UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, Washington 98115

NMFS Tracking No.:
2010/04010

April 26, 2011

Michelle Walker
Chief, Regulatory Branch
U.S. Army Corps of Engineers, Seattle District
CENSW-OD-RG
Post Office Box 3755
Seattle, Washington 98124-3755

Re: Re-initiation of Endangered Species Act Section 7 Programmatic Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Nationwide Permit 48 Activities in Washington State.

Dear Ms. Walker:

This correspondence is in response to your request for re-initiation of consultation under the Endangered Species Act (ESA) for this project.

Endangered Species Act

On April 28, 2009, the National Marine Fisheries Service (NMFS) completed formal section 7 consultation under the Endangered Species Act on Nationwide 48 permit (NWP 48) - existing shellfish aquaculture activities - in Washington State, and issued a Biological Opinion (opinion; NMFS Tracking No. 2008/04151 (NMFS 2009)) to the U.S. Army Corps of Engineers (COE). That consultation concluded that NWP 48 would not jeopardize the continued existence of the species listed in Table 1 or destroy designated critical habitat for those species with designated critical habitat. The opinion included an incidental take statement, but does not exempt "take" from the effects of shellfish aquaculture conducted under NWP 48, as NMFS concluded that take was not reasonably certain to occur, except as due to the interdependent activity of carbaryl application, which is not within the Corps's regulatory authority.

The NMFS received your request to reinitiate consultation on August 19, 2010, and has reviewed the information provided in that request, including the Biological Evaluation (BE), and additional information received March 9, 2011.

The need for reinitiation was triggered by the listing under ESA of Southern Distinct Population Segment (DPS) Pacific eulachon (*Thaleichthys pacificus*), and the Puget Sound/Georgia Basin DPSs of yelloweye rockfish (*Sebastes ruberrimus*), canary rockfish (*S. pinniger*), and bocaccio rockfish (*S. paucispinis*). Additionally, critical habitat was designated for Southern DPS North American green sturgeon (*Acipenser medirostris*), and proposed for eulachon (Table 1). Further, the COE provided NMFS with new information regarding geoduck dive harvesting that was not available at the time of the original consultation. This information includes greater detail regarding geoduck dive harvest methods and the acreage of planted geoduck farms.

Proposed critical habitat for eulachon in Washington State includes the Columbia River and its tributaries, and the Elwha River. Aquaculture activities covered in this re-initiation and the opinion do not occur in areas proposed for eulachon critical habitat. Therefore, there is no effect to proposed eulachon critical habitat from aquaculture activities covered by NWP 48.

This re-initiation of consultation covers effects of the effects of geoduck harvesting, as supplemented by the newly available information, on all species listed in Table 1, and any designated critical habitat. It will also analyze the effects of geoduck harvesting as well as all other activities described under the original opinion (NMFS 2009) for potential effects on eulachon and rockfish, and designated habitat for green sturgeon.

The COE requests concurrence with its determination that the proposed action may affect, but is not likely to adversely affect Pacific eulachon, yelloweye rockfish, canary rockfish, or Bocaccio, or designated critical habitat for green sturgeon. The COE also requests NMFS' concurrence with its determination that effects from geoduck harvesting, considered in light of the newly available information, may affect, but are not likely to adversely affect the 23 species analyzed under the original opinion (Table 1), and would not adversely affect the designated critical habitat of any species analyzed in the previous opinion.

Description of the Proposed Action

On March 9, 2011, the COE submitted an addendum to the original BE, at which time consultation was initiated. The addendum included information regarding geoduck dive harvest techniques, as well as a quantification of acreage of geoduck culture.

Detailed Activities of Geoduck Dive Harvest

Divers harvest geoducks using hand-operated water jet probes. The probe is a pipe 18 to 24 inches long with a nozzle on the end that releases pressurized, surface-supplied seawater from a 1-inch diameter hose at flows up to 20 gallons per minute. The harvester inserts the probe in the substrate and discharges pressurized water around the geoduck, loosening the sediment to allow removal of the geoduck by hand. This method allows for the extraction of geoducks without removal or significant disturbance of large quantities of overlying sediments. One diver can harvest 500 to 1,000 geoducks per day. Dive harvesters typically work from small vessels or dive platforms that contain machinery for diver air and water jets and other equipment. The vessel engines are generally shut off while divers are harvesting, especially in shallow waters.

Although these vessels typically do not ground-out, beach access is sometimes necessary, which requires temporary beach landing. Pump intake screens are sized below NMFS' criteria for juvenile fish, meaning that they provide assurance that juvenile fish will not be entrained in water uptake. Dive harvest of geoducks is currently limited to Puget Sound, Hood Canal, and the southeast shoreline of the Strait of Juan de Fuca.

Acreage of Geoduck Farms

According to the COE, a total of 355 acres of tidelands are currently farmed for geoducks under NWP 48. This is fifteen percent of the roughly 5,225 acres of shellfish aquaculture farms (project areas) where geoduck is identified as a planted species. The remaining portion of the 5,225 acres is fallow or planted with other shellfish, but geoduck could be rotated into the entire 5,225 acres under NWP 48. The 355 acres of currently planted geoduck is a very small percentage of the estimated 95,000 total acres of intertidal habitat in Puget Sound and Hood Canal, where geoduck aquaculture under NWP 48 might occur. Shellfish growers estimate that geoduck production will not increase by more than 10 to 20 percent (roughly 35-70 acres) in the future, due to habitat limitations, including preexisting buried oyster and clam shells and other features that render habitat unsuitable for geoduck farming. Any expansion beyond the project area identified in NWP 48 pre-construction notification would require an individual permit from the COE and separate consultation with NMFS.

The action area includes all areas directly or indirectly affected by the Federal action and not merely the immediate area involved in the action (50 C.F.R. 402.02). The action area for this consultation consists of several, non-contiguous portions of the waters of Washington State in which ongoing shellfish aquaculture operations affect the local environment. These areas include small, separate locations in parts of Puget Sound (including Hood Canal and the Strait of Juan de Fuca), Willapa Bay, and Grays Harbor; however, geoduck dive harvest does not occur within Willapa Bay or Grays Harbor. The action area specifically includes the total area within the footprint of sites under present aquaculture operations, including sites previously managed and now fallow. The action area also includes acreage surrounding each individually-managed site to account for the drift of turbid water beyond the footprint of each managed site. After reviewing data and studies related to turbidity settlement in the marine environment, where covered operations cause turbid water, the effects of turbidity are likely to extend to an area at most 5 percent larger than the footprint of the plot from which the turbidity emanates. All activities affecting listed species considered in this consultation will occur on: (1) land that is currently being used for shellfish aquaculture; (2) land that is currently lying fallow as part of a rotational cycle; and (3) locations within the range of ESA-listed species, designated critical habitat, and/or EFH designated under the MSA.

Species Determination

Salmon (Table 1)
Steelhead (Table 1)

The NMFS concurs with the COE's determination that the proposed action may affect, but is not likely to adversely affect Lower Columbia River (LCR) Chinook salmon, Upper Columbia River (UCR) spring-run Chinook salmon, Snake River (SR) fall-run Chinook salmon,

SR spring/summer-run Chinook Salmon, Upper Willamette River (UWR) Chinook salmon, SR sockeye salmon, Lake Ozette sockeye salmon, LCR coho salmon, Columbia River (CR) chum salmon, Puget Sound (PS) steelhead, LCR steelhead, Middle Columbia River steelhead, UCR steelhead, SR Basin steelhead, or UWR steelhead. For the Columbia Basin salmonids listed immediately above, NMFS has determined that they are not present in the action area and consequently not exposed to any of the effects of the action. Lake Ozette sockeye are not present in the action area, and are not likely to encounter any effects of the action. Furthermore, PS steelhead life history is such that they quickly bypass the nearshore, using deeper, offshore water immediately after entry into the Puget Sound estuary, rendering exposure to any effects of the action unlikely. Thus, effects to those species are discountable.

Juvenile Hood Canal (HC) summer-run chum salmon, and juvenile PS Chinook salmon could be present in the action area during geoduck harvest.

As described in the BE and its addendum, various hand or mechanical harvest methods used in shellfish aquaculture involve a physical disturbance of the bottom that affect sediment and benthic fauna. The harvest of geoduck by divers using pressurized sea water also creates effects to water quality and benthic fauna. All of these effects have been shown to be quite temporary. Sizemore (1999) explained that because geoduck harvest only affects a portion of the overall geoduck bed, recolonization of most marine organisms from surrounding sources within and adjacent to the bed was expected to occur in a short time. Benthic fauna have been shown to recolonize following geoduck harvest within weeks to months (WDNR 2008). Turbidity plumes caused by harvest of geoduck with pressurized water are short-term pulsed events ranging in duration depending on tidal currents and harvest intensity. Other temporary effects include general noise disturbance from boat motors and pumps, and benthic disturbance from occasional beach landings of harvest vessels. These effects cease when harvest concludes.

A typical Puget Sound geoduck farm consists of bare and unvegetated beach sediments. However, in north Puget Sound, Hood Canal, and Strait of Juan de Fuca, geoduck could be farmed adjacent to submerged aquatic vegetation (SAV), i.e., eelgrass (*Zostera spp*.) and other beds. If eelgrass colonizes or seeds within a previously planted geoduck bed, harvesting would still occur. However, dive harvesting could disrupt or displace individual eelgrass plants. Geoduck harvest operations could also introduce fine sediments onto eelgrass growing within or adjacent to planted tracts, although direct loss of eelgrass in adjacent beds has not been attributed to geoduck harvest. Geoduck aquaculture is also reported to contribute to water clarity via the filter feeding, removing phytoplankton from the water column (Dumbauld 1997). Such improved water quality can also contribute to improving habitat for the establishment of SAV, which in turn, provides rearing, foraging, and cover habitat for a variety of aquatic organisms including juvenile salmonids (WDNR 2008).

The proposed action is reasonably certain to maintain existing conditions of limited eelgrass presence within the footprint of management actions covered by this proposed amendment to NWP 48. As a result, managed sites are unlikely to support eelgrass beds at densities that would provide optimal juvenile salmonid rearing habitat. However, eelgrass colonization is common following geoduck and other aquaculture harvest that are adjacent to eelgrass, providing interim habitat functions between harvests. This condition is not likely to change with continued harvest

practices. But, nothing inherent in geoduck harvest and total acreage of geoduck culture prevents bed formation or impairs beds adjacent to, or near, managed sites.

The Puget Sound Salmon Recovery Plan (Shared Strategy 2007) identified aquaculture activities as a potential stressor towards Puget Sound ecosystem health[1]. However, as discussed in the BE and the opinion, while the proposed action is reasonably certain to maintain existing conditions of limited eelgrass presence within the footprint of management actions covered by this proposed amendment to NWP 48, there is nothing inherent in aquaculture that precludes eelgrass from forming beds near aquaculture activities (NMFS 2009). Eelgrass colonization is common following geoduck and other aquaculture harvest that are adjacent to eelgrass, providing interim habitat functions between harvests. A review of publically available aerial photography (e.g. Google Earth) will show unaffected eelgrass sites immediately adjacent to managed aquaculture sites. Such review will also show that SAV is also present within many aquaculture sites, at least during portions of the production cycle at these sites. Newell (2006) observed that eelgrass growth is likely accelerated in areas where the plants are co-mingled with bottom-growing shellfish. Though the function of eelgrass beds cannot be artificially replaced by structures used for shellfish aquaculture, managed shellfish sites have been observed to support some habitat function juvenile salmonid rearing. To some extent, shellfish beds substitute for the habitat structural function otherwise provided by eelgrass beds that cannot form at those sites. For example, Dumbauld (1997) found that when comparing the function of habitat at oyster bottom culture sites to eelgrass beds and mud bottom habitat, both eelgrass beds and oyster culture sites provide similar species richness and habitat utilization by salmonids in excess of adjacent mud flat habitats (NMFS, 2009). Further, shellfish stake culture supports a species richness, albeit a different species suite, that compares to eelgrass beds (ENVIRON 2008). A study of similar comparisons with rack and bag shellfish aquaculture found similar results in a tidal estuary in Southern Rhode Island (DeAlteris et al. 2004). By comparison, inter-tidal habitat occupied by aquaculture sites comprises a relatively small proportion of the salmonid habitat that exists in these coastal and estuarine waters (NMFS, 2009).

The NMFS finds that harvesting of geoducks and known acreage of geoduck harvest will not substantially change existing conditions of limited eelgrass. Further, although the effects of these activities could include changes in the environment, none do so to an extent that would impair normal behavioural patterns of listed species. Therefore, NMFS agrees that maintaining an existing condition of reduced eelgrass within geoduck beds is not likely to adversely affect ESA-listed fish in the action area.

The consultation process revealed no evidence that forage productivity is limited in and around managed sites. In fact, based on the currently available evidence, the level of benthic disturbance from existing shellfish aquaculture in Washington State is well within the range of normal benthic processes, and any negative effects on prey productivity are likely to be so

[1] The Recovery Plan cited to Williams et al. (2001) for the proposition that shellfish aquaculture may adversely affect eelgrass habitat. However, upon further review of available literature, NMFS finds that such affects are unlikely in Puget Sound because aquaculture activities represent a small fraction of available intertidal habitat, and current literature does not support the premise of adverse affects on eelgrass from aquaculture throughout Puget Sound.

limited in space (the footprint of the shellfish bed plus some down drift area to account for current) and duration (a few weeks to months, every 3 to 6 years), that they are not likely to adversely affect foraging and feeding among listed salmon, steelhead, or sturgeon (NMFS 2009). Therefore, the effects of geoduck harvest activities on benthic communities are unlikely to impair or even influence normal feeding and rearing behavioral patterns in the action area.

Individual HC summer-run chum salmon, and juvenile PS Chinook salmon would have spent several months to years in their natal estuaries or streams prior to migrating into areas where geoduck harvest might occur. Therefore, these individual fish would be of sufficient size and swimming ability to avoid any significant effects from harvest methods discussed above. Adult salmonids are expected to avoid any disturbance related to geoduck harvest. Thus, effects to HC summer-run chum salmon, and PS Chinook salmon are insignificant.

Additionally, all actions in this consultation are subject to the conservation measures and conclusions as found in the original opinion (NMFS 2009), and new conservation measures found on page 52 of the amended BE (Appendix A). The NMFS concludes that new information related to geoduck harvest and acreage does not significantly change the outcome of the analysis of effects to PS Chinook salmon, or HC summer-run chum, or the conclusions found in the opinion. Therefore, NMFS concurs with the COE's determination that the proposed action may affect, but is not likely to affect PS Chinook salmon, or HC summer-run chum.

Southern Distinct Population Segment North American Green Sturgeon

The Southern green sturgeon spawns in the Sacramento River. Adults migrate into the river to spawn between April and July. Juveniles spend 1 to 4 years in freshwater before migrating to the ocean. Evidence of green sturgeon spawning in the coastal estuaries of Washington is lacking (Adams et al. 2002). During the late summer and early fall, subadult and non-spawning adult green sturgeon can frequently be found aggregating in estuaries along the Pacific coast (Emmett et al. 1991; Moser and Lindley 2007). Particularly large concentrations occur in the Columbia River estuary, Willapa Bay, and Grays Harbor (Emmett et al. 1991; Moyle et al. 1992). Adult green sturgeon are common in the seawater and mixing zones of the Columbia River, Willapa Bay, and Grays Harbor during high salinity periods, with the highest abundance from July through early October (Monaco, et al. 1990).

Subadult and non-spawning adult green sturgeon are the age classes that may be present in the action area during geoduck harvest or other aquaculture activities as described in the original opinion (NMFS, 2009). Because of their size and swimming ability, any green sturgeon that may encounter aquaculture activities would be able to avoid disturbance and any potential for significant effects. Further, the opinion concluded that there is no evidence that benthic disturbances from shellfish aquaculture interfere with benthic productivity or decrease the availability of forage for green sturgeon. Therefore, NMFS concurs with the COE's determination that the proposed action may affect, but is not likely to affect green sturgeon because effects to the DPS are insignificant.

Southern Distinct Population Segment Pacific Eulachon

The majority of southern DPS eulachon spawn in the mainstem and tributaries of the lower Columbia River. Southern DPS eulachon occur in small numbers within Puget Sound (Emmett et al. 1991) and occur sporadically in Willapa Bay and Grays Harbor portions of the action area.

Potential effects to eulachon from aquaculture activities include physical disturbance to fish that may be in the action area, turbidity, and effects to prey resources. Such effects may lead to avoidance of normal foraging and migrating activities, and altered behavioral responses of eulachon. As discussed above, aquaculture activities occur primarily in areas not regularly used by eulachon. Further, disturbance from aquaculture activities are intermittent, temporary, and localized in nature. Because of these reasons, co-location of eulachon and disturbance from aquaculture activities are not expected to occur with any predictable regularity. Further, any negative effects on prey productivity are likely to be limited in space and duration, and it is not expected that habitat utilization, forage, spawning, or migration would be appreciably reduced for eulachon. In the event of co-location of eulachon and those physical disturbances discussed above, eulachon would have the swimming ability to avoid the disturbance and any significant effects. Therefore, effects on eulachon from aquaculture activities are insignificant, and NMFS concurs with the COE's determination that the proposed action may affect, but is not likely to affect Pacific eulachon.

Puget Sound/Georgia Basin Distinct Population Segment Yelloweye Rockfish
Puget Sound/Georgia Basin Distinct Population Segment Canary Rockfish
Puget Sound/Georgia Basin Distinct Population Segment Bocaccio

The NMFS listed the PS/Georgia Basin DPSs of yelloweye rockfish and canary rockfish as threatened and bocaccio as endangered under the ESA on April 28, 2010 (75 FR 22276). Rockfish fertilize their eggs internally and the young are extruded as larvae. Rockfish larvae are pelagic, often occupying the surface of open waters, under floating algae, detached seagrass, and kelp. Juvenile bocaccio and canary rockfish settle onto shallow nearshore water in rocky or cobble substrate that support kelp growth at 3 to 6 months of age, and move to progressively deeper waters as they grow (Love et al. 1991; Love et al. 2002). Shellfish aquaculture activities and geoduck harvest occurs along intertidal areas, with the deepest geoduck harvest occurring at approximately minus 38 feet Mean Lower Low Water (MLLW) (all in areas of unconsolidated sediment). The likelihood of presence of juveniles or adults of ESA-listed rockfish within these relatively shallow and non-rocky habitats is discountable. Juvenile yelloweye rockfish do not typically occupy intertidal waters and shallow habitats (Love et al. 1991) and are very unlikely to occur in the action area. Adult yelloweye rockfish, canary rockfish and bocaccio typically occupy waters deeper than 120 feet (Love et al. 2002) and are very unlikely to occur within areas of geoduck harvest and other shellfish aquaculture, which are shallower than this depth. Because geoduck harvest occurs within mud-flats that do not support kelp species, it is unlikely that juvenile canary rockfish or bocaccio to be present during harvest activities.

The installation and maintenance of buoys, floats, racks, trays, nets, lines, tube containers, and other structures necessary for existing commercial aquaculture operations could disturb substrates and induce turbidity. Similarly, geoduck harvest causes localized sediment plumes. Should a juvenile or adult ESA-listed rockfish occur near an area of active geoduck or other shellfish aquaculture activities, the effects would be insignificant because in-water activities and small levels of turbidity would not harm adult or juvenile fish. Suspended sediment levels within the Puget Sound are naturally variable, particularly within nearshore habitats that are subject to sediment suspension as a result of tide, wave and wind action (Downing 1983). Thus any suspended sediment would likely be within the range of natural variability experienced by rockfish. Divers and other removal apparatus could induce rockfish movement away from areas undergoing harvest operations. Once harvest is finished, normal rockfish habitat use would recommence. The direct effects of these temporary behavioral changes would be insignificant as they would not appreciably alter feeding, shelter or other essential behaviors of individual fish. Effects to habitat function from aquaculture infrastructure would be insignificant to juvenile canary rockfish and bocaccio because areas of unconsolidated sediments do not support kelp growth anyway. To avoid and minimize the likelihood of net and other infrastructure escapement into the aquatic environment, the beaches in the project vicinity will be patrolled at least once every 3 months by crews who will retrieve any debris that escapes from the project area, as described in the BE addendum received on March 9, 2011.

Larval yelloweye rockfish, canary rockfish or bocaccio probably ephemerally occur within the action area, but are generally dispersed by currents after they are born, making the concentration or probability of presence of larvae in any one location extremely small (NMFS 2003), particularly larvae from depleted populations of ESA-listed rockfish. The small size of the turbidity plumes resulting during harvest activities, combined with the short duration of harvest, make it extremely unlikely and therefore discountable that a larval yelloweye rockfish, canary rockfish or bocaccio will be present and thus exposed to habitat conditions that could cause harm. Similarly, potential disruptions to benthic invertebrates that may serve as prey for juveniles of ESA-listed rockfish would occur over small spatial and temporal areas, and thus would have insignificant effects.

Therefore, NMFS concludes that the proposed action would have discountable and insignificant effects and concurs with the COE determination of “may affect, not likely to adversely affect” for PS/Georgia Basin yelloweye rockfish, canary rockfish and bocaccio.

Southern Resident Killer Whales
Steller Sea Lions
Humpback Whales

The above ESA-listed marine mammal species may occur in the proposed action area. There are no Steller sea lion rookeries in Washington State, and Steller sea lion haul-out locations in Washington State are not proximate to areas with ongoing shellfish aquaculture in the proposed action area. The NMFS concurs that the new information related to geoduck dive harvest activities and total acreage of geoduck farms does not substantially change the outcome of the analysis of effects to Southern Resident (SR) killer whales, humpback whales, and Steller sea lions, as described below.

The vessels involved in the geoduck dive harvest activities are slow moving, follow a predictable course, do not target marine mammals, and should be easily detected by the animals. Thus, vessel strikes are extremely unlikely and therefore discountable. In the event marine mammals are present during geoduck dive harvest activities, any potential vessel encounters with SR killer whales, humpback whales, or Steller sea lions are expected to be short-term and transitory in nature and therefore insignificant. Vessels would remain relatively immobile with engines generally shut off while divers are harvesting, with minimal sound and insignificant potential for disturbance. Steller sea lions potentially swimming in the vicinity of geoduck dive harvest activities may temporarily avoid the action area, also with insignificant potential for disturbance.

As described above, the current total acreage of farmed geoducks on privately-owned tidelands is a very small percentage of intertidal habitat in Puget Sound and Hood Canal. The NMFS does not anticipate an increase of roughly 35-70 acres of geoduck harvest in intertidal habitat would cause more than potential minor deviations of course to avoid the geoduck harvest activities, with insignificant effects. Additionally, the new information related to geoduck dive harvest activities and total acreage of geoduck farms does not substantially change the outcome of the analysis of effects to salmonid prey, as discussed above.

The beaches in the project vicinity shall be patrolled at least once every 3 months by crews who will retrieve any debris that escapes from the project area. The removal of any debris from will benefit marine mammals by eliminating a potential source of entanglement.

Because all potential adverse effects to ESA-listed marine mammals are discountable or insignificant, NMFS concurs with the COE determination of "may affect, not likely to adversely affect" for Southern Resident killer whales, humpback whales, and Steller sea lions.

Critical Habitat Determination

The NMFS reviews the status of critical habitat and proposed critical habitat affected by a proposed action by examining the condition and trends of primary constituent elements (PCEs) or essential features of critical habitat throughout the designated area. The PCEs and essential features are physical features essential to the conservation of the ESU/DPS.

Salmon (Table 1)
Steelhead (Table 1)

Geoduck harvest and acreage do not occur within the boundaries of critical habitat for LCR Chinook salmon, CR chum salmon, UCR spring-run Chinook salmon, Snake SR fall-run Chinook salmon, SR spring/summer-run Chinook Salmon, UWR Chinook salmon, SR sockeye salmon, Lake Ozette sockeye salmon, LCR coho salmon, LCR steelhead, Middle Columbia River steelhead, UCR steelhead, SR Basin steelhead, or UWR steelhead. Critical habitat has not been designated for PS steelhead. Designated critical habitat boundaries for PS Chinook salmon, and HC summer-run chum salmon within the action area include areas contiguous with the shoreline from the line of extreme high water out to a depth no greater than 98 feet relative to MLLW. The PCE for that critical habitat in the action area is:

Nearshore marine areas free of obstruction and excessive predation with: (1) water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and (2) natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.

The NMFS analyzed the potential impacts of the project on the designated critical habitat and the PCE, and determined that the affects will be insignificant for the following reasons:

1. Geoduck harvest by divers may cause a brief change to migratory behavior of PS Chinook salmon as a result of small turbid plumes and general disturbance in the nearshore area. However, because of the localized and intermittent nature of geoduck harvest, migratory corridors would continue to be available along the nearshore. Forage conditions may be degraded from turbidity and general disturbance as well. However, degradation of forage conditions would be temporary, and forage opportunities would continue to be available from areas immediately surrounding the disturbance. Because of these reasons, migratory and forage conditions would not be appreciably reduced and juvenile salmonids can avoid any disturbance and pass through the work area.

2. The proposed project has the potential to alter natural cover conditions that might form on geoduck culture sites between harvests. Specifically, SAV (typically eelgrass), has been known to colonize on some geoduck beds in between harvest cycles. The density of eelgrass coverage in a geoduck culture area is typically reduced following geoduck harvest. However, the effects are temporary and localized, and would not substantially affect natural cover conditions on a scale that would inhibit the conservation value of this PCE.

Therefore, NMFS concludes that the potential effects of the project are not likely to adversely affect designated critical habitat of PS Chinook salmon, or HC summer-run chum salmon.

Southern Distinct Population Segment North American Green Sturgeon

The NMFS designated critical habitat for the Southern DPS North American green sturgeon on September 9, 2009 (74 FR 52300). The PCEs potentially found in the action area include:

1. Food resources. Abundant prey items within estuarine habitats and substrates for juvenile, subadult, and adult life stages.

2. Water quality. Water quality, including temperature, salinity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages.

3. Migratory corridor. A migratory pathway necessary for the safe and timely passage of Southern DPS fish within estuarine habitats and between estuarine and riverine or marine habitats.

4. Depth. A diversity of depths necessary for shelter, foraging, and migration of juvenile, subadult, and adult life stages.

5. Sediment quality. Sediment quality (i.e., chemical characteristics) necessary for normal behavior, growth, and viability of all life stages.

The NMFS analyzed the potential impacts of the project on the designated PCEs of critical habitat potentially found in the action area, and determined that the impacts to these PCEs will be insignificant for the following reasons:

1. Food resources. As discussed in the effects section above, aquaculture activities are not expected to reduce available prey items within habitats and substrates for subadult and adult life stages.

2. Water quality. The proposed project has the potential to briefly alter water quality through mobilization of sediment into the water column. However, because the effects will be rapidly diluted and temporary, water quality will not be impaired to a degree that modifies its suitability to support conservation purposes.

3. Migratory corridor. Because of their size and swimming ability, any subadult or adult green sturgeon that may encounter aquaculture activities would be able to avoid habitat disturbance (areas of suspended sediment), and thus avoid potential for any significant effects to migration from exposure to turbidity and general disturbance.

4. Depth. The relatively small area affected by aquaculture activities in Willapa Bay and Grays Harbor will not appreciably reduce the diversity of depths for forage, shelter or migration at juvenile, subadult, and adult life stages.

5. Sediment quality. Because geoduck harvest activities are temporary and localized, and because geoduck harvest areas are known to become re-colonized with benthic invertebrates and SAV within days to weeks following harvest, these activities are not expected to appreciably reduce chemical characteristics of sediment necessary for normal behavior, growth, or viability of all life stages of green sturgeon.

Therefore, NMFS concludes that the potential effects of the project are not likely to adversely affect designated critical habitat of Southern DPS green sturgeon.

Southern Resident Killer Whale

Critical habitat for Southern Resident killer whales occurs in the proposed action area. The proposed action may affect PCEs of the whales' critical habitat, including passage, and quantity and quality of prey (as described in NMFS 2009). As described above, the new information related to geoduck harvest and acreage does not substantially change the outcome of the analysis of effects on prey quantity and quality in the action area, including designated critical habitat of SR killer whales. Vessels associated with the geoduck harvest activities would remain relatively immobile, with minimal sound and insignificant potential to affect passage. Any encounters

with SR killer whales are expected to be sporadic and transitory and effects on passage are extremely unlikely and therefore discountable.

Because all potential adverse effects are discountable or insignificant, NMFS concurs with the COE determination of "may affect, not likely to adversely affect" for Southern Resident killer whale critical habitat.

Magnuson-Stevens Fishery Conservation and Management Act

Federal agencies are required, under section 305(b)(2) of the MSA and its implementing regulations (50 CFR 600 Subpart K), to consult with NMFS regarding actions that are authorized, funded, or undertaken by that agency that may adversely affect Essential Fish Habitat (EFH). The MSA (section 3) defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." If an action would adversely affect EFH, NMFS is required to provide the Federal action agency with EFH conservation recommendations (section 305(b)(4)(A)). This consultation is based, in part, on information provided by the Federal agency and descriptions of EFH for Pacific coast groundfish, coastal pelagic species, and Pacific salmon contained in the Fishery Management Plans developed by the Pacific Fishery Management Council and approved by the Secretary of Commerce.

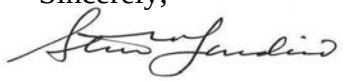
The proposed action is described in pages 2 through 15 of the opinion and on pages 2 through 8 of the BE addendum. The project area includes habitat which has been designated as EFH for various life stages of species listed in Table 2.

EFH Conservation Recommendations: Conservation recommendations were provided on pages 85-86 of the opinion (NMFS 2009). The NMFS has reviewed the new information related to geoduck dive harvest and acreage of geoduck culture. Because the effects to EFH from the proposed action are within the scope of effects analyzed in the original opinion, further conservation recommendations are not required. Therefore, NMFS refers to the original EFH determinations and conservation recommendations as applicable to this consultation.

This concludes consultation under the MSA. If new information becomes available that affects the basis for NMFS' EFH conservation recommendations, the Corps will need to reinitiate consultation in accordance with the implementing regulations for EFH at 50 CFR 600.920(l).

The NMFS appreciates your efforts to comply with requirements under the ESA. If you have questions, please contact Scott E. Anderson at the Washington State Habitat Office, (360) 753-5828, or email Scott.Anderson@noaa.gov.

Sincerely,



for William W. Stelle Jr
Regional Administrator

cc: Maryann Baird, COE

Table 1. Federal Register notices for final rules that list threatened and endangered species, designate critical habitats, or apply protective regulations to listed species considered in this consultation.

Species	ESU or DPS	Original Listing Notice	Listing Status Reaffirmed	Critical Habitat	Protective Regulations
Chinook salmon (*Oncorhynchus tshawytscha*)	Lower Columbia River	3/24/99 64 FR 14308 Threatened	6/28/05 70 FR 37160 Threatened	9/02/05 70 FR 52630	6/28/05 70 FR 37160
	Upper Willamette River spring-run	3/24/99 64 FR 14308 Threatened	6/28/05 70 FR 37160 Threatened	9/02/05 70 FR 52630	6/28/05 70 FR 37160
	Upper Columbia River spring-run	E 3/24/99 64 FR 14308 Endangered	6/28/05 70 FR 37160 Endangered	9/02/05 70 FR 52630	ESA section 9 applies
	Snake River spring/summer run	4/22/92 57 FR 14653 Threatened ------ 6/3/92 57 FR 23458 Correction	6/28/05 70 FR 37160 Threatened	10/25/99 64 FR 57399	6/28/05 70 FR 37160
	Snake River fall-run	4/22/92 57 FR 14653 Threatened	6/28/05 70 FR 37160 Threatened	12/28/93 58 FR 68543	6/28/05 70 FR 37160
	Puget Sound	3/24/99 64 FR 14308	6/28/05 70 FR 37160 Threatened	9/02/05 70 FR 52630	6/28/05 70 FR 37160
Chum salmon *(O. keta*)	Columbia River	3/25/99 64 FR 14507 Threatened	6/28/05 70 FR 37160 Threatened	9/02/05 70 FR 52630	6/28/05 70 FR 37160
	Hood Canal summer-run	3/25/99 64 FR 14507 Threatened	6/28/05 70 FR 37160 Threatened	9/02/05 70 FR 52630	6/28/05 70 FR 37160
Coho salmon (*O. kisutch*)	Lower Columbia River	6/28/05 70 FR 37160 Threatened	6/28/05 70 FR 37160 Threatened	Not applicable	6/28/05 70 FR 37160
Sockeye salmon (*O. nerka*)	Snake River	11/20/91 56 FR 58619 Endangered	6/28/05 70 FR 37160 Endangered	12/28/93 58 FR 68543	ESA section 9 applies
	Ozette Lake	3/25/99 64 FR 14528 Threatened	6/28/05 70 FR 37160 Threatened	9/02/05 70 FR 52630	6/28/05 70 FR 37160
Steelhead (*O. mykiss*)	Lower Columbia River	3/19/98 63 FR 13347 Threatened	1/05/06 71 FR 834 Threatened	9/02/05 70 FR 52630	6/28/05 70 FR 37160
	Upper Willamette River	3/25/99 64 FR 14517 Threatened	1/05/06 71 FR 834 Threatened	9/02/05 70 FR 52630	6/28/05 70 FR 37160
	Middle Columbia River	3/25/99 64 FR 14517 Threatened	1/05/06 71 FR 834 Threatened	9/02/05 70 FR 52630	6/28/05 70 FR 37160
	Upper Columbia River	8/18/97 62 FR 43937 Endangered	1/05/06 71 FR 834 Threatened	9/02/05 70 FR 52630	2/1/06 71 FR 5178
	Snake River Basin	8/18/97 62 FR 43937 Threatened	1/05/06 71 FR 834 Threatened	9/02/05 70 FR 52630	6/28/05 70 FR 37160
	Puget Sound	5/11/07 72 FR 26722 Threatened	Not applicable	Not applicable	9/25/08 73 FR 55451

Species	ESU or DPS	Original Listing Notice	Listing Status Reaffirmed	Critical Habitat	Protective Regulations
North American Green Sturgeon (*Acipenser medirostris*)	Southern DPS	4/07/06 71 FR 17757 Threatened	Not applicable	10/09/09 74 FR 52300	6/02/2010 74 FR 30714 Proposed
Pacific eulachon (*Thaleichthys pacificus)*	Southern DPS	3/18/10 75 FR 13012 Threatened	Not applicable	01/05/11 76 FR 515 Proposed	Not applicable
Yelloweye rockfish (*Sebastes ruberrimus*)	Puget Sound/ Georgia Basin	4/28/2010 75 FR 22276 Threatened	Not applicable	Not applicable	Not applicable
Canary rockfish (*Sebastes pinniger*)	Puget Sound/ Georgia Basin	4/28/2010 75 FR 22276 Threatened	Not applicable	Not applicable	Not applicable
Bocaccio rockfish (*Sebastes paucispinis*)	Puget Sound/ Georgia Basin	4/28/2010 75 FR 22276 Endangered	Not applicable	Not applicable	Not applicable
Humpback Whale (*Megaptera noveangliae*)	All Populations	12/2/1970 35 FR 18319 Endangered	Not applicable	Not applicable	12/2/1970 35 FR 18319
Southern Resident killer whales (*Orincus orca*)	Souther Resident	12/22/2004 69 FR 76673 Threatened	3/2011 75 FR 17377 Endangered	11/29/2006 71 FR 69054	11/18/2005 70 FR 69903
Steller Sea Lion *(Eumetopias jubatus)*	Eastern DPS	11/26/1990 55 FR 49204 Threatened	5/5/1997 62 FR 24345 Threatened	8/27/1993 58 FR 45269	5/ 5/1997 62 FR 24345

Table 2. Species of fishes with designated EFH in the action area.

Groundfish Species	Pacific ocean perch *S. alutus*	flathead sole *Hippoglossoides elassodon*
soupfin shark *Galeorhinus galeus*	redbanded rockfish *S. babcocki*	Pacific sanddab *Citharichthys sordidus*
spiny dogfish *Squalus acanthias*	rosethorn rockfish *S. helvomaculatus*	petrale sole *Eopsetta jordani*
big skate *Raja binoculata*	rougheye rockfish *S. aleutianus*	rex sole *Glyptocephalus zachirus*
California skate *R. inornata*	sharpchin rockfish *S. zacentrus*	rock sole *Lepidopsetta bilineata*
Longnose Skate *R. rhina*	shortbelly rockfish *S. jordani*	sand sole *Psettichthys melanostictus*
ratfish *Hydrolagus colliei*	shortraker rockfish *S. borealis*	starry flounder *Platichthys stellatus*
Pacific rattail *Coryphaenoides acrolepis*	silverygray rockfish *S. brevispinis*	
lingcod *Ophiodon elongatus*	splitnose rockfish *S. diploproa*	**Coastal Pelagic Species**
Pacific cod *Gadus macrocephalus*	stripetail rockfish *S. saxicola*	anchovy *Engraulis mordax*
sablefish *Anoplopoma fimbria*	vermilion rockfish *S. miniatus*	Pacific sardine *Sardinops sagax*
aurora rockfish *Sebastes aurora*	widow rockfish *S. entomelas*	Pacific mackerel *Scomber japonicus*
black rockfish *S. melanops*	yellowtail rockfish *S. flavidus*	jack mackeral *Trachurus symmetricus*
blue rockfish *S. mystinus*	shortspine thornyhead *Sebastolobus alascanus*	market squid *Loligo opalescens*
bocaccio *S. paucispinis*	arrowtooth flounder *Atheresthes stomias*	
chilipepper *S. goodei*	butter sole *Isopsetta isolepis*	**Pacific Salmon *Species***
darkblotched rockfish *S. crameri*	curlfin sole *Pleuronichthys decurrens*	Chinook salmon *Oncorhynchus tshawytscha*
greenspotted rockfish *S. chlorostictus*	Dover sole *Microstomus pacificus*	coho salmon *O. kisutch*
greenstriped rockfish *S. elongatus*	English sole *Parophrys vetulus*	

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APPENDIX A.

1. If conducting: 1) mechanical dredge harvesting; 2) raking; 3) harrowing; 4) tilling or other bed preparation activities; or 5) frosting or applying oyster shell on beds, within a mapped tidal reference area and outside the specified work windows for Pacific herring, the work area shall be surveyed for the presence of herring spawn. Vegetation, substrate, and aquaculture materials (nets, etc) should be inspected. If Pacific herring spawn is present, these activities are prohibited in the areas where spawning has occurred until such time as the eggs have hatched and herring spawn is no longer present. The Corps encourages growers to complete a training class on identifying herring spawn with WDFW. Information can be obtained by contacting WDFW at (360) 902-2200. A map showing the tidal reference areas and a table with the work windows for forage fish species can be found at http://www.nws.usace.army.mil/PublicMenu/Menu.

2. Newly positioned shellfish long-lines within an existing aquaculture project area that are spaced closer than 5 feet shall not be located above existing vegetated shallows or within a buffer distance of 3 meters of vegetated shallows. Alternate spacing (e.g., two to four lines spaced at 1 foot to 2.5 feet and an open row of 10 feet and then repeated) is also permitted. Vegetated shallows are defined at 72 FR 11197. "Newly positioned" is defined as being re-positioned or placed within an area where operations are not currently located and where aquaculture has not previously occurred.

3. Newly positioned shellfish rafts within an existing aquaculture tract shall not be located above existing vegetated shallows. Vegetated shallows are defined at 72 FR 11197. Newly positioned is defined as being re-positioned or placed within an area where operations are not currently located and where aquaculture has not previously occurred.

4. All pump intakes (for geoduck harvest, washing down gear, etc.) that use seawater should be screened in accordance with NMFS and WDFW criteria. Note: This does not apply to work boat motor intakes (jet pumps).

5. All-terrain vehicle (ATV) wash water must be treated before discharge.

6. Vehicles shall be stored, fueled, and maintained in a vehicle staging area placed 150 feet or more from any stream, waterbody, or wetland. Where this is not possible, documentation must be provided to the Corps as to why not, written approval from the Corps must be obtained, and the operators shall have a spill prevention plan and maintain a spill prevention kit, which shall be readily available.

7. All vehicles operated within 150 feet of any stream, waterbody, or wetland will be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected will be repaired in the vehicle staging area before the vehicle resumes operation. Inspections will be documented in a record that is available for review on request by the Corps and NMFS.

8. Washed gravel shall be used for shellfish bed preparation.

9. Monitoring is recommended at sites where eelgrass beds are present in the immediate harvest areas, to quantify the turbidity levels and timing effects on light transmission and sedimentation on eelgrass blades. This monitoring should be directed at determining the effects of dive harvest on turbidity and light transmission in relation to eelgrass light level requirements, limited to a few selected locations/harvest conditions, and will reflect the application of any Best Management Practices (BMPs) that may be in place during harvest.

bc: F/NWR – PDF (Baker)
WSHO – File Copy
WSHO – PDF (Chron)
WSHO – PDF (Anderson)
WSHO – PDF (Kreitman)
PRD – PDF (Mongillo)
PRD – PDF (Tonnes)

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