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ATTN: Ms. Pamela Sanguinetti

From: Jan Wold  
P. O. Box 1340  
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December 19, 2016

I am commenting on the Army Corps of Engineers 2017 Nationwide Permit (NWP) 48 Commercial Shellfish Aquaculture Activities. I live along Hood Canal, on Shine Road, adjacent to Squamish Harbor, in Port Ludlow, Washington. I own the tidelands in Squamish Harbor below my home. Estuaries such as Squamish Harbor are some of the most diverse and imperiled ecosystems in the world.

Marbled murrelets (*Brachyramphus marmoratus*) are listed as a federally “threatened species.” The species has been newly up-listed to “endangered” by the State of Washington and are protected by law. Marbled murrelets have been documented around portions of the Olympic Peninsula and in Squamish Harbor by the U. S. Forest Service, Washington State Department of Fish and Wildlife and by local residents. Marbled murrelets live here because of the forage fish they eat and feed to their one annual nestling and because of the proximity to old-growth forest nesting habitat. We should not further endanger their existence and habitat.

Squamish Harbor is a feeding ground for large quantities of both local and migrating birds, some protected by law. The western grebe is a state candidate for listing as endangered, threatened or sensitive. The common loon is a state sensitive species. Both species are seen feeding in Squamish Harbor. Additionally, the following birds are all frequent users of Squamish Harbor, as observed and documented by local residents, and they depend on either the eelgrass and associated species, or forage fish for food: pacific loons, horned grebe, red-necked grebes, great blue herons, Brandt's cormorants, double crested cormorants, pelagic cormorants, belted kingfishers, rhinoceros auklets, osprey and bald eagles, brants, American wigeons, northern shovelers, northern pintails, green-winged teal, ring-neck ducks, greater scaups, surf scoters, white-winged scoters, black scoters, buffleheads, common goldeneyes, common mergansers, red-breasted mergansers, and American coots. We should not discourage their presence by threatening their food supply and increasing the amount of human disturbance in the area.

The executive summary of the "Washington Department of Fish and Game for the Periodic Status Review for Threatened and Endangered Species for the Marbled Murrelet in Washington (2016)," published in October of 2016 states that:

"The marbled murrelet (Brachyramphus marmoratus) is a small seabird that inhabits near shore marine environment in western North America. The distribution of murrelets in Washington includes the southern Salish Sea and the outer coast. The species was listed as threatened under the U.S. Endangered Species Act in 1992 in Washington, Oregon and California and... was subsequently listed by the Washington Fish and Wildlife Commission as threatened in 1993. ... Marbled murrelets forage in the marine environment and may fly up to 55 miles inland where they nest and rear a single young on large tree limbs in mature and old conifer forests. Murrelets prey primarily on a variety of forage fishes, and sometimes on larger zooplankton. They exhibit strong site fidelity to nesting areas, appear to nest in alternate years, on average, and have a naturally low reproductive rate.

... At-sea population monitoring from 2001 to 2015 indicated a 4.4% decline in the murrelet population annually, which represents a 44% reduction since 2001. The 2015 population estimate for Washington is about 7,500 birds.

Sustained low juvenile recruitment has been identified as a main cause of the decline, ... A 20% nest success rate in Washington for the period 2004-2008 was attributed to nestling starvation or adults abandoning eggs before completing incubation, suggesting low prey availability. Human marine activities appear to influence murrelet abundance and distribution in the Salish Sea. Declines in populations of forage fish species such as herring and anchovy subsequently resulted in an increased use of lower trophic level, less calorie-rich food sources (invertebrates). Ultimately, these changes to the marine food web may have influenced reproductive output. ...

The magnitude of the population decline indicates that the status of the marbled murrelet in Washington has become more imperiled since state listing in 1993. Without solutions that can effectively address these concerns in the short-term, it is likely the marbled murrelet could become functionally extirpated in Washington within the next several decades. Therefore, our recommendation is to list the Marbled Murrelet as a state endangered species in Washington."

The Marbled murrelet research paper titled, "Breeding Ecology of the Marbled murrelet in Washington State, Five Year Project Summary (2004-2008)," May 2009, by Thomas D. Bloxton, Jr. and Martin G. Raphael, USDA Forest Service, Pacific Northwest Research Station, Olympia, Washington stated:

"...only one nest was apparently successful in each year from 2004- 2006, and in 2008, and none of the five nests monitored in 2007 were successful. The majority of nest failures appear to be related to nestling starvation or adults abandoning eggs prior to completion of the incubation period (or eggs failing to hatch after 40+ days). The low observed rate of confirmed nest initiation in all years (2004 [3 of 27 adults], 2005 [8/40], 2006 [2/40], 2007 [5/32], & 2008 [2/18]) and high rate of nest failure (80%) is possibly due to low prey availability at sea."

The research article, "Marine Habitat Selection by Marbled murrelets (Brachyramphus marmoratus) during the Breeding Season, by Theresa J. Lorenz, Martin G. Raphael and Thomas

S. Bloxton, Jr., USDA, Forest Service, Pacific Northwest Research Station, Olympia, Washington," states:

"In particular, marine areas in close proximity to old-growth nesting habitat appear important for murrelets during the breeding season and should be priorities for protection...the conservation of marbled murrelets may hinge on protecting not only nesting habitat--the focus of conservation efforts to date--but also on foraging habitat.

Sand lance (*Ammodytes hexapterus*) are considered an important prey of breeding marbled murrelets...They are associated with fine gravel or sandy-bottomed coastal waters ...

Given the marine habitat selection we observed in this study, we suggest that marine areas that should be prioritized for protection are those in closest proximity to large tracts of nesting habitat, with low human footprint, and near sand or gravel beaches."

The Army Corps of Engineers should not approve any commercial shellfish farming permits in areas used by the endangered marbled murrelets. Gravel and sand tidelands that provide native eel grass and spawning areas for sand lance and herring should be excluded from approval of any permits for commercial shellfish farming in those areas of Hood Canal and Puget Sound that are being used by this endangered species for foraging and for feeding their single nestling.

Hood Canal also provides for the threatened Hood Canal Summer Chum Salmon in these same types of tidelands, adding even more need to conserve these areas. Shellfish are touted as being important for cleaning the water of Puget Sound, but the extreme numbers found in shellfish farms may in fact be cleaning the water of the very organisms that serve as the base of the food chain for marbled murrelets and Hood Canal Summer Chum Salmon.

I want to share an example of the importance of not only preserving habitat for threatened and endangered species, abut looking at the additive impact of shellfish farming. Squamish Harbor is

unique among the estuaries of Puget Sound. Squamish Harbor is a shallow shelf at the head of Hood Canal, facing south, directly in the path of winter storms that usually blow north along the length of Hood Canal. Winds of 40 miles per hour are frequent during the winter, and gusts of 60+ mph are not unknown. The Squamish Harbor shoreline withstands the worst of these storms. As storm waves break over the shelf into Squamish Harbor, they churn and scour the sea floor. The water becomes very muddy. These storms can and do unseat large numbers of tubes, nets and other apparatus placed in the sand and on tidelands by shellfish farmers. This additional sediment, churned up in “farmed” areas, can adversely impact spawning gravels and sands used by sand lance and herring.

Squamish Harbor is documented by the State of Washington as a refuge for native eelgrass, which provides habitat cover and food organisms for the federally listed, “threatened” Hood Canal Summer Chum salmon. Squamish Harbor is also a holding area for salmon moving up Shine Creek to spawn.

DNR has documented Squamish Harbor as a spawning ground for herring and sand lance. These are the primary foods for marbled murrelets, listed by the federal government as a threatened species. Marbled murrelets were up-listed in 2016 to a state “endangered species” by the Washington Fish and Wildlife Commission. We should not endanger marbled murrelets and their food sources with shellfish farming, geoduck tubes, nets, harvesting and planting disturbances.

A Peninsula Daily News article on August 5, 2016 features a story describing how scientists investigating the death of 400 rhinoceros auklets who breed on Protection Island (in Puget Sound northwest of Hood Canal) were likely starved because the size of the sand lance and herring they eat had become too small to satisfy their dietary requirements.

Squamish Harbor is also a breeding place and home for large quantities of Dungeness crab. Young and adult crab roam the underwater sand of Squamish Harbor and are the source of both local and commercial recovery as local food. We should not restrict their movement or risk their entanglement by permitting nets on the floor of the bay.

As reported in the Bellingham Herald on September 1, 2016: "Aside from the salmon industry, Puget Sound also generates money through tourism. Heck's office reports that Puget Sound drives about \$9.5 billion in travel spending along with about 88,000 tourism-related jobs responsible for nearly \$3 billion in income for Washington's economy."

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ATTN: Ms. Pamela Sanguinetti

From: Jan Wold  
P. O. Box 1340  
Poulsbo, WA 98365  
January 5, 2017

I am commenting for the second time on the U. S. Army Corps of Engineers 2017 Nationwide Permit (NWP) 48 Commercial Shellfish Aquaculture Activities due to changes that were just announced by the Army Corps to remove environmental protections for eelgrass and forage fish by eliminating General Conditions 10 and 14 of the permit. I live along Hood Canal, on Shine Road, adjacent to Squamish Harbor, in Port Ludlow, Washington. I own the tidelands in Squamish Harbor below my home. Estuaries such as Squamish Harbor and Puget Sound are some of the most diverse and imperiled ecosystems in the world.

The federal government is spending billions of dollars to restore Puget Sound habitat that is so important for dwindling numbers of forage fish, salmon, marbled murrelets, green sturgeon and numerous other species. Herring and surf smelt populations continue to decline.

Squamish Harbor, near the head of Hood Canal, has both eelgrass and forage fish spawning areas. I have seen first-hand the massive destruction of nearby tidelands by a local geoduck farmer. The worst destruction is yet to come when he harvests the geoducks. The eelgrass that is so important for our natural system was raked up and eliminated to plant geoducks. There seems to be no oversight by the state of Washington Department of Fish and Wildlife. The geoduck farmer has thus far ignored the Jefferson County Shoreline Master Plan requirements. To their credit, the Army Corps has cancelled some of this shellfish farmer's permits due to violations. However, the local geoduck farmer is still farming.

The new Army Corps Biological Assessment states as follows: "the proposed action may affect, likely to adversely affect Puget Sound Chinook salmon, Hood Canal Summer Chum salmon, bull trout and their designated critical habitat." The Army Corps needs to take action to address the effects on these species.

Marbled murrelets (*Brachyramphus marmoratus*) are listed as a "threatened" species under the Rare and Endangered Species Act of 1973. The species has been newly up-listed to "endangered" by the State of Washington and are protected by law. Marbeled murrelets have been documented around portions of the Olympic Peninsula and in Squamish Harbor by the U. S. Forest Service, Washington State Department of Fish and Wildlife and by local residents. Marbeled murrelets exist here owing to availability of the forage fish they eat and feed to their one annual nestling and because of the proximity to old-growth forest nesting habitat. We should not further endanger their existence and habitat. The U. S. Army Corps of Engineers needs to update the information and requirements in the permits to reflect the new endangered status of the marbled murrelet.

Squamish Harbor is a feeding ground for large quantities of local and migrating birds, some protected by law. The western grebe is a state candidate for listing as endangered, threatened or sensitive. The common loon is a state sensitive species. Both species are seen feeding in Squamish Harbor. Additionally, the following birds are all frequent users of Squamish Harbor, as observed and documented by local residents, and they depend on either the eelgrass and associated species, or forage fish for food: pacific loons, horned grebe, red-necked grebes, great blue herons, Brandt's cormorants, double crested cormorants, pelagic cormorants, belted kingfishers, rhinoceros auklets, osprey and bald eagles, brants, American wigeons, northern shovelers, northern pintails, green-winged teal, ring-neck ducks, greater scaups, surf scoters, white-winged scoters, black scoters, buffleheads, common goldeneyes, common mergansers, red-breasted mergansers, and American coots. We should not discourage their presence by threatening their food supply and increasing the amount of human disturbance in the area.

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Sand lance (Ammodytes hexapterus) are considered an important prey of breeding marbled murrelets...They are associated with fine gravel or sandy-bottomed coastal waters ...

Given the marine habitat selection we observed in this study, we suggest that marine areas that should be prioritized for protection are those in closest proximity to large tracts of nesting habitat, with low human footprint, and near sand or gravel beaches."

The Puget Sound Factbook, 2015, states on page 74:

'... that of the 39 most common bird species that overwinter in the Salish Sea, species that dive and eat schooling forage or bait were 16X more likely to be in decline, suggesting a decrease in the quantity or quality of forage fish in the Salish Sea.'

It further states, on page 76:

"In the last 40 years Pacific herring and surf smelt abundance has decreased 99% in Central and South Puget Sound."

The U. S. Army Corps of Engineers should not approve any commercial shellfish farming permits in areas used by the endangered marbled murrelets. Gravel and sand tidelands that provide native eel grass and spawning areas for sand lance and herring should be excluded from approval of any permits for commercial shellfish farming in those areas of Hood Canal and Puget Sound that are being used by this endangered species for foraging and for feeding their single nestling.

Hood Canal also provides habitat for the threatened Hood Canal Summer Chum Salmon in these same types of tidelands, adding even more need to conserve these areas. Shellfish are touted as being important for cleaning the water of Puget Sound, but the extreme numbers

found in shellfish farms may in fact be cleaning the water of the very organisms that serve as the base of the food chain for marbled murrelets and Hood Canal Summer Chum Salmon.

I want to share an example of the importance of not only preserving habitat for threatened and endangered species, but also looking at the additive impact of shellfish farming. Squamish Harbor is unique among the estuaries of Puget Sound. Squamish Harbor is a shallow shelf at the head of Hood Canal, facing south, directly in the path of winter storms that usually blow north along the length of Hood Canal. Winds of 40 miles per hour are frequent during the winter, and gusts of 60+ mph are not unknown. The Squamish Harbor shoreline is pounded by surf from several of these storms every year. As storm waves break over the shelf into Squamish Harbor, they churn and scour the sea floor. The water becomes very muddy. This additional sediment, churned up in "farmed" areas, can adversely impact spawning gravels and sands used by sand lance and herring.

These winter storms can and do unseat large numbers of tubes, nets and other apparatus placed in the sand and on tidelands by shellfish farmers. Much of this "farm junk" becomes a witch's brew of deteriorating plastic and netting that settles into deeper water where the "farmers" make no effort at recovery. It remains there as a deadly hazard, ensnaring crabs and diving birds.

Squamish Harbor is documented by the State of Washington as a refuge for native eelgrass, which provides habitat cover and food organisms for the federally listed, "threatened" Hood Canal Summer Chum salmon. Squamish Harbor is also a holding area for salmon moving up Shine Creek to spawn.

Washington DNR has documented Squamish Harbor as a spawning ground for herring and sand lance. These are the primary foods for marbled murrelets, listed by the federal government as a "threatened" species. Marbled murrelets were just up-listed at the close of 2016 to a state "endangered species" by the Washington Fish and Wildlife Commission. We should not further endanger marbled murrelets and their food sources with shellfish farming, geoduck tubes, nets, harvesting and planting disturbances.

A Peninsula Daily News article on August 5, 2016 features a story describing how scientists investigating the death of 400 rhinoceros auklets who breed on Protection Island (in Puget Sound northwest of Hood Canal) were likely starved because the size of the sand lance and herring they eat had become too small to satisfy their dietary requirements.

I urge you to put the protections for eelgrass and forage fish back into the nationwide permit for Washington. At a minimum, they should be applied to any areas of Hood Canal and Puget Sound that have struggling populations of listed species such as marbled murrelets and Hood Canal Summer Chum salmon. The next listing phase for marbled murrelets is "extinct." Surely, we can begin to take some action to protect their food source prior to that occurring.

The U. S. Army is a primary national resource for protection of U. S. citizens, their waters and their interests. The most modest of biological educations should provide its leaders with the knowledge that damage to eelgrass beds and forage fish constitute some of the most serious damage that shellfish farmers can inflict on the near shore environment. I hope we can trust the Army Corps to protect the environment according to its charge. I hope we can trust the Army Corps officers to avoid falling in league with environmental destroyers angling to pad their coffers by removing the general conditions from the shellfish farming permit that specifically protect vitally important eelgrass and forage fish at the base of the marine food chain.