United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON MARITIME NATIONAL WILDLIFE REFUGE COMPLEX
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San Juan Islands NWR - Flattery Rocks NWR - Copalis NWR - Quillayute Needles NWR
Dungeness NWR - Protection Island NWR

In Reply Refer To:
FWS/RI /NWRS/FF01RWMT00

May 22, 2019

Pamela Sanguinetti
P.O. Box 3755
Seattle, WA 98124-3755

Dear Ms.Sanguinetti:

Please accept this letter and attachment as an update to our February 27, 2019 comment regarding US Army Corps of Engineers and WA Department of Ecology permit application NWS-2007-1213 for commercial oyster operations within Dungeness National Wildlife Refuge. The purpose of this comment is not to provide a permitting determination, as it is not our role to provide or deny permission for this commercial activity. Rather, we are providing documentation and supporting scientific literature related to the potential impacts of the proposed project on the Refuge's wildlife and habitat.

We recognize the Jamestown S'Klallam Tribe's commitment to operating a commercial enterprise in a manner that is sensitive to environmental and cultural concerns. We remain concerned about potential impacts to the wildlife and habitats of Dungeness National Wildlife Refuge from a commercial oyster operation located in the Refuge's highest use area for waterfowl and shorebirds.

We believe identification of a culturally appropriate, alternate commercial aquaculture farm location could meet the Jamestown S'Klallam Tribe's goals while eliminating impacts to this high use area. Thank you for the opportunity to comment on this application. Please feel free to contact me with any questions at jennifer brownscott@fws.gov or (360) 457-8451.

Sincerely,

Jennifer Brown-Scott
Project Leader

Cc: Jamestown S'Klallam Tribe

The commercial aquaculture permit application SHR2017-00011 requests placement of 80,000 on-bottom bags and additional on-beach oysters within the highest use area for waterfowl and shorebirds on Dungeness National Wildlife Refuge (Refuge). It is our understanding that operation of this commercial enterprise (e.g., setup, maintenance, harvest) will require year-round access. The JARPA did not quantify the number of days or people needed for the operation. SEPA documents estimate that up to 15 people are needed for up to 90 days annually for maintenance and harvest. Additional operational access (e.g., setup, outplanting) does not appear to be addressed in the application materials. The site will be accessed by boat, with an identified landing location in its easternmost corner. We do not have a clear understanding of pest management actions, if any, that would be used on the site (e.g. hazing, lethal control or removal of wildlife).

Dungeness National Wildlife Refuge was established with the purpose of providing “a refuge, preserve and breeding ground for native birds” (Executive Order 2123, January 20, 1915). Tidelands of the second class within the Refuge boundary were conveyed to the United States of America, Fish and Wildlife Service through a permanent easement on May 29, 1943 for the purpose of “establishing and maintaining on these lands as a wildlife refuge.” Refuge concerns related to wildlife and habitat impacts from aquaculture in this location have been stated a number of times over the past 40 years. For example, in 1983 the Ecological Services Field Supervisor requested, “harvest only be allowed May 1 – September 30 to avoid the greatest waterfowl concentrations.” In 1990, the Refuge Manager requested, “oyster operation(s) be conducted in such a manner as to minimize interference with waterfowl…” Exhibit B of the lease agreement signed in 2007 (20-A13012), recognizes the importance of the area to Brant and the potential for impacts, stating, “Human activity in the area should be limited to May 15 – July 30, when cultivation activities will be least disruptive to the use of the Bay by Brant and other waterfowl.” We note that this 2007 lease agreement is currently in holdover status and outlines shellfish activities that are small in scale and primarily experimental in nature.

Due to its importance for migrating and wintering waterfowl and shorebirds, the tidelands encompassing the proposed site have been closed to public use from October 1 – May 15, since 1997 (USFWS 1997). To reduce impacts to habitat and wildlife during May 16 – September 30, only non-wake causing activities are allowed, and a 300-foot buffer is maintained along the shoreline. Adjacent uplands are also closed to public access year round.

Concerns Related to On-Bottom Structure

We recognize there has been little research on the specific impacts of commercial, on-bottom (i.e. on-beach) or on-bottom bag aquaculture on the bird species found on this Refuge. However, during a five-year investigation of on-bottom bag aquaculture practices, Kelly et al. (1996) found that Dunlin and Western Sandpiper (the two most abundant shorebirds in their study and on the Refuge) ”significantly avoided aquaculture areas” and their ”results suggest a net decrease in total shorebird use of areas developed for aquaculture” in the form of on-bottom bags. On-bottom bags and on-beach oysters could also restrict growth of eelgrass within the proposed site due to ground disturbance from human trampling, the on-bottom bags and the on-beach oysters themselves, depending on density (Tallis et al. 2009, Wagner et al. 2012). Eelgrass impacts from on-beach oysters have been observed to exceed the actual cover of oysters even at shell cover of less than 5 percent (Wagner et al. 2012). The applicant’s willingness to provide a 25-

foot buffer from eelgrass beds will largely avoid effects to currently identified eelgrass beds; however, a 2016 eelgrass survey jointly conducted by the Refuge and Jamestown S'Klallam Tribe (Tribe) staff identified eelgrass outside of the buffer area. When 1987 eelgrass survey maps (Wilson 1988, unpublished progress report; Wilson and Atkinson 1995) are displayed in GIS, these surveys appear to identify eelgrass (although sparse) within the portion of the site proposed for aquaculture, further documenting the area's suitability for eelgrass growth. Based on tidal elevation provided in the Department of Ecology and Army Corps of Engineers Joint Public Notice Project Cultivation Map, most of the site also appears to be located within the growth range for eelgrass provided by Mumford (2007). Due to shading (Mumford 2007, Dumbauld et al. 2009) and abrasion of the substrate (e.g., tidal movement and flipping of bags) and trampling by workers tending the 80,000 on-bottom bags, eelgrass would likely be excluded from the areas immediately impacted by these structures and activities. Eelgrass growth in higher tidal elevations, such as on this site, is important because Brant forage almost exclusively on eelgrass and availability is limited during high tides due to the depth at which Brant can forage and eelgrass can grow (Moore and Black 2006, Mumford 2007). However, actions that could reduce impacts to eelgrass from aquaculture structures (e.g., bags) by moving them to a portion of the site outside of eelgrass growth zone, would compound impacts to shorebirds by increasing the proximity of operations to one of their most highly used foraging areas (Kelly et al. 1996, Smit and Visser 1993).

Concerns Related to Human Disturbance

Since many of our concerns are based on disturbance from human activities occurring on the site, studies assessing disturbance from human uses that are similar to, or are components of, the aquaculture operation provide insight into potential impacts to waterfowl and shorebirds in this high use area. Activities considered similar to those associated with maintenance of a commercial aquaculture plot include bait digging or clamming (comparable to harvesting "on-beach" oysters), walking on tide flats (walking to and from the main anchorage point and the plot as well as within the plot) and boat access. Because Wigeon, Brant and Dunlin are among the most abundant species using the Refuge, and because Brant and Wigeon rely on eelgrass for forage, we focused on these species when studies provided species-specific impacts.

Impacts of human disturbance on wildlife vary considerably and the wildlife response is complex and dynamic based on species, species assemblages, flock size, activity (i.e. foraging or roosting), tidal stages, different types of disturbance, and time of year (Cayford 1993, Mori et al. 2001, Smit and Visser 1993, Owens 1977). For example, Brant response to disturbance was highest to boat traffic (27 percent of events) and clamming (22 percent) on Humboldt Bay (Henry 1980). In addition, Mori et al. (2001) studied the flushing distance of waterfowl to boats and found the response varied by species (i.e. up to 480 feet versus 300 feet for Wigeon and Mallard respectively), with multi-species flock flushing distance usually driven by the most sensitive species in the flock. They also found the response to disturbance varies by activity, with foraging birds flushing at a greater distance from disturbance than those that are resting. They concluded the behavior of actively foraging birds may be more affected by human disturbance than that of birds at rest, compounding the negative effects of energetically expensive flight with lost foraging time (Mori et al. 2001). This is important from an energetic standpoint, which will be discussed in the next section. Owens (1977) found Brant more sensitive to human disturbance (from bait diggers, people walking out to shellfish beds or moored boats) when foraging at low tides. Furthermore, repeated encounters (two) of people walking toward Brant on eelgrass beds increased the flushing distance to 2,400 feet (Owens 1977). It is important to note that Brant forage exclusively on eelgrass and, because Brant are dabblers, they are only able to forage on eelgrass within 1.2 feet of the water surface (Moore and Black 2006). This requires them to feed on eelgrass at different tidal elevations as water depths change throughout the day (Lewis et al. 2013, Wilson and Atkinson 1995, Davidson and Rothwell 1993). Therefore, to maintain availability of this temporally limited food resource, it is important to protect foraging areas at varying tidal elevations from disturbance. In addition to impacts to foraging Brant, human disturbance will cause Wigeon foraging on eelgrass beds at low tides to abandon the bed until the next tidal cycle (Fox et al. 1993), and frequent or severe disturbance can cause wildlife to abandon a foraging site entirely (Fox et al. 1993, Smit and Visser 1993). The proposed aquaculture operations, transportation travel paths, and boat anchorage are located within the highest use area for waterfowl on the Refuge and adjacent to eelgrass beds. The boat anchorage area will likely be a hub of activity for workers as they come and go from the site and unload and load supplies, equipment, and oysters. Based on the aforementioned studies, it is likely foraging Brant and Wigeon would flush and potentially abandon eelgrass within and adjacent to the aquaculture site during commercial aquaculture operations in this location. As a result, commercial aquaculture would reduce their access to this important and limited forage resource. It is also likely that waterfowl using the Refuge adjacent to boat travel paths and anchorage sites would be flushed by workers accessing the site during commercial operations.

Shorebirds also display flushing response to activities that are similar to those associated with commercial aquaculture. For instance, Smit and Visser (1993) found Dunlin foraging on the tide flats will flush in response to walkers approaching them by up to 900 feet, creating an “exclusion area,” due to disturbance, of 32 acres. They also noted Dunlin will tolerate bait diggers working at the same spot for long periods at much closer distances than walkers approaching them on the tide flat, but did not quantify the distance (Smit and Visser 1993). One of the few high quality foraging sites for Dunlin in Dungeness Basin is located adjacent to the proposed aquaculture location and within the flushing distances recorded by Smit and Visser (1993). Since wildlife cannot distinguish between workers approaching them, or walking in their direction to attend to work or approach a boat, it appears likely that common activities associated with commercial aquaculture will result in flushing Dunlin (and other birds flocked with them) from this important foraging area.

Finally, multiple studies have shown that wildlife become more sensitive to human disturbance when compounded by additional external disturbances. Both Owens (1977) and Smit and Visser (1993) noted a heightened response (i.e. more frequent flushing and at longer distances) from Brant and shorebirds to other forms of human disturbance, particularly during hunting season or during instances of cumulative disturbance (i.e. multiple approaches by people walking on the mud flats). Further, Townshend and O'Connor (1993) found Wigeon abundance and use of sites over the winter months decreased during the hunting season primarily when bait-diggers were present in areas where hunting was prohibited (i.e. refugia from hunting). This is relevant to the development of a commercial aquaculture plot in the highest wildlife use area of the Refuge because there are six public and private hunting areas in and around the Bay. Since the Refuge is closed to public use during the hunt season, it provides one of the few disturbance-free areas during this time. The existence of hunting outside of the Refuge boundary, coupled with activities associated with commercial aquaculture, will likely increase both the quantity and magnitude of flushing occurrences within the highest use area of the Refuge for waterfowl and shorebirds during the sensitive wintering season.

Repercussions of Human Disturbance

Given that disturbance of waterfowl and shorebird species is likely to occur in and adjacent to the proposed commercial aquaculture farm based on the scientific evidence described above, it is important to understand the impact this disturbance would have on these species. Reducing or eliminating impacts to these species is important because the Refuge was established and continues to be managed to provide refuge for migratory birds. In addition, impacts to waterfowl and shorebirds on the Refuge could extend to a regional or international scale (K. Spragens, WDFW, pers. comm.; USFWS/WDFW unpublished data). Refuge counts can account for up to 98 percent of Brant and 61 percent of Wigeon in Clallam County during midwinter (USFWS/WDFW unpublished data). The area of the Refuge proposed for commercial aquaculture development is also important statewide, because it is within 1,000 feet of a haul-out and gritting site for Brant during high tides that is adjacent to undisturbed eelgrass beds (K. Spragens, WDFW, pers. comm.). In order to digest their food and gain necessary calcium, Brant must access gritting sites approximately every three days (K. Spragens, WDFW, pers. comm.; Lewis et al. 2013). Gritting sites are limited because Brant are selective of grit characteristics (e.g. calcium content and grain size) and are intolerant of disturbance (Lee et al. 2004). The close proximity of these three habitat components are believed to be the reason for an increase in abundance of Brant observed on the Refuge, a level not observed elsewhere in the state in recent years (K. Spragens, WDFW, pers. comm.). The Refuge is also important for this species internationally because it supports spring staging Brant that breed in Russia and the Canadian high arctic (K. Spragens, WDFW, pers. comm.). Finally, the south shore of Dungeness Spit immediately adjacent to the project area (i.e. two miles from the base of the spit to Graveyard Lagoon) is one of the few high quality foraging sites for Dunlin in the Dungeness Basin. This species is the most abundant shorebird species on the Refuge during winter and migration (up to 2,000 birds per day).

Flushing in response to human activities that are similar to, or are components of, operating a commercial aquaculture project on the Refuge is likely to reduce the time shorebirds and waterfowl spend feeding or resting, and increase energetic demands of flight (Buchanan 2006, Fox et al. 1993, Smit and Visser 1993, Lewis et al. 2013, Moore and Black 2006). If the disturbance is severe or regular enough, they could abandon preferred sites (Henry 1980, Fox et al. 1993, Cayford 1993). Reoccurring, severe, or cumulative disturbance further increases energetic costs to waterfowl and can lead to reduced fitness, decreased productivity, or increased mortality rates (Buchanan 2006, Davidson and Rothwell 1993, Baldassarre and Bolen 1994, Ward and Andrews 1993). During severe winter weather, energy demand for thermoregulation increases, which increases the need to forage (Davidson and Rothwell 1993). When severe weather lasts for a few days or more, and waterfowl and shorebirds are unable to forage or experience additional stressors resulting in flushing, mortality rates can increase (Buchanan 2006, Davidson and Rothwell 1993). In spring and fall, most waterfowl and shorebirds must gain large stores of fat and protein in preparation for migration (Lewis et al. 2013, Buchanan 2006, Davidson and Rothwell 1993). In some years, if spring snowmelt is late and weather conditions are bad, Arctic-breeding shorebirds and waterfowl need to draw heavily on their stores soon after arriving on the breeding grounds. Therefore, reduced energy stores may affect breeding success or adult survival (Belanger and Bedard 1990, Buchanan 2006, Davidson and Rothwell 1993). Studies have shown that human disturbance during winter and the spring staging period is of particular concern for Brant, because it can negatively affect their ability to build energy reserves for migration and breeding and thus reduce reproductive success (Henry 1980, Lewis et al. 2013, Ward et al. 2005). Davidson and Rothwell (1993) noted impacts on fitness from disturbance during their major molt in fall are high due to increased energy demands for the growth of new feathers. They also note, some waterfowl undergo a flightless molt in fall and become more vulnerable to human disturbance that causes them to move from safe refuges to areas where depredation risk is greater and/or forage is scarcer (Davidson and Rothwell 1993). Shorebirds share the same basic energetic requirements as waterfowl, with dramatic changes in body mass during their time on the Refuge (McEwan and Whitehead 1984, Buchanan 2006).

Multiple studies have shown that if forage availability is limited, waterfowl and shorebirds will forage at night (Fox et al. 1993, Cayford 1993, Owens 1977). This adaptation is key in tidally influenced areas such as Dungeness NWR, where higher tidal elevations prevail during the day in winter. If nighttime foraging coincides with periods of high human disturbance during periods of high energetic demand (i.e. molt or spring staging), additional mortality or displacement can occur. Almost all winter low tides appropriate for work on the site occur at night, necessitating nighttime access during this period.

The scientific evidence presented above suggests that the proposed commercial aquaculture operation will almost certainly have some level of impact on wildlife and habitats year round, and increased impacts to shorebirds and waterfowl during the migration and wintering periods (August 1 - May 14). The migration and wintering period is based on unpublished wildlife use data for the Refuge, which we have previously shared with the Tribe, and the following references: Paulson 1993, Wilson and Atkinson 1995, Buchanan 2006, and the Birds of North America Accounts for the primary species that occur on the refuge (Mallard, American Wigeon, Brant, Northern Pintail, Dunlin, Western Sandpiper, Least Sandpiper, Black-bellied Plover, and Sanderling) available online at https://birdsna.org/Species-Account/bna/home. Because of the increased sensitivity of these species during the migration and wintering periods, a general public use closure is in effect on the tidelands October 1 - May 14. These high use areas are also protected from impacts associated with public use of the tidelands by a year-round closure of the adjacent uplands, a 300-foot public use closure of the waters adjacent to the shoreline, low tide water depth limitations, and no-wake regulations. We have additional concerns related to commercial aquaculture operations during the fall shorebird migration period (August - October), because the proposed site is immediately adjacent to one of the most highly used shorebird foraging areas in Dungeness Bay (Sanguinetti 2003, Thomas 2005). Commercial aquaculture activities will be concentrated in and adjacent to this high use area and impacts, as described above, are likely. Shoreline retrieval of aquaculture gear from August 1 - May 14, and retrieval from growing or standing eelgrass would also cause impacts from human disturbance and/or habitat alteration.

Based on the likely impacts to migrating and wintering shorebirds and waterfowl within the highest use area for these species groups on the Refuge, we recommend that an alternate site be identified in a location that results in less potential impacts to wildlife, is appropriate for commercial aquaculture, and meets the goals of the Tribe.

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