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

These comments are made in response to the announcement from the Washington State Department of Ecology that it is considering issuing permit modifications to Cooke Aquaculture to allow a shift from culture of non-native Atlantic salmon to a domesticated version of a native species, steelhead.

I preface my comments with some broader statements that provide a context which should bear on Ecology's considerations on how, when, and whether to proceed.

- Cooke and predecessor companies owning and managing net pen fish culturing operations in Puget Sound have a history of delayed and inadequate maintenance of their net pen facilities, resulting in multiple instances of net pen failures and escapement of farmed fish (a pollutant) into Puget Sound waters. Note that in the case of the Cypress Island pens, a decision was made in 2018 to continue to rear fish to maturity after serious structural failings in the pens had been identified, thereby underscoring the company's bias to opt for profits over risks to the safety of the public waters and resources of the State. **These recurring issues do not lend credence to a determination of low risk for how these operations are managed or for the probability of another escapement occurring.**

- This request to modify the net pen permits comes at a time when a high priority for people of this state is to restore the native salmon species (some of which are ESA-listed) that have populated Puget Sound's waters and in so doing to restore the health and viability of the ESA-listed Southern Resident orca population. ESA listing presents a high bar for looking at any impacts to the listed species. **There are multiple ways in which these unnaturally concentrated rearing facilities for fish can impact the water quality and health of the Puget Sound ecosystem and therefore work against the health and restoration of listed species.**

- HB 2957, passed by the State legislature in 2018, charges Ecology and other state agencies regulating net pens "to eliminate commercial marine net pen escapement and to eliminate negative impacts to water quality and native fish, shellfish, and wildlife." T**his is the bar for measuring whether permit terms are sufficient.**

- The WDFW determination of non-significance under SEPA (MDNS) is currently being legally appealed. This challenge should be resolved before proceeding. **New information since the original EIS in the 1990's needs to be brought forth and considered before proceeding with drafting or even considering the appropriateness of a modified NPDES permit.**

The following comments focus on how the expansion and continuation of open water net pen fish culture is likely to have a "significant adverse impact on water quality or human health." Per Ecology, the discharged pollutants from the net pens consists of uneaten fish food, feces, and accidental release of fish being reared. **An additional pollutant is tissue fragments from dead and diseased fish.**

1) Raising fish in a net pen is like a concentrated animal feeding operation (CAFO) on land. Animals are unnaturally crowded together, and therefore there is a highly localized production of fecal waste and a higher potential for disease, necessitating a regimen of medications to counter that. On land, the fecal waste is required to be contained, so as not to contaminate water bodies. Ironically, the same practices of concentrated rearing in water rely on the water to disperse and dilute the waste in the broader water body, and also provide a non-ecologically-based zone of deposit (ZID) where waste is allowed to accumulate and cause impacts. **Net pen operations are a concentrated feeding operation and therefore a concentrated source of (oxygen-demanding) fecal waste in the water body, with the uneaten feed acting as an attractant for native fish, marine mammals, and waterfowl.** This attraction has been referred to as "chumming," causing the animals to congregate and disrupting their normal patterns of movement and migration, making them more vulnerable to predation. Among other impacts, it may even include forage fish and smaller salmon entering the net pens to obtain feed, and subsequently being consumed by the farmed fish.

2) Concentrated animals are more susceptible to spreading disease. If the fish in the pens become diseased, there is nothing that insulates native fish in the vicinity from picking up the disease or the parasite from this concentrated source as they swim by or congregate (as described above). When the fish feed is medicated, some of this feed disperses and is consumed by the native fish populations. Where a particular drug requires that a harvested fish be drug free for 30 days or more before it can be marketed for food, that delay period can't be applied to wild fish that are caught by fishermen nearby. **The ecological risk of the spread of fish disease and of broad application of medications, including antibiotics, to the marine system in this area and to humans catching wild fish nearby is unacceptable.**

3) Besides fecal and food waste, animal tissue from dead and diseased fish is also dispersed into the water, with the potential to be a disease vector infecting other fish. Disease is a very real issue for these operations. Cooke states that divers remove dead fish every three days, but in the meantime, their flesh can easily be shredded and enter the waters of the surrounding area. In May 2012 there was a major outbreak of infectious hematopoietic necrosis (IHN) in the pens in Rich Passage off Bainbridge Island. After a sequence of rapidly increasing mortalities, all of the fish from the pens had to be removed and killed and the pens removed and cleaned. **The risk of disease being transmitted to nearby congregating and migrating wild fish populations is high. This risk is not justified under ESA and the need to restore native fish populations in Puget Sound.**

4) Cooke is proposing to use triploid all-female steelhead that are presumably sterile, however they acknowledge that the process to induce triploidy is not 100% effective and there is debate about whether the estimates of effectiveness were done properly. (WDFW made an effort to recalculate and verify the figures submitted by Cooke, but the sample sizes were still too small). This means that with escaped fish there is a real possibility of sexually mature females being able to mate and reproduce and impact the native populations. There is the possibility of escapement (leakage) as the juvenile fish are being stocked into the pens, and then again if there is a failure in the pen structural integrity. If released, these fish are rapid growing and therefore aggressive consumers of the same prey as the native wild fish in the vicinity. **The record of past escapements from net pen facilities indicates these risks are too high and can have a significant impact on native salmonid populations.**

I ask that you seriously reconsider the risks to the Puget Sound ecosystem and the listed marine species in determining whether any further water quality impact from these net pen facilities is warranted.