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To: [BrownScott, Jennifer](#); [Sollmann, Lorenz](#)
Subject: Aquaculture practices and some actions not covered by the Programmatic Consultation
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Attachments: [Bio Opp - Actions and Conservation Measures.docx](#)

Attached are excerpts from the Bio Opp that include helpful descriptions on common practices, definitions of timing of activities (new, fallow, etc.) and actions not covered by the programmatic consult. Some things to think about and maybe discuss/note in our comments. I have not had time to winnow much.. My plan for the rest of my time before our discussion is to continue reading through the bio opp and extract excerpts from the sp info and effects section unless something comes up or you have more important priorities for me.

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Bio Opp:

Ground-based Culturing of Oysters (Bottom, Rack and Bag, Stake, Longline)

Hatchery and Nursery Operations

Oyster cultch is the basis for both ground-based and suspended culturing of oysters. While the term “cultch” may refer to the mass of stone, broken shell, and grit that compose an oyster bed, where used here the term refers to aged oyster shell that has been prepared and placed in the intertidal or shallow subtidal zone with the specific goal of collecting a natural set of oyster seed (or “spat”)(Corps 2015, p. 14). Cultch is sometimes seeded in a hatchery or in upland tanks, but the practice of placing bundled cultch on the intertidal bed is more common.

Site /Bed Preparation

Oyster growers and farm operators use all or most of the same methods, practices and techniques including the removal or relocation of native and non-native shellfish predators, and leveling and harrowing of the bed (Corps 2015, p16). Leveling and harrowing of the bed may in some instances result in measurable impacts to submerged aquatic vegetation, including native eelgrass and or rooted kelp.

Graveling or frosting is a practice often used in oyster operations especially where the native substrate is unconsolidated and must be ‘hardened’ to prevent oysters from sinking and smothering. Some growers gravel or frost their oyster beds on an annual basis while others do so less frequently.

Mechanical methods of preparing and maintaining the cultured beds, and of harvesting, are fairly common and widespread among Washington State’s oyster growers and farm operators. Larger, contiguous oyster beds are often leveled mechanically, most commonly by dragging a chain or bag from a vessel traveling at slow speed (Corps 2015, pp. 15, 17, 19). Growers use mechanical harrows to pre-harvest and prepare beds, to pull sunken and embedded oysters to the surface, and to recover oysters that have dislodged and fallen from stakes or longlines (Corps 2015, pp. 17, 20).

Use of drift fences or oyster corrals is specifically excluded from coverage under the Corps programmatic consultation (Corps 2015, p 39).

Tumble bags incorporate small floats and as the tides rise and fall the bags are repeatedly inverted and tumbled.

Farmed oysters are commonly collect and redistribute across multiple farm plots during grow-out (Corps 2015, p. 17). Some beds and far plot provide conditions that are best suited for collecting a natural seed set, some are ideal for maturing young oysters, and other are better suited for fattening mature oysters prior to final harvest. Many perhaps most, growers/farm operators transplant their oysters across multiple sites within and between individual farms, depending upon age, maturity, and rate of growth.

Growers/farm operators commonly use mechanical harrows to pull sunken and embedded oysters to the surface, and to recover oysters that have dislodged and fallen from stakes or longlines (Corps 2015, pp. 17, 21).

Harvest

Where oysters are cultured directly on the intertidal bed (bottom culture) hand harvesting at low tide (Figure 14), and mechanical dredge harvesting at middle or high tides, are both common and widespread practices (Corps 2015, p. 17). Mechanical oyster dredges are deployed from one or both sides of a working vessel or barge. The dredge bag(s) are lowered to an elevation at or just below the bed surface by boom crane or hydraulic winch, and pulled at slow vessel speeds across and through the substrate. The dredge bags are emptied onto a barge deck, and then redeployed (Figure 15). A given area may be dredged twice in succession to ensure recovery of the maximum number of oysters, and the farm plot may be mechanically harrowed between the two successive dredge harvests in order to increase the recovery of oysters (Corps 2015, p. 17).

A typical pattern of site access from the water includes: temporarily grounding on exposed sand or mudflats, off loading crew, then temporarily anchoring the vessel in deeper intertidal or subtidal waters.

Activities Excluded from Programmatic Coverage:

- (1) Vertical fencing/vertical nets or drift fences (includes oyster corrals).
- (2) New berms or dikes or the expansion or maintenance of current, authorized berms or dikes.
- (3) Use of a hopper-type barge or other method that results in material (i.e. gravel or shell) placed during graveling or frosting activities that is thicker than 1 inch in depth even for short periods of time.
- (4) Pile driving.
- (5) Installation and maintenance of mooring buoys.
- (6) Construction, maintenance, and operation of upland hatcheries.
- (7) Cultivation of shellfish species not previously cultivated in the action area.
- (8) Construction, maintenance, and operation of attendant features, such as docks, piers, boat ramps, stockpiles, or staging areas.
- (9) Deposition of shell material back into waters of the United States as waste.
- (10) Dredging or creating channels so as to redirect fresh water flow.
- (11) Installation of new rafts, floats, or FLUPSYs, or the relocation or expansion of continuing rafts, floats, or FLUPSYs.
- (12) Any form of chemical application to control undesired species (e.g., non-native eelgrass, *Zostera japonica*; ghost shrimp, *Neotrypaea californiensis*; mud shrimp, *Upogebia pugettensis*).
- (13) Use of materials that lack structural integrity in the marine environment (e.g. plastic children's wading pools, unencapsulated Styrofoam®).
- (14) Unauthorized activities.

(Corps 2015, p. 39)

Conservation Measures

Shellfish activities will be conducted in a manner consistent with the following conservation measures (Corps 2015, p 49-53)”

1. Gravel and shell shall be washed prior to use for substrate enhancement (e.g., frosting, shellfish bed restoration) and applied in minimal amounts using methods, which result in less than 1 inch depth on the substrate annually. Use of a split-hull (e.g., hopper-type) barge to place material is prohibited.
2. The placement of gravel or shell directly in the water column (i.e., gaveling or frosting) shall not be conducted between February 1 and March 15 in designated critical habitat for Hood Canal summer chum salmon.
3. For ‘new’ activities only, gravel or shell material shall not be applied to enhance substrate for shellfish activities where native eelgrass (*Zostera marina*)* or kelp (rooted/attached brown algae in the order Laminariales) is present.

[*Note: Where the conservation measures refer to native eelgrass, they refer to and use the definition, description, and methods of delineation that have been endorsed and adopted by the Corps’ Seattle District (Corps 2016).]

4. Turbidity resulting from oyster dredge harvest shall be minimized by adjusting dredge bags to “skim” the surface of the substrate during harvest.
5. Unsuitable material (e.g., trash, debris, car bodies, asphalt, tires) shall not be discharged or used as fill (e.g., used to secure nets, create nurseries, etc.).
6. For ‘new’ activities only, shellfish activities (e.g., racks, stakes, tubes, nets, bags, long- lines, on-bottom cultivation) shall not occur within 16 horizontal ft of native eelgrass (*Zostera marina*) or kelp (rooted/attached brown algae in the order Laminariales). If eelgrass is present in the vicinity of an area new to shellfish activities, the eelgrass shall be delineated and a map or sketch prepared and submitted to the Corps. Surveys to determine presence and location of eelgrass shall be done during times of peak above- ground biomass (June 1 to September 30). The following information must be included to scale: parcel boundaries, eelgrass locations and on-site dimensions, shellfish activity locations and dimensions.
7. For ‘new’ activities only, activities shall not occur above the tidal elevation of +7 ft MLLW if the area is listed as documented surf smelt (*Hypomesus pretiosus*) spawning habitat by the Washington State Department of Fish and Wildlife (WDFW). A map showing the location of documented surf smelt spawning habitat is available at the WDFW website.
8. For ‘new’ activities only, activities shall not occur above the tidal elevation of +5 ft MLLW if the area is listed as documented Pacific sand lance (*Ammodytes hexapterus*) spawning habitat by WDFW. A map showing the location of documented Pacific sand lance spawning habitat is available at the WDFW website.
9. If conducting 1) mechanical dredge harvesting, 2) raking, 3) harrowing, 4) tilling, leveling or other bed preparation activities, 5) frosting or applying gravel or shell on beds, or 6) removing equipment or material (nets, tubes, bags) within a documented or potential spawning area for Pacific herring (*Clupea pallasii*) outside the approved work window (see Seattle District Corps website), the work area shall be surveyed for the presence of herring spawn prior to the activity occurring. Vegetation, substrate, and materials (nets, tubes, etc.) shall be inspected. If 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. A record shall be maintained of spawn surveys including the date and time of surveys; the area, materials, and equipment surveyed; results of the survey, etc. The Corps and the Services shall be notified if spawn is detected during a survey. The record of spawn surveys shall be made available upon request to the Corps and the Services.

10. For 'new' activities only, activities occurring in or adjacent to potential spawning habitat for sand lance, or surf smelt shall have a spawn survey completed in the work area by an approved biologist* prior to undertaking bed preparation, maintenance, and harvest activities if work will occur outside approved work windows for these species. If eggs are present, these activities are prohibited in the areas where spawning has occurred until such time as the eggs have hatched and spawn is no longer present. A record shall be maintained of spawn surveys including the date and time of surveys; the area, materials, and equipment surveyed; results of the survey, etc. The Corps and the Services shall be notified if spawn is detected during a survey. The record of spawn surveys shall be made available upon request to the Corps and the Services.

[*Note: For information on how to become an "approved biologist" for the purpose of conducting forage fish surveys parties should contact WDFW.]

18. All tubes, mesh bags, and area nets shall be clearly, indelibly, and permanently marked to identify the permittee name and contact information (e.g., telephone number, email address, mailing address). On the nets, identification markers shall be placed with a minimum of one identification marker for each 50 ft of net.

22. At least once every three months, beaches in the project vicinity will be patrolled by crews who will retrieve debris (e.g., anti-predator nets, bags, stakes, disks, tubes) that escapes from the project area. Within the project vicinity, locations will be identified where debris tends to accumulate due to wave, current, or wind action, and after weather events these locations shall be patrolled by crews who will remove and dispose of shellfish related debris appropriately. A record shall be maintained with the following information and the record will be made available upon request to the Corps and Services: date of patrol, location of areas patrolled, description of the type and amount of retrieved debris, other pertinent information.

23. When performing other activities on-site, the grower shall routinely inspect for and document any fish or wildlife found entangled in nets or other shellfish equipment. In the event that a fish, bird, or mammal is found entangled, the grower shall: 1) provide immediate notice (within 24 hours) to WDFW (all species), the Services (ESA listed species), or the Marine Mammal Stranding Network (marine mammals), 2) attempt to release the individual(s) without harm, and 3) provide a written and photographic record of the event, including dates, species identification, number of individuals, and final disposition, to the Corps and Services. Contact the U.S. Fish and Wildlife Service Law Enforcement Office at (425) 883-8122 with any questions about the preservation of specimens.

24. Vehicles (e.g., ATVs, tractors) shall not be used within native eelgrass (*Zostera marina*). If there is no other alternative for site access, a plan will be developed describing specific measures and/or best management practices that will be undertaken to minimize negative effects to eelgrass from vehicle operation. The access plan shall include the following components: (a) frequency of access at each location, (b) use of only the minimum vehicles needed to conduct the work and a description of the

minimum number of vehicles needed at each visit, and (c) consistency in anchoring/grounding in the same location and/or traveling on the same path to restrict eelgrass disturbance to a very small footprint.

25. Vessels shall not ground or anchor in native eelgrass (*Zostera marina*) or kelp (rooted/attached brown algae in the order Laminariales) and paths through native eelgrass or kelp shall not be established. If there is no other access to the site or the special condition cannot be met due to human safety considerations, a site-specific plan shall be developed describing specific measures and/or best management practices that will be undertaken to minimize negative effects to eelgrass and kelp from vessel operation and accessing the shellfish areas. The access plan shall include the following components: (a) frequency of access at each location, (b) use of only the minimum number of boats and/or crew members needed to conduct the work and a description of the minimum number of boats and crewmembers needed at each visit, and (c) consistency in anchoring/grounding in the same location and/or walking on the same path to restrict eelgrass disturbance to a very small footprint.

Action Area

The action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment. At all locations, the action area extends a minimum of 2,000 ft from the farm footprint (active and fallow). This distance encompasses those areas of the nearshore that may experience temporary effects (e.g., temporary effects to water quality, temporary effects to the sound environment, etc.).

Applicants wishing to continue regulated shellfish activities must obtain reauthorization from the Corps every five to ten years. The majority of the Corps' shellfish permit actions (permits and permit verifications) involve reauthorization of continuing activities and farms; specifically, reauthorizations of continuing commercial, intertidal farms producing shellfish for human consumption (Corps 2015, p. 5). Over the expected 20-year timeframe of the programmatic, activities located within the same farm footprint could be reauthorized by the Corps as many as three or four times.

Under the Corps' regulatory program in Washington State, continuing shellfish activities are those activities that were granted a permit, license, or lease from a state or local agency, authorizing shellfish activities within a defined footprint prior to March 18, 2007 (Corps 2015, p. 6). "New" shellfish activities are those activities that were undertaken after March 18, 2007.

Some continuing shellfish activities include a fallowed farm footprint, or a portion of the defined farm footprint that is currently fallow (i.e., left un-farmed or un-cultured). For the purpose of defining and documenting the geographic distribution and spatial extent of fallowed farm footprints, the Corps assessed status as of March 18, 2007, and again during 2012-2013 when most continuing shellfish activities were last reauthorized (Corps 2015, p. 6). "Acreage classified as continuing active has by definition been engaged in shellfish activity since at least 2007 and likely for much longer" (Corps 2015, p. 79). "Acreage identified as continuing fallow may also have been engaged in shellfish activity at some point in the past ... but is not engaged in shellfish activity presently ... No shellfish activity has occurred

on fallow lands since at least 2007 and most for a much longer time period (e.g., decades)” (Corps 2015, p. 79).

“The aquatic habitat has ... been modified by shellfish cultivation and harvest activities that have been occurring for many years on the continuing active acreage. [However,] the status of the aquatic habitat on fallow acreage is unknown since shellfish activities on these lands have not occurred for many years. Based on the permit application record which indicates the fallow areas have not had active cultivation since at least 2007, it is assumed ... that the fallow lands exist currently in an unmodified or ‘recovered’ state. A resumption of shellfish activity in these areas may therefore result in impacts to the aquatic habitat similar to the impacts that might result from aquaculture initiated in areas classified as new” (Corps 2015, p. 79). “Since no activity has occurred on the fallow lands for at least five years [since 2007], the habitat conditions ... [are] likely different than if [they] had been engaged in aquaculture or some regular rotation of aquaculture. [The habitat] has likely ‘recovered’ from any prior aquaculture impact” (Corps 2015, p. 81).

This programmatic consultation provides coverage for most culturing activities and practices on continuing farms and operations (except excluded activities; Table 1, pp. 32). This programmatic consultation extends this same coverage to most culturing activities and practices on “new” farms and operations, but does not provide coverage for some specific suspended culturing practices (i.e., initial installation of new rafts, floats, or FLUPSYs; relocation and/or expansion of continuing rafts, floats, or FLUPSYs)(Corps 2015, p. 39).