

including piscene orthoreovirus (PRV). Rainbow/steelhead trout are vulnerable to a deadly form of infectious hematopoietic necrosis virus that can spread to and kill wild steelhead. While vaccination and state monitoring can limit this risk, it remains a greater risk than existed with Atlantic salmon.

The experience from a 2012 outbreak of the Atlantic salmon-specific strain of IHN indicates the danger of an outbreak in farmed rainbow/steelhead trout. While response plans call for rapid culling of infected fish to prevent the spread of disease, in 2012 the culling dragged on for months, with the Northwest Indian Fisheries Commission's fish health specialist noting the pen owner "reported increased mortalities starting in April. We now are at end of May and infected fish are still in those pens shedding virus." (https://nwifc.org/ihn-virus-detected-in-atlantic-salmon-farm-near-bainbridge-island/) The effect of such a delay if farmed rainbow/steelhead trout were infected with the strain shared with wild steelhead would be catastrophic.

Concentrated populations raised in what are effectively aquatic animal feedlots, face greater risk of disease, parasitic, and viral amplification than free-ranging, especially wild, populations. When viral, bacterial, fungal, or parasitic diseases break out in net pens, the disease-causing organisms are rapidly amplified in number and leaked to the surrounding aquatic environment in large numbers. Because their conspecifics (and other salmonids of concern, including coho salmon, ESA-listed Chinook salmon and bull trout and as required by WAC 197-11-080) will be swimming in close proximity to the pens, there is likely to be a spread of disease to endangered wild steelhead and other salmonids. In 2017, a B.C. study documented a strong correlational connection between disease prevalence in net pens and disease transfer to wild fish populations (Morton et al., 2017). Recent research in British Columbia found novel viruses in endangered salmon, and found evidence that these novel viral infections may originate from farmed salmonids (Mordecai et al., 2019).

As with terrestrial feedlots, the diseases that spread in and from net pens are likely to include the spread of antibiotic- and fungicide-resistant pathogens to wild steelhead and hatchery

steelhead, which poses additional risk to hatcheries and the humans and wild species that feed on steelhead and other Puget Sound salmonids (discussed further below, along with other risks of pollution from net pens). As the *Seattle Times* reported in October: "The risk is low, but consequences could be severe." (https://www.seattletimes.com/seattle-news/environment/cooke-aquaculture-seeks-to-farm-native-steelhead-in-puget-sound-after-2017-atlantic-salmon-escape/)

A comprehensive EIS should examine the risks to these protected species from raising biologically-engineered steelhead/rainbow trout in these net pens, and develop appropriate mitigation measures in consultation with federal, tribal, and international co-managers. That analysis should include an assessment of disease transmission to predator species, as well as the effects of these diseases on wild fish, and the potential for transmission of resistant strains to hatcheries.

Fertility of steelhead eggs treated for triploid sterility

The mDNS Summary (and Attachment A to Cooke's SEPA checklist) notes that the induction of triploidy in fertilized eggs at Cooke's hatcheries is imperfect. The likely adverse effects on native rainbow and steelhead from the escape of fertile aquaculture rainbow highlights the importance of providing firm risk-averse quantitative criteria and associated procedures regarding the estimation of the rate of triploid failure in each lot of eggs intended for production of smolts for outplanting to Cooke's marine net pen facilities. WDFW's Summary notes some concerns with the procedure Cooke employs to estimate the triploidy failure rate ("failure rate", Cf. Attachment B, Cooke's response to WDFW question C2, pp. B-25,26). We believe WDFW's concerns are valid but that their recommendations do not go far enough to adequately reduce the risk posed by the presence of diploid (fertile) rainbow/steelhead in net pens in Puget Sound.

First, we note that the assertion by Cooke on page B-25 that the results of sampling to test triploid induction presented in Attachment A "are additive" is erroneous. The data in Appendix A show results from samples of 60 to 100 fertilized eggs from 36 separate lots sampled between 2013 and 2018. These samples can legitimately be pooled only if all 36 samples were obtained from a single lot (cohort) of eggs. This is clearly not the case. Further, Attachment A contains no data on the total number of eggs in each lot from which each sample was obtained. This missing information is critical to determining the adequacy of the sample sizes for estimating the triploid failure rate of each lot.

A Bayesian assessment of the data in Attachment A (modeling 36 separate draws of the same sizes observed, drawn from a hypergeometric distribution with unknown rate of diploidy) provides a 95% Highest Posterior Density Interval for the rate of diploidy of 0.06%-0.35%, and an 80% HPDI of 0.09%-0.28%. A worst case assessment as required by WAC 197-11-080 should consider not just the average triploidy rate in these samples, but the likely range of scenarios, and should attempt to cap the risk.

We recommend an alternative approach described in the following. The details in the approach we suggest also illustrate a robust general approach to risk assessment, particular in contexts of endangered species.

There are two basic issues in regard to the risk posed by the failure of triploid induction:

1. the failure rate itself (i.e., how many diploids will be reared and released into each net pen per batch of fertilized eggs in the hatchery that have been subjected to the triploid-induction treatment)?
2. The total number of diploids in a pen that would escape either via low level leakage or catastrophic failure.

The first (failure rate) in conjunction with the size (number) of fertile eggs subjected to the triploidy-induction procedure is relevant to determining the minimum sample size of eggs from

each lot that should be tested for triploid failure in order to assure an appropriate low risk of diploids being released into the pens. The second determines the probability or likelihood that escapes – especially under conditions of a catastrophic failure – would survive in sufficient numbers to pose a significant threat to wild rainbow or steelhead. Here, we assume that 'significant threat' is one that would amount to a take of a threatened or endangered salmon, steelhead, and bull trout under the ESA. Determination of this number, therefore, requires an appropriate determination by National Marine Fisheries Service (NMFS) and issuance from NMFS of an appropriate Endangered Species Act (ESA) Incidental Take Statement (ITS).

Determining a risk-averse failure rate (issue 1) is dependent on determining the risk-averse probability that escapes under a catastrophic failure of a net pen would pose a 'significant threat' to ESA-listed salmonids from surviving escaped diploid rainbow/steelhead. This, in turn, requires, a determination of the maximum allowable number of diploids per total number of individuals out-planted to each farm facility. We follow WDFW in expressing this number per-million eggs tested.

On page 6 of the Summary, WDFW conducts a rough illustrative exercise estimating the numbers of diploids surviving to potentially interact with wild rainbow or steelhead on the spawning grounds. WDFW provides a lower estimate of 63 mature diploid fertile fish from a catastrophic escape from a pen initially planted with 1,000,000 smolts, given a variety of assumptions about intermediate rates leading from the initial escape to the presence of surviving diploids on the spawning grounds. WDFW calculates that there would be a total of 63 such fertile escaped rainbow/steelhead, under a presumed "low survival" scenario and 316 under a "high survival" scenario.

In order to be very risk-averse (in keeping with the high priority placed on protecting ESA-listed salmon, steelhead, and bull trout), suppose we adopt a maximum of 50 fertile diploid escapees from a total net pen failure of 1,000,000 rainbow/steelhead. Under the assumptions of the WDFW "low survival" scenario 1,000,000 rainbow/steelhead net pen rearing primarily sterile

triploid fish would have to consist of a maximum of 1560 fish in which triploid-induction had failed (Table 2). 1560 escaped diploids would result in no more than 50 surviving with the potential to reach the spawning grounds of wild steelhead or rainbow, given the assumptions used in WDFW's low-estimate scenario, which we adopt here for the sake of illustration.

In a total population of 1,000,000, 1560 diploids yields a point estimate of the triploid-induction failure rate of 0.00156. To be risk-averse with respect to ESA-listed fish, we argue that the number of fertilized eggs post-triploidy induction sampled and tested for triploid failure should be large enough to assure a probability of 0.95 (95%) or greater that the total number of diploids in the lot of 1,000,000 eggs is no greater than 1560. This requires a sample of approximately 3000 randomly selected eggs (per million eggs). The standard would require a random sample of at least 3000 be tested from each lot of one million fertilized eggs (or hatched fry) and result in no more than 1 triploid failure (figures 1 & 2). A lower-cost alternative protocol with the same effect would be to test consecutive lots of 100 eggs from each batch of 1,000,000 fertilized eggs, and to continue testing lots until either one or more diploids is detected from the current lot or until a total of 3500 eggs has been tested and no more than one diploid has been found. The occurrence of one (or more) diploid eggs in a total number of eggs fewer than 3500 would result in a distribution of the total number of diploids in the one million egg lot being tested in which the 95th percentile of the cumulative probability distribution exceeds the critical value of 1560.

It is also of interest that if the total of 2950 samples tested for failure of triploid induction (diploidy) listed in Attachment A of Cooke's SEPA Checklist, of which 5 diploids were found, were obtained from a single lot of 1,000,000 fertile eggs, the mean number of diploid in the entire lot of 1,000,000 eggs would be more than 2000, the median number would be 1900, and there would be a probability of just over 5% that the true number was greater than 3500 (Figure 2). Each of these quantities is clearly greater than the hypothetical maximum of 1560 described above.

In summary, the risk standard should be stated as a high probability that the outcome of a specified quantitative sampling protocol not exceed a specified quantitative upper bound judged sufficient to assure that an adverse outcome of management concern will not occur. Here, the quantitative upper bound is the number of triploid failures per 3000 random samples tested (here 1), which corresponds to a corresponding high probability that no more than some total number of triploid failures (here 1560) occur per batch of million fertile eggs or fry sampled. The latter maximum number (1560) is in turn derived from an appropriate estimation of the distributions of the quantities (parameters) required to estimate (with appropriately high probability) the total number of fertile escaped diploid farmed rainbow/steelhead that would survive following a catastrophic net pen failure, where the total number of surviving fertile escaped diploids is itself determined on the basis a similar assessment of the risk posed to ESA-listed steelhead by the presence of escaped diploid farmed rainbow/steelhead on the spawning grounds of wild steelhead. The determination of such a risk standard requires that full probability distributions of the relevant quantities of interest be calculated (estimated) so that risk-averse probabilities of attainment of a risk-averse standard can be specified as a probability from the relevant tails of the distributions. Picking a point estimate, such as the mean of a sample, as in the WDFW summary (picking the mean triploidy-failure rate of 0.0017 (0.17%) from Cooke's sampling data (Attachment A to Cooke's SEPA checklist) is inappropriate and very likely to be insufficiently risk averse.

This analysis is necessarily limited given the short comment window. The State must develop and "document…its worst case analysis and the likelihood of occurrence" as required by WAC 197-11-080. A fuller analysis of the genetic risks posed by escaped non-triploid rainbow/steelhead, and measures that might mitigate those risks, would be possible with a longer comment period, and should properly be undertaken as part of a comprehensive EIS.

The proposed escape recovery plan is clearly insufficient

It appears that Cooke's recovery plans are no different from the ones employed to address the catastrophic 2017 net pen failure and escape at Cypress Island. In Appendix B, they state:

> Upon receiving authorization from WDFW, the company will commence recovery of escaped fish through one or more of the following actions: (1) use of company skiffs and seine nets; (2) contacting the Northwest Indians Fishery Commission and nearby tribal Natural Resource managers to help facilitate the recapture of escaped fish; (3) contacting and engaging the services of local commercial fishing boat operators to facilitate the recapture escaped fish.

This approach was inadequate in 2017, resulting in substantial unrecovered escapees. It is far less adequate for this proposal. Here, the escaped fish may school with threatened wild salmonids and conspecifics. While non-specialists might reasonably have been expected to make quick distinctions between a recovered Atlantic salmon and a wild salmonid, those distinctions will be much harder in this case. A captured steelhead might be a threatened wild steelhead that must be immediately released, or a hatchery-raised steelhead subject to catch limits, or a farm-raised steelhead that must be retained. This distinction may be difficult for non-specialists to make under emergency conditions. As a result, escapees are likely to be harder to recover than were Atlantic salmon.

A recent comprehensive review of efforts to recapture escaped fish from marine aquaculture (including open net pen farmed Atlantic salmon and rainbow trout) demonstrates that such efforts are largely unsuccessful (Dempster et al. 2018). This review casts considerable doubt that escaped farmed salmon and steelhead that escape during either persistent low-level "leakage" or less frequent catastrophic failures such as the one that occurred at Cypress Island in August 2017 cannot be recaptured in ecologically significant numbers.

In passing HB 2957, the state legislature tasked state agencies "to eliminate commercial marine net pen escapement." Using the same escape plan that failed dramatically in 2017 does not fulfill that statutory language, or the high standard that the legislature and the people of Washington demanded of the marine aquaculture industry. WAC 197-11-080 requires an analysis of the worst case scenario and its likelihood, which are not adequately discussed.

A full EIS would allow WDFW and other agencies and co-managers to consider a range of alternatives to better mitigate this risk.

The "no-recovery" option for escapes as an unmitigated environmental risk requiring SEPA review

SEPA review requires a threshold determination of whether an action is likely to have a "significant adverse environmental impact." As the Department of Ecology SEPA FAQ notes, "An impact may be significant if its chance of occurrence is not great, but the resulting environmental impact would be severe." The FAQ explains further that an agency may issue a "mitigated DNS in lieu of preparing an EIS when there is assurance that specific enforceable mitigation will successfully reduce impacts to a nonsignificant level."

In this case, one of the forms of mitigation required by the DNS seems to acknowledge that there are risks that cannot reduce impacts to a nonsignificant level. Regarding escape recovery plans, including scenarios for recovery after a catastrophic failure of the pens, the mDNS states:

It is conceivable that an attempt to recover fish after an escape event may negatively affect native Pacific salmonids more than no attempt to recover fish. Cooke is required to work with WDFW, Ecology, and DNR to include a no-recovery option in the 2020 Fish Escape Prevention, Response, and Reporting Plan, to be finalized December 2019. This option should include when, where, and under what conditions a recovery effort should not be attempted. A no-

recovery option would be triggered by the state, in consultation with co-managers and federal agencies for the purpose of protecting native Pacific salmonids. A no-recovery option can be triggered by Cooke if the attempted recovery would put the health and safety of its employees at risk.

This scenario exceeds the scope of an mDNS and demonstrates the need for a finding of significance and an environmental impact statement.

The mDNS rightly treats the possibility of escape as a real and serious threat that must be addressed before planting fish in the net pens. Escaped fish pose a range of risks to endangered wild salmonids, and to the ecology of Puget Sound and its watersheds. The recovery efforts following the 2017 collapse demonstrated inadequacies of the existing escape plan even for non-native species. As DFW notes in the mDNS and their exchanges with Cooke in Attachment B, an escape on the scale of 2017 would have released a number of fertile female steelhead that "would have exceeded the number of wild steelhead returning to spawn in many rivers in Puget Sound." DFW's exchange with Cooke states that the use of eggs treated to induce triploid sterility "would reduce, but not eliminate the risk."

To mitigate that risk, DFW requires Cooke to prepare an escape recovery plan. That escape recover plan itself could pose environmental risks. DFW recognizes that significant risk and imposes a further mitigation, one in which no recovery is attempted. This option could be triggered by the state in consultation with federal and tribal partners, but also can be triggered by Cooke based on its assessment of risk to its crew.

This creates a risk that there would be no mitigating effort taken to address the adverse environmental impacts of an escape. DFW's own arguments in the mDNS lead to the conclusion that this impact cannot be mitigated, and that it is inappropriate to proceed with a mitigated Determination of Non-Significance. To assess the risks of this projects requires a full EIS.

The pens' structure is likely to be unsafe for prevailing conditions in Puget Sound

The joint DFW/DOE/DNR investigation of the Cypress Island net pen collapse of 2017 identified failures of maintenance and engineering which resulted in the collapse of that ten-cage net pen and the release of hundreds of thousands of farmed fish. In the course of ongoing litigation resulting from that collapse, Wild Fish Conservancy contracted an independent marine engineer to provide expert testimony evaluating the collapsed pen and assessing the risks posed by the surviving pens.

Like the state's own investigation, Dr. Tobias Dewhurst's assessment found evidence that the net pen had not been adequately cleaned, and that there had been a persistent failure to confirm the soundness of the pens and their anchoring systems, despite those cleanings and inspections being required by permits and industry best practices prevailing before 2017. In addition, Dr. Dewhurst compared manufacturers' ratings for the surviving pens with conditions at the sites where they are currently deployed, and found "conditions at each of its eight sites exceeded the maximum rated conditions specified by the net pen manufacturer. Based on Cooke's documentation that I have reviewed to date, these issues persist at many of the remaining net pen sites. Thus, the remaining net pen systems may be at risk of partial or catastrophic failure during instances of extreme environmental loading, which could result in fish escapement."

He concluded: "As a result of excessive loads on the net pen system created by:

- currents and net sizes exceeding those specified by the net pen manufacturer,
- biofouling levels potentially exceeding design values, and
- mooring system installations that deviate from manufacturer recommendations and were not approved by a marine engineer, pens and cages operated by Cooke were at risk of complete failure. One pen, Cypress Site 2, did experience a catastrophic failure."

DFW and its partner agencies should not regard it as sufficient mitigation of risk to permit these pens to transition to rainbow trout/steelhead without new engineering plans in place. The current mitigation proposal would allow these pens to operate without "engineered mooring and anchoring plans and site-specific engineered drawings stamped by a structural engineer" until 2021, and would allow them to operate without a third-party inspection for periods as long as two years.

Given the history of these net pens, the consequences of the mismatch between their manufacturers' ratings and conditions in Puget Sound, and the inadequate maintenance and inspection preceding the 2017 collapse, these pens should be required to have adequately-engineered structures before transitioning to rainbow trout/steelhead. The engineering plans should be incorporated into a full EIS, allowing independent engineers to review the plans and assess the risks posed by the re-engineered pens and anchoring systems. The analysis should incorporate worst case scenarios and their likelihood, as required by WAC 197-11-080. Without that information, how can DFW and its partner agencies, or the voting public and elected leaders who reacted with outrage to the 2017 collapse, assess the risk and sufficiency of this current proposal?

The pens' structure is unsafe for foreseeable conditions in Puget Sound

Puget Sound is a seismically active area, with structures facing threats of significant damage from shaking in an earthquake, and from tsunamis caused by local earthquakes and those traveling from more distant quakes up and down the coast. A substantial tsunami is likely to occur during the life of these pens, and much state policy has been directed in recent years to make high-risk structures safe from seismic risks. While the exact time of such a tsunami is not predictable, there is a substantial likelihood of such a tsunami in the foreseeable future, and much attention and policymaking effort has been dedicated to incorporating that risk into planning.

Unlikely as that risk might be, it is necessary to consider here because, as noted in the Depart of Ecology SEPA FAQ: "An impact may be significant if its chance of occurrence is not great, but the resulting environmental impact would be severe." Since there is evidence that the net pens are already operating at or past their engineered limits, and since the people of Washington State have seen the tremendous harm done when these pens fail, understanding low-probability/high-risk events that threaten further collapses is critical in addressing the pens' full environmental impact.

Modeling by Washington's Department of Natural Resources and NOAA recently examined consequences of tsunamis for Puget Sound. Tsunami waves in some ways simply amplify the existing concerns about the structural soundness of the net pens, and add to the likelihood of a partial or complete collapse of one or more pens already considered as part of Dr. Dewhurst's engineering study. The forces generated by tsunami waves may differ in more than just intensity from routine tidal flow, in part due to the intense oscillation and the rebound of waves off of nearby shores. This risk deserves additional concern and scrutiny as part of a comprehensive EIS. A full-blown analysis of these forces is impractical given the limited time available for public comment.

To help understand the consequences of tsunamis, we requested simulated wave amplitudes and current velocities for the net pen sites. The DNR/NOAA simulations show significant added risk to all of the sites in the event of a tsunami within Puget Sound. The Fort Ward and Clam Bay sites see modeled wave heights nearly 20 feet high, as does the Port Angeles site, while the Cypress Island sites would face a wave over 10 feet high. The Skagit Bay site and Fort Ward site would face variable currents, with current speeds as high as 14 knots and rapid changes in direction and intensity. This oscillation in the course of a tsunami seems likely to generate forces outside those in normal engineering assumptions, and call for further consideration of anchoring systems and structural integrity.

There is no reason that a seismic catastrophe should be allowed to place Puget Sound's wildlife at needless risk due to inadequate planning and preparation. WAC 197-11-080 requires a consideration of worst case scenarios, and state law requires other facilities, such as hazardous waste storage sites, to be evaluated for seismic risks. These aquaculture net pens should be subjected to a full EIS that includes consideration of the seismic risks that they uniquely face as semi-permanent, in-water structures containing farmed fish whose escape would cause significant environmental risks.

Water withdrawal and discharge into Puget Sound

The SEPA checklist states "No surface water withdrawals or diversions are required to implement the species change proposal, or to continue operations at existing floating net pen facilities." This is incorrect, since routine operations—including harvest—entail drawing water out of the pens, extracting the fish on board the harvest ship, and then allowing the water to flow back into the Sound after sluicing across the ship. This process adds pollutants including fish blood, damaged fish parts, and injured bycatch fish to the water before it returns to the Sound. A full EIS would consider the environmental impacts of that removal and addition of water to the Sound.

Pollution from the pens would be harmful to the plants and animals in nearby waters, including to endangered and threatened species

Open water net pens raising salmonids routinely disperse large volumes of feed into public waters within the boundaries of the net pens as sustenance for their farmed fish. Some portion of the feed dispersed may not be consumed by fish 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 these 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 into or near the pens.

Physically small fish species, such as baitfish species and out-migrating 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 rainbow trout/steelhead 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 these rainbow trout/steelhead net pens 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.

In order to treat specific diseases or 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 where the U.S. Food and Drug Administration (FDA) requires a 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 waiting period. A full EIS would assess the risks posed to wild fish and their human and non-human consumers by outflows of food or medicine, and from exposures of native fish entering the pens.

An additional concern with antibiotic-treated feed and treatments to fish or water is the facilitation of the development of antibacterial resistant bacteria in the sediments (Heuer et al 2009, Cabello et al. 2013, Hu 2019). This issue needs to be explicitly addressed, including the provision of data pertaining to any monitoring of the sediments below each of the extant net pens in Puget Sound that may be available, if any.

In the SEPA checklist, Cooke refers in passing to the use of unspecified probiotics in net pens. These unspecified introduced microbes are likely to colonize the microbiome of native fish and the environment near net pens. Given the growing scientific appreciation of the role of the microbiome in health and development of fish and other animals and plants, this practice deserves greater scrutiny than is practical in the limited comment period available.

The pens are also subject to, and possibly causes of, lethal algal blooms. On November 15, marine aquaculture net pens in Clayoquot Bay began seeing die-offs due to a bloom of diatomaceous algae (https://thetyee.ca/News/2019/11/20/Algal-Blooms-Tofino/). The concentration of fecal material, excess food, and fish flesh near pens may exacerbate these blooms, and the resulting fish deaths then produce additional pollution as they cannot be extracted from the nets quickly enough. Observers near the recent die-offs report that the waters near the pens turned "a dark brown muddy river-like colour," due to the rotting flesh.

These die-offs are likely to be more frequent in the future, since reporters observe these algae and their large blooms "have expanded their range and frequency as climate change has warmed, acidified and robbed coastal waters of normal oxygen levels." As discussed below, the inability to quickly empty the pens in the event of massive deaths or a disease outbreak

poses significant risks to Puget Sound at large. One such risk is that the weight of the dead fish itself can add stresses to the pens' structure, making a collapse more likely during those emergency operations, and when the contents of the pens pose the greatest risk to the environment.

In passing HB 2957, the state legislature tasked state agencies "to eliminate negative impacts to water quality and native fish, shellfish, and wildlife." Allowing these pens to continue emitting this pollution fails to comply with that statutory language and the high standard that the legislature and the people of Washington demanded of the marine aquaculture industry.

A full EIS would assess all of these risks, including the risks posed by artificial probiotics to the microbial biodiversity of the Sound and its wild denizens, and benthic effects near pens.

Bycatch of fish entering pens or in harvesting and escape recovery efforts

Native fishes—including but not limited to forage fishes such as Pacific herring and potentially migrating or rearing juvenile salmon (including ESA-listed Chinook and chum salmon, steelhead, and bull trout)—may be attracted to the net pens due to the presence of feed and the presence of lower trophic taxa drawn to the feed and waste emanating from the pens.. 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 rainbow trout/steelhead. There are (at least) two issues that DFW and its partner agencies must address with regard to this issue in the permits as part of a full EIS:

1. A comprehensive accounting of species composition as well as total numbers of non-target fishes entrained during each net pen harvest period in which adult farmed rainbow trout/steelhead 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 state agencies and NOAA and available for public review.

2. As documented during Cooke harvesting operations in Puget Sound, all non-target fish 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 adjacent to the net pens during the harvest, feeding on the native fish as they are being discarded in violation of state and federal laws prohibiting the feeding of pinnipeds.

It is not surprising that there would be such bycatch, and it is likely that it includes endangered and threatened species. British Columbia requires reporting of bycatch (or what they term "incidental catch") at aquaculture facilities. A complete record of the species captured since 2011 is available from the Canadian Department of Fisheries and Oceans (https://open.canada.ca/data/en/dataset/0bf04c4e-d2b0-4188-9053-08dc4a7a2b03). In that dataset, salmon species are recorded for every year on file. In some cases, hundreds of thousands of fish are recorded as incidental catch as part of a rapid depopulation of the pens to control a disease outbreak. Even excluding those incidents, an average of over 35,000 incidental catches in net pens per year are recorded in British Columbia. It is likely that a proportionate amount of bycatch occurs in Puget Sound, and could have serious effects on the Sound's sensitive ecology. Because Cooke does not report that bycatch, the state does not monitor their efforts, and independent observers are not able to view the harvest process in detail, we cannot fully measure the harm this bycatch causes.

Surveys of aquatic diversity at sites near these net pens indicate substantial numbers of threatened and endangered juvenile salmonids, and forage fish. State-funded surveys including "West Sound Nearshore Fish Utilization & Assessment (SRFB Grant: 07-1898)" (2010),

"Cypress Island Aquatic Reserve Pilot Nearshore Fish Use Assessment" (2011), "West Whidbey Nearshore Fish Use Assessment" (2007), and the ongoing "Hood Canal Nearshore Juvenile Fish Use Assessment" find substantial populations of threatened coho, Chinook, pink, and chum salmon in near-shore waters at sites near and similar to those where net pens operate. Those surveys also demonstrate substantial variation in total species diversity and population sizes from site to site (e.g. Figure 3), and between surveys at the same site over time. Salmonid populations could vary by orders of magnitude from month to month, and between years. This highlights the difficulty of monitoring and predicting the potential bycatch that might occur in these pens without active, independent monitoring.

There are three additional issues here that DFW and partner agencies must address as part of a full EIS:

- Indirect predation by net pen steelhead on ESA-listed juvenile Chinook salmon, steelhead, and bull trout (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, steelhead, and bull trout in the vicinity of the pens.
- The harvester crew and/or net pen operator must obtain a fishing license or permit that would allow them to harvest native fish as described above.

Further, addressing this and other issues concerning potential adverse impacts to public resources from the operations of each net pen requires that WDFW as the primary regulatory agency have the authority to conduct regular and unannounced site visits and to conduct any biological sampling and testing deemed advisable to assure the public that no adverse impacts are occurring. At the very least, mitigation should require the presence of independent observers on-site during each harvest operation to quantify and describe the species and life stages of all by-caught species. A full EIS would allow analysis of the effects of bycatch on Puget Sound ecosystems and recovery plans for ESA-listed species, and the proper regulatory

frameworks to apply for monitoring and limiting bycatch, and due consideration of various alternatives for mitigation.

Air and noise pollution impacts to adjacent lands

Net de-fouling and cleaning operations have been found to cause fouling of the air and significant noise. 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 and the loud noises associated with generators, pumps, and other industrial equipment. This air and noise pollution causes severe depression of local residential property values, apart from human respiratory impacts. A full EIS would allow DFW and partner agencies to determine appropriate maximum levels of airborne particulates, odor-causing chemicals, and noise levels, and require facility operations to monitor and maintain appropriate airborne pollutant and sound levels.

As part of a full EIS, DFW and partner agencies should commission an appropriate sociological survey of resident households within one-half mile of the shorelines of the locations of each net pen facility. 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 air and noise pollution.

Fish flesh discharge

Open-air salmonid 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

conspecific steelhead and other salmonids. Studies have shown that these particles are potential vectors for pathogens.

This fish flesh also serves as an attractant for protected marine mammals and birds, and a full EIS should be undertaken to assess the harm this may do to those protected species.

A NMFS-approved Hatchery Genetic Management Plan (HGMP) is required

In view of the several issues of potential concern to public waters and ESA-listed native salmonids posed by the proposed open water net pen operations, a NMFS-approved Hatchery Genetic Management Plan (HGMP) for each of Cooke's freshwater hatcheries hatching rainbow/steelhead eggs, rearing fry and smolts, and outplanting smolts to open water net pens is required. This is the required ESA Section 4 Incidental Take Permit required of any artificial production facility producing any species of finfish that may have an adverse impact on ESA-listed salmonids. It is clear that open water marine salmonid net pen operations, including those currently operated by Cooke and those proposed to be operated using "triploid" rainbow/steelhead pose risks to native ESA-listed steelhead, Chinook salmon, and bull trout.

Further, since evaluation and approval of an HGMP is clearly a federal action, NEPA likely applies and a NMFS evaluation of any such HGMP would therefore require a full NEPA analysis, including preparation of an EIS.

Need for a thorough economic cost-benefit analysis of the proposed action and alternatives

Regardless of the biological concerns posed by the proposed action, no credible evaluation of the possible benefits of the proposed action can be considered complete without a full cost-

benefit analysis of the proposed action and reasonable alternative uses of the locations currently leased by Washington Department of Natural Resources (WDNR) to Cooke Aquaculture. The public and the public servants charged with making the decision on the proposed action cannot adequately evaluate the possible benefits of the proposed action in the absence of an understanding of what the presumed benefits to the public from the proposed action are and what benefits from reasonable alternative uses of the locations are or may be. It bears reminding that the locations at which the current net pens are located, including the bottom lands and the water in and surrounding each net pen belong to the public. The public needs to be presented with a complete and clear analysis of the economic costs and benefits of the proposed action and alternative uses of these resources. This can only be achieved by a thorough economic cost-benefit analysis embedded in a bona fide alternatives analysis through a full EIS.

The proposed mitigations are inadequate and not reasonably certain to address the risks

While a full EIS would be a more appropriate way to identify and evaluate methods for mitigating the risks of introducing steelhead into net pens, there are several important mitigations that are absent from the current proposal, or that must be strengthened before the proposal moves forward. As it stands, these mitigations are not reasonably certain to address the risks that the state acknowledges, and thus do not satisfy the requirements of SEPA.

While not comprehensive, these are some suggested changes to the proposed mitigations:

- As discussed above, the harvest process must be monitored by independent observers to assess bycatch and to ensure that blood, fish parts, or other waste is not discharged into public waters.

- WDFW and other regulators must have clear authority to conduct unannounced visits and inspections of facilities. They must have authority to review maintenance logs and to examine the structures, fish, feed, medicine, mort tanks, and other regulated components of the facility to ensure that Cooke is fulfilling all obligations under its permits and the required mitigations here.
- Independent inspections of the facilities should be required on an annual basis, not biennially.
- Reports from the independent engineer, and all other reports required from Cooke as part of this mitigation, must be clearly recognized as public records and made available to the public immediately through a publicly-accessible website.
- As discussed above, the mitigation should not merely establish a consistent means of estimating triploidy error rate, but should set a maximum acceptable error rate, and a sampling regime sufficient to assure that the error rate is estimated probabilistically and with high precision. A minimum number of total random samples for a specific, fixed number of fertile eggs from each egg cohort should be specified to assure that the total number of diploids in a specific total number of eggs from each cohort does not exceed a specified maximum threshold number T with high probability P (95% or greater) The attainment standard would be a probability of less than (1-P) that the number of diploids is not greater than the threshold number T. This error rate cap should be derived based on maximum number of fertile females that might escape from a pen.
- All forms of PRV should be reportable. In addition to screening eggs and smolts, WDFW inspectors should inspect the tanks to assess the rate at which net pens are amplifying pathogens, and act to address pathogen levels that might pose significant risks to wild species attracted to the pens' vicinity.
- All farmed fish should be clearly identifiable in the event of an escape. There is no basis for allowing any of these biologically-altered domestic rainbow/steelhead trout to be introduced without a clear and approved plan in place for visually distinguishing them from any other fish in Puget Sound.

The proposal is deficient by the standards of the 1990 EIS

As stated above, we disagree with the choice to rely on the 1990 EIS for analysis of the current SEPA review. Substantial changes in the list of endangered and threatened species in Puget Sound, improved understanding of the risks posed by industrial net pens and industrial aquaculture, and changes in state law all make a compelling demand for a new EIS. But since the EIS relies on that dated document, any failure to implement its guidelines should be ground to refuse to allow the proposed action or to compel a full environmental review of the effects of that deviation.

The 1990 EIS recognizes that aquaculture with native fish (such as the rainbow/steelhead trout at issue here) pose different, and in some cases greater, risks than non-native fish like Atlantic salmon. As such there are some guidelines which were not applied in planning and approving the siting and construction of the existing net pens for use with Atlantic salmon which must now be applied in evaluating the pens' use for rainbow/steelhead trout.

On pages 69-70 of the 1990 EIS, section 5.7.2.2 reads in full:

> It is recommended that the following guidelines be used by WDF when reviewing fish farm proposals:
>
> - When Pacific salmon stocks are proposed for farms in areas where WDF determines there is a risk to indigenous species, WDF should only approve those stocks with the greatest similarity to local stocks near the farm site.
> - In areas where WDF determines there is a risk of significant interbreeding or establishment of harmful self-sustaining populations, WDF should only approve the farming of sterile or monosexual individuals, or genetically incompatible species.

- In areas where WDF determines that wild populations could be vulnerable to genetic degradation, WDF should establish a minimum distance of separation between farms and river mouths.

In the following section, "Mitigation Measures and Unavoidable Significant Adverse Impacts," the EIS states: "WDF and other local experts agree that the potential for significant genetic impacts resulting from farm escapees interbreeding with wild stocks is low. Existing regulations and the use of the guidelines indicated in the Preferred Alternative are adequate to avoid any significant adverse impacts and additional mitigation measures are not necessary."

Unfortunately, there is no evidence that the guidelines indicated in the Preferred Alternative have been applied. We can locate no record of any policy regulating the distance of net pens to the mouths of rivers, and WDFW staff confirmed that they are also unaware of any policies addressing the distance of net pens to river mouths. This guideline only applied to proposals for native fish aquaculture, so would have been unnecessary under the 1990 EIS until now. WDFW staff queried about this guideline cited the use of monosexual and partially sterile stock in this proposal as adequate mitigation, but the plain language of the 1990 EIS requires both, not one or the other.

This issue is crucial in considering the risks of a farmed domestic fish in waters populated with a threatened wild conspecific, as with wild steelhead and rainbow/steelhead trout. Farmed fish that escape near a river mouth could rapidly migrate upriver and interbreed with wild fish. As noted above, the wild steelhead populations in many rivers could be swamped by the number of fertile females if an escape on the scale of 2017 occurred. But the threatened state of the wild species is so dire that population estimates for some rivers—according to the National Marine Fisheries Service steelhead recovery plan (NMFS 2018)—are as low as 5 individuals in some rivers. Even a single fertile female breeding in such a river could destroy the wild genetics.

As shown in the attached map, the existing seven net pen farm sites are less than 20 kilometers (12.5 miles) by water from important wild steelhead rivers, including the Elwha, Dungeness, Samish, Skagit, Stillaguamish, Cedar, and Green rivers. Other nations restrict net pen farm sites from being as near as 10 km from river mouths, and distances of under 1 km clearly pose serious risk that escapees could breed before recovery.

It should be noted that even the discussion of risks from escapees on breeding grounds rely on dubious assumptions, discussed in detail above. The analysis ignores the loss of breeding opportunities when wild males attempt to mate with escapees (even if those matings are not successful), and the loss of mating opportunities if escapees are able to outcompete wild females for redd sites. Even if the reproductive fitness for escaped females was exactly zero, those effects mean there would still be harm to fragile wild populations. Furthermore, the analysis of reproductive success considers only a point estimate of reproductive success rate, and doesn't address the full distribution of this or other rates, and thus systematically under-estimates the number of offspring that might result from escapes and the long-term harm to wild steelhead genetics. There is no worst case analysis or discussion of that worst case's likelihood, as required by WAC 197-11-080.

In the absence of established guidelines, and with no discussion in the SEPA checklist or associated documents assessing the risk of releasing these potentially-fertile fish in proximity to river mouths, the conditions set by the 1990 EIS have not been fulfilled, and the proposed actions must be deemed to carry too high a risk of environmental harm. The mDNS should be withdrawn and a full EIS should be conducted assessing the risks associated with each of the existing net pen sites and its neighboring rivers.

The SEPA analysis failed to account for changes in risk assessment imposed by new law

After the 2017 collapse, the Washington Legislature acted deliberately and overwhelmingly to limit open-water marine net pen aquaculture, and the Governor signed the new law enthusiastically. In addition to phasing out Atlantic salmon farming by 2022, the new law imposed a series of other requirements, and established its clear intent that future marine net pen aquaculture be subjected to greater scrutiny. Section 1 of the legislation passed by both houses states:

> Recent developments have thrown into stark relief the threat that nonnative marine finfish aquaculture may pose to Washington's native salmon populations. But just as evidence has emerged that nonnative marine finfish aquaculture may endanger Washington's native salmon populations, so too has evidence emerged that marine finfish aquaculture in general may pose unacceptable risks not only to Washington's native salmon populations but also to the broader health of Washington's marine environment. Given this evidence, the legislature intends to phase out nonnative finfish aquaculture in Washington's marine waters. Because the state of the science and engineering with regard to marine finfish aquaculture may be evolving, the legislature further intends to study this issue in greater depth, and to revisit the issue of marine finfish aquaculture once additional research becomes available.

This language was vetoed as the Governor signed the law, but demonstrates the legislature's intent. That intent is also shown in Section 5 of the engrossed bill, which requires agencies to "continue the existing effort to update guidance and informational resources to industry and governments for planning and permitting commercial marine net pen aquaculture," and mandating: "The guidance must be designed to eliminate commercial marine net pen

escapement and to eliminate negative impacts to water quality and native fish, shellfish, and wildlife."

In finding that "marine finfish aquaculture in general may pose unacceptable risks" and mandating guidance to "eliminate" those risks the legislature overturned the 1990 EIS's determination that Atlantic salmon aquaculture posed acceptable risks and imposed a stricter standard than existed previously. It is clear that the legislature intended to alter the risk assessment framework used for marine finfish aquaculture in general from the status quo. Relying on the 1990 EIS without acknowledging the significant shift in risk assessment mandated by this law is clearly unwarranted and contrary to the law passed in response to the 2017 catastrophe.

The legislature clearly understood that its actions would not only affect Atlantic salmon farming. In addition to the explicit statement to that effect in Section 1, they heard this testimony from Dr. Ken Warheit, supervisor of WDFW's fish health program:

> We suggest that if the State is going to restrict marine fish aquaculture, it removes authorization also for other nonnative fish. More importantly, it should also remove authorization for native salmonid marine commercial aquaculture which WDFW considers to be a greater risk to the State's native wild and hatchery salmonid populations, than is Atlantic salmon marine aquaculture.

The legislation did not forbid the use of biologically-altered rainbow/steelhead trout, but it did establish that the risks of Atlantic salmon aquaculture are too great, and express concern that the same might be true of all marine finfish aquaculture. It urged further study of that risk and raised the bar for future risk assessment.

Unfortunately, the guidance mandated to eliminate these risks has not been issued, even though a report to the legislature regarding its progress was due during this comment period.

In light of that change in state law, it is inappropriate to apply the same risk assessment used in 1990 to a proposal today. In evaluating the risk of marine finfish aquaculture proposals not forbidden under HB 2957, state agencies should conduct an EIS on any proposal that is riskier than the best-case scenario for marine Atlantic salmon aquaculture. Since this proposal does not clear even the guidelines laid out in the 1990 EIS (since no assessment of proximity to river mouths was conducted), and since the farmed fish in this proposal could directly interbreed with a federally-listed steelhead species and degrade its genetics, a new EIS is clearly warranted.

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Tables

River/River system	Population (five year geometric mean, 2010-2014)
Cedar	4
Green	552
Puyallup	277
White	531
Dungeness	141
East Hood Canal Tributaries	60
Sequim/Discovery Bay Tributaries	19
Samish/Bellingham Bay Tributaries	846
Skagit	5123

Stillaguamish	392

Table 1. Estimated wild adult steelhead populations (five year geometric mean, 2010-2014) in rivers within a 12 mile radius of the existing net pens. The highly domesticated fertile net-pen-origin females that are predicted to escape during a net pen failure comparable to that of 2017 would comprise a significant proportion of the spawning population in many Puget Sound rivers.

Number of Fish	1000000
Proportion Diploid	0.00156
Number Diploid Outplanted	1560
Probability of Escape	0.82
Number of Diploid Escapes	1279.2
Probability of Non-Recovery	0.77
Number Diploids Not Recovered	985
Proportion Sexually Mature_High Estimate	0.5
Number Mature Diploids_High Estimate	493
Proportion Sexually Mature_Low Estimate	0.1
Number Mature Diploids_LowEstimate	99

Proportion Fertile Surviving to Spawn	0.5
Number of Mature survivors_High Estimate	247
Number of Mature survivors_Low Estimate	50

Table 2. Estimate of number of the maximum number diploid individuals per million farmed rainbow/steelhead outplanted to a net pen that would result in no more than the number of mature escapees surviving to sexual maturity (bottom row) given the assumptions in WDFW's mDNS Summary, page 6.

Figures

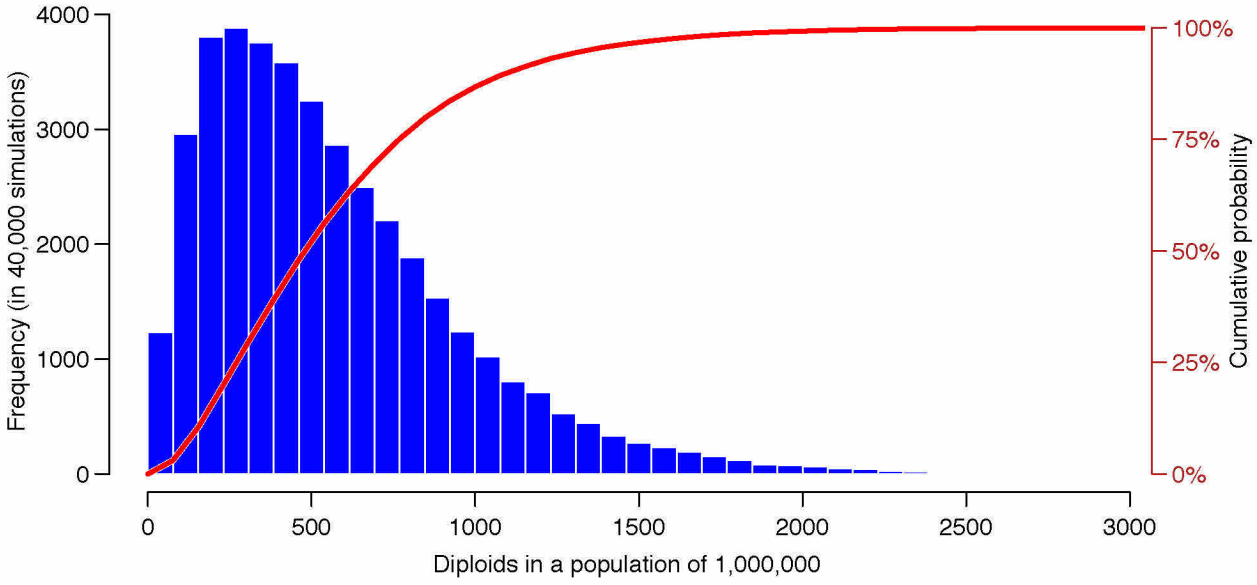


Figure 1. Distribution of the number of diploids (triploid-induction failures) in one million eggs when the number of diploids in a random sample without replacement of 3500 is one. The blue bars show the number of diploids in the interval on the horizontal x-axis (for example, 5000 in the interval between 3000 and 400 shown on the left y-axis). These numbers were computed through a Bayesian analysis that sampled 40,000 probable values (so the probability that the true number of diploids in the population of 1,000,000 is 5,000/40,000 = 0.125 or 12.5%). The

red curve is the cumulative probability distribution. The shows the probability that a given value on the x-axis is less than or equal to the corresponding value on the right y-axis. For example, 95% of the distribution is less than 1400 and 97.5% is less than 1600, satisfying a risk-averse criteria that 95% of the distribution of possible values be no greater than 1560 diploid per million eggs or fry. About half the distribution (50%) is less than 500.

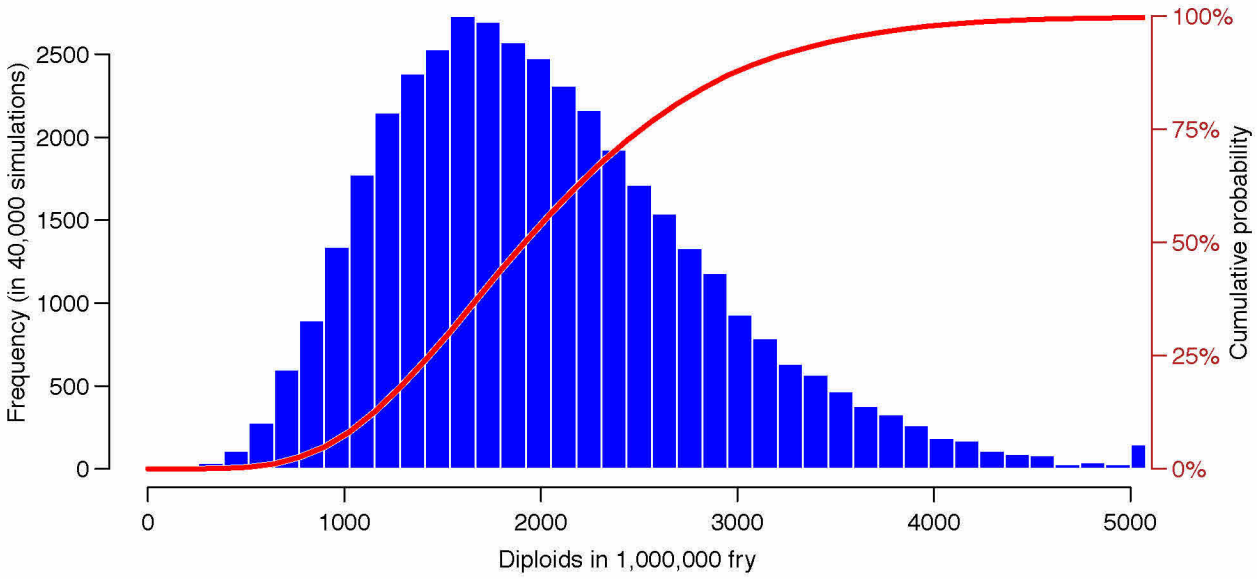


Figure 2. Distribution of the number of diploids (triploid-induction failures) in one million eggs when the number of diploids in a random sample without replacement of 2950 is five (per Attachment A of Cooke's SEPA Checklist). The mean is 2029, the median is 1900. 95% of the distribution is less than 3600. There is a 5% chance that the true number of diploids is between 3500 and 5000.

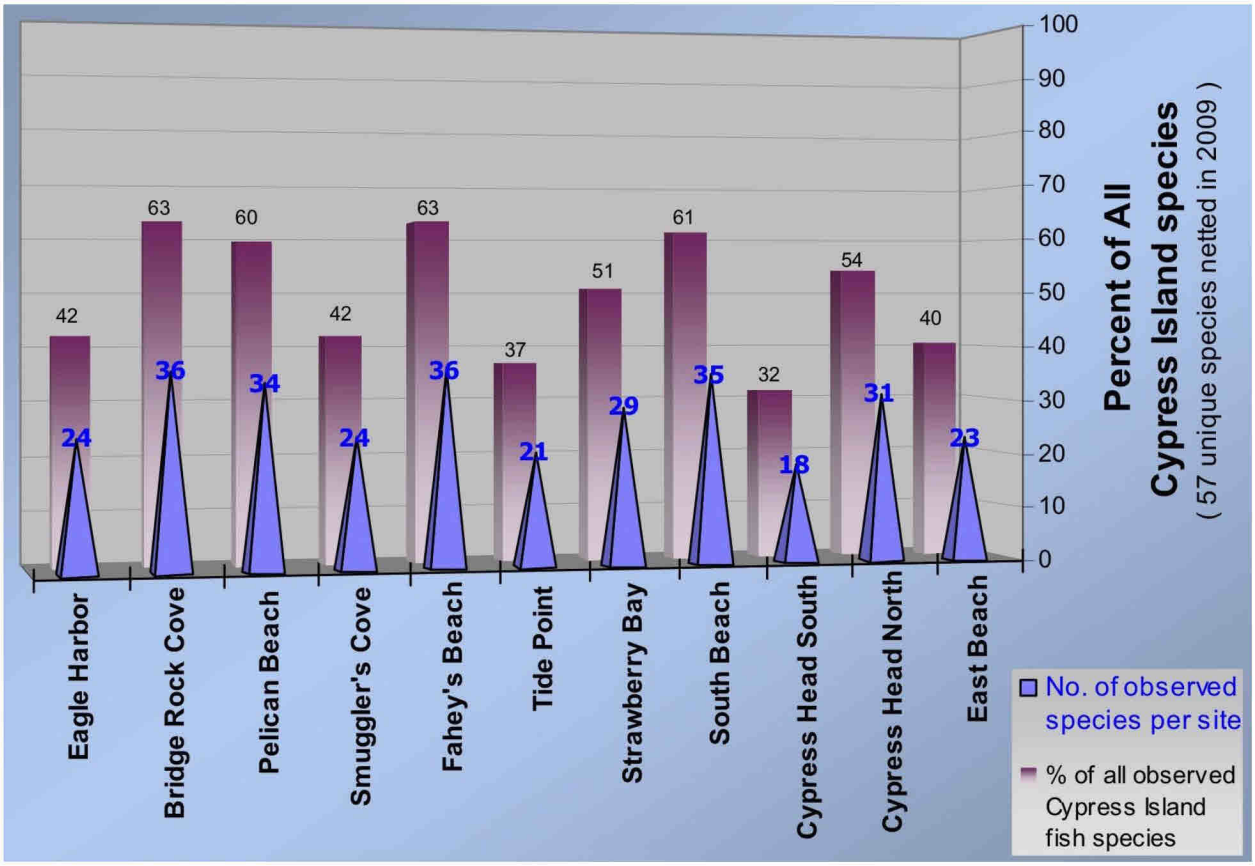
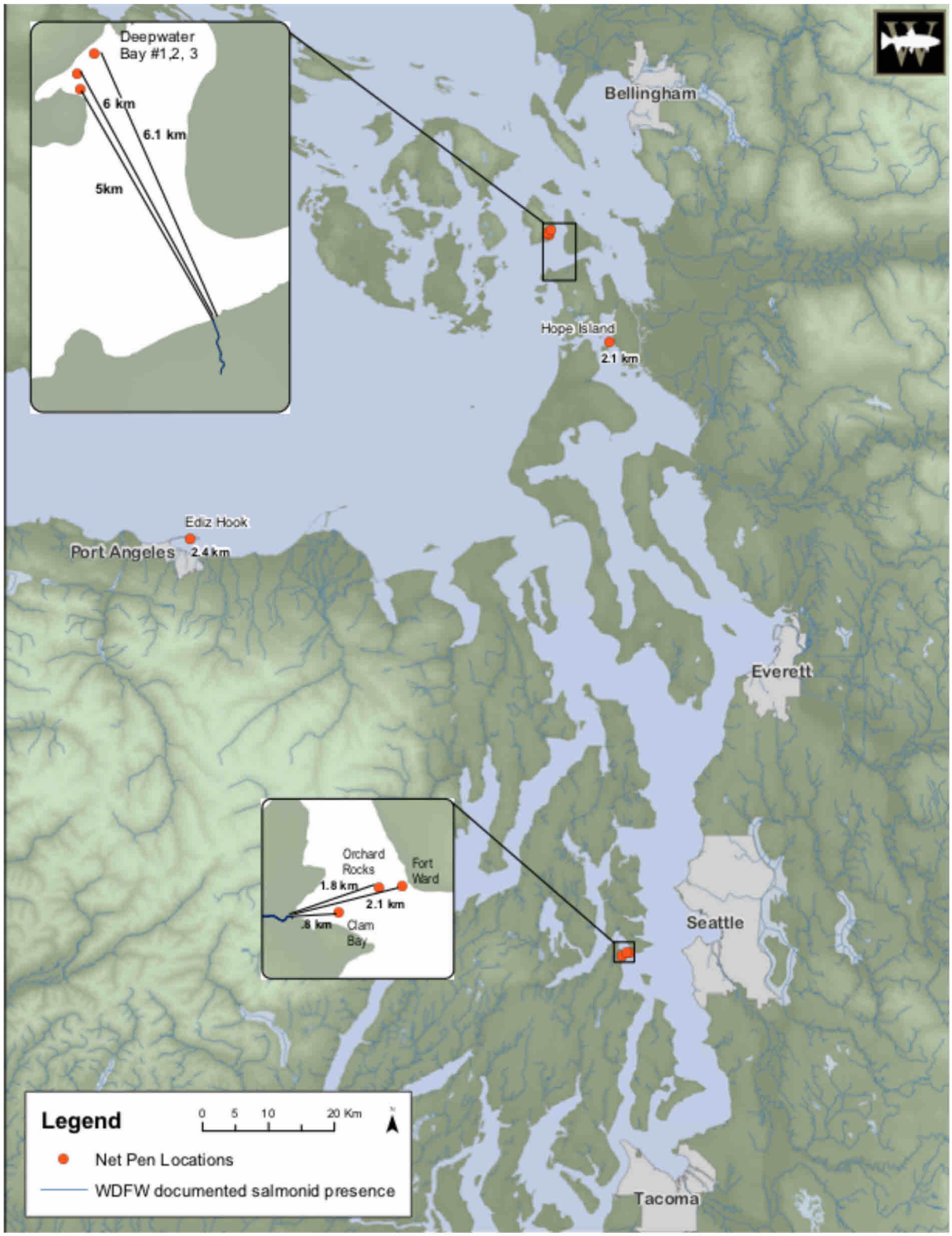


Figure 3. The total number of species encountered at each sample site in a survey of Cypress Island nearshore habitats, as well as the per-site percentage of all species netted from the Cypress nearshore. No single locale had greater than 65% of all species present across the 11 widely dispersed sites. From "Cypress Island Aquatic Reserve Pilot Nearshore Fish Use Assessment" (2011).

Map


Deepwater Bay #1,2, 3
6 km
6.1 km
5km
Bellingham
Hope Island
2.1 km
Ediz Hook
Port Angeles
2.4 km
Everett
Orchard Rocks
Fort Ward
1.8 km
2.1 km
.8 km
Clam Bay
Seattle
Tacoma
Legend
0 5 10 20 Km
Net Pen Locations
WDFW documented salmonid presence

The Appendix submitted with the original comments has been removed in order to meet the 30 MB file limit on Ecology's NPDES permit comment website. The full document with appendix can be viewed and downloaded online at the following link:

https://drive.google.com/file/d/1gt5btZa5-6o7odMLpS-Mu0xPlMVuUjOj/view?usp=sharing

ATTACHMENT 3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3188

WATER
DIVISION

May 29, 2020

Dr. Kim Kratz
Assistant Regional Administrator
National Marine Fisheries Service
Oregon & Washington Coastal Area Office
510 Desmond Drive Southeast, Suite 103
Lacey, Washington 98503-1263

Dear Dr. Kratz:

On April 8, 2011, the Environmental Protection Agency and National Marine Fisheries Service completed the Endangered Species Act Section 7 consultation on the Washington State Department of Ecology's Sediment Management Standards (WAC 173-204-412) regarding marine finfish rearing facilities. Following the collapse of a net pen facility near Cypress Island in August 2017, and the following escapement recovery efforts, Wild Fish Conservancy supplemented the existing litigation regarding disease transmission against both agencies. On August 7, 2018, in *Wild Fish Conservancy v. EPA et al*, 331 F. Supp. 3d 1210 (W.D. Wash. 2018), the Court issued an order denying the federal agencies' motion for judgment on the pleadings and addressing the legal duty of both agencies with regard to reinitiation of ESA consultation and the scope of such consultation.

The EPA disagrees with the Court's holding that it retains sufficient discretion over previously approved state water quality standards to reinitiate consultation. However, consistent with the Court's order, the EPA sent NMFS a letter requesting the reinitiation of consultation on October 1, 2018, which NMFS accepted in a response dated October 3, 2018.

Enclosed is the 2020 Biological Evaluation Addendum prepared by the EPA to facilitate the reinitiation of formal consultation with NMFS. The Addendum incorporates the following new information since the 2008 and 2010 BEs:

- Disease transfer from Atlantic salmon net pen fish to Pacific salmon, primarily relying on a letter from NMFS dated January 12, 2016, and accompanying memo.
- An escapement event that occurred on or around August 19, 2017, at Cooke Aquaculture's Site 2 net pen off Cypress Island and the follow up and the associated response actions.
- Updated National Pollutant Discharge Elimination System permitting actions by the Department of Ecology to minimize escapement risk and covers the planned transition at

existing commercial net pens facilities to raise steelhead instead of Atlantic salmon, which must be phased out by 2022 per Washington state law.

- The EPA NPDES general permit which currently covers tribal enhancement net pen facilities and the reissuance of the general permit in late 2020. The EPA plans to expand the scope of the general permit to include federal research facilities and to allow for the marginal expansion of tribal enhancement facilities. The tribal enhancement facilities raise and release native salmonids and the federal research facilities will raise native fish (Pacific salmon, sablefish, etc.).

In accordance with ESA Section 7(a)(2), the EPA is hereby providing our analysis of potential effects on listed species and critical habitat resulting from the EPA's approval of portions of the Sediment Management Standards at the Washington Administrative Code 173-204, including new information since the previous BEs. The EPA's effects determinations for the species under NMFS's purview are presented in Section 8 of the BE Addendum and summarized below.

	Species	**ESU/DPS/Population**	**Species Effects Determination**	**Critical Habitat Designation**	**Critical Habitat Effects Determination**
1	Chinook Salmon (*Oncorhynchus tshawytscha*)	Puget Sound ESU	LAA	Yes	NLAA
2	Chum Salmon (*Oncorhynchus keta*)	Hood Canal summer-run ESU	LAA	Yes	NLAA
3	Steelhead (*Oncorhynchus mykiss*)	Puget Sound, DPS	LAA	Yes	NLAA
4	Bocaccio (*Sebastes paucispinis*)	Puget Sound/Georgia Basin DPS	LAA	Yes	NLAA
5	Yelloweye Rockfish (*Sebastes ruberrimus*)	(Puget Sound/Georgia Basin DPS)	LAA	Yes	NLAA
6	North American Green Sturgeon (*Acipenser medirostris*)	Southern DPS	NLAA	Yes	NLAA
7	Pacific Eulachon (*Thaleichthys pacificus)*	Southern DPS	NLAA	Yes	NLAA
8	Humpback Whale (*Megaptera novaeangliae*)	Pacific Coast, Mexico DPS and Central America DPS	NLAA	No	--
9	Killer Whale (*Orinus orca*)	Southern Resident, DPS	NLAA	Yes	NLAA

LAA – likely to adversely affect
NLAA – may affect, but not likely to adversely affect

We respectfully request your concurrence on the Agency's determinations for the species and critical habitat that are not likely to be adversely affected.

For the species and critical habitat that are likely to be adversely affected by the Agency's proposed action, we request that you notify the EPA of your agreement to reinitiate formal consultation within 30 days from the receipt of this letter. As described in the duration and extension of formal consultation section at 50 CFR 402.14(e), we anticipate receiving the biological opinion from NMFS within 135 days of initiating formal consultation and if an extension is necessary, procedures in this section will be followed.

The EPA appreciates the technical support from your staff, including the ongoing coordination to discuss NMFS's information needs. We remain available to provide any additional assistance and/or clarification of the enclosed Addendum.

If you have any questions or wish to discuss this matter further, please call me at (206) 553-1855 or contact Matthew Szelag, the EPA staff lead, at (907) 271-1208 or szelag.matthew@epa.gov.

Sincerely,

Daniel D. Opalski
Director

Enclosure

cc (e-copy): Jennifer Quan, NMFS
Jeff Vanderpham, NMFS
Caitlin Imaki, NMFS

ADDENDUM TO THE UPDATED BIOLOGICAL EVALUATION DATED DECEMBER 13, 2010

REGARDING THE EPA CLEAN WATER ACT ACTION ON WASHINGTON'S MARINE FINFISH REARING FACILITY PROVISION CONTAINED IN THE SEDIMENT MANAGEMENT STANDARDS AT WASHINGTON ADMINISTRATIVE CODE 173-204-412

PREPARED FOR:
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE

PREPARED BY:
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 SIXTH AVENUE, SUITE 155
SEATTLE, WA 98101

May 29, 2020

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Preface

In the Biological Evaluation of April 17, 2008, and supplemented on August 6, 2008 (collectively referred to as the 2008 BE),[1] the EPA concluded that the approval of certain new and revised water quality standards at WAC 173-204, Washington's Sediment Management Standards, were not likely to adversely affect listed fish species or marine mammals or their designated critical habitat areas since the effects of such approval would be insignificant.

The EPA's approval, following the completion of Endangered Species Act consultation in 2008, of Washington's Sediment Management Standards was challenged in court by Wild Fish Conservancy. On April 28, 2010, the U.S. District Court for the Western District of Washington issued an order setting aside the 2008 consultation on Washington's Sediment Management Standards on grounds that the EPA and NMFS had failed to consider two NMFS recovery plans for Puget Sound Salmon and Southern Resident Killer Whales. *Wild Fish Conservancy v. U.S. Envtl. Prot. Agency*, No. C08-156-JCC, 2010 U.S. Dist. LEXIS 41838, pp. 15-16 (Apr. 28, 2010). Following the Court's decision, the EPA reviewed the two NMFS recovery plans along with the data in the original 2008 BE and other updates to information and analysis and issued an Addendum to the 2008 BE on December 13, 2010 (referred to as the 2010 BE).[2]

> 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]

Following a review of the information presented in the recovery plans, the EPA determined that although net pen operations in accordance with the provisions at WAC 173-204 may affect ESA listed species or their critical habitat, such effect is not likely to adversely affect (NLAA) the three species of salmonids and the southern resident killer whale. Therefore, the EPA reaffirmed the NLAA and no effect determinations contained in the 2008 BE. The EPA also provided an analysis and a NLAA determination for the three additional listed species of rockfish in Puget Sound: bocaccio, canary, and yelloweye rockfish. ESA consultation was completed on April 8,

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[1] April 17, 2008. Supplemented August 6, 2008. 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.

[2] December 13, 2010. U.S. 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.* Prepared for National Marine Fisheries Service.

[3] Available online at: https://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/puget_sound/puget_sound_chinook_recovery_plan.html

[4] Available online at: https://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/killer_whale/recovery_plan.html

2011,[5] and the EPA re-approved the applicable provisions on April 22, 2011.[6]

On November 4, 2015,[7] Wild Fish Conservancy filed new litigation alleging that the informal consultation concluded in April 2011 was arbitrary, and that the EPA and NMFS had a duty to reinitiate consultation based on new information related to disease outbreak. On December 7, 2017, following the collapse of a commercial net pen and escape of Atlantic salmon, Wild Fish Conservancy filed a second amended complaint supplementing its litigation to claim that the net pen collapse presented additional information requiring both federal agencies to reinitiate consultation.[8] The EPA acknowledged the net pen failure in a letter to NMFS on December 14, 2017.[9] On August 7, 2018, the Court issued an order denying the federal agencies' motion for judgment on the pleadings and addressing the legal duty of both agencies with regard to reinitiation of consultation and the scope of such consultation.[10] *Wild Fish Conservancy v. EPA et al*, 331 F. Supp. 3d 1210 (W.D. Wash. 2018).

The EPA disagrees with the Court's holding that it retains sufficient discretion over previously approved state water quality standards to reinitiate consultation. However, consistent with the Court's order, the EPA sent NMFS a letter requesting the reinitiation of consultation on October 1, 2018,[11] which NMFS accepted in a response dated October 3, 2018.[12]

This 2020 BE Addendum incorporates new information on several different topics. First, additional information regarding disease transfer from Atlantic salmon net pen fish to Pacific

[5] April 8, 2011. Letter from William W. Stelle, Jr., Regional Administrator, NFMS to Jannine Jennings, Water Quality Standards Unit, 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).*

[6] April 22, 2011. U.S. EPA Region 10. Letter from Michael A. Bussell, Director Office of Water and Watersheds, EPA Region 10 to Mr. Kelly Susewind and Mr. Jim Pendowski, Department of Ecology*, 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.*

[7] November 4, 2015. Case 2:15-cv-01731. WFC V. U.S. EPA and NMFS. *Complaint for Declaratory and Injunctive Relief.*

[8] November 22, 2017. Case 2:15-cv-01731-BJR. WFC V. U.S. EPA and NMFS. *Plaintiff's Motions to Supplement Pleadings and Amend Case Schedule.*

[9] December 14, 2017. Letter from Michael Lidgard, Acting Director, Office of Water and Watersheds, EPA Region 10 to Mr. Kim Kratz, Assistant Regional Administrator, NMFS, *Re: August 2017 Puget Sound Net Pen Failure.*

[10] August 7, 2018. Case 2:15-cv-01731-BJR. WFC V. U.S. EPA and NMFS. *Order Denying (1) Federal Defendants' Motion for Judgment on the Pleadings and (2) Cooke Aquaculture's Motion to Dismiss.*

[11] October 1, 2018. Letter from Daniel D. Opalski, Director Office of Water and Watersheds, EPA Region 10 to Mr. Kim Kratz, Assistant Regional Administrator, NMFS *Re: Request to Reinitiate Endangered Species Act Section 7 Consultation on the Environmental Protection Agency's Approval of Washington State Department of Ecology's Sediment Management Standards (WAC 173-204-412) Regarding Marine Finfish Rearing Facilities.*

[12] October 3, 2018. Letter from Barry A. Thom, Regional Administrator, NMFS, to Dan Opalski Director Office of Water and Watersheds, EPA Region 10, *Re: Request to Reinitiate April 8, 2011 Endangered Species Act Section 7 Consultation on the Environmental Protection Agency's Approval of Washington State Department of Ecology's Sediment Management Standards (WAC 173-204-412) Regarding Marine Finfish Rearing Facilities (refer to NMFS No.: NWR-2010-6071).*

salmon has been included, primarily relying on a letter from NFMS dated January 12, 2016,[13] and accompanying memo in response to a request from the EPA on December 16, 2015.[14] Second, further information regarding an escapement event that occurred on or around August 19, 2017, at Cooke Aquaculture's Site 2 net pen off Cypress Island, including the follow up and the associated response has been included in this 2020 BE Addendum. The Addendum incorporates updated National Pollutant Discharge Elimination System (NPDES) permitting actions by the Washington State Department of Ecology (Ecology), to minimize escapement risk and covers the planned transition at commercial net pen facilities to raise steelhead instead of Atlantic salmon which must be phased out by 2022. Lastly, the Addendum discusses facilities covered by the current EPA NPDES general permit (WAG132000),[15] which covers tribal enhancement facilities. In their reissuance of the general permit in late 2020, EPA plans to expand the scope of the general permit to include federal research facilities and to allow for the marginal expansion of tribal enhancement facilities. The tribal enhancement facilities raise and release native salmonids and the federal research facilities will raise native fish (Pacific salmon, sablefish, etc.). Please note that throughout this Addendum, the EPA will refer to both the currently covered tribal enhancement facilities and the soon to be covered federal research facilities broadly as "facilities covered under EPA's NPDES GP." The current EPA general permit cites, but does not necessarily rely on, the Sediment Management Standards at WAC 173-204 for their permitted operations, and the reissued NPDES GP will be similar in this regard.

Given the gap between the 2010 BE and this 2020 Addendum, the EPA is providing updated information to be considered in this ESA consultation. Below is a crosswalk that explains the updates to each section of the 2010 BE that are included in this 2020 Addendum. The updates include:

1. Updates to the **Background** to revise the number of net pen facilities included in the consultation and Ecology's permitting activities and moratorium on Atlantic salmon net pens
2. Minor updates to the **Description of the Agency Action** to reflect changes to the provisions at WAC 173-204
3. Updates to the **Description of the Action Area** to note the net pen facilities included in this consultation

[13] January 12, 2016. Letter from Kim W. Kratz, Ph.D., Assistant Regional Administrator, Oregon Washington Coastal Office, NMFS, to Dan Opalski, Director Office of Water and Watersheds, EPA Region 10 with enclosed memo dated December 17, 2015 from Dr. Dickhoff to Dr. Kratz *Re: Scientific Review of Intent to Sue U.S. Environmental Protection Agency and National Marine Fisheries Service for violations of the Endangered Species Act associated with consultation of Washington State's Revised Sediment Management Standards for Marine Finfish Facilities dated 25 August 2015.*

[14] December 16, 2015. Letter from Daniel D. Opalski, Director Office of Water and Watersheds, EPA Region 10 to Mr. William Stelle, Administrator, West Coast Region, NMFS *Re: Washington's Sediment Management Standards regarding Netpen Facilities.*

[15] September 9, 2015. EPA Region 10. Tribal Marine Net Pen Enhancement Facilities NPDES General Permit for Washington. WAG132000. https://www.epa.gov/sites/production/files/2018-03/documents/r10-npdes-washington-tribal-net-pen-gp-wag132000-final-permit-2015.pdf

4. Updates to the **Species Status and Life History** to include newly listed species of North American Green Sturgeon and Pacific Eulachon along with steelhead, bocaccio and yelloweye rockfish designated critical habitat since 2010
5. The **Environment Baseline** remains largely unchanged except where noted
6. Updates to the **Analysis of Effects** regarding the indirect effects associated with disease transfer, escapement events, permitting activity to minimize escapement risk/additional net pen facilities, and new native species reared
7. The **Cumulative Effects** section remains unchanged
8. New **Summary of Findings** to reflect the EPA's revised determinations
9. The **Sediment Testing Methodology Provisions** section remains largely unchanged except where noted
10. **References**
11. Updated **Maps**

1. Background

In 1991, the EPA approved Washington's Sediment Management Standards (SMS). On June 3, 1996, 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 at WAC-173-204-412. These revisions were subject to the Alaska Rule[16] since they were adopted by Washington and submitted to the EPA for review prior to May 30, 2000, and the EPA took no action prior to that date. In accordance with 40 CFR 131.21(c)(1), Washington's 1996 sediment management standard revisions went into effect for Clean Water Act purposes as soon as they were effective under state law.

The addition of the marine finfish rearing facility section exempts net pen facilities in Puget Sound from portions of Washington's sediment management standards, underneath and around the immediate area of the net pen. The section also states that sediment quality compliance and monitoring requirements of net pen facilities are addressed through the NPDES permitting program. The section provides for a special sediment impact zone by rule within and including a distance of 100 feet from the outer edge of net pen facility structures; consequently, such facilities and their associated discharges are exempt from marine sediment quality standards, sediment impact zone maximum criteria, and sediment impact zone standards at WAC 173-204-415. The section also allows Ecology to authorize sediment impact zones beyond 100 feet via NPDES permits or administrative actions, subject to increased monitoring. The rule provides no exemptions to compliance with Washington's water quality standards for net pen facilities.

For commercially operated net pens, the Washington State Department of Natural Resources (WDNR) issues a site license for each facility (lease expiration date) and the Washington Department of Fish and Wildlife (WDFW) regulates disease control, fish health and escape management at each facility.

[16] Rule specifying that new and revised standards adopted by States and authorized Tribes on or after May 30, 2000, become "applicable standards for Clean Water Act purposes" only when approved by EPA. https://www.federalregister.gov/documents/2000/04/27/00-8536/epa-review-and-approval-of-state-and-tribal-water-quality-standards

Currently, there are four active commercially operated Atlantic salmon net pen facilities in Puget Sound operated by Cooke Aquaculture. Previously, there were eight active facilities, but due to the collapse of Site #2 off Cypress Island and the closure of the Port Angeles (Ediz Hook) net pen, among others off Cypress Island, the number of facilities has been reduced to four since the 2010 BE. The remaining net pens include one near Hope Island (Skagit Bay) and three in Rich Passage near Bainbridge Island. Although the operator may pursue using some of the previously active net pens in the future, the potential effects from those sites would be similar to the sites evaluated in this BE Addendum.

Ecology reissued NPDES permits for the four active commercially operated net pen facilities on July 11, 2019.[17] The updated NPDES permit requirements allow Ecology to ensure that facilities are meeting water quality standards until the Atlantic salmon net pens are phased out. In 2018, following the collapse of Cooke's net pen facility Cypress Island—Site 2 and the resulting escape of approximately 250,000 Atlantic salmon, the Washington State Legislature passed House Bill 2957, phasing out marine rearing of all Atlantic salmon as the facility aquatic lands leases expire by 2022.[18] More information regarding new permitting activity for these facilities is provided in the Analysis of Effects section of this BE Addendum.

These facilities are expected to be converted to steelhead (all-female triploid rainbow trout) facilities, as indicated in a permit application submitted by Cooke Aquaculture Pacific, LLC, to WDFW on January 18, 2019.[19] On January 21, 2020, WDFW approved Cooke's application after completing the State Environmental Policy Act (SEPA) process.[20] The five-year permit enables Cooke to farm all-female, sterile (triploid) rainbow trout/steelhead in Puget Sound and applies to existing net pens in Puget Sound where Cooke holds valid aquatic land leases with the Washington Department of Natural Resources. This includes four pens currently operating near Rich Passage and Skagit Bay, but may later extend to three additional net pens owned by Cooke. Ecology is currently in the process of revising the NPDES permits authorizing Cooke to transition to rearing steelhead and is accepting public comments until June 8. 2020.[21]

To ensure a complete review and analysis in this 2020 Addendum, the EPA is also including facilities covered under EPA's NPDES GP. There are significant differences (such as the sizes of the facilities and types of operations, species raised such as Coho or sablefish, etc.) between the permittees covered under the EPA NPDES GP and Ecology's permitting of large commercial net

[17] Washington Department of Ecology. Atlantic salmon net pen individual permits. Accessed May 26, 2020. https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Water-Quality-individual-permits/Net-pens

[18] March 26, 2018. Washington State House Bill 2957. Nonnative Finfish—Marine Aquaculture—Escape. Chapter 179, Laws of 2018.

[19] January 18, 2019. Cooke Aquaculture Pacific, LLC. Fin Fish Aquaculture Permit – Plan of Operation. All-female Triploid Rainbow Trout (Oncorhynchus mykiss).

[20] January 21, 2020. WDFW. Justification for the Mitigated Determination of Non-Significance (MDNS) for Washington Department of Fish and Wildlife SEPA 19-056 and for the Approval of Cooke Aquaculture Pacific's Marine Aquaculture Permit Application. https://wdfw.wa.gov/sites/default/files/2020-01/marine_aquaculture_permit_justification-01-31-20.pdf

[21] Washington Department of Ecology. Salmon net pen water quality individual permits. Accessed May 26, 2020. https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Water-Quality-individual-permits/Net-pens

pen facilities. The permitting regulations distinguish between these two types of net pen facilities found in Puget Sound are discussed in more detail below in the Analysis of Effects.

2. Description of the Agency Action

The following is a list of the SMS provisions which could affect aquatic life and were addressed in the 2008 and 2010 BEs.

- 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)(a) and (3)(b): Sediment monitoring requirements of marine finfish rearing facilities.
- WAC 173-204-412 (4), (4)(a), (4)(a)(i), (4)(a)(ii) and (4)(b): Sediment impact zones for marine finfish rearing facilities.
- WAC 173-204-420 (3)(c)(iv)
- WAC 173-204-520 (3)(d)(iv)

This 2020 Addendum updates the following two provisions from the 2010 BE. These changes have no effect on the outcome of the consultations from 2010 and 2008. The remainder of the provisions have not been revised and there are no new additional provisions in the SMS to be included in this consultation.

1. On December 18, 2015, the EPA approved a minor non-substantive edit to the definition of *"marine finfish rearing facilities" at WAC 173-204-200 (13)*.[22] The revisions are reflected below in strikeout. This minor revision has no effect on the updated consultation.

(13) "Marine finfish rearing facilities" ((~~shall~~)) means 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.

2. The second provision that was revised is *WAC 173-204-520(3)(d)(iv). Juvenile polychaete Puget Sound marine sediment cleanup screening levels and minimum cleanup level biological criteria.*

The state deleted and substantively replaced this provision as part of its revisions to the SMS in 2013. On December 18, 2015, the EPA rescinded its 2008 approval of this provision because it

[22] December 18, 2015. Letter from Dan Opalski, Director, Office of Water and Watershed, EPA Region 10 to Maia Bellon, Director, Washington Department of Ecology, *Re: EPA's Approval and Decision on Revisions to Washington's Sediment Management Standards (SMS), Chapter 173-3014 WAC* and enclosed Technical Justification.

determined that Part V of the SMS is not a water quality standard. Therefore, this provision is no longer relevant to the consultation and this Addendum.

Note that the revisions outside of WAC 173-204-412 (and the definition of marine finfish rearing facilities) relate to sediment testing methodology. They were originally described in the EPA's August 6, 2008 supplement to the 2008 BE. The EPA reevaluated its conclusions in the August 6, 2008 supplement based upon new information and has not modified these conclusions since the provisions are applicable only to sediment testing methodology. See Section 9 of this Addendum for more information.

3. Description of the Action Area

The action area subject to this consultation on the SMS is the Puget Sound. The definition of Puget Sound has not been revised since the 2008 and 2010 consultation. Puget Sound is defined in the SMS at 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.

The SMS for marine finfish rearing facilities are applicable to all commercially operated net pen facilities in Puget Sound, regardless of species reared. In this addendum, facilities covered under EPA's NPDES GP are also evaluated. Although the EPA's approval action of the SMS 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).

The EPA's view of the action area is informed by its understanding of the areas that may be affected directly or indirectly by its approval of the SMS related to marine finfish rearing facilities. Furthermore, the effects of the action – whether direct or indirect – occur within Puget Sound; therefore, the EPA continues to define the Puget Sound as the area that may be affected by this action. However, the EPA understands the concerns associated with escaped fish movement and recovery efforts related to the 2017 net pen collapse. To address such concerns, the EPA has chosen to voluntarily consider the effects of its action on freshwater steelhead critical habitat and freshwater Eulachon habitat and is making a corresponding effects determination in this Addendum.

4. Species Status and Life History of Fish Species Assessed

Subsequent to the 2010 BE and the addition of three rockfish species, two new species have been listed – North American Green Sturgeon and Pacific Eulachon (southern DPS). In addition, steelhead and two species of rockfish critical habitats have been designated for Puget Sound. Effective March 24, 2017, Canary Rockfish were delisted. The species status and life history for these newly listed species and critical habitat has been added below.

Please note the numbering in this section is consistent with the 2010 BE. There are no updates to 4.B.1. Chinook salmon and 4.B.2. Chum Salmon.

4.B.3. Steelhead Puget Sound DPS (Updated Critical Habitat)[23]

Critical Habitat

Critical habitat designation for the Puget Sound steelhead was proposed on January 14, 2013. The areas under consideration include watersheds in Puget Sound and the Strait of Juan de Fuca in Washington.

Critical habitat was designated for the remaining five of Oregon and Washington listed steelhead on September 2, 2005 (70 FR 52630). Indian lands are excluded from critical habitat for these populations.[24]

On February 24, 2016, NMFS issued a final rule designating critical habitat for threatened Puget Sound steelhead (81 FR 9251). The specific areas designated include approximately 2,031 miles (3,269 km) of freshwater and estuarine habitat in Puget Sound, including areas in the upper Elwha River that were not occupied by steelhead at the time of designation but that were determined to be essential for the conservation of the species. In keeping with the ESA and NMFS's past practice, the final designation excludes approximately 70 miles (113 km) of streams in Indian lands, 1,361 miles (2,190 km) of streams associated with approved Habitat Conservation Plans, and 28 miles (45 km) of streams associated with military lands where potential impacts on national security outweigh the benefits of designation as critical habitat. NMFS also excluded all habitat areas in three watersheds (Lake Washington, Lake Sammamish, and Sammamish River watersheds) where the economic impacts were deemed to outweigh the benefits of designation. A critical habitat map for this species is shown in the Maps section and is also available online.[25]

On December 30, 2019, NFMS issued a recovery plan for the Steelhead Puget Sound DPS.[26]

4.B.4. Bocaccio Puget Sound/Georgia Basin DPS

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[23] This information has been adapted from the EPA's *Revised* Biological Evaluation for the General NPDES Permit for Offshore Seafood Processing Discharge within Federal Waters Off the Coasts of Washington and Oregon Permit No. WAG520000. Revised May 2017. https://www.epa.gov/sites/production/files/2017-06/documents/r10-npdes-offshore-seafood-gp-wa-or-wag520000-biological-evaluation-2017.pdf

[24] Further information from NMFS provided on ESA Critical Habitat for Puget Sound Steelhead website accessed on May 26, 2020. https://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/puget_sound/steelhead_recovery_workshop_2013/stone_habitat.html

[25] NMFS. Map of Designated Critical Habitat for Puget Sound Steelhead. Accessed May 26, 2020. https://www.westcoast.fisheries.noaa.gov/publications/gis_maps/maps/salmon_steelhead/critical_habitat/steelhead/steelhead_ps.pdf

[26] December 20, 2019. NOAA Fisheries. ESA Recovery Plan for the Puget Sound Steelhead Distinct Population Segment (Oncorhynchus mykiss). https://www.fisheries.noaa.gov/resource/document/esa-recovery-plan-puget-sound-steelhead-distinct-population-segment-oncorhynchus

Critical Habitat was designated for Bocaccio on November 13, 2014 (79 FR 68041). Critical habitat is found throughout Puget Sound. The specific areas in the final designation include 590.4 square miles of nearshore habitat and 414.1 square miles of deepwater habitat. A critical habitat map for this species is shown in the Maps section and is also available online.[27]

Species range, critical habitat, life history and ecology, and population trends and risks for Bocaccio Puget Sound/Georgia Basin DPS can be found at https://www.westcoast.fisheries.noaa.gov/publications/protected_species/other/rockfish/final_yelloweye_rockfish_and_bocaccio_recovery_plan_508.pdf

4.B.5. Canary Rockfish Puget Sound/Georgia Basin DPS

Effective March 24, 2017, Canary Rockfish were delisted[28] and therefore are no longer part of this analysis.

4.B.6. Yelloweye Rockfish Puget Sound/Georgia Basin DPS

Critical Habitat was designated for Yelloweye Rockfish on November 13, 2014 (79 FR 68041). Critical habitat is found throughout Puget Sound. The specific areas in the final designation includes 414.1 square miles of deepwater habitat. A critical habitat map for this species is shown in the Maps section and is also available online.[29]

Species range, critical habitat, life history and ecology, and population trends and risks for Yellow Rockfish Puget Sound/Georgia Basin DPS can be found at https://www.westcoast.fisheries.noaa.gov/publications/protected_species/other/rockfish/final_yelloweye_rockfish_and_bocaccio_recovery_plan_508.pdf

4.B.7. North American Green Sturgeon[30]

The North American green sturgeon was officially divided into two Distinct Population Segments by the NMFS on January 29, 2003 (68 FR 4433). The Southern DPS, which includes

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[27] NMFS. Map of Designated Critical Habitat for Bocaccio, Canary, and Yelloweye Rockfish Distinct Population Segments. Accessed May 26, 2020. https://www.westcoast.fisheries.noaa.gov/publications/gis_maps/maps/other/rockfish/pugetsoundrockfishch8_25_14.pdf

[28] 82 FR 7711. January 23, 2017. Endangered and Threatened Species; Removal of the Puget Sound/Georgia Basin Distinct Population Segment of Canary Rockfish From the Federal List of Threatened and Endangered Species and Removal of Designated Critical Habitat, and Update and Amendment to the Listing Descriptions for the Yelloweye Rockfish DPS and Bocaccio DPS. https://www.federalregister.gov/documents/2017/01/23/2017-00559/endangered-and-threatened-species-removal-of-the-puget-soundgeorgia-basin-distinct-population

[29] NMFS. Map of Designated Critical Habitat for Bocaccio, Canary, and Yelloweye Rockfish Distinct Population Segments. Accessed May 26, 2020. https://www.westcoast.fisheries.noaa.gov/publications/gis_maps/maps/other/rockfish/pugetsoundrockfishch8_25_14.pdf

[30] This information has been adapted from the EPA's *Revised* Biological Evaluation for the General NPDES Permit for Offshore Seafood Processing Discharge within Federal Waters Off the Coasts of Washington and Oregon Permit No. WAG520000. Revised May 2017. https://www.epa.gov/sites/production/files/2017-06/documents/r10-npdes-offshore-seafood-gp-wa-or-wag520000-biological-evaluation-2017.pdf

any coastal or Central Valley, California populations south of the Eel River in California (the only known population being in the Sacramento River), was listed as Threatened on April 7, 2006 (71 FR 17757).[31]

Species Range

Green sturgeon are the most broadly distributed, wide-ranging, and most marine-oriented species of the sturgeon family. The green sturgeon ranges from Mexico to at least Alaska in marine waters, and is observed in bays and estuaries up and down the west coast of North America (Moyle et al., 1995).

Critical Habitat

Critical habitat for the Southern DPS of North American green sturgeon was designated on October 9, 2009 (74 FR 52300). A critical habitat map for this species is shown in the Maps section and is also available online.[32]

All of the freshwater riverine parts of the critical habitat are in California; there are none in Oregon or Washington.

Coastal bays and estuaries included in the critical habitat designation include Coos Bay, Winchester Bay, Yaquina Bay, and Nehalem Bay in Oregon; Willapa Bay and Grays Harbor in Washington; and the Lower Columbia River estuary in both states. Critical habitat in bays and estuaries includes tidally influenced areas as defined by the elevation of mean higher high water. The boundary between coastal marine areas and bays and estuaries are delineated by the COLREGS lines (33 CFR 80).

The marine portion of the critical habitat includes all U.S. coastal marine waters out to the 60 fathom (fm.) (110 m) depth bathymetry line (relative to MLLW) from Monterey Bay, California north and east to include waters in the Strait of Juan de Fuca, Washington. The Strait of Juan de Fuca includes all U.S. marine waters: in Clallam County east of a line connecting Cape Flattery, Tatoosh Island, and Bonilla Point, British Columbia; in Jefferson and Island counties north and west of a line connecting Point Wilson and Partridge Point; and in San Juan and Skagit counties south of lines connecting the U.S.-Canada border and Pile Point, Cattle Point and Davis Point, and Fidalgo Head and Lopez Island. Critical habitat in coastal marine areas is defined by the zone between the 60 (fm.) depth bathymetry line and the line on shore reached by mean lower low water (MLLW), or to the COLREGS lines.

The primary constituent elements of nearshore coastal marine critical habitat areas that are essential for the conservation of the Southern DPS of green sturgeon are:

(i) Migratory corridor: a migratory pathway for the safe and timely passage within marine and between estuarine and marine habitats.

(ii) Water quality: nearshore marine waters with adequate dissolved oxygen levels and acceptably low levels of contaminants (e.g., pesticides, organochlorines, elevated levels

[31] Further information from NMFS provided on Green Sturgeon website accessed on May 26, 2020. https://www.westcoast.fisheries.noaa.gov/protected_species/green_sturgeon/green_sturgeon_pg.html

[32] NMFS. Map of Designated Critical Habitat for Southern DPS of Green Sturgeon. Accessed May 26, 2020. https://www.westcoast.fisheries.noaa.gov/publications/gis_maps/maps/salmon_steelhead/critical_habitat/greensturgeon_ch_maps.pdf

of heavy metals) that may disrupt the normal behavior, growth, and viability of sub-adult and adult green sturgeon.
(iii) Food resources: abundant prey items for sub-adults and adults, which may include benthic invertebrates and fishes.

Certain areas in the Strait of Juan de Fuca and Whidbey Island, Washington that are owned or controlled by the Department of Defense, or designated for its use, are excluded from critical habitat.

All Indian lands of the Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw as well as the Coquille Indian Tribe in Oregon; and the Hoh, Jamestown S'Klallam, Lower Elwha, Makah, Quileute, Quinault, and Shoalwater Bay Tribes in Washington are excluded from critical habitat designation.

Life history and ecology

Green sturgeon are long-lived, slow-growing fish. Mature males range from 4.5-6.5 feet (1.4-2 m) in "fork length" and do not mature until they are at least 15 years old (Van Eenennaam, 2002), while mature females range from 5-7 feet (1.6-2.2 m) fork length and do not mature until they are at least 17 years old. Maximum ages of adult green sturgeon are likely to range from 60-70 years (Moyle, 2002).

Green sturgeon are believed to spend the majority of their lives in nearshore oceanic waters, bays, and estuaries. Early life-history stages reside in fresh water, with adults returning to freshwater to spawn when they are more than 15 years of age and more than 4 feet (1.3 m) in size. Spawning is believed to occur every 2-5 years (Moyle, 2002). Adults typically migrate into fresh water beginning in late February; spawning occurs from March-July, with peak activity from April-June (Moyle et al., 1995). Females produce 60,000-140,000 eggs (Moyle et al., 1992). Juvenile green sturgeon spend 1-4 years in fresh and estuarine waters before dispersal to saltwater (Beamsesderfer and Webb, 2002). They disperse widely in the ocean after their out-migration from freshwater (Moyle et al., 1992).

The only available feeding data on adult green sturgeon shows that they eat benthic invertebrates including shrimp, mollusks, amphipods, and even small fish (Moyle et al., 1992).

Population trends and risks

Little data on current population sizes exists and data on population trends is lacking. The principal factor in the decline of the Southern DPS is reduction of the spawning area to a limited section of the Sacramento River. Other threats to the Southern DPS include insufficient freshwater flow rates in spawning areas, contaminants (e.g., pesticides), bycatch of green sturgeon in fisheries, potential poaching (e.g., for caviar), entrainment by water projects, influence of exotic species, small population size, impassable barriers (dams) to spawning grounds, and elevated water temperatures.[33]

[33] Further information from NMFS provided on Green Sturgeon website accessed on May 26, 2020. https://www.westcoast.fisheries.noaa.gov/protected_species/green_sturgeon/green_sturgeon_pg.html

4.B.8. Pacific Eulachon (Southern DPS)[34]

Eulachon (*Thaleichthys pacificus*), commonly called smelt, candlefish, or hooligan, are a small, anadromous fish from the eastern Pacific Ocean. The Southern DPS of the species was listed as threatened on April 13, 2011 (76 FR 20558).[35]

Species range

Eulachon are endemic to the eastern Pacific Ocean, ranging from northern California to southwest Alaska and into the southeastern Bering Sea. In the continental United States, most Eulachon originate in the Columbia River Basin. Other areas in the United States where Eulachon have been documented include the Sacramento River, Russian River, Humboldt Bay and several nearby smaller coastal rivers (e.g., Mad River), and the Klamath River in California; the Rogue River and Umpqua Rivers in Oregon; and infrequently in coastal rivers and tributaries to Puget Sound, Washington. Eulachon occur in nearshore ocean waters and to 1000 feet (300 m) in depth, except for the brief spawning runs into their natal (birth) streams.[36]

Critical habitat

Sixteen specific areas within the states of California, Oregon, and Washington, of which thirteen are in Washington and Oregon, were designated as critical habitat for the southern Distinct Population Segment (DPS) of Pacific Eulachon on October 20, 2011 (76 FR 65324). The designated areas are a combination of freshwater creeks and rivers and their associated estuaries, comprising approximately 539 km (335 mi) of habitat.

Critical habitat for this DPS includes portions of the Umpqua River, Tenmile Creek, and Sandy River in Oregon; Grays River, Skamokawa Creek, Elochoman River, Cowlitz River, Toutle River, Kalama River, Lewis River, Quinault River, and Elwha River in Washington; and Columbia River in both states. Tribal lands of four Indian tribes are excluded from designation.

A critical habitat map for this species is shown in the Maps section and is also available online.[37]

Life history and ecology

Eulachon typically spend 3 to 5 years in saltwater before returning to freshwater to spawn from late winter through mid-spring. Spawning grounds are typically in the lower reaches of larger snowmelt-fed rivers with water temperatures ranging from 39 to 50° F (4-10° C). Spawning occurs over sand or coarse gravel substrates. Eggs are fertilized in the water column. After

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[34] This information has been adapted from the EPA's *Revised* Biological Evaluation for the General NPDES Permit for Offshore Seafood Processing Discharge within Federal Waters Off the Coasts of Washington and Oregon Permit No. WAG520000. Revised May 2017. https://www.epa.gov/sites/production/files/2017-06/documents/r10-npdes-offshore-seafood-gp-wa-or-wag520000-biological-evaluation-2017.pdf

[35] Further information from NMFS provided on Eulachon website accessed on May 26, 2020. https://www.westcoast.fisheries.noaa.gov/protected_species/eulachon/pacific_eulachon.html

[36] Further information from NMFS provided on Eulachon website accessed on May 26, 2020. https://www.westcoast.fisheries.noaa.gov/protected_species/eulachon/pacific_eulachon.html

[37] NMFS. Map of Designated Critical Habitat for Southern DPS of Eulachon. Accessed May 26, 2020. https://www.westcoast.fisheries.noaa.gov/publications/gis_maps/maps/other/eulachon/eulachon-ch-maps.pdf

fertilization, the eggs sink and adhere to the river bottom. Most Eulachon adults die after spawning. Eulachon eggs hatch in 20 to 40 days. The larvae are then carried downstream and are dispersed by estuarine and ocean currents shortly after hatching. Juvenile Eulachon move from shallow nearshore areas to mid-depth areas. Within the Columbia River Basin, the major and most consistent spawning runs occur in the mainstem of the Columbia River as far upstream as the Bonneville Dam, and in the Cowlitz River.[38]

Population trends and risks

Eulachon abundance exhibits considerable year-to-year variability. However, nearly all spawning runs from California to southeastern Alaska have declined in the past 20 years, especially since the mid-1990s. From 1938 to 1992, the median commercial catch of Eulachon in the Columbia River was approximately 2 million pounds (900,000 kg) but from 1993 to 2006, the median catch had declined to approximately 43,000 pounds (19,500 kg), representing a nearly 98 percent reduction in catch from the prior period. Eulachon returns to British Columbia rivers similarly suffered severe declines in the mid-1990s and, despite increased returns during 2001 to 2003, presently remain at very low levels. The populations in the Klamath River, Mad River, Redwood Creek, and Sacramento River are likely extirpated or nearly so.

Habitat loss and degradation threaten Eulachon, particularly in the Columbia River basin. Hydroelectric dams block access to historical spawning grounds and affect the quality of spawning substrates through flow management, altered delivery of coarse sediments, and siltation. The release of fine sediments from behind a U.S. Army Corps of Engineers sediment retention structure on the Toutle River has been negatively correlated with Cowlitz River Eulachon returns 3 to 4 years later and is thus implicated in harming Eulachon in this river system, though the exact cause of the effect is undetermined. Dredging activities in the Cowlitz and Columbia rivers during spawning runs may entrain and kill fish or otherwise result in decreased spawning success.

Eulachon have been shown to carry high levels of chemical pollutants, and although it has not been demonstrated that high contaminant loads in Eulachon result in increased mortality or reduced reproductive success, such effects have been shown in other fish species. Eulachon harvest has been curtailed significantly in response to population declines. However, existing regulatory mechanisms may be inadequate to recover Eulachon stocks.

Global climate change may threaten Eulachon, particularly in the southern portion of its range where ocean warming trends may be the most pronounced and may alter prey, spawning, and rearing success.[39]

5. Environmental Baseline

The environmental baseline of Puget Sound and the surrounding area is largely unchanged from the previous consultation; however, additional studies and new information are provided

[38] Further information from NMFS provided on Eulachon website accessed on May 26, 2020. https://www.westcoast.fisheries.noaa.gov/protected_species/eulachon/pacific_eulachon.html
[39] Further information from NMFS provided on Eulachon website accessed on May 26, 2020. https://www.westcoast.fisheries.noaa.gov/protected_species/eulachon/pacific_eulachon.html

throughout this Addendum. The human population of the Puget Sound region has continued to grow and as a result the pollution sources have also increased. However, as noted above, the number of commercial Atlantic salmon net pen facilities has been reduced from eight to four and the state of Washington has passed legislation to phase out non-native net pen rearing entirely by 2022. Additionally, it is expected that these four facilities will transition to rearing steelhead prior to the 2022 deadline. The EPA has also incorporated facilities covered under EPA's NPDES GP into this analysis as discussed in more detail below.

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 CWA section 303(d) list, submitted to the EPA biennially. None of the currently permitted net pen facilities operate in areas that are listed as impaired for sediment on Ecology's most recent 303(d) list of impaired waters.

6. Analysis of Effects

The EPA's approval of Washington's revised sediment management standards, and in particular the marine finfish rearing facility provision at WAC 173-204-412, did not directly affect ESA listed or proposed species. However, there are potential indirect effects to ESA listed species and critical habitat through NPDES permitting that includes the revised SMS provisions that the EPA approved in 2008. Therefore, the effects analysis below updates the 2010 BE based on new information for the potential indirect effects from the EPA's prior approval action. This analysis reflects the current number of commercial net pen facilities being reduced from eight to four, the change in species being raised, and includes facilities covered under the EPA's NPDES GP. While the operator may pursue using some of the previously active sites in the future, the potential indirect effect would be similar to those analyzed in this BE Addendum.

The Analysis of Effects in the EPA's 2010 BE, Section 6.A.:

The EPA's 2010 analysis, incorporated herein (in italicized text) and updated in the next section, assumed there would not be an increase in the number of net pen facilities in Puget Sound, that Atlantic salmon would be the fish species reared in those net pen facilities, and that the regulatory structure would remain intact.

The 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.*
- *Net pen facilities have an insignificant impact on aquatic life in Puget Sound.*
- *The existing regulatory framework for net pens provides protection to surrounding habitat and other species.*
- *The effects on the benthic community are accounted for and monitored.*

- *The closure procedures of net pen facilities ensure the aquatic environment is restored to baseline levels.*
- *The indirect effects of net pen 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 net pen farm in northern Puget Sound. The study found that net pens in Puget Sound provide a beneficial effect since they provide enhanced habitat for diverse populations of invertebrates and seaweeds. Therefore, the biofouling associated with net pens 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 siting location accounts for depth and current conditions that distribute net pens 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 net pens 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 net pen 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 net pens, 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 net pen 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.

Update to Section 6.A.6. of the 2010 BE: Indirect Effects of Net Pen Facilities.

This Addendum incorporates new information on the following indirect effects. First, additional information regarding disease transfer from Atlantic salmon net pen fish to Pacific salmon has been included, primarily relying on a letter from NFMS dated January 12, 2016,[40] and accompanying memo. Second, further information regarding an escapement event that occurred on or around August 19, 2017, at Cooke Aquaculture's Site 2 net pen off Cypress Island and the follow-up and the associated response has been included in the Addendum. This Addendum also discusses potential future uses of commercially operated net pen facilities as steelhead rearing facilities instead of Atlantic salmon rearing facilities. Lastly, the Addendum discusses facilities covered by the current EPA NPDES general permit (WAG132000),[41] which covers tribal enhancement facilities. In their reissuance of the general permit in late 2020, EPA plans to expand the scope of the general permit to include federal research facilities and to allow for the marginal expansion of tribal enhancement facilities. The tribal enhancement facilities raise and release native salmonids and the federal research facilities will raise native fish (Pacific salmon, sablefish, etc.). The current EPA general permit cites, but does not necessarily rely on, the Sediment Management Standards at WAC 173-204 for their permitted operations, and the reissued NPDES GP will be similar in this regard. The effects from the EPA NPDES GP are also discussed in the context of disease transmission and escape.

Disease Transmission

The information regarding disease transfer from Atlantic net pen fish to Pacific salmon is summarized below, relying primarily on a letter from NFMS dated January 12, 2016,[42] and accompanying memo dated December 17, 2015.

On August 25, 2015, the EPA requested NOAA Fisheries' views on the allegations raised by Wild Fish Conservancy regarding an outbreak of infectious hematopoietic necrosis virus (IHNV) in 2012 at the Atlantic salmon net pen facilities near Rich Passage off Bainbridge Island. This request was made as a result of Wild Fish Conservancy's notice of intent to sue issued in August

[40] January 12, 2016. Letter from Kim W. Kratz, Ph.D., Assistant Regional Administrator, Oregon Washington Coastal Office, NMFS, to Dan Opalski, Director Office of Water and Watersheds, EPA Region 10 with enclosed memo dated December 17, 2015 from Dr. Dickhoff to Dr. Kratz *Re: Scientific Review of Intent to Sue U.S. Environmental Protection Agency and National Marine Fisheries Service for violations of the Endangered Species Act associated with consultation of Washington State's Revised Sediment Management Standards for Marine Finfish Facilities dated 25 August 2015.*

[41] September 9, 2015. EPA Region 10. Tribal Marine Net Pen Enhancement Facilities NPDES General Permit for Washington. WAG132000. https://www.epa.gov/sites/production/files/2018-03/documents/r10-npdes-washington-tribal-net-pen-gp-wag132000-final-permit-2015.pdf

[42] January 12, 2016. Letter from Kim W. Kratz, Ph.D., Assistant Regional Administrator, Oregon Washington Coastal Office, NMFS, to Dan Opalski, Director Office of Water and Watersheds, EPA Region 10 with enclosed memo dated December 17, 2015 from Dr. Dickhoff to Dr. Kratz *Re: Scientific Review of Intent to Sue U.S. Environmental Protection Agency and National Marine Fisheries Service for violations of the Endangered Species Act associated with consultation of Washington State's Revised Sediment Management Standards for Marine Finfish Facilities dated 25 August 2015.*

2015. On January 12, 2016, NMFS responded via letter and an accompanying memo dated December 17, 2015 from Walton Dickhoff, Ph.D., Director, Environmental and Fisheries Sciences Division, Northwest Fisheries Science Center (NWFSC). That memo outlines scientific opinions on the information provided by Wild Fish Conservancy and concludes that the information provided does not substantiate the claims and that there were substantial errors in the assumptions and analysis of impacts.

In short, NOAA Fisheries' NWFSC's experts concluded that the technical claims in the notice of intent to sue were not supported by the best available scientific and commercial information. After reviewing NWFSC's memo, NMFS concluded that the factual allegations presented by Wild Fish Conservancy do not establish any potential for new or different effects of the commercial salmon farms in Puget Sound from what was already considered in the EPA's consultation with NOAA Fisheries that concluded on April 8, 2011, following the submission of the EPA's 2010 BE.

In addition, on March 5, 2019, NMFS provided additional documents to the EPA regarding disease transfer to be considered in this consultation building on those that have been part of the previous record for this consultation. These are listed in the table below. Although the EPA has reviewed these documents, and is including them in the administrative record, the EPA is relying upon the technical expertise from NMFS in evaluating these studies in detail. The EPA does not have additional technical information beyond what has been supplied by NMFS on this topic.

In the EPA's assessment of the technical information provided by NMFS, the EPA notes the following key findings regarding disease risk and transmission:

- "The 2012 outbreak of IHNV in Atlantic salmon does not represent a new or unexpected event, but is an example of the previously reported observation that diseases in Atlantic salmon farms are caused by local pathogens that they obtain from local Pacific salmon. This is known to occur, and was considered thoroughly in the original report by Nash et al., 2001. The 2012 netpen outbreak conforms to that description and is not a new phenomenon that was not previously considered."… "For any Chinook salmon or steelhead that did become infected, the probability that the infection progressed to cause disease or mortality is extremely unlikely, and not expected to occur." (Gael Kurath, page 6).

- "The ubiquitous nature of piscine orthoreovirus (PRV), its apparent historic presence in wild Pacific salmonid stocks in the Pacific Northwest and the lack of clear association with disease in Pacific salmonids suggest the virus poses a low risk to wild species of Pacific salmonids." (T.R. Meyers, page 2).

- "In response to reported findings of infectious salmon anaemia virus (ISAV) in British Columbia (BC), Canada, in 2011, U.S. national, state and tribal fisheries managers and fish health specialists developed and implemented a collaborative ISAV surveillance plan for the Pacific Northwest region of the United States. …All 4,962 completed tests were negative for ISAV RNA. Results of this surveillance effort provide sound evidence to support the absence of ISAV in represented populations of free-ranging and marine-

farmed salmonids on the northwest coast of the United States." (Gustafson, L.L., Creekmore, L.H., Snekvik, K.R., Ferguson, J.A., Warg, J.V., Blair, M., Meyers, T.R., Stewart, B., Warheit, K.I., Kerwin, J. and Goodwin, A.E, pages 1-2).

- "Our analysis showed evidence of Heart and skeletal muscle inflammation (HSMI) histopathological lesions over an 11-month timespan, with the prevalence of lesions peaking at 80-100% in sampled fish, despite mild clinical signs with no associated elevation in mortalities reported at the farm level." (Di Cicco, E., Ferguson, H.W., Schulze, A.D., Kaukinen, K.H., Li, S., Vanderstichel, R., Wessel, Ø., Rimstad, E., Gardner, I.A., Hammell, K.L. and Miller, K.M., page 1).

- "Viral genome sequencing revealed no consistent differences in (Piscine orthoreovirus Strain) PRV-1 variants intimately involved in the development of both diseases suggesting that migratory chinook salmon may be at more than a minimal risk of disease from exposure to the high levels of PRV occurring in salmon farms." (Di Cicco E, HW Ferguson, KH Kaukinen, AD Schulze, S Li, A Tabata, OP Günther, G Mordecai, CA Suttle, and KM Miller, page 599).

- "We conclude that the longer-term presence of PRV in BC prior to 2001 has not been adequately described and that the evidence that the virus was introduced from Norway is more robust than the hypothesis that PRV is endemic to the eastern Pacific Ocean." (Kibenge, M.J., Wang, Y., Morton, A., Routledge, R. and Kibenge, F.S., page 5).

- "Importantly, infectious salmon anemia virus, salmonid herpesvirus, salmon alphavirus, and infectious pancreatic necrosis virus were not detected. Furthermore, while the agents associated with proliferative gill disease (*D.lep, Ca.B.cys*, and gill chlamydia) were all detected, few fish showed evidence of lesions associated with this multifactorial disease. The majority of agents detected on BC salmon farms were known to be endemic, but new findings include the marine detections of some infectious agents reported to only cause freshwater or hatchery-based diseases (*Flavobacterium psychrophilum and Ichthyophthirius multifiliis*)." (Laurin, E., Jaramillo, D., Vanderstichel, R., Ferguson, H., Kaukinen, K.H., Schulze, A.D., Keith, I.R., Gardner, I.A. and Miller, K.M., page 220).

- "Overall, the assessment concluded that IHNV attributable to Atlantic Salmon farms in the Discovery Islands poses minimal risk to Fraser River Sockeye Salmon abundance and diversity under the current fish health management practices." (Mimeault, C., Wade, J., Foreman, M.G.G., Chandler, P.C., Aubry, P., Garver, K.A., Grant, S.C.H., Holt, C., Jones, S.R.M., Johnson, S.C. and Trudel, M., page v).

- "These results suggest that PRV transfer is occurring from farmed Atlantic salmon to wild Pacific salmon, that infection in farmed salmon may be influencing infection rates in wild salmon, and that this may pose a risk of reduced fitness in wild salmon impacting their survival and reproduction." (Morton, A., Routledge, R., Hrushowy, S., Kibenge, M. and Kibenge, F, page 1).

- "… we tested a subset of these samples for infectious salmon anaemia virus (ISAV) RNA with three additional published molecular assays, as well as for RNA from salmonid alphavirus (SAV), piscine myocarditis virus (PMCV) and piscine orthoreovirus (PRV). All samples (n = 2,252; 121 stock cohorts) tested negative for RNA from ISAV, PMCV, and SAV. In contrast, there were 25 stock cohorts from Washington and Alaska that had one or more individuals test positive for PRV RNA; prevalence within stocks varied and ranged from 2% to 73%. The overall prevalence of PRV RNA-positive individuals across the study was 3.4% (77 of 2,252 fish tested)." (Purcell, M.K., Powers, R.L., Evered, J., Kerwin, J., Meyers, T.R., Stewart, B. and Winton, J.R, page 347).

The EPA has discussed the scientific finding with NMFS and concluded that its analysis of effects for species and critical habitats remains unchanged from the findings in the 2010 BE regarding disease transmission. Further details are available in the December 17, 2015 memo by NWFSC and the documents identified in the table below and the EPA is relying upon the technical expertise from NMFS in evaluating these studies in more detail.

Date	Author(s)	Title/Journal
8/1/17	Gael Kurath, M.S., Ph.D., U.S.G.S. Western Fisheries Research Center, Microbiologist	Scientific Review of the Risk Posed to Endangered Pacific Salmon in Puget Sound, Washington, by an Outbreak of the Salmon Virus, IHNV in Atlantic Salmon Farm Netpens in Puget Sound. RE: Case No. 2:15-CV-01731-MJP, *Wild Fish Conservancy v. United States Environmental Protection Agency and the National Marine Fisheries Service*. USGS. 26 pages.
9/17	T.R. Meyers, Alaska Department of Fish and Game, Juneau Fish Pathology Laboratory	Piscine Orthoreovirus (PRV) in the Pacific Northwest Appears to be of Low Risk to Wild Pacific Salmonids. The Pacific Northwest Fish Health Protection Committee. 6 pages.
8/28/18	Gustafson, L.L., Creekmore, L.H., Snekvik, K.R., Ferguson, J.A., Warg, J.V., Blair, M., Meyers, T.R., Stewart, B., Warheit, K.I., Kerwin, J. and Goodwin, A.E	A systematic surveillance programme for infectious salmon anaemia virus supports its absence in the Pacific Northwest of the United States. Journal of fish diseases, 41(2), pp.337-346.
2/22/17	Di Cicco, E., Ferguson, H.W., Schulze, A.D., Kaukinen, K.H., Li, S., Vanderstichel, R., Wessel, Ø., Rimstad, E., Gardner, I.A., Hammell, K.L. and Miller, K.M.	Heart and skeletal muscle inflammation (HSMI) disease diagnosed on a British Columbia salmon farm through a longitudinal farm study. PLoS One, 12(2), p.e 0171471.
4/23/18	Di Cicco E, HW Ferguson, KH Kaukinen, AD Schulze, S Li, A Tabata, OP Günther, G Mordecai, CA Suttle, and KM Miller.	The same strain of Piscine orthoreovirus (PRV-1) is involved in the development of different, but related, diseases in Atlantic and Pacific Salmon in British Columbia. FACETS 3:599–641.
11/30/17	Kibenge, M.J., Wang, Y., Morton, A., Routledge, R. and Kibenge, F.S.	Formal comment on: Piscine reovirus: Genomic and molecular phylogenetic analysis from farmed and wild salmonids collected on the

		Canada/US Pacific Coast. PloS one, 12(11), p.e 0188690.
8/29/18	Laurin, E., Jaramillo, D., Vanderstichel, R., Ferguson, H., Kaukinen, K.H., Schulze, A.D., Keith, I.R., Gardner, I.A. and Miller, K.M.	Histopathological and novel high-throughput molecular monitoring data from farmed salmon (Salmo salar and Oncorhynchus spp.) in British Columbia, Canada, from 2011–2013. Aquaculture.
12/1/17	Mimeault, C., Wade, J., Foreman, M.G.G., Chandler, P.C., Aubry, P., Garver, K.A., Grant, S.C.H., Holt, C., Jones, S.R.M., Johnson, S.C. and Trudel, M. Fisheries and Oceans Canada (DFO).	Assessment of the Risk to Fraser River Sockeye Salmon Due to Infectious Hematopoietic Necrosis Virus (IHNV) Transfer from Atlantic Salmon Farms in the Discovery Islands, British Columbia. Canadian Science Advisory Secretariat (CSAS).
12/12/17	Morton, A., Routledge, R., Hrushowy, S., Kibenge, M. and Kibenge, F	The effect of exposure to farmed salmon on piscine orthoreovirus infection and fitness in wild Pacific salmon in British Columbia, Canada. PloS one, 12(12), p.e 0188793.
9/6/17	Purcell, M.K., Powers, R.L., Evered, J., Kerwin, J., Meyers, T.R., Stewart, B. and Winton, J.R	Molecular testing of adult Pacific salmon and trout (Oncorhynchus spp.) for several RNA viruses demonstrates widespread distribution of piscine orthoreovirus in Alaska and Washington. Journal of fish diseases, 41(2), pp.347-355.

Additionally, the EPA has discussed the scientific findings on disease transfer with NMFS and understands that similar disease transmission concerns remain relevant between net pen facilities raising native species (Coho, sablefish, future steelhead facilities, etc.) and wild salmon; however, the risks and pathways may vary. The analysis of the net pen facilities in this Addendum addresses the low risk associated with disease transfer between the additional native species and wild salmon.

Escapement

Information regarding an escapement event that occurred on or around August 19, 2017, at Cooke Aquaculture's Site 2 net pen off Cypress Island and the follow up and the associated response is summarized below.

On March 5, 2019, NMFS provided documents to the EPA regarding the 2017 escapement event to be considered in this consultation. These are listed in the table below. Although the EPA has reviewed these documents and is including them in the administrative record, the EPA is relying upon the technical expertise from NMFS in evaluating these studies in more detail and providing analysis. The EPA does not have further technical information beyond what has been supplied by NMFS on this topic.

In the EPA's assessment of the technical information provided by NMFS, the EPA notes the following key findings regarding the escapement event:

- "Cooke reacted to the August 19 failure with substantial resources in an attempt to save the net pen again. When its efforts were unsuccessful, the company then turned to

stabilizing the collapsed structure, extracting the dead fish, and salvaging the pen. Cooke removed the surface portions of the net pen by September 24. Although Cooke stated by letter that it had removed all debris from the bottom of Deepwater Bay, an inspection by DNR on October 27 showed that substantial debris remained. DNR required further cleanup that lasted into January 2018." (D Clark, K Lee, K Murphy, A Windrope, pages 7-8).

- As a result of the 2017 net pen failure and escapement event, 56,810 fish were recovered and between 186,149-205,849 fish were not recovered. 390 fish were recovered through beach seining in Deepwater Bay by Cooke and the smelt fishery caught 2,261 fish in the San Juan Islands through beach seining efforts. (D Clark, K Lee, K Murphy, A Windrope, page 111 and page 97).

- "Recovering fish from Puget Sound required a detailed understanding of co-management, fish regulations, fish science and an existing relationship with the fishing fleets. In the future, it may be more effective for DFW and co-managers to work together to design and implement recovery efforts with input and support from the net pen operator. The combined recovery effort could be tested and refined similar to the preparations for oil spill response." (D Clark, K Lee, K Murphy, A Windrope, page 112).

- "The recovery response plan was not adequately detailed and future response plans need to be tailored to the site such that they reflect site-specific conditions, geography, currents and best approaches for recovery given those specifics. Initial recovery efforts were successful as the fish kept close to shore and were within the immediate area. As the recovery period moved past the first few weeks, however, the fish became widely dispersed or died and recovery became very difficult. In the future, recovery efforts should be immediate and comprehensive prior to dispersal." (D Clark, K Lee, K Murphy, A Windrope, page 112).

- "1) To date, there is no evidence that the escaped Atlantic salmon were eating native fauna nor is there evidence that they were sexually mature. 2) Over time, the fish in the marine system contracted native pathogens and have shown decreasing health status. 3) Atlantic salmon have been found in a limited number of rivers in Puget Sound (Skykomish and Skagit rivers). Atlantic salmon have not been seen at any DFW hatchery despite monitoring. There is no indication that Atlantic salmon have been caught in Nooksack drainage or at Whatcom Creek Hatchery drainage. DFW was present at the chum spawns in late fall at Bellingham Technical College and did not see any Atlantic salmon in Whatcom Creek. 4) The limited numbers of Atlantic salmon found in the freshwater system appear healthy. There is no evidence that they were feeding in the freshwater system nor were they sexually mature. The Atlantic salmon in freshwater may survive for some time." (D Clark, K Lee, K Murphy, A Windrope, page 113).

- "The 2017 Deepwater Bay releases were significant in size but follow a long period of minimal releases in Washington State and British Columbia and do not redefine the declining trend in Washington or B.C." (Rensel, J.E., page 2).

- "No self-sustaining runs of Atlantic salmon have been established in either Washington State or British Columbia, either from repeated intentional plantings by government agencies starting many decades ago or from farmed salmon escapes. It is apparent that the vast majority of these fish do not survive very long outside aquaculture facilities as stomachs of recaptured fish in marine or freshwater are almost always empty. Five hundred fish stomachs were sampled from recovered fish in the 2017 Deepwater Bay releases. All stomachs were empty and that pattern occurs for the vast majority of other releases in the past." (Rensel, J.E., page 2).

- "Cooke agrees with many of the lessons learned, particularly with respect to need for greater and closer coordination with the state, tribes, and the federal government. Cooke has already drafted revisions to its Fish Escape and Response Plan, is evaluating whether other operational changes may be needed and invites continued dialogue with agencies on how to improve regulatory oversight of its operations." (Steding, D.J., page 11)

The EPA has discussed the scientific finding and lessons learned from the 2017 escapement event with NMFS. The EPA has concluded that its analysis of effects for certain species should be modified from the not likely to adversely affect (NLAA) finding in the 2010 BE to likely to adversely affect (LAA) due to the escapement risks and associated response. Although the inbreeding risk between the two species is low as a result of the escapement, adverse effects to listed species and take could occur from the process of collecting escaped fish (and facility debris) and potential bycatch of ESA-listed species. See 6.B., 6.C., and 6.D. below for the analysis of those effects and the EPA's modification of the determinations to species and critical habitat. Further details are available in the documents identified in the table below and the EPA is relying upon the technical expertise from NMFS in evaluating these studies in more detail.

Date	Author(s)	Title/Journal
1/30/18	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. 120 pages.[43]
2018	Rensel, J.E. (Jack)	Escaped Atlantic Salmon in Washington State. Prepared by Rensel Associate Aquatic Sciences for Cooke Aquaculture Pacific, Inc. 59 pages.
1/29/18	Steding, D. J.	Letter to Investigation and Review Panel, RE: Draft of Incident Review Board Report. January 29, 2018.

As noted previously, the EPA has discussed the scientific findings on escapement with NMFS and understands that escapement risks remain relevant between net pen facilities raising native species that are not intended for release (sablefish, future steelhead facilities, etc.) and wild salmon. The proposed steelhead rearing activities would only raise sterile all-female triploid trout; therefore, if escapement were to occur it is the EPA's understanding that the fish would

[43] January 30, 2018. 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. https://www.dnr.wa.gov/sites/default/files/publications/aqr_cypress_investigation_report.pdf?vdqi7rk

have a low likelihood of reproduction. While the EPA anticipates that steelhead would not prey on other species, the Agency is relying upon the technical expertise from NMFS in evaluating the potential risks of steelhead escapement and any subsequent reproduction and competition for space and resources. The inclusion of these facilities in this Addendum addresses the low risk of escapement and the interaction between the additional native species and wild salmon. Fish from salmon enhancement facilities (like those covered under the EPA's NPDES GP) will be released into the wild at a future date, and their time in the net pens only serves to imprint the fish for purposes of return. Therefore, the inclusion of those facilities in this Addendum does not impact the analysis of effects due to escapement.

NPDES Permitting Actions to Minimize Risk

Lastly, this Addendum incorporates updated NPDES permitting actions by Ecology to minimize escapement risk and the upcoming phase out and moratorium on non-native fish species rearing by 2022, as well as the inclusion of facilities covered under the EPA's NPDES GP. This Addendum also discusses the proposed rearing of steelhead trout in the net pens facilities previously used for Atlantic salmon.

NPDES permitting regulations for net pen facilities are found in the following regulations: 40 CFR Part 451, 40 CFR Part 122.24, and 40 CFR Part 122 appendix C, which together comprise the permitting regulatory requirements for different types of net pen facilities. One main difference is that net pen facilities that produce 100,000 pounds or more per year of aquatic animals, except for facilities rearing native species released after a growing period of no longer than 4 months to supplement commercial and sports fisheries, must follow the Effluent Limitation Guidelines (ELGs) at 40 CFR part 451. Facilities that do not fall under the ELGs may require an NPDES permit to discharge if the facility operates for more than 30 days per year, produces more than 20,000 pounds of harvest or release weight of aquatic animals per year, and feeds more than 5,000 pounds of food during the calendar month of maximum feeding.

<u>Commercially Operated Net Pen Facilities</u>

As indicated in the Background section, currently there are four commercial net pen facilities still in operation in Puget Sound. The 2010 BE evaluated impacts from eight facilities, but due to the collapse of Cooke's net pen facility Cypress Island—Site 2 and the closure of the Port Angeles (Ediz Hook) net pen facility among others off Cypress Island, the number of active facilities has been reduced to four, including three in Rich Passage near Bainbridge Island (Clam Bay, Fort Ward, and Orchard Rocks) and one near Hope Island (Skagit Bay). The locations are shown on the maps included at the end of this Addendum.

Below is a table with information on the four current commercial net pen facilities in Puget Sound permitted by Ecology:

Waterbody	**Rich Passage (Clam Bay)**	**Rich Passage (Fort Ward)**	**Rich Passage (Orchard Rocks)**	**Skagit Bay (Hope Island)**
Facility Owner	Cooke Aquaculture	Cooke Aquaculture	Cooke Aquaculture	Cooke Aquaculture
Permit Number	WA0031526	WA0031534	WA0031542	WA0031593
Latitude	47° 34' 17'' N (47.57139)	47° 34' 30'' N (47.5750)	47° 34' 30'' N (47.5750)	48° 24' 28'' N (48.4078)

Longitude	122° 32' 25'' W (-122.54028)	122° 31' 30'' W (-122.5250)	122° 31' 50'' W (-122.5306)	122° 33' 32'' W (-122.5589)
Net Pen Area (in feet)	1010 x 185	650 x 185	900 x 185	10 pens approximately 80 square feet
Minimum Water Depth at Site ^	65 feet	45 feet	45 feet	Between 113 and 80 feet
Lease Acreage	98.62 total (for all Rich Passage facilities)	98.62 total (for all Rich Passage facilities)	98.62 total (for all Rich Passage facilities)	31.47
Lease Expiration Date[44]	11/10/2022	11/10/2022	11/10/2022	3/31/2022
Current Species	Atlantic Salmon	Atlantic Salmon	Atlantic Salmon	Atlantic Salmon
Future Species	Native species	Native species	Native species	Native species

^ Depths are given at Mean Lower Low Water (MLLW).
Information obtained from WDNR and Ecology draft permits.

In 2018, following the collapse of Cooke's net pen facility Cypress Island—Site 2 and the resulting escape of approximately 250,000 Atlantic salmon, the Washington State Legislature passed House Bill 2957, phasing out marine rearing of Atlantic salmon as the facility aquatic lands leases expire in 2022. Under the provisions of House Bill 2957, Ecology is authorized to renew the NPDES permits for the marine Atlantic salmon net pen facilities until the leases administered by DNR expire. Until Atlantic salmon farming is officially banned from Puget Sound starting in 2022, companies are required to have water quality discharge permits (NPDES permits). The updated permits incorporate lessons learned from the Cypress Island net pen failure and include closure requirements for the phaseout.

Ecology issued new NPDES permits for these four commercial net pen facilities on July 11, 2019.[45] The previous permits for these facilities were issued in 2007 and administratively extended in 2012. The NPDES permits require Best Management Practices (BMPs), monitoring, and reporting to ensure water quality standards are met. These facilities are operated to rear fish for harvest and market sale. Uneaten fish food, fish feces, antibiotics and the accidental release of Atlantic Salmon are the primary pollutants resulting from the operation of these facilities. The requirements in the permits allow Ecology to ensure that facilities are meeting water quality standards.

Additional protective measures in the updated 2019 permits 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.

[44] December 21, 2018. Personal communication with Jeff Vanderpham, NMFS. Information regarding Washington DNR aquatic leases.
[45] Washington Department of Ecology. Atlantic salmon net pen individual permits website. Accessed May 26, 2020. https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Water-Quality-individual-permits/Net-pens

- Improving net cleaning and maintenance procedures to prevent biofouling and 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.[46]

The fact sheet for the permits summarizes the updated requirements as follows:

"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. Underwater video survey is also required annually rather than twice per permit cycle. Daily dissolved oxygen (DO) sampling at the edge of the pens in August and September has been added to the permit, to verify that aeration of the pens, a BMP employed to maintain DO levels within the pens, is effective during this critical period. Monitoring of current velocity has been added to this permit, as strong currents contribute to wear on the net pen structures. With this issuance of the permit, the Permittee is required to use the Water Quality Permitting Portal to submit electronic discharge monitoring reports (DMRs) and other required permit submittals and reports.

As part of the required pollution prevention plan, fish escape prevention plan, and fish escape reporting and response plan, this permit adds requirements related to engineering documents, notification of structural issues and repairs, net cleaning to prevent excess biofouling, and staff training in escape prevention and response."[47]

While these NDPES permitting requirements for Atlantic salmon net pen facilities should reduce the risk of escapement and the effects of response efforts related to an escapement event interfering with listed species and their critical habitat, they do not eliminate them. These permitting activities do not affect facilities covered by the EPA's NPDES GP.

As indicated elsewhere in this Addendum, all-female triploid rainbow trout are expected to replace Atlantic salmon at all commercial net pen facilities. On January 21, 2020, WDFW approved an application from Cooke Aquaculture to farm all-female, sterile (triploid) rainbow trout/steelhead in Puget Sound. Ecology is now in the process of revising the NPDES permits to authorize the transition to rearing steelhead and is accepting public comments until June 8, 2020. Those potential indirect effects have been discussed above.

Facilities Covered Under the EPA's NPDES General Permit

Out of an abundance of caution, the EPA is including facilities covered under the EPA's NPDES GP which cites, but does not necessarily rely upon, the SMS at WAC 173-204, in this 2020

[46] Washington Department of Ecology. Atlantic salmon net pen individual permits website. Accessed May 26, 2020. https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Water-Quality-individual-permits/Net-pens

[47] Washington Department of Ecology. Atlantic salmon net pen individual permits website. Fact Sheets. Accessed May 26, 2020. https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Water-Quality-individual-permits/Net-pens

Addendum. There are significant differences (including duration, size, operation, etc.) between the permittees covered under the EPA's NPDES GP, which applies to tribal enhancement and federal research facilities, and those covered under Ecology's NPDES permits for large commercial net pen facilities for fish harvest and sale.

The EPA's NPDES GP, which expires October 31, 2020, covers five tribal enhancement facilities[48] and specifically limits coverage to facilities rearing and releasing native fish species. One federal facility does not yet have permit coverage but is expected to be covered by the reissued EPA NPDES GP by the end of 2020. The reissued EPA NPDES GP anticipates including the facilities listed in the table below:

Facilities Covered Under the EPA's NPDES GP

Waterbody	**Agate Pass**	**Elliott Bay**	**Peale Passage**	**Port Gamble**	**Quilcene Bay**	**Clam Bay**
Facility Operator	Suquamish Tribe	Suquamish Tribe	Squaxin Island Tribe	Port Gamble S'Klallam Tribe	Skokomish Tribe	NOAA (Manchester Research Station)
Coverage Status	Covered	Covered	Covered	NOI Submitted	NOI Submitted	Applied – will be covered under new general permit
EPA Permit #	WAG132001	WAG132002	WAG132003	WAG132004	WAG132005	N/A
Latitude	47.7036	47.6222	47.2004	47.8454	47.7893	47.5734
Longitude	-122.5750	-122.3676	-122.9042	-122.5738	-122.8519	-122.5456
lbs of fish	45,000	90,909	47,500	45,850	13,000	58,429
# Months/Year	March-June (4)	March-June (4)	January-June (6)	February – May (4)	January-May (5)	Year-round

[48] September 9, 2015. EPA Region 10. Tribal Marine Net Pen Enhancement Facilities NPDES General Permit for Washington. WAG132000. https://www.epa.gov/sites/production/files/2018-03/documents/r10-npdes-washington-tribal-net-pen-gp-wag132000-final-permit-2015.pdf
April 30, 2015. EPA Region 10. Fact Sheet. Tribal Marine Net Pen Enhancement Facilities NPDES General Permit for Washington. WAG132000. https://www.epa.gov/sites/production/files/2018-03/documents/r10-npdes-washington-tribal-net-pen-gp-wag132000-fact-sheet-2015.pdf

Lease Acreage	5.5	Unknown	20.89	1.62	Unknown	Unknown
Current Species	Coho	Coho	Coho	Coho	Coho	Sablefish
Min Clearance to Seafloor (ft)	15	15	9.7	23		
Mean Low Water Depth (ft)	45	40	24.5	48	30	~36 (unknown tide)
Current (cm/sec)	206 (max)	77	7	82	257	

NOI – notice of intent

In the EPA's NPDES GP, the Total Organic Carbon (TOC) reference value table for sediment characterization directly underneath each net pen facility from the SMS was used. Also, the EPA cited the SMS regulations and net pen provisions in the factsheet in response to Ecology's CWA section 401 certification. However, the EPA did not permit the allowance of a sediment impact zone. The permit already includes language prohibiting anoxic sediments beneath the net pens and dissolved oxygen water column monitoring and evaluation.

In addition, the EPA acknowledges the existence of other net pens in Puget Sound, however, since there are no NPDES permits associated with these facilities, the SMS regulations at WAC-173-204-412 do not apply. Therefore, these facilities are not analyzed in this BE Addendum.

6.B. ANALYSIS OF EFFECTS ON FISH SPECIES

The analyses in this Addendum and the previous BEs with the support of the NOAA technical memorandums, conclude that the marine finfish rearing facility provision is protective of designated uses, including those related to wild salmon in Puget Sound, and net pen facilities carry an insignificant risk of negatively affecting wild salmon. However, due to escapement concerns and effects following the 2017 net pen collapse, the EPA has concluded that its approval of WAC 173-204-412 **is 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)
Sebastes paucispinis	Bocaccio (Puget Sound/Georgia Basin DPS)
Sebastes ruberrimus	Yelloweye Rockfish (Puget Sound/Georgia Basin DPS)

Note that this determination is a result of the indirect effects of the operation of commercial net pen facilities. There is a low risk of competition between the escaped fish and ESA-listed species. The risk is also low associated with bycatch of ESA-listed species during potential recovery efforts.

The EPA has concluded that its approval of WAC 173-204-412 is unchanged from the 2010 BE as escape from commercial net pens is not likely to create an increased risk to non-salmon species. This analysis has been updated to include North American Green Sturgeon (Southern DPS) and Pacific Eulachon (Southern DPS). Therefore, the EPA has concluded its action **may affect, but is not likely to adversely affect** the following listed species:

Acipenser medirostris	North American Green Sturgeon (Southern DPS)
Thaleichthys pacificus	Pacific Eulachon (Southern DPS)

6.C. ANALYSIS OF EFFECTS ON MARINE MAMMALS

The EPA has concluded that its approval of WAC 173-204-412 is unchanged from the 2010 BE as escape from commercial net pens is not likely to create an increased risk to marine mammals. Therefore, the EPA has concluded its action **may affect, but is not likely to adversely affect** the following listed species:

Megaptera novaeangliae	Humpback Whale (Pacific Coast, Mexico DPS and Central America DPS)
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 2010 BE are Chinook salmon (Puget Sound ESU), Chum salmon (Hood Canal summer-run ESU), and Killer Whale (Southern Resident, DPS). This Addendum has been updated to include critical habitat for Steelhead (Puget Sound, DPS), North American Green Sturgeon (Southern DPS), Pacific Eulachon (Southern DPS), Bocaccio (Puget Sound/Georgia Basin DPS) and Yelloweye Rockfish (Puget Sound/Georgia Basin DPS).

After evaluating escape concerns and effects following the 2017 net pen collapse, the EPA has concluded that its approval of WAC 173-204-412 **may affect, but is not likely to adversely affect** critical habitat for the following listed species. Despite concluding likely to adversely affect due to escapement and response efforts for these species, critical habitat is not implicated in the same manner as the species themselves.

Oncorhynchus tshawytscha	Chinook Salmon (Puget Sound ESU)
Oncorhynchus keta	Chum Salmon (Hood Canal summer-run ESU)
Oncorhynchus mykiss	Steelhead (Puget Sound, DPS)
Sebastes paucispinis	Bocaccio (Puget Sound/Georgia Basin DPS)
Sebastes ruberrimus	Yelloweye Rockfish (Puget Sound/Georgia Basin DPS)

This analysis has been updated to include North American Green Sturgeon (Southern DPS) and Pacific Eulachon (Southern DPS) critical habitat. As with the determination above, the EPA has concluded its action **may affect, but is not likely to adversely affect** the critical habitat for the following listed species:

Acipenser medirostris	North American Green Sturgeon (Southern DPS)
Thaleichthys pacificus	Pacific Eulachon (Southern DPS)

Consistent with the 2010 BE, the EPA is not revising the analysis of effects on critical habitat for the Killer Whale (Southern Resident, DPS) as escapement risk and the EPA's action **may affect, but is not likely to adversely affect** critical habitat for that marine mammal species.

7. Cumulative Effects

The findings for this section are unchanged from the 2010 BE.

8. Summary of Findings

Table 8-1 Species and Critical Habitat that this Consultation May Affect (LAA or NLAA).[49]

	Species	ESU/DPS/Population	Critical Habitat Designation
1	Chinook Salmon (*Oncorhynchus tshawytscha*)	Puget Sound ESU	Yes
2	Chum Salmon (*Oncorhynchus keta*)	Hood Canal summer-run ESU	Yes
3	Steelhead (*Oncorhynchus mykiss*)	Puget Sound, DPS	Yes
4	Bocaccio (*Sebastes paucispinis*)	Puget Sound/Georgia Basin DPS	Yes
5	Yelloweye Rockfish (*Sebastes ruberrimus*)	(Puget Sound/Georgia Basin DPS)	Yes
6	North American Green Sturgeon (*Acipenser medirostris*)	Southern DPS	Yes
7	Pacific Eulachon (*Thaleichthys pacificus)*	Southern DPS	Yes
8	Humpback Whale (*Megaptera novaeangliae*)	Pacific Coast, Mexico DPS and Central America DPS	No
9	Killer Whale (*Orinus orca*)	Southern Resident, DPS	Yes

Table 8-2 summarizes the EPA's determinations, updated from the 2010 BE, for ESA-listed species, under NOAA jurisdiction, analyzed for the EPA's approval of Washington's marine finfish rearing facility provision, WAC 173-204-412.

Table 8-2 LAA Summary of Findings.

Species	ESU/DPS/Population	Effects Determination for the EPA's Approval of WAC 173-204-412
Chinook Salmon (*Oncorhynchus tshawytscha*)	Puget Sound ESU	LAA

[49] March 7, 2019. Personal communication with Jeff Vanderpham, NMFS. Species list/critical habitat for net pen consultation.

Chum Salmon (*Oncorhynchus keta*)	Hood Canal summer-run ESU	LAA
Steelhead (*Oncorhynchus mykiss*)	Puget Sound, DPS	LAA
Bocaccio (Sebastes paucispinis)	Puget Sound/Georgia Basin DPS	LAA
Yelloweye Rockfish (Sebastes ruberrimus)	Puget Sound/Georgia Basin DPS	LAA

LAA – Likely to adversely affect

Table 8-3 summarizes the EPA's determinations, updated from the 2010 BE, for ESA-listed species, under NOAA jurisdiction, analyzed for the EPA's approval of Washington's marine finfish rearing facility provision, WAC 173-204-412.

Table 8-3 NLAA Summary of Findings.

Species	ESU/DPS/Population	Effects Determination for the EPA's Approval of WAC 173-204-412
Humpback Whale (*Megaptera novaeangliae*)	Pacific Coast, Mexico DPS and Central America DPS	NLAA
Killer Whale (*Orinus orca*)	Southern Resident, DPS	NLAA
North American Green Sturgeon (*Acipenser medirostris*)	Southern DPS	NLAA
Pacific Eulachon (*Thaleichthys pacificus*)	Southern DPS	NLAA

NLAA – May affect, but is not likely to adversely affect

Table 8-4 summarizes the EPA's determination of No Effect for ESA-listed species, under NOAA jurisdiction, analyzed for the EPA's approval of Washington's marine finfish rearing facility provision, WAC 173-204-412. These findings are unchanged from the 2010 BE.

Table 8-4 NE Summary of Findings.

Species	ESU/DPS/Population	Effects Determination for the 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 the 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
Green Sea Turtle (*Chelonia mydas*)		NE
Leatherback Sea Turtle (*Dermochelys coriacea*)		NE

NE – No effect

Table 8-5 summarizes the EPA's determinations, updated from the 2010 BE, for critical habitat, under NOAA jurisdiction, analyzed for the EPA's approval of Washington's marine finfish rearing facility provision, WAC 173-204-412.

Table 8-5 Critical Habitat Summary of Findings.

Species	ESU/DPS/Population	Effects Determination for the 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
Killer Whale (*Orinus orca*)	Southern Resident, DPS	NLAA
Bocaccio (*Sebastes paucispinis*)	Puget Sound/Georgia Basin DPS	NLAA
Yelloweye Rockfish (*Sebastes ruberrimus*)	Puget Sound/Georgia Basin DPS	NLAA
North American Green Sturgeon (*Acipenser medirostris*)	Southern DPS	NLAA
Pacific Eulachon (*Thaleichthys pacificus*)	Southern DPS	NLAA

NLAA – May affect, but is not likely to adversely affect

9. Sediment Testing Methodology Provisions

The EPA is not changing the results of the findings in the 2010 BE for these provisions and the listed species/critical habitat covered in the 2010 BE (with the exception of WAC 173-204-520(3)(d)(iv)). As noted above, *WAC 173-204-520(3)(d)(iv). Juvenile polychaete Puget Sound marine sediment cleanup screening levels and minimum cleanup level biological criteria,* is no longer included in this ESA consultation. The state deleted and substantively replaced this

provision as part of its revisions to the SMS in 2013. On December 18, 2015, the EPA rescinded its 2008 approval of this provision and no longer views Part V of the SMS to be WQS. Therefore, this provision is no longer part of the consultation and this Addendum.

See the 2010 BE for more information and details on the remaining sediment testing methodology provisions. Because these provisions that the EPA included in the 2010 BE 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, the EPA concludes this action **may affect, but is not likely to adversely affect** endangered or threatened species or designated critical habitat for the following new species and critical habitat listed since 2010:

- North American Green Sturgeon, Southern DPS
- Pacific Eulachon, Southern DPS
- Steelhead Puget Sound DPS Critical Habitat
- Bocaccio Puget Sound/Georgia Basin DPS Critical Habitat
- Yelloweye Rockfish Puget Sound/Georgia Basin DPS Critical Habitat

10. References

1. April 17, 2008. Supplemented August 6, 2008. 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.

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3. 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. https://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/puget_sound/puget_sound_chinook_recovery_plan.html

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Promulgated by the Washington State Department of Ecology (HUC 17110019, Puget Sound).

6. April 22, 2011. U.S. EPA Region 10. Letter from Michael A. Bussell, Director Office of Water and Watersheds, EPA Region 10 to Mr. Kelly Susewind and Mr. Jim Pendowski, Department of Ecology*, 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.*

7. November 4, 2015. Case 2:15-cv-01731. WFC V. U.S. EPA and NMFS. *Complaint for Declaratory and Injunctive Relief.*

8. November 22, 2017. Case 2:15-cv-01731-BJR. WFC V. U.S. EPA and NMFS. *Plaintiff's Motions to Supplement Pleadings and Amend Case Schedule.*

9. December 14, 2017. Letter from Michael Lidgard, Acting Director, Office of Water and Watersheds, EPA Region 10 to Mr. Kim Kratz, Assistant Regional Administrator, NMFS, *Re: August 2017 Puget Sound Net Pen Failure.*

10. August 7, 2018. Case 2:15-cv-01731-BJR. WFC V. U.S. EPA and NMFS. *Order Denying (1) Federal Defendants' Motion for Judgment on the Pleadings and (2) Cooke Aquaculture's Motion to Dismiss.*

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12. October 3, 2018. Letter from Barry A. Thom, Regional Administrator, NMFS, to Dan Opalski Director Office of Water and Watersheds, EPA Region 10, *Re: Request to Reinitiate April 8, 2011 Endangered Species Act Section 7 Consultation on the Environmental Protection Agency's Approval of Washington State Department of Ecology's Sediment Management Standards (WAC 173-204-412) Regarding Marine Finfish Rearing Facilities (refer to NMFS No.: NWR-2010-6071).*

13. January 12, 2016. Letter from Kim W. Kratz, Ph.D., Assistant Regional Administrator, Oregon Washington Coastal Office, NMFS, to Dan Opalski, Director Office of Water and Watersheds, EPA Region 10 with enclosed memo dated December 17, 2015 from Dr. Dickhoff to Dr. Kratz *Re: Scientific Review of Intent to Sue U.S. Environmental Protection Agency and National Marine Fisheries Service for violations of the Endangered Species Act associated with consultation of Washington State's Revised Sediment Management Standards for Marine Finfish Facilities dated 25 August 2015.*

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NMFS *Re: Washington's Sediment Management Standards regarding Netpen Facilities.*

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23. EPA's *Revised* Biological Evaluation for the General NPDES Permit for Offshore Seafood Processing Discharge within Federal Waters Off the Coasts of Washington and Oregon Permit No. WAG520000. Revised May 2017. https://www.epa.gov/sites/production/files/2017-06/documents/r10-npdes-offshore-seafood-gp-wa-or-wag520000-biological-evaluation-2017.pdf

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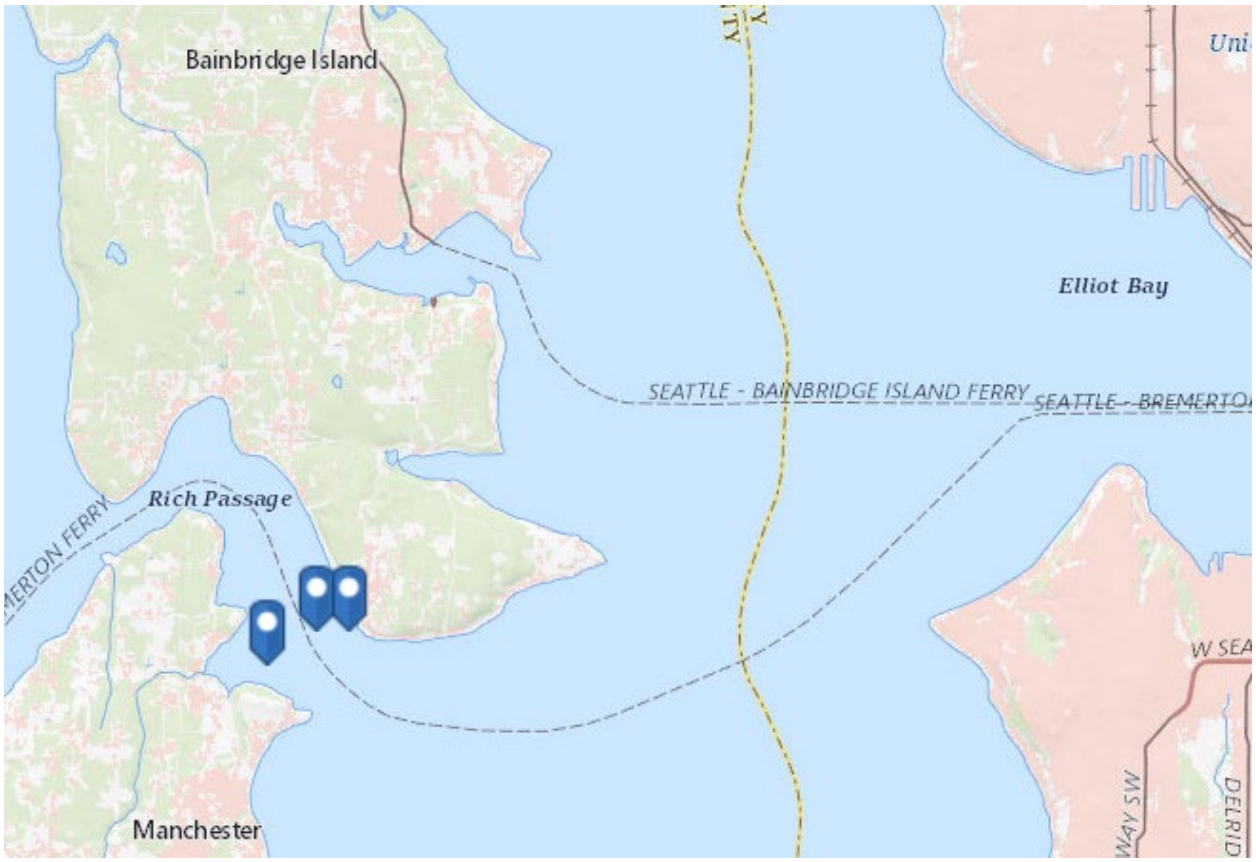
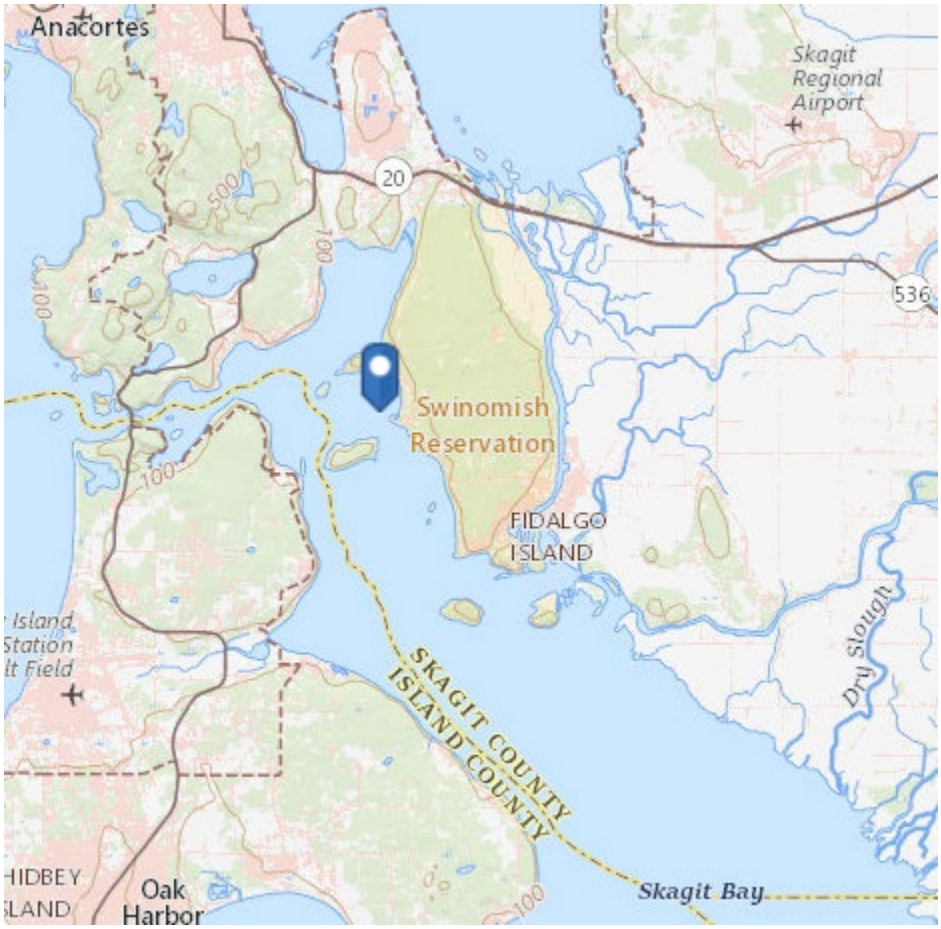
11. Maps

Figure 1. Rich Passage Atlantic Salmon Rearing Facilities



From Ecology (accessed May 26, 2020):
https://ecology.wa.gov/DOE/media/Images/WATER-SHORELINES/Water%20quality/Regs%20Permits/3-netpens.PNG

Figure 2. Hope Island (Skagit Bay) Atlantic Salmon Rearing Facility



From Ecology (accessed May 26, 2020): https://ecology.wa.gov/DOE/media/Images/WATER-SHORELINES/Water%20quality/Regs%20Permits/skagit-netpen.PNG

Figure 3. Facilities Covered Under EPA's General Permit

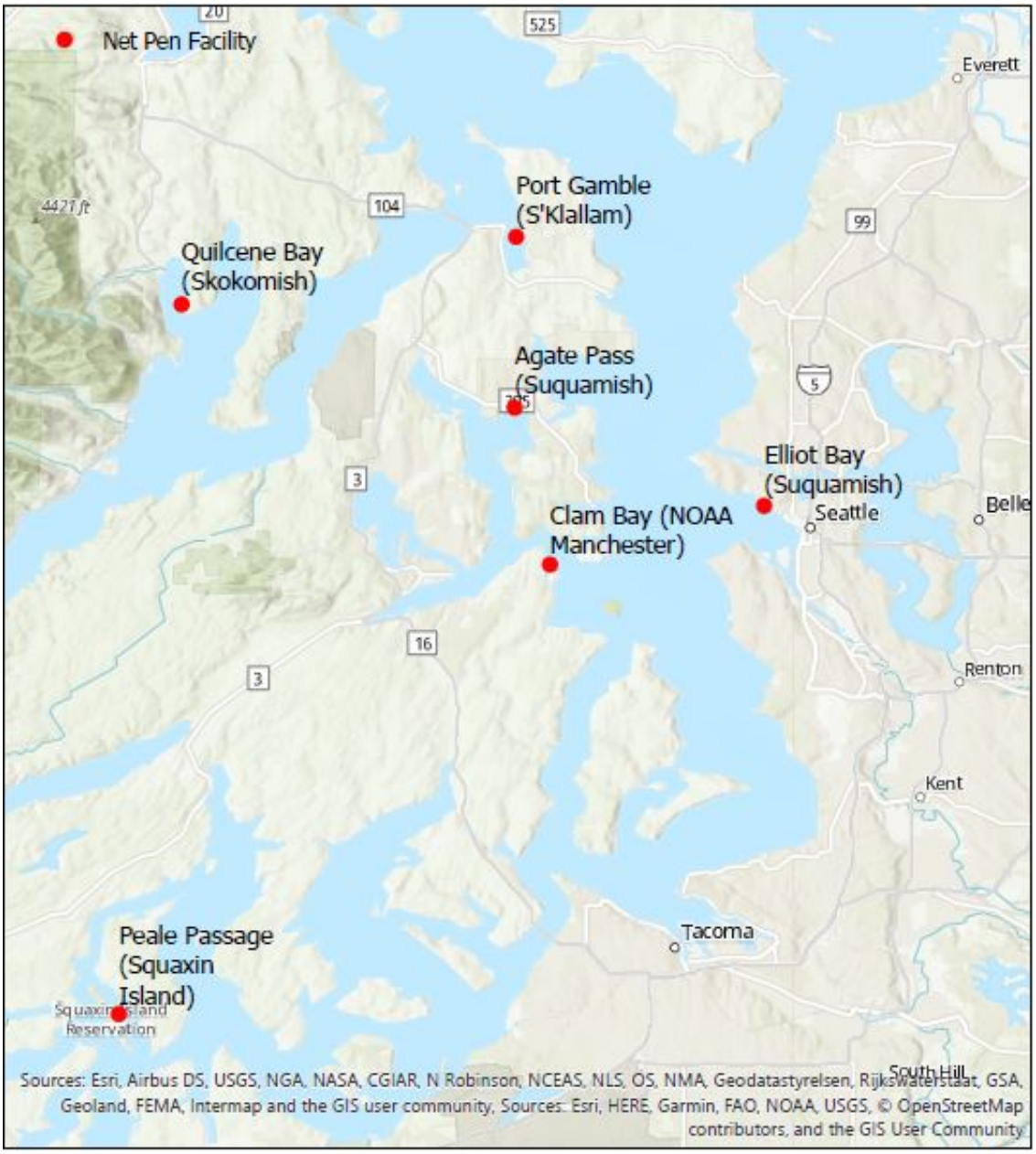
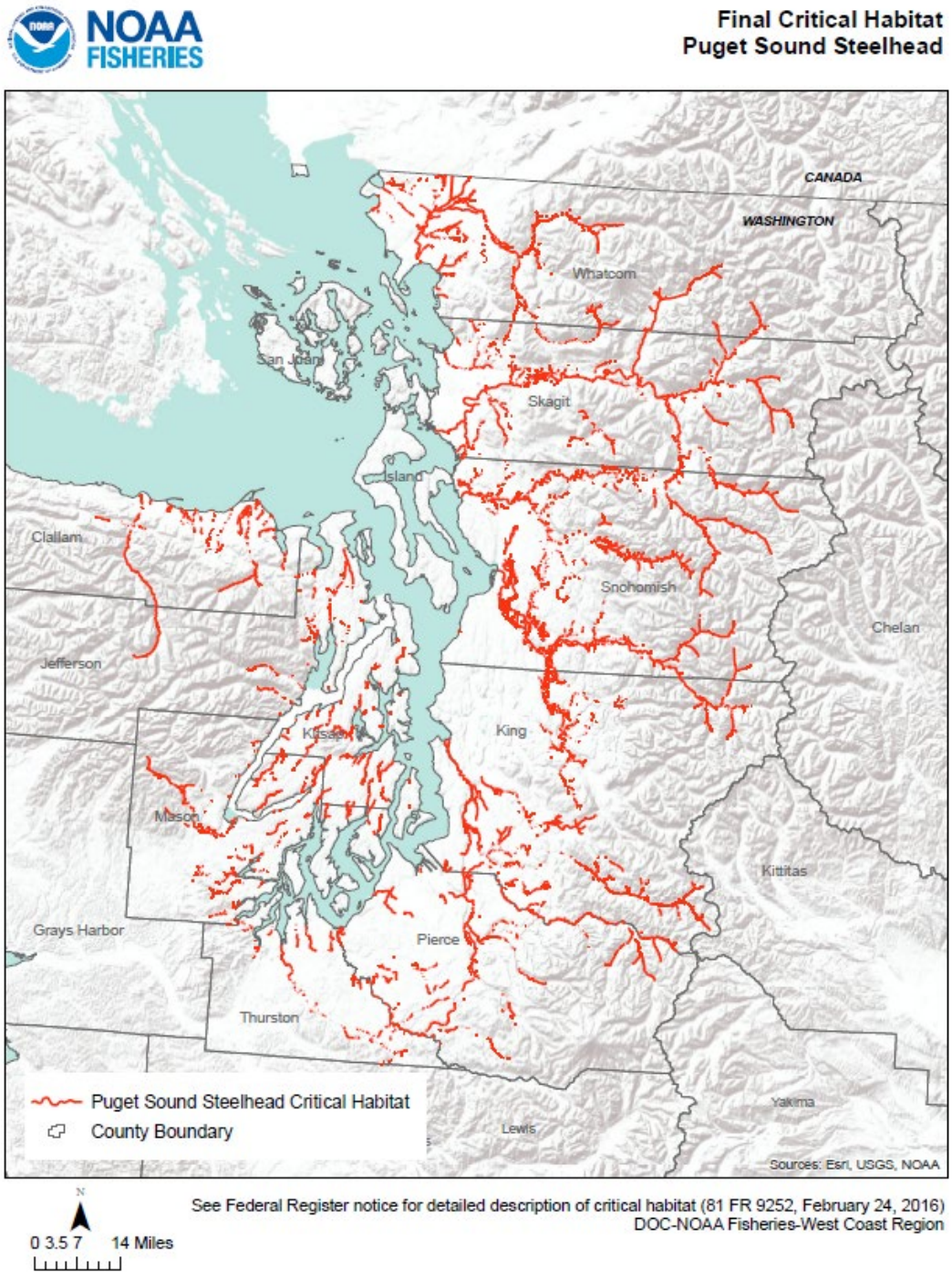
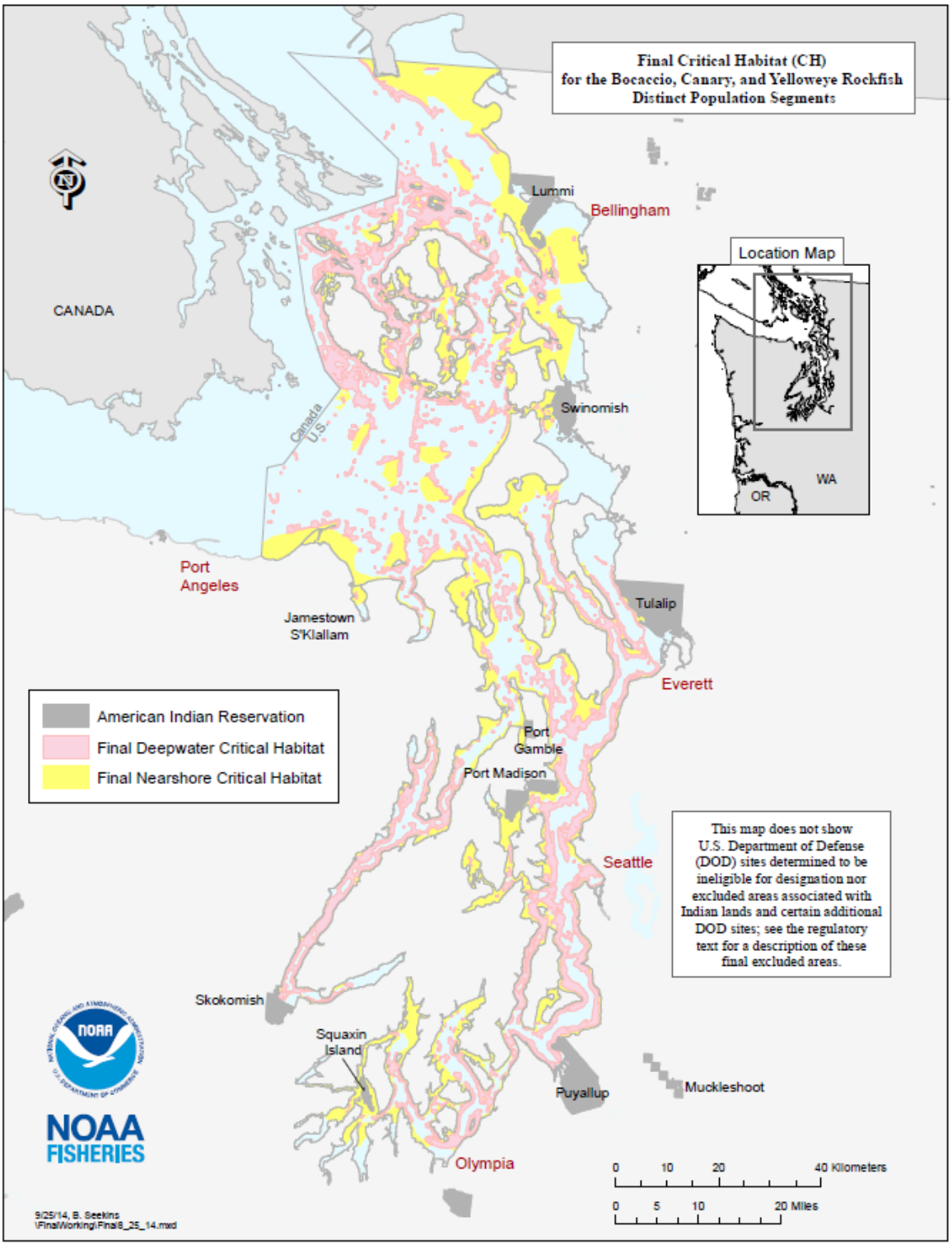


Figure 4. Puget Sound Steelhead Critical Habitat



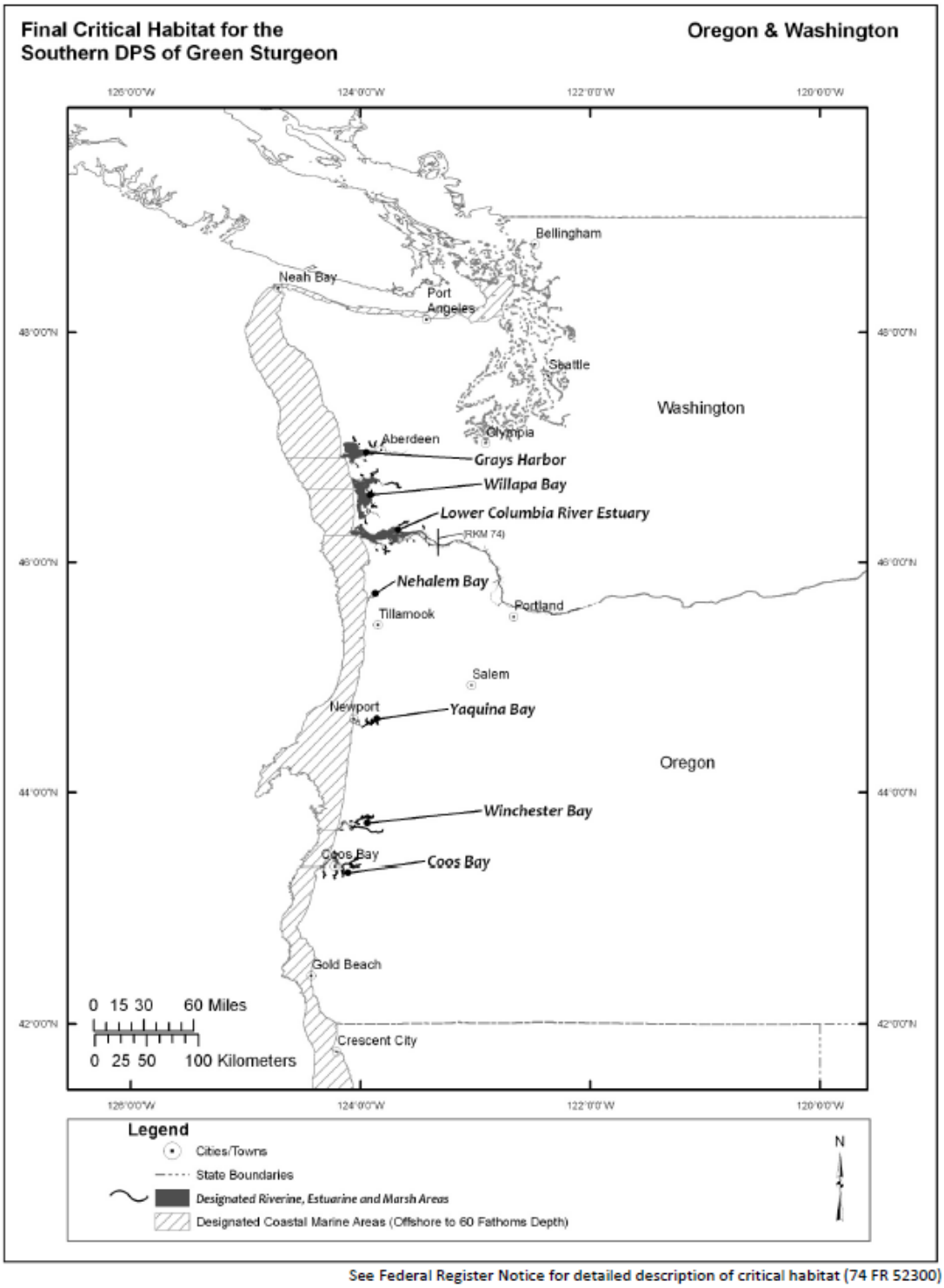
From NOAA Fisheries (accessed May 26, 2020):
https://www.westcoast.fisheries.noaa.gov/publications/gis_maps/maps/salmon_steelhead/critical_habitat/steelhead/steelhead_ps.pdf

Figure 5. Bocaccio and Yelloweye Rockfish Critical Habitat



From NOAA Fisheries (accessed May 26, 2020): https://www.westcoast.fisheries.noaa.gov/publications/gis_maps/maps/other/rockfish/pugetsoundrockfishch8_25_14.pdf **Note:** Effective March 24, 2017, Canary Rockfish were delisted.

Figure 6. Green Sturgeon Critical Habitat



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https://www.westcoast.fisheries.noaa.gov/publications/gis_maps/maps/salmon_steelhead/critical_habitat/greensturgeon_ch_maps.pdf

Figure 7. Eulachon Critical Habitat

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ATTACHMENT 4

Estimated municipal equivalent daily Nitrogen and Phosphorus discharge from all 7 Puget Sound salmon farms at maximum production

Nick Gayeski, WFC June 17 2020

In 2017 we estimated the total discharge of nitrogen and phosphorus waste from all seven Atlantic salmon net pen aquaculture farms when each was at estimated maximum production based on recent monthly NPDES reports to Washington Department of Ecology. We estimated that the total production to be 2,111, 567 adult salmon each weighing 5.5 kilograms (~ 11 pounds). Over the course of the growing period (approximately 20 months) the estimated total discharge of Nitrogen (N) is 2,595,321 pounds and the total discharge of Phosphorus (P) is 554,244 pounds. These nutrient discharges were equivalent to daily discharges of 4326 pounds of N and 924 pounds of P.

We compared this to municipal the per-person daily discharge of N and P in Puget Sound based on conventional secondary treatment and under the new tertiary treatment of King County's Brightwater waste treatment facility. For conventional treatment, the estimated daily N and P discharge per person is 0.0363 and 0.0027 pounds, respectively. For new tertiary treatment, the values are 0.0195 and 0.0022 pounds per person per day, respectively.

Dividing the total daily discharge of N and P from all seven farms operating a maximum capacity by each of the per person daily municipal discharges yields an estimate of the size of an average Puget Sound municipality that would discharge the same daily total of N and P as all seven farms.

For conventional treatment, the daily discharge of N from all seven farms is equivalent to the daily discharge of a city of 119,173. The daily discharge of P from all seven farms is equivalent to the discharge from a city of 347,164. For cities with Brightwater level waste treatment, the daily discharge of N from all seven farms is equivalent to the discharge from a city of 222,120 and the daily discharge of P from all seven farms is equivalent to the discharge from a city of 426,001.