

SUMMARY OF COMMENTS

WDFW SEPA 19-056 Mitigated Determination of Non-Significance

Washington Department of Fish and Wildlife

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OVERVIEW

On October 1, 2019 WDFW issued a Mitigated Determination of Nonsignificance (MDNS) for Cooke's proposed action described in their SEPA Checklist and supporting documents (see SEPA 19-056 at <https://wdfw.wa.gov/licenses/environmental/sepa/closed-final>). When issuing the MDNS WDFW provided a three-week public comment period, ending October 22, 2019. The deadline for public comment was extended twice: on October 16 extending deadline to November 1, 2019, and on October 30 extending deadline to November 22, 2019. In total the length of the public comment period was 53 days or nearly eight weeks. On January 21, 2020, WDFW finalized the MDNS for SEPA 19-056 and issued to Cooke Aquaculture a five-year Marine Aquaculture Permit. During the 38 workdays between the end of the comment period and WDFW's final SEPA decision, WDFW (1) compiled and read all comments, (2) categorized each comment (see methods below), (3) analyzed and summarized the comments, (4) considered all aspects of our preliminary decision, based on our own analyses, and public and tribal comments, and (5) finalized our "Justification for the Mitigated Determination of Non-significance" document, which served, in part as a response to comments. This current document provides the details for the categorizing, analyzing, summarizing, and responding to the tribal and public comments.

METHODS

In early October we developed a simple MS Access database to track and record content of every public comment. Once all comments were received, we transferred the data from Access to MS Excel. WDFW received most comments by email, and for each comment we entered manually into the database the following bookkeeping data:

1. Sender email name (not necessary the person's actual name),
2. email address,
3. email subject,
4. date and time email were received by WDFW's SEPA port,

5. data and time email were uploaded into an accessible directory,
6. last and first names of the sender if included in the body of the email,
7. a check box if the comment agreed or disagreed with the MDNS,
8. the number of days requested for a comment period extension (zero if no extension was requested), and
9. a comment field mostly used to track an organization represented by the email sender.

We also recorded manually the following content data:

1. The comment's subject or topic categories (see below), and
2. checkbox indicating if the comment was substantive. All comments are equally important, but some comments contained citable information and provided more detail than can be summarized easily by subject categories. The comments marked as substantive were reviewed repeatedly when we developed our final SEPA decision and this summary document.

Subject Categories – We received over 3500 comments (many duplicates; see below), with some comments containing only one sentence and others over 50 pages of text. To grasp the substance of over 3500 comments required that we expeditiously, but comprehensively summarize the content of each comment. We did this by establishing a series of keywords, phases, and concepts, which were then categorized into 26 subject categories (Table 1). The content of the comments is represented by these categories. Some categories are self-evident and easily identifiable within each comment (e.g., subject category “2017 net-pen failure”), while other categories are more complex and require explanation (e.g., “Ecological”). Every comment was read completely at least once by one individual (Ken Warheit) over a period of two months (mid-October – mid-December 2019). Many comments were read several times. Although having one person only to categorize the comments removed variability in the comment categorization process, we made no attempt to determine if category consistency was strictly maintained over the two-month period. Therefore, there is undoubtedly some variation in how the content of comments were categorized. Nevertheless, this summary should provide a realistic range of the public’s concerns with Cooke Aquaculture’s proposed aquaculture plan and WDFW’s SEPA process.

For a category to be associated with a comment, that comment needs to mention or discuss the keywords or phrases associated with each category. For the most-part, all categories, except “Farm-raised salmon good,” were associated with comments that were opposed to open net-pen aquaculture or Cooke Aquaculture’s Marine Aquaculture application, or disagreed with WDFW’s MDNS. The following provides the keywords, phrases, or concepts below the name for each category. Please note, the following are effectively the definitions of the subject categories we used to describe public and tribal comments. The following are not WDFW’s conclusions about open net-pen aquaculture in Puget Sound. The subject categories appear below in the same order as in Table 1.

- Disease
 - Pathogen or disease transmission
 - Microbes: viruses, bacteria, parasites, IHNV, PRV, sea lice
 - Virulence or pathogenicity
 - Pathogen evolution
- Pollution
 - Benthic and water quality concerns
 - Unconsumed food pellets
 - Debris and marine plastics
- Cooke Aquaculture
 - Not reliable, can't be trusted
 - Careless operations and poor management
 - Bad partners
 - Concerned with profit only
 - Blamed 2017 Cypress #2 net-pen collapse on solar eclipse
- General
 - Non-specific comments, such as
 - Vote against net-pens or a statement that net-pens are bad
 - Critical comment about WDFW or the people working for WDFW
 - Request for an extension to the comment period
 - Non-target but somewhat relevant comment (contrast with "Not Applicable" below), such as
 - Net-pens don't promote fishing opportunities
- Environmental review (EIS)
 - WDFW needs to retract MDNS, issue a DS, and write an Environmental Impact Statement (EIS)
 - Basing the MDNS on an outdated 1990 programmatic EIS
- Antibiotics
 - Large, excessive, or over-use of antibiotics
 - Concerns about antibiotic resistance
- 2017 net-pen failure
 - Any mention of the 2017 Cypress #2 net-pen collapse
- Protect native fish
 - Any statement that net-pen aquaculture will affect negatively individual native fish or their populations
- Ecological
 - Ecosystem effects and reduction of ecosystem services
 - Ecological effects on other species – predation, competition
 - Effects on habitats – fragile habitats, eelgrass, marine preserves
 - Marine mammal and bird entanglement

- Fish in net-pens are invasive species
- Infrastructure
 - Structural integrity of net-pens
 - Concerns about mooring stability
 - Large releases and small chronic releases or leakage
 - Tsunamis
 - Incorrect design for the environment or not within design specifications
 - Infrastructure is too old or in disrepair
- Genetic effects
 - Hybridization with native steelhead
 - Lower fitness of native steelhead populations
 - Triploidy error rate
- Orca
 - Any statement that net-pen aquaculture will affect negatively individual Orca or the Southern Resident population
- Politics
 - Affects existing litigation (with and without specifying the specific litigation)
 - Coastal community concerns
 - Local regulation
 - State is making money from granting permit
 - Governor stated no new net-pens
 - Violates new law (new law interpreted as sunsetting all marine finfish aquaculture)
 - Violates the vote of the people (no statement as to where or when the vote occurred)
 - WDFW fast-track avoiding public review
 - WDFW pandering to Cooke stockholders
 - Industry influences state
 - Triploid fish are not native (violates new state law)
- Bioengineered
 - All-female triploid fish labeled as bioengineered
 - Fish are genetically modified (GMOs)
- Land-based
 - All finfish aquaculture should be moved to land-based upland environments
- Commons
 - Commercial use of the commons without appropriate compensation
 - Commons should not be used for private profit
 - Net-pens not in the public interest
- Farm-raised salmon good
 - Demand for farm-raised salmon

- Fish raised to highest standards
 - Generates local jobs
 - Supports fish farms
 - Support for Jamestown S'Klallam – Cooke joint venture
- Aesthetics
 - Operational concerns – noise, light, odor
 - Disrupts view
- Human Health
 - Operations not good for human health
 - Product is unhealthy
- Illegal bycatch
 - Harvest results in an illegal bycatch of listed finfish species
- No Content
 - Email or hard copy letter had no content
- Climate Change
 - WDFW failed to consider climate change in their SEPA decision
- Hatchery feed production
 - Production of hatchery feed is bad for environment
 - Hatchery feed uses harvested forage fish
- Navigation
 - Net-pens disrupt marine navigation
 - Net-pens are unsafe for marine navigation
- Violates federal law
 - Net-pens violate federal law (federal not specified)
- Not applicable
 - Comment was inadvertently submitted to wrong SEPA public comment

RESULTS

We received 3564 electronic and 14 hardcopy comments for a total of 3578 comments. There were three sets of identical or nearly identical comments, each one may have been generated by automated internet programs (e.g., “bots”). Of the 3578 comments, 2669 (75%) were from these three sets of duplicated comments. Although we considered all comments, we conducted two analyses – with and without these duplicated comments. Of the remaining 909 comments, 25 were either comments duplicated between hard and electronic copies, or identical comments submitted more than once by the same author. This resulted in a total 884 “unique” comments, although many of these comments had elements that were copied from either a single source or were shared among a cluster of people or organizations.

The number of subject categories per comment ranged from one category ($n = 414$ comments; 47%) to 15 categories (4 comments; 0.5%) (Figure 1). The most-common category among the one-category comments was the General category ($n=244$). This means that of the 884 unique comments, 25% of the comments were of a general nature only. The mean number of categories per comment is 2.7 and 90% of the comments had six or fewer categories (Figure 1).

The subject categories that occurred most-frequently among the comments were Disease, Pollution, and Cooke Aquaculture, whether we did or did not include the duplicate comments (Table 1). These three categories and the Environmental Review (EIS) category, were the only categories where their relative importance was roughly the same between the Unique and the With Duplicates analyses (Table 1). Other categories frequently mentioned in the Unique comments were Protect native fish and Ecological; and in the With Duplicate comments were Antibiotics, 2017 net-pen failure, and Genetic effects. Overall, the With Duplicate comments emphasize only a subset of the unique comments. That is, when you total all the comment categories contained within the Unique and With Duplicate comments, separately, the categories in the top quartile (green highlighted categories in Table 1) make up only 57% of all comment categories for the Unique analysis, but over 93% of all comment categories for the With Duplicates analysis.

RESPONSE TO COMMENTS

As we stated above in the Overview section, and in the “Justification for the Mitigated Determination of Non-significance” document, most of our response to public and tribal comments are included in the “Justification” document. In what follows, we briefly summarize our responses that were included in that document and provide responses here to those categories not addressed in the Justification document. We removed the citations from the material here that we copied directly from the Justification document to make the text easier to read. See the Justification document for the relevant literature. The Sections mentioned below refer to the Section numbers in the Justification document. The Justification document can be found at SEPA 19-056 at <https://wdfw.wa.gov/licenses/environmental/sepa/closed-final>. The document is also included below as Appendix 1.

Tribal Comments

We received comments from eight Puget Sound tribes. Five tribes opposed WDFW’s MDNS and permitting decisions, one tribe supported those decisions, one tribe was opposed to the location of one of the fish farms, and one tribe provided no opinion. When reviewing all comments, we considered tribal comments separately from the public comments, but used the same system to categorize tribal comments, and summarized those comments with the public comments, with one exception: our discussion of Tribal Rights, particularly fishing treaty rights. Two of the tribes that were opposed to WDFW’s decision stated that the net-pen facilities

impeded access to or threatened their tribal U and A fishing treaty rights. WDFW appreciates the concerns raised by these tribes regarding the presence of the net-pens and the possible impacts to their fishing treaty rights. Cooke's proposed action is limited to switching production from Atlantic salmon to all-female triploid steelhead trout. WDFW's evaluation of Cooke's application is limited by our regulatory authority over the genetic and biological risks associated with Cooke's proposed action, and to the structural integrity of net-pen infrastructure, as required by EHB 2957. WDFW's SEPA review and determination is limited in scope to Cooke's proposed action, which does not include siting issues related to already existing net-pen infrastructure. Therefore, for this SEPA action, WDFW did not review the impact of Cooke's net-pen facilities on fishing treaty rights. Finally, one tribe stated that harvesting seafood is a Treaty Right, that marine net-pen farming can be done sustainably, and that such farming is consistent with their Treaty Rights.

Overview – Statutory limits to WDFW SEPA review

Cooke Aquaculture's 5-year Marine Aquaculture Permit application was to transition production from Atlantic salmon to all-female triploid (sterile) steelhead trout at their existing marine net-pen facilities in Puget Sound. Included with the application were Fish Escape, Prevention, Response, and Reporting Plan; Regulated Finfish Pathogen Reporting Plan; Plan of Operation for All-female Triploid Rainbow Trout¹; and Plan of Operation for Atlantic Salmon Rearing. WDFW's SEPA review and determination was limited in scope to Cooke's proposed action. That is, our SEPA review was limited to evaluating the effects of *transitioning production* from Atlantic salmon to steelhead trout and was not a review of all aspects of finfish marine net-pen aquaculture in Washington State. With respect to commercial finfish marine net-pen aquaculture, WDFW's authority is constrained by RCW Chapters 77.115 and 77.125, and WAC Chapter 220-370. In general, WDFW's authority is limited to (1) assessing and controlling the transmission of disease; (2) assessing genetic and ecological risk of net-pen operations to native species and their habitat; (3) preventing, reporting, and recapturing finfish released from commercial net-pen facilities; and (4) determining if the structural integrity of net-pen facilities is sufficiently adequate to receive or continue to hold the aquacultural product (e.g., Atlantic salmon or steelhead trout). In administering a disease control program, the Director of WDFW "shall not place constraints on or take enforcement actions in respect to the aquaculture industry that are more rigorous than those placed on the department or other fish-rearing entities" (RCW 77.115.010(6)). See Section 1.2.1 in Justification document.

Disease

We provided an extensive discussion on disease, pathogen, and parasite control in Section 4.2. See entire section, but for specifics on pathogen amplification and transmission, see Section 4.2.4; pathogen virulence and emergence of new pathogens (Section 4.2.5); IHNV (Section

¹ Rainbow Trout is the standard commercial aquaculture terminology for the species *Oncorhynchus mykiss*, which also includes steelhead trout. In many of their documents, Cooke uses the commercial aquaculture terminology.

4.2.6.1); PRV (Section 4.2.6.2); and sea lice (Section 4.2.6.3). There would be minimal differences between rearing Atlantic salmon and all-female triploid steelhead trout in Puget Sound net-pens in (1) the contraction, amplification, or transmission of pathogens; (2) their development of disease or their promotion of disease in wild finfish; or (3) their involvement in the increase virulence of existing pathogens or in the development of new pathogens. Furthermore, we consider the overall risk of these hazards to be relatively low.

Pollution

We provided a discussion on water quality and the benthic environment in Section 4.4.2. Washington Department of Ecology has the state's regulatory authority to protect water and sediment quality. The U.S. Environmental Protection Agency (EPA) authorized Ecology to administer the Federal Clean Water Act in Washington through National Pollutant Discharge Elimination System (NPDES) permits. RCW Chapter 90.48 defines Ecology's authority and obligations in administering the wastewater discharge permit program. On July 11, 2019, Ecology issued updated NPDES permits for the rearing of Atlantic salmon at four of Cooke's net-pen facilities, Hope Island, Clam Bay, Orchard Rocks, and Fort Ward. These updated permits require increased routine monitoring, inspections, and spill response planning and reporting.

WDFW has consulted with Ecology in making its SEPA determination and issuing to Cooke a Marine Finfish Aquaculture Permit to raise all-female triploid steelhead trout. Ecology has begun a multi-step process to evaluate Cooke Aquaculture's NPDES permit application to raise all-female triploid steelhead trout at its existing net-pen facilities in Puget Sound. There will be several opportunities for public comment. Ecology will evaluate if changing culture from Atlantic salmon to all-female triploid steelhead trout will change the character and degree of impact to water and sediment quality. WDFW defers to Ecology on their evaluation of the risk to the water and sediment from Cooke's proposed action. As a mitigating provision, Cooke's Marine Finfish Aquaculture Permit to raise all-female triploid steelhead trout is contingent on receiving NPDES authorization from Ecology for this activity.

Cooke Aquaculture

In a variety of machinations 26% of the Unique comments and 81% of the With Duplicate comments concluded that Cooke Aquaculture was not competent to own or manage finfish marine farms in Washington State. If Cooke Aquaculture holds valid permits and aquatic lands leases, it has the legal right to operate finfish net-pen aquaculture in the marine waters of Washington State. This SEPA process was not an evaluation of the people who own or operate Cooke Aquaculture in Puget Sound. This SEPA process concerned only Cooke's proposed transition from culturing Atlantic salmon to culturing steelhead trout. See "Overview – Statutory limits to WDFW SEPA review" section above, and Section 1.2 in the Justification document. WDFW's statutes do not include the authority to base our SEPA determinations or permit decisions on the relative appeal of Cooke Aquaculture.

General

As requested by 203 comments, we extended the comment period twice for an additional 32 days, bringing the total number of days in the period to 53. Tribal and public comments provide WDFW with an understanding of how a portion of the tribes and public may feel about an agency action, and a perspective perhaps not known or understood by the agency. These comments are a necessary part of our management process, and they are a value to us, but solicitation of comments does not represent a voting process. For this SEPA decision, the comments were not an unbiased perspective of Washington's public opinion. This is evident in the comparison of categories between the Unique and With Duplicate comments discussed above (see also Table 1), and the large number of comments that used text taken directly from a few NGOs comments or postings.

Environmental review (EIS)

Most of the comments that included an environmental review or EIS category claimed that WDFW built its SEPA review on the 1990 Fish Culture in Floating Net-Pens Final Programmatic EIS. By assuming that our determination was based on a nearly 30-year-old document, the authors of these comments concluded that our SEPA review was insufficient and asked that the MDNS be put aside and an EIS be written. At no point before, during, or after the SEPA process did WDFW indicate that our review of Cooke Aquaculture's 5-year Marine Aquaculture Permit or Cooke's SEPA documents was based on the 1990 PEIS. The comments that stated we based our SEPA MDNS on the 1990 PEIS are false narratives. WDFW's declaration of the MDNS incorporated the 1990 PEIS by reference only. WDFW was required by SEPA to ascertain if previous environmental documents are relevant to or have already addressed marine net-pen aquaculture in Washington State. Therefore, we incorporated by reference the PEIS in our SEPA. The incorporation of the PEIS document in our SEPA determination does not indicate that the document was the only or main source used for our determination. WDFW first began the analysis of Cooke's proposal using the information provided by Cooke in the SEPA Checklist and supporting documents. Initially, we considered the PEIS, and a series of summary documents with publication or posting dates ranging from 2001 – 2019 (see Section 4.1). However, our primary evaluation was based on over 300 publications, including publications as recent as 2020. In addition to the literature, we consulted with experts within and outside of WDFW, used unpublished data or analyses when required, and considered tribal and public comment. Based on our analysis, detailed in the Justification document, we made a MDNS, which did not necessitate an EIS. See Section 1.2.2 for discussion of SEPA rules, Section 1.2.3 for the 1990 PEIS, Section 3 for Cooke's SEPA application, and Section 4.1 for the types of data used by WDFW to make our determination.

Antibiotics

Antibiotics and medicated feed are discussed in Section 4.2.7. Antibiotics are administered to net-pen fish usually through medicated feed, referred to as Veterinary Feed Directives (VFDs). These are prescriptions written by licensed veterinarians that have established a Veterinary-

Client-Patient-Relationship (VCPR) with the aquatic farmer and the fish. A veterinarian with a VCPR is formally recognized as the veterinarian of record (VOR) for a facility. VFDs, VCPRs, VORs, veterinary licenses, and the drugs that can be used for treatment of specific pathogens are all regulated by both Federal and Washington State rules. It is the VOR's obligation to adhere to these rules (i.e., violations of these rules can result in loss of license and livelihood). The "client" (owner of the fish, or the aquatic farmer) has the freedom to refuse treatment, but only a licensed veterinarian with a VCPR can order a VFD. It is the licensed veterinarian's and the VOR's license that are at risk if VFDs or other chemicals used on the fish are applied improperly or illegally, even if it is without the knowledge of the veterinarian. It is also the veterinarian's responsibility to adhere to the U.S. Food and Drug Administration's (FDA) Judicious Use of Antimicrobials policy.²

2017 net-pen failure

There have been four large-scale Atlantic salmon net-pen escape events recorded in Washington; three events in four years, 1996 (107,000 salmon escaped), 1997 (369,000 fish), 1999 (115,000 fish); then no events for 18 years until the accident at Cooke's Cypress #2 net-pen in 2017 (250,000 fish). WDFW acknowledged that the 2017 accident occurred, and along with the Departments of Natural Resources and Ecology placed the blame for the accident on Cooke Aquaculture.³ Cooke was fined \$332,000 by Washington Department of Ecology as a result of the accident, and the loss of their lease for the Cypress Island net-pens was due in part to maintenance conditions that lead directly to the accident. See Infrastructure below and Section 4.3.1 for additional discussion.

Protect native fish

This category is a catch-all category and exists because we received comments that stated that native fish must be protected. Many of these comments did not state how native fish would be at risk from net-pen aquaculture or from Cooke's transitioning from Atlantic salmon to steelhead trout. Protect native fish was ranked sixth, occurring in 16% of the Unique comments, but drops to ninth and in only 4% of the With Duplicates comments. That is, none of the With Duplicates comments mentioned the Protected native fish category. Of the 139 times the Protect Native Fish category was mentioned, it was most-frequently mentioned with Disease (65% of the 139 comments), Killer Whales (55%), Pollution (55%), and Ecological Interactions (40%) categories. See discussion of these categories for discussion related to the Protecting native fish category.

² See <https://www.fda.gov/animal-veterinary/antimicrobial-resistance/judicious-use-antimicrobials>

³ Clark, D., K. Lee, K. Murphy, and A. Windrop. 2018. Cypress Island Atlantic Salmon net pen failure: an investigation and review. Washington Department of Natural Resources, Olympia, WA.

Ecological

We discuss ecological interactions in Sections 4.3.2 and 4.4.1 in the Justification document. As with the Protect native fish and Orca categories, much of the published literature concerns risks associated with escaped net-pen fish. As it relates to interactions, most of the literature discusses genetic rather than ecological effects (see Genetics category below and Sections 4.3.3 and 4.3.4 in the Justification document). In terms of competition for food or predation by escaped net-pen fish, the ability of escaped Atlantic salmon from fish farms in Norway to switch from pelleted feed to wild prey appears to depend upon their life stage at escape. Older, larger fish that escape often do not switch to live feed and survive poorly to sexual maturation. Fish from the 2017 Cypress #2 event that were at a harvest size of about ten pounds when the incident occurred were found not to feed in the wild. In contrast, fish that escape at early life stages appear to have a higher likelihood of adapting, feeding, and migrating to return as maturing adults. It is important to note that nearly all studies on the ecological effects of escaped net-pen fish are based on fertile (diploid) Atlantic salmon. Those studies that compared the ecological risks from escaped diploid and triploid fish in the field showed that triploid Atlantic salmon may be less resistant to stressful environmental conditions and have significantly higher occurrence of lens cataracts than the diploid fish. Laboratory experiments pairing full-sibling diploid and triploid Atlantic salmon subjected to seawater challenges showed that the triploid fish grow a suite of developmental deformities that may compromise their fitness in marine waters. In a study comparing diploid and triploid steelhead trout, after 15 months in saltwater, the survivorship of the triploid fish was only 35% of their starting population, compared with 72% for the diploid fish. These studies indicate that escaped net-pen fish, particularly escaped triploid fish may be at a competitive disadvantage compared with wild fish. Furthermore, we anticipate that in the unlikely event of a large-scale accidental release of all-female triploid steelhead trout from a net-pen in Puget Sound, the relative survival of the steelhead trout would be the same as or less than that previously seen with Atlantic salmon in this region.

Two potential ecological risks to wild populations from net-pen aquaculture that have received limited attention in the literature are (1) the attraction of wild populations to the net-pen facilities, and (2) the potential entrapment and inadvertent harvest (bycatch) of wild fish with the net-pen cages. We discuss bycatch in the Illegal bycatch category below. The interactions between wild fish populations and active net-pens facilities are complicated and vary spatially and at several temporal scales. Many of the effects depend on fishery regulations and practices. One study in Norway concluded that there may be effects to individual wild fish from net-pen facilities related to wild fish condition, growth, and reproductive success, and to their population's overall biomass and migratory patterns. However, these factors are poorly understood and the overall effect to population viability is unknown. We assume that the interactions involving Puget Sound net-pen facilities may be similar to those in Norway. But there would be no difference in those interactions between the farming of Atlantic salmon and all-female triploid steelhead trout at Cooke's existing facilities.

Infrastructure

The collapse of Cooke's Cypress #2 net-pen facility in 2017 that released an estimated 250,000 Atlantic salmon resulted from a failure of the mooring system and structural members of the raft's framing structure. Excessive biofouling by mussels and other marine organisms increased the drag force on the net-pen array, which likely resulted in the infrastructure failure.

Following the Cypress #2 accident, management actions were taken that will lower the risk of net-pen infrastructure failure, compared with the risk that existed prior to the Cypress #2 accident. First, Cooke Aquaculture is now required to implement a net hygiene monitoring protocol to improve net hygiene and document full compliance with the DNR Aquatic Land Leases. This protocol was jointly developed by Cooke Aquaculture and DNR. Net cleanliness is verified by videography. Second, EHB 2957 requires that approximately every two-years, when net-pens are fallow, each of Cooke's facilities must be inspected by an independent marine engineering firm, approved by WDFW, and to receive fish the facility must be considered in good working order. In December 2019, a Consent Decree was reached between Cooke and Wild Fish Conservancy in a federal lawsuit, where both parties agreed that before Cooke restocks any of their net-pen facilities, they are required to conduct a load analysis of the mooring and cage systems using environmental condition data that are consistent with the Norwegian aquaculture standard NS 9415. As part of the inspections mandated by EHB 2957, WDFW will require that Cooke provide an engineering analysis certifying that the net-pens conform to the parameters derived from the NS 9415 standard. Third, in addition to the inspections mandated by EHB 2957, following the Cypress #2 accident, DNR, Ecology, and WDFW have initiated coordinated routine inspections of net-pen infrastructure. Also, DNR, Ecology, and WDFW have greatly improved inter-agency communication, and along with Cooke Aquaculture have implemented communication procedures concerning events or activities at net-pen facilities that may affect their structural integrity. For example, starting in 2020 we have implemented an "unusual event" reporting procedure, by which Cooke Aquaculture is required to contact DNR, Ecology, and WDFW. We defined an unusual event at a marine net pen facility as "an uncommon event or abnormal situation that is not an active fish escape or a spill or release of toxic substances. An 'unusual' event can create or lead to an increased potential for accidental fish escapement, structural failure of the net pen array, or spill." See Section 4.3.1 in the Justification document.

Genetic effects

Genetic issues are discussed in Sections 4.3.3 and 4.3.4 (including Section 4.3.4.1) in the Justification document. Based on data from Norway, the genetic consequences of escaped diploid-fertile native species of farmed fish into open waters present a major risk from marine net-pen aquaculture. For example, escapes of fertile Atlantic salmon from open net pen aquaculture in the North Atlantic have been shown to have damaging impacts on the genetic variability both within and between native populations of Atlantic salmon. There would be a similar risk to native steelhead populations in Puget Sound if Cooke Aquaculture had proposed

to switch from culturing Atlantic salmon to culturing fertile steelhead. However, Cooke is proposing to culture all-female, triploid (sterile) fish, not fertile fish. The use of triploid fish is recognized as a normal aquaculture procedure that mitigates for the potential risks to the genetic structure and viability of wild populations from escaped farmed fish. We discuss triploidy error rates in Section 4.3.5 in the Justification document. See also discussion of triploid fish in the Bioengineered category discussion below.

Orca

Ninety-eight comments included the Orca or killer whale category. Most of these comments provided little or no examples of how the presence of net-pen aquaculture in general or transitioning from culturing Atlantic salmon to steelhead trout would *directly* affect Orca populations. Most of the comments are either statements about the environmental requirements of Orca, or general statements similar to those by Wild Fish Conservancy and Our Sound Our Salmon – “[t]his 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.” The only exception was the comment that net-pen infrastructure may impede Orca movements. However, the location of the net-pens will not be affected by transitioning culture from Atlantic salmon to steelhead trout. Finally, the Final Report and Recommendations from the Southern Resident Orca Task Force did not list finfish marine aquaculture in any form as a risk to Orca, nor did the report include any recommendation for the reduction or elimination of finfish marine aquaculture in Washington. WDFW does not consider Cooke Aquaculture’s proposed transition from culturing Atlantic salmon to steelhead trout to be a risk to Orca.

Politics

This SEPA process concerned transitioning from Atlantic salmon to steelhead trout, not an evaluation of the political, social, or economic issues associated with Cooke’s Marine Aquaculture Permit application (see “Overview – Statutory limits to WDFW SEPA review” section above, and Section 1.2 in the Justification document). WDFW’s statutes do not include the authority to base our SEPA determinations or permit decisions on political, social, or economic concerns. We will address four of the defining concepts associated with this category since these concepts contain misinformation. First, the accusation that WDFW was pandering to Cooke stockholders: To our knowledge Cooke Aquaculture is a family-owned business and there are no stockholders. Nevertheless, WDFW has maintained objectivity when applying our regulatory authority over marine finfish aquaculture. We have granted to Cooke Aquaculture 5-year Marine Aquaculture Permits, and many Fish Transport Permits. We have also denied at least two Fish Transport Permits out of concerns that Cooke Aquaculture would introduce a North Atlantic PRV (virus) variant into Puget Sound. Our denial of these permits resulted in over two million Atlantic salmon smolts being euthanized by Cooke Aquaculture. Second, the statement that WDFW or the State of Washington makes money from granting the 5-year Marine Aquaculture permit: WDFW does not charge a fee and therefore receives no income

from Cooke Aquaculture from the issuance of either the Marine Aquaculture Permit or Finfish Transport Permits. Third, the claim that the MDNS violated the new law (EHB 2957): The new law, with bipartisan support, and the clear and explicit backing from many tribes and environmental NGOs, unambiguously allows for the continued operation of commercial net-pen aquaculture in Puget Sound, including in areas where operations currently exist. The new law imposes only a few constraints related to the continued operations of commercial net-pen aquaculture. Among those constraints are: (1) DNR may not allow the commercial culturing of nonnative finfish as an authorized use under any new state-owned aquatic lands lease, and DNR cannot renew or extend current leases for nonnative finfish aquaculture beyond their current termination date; and (2) Ecology and WDFW may authorize or permit the commercial culturing of nonnative finfish, or related activities only if these activities are performed under a valid lease of state-owned aquatic lands (see Section 1.1 for more details). Fourth, the idea that the triploid steelhead to be cultured by Cooke Aquaculture are not native finfish: The broodline of steelhead Cooke Aquaculture will use in their operation was locally derived from Puyallup River (Puget Sound) steelhead trout around 1960. That is, these steelhead are derived from a native, Puget Sound population. The triploidy process does not turn these native fish into nonnative fish.

Bioengineered

On October 2, 2020, less than 24 hours after WDFW released our MDNS, Wild Fish Conservancy (WFC) stated in a media release that WDFW “advanced a proposal to *allow biologically-engineered steelhead trout* to be planted in Cooke’s surviving net pens” (emphasis added). We assumed that WFC was referring to the all-female, triploid steelhead to be used by Cooke Aquaculture as the biologically-engineered trout, but WFC left that phrase undefined. This WFC sentence has a negative connotation. Therefore, we also assume that WFC and the other 86 authors of comments that used “biologically-engineered,” “bioengineered,” “genetically modified,” “GMO,” or similar terms, were describing all-female, triploid steelhead as a negative – as a reason that the Marine Aquaculture Permit should be denied. University of California defines bioengineering as “a discipline that applies engineering principles of design and analysis to biological systems and biomedical technologies. Examples of bioengineering research include bacteria engineered to produce chemicals, new medical imaging technology, portable disease diagnostic devices, and tissue engineered organs” (<https://bioeng.berkeley.edu/about-us/what-is-bioengineering>). WDFW considers bioengineering to be a positive, not a negative, and an engineering discipline that is making contributions to society. The use of all-female, triploid steelhead in Puget Sound net-pens is also a positive, not a negative factor. Triploidy, which is seen at low rates naturally in wild salmonids, renders the fish sterile. Sterile females will be unable to successfully breed with native males and will eventually senesce and die. In addition, some results suggest that sterile salmon have a reduced instinct to enter freshwater. Thus, escaped sterile females will also be less likely to compete for the spawning of wild males or dig up the redds of wild females. The process to produce triploid fish can be called bioengineering, but triploid fish are not genetically modified (GMO) in the sense of a transgenic fish; a fish that

possesses genetic material transferred from one species to another. The use of transgenic fish in Washington is prohibited (WAC 220-370-100). See Genetic section above, and Sections 4.3.4 in the Justification document for a discussion of all female, triploid fish.

Land-based

This SEPA process concerned only Cooke's proposed transition from culturing Atlantic salmon to culturing steelhead trout in existing net-pen facilities. WDFW agrees that it might be in the state's interest for the aquaculture industry to investigate additional types of aquaculture methods, locations, and facilities. However, consideration of aquaculture that is land-based compared with that based on marine net-pens was beyond the scope of this SEPA process.

Commons

This SEPA process concerned only Cooke's proposed transition from culturing Atlantic salmon to culturing steelhead trout. See "Overview – Statutory limits to WDFW SEPA review" section above, and Section 1.2 in the Justification document. WDFW's statutes do not include the authority to base our SEPA determinations or permit decisions on public resource-use economics, or the appropriateness of using public resources for private profit.

Farm-raised salmon good

This SEPA process concerned only Cooke's proposed transition from culturing Atlantic salmon to culturing steelhead trout. See "Overview – Statutory limits to WDFW SEPA review" section above, and Section 1.2 in the Justification document. WDFW's statutes do not include the authority to base our SEPA determinations or permit decisions on the economics of marine aquaculture, or the quality of the aquaculture product.

Aesthetics

This SEPA process concerned only Cooke's proposed transition from culturing Atlantic salmon to culturing steelhead trout. See "Overview – Statutory limits to WDFW SEPA review" section above, and Section 1.2 in the Justification document. WDFW's statutes do not include the authority to base our SEPA determinations or permit decisions on the aesthetics effects of marine aquaculture infrastructure or operations. However, operational concerns that violate permit conditions are reportable to the permitting agency (e.g., WDFW or Ecology) and can be remediated.

Human Health

Human health was a category discussed in nine comments and was associated with two concepts: (1) the aquacultural operation, and (2) the aquacultural product were harmful to human health. None of the comments provided data or citations about how the operations or the product negatively affected human health. In addition, there is no evidence that the triploidy process affects human health as the process has been used for decades in the production of food fish. For example, WDFW has produced and released nearly 10 million

triploid steelhead trout since 1995, to serve recreational fishers, with no indication that human health of those who caught and ate many of those fish was negatively affected by the triploid process.

Illegal bycatch

The Canadian Government compiles and makes available the incidental finfish bycatch within British Columbia's marine finfish aquaculture farms.⁴ From 2011 through September 2019 there were 1256 bycatch incidents reported by the Canadian Government that involved a total of 708,574 fish. However, two of these incidents were the deliberate depopulation of the net-pens to control the spread of IHNV outbreaks. These two incidents involved a single species (Pacific herring) and 406,366 fish, or 57% of the nine-year total. Overall, Pacific herring accounted for 638,950 (90%) of the total bycatch. The median number of fish caught as bycatch was eight individual fish per incident. A total of 308 Pacific salmon were caught in 87 incidents (median = 9 fish per incident in which they Pacific salmon were caught; mean = 3.5 fish per incident in which they Pacific salmon were caught; and mean = 0.25 fish per total incidents), and no steelhead trout were caught in any incident. The population-level effects of this bycatch are not known, but the number of fish caught per incident is small absolutely, and small relative to their population sizes. There is no reason to assume that the bycatch, if any, would differ between the farming of Atlantic salmon and the farming all-female triploid steelhead trout at these net-pen facilities. See also Section 4.4.1 in the Justification document.

Climate Change

Climate change was mentioned in only six comments, most notably by the Washington Department of Natural Resources. WDFW has little doubt that climate change has and will continue to alter the terrestrial, freshwater, and marine environments in Washington. This change may have profound effects on wild, hatchery, and net-pen cultured salmonids. In fact, climate change may cause wild populations to go extinct, and may make it impossible to culture salmon in either hatcheries or in marine net-pens. Although we think that ultimately climate change will affect negatively commercial net-pen *operations and production* in Puget Sound, we disagree that Cooke Aquaculture's transitioning from Atlantic salmon to steelhead trout will make the effects of climate change worse for native salmonids in Puget Sound.

Hatchery feed production

An under-appreciated environmental concern of net-pen aquaculture is the source and production of feed, as evident by the paucity of comments (n= 4) that included this category (Table 1). Feed can be composed in part of fishmeal and fish oil taken from harvested forage fish such as herring. This would create an environmental concern if such harvest was taken from depleted stocks or if more marine-sourced protein was needed to feed the cultured fish than was produced by the cultured fish themselves. See discussion at:

⁴ <https://open.canada.ca/data/en/dataset/0bf04c4e-d2b0-4188-9053-08dc4a7a2b03>

<https://www.fisheries.noaa.gov/insight/feeds-aquaculture#why-use-fishmeal-and-fish-oil-in-the-diets-of-farmed-fish?> However, over the past decade or so there have been advances in the formulation of hatchery feed. More of the marine sources of protein and oil (fishmeal and fish oil) are from byproduct waste from harvest; marine fishmeal and fish oils are being replaced by terrestrial sources; and improved technology has resulted in better feed-weight to live fish-weight ratio. By some estimates the ratio of the weight of marine fish protein in feed needed to produce one kilogram of farmed-salmon protein is now below one, indicating that net-pen farm production of salmon can result in a net increase in protein from marine waters. Most of the salmon-trout feed data are from Atlantic salmon. Although the nutritional requirements for culturing net-pen steelhead in Puget Sound may differ somewhat from that of Atlantic salmon, we do not anticipate that the sources of protein and oil in the feed used by Cooke Aquaculture to culture steelhead would differ significantly from that used to culture Atlantic salmon.

Navigation

Four comments were concerned that the location of the net-pen infrastructure was either a hazard to or will disrupted marine navigation in Puget Sound. This SEPA process concerned only Cooke's proposed transition from culturing Atlantic salmon to culturing steelhead trout. Since Cooke Aquaculture will be using existing facilities, the location of these facilities in relationship to navigation was not a subject of the SEPA process.

Violates federal law

The four comments that stated that Cooke Aquaculture and WDFW were breaking federal law did not state which law was being broken. WDFW is not aware of any federal law that is being broken by our SEPA MDNS or the issuance of the Marine Aquaculture Permit, nor have we been notified by the federal government that a law has been broken by our SEPA MDNS or the issuance of the Marine Aquaculture Permit.

Table 1. The frequency of subject categories considering only the unique comments (Unique) or including all comments even those that were identical or near-identical copies (With Duplicates). The Joint Ranks are the average ranks from the Unique and With Duplicate comments, and the table is sorted by the Joint Ranks. The green shading denotes those categories that are in the top quartile (25%) for each set of comments. The hashed green shading includes (forward hash) or does not include (backward hash) the General subject category

Subject Category	Count		Percent Comments		Rank		
	Original	With Duplicates	Original	With Duplicates	Original	With Duplicates	Joint
Disease	275	2912	31%	83%	2	1	1.5
Pollution	252	2889	29%	82%	3	2	2.5
Cooke Aquaculture	231	2868	26%	81%	4	3	3.5
General	277	277	31%	8%	1	8	4.5
Environmental review (EIS)	170	1117	19%	32%	5	5	5
Antibiotics	94	1784	11%	51%	11	4	7.5
2017 net-pen failure	111	1058	13%	30%	9	6	7.5
Protect native fish	139	139	16%	4%	6	9	7.5
Ecological	136	136	15%	4%	7	10	8.5
Infrastructure	126	126	14%	4%	8	11	9.5
Genetic effects	76	1023	9%	29%	14	7	10.5
Orca	98	98	11%	3%	10	12	11
Politics	88	88	10%	2%	12	13	12.5
Bioengineered	87	87	10%	2%	13	14	13.5
Land-based	71	71	8%	2%	15	15	15
Commons	44	44	5%	1%	16	16	16
Farm-raised salmon good	40	40	5%	1%	17	17	17
Aesthetics	20	20	2%	1%	18	18	18
Human Health	9	9	1%	0%	19	19	19
Illegal bycatch	8	8	1%	0%	20	20	20
No Content	7	7	1%	0%	21	21	21
Climate Change	6	6	1%	0%	22	22	22
Hatchery feed production	4	4	0%	0%	25	23	24
Navigation	4	4	0%	0%	24	24	24
Violates federal law	4	4	0%	0%	23	25	24
Not applicable	1	1	0%	0%	26	26	26

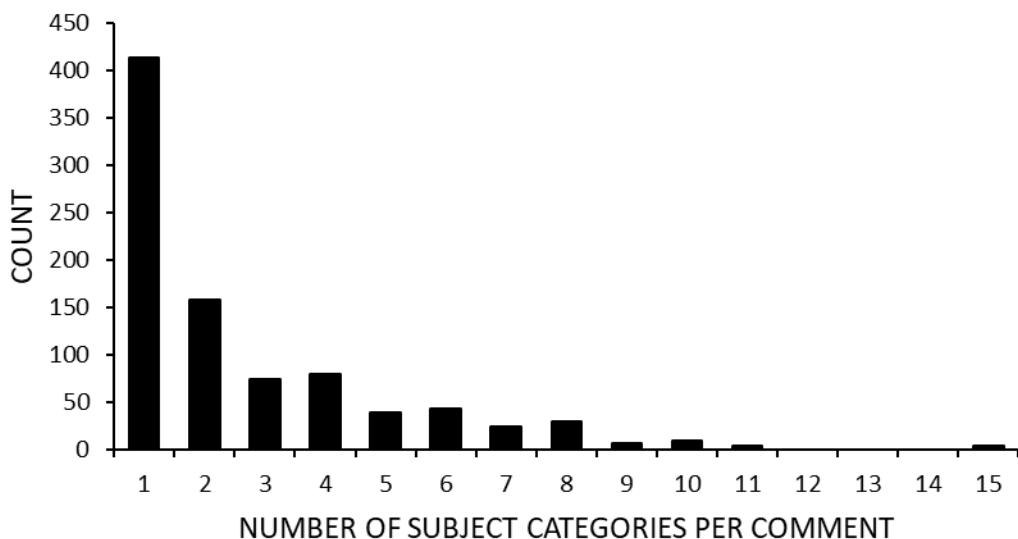
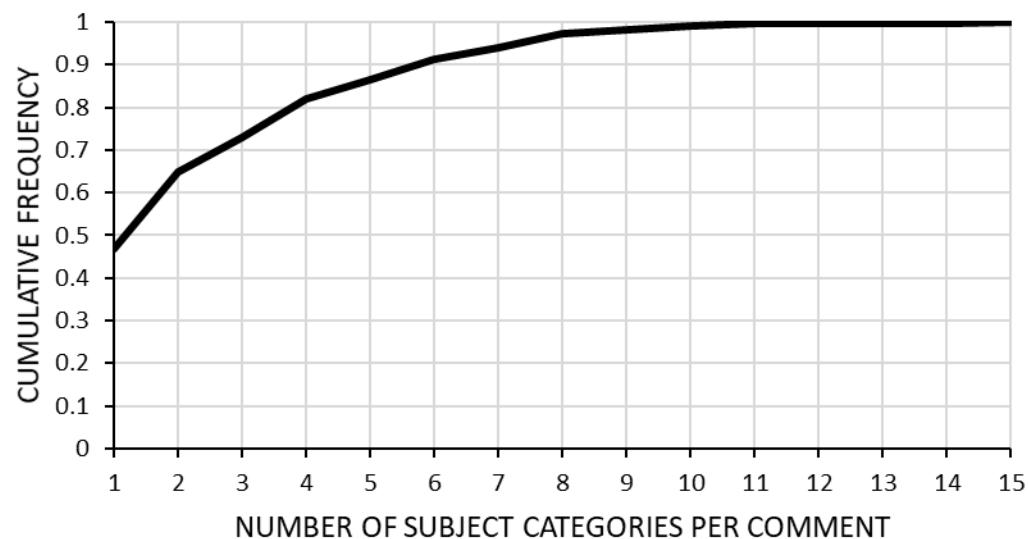
A**Count of Subject Categories****B****Cumulative Frequency of Subject Categories**

Figure 1. A. The number of comments with 1 – 15 subject categories as content. For example, the content of 414 comments was limited to only one subject category, while the content of four comments included 15 subject categories. B. Cumulative frequency distribution for the number of subject categories per comment. Nearly half (0.5 or 50%) of the comments contained only one subject category, while roughly 90% (0.9) of the comments contained six or fewer categories.