Coastal Watershed Institute (CWI)

www.coastalwatershedinstitute.org

"Our mission: To protect and restore marine and terrestrial ecosystems through scientific research and local community, place based partnerships."

10 July 2017

Mary Ellen Winborn , Director
Clallam County DCD
223 E. 4th St.Suite 5
Port Angeles, WA 98362

Comments on proposed MDNS for project Legal No.766276

Cooke Aquaculture Pacific (CAP) project (formerly Icicle /American Gold (AG) Seafoods) has proposed the building a new in water net pen facility and production expansion, by 20%, to rear Atlantic salmon. The Cooke project sponsor currently has an Atlantic Salmon net pen facility that is located in Port Angeles harbor, in the Elwha littoral cell. The proposed new facility location is 1.5 miles east and north, offshore of the Morse Creek river mouth and along the Dungeness littoral cell. The stated justification for this new facility is to avoid proposed Navy development adjacent to the net pens current location in Port Angeles harbor.

The project description reads: *' The proposal would be comprised of fourteen (14) floating high density polyethylene (HDPE) plastic pipe circular net pens, which are designed for open water conditions. Each net pen will be 126 feet in diameter, 45 feet deep, and in approximately 100 foot deep water. The proposal also includes a 40 foot wide by 100 foot long feed barge. The height of the feed barge will be approximately 19 feet above the water level when empty and 14 feet when is fully loaded with about 350 tons of fish feed. The pens would be comprised of two rows of 7 pens each with a feed barge at the eastern end of the array. Each of the net pens and the feed barge would be located 72 feet apart from each other, and would be held in place by up to sixty 4,000 to 8,000 mooring anchor, anchor lines, chains, and hardware. This proposal would encompass 9.7 acres of water surface area and require a 52 acre Aquatic lease from the WA State Department of Natural Resources (DNR). Location of the Proposal: The CAP new aquaculture net pen facility is proposed to be located approximately 3.8 miles east of Ediz Hook, 1.8 miles north of Morse Creek, and approximately 1.5 miles north of Green Point, within Section 10, Township 30 North, Range 5 West, W.M.'*

Our comments to this project include but are not limited to the following. Additional comments may be provided in the future.

We feel strongly that both the existing and the new proposed net pen facility should be moved from marine waters completely, and relocated to an upland, closed system facility.

A new in water facility, as proposed, should absolutely not be built at all. Production at the current location should absolutely not continue, or be increased.

The ecosystem impacts of net pens are well documented. The Millennium Ecosystem Assessment (2005) clearly identified aquaculture as a major threat, stating: "*The greatest threat to coastal systems is the development-related conversion of coastal habitats... through coastal urban sprawl, resort and port development, aquaculture, and industrialization*" (emphasis added).

Aquaculture, including net pens, are a significant source of marine plastic debris (Hinojosa and Thiel 2009, Thiel et al 2011, Arthur and Baker 2011). Locally, the current net pen site in Port Angeles harbor was one of the top sources of marine debris in early Clallam MRC/NWS Commission derelict gear clean up efforts (Clallam MRC personal communication).

Net pens ecosystem scale impacts are significant. They concentrate and propagate parasites and disease for native stocks of salmon and forage fish (Morton et al 2011, Krkošek et al 2013, Morton et al 2008). They fail regularly and introduce non-native/nuisance species of salmon to wild systems. Insecticides, herbicides, antibiotics, and high concentrations of fish feed used as a course of business with netpens all have impacts to the marine ecosystem (Dill 2011).

Salmon farm/net pen impacts to native fish are well documented, and catastrophic. Ford and Myers (2008) document a world-wild impact of net pens on wild salmon. These have significant impact to fish survival, including sockeye (Godwin et al 2017). Connors et al. (2010) documented negative impact on wild coho production due to net pens. Morton and Symonds (2002) documented negative impact of net pen management practices on killer whales, *Orcinus orca*. Davis (2016) summarizes the link between salmon net pens and the collapse of wild salmon runs in British Columbia. Net pens are banned in Alaska- the world's last remaining strong hold for wild salmon.

As a result of these impacts, and the clear risk net pens pose to invaluable Washington salmon and forage fish and the ecosystems on which they depend, a number of counties in Washington state are intending to/ or have already severely restricted and/ or banned net pens in their SMP updates including the City of Bainbridge, Pierce County, San Juan Islands, Whidbey Island, Whatcom County, and Jefferson County. Clallam County SMP is currently being updated. Given the length, current relative intact nature, and importance of the coastline of Clallam County, net pens should be listed as banned in the Clallam SMP also.

The proposal to move the existing net pens from Port Angeles harbor is not, as implied, a simple shift of an existing facility. It is a new and significant structure to be placed along the Strait of Juan de Fuca. This is an extremely high risk new location. The Strait of Juan de Fuca is the corridor through which the majority water of the Salish Sea is exchanged. This reach of the Strait of Juan de Fuca is a very high energy open coastal environment with severe currents, wind, fetch, swell and wind wave conditions. Net flow direction

along the southern Strait shoreline is to the east, and into Puget Sound (Mackas and Harrison 1997). There is no doubt that, if installed, these structures will fail (as they have done in the past in the relatively protected Port Angeles harbor).

Ecologically, the siting of both the existing net pens and the proposed new facility site is extremely poor. The Strait of Juan de Fuca is a major migratory corridor for many of the region's salmon, forage fish, bird, and marine mammal species. The site is just offshore of the eastern edge of the Elwha drift cell and at the beginning of the Dungeness drift cell. Both reaches support world scale ecosystem processes, including sediment delivery, forage fish and salmon migration, forage fish spawning and whale and bird migration.

The Strait of Juan de Fuca is an extremely important migratory, rearing, and feeding corridor-for many of the region's critically endangered and declining salmon and forage fish stocks, and many use shallow and inshore areas including those associated with the proposed project site. These include sockeye, Chinook, coho, steelhead, chum, cutthroat, and bull trout, surf smelt, sand lance, herring, and eulachon. Surf smelt spawn on the beaches adjacent and just down drift of this proposed facility (Fresh 2006, Quinn, 2009, Melnychuk et al 2010, Moore et al 2010, Shaffer et al 2012, Parks et al 2013, Wefferling, 2014, Fresh et al unpublished data). Ecto-parasitic copepods are observed regularly on juvenile herring and sand lance along the central Strait nearshore (Shaffer unpublished data), indicating that impacts from the existing net pen facility are already occurring.

Placing net pens at the new high energy location will not only assure increased structural failure, resulting in pollution and plastic and metal wreckage on the shoreline. It will also insert disease, parasite, and pollution vectors more directly into the head of the Salish sea water system as well as the migratory path of the majority of Salish Sea salmon and forage fish species that use the Strait of Juan de Fuca as they transit to and from inland waters.

Ecosystem services analysis have repeatedly proven that protecting and restoring intact natural capital systems-which when functioning don't cost a penny, and do not contaminate our marine ecosystems but instead contribute to the economic efficiency of our communities- are the only meaningful way to sustain our highly valued region (Flores 2014). The Ecosystem Services Valuation that Clallam County co-authored documented that the stretch of shoreline included in this project proposal has some of the highest value and intact services of the region that should be protected (Flores et al 2014). In the context of salmon farms, protection means total avoidance of marine waters and ecosystems. This is possible through upland and closed systems.

Because of the importance of our region's fish and the ecosystems they depend on, the county, State of Washington and federal government have spent literally billions of dollars over the last two decades to restore the ecosystem and fisheries resources of Puget Sound. In 2015, the top 12 proposed restoration projects alone of Washington state's Puget Sound Partnership were estimated to cost $173 million dollars (Dunagan 2015). Projects have included hundreds of millions of federal and state dollars for the Elwha

dam removals, the largest dam removal in the world, and ongoing efforts to restore and protect the Dungeness River and Dungeness Bay to restore and protect salmon and forage fish species. This project is exactly in the middle of both of these littoral cells.

With the extremely high value of fish ecosystem services and resources currently thriving along this exact shoreline in Clallam County, as well as investments in restoring Puget Sound, the damage net pen/salmon farm facilities do to these exact same resources, and the advances in land based/closed system salmon farm technology, it is therefore absolutely contra indicated and unnecessary to allow the region's salmon and forage fish resources to be exposed to the large scale harm that will occur with the currently proposed new net pen project, or continue to be exposed to the existing facility.

The mitigation in the proposed project is grossly inadequate to address the harm these structures do to our coastal ecosystems. Specifically: The mitigation plan nowhere addresses the fact that net pens are a documented ecosystem scale source and vector of disease and parasites upon native wild salmon and forage fish stocks. Further, mitigation to address the fuel consumption to service the offshore net pens is not addressed, nor is an adaptive management plan for the inevitable failure of this system that will negatively impact Dungeness National Wildlife Refuge, one of the nation's most important wintering grounds for migratory waterfowl.

All of these impacts are completely avoidable by the system being redesigned to a land based/ upland, closed design. The technology for closed system aquaculture has been proven to be cost effective, and environmentally sound (Tal et al 2009). Given the environmental impact of in water salmon farms, clearly upland contained/closed systems are a logical and reasonable option. For these reasons the existing Icicle/American Gold net pens should not be allowed to build a new marine facility as proposed. The existing net pens should be removed from Port Angeles harbor, and replaced only with upland and contained closed system aquaculture –at a location off the shoreline/off the Ediz Hook.

Further, Clallam County should follow other counties lead and limit net pens to upland facility only. Clallam County should, in its' SMP update, ban net pens from its shorelines, which provide critical rearing and migratory ecosystems for a number of struggling and restoring species that are the focus of national, federally funded restoration and protection actions.

Respectfully,

Anne Shaffer, PhD
Executive Director, Lead Scientist

Literature Cited

Arthur, C. and J. Baker (eds.). 2011. Proceedings of the Second Research Workshop on Microplastic Debris. November 5-6, 2010. NOAA Technical Memorandum NOS-OR&R-39.

Connors, B.M., Krkošek, M., Ford, J. and Dill, L.M., 2010. Coho salmon productivity in relation to salmon lice from infected prey and salmon farms. *Journal of Applied Ecology*, *47*(6), pp.1372-1377.

Costello, M.J., 2009. How sea lice from salmon farms may cause wild salmonid declines in Europe and North America and be a threat to fishes elsewhere. *Proceedings of the Royal Society of London B: Biological Sciences*, *276*(1672), pp.3385-3394.

Davis, M. 2016. http://www.huffingtonpost.ca/marc-davis-/fish-farming-wild-salmon_b_9361814.html

Dill, L. 2011. Presentation to general public for the Coastal Watershed Institute. **https://vimeo.com/47903851 and http://vimeo.com/47906547**

Dunagan, C. 2015. **http://invw.org/2015/04/12/budget-cutters-take-aim-at-key-puget-sound-projects/**

Flores, L., 2014. Nature's Values in Clallam County: Policy Implications of the Economic Benefits of Feeder Bluffs and 12 Other Ecosystems.

Flores, L., Harrison-Cox, J., Wilson, S. and Batker, D., 2013. Nature's value in Clallam County: the economic benefits of feeder bluffs and 12 other ecosystems. Earth Economics, Tacoma, Washington, USA.

Ford, J.S. and Myers, R.A., 2008. A global assessment of salmon aquaculture impacts on wild salmonids. *PLoS Biol*, *6*(2), p.e33.

Fresh, K.L. 2006. Juvenile Pacific Salmon in Puget Sound. Puget Sound Nearshore Partnership Report No. 2006-06. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, Washington.

Godwin, S.C., Dill, L.M., Krkošek, M., Price, M.H.H. and Reynolds, J.D., 2017. Reduced growth in wild juvenile sockeye salmon Oncorhynchus nerka infected with sea lice. *Journal of Fish Biology*.

Hinojosa, I and M. Thiel 2009. Floating marine debris in fjords, gulfs and channels of southern Chile. Mar. Pollut. Bull., 58 (2009), pp. 341–350

Krkošek, M., Revie, C.W., Gargan, P.G., Skilbrei, O.T., Finstad, B. and Todd, C.D., 2013. Impact of parasites on salmon recruitment in the Northeast Atlantic Ocean. *Proceedings of the Royal Society of London B: Biological Sciences*, *280*(1750), p.20122359.

Mackas, D.L. and Harrison, P.J., 1997. Nitrogenous nutrient sources and sinks in the Juan de Fuca Strait/Strait of Georgia/Puget Sound estuarine system: assessing the potential for eutrophication. *Estuarine, Coastal and Shelf Science*, *44*(1), pp.1-21.

Melnychuk, M.C., Welch, D.W. and Walters, C.J., 2010. Spatio-temporal migration patterns of Pacific salmon smolts in rivers and coastal marine waters. *PloS one*, *5*(9), p.e12916.

Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Synthesis. Island Press, Washington, DC.

Moore, M.E., Berejikian, B.A. and Tezak, E.P., 2010. Early marine survival and behavior of steelhead smolts through Hood Canal and the Strait of Juan de Fuca. *Transactions of the American Fisheries Society*, *139*(1), pp.49-61.

Morton, A., Routledge, R., Peet, C. and Ladwig, A., 2004. Sea lice (Lepeophtheirus salmonis) infection rates on juvenile pink (Oncorhynchus gorbuscha) and chum (Oncorhynchus keta) salmon in the nearshore marine environment of British Columbia, Canada. *Canadian Journal of Fisheries and Aquatic Sciences*, *61*(2), pp.147-157.

Morton, A.B. and Symonds, H.K., 2002. Displacement of Orcinus orca (L.) by high amplitude sound in British Columbia, Canada. *ICES Journal of Marine Science: Journal du Conseil*, *59*(1), pp.71-80.

Parks, D., Shaffer, A. and Barry, D., 2013. Nearshore drift-cell sediment processes and ecological function for forage fish: implications for ecological restoration of impaired Pacific Northwest marine ecosystems. *Journal of Coastal Research*, *29*(4), pp.984-997.

Quinn et al 2009. Puget Sound salmon migrations. https://digital.lib.washington.edu/researchworks/bitstream/.../quinn.pdf

Shaffer, J.A., Crain, P., Kassler, T., Penttila, D. and Barry, D., 2012. Geomorphic habitat type, drift cell, forage fish and juvenile salmon: are they linked?. *Journal of Environmental Science and Engineering. A*, *1*(5A).

Tal, Y., Schreier, H.J., Sowers, K.R., Stubblefield, J.D., Place, A.R. and Zohar, Y., 2009. Environmentally sustainable land-based marine aquaculture. *Aquaculture*, *286*(1), pp.28-35.

Thiel, M., Bravo, M., Hinojosa, I.A., Luna, G., Miranda, L., Núñez, P., Pacheco, A.S., Vásquez, N., 2011. Anthropogenic litter in the SE Pacific: an overview of the problem and possible solutions. Journal of Integrative Coastal Zone Management 11, 115–134.

Wefferling, L.T., 2014. *Forage Fish Spawning in the Elwha Nearshore: Ecological Form and Function in a Changing Environment* (Doctoral dissertation, Evergreen State College).