UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Boulevard, Suite 1100
Portland, OR 97232

**Refer to NMFS No.:**
**WCR-2014-825**

September 23, 2014

Shawn H. Zinszer
Chief, Regulatory Branch
U.S. Army Corps of Engineers, Portland District
P.O. Box 2946
Portland, Oregon 97208-2946

Re: Endangered Species Act Section 7(a)(2) Programmatic Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for Commercial Shellfish Aquaculture and Native Shellfish Restoration Authorized by the U.S. Army Corps of Engineers in Oregon

Dear Mr. Zinszer:

Thank you for your letter of May 2, 2014, requesting initiation of consultation with the National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) of 1973 (ESA) (16 U.S.C. 1531 et seq.) for Commercial Shellfish Aquaculture and Native Shellfish Restoration Programmatic activities authorized by the U.S. Army Corps of Engineers (Corps) in Oregon. This action is in accordance with the Corps' regulatory and civil works authorities under section 10 of the Rivers and Harbors Act of 1899 and section 404 of the Clean Water Act of 1972. This response to your request was prepared by NMFS pursuant to section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402, and agency guidance for preparation of letters of concurrence.

During this consultation, we concurred with your determination that the proposed action is not likely to adversely affect Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*), or their designated critical habitat, or southern distinct population segment (SDPS) green sturgeon (*Acipenser medirostris*) or their designated critical habitat. Although you requested formal consultation for southern distinct population segment (SDPS) Pacific eulachon (*Thaleichthys pacificus*) (hereafter referred to as 'eulachon') and their designated critical habitat, we gathered additional information regarding pump usage by commercial shellfish growers and determined that formal consultation was not warranted. Therefore, we determined the proposed action is also not likely to adversely affect SDPS eulachon or their critical habitat.

We also reviewed the proposed action for potential effects on essential fish habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including conservation measures and any determination you made regarding the potential effects of the action. This review was pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). A complete record of this consultation is on file at Roseburg, Oregon.

**Proposed Action and Action Area**

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR 402.02). "Interrelated actions" are those that are part of a larger action and depend on the larger action for their justification. "Interdependent actions" are those that have no independent utility apart from the action under consideration (50 CFR 402.02). The NMFS did not identify any interrelated or interdependent actions.

For this consultation, the proposed action is a set of design criteria that the Corps will use to guide the permitting of existing and new or expanded commercial shellfish aquaculture operations and native shellfish restoration in Oregon as regulated under section 10 of the Rivers and Harbors Act of 1899 and section 404 of the Clean Water Act. The Corps is only proposing to use the Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration programmatic consultation to authorize activities in the following seven estuaries: (1) Tillamook Bay; (2) Netarts Bay; (3) Yaquina River; (4) Siuslaw River; (5) Winchester Bay (Umpqua River); (6) Coos Bay including South Slough; and (7) Alsea Bay.

The Corps is proposing to use the proposed design criteria when authorizing four categories of actions, specifically:

**Existing farm.** Ongoing aquaculture activities at a commercial shellfish farm that has been granted a permit, license, or lease from a state or local agency specifically authorizing commercial shellfish aquaculture activities and which has undertaken such activities prior to February 21, 2012. The farm area consists of the area covered by the state or local aquaculture permit, license, or lease, and may include portions of previously leased areas (i.e., prior to February 21, 2012) in which there has been no previous aquaculture activity (see newly positioned below) and/or areas that are periodically allowed to lie fallow as part of normal operations. Existing commercial shellfish aquaculture farms occur in 6 areas in Oregon: (1) Tillamook Bay; (2) Netarts Bay; (3) Yaquina River; (4) Siuslaw River; (5) Winchester Bay (Umpqua River); and (6) Coos Bay including South Slough (Table 1; Appendix A - Maps).

**Newly positioned.** New shellfish aquaculture operations placed within an existing farm where operations are not currently located and where aquaculture has not previously occurred.

**New/expanded farm.** New shellfish aquaculture operations placed in an area that is not an existing farm and where aquaculture has not previously occurred. New/expanded farms authorized by the Corps using the Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration programmatic consultation will only occur in the six estuaries with existing farms plus Alsea Bay. The overall amount of new/expanded commercial shellfish aquaculture operations will be limited to the estimated acreages provided (Table 2).

**Native shellfish restoration.** To restore or re-introduce populations of native molluscan shellfish into bays, estuaries, or the marine environment by (a) enhancement of settling substrate, (b) placement of juveniles or adults into the marine/estuarine environment, and (c) planting native submerged aquatic vegetation as part of a shellfish restoration action.

**Table 1.** Location, acreage, species harvested, culture methods, and harvest methods for existing Oregon commercial shellfish aquaculture areas.

| Name of Waterbody | County | Location of Shellfish Culture | Total Acreage* (Number of Growers) | Species Harvested | Culture and Harvest Methods |
|---|---|---|---|---|---|
| Tillamook Bay[Y] | Tillamook | Throughout bay | 2,606 (5) | Pacific and Kumamoto oysters<br><br>(includes 9.47 acres of littleneck clams with bottom/bag culture and hand harvest only) | Bottom culture and variety of off bottom techniques including bag, rack-and-bag, rack-and-tray, long-line, and culture<br><br>Hand and mechanical harvest |
| Netarts Bay | Tillamook | Mid and upper bay | 531 (13) | Pacific and Kumamoto oysters | Bottom and off bottom culture (*e.g.* rack-and-bag)<br><br>Hand harvest |
| Yaquina River[Y] | Lincoln | Mid-bay | 519 (3) | Oysters | Suspended raft culture** and bottom culture<br><br>Hand harvest<br>Mechanical harvest[±] |
| Siuslaw River | Lane | RM 4-5 | 9 (1) | Oysters | Off bottom rack-and-tray culture<br><br>Hand harvest |
| Winchester Bay (Umpqua River) | Douglas | RM 0 (mouth); RM 2-5 | 120 (2)[†] | Oysters | Off bottom rack-and-tray culture, off bottom rack culture, and long-line[†] culture<br><br>Hand harvest |
| Coos Bay | Coos | South Slough<br><br>Upper bay (RM 10-12) | 240 (4)<br><br>1,062 (3)[†] | Pacific and Kumamoto oysters | Bottom culture; bag culture, stake culture,[†] and long-line culture<br><br>Hand and mechanical harvest; harrowing[†] |
| **TOTAL** | | | **5,087 (31)** | | |

*Total acreage represents a summation of all ODA acreages provided in the ODA 'Oyster Growers and Plats Table' and acreages provided to the Corps (Environ 2009). There may be some variation from the true acreage since minor discrepancies were noted between the ODA grower table, ODA plat boundary shapefile, and information collected by the Corps.
[Y]NMFS estimates that approximately 250 lease acres, as reported by the Corps, in Tillamook Bay are classified as 'prohibited' by ODA. There is also an area of overlap (acres unknown) between leases and prohibited area in Yaquina River upstream of Flesher Slough.
[†]Updated to include additional growers and culture method provided in notifications received by Corps in 2010.
[±]Updated based on ODFW observations in Yaquina River and NMFS site visit[1].
**The Corps is not proposing to authorize suspended raft culture operations through this programmatic consultation. These can be submitted by the Corps to NMFS for individual, site-specific ESA and EFH consultation.

[1] Personal communication and site visit by Bridgette Lohrman, NMFS, with Dan Avery, ODFW, on June 24, 2010.

**Table 2.** Acreage estimates by estuary for new/expanded farm areas (i.e., areas which require an additional state or local aquaculture lease or permit) that are likely to occur over the next five years. RM = River Mile.

| Estuarine Areas | Estimated Acreage for Expansion/New Areas |
|---|---|
| Alsea Bay | 5 acres |
| Tillamook Bay | 100 acres<br>Estimates may be reduced pending completion of Oregon Department of Agriculture (ODA) GIS updating of existing plat locations. |
| Netarts Bay | 20 acres<br>Estimates may be reduced pending completion of ODA's GIS updating of existing plat locations. |
| Coos Bay<br><br>Coos Estuary<br>South Slough/Joe Ney Slough | <br><br>50 acres<br>0 acres (No expansion currently anticipated.) |
| Siuslaw River (RM 4 to 5) | 15 acres |
| Umpqua River (RM 2 to 5) | 0 acres (No information available.) |
| Yaquina Bay | 0 acres (No expansion anticipated.) |

The Corps, based on an assessment provided by the Pacific Coast Shellfish Grower's Association (PCSGA) regarding the potential for new/expanded operations, has estimated new and expanded acreages and areas for new commercial shellfish aquaculture operations (Table 2). With one exception, Alsea Bay, these estimates overlap bays/estuaries where existing commercial shellfish aquaculture occurs. Growing and harvesting methods as well as the species cultivated will remain as identified under existing operations and as documented in Environ (2009), over the course of the next five years. The ODA has not developed a management plan for Alsea Bay. Any growers proposing expansion into Alsea Bay will provide documentation that they are proposing commercial aquaculture of species that have been previously cultivated in Alsea Bay or are indigenous to the area.

For existing commercial shellfish aquaculture farms, the Corps used three primary sources of information to determine the number of existing growers/operations, location of activities, acreages, and culture methods: (1) Oregon Department of Agriculture's (ODA) lease database for grower's cultivating on state-owned lands; (2) information contained in ODA's food safety license database; and (3) information collected from growers. Although derived from best available information, the acreages in Table 1 are estimates only, but are the best estimate of existing operations in Oregon. This information was documented in Environ (2009) and supplemented by the Corps and Oregon Department of Fish and Wildlife (ODFW). Although an area may be leased, it may not be in active production. Some of these areas may be fallow, but it may be desirable for a grower to keep the lease for future use. Other lease areas may contain areas that may be unusable (i.e., too deep, too shallow, too soft, too muddy, or otherwise unsuited for production).[2] "Acres leased" is likely to be an overestimate of acres actively being

[2] E-mail from Alex Manderson, ODA, to Michelle McMullin, NMFS (November 5, 2010) (discussing ODA Food Safety management of Tillamook Bay, Netarts Bay, Yaquina Bay, Siuslaw River, Winchester Bay (Umpqua River), and Coos Bay including South Slough in Oregon).

used for existing commercial shellfish aquaculture in Oregon, but likely represents the maximum footprint of existing and ongoing operations.

With the exception of the Siuslaw River, all of the estuaries with existing commercial shellfish aquaculture have management plans for commercial shellfish harvesting (ODA 1996, 2003, 2008a, 2008b, 2009, 2010). Only certain areas of the estuaries are classified by ODA in the management plan as approved or conditionally approved, and the remaining areas are prohibited for commercial shellfish harvest for human consumption.

A general description of activities and methods used by commercial shellfish aquaculture growers in Oregon can be found in Environ (2009), and are briefly summarized below.

Hatchery and nursery operations (algal production, larval rearing, nursery seeding, and broodstock maintenance) are performed in facilities located onshore. Algal production involves culturing a variety of phytoplankton for use as feed for larvae, seed, and broodstock. Larval culture involves the rearing of free-swimming bivalve larvae. Nursery seed production is the rearing of larvae from the time they near the settle-out or setting phase, to the time they are ready for planting. Broodstock maintenance consists of the care and feeding of adult bivalves used for propagating future generations of various shellfish species. These operations are conducted in separate tanks and require the use of water that is pumped from the sea. The pumps may be attached to existing dock structures or simply placed in the water at the time of need and then removed. Pumps are screened in accordance with NMFS and ODFW criteria.[3]

Bottom culture is the most common method of oyster and clam aquaculture in Oregon. Typical seeding density is approximately 200 to 250 bushels/bags per acre although density may vary depending on site productivity. Rumrill (2013) noted that commercial oyster aquaculture operations in Pacific Northwest bays and estuaries frequently have an initial seeding density of approximately 150-250 bushels/bags per acre. Oyster density increases throughout the growout period as the young oysters mature and increase in size (Wagner *et al.* 2012). The primary source of shellfish seed stock used in Oregon is the Whiskey Creek Shellfish Hatchery in Netarts. Shellfish imports in Oregon are prohibited by the state except by permit.

Oyster cultch[4] is generally prepared by bundling washed and aged Pacific oyster shells ("mother shells") in large plastic mesh bags at facilities on land. Hundreds to thousands of cultch bags may be required to sustain farm inventories. For natural set on cultch, the cultch bags are placed on stakes or other substrate, and placed in the intertidal zone prior to spawning season. Once the oysters have set on the cultch, they are kept until a suitable size for planting. Alternatively, remote setting may occur at an upland site. Based on our best available information at this time, we believe that approximately 6 growers in Oregon remote set oyster larvae on cultch.[5] In this case, cultch bags (typically stacked on pallets) are placed in large tanks containing well-mixed,

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[3] NMFS criteria are designed for the safe, timely, and efficient upstream and downstream passage of anadromous salmonids at impediments created by artificial structures, natural barriers, or altered instream hydraulic conditions. Screen criteria in NMFS (2011a) are provided for the smallest fry-sized juvenile salmonids. Available at: http://www.westcoast.fisheries.noaa.gov/publications/hydropower/fish_passage_design_criteria.pdf

[4] Cultch provides points of attachment for oyster larvae.

[5] Personal communication with Peter Mohr, representing Pacific Coast Shellfish Growers Association (July 18, 2014).

temperature-controlled seawater. Ready-to-set larvae are added to the seawater, sometimes with a small quantity of algal "paste." The larvae then rapidly set onto the cultch and metamorphose into tiny juvenile oysters or "spat." The set cultch bags are then placed on the beach, either loose or on pallets, until the seed is large enough or "hard" enough (firmly cemented onto the mother shell and able to resist predation and desiccation) to withstand being moved onto the culture beds. Remote setting occurs when larvae are available but typically occurs from April through September.[5] Small pumps, $\leq 5$ horsepower, are used to fill the tanks with seawater and only one pump per operation is necessary. The intake diameter of the pump is $\leq 2.5$ inches. Tank size varies as do the number of tanks per grower, but on average each grower would use approximately 500 gallons to initially fill their tank(s). Once the tanks are initially filled with seawater and oyster larvae are added, the pumps are only used to feed the oyster larvae in the tanks by adding fresh seawater. There is no set pattern to feeding as it is dependent on oyster larvae condition. Seawater may be pumped for as short of a time as 15 minutes or as long as 4 hours for each feeding. Feeding may be needed every day, every other day, or even less frequently. We do not know how long oyster larvae are fed before being set out in the estuary in Oregon or how many batches a grower will remote set per year. In general, and dependent on water temperature, each batch may be held in tanks for up to a month in early spring, or as little as a week in summer (Helm and Bourne 2004). Remote setting only occurs in Coos Bay, Tillamook Bay, and in the Yaquina River.[5]

Harvest occurs by hand or by a mechanical oyster dredge. Hand harvest occurs in all estuaries while mechanical oyster dredge harvest occurs in Tillamook Bay (553 acres), Yaquina River (512 acres), and Coos Bay/South Slough (1,062 acres). A typical oyster dredge consists of a steel frame, approximately 1– 6.5 feet wide with a toothed blade (Shumway 2011). The oyster bag and a tow chain/wire are attached to either side of the frame. Tow speed is $< 3.3$ feet per second (fps). The oyster bag is composed of large metal mesh links that collect oysters while allowing other smaller material to pass through the links. A diving plate attached to the frame holds the device on top of the substrate and creates a suction that lifts oysters up off the substrate and into the dredge bag.

Commercial shellfish aquaculture activities are generally performed within intertidal areas where the tides are low enough to expose the culture bed so that operations can be performed by workers on foot. Such low tides occur for a period of several days each lunar month or approximately 29 days per year. These tides occur near midnight in December, near noon in June, and at corresponding intermediate times in other months. During these low tides, workers could be on the beds for 3 to 6 hours, depending on tidal elevations.

In Oregon, harrowing does occur (i.e., in Coos Bay), but it is not a common practice. Harrowing is necessary in areas where the substrate is too soft and the oysters may sink into the mud. Unlike clams that live in the substrate, oysters must stay on the substrate surface to survive. When oysters sink below the substrate surface, they are periodically harrowed to remove them from the mud. The harrow is a skidder with many tines, towed along the substrate by a boat. The harrow penetrates the substrate by a few inches and returns the oysters to the surface. Harrowing may also occur in Tillamook Bay and the Yaquina River because mechanical oyster dredge harvest also occurs in these estuaries.

Commercial shellfish aquaculture requires the use of vessels (i.e., boats) to access the beds for intertidal culture. The principal vessels used consist of small open craft powered by 2-stroke or 4-stroke outboard motors. These vessels are used to transport crews and material to and from the culture beds. Larger vessels and barges may be used to transport mechanical equipment such as harvesters, and to transport harvested shellfish. When used for culture or harvest activities, vessels serving shellfish beds are generally grounded on mudflats or vacant culture beds to avoid or minimize damage to shellfish beds and reduce turbidity, which can be harmful to shellfish beds. Vessel operations avoid eelgrass areas to the extent practicable. When eelgrass is present within shellfish beds, effort is taken to prevent vessel grounding in eelgrass. Large vessels are maintained and fueled at designated shore facilities, although small vessels used by small-scale growers may be maintained and fueled at the growers' own docks.

Crews must be able to access the culture beds, and areas immediately adjacent, from land to perform many shellfish culture activities, including bed preparation, inspection and maintenance during grow-out, and harvest. At some farms, the beach is accessed directly from land, which may also require the crew to move equipment and personnel through the foreshore upper and middle intertidal zones. This is generally conducted along a pre-existing access route and effort is taken to minimize disturbances to the upper and middle intertidal zones. This access is typically conducted by foot or by an all-terrain vehicle (ATV).

Following harvest, the shellfish are transported to a processing facility. Transportation may involve use of boats, ATVs, and/or trucks. Once received, the shell stock may be processed directly, rinsed before processing or placed in cold, dry storage or wet storage until it can be processed (Environ 2009). Wet storage does not occur in Oregon and most estuaries have a prohibited zone along the shoreline which would prevent growers from rinsing shellfish with water withdrawn from estuaries near processing plants in order to avoid violating ODA's food safety regulations.[6]

Shells and shell fragments are another by-product generated during shellfish processing. Whole oyster shell may be reclaimed for use as cultch for future culture activities. Shell may also be crushed for other uses.

The Corps is proposing to apply the proposed design criteria when authorizing the following shellfish activities in Oregon for all existing farms, all new/expanded farms, and native shellfish restoration. Under this programmatic consultation, the Corps is only proposing to include those shellfish activities most commonly and frequently conducted in Oregon and thus is not proposing to cover every possible shellfish activity that could be authorized. The following are the only activities to be authorized by the Corps under this programmatic consultation.

- bed preparation and seeding
- oyster long-line culture
- oyster rack-and-bag culture
- oyster stake culture
- oyster bottom culture
- oyster suspended culture

[6] E-mail from Alex Manderson, ODA, to Michelle McMullin, NMFS (July 9, 2014) (discussing ODA shellfish regulations).

- littleneck clam ground culture
- littleneck clam bag culture
- mechanical harvest (oysters only)
- hand harvest
- harrowing
- support activities – vessel operations, work on beach, and onshore facilities
- placement and installation of buoys, floats, racks, trays, nets, lines, tubes, containers, and other structures necessary for the operation of the commercial shellfish aquaculture activity
- pumps and related pipelines used in the withdrawal of water for rinsing shellfish prior to processing, wet storage, and activities associated with hatchery and nursery operations (i.e., remote setting)
- native shellfish restoration activities, including the placement of shellfish seed (i.e., immature individual shellfish or spat on shell), adults, and/or shells/shell fragments to increase natural shellfish production

The proposed action also includes authorization of activities to restore native shellfish beds in Oregon. For 2005 to present, no more than 2 restoration activities occurred per year in the action area (described below).[7] We believe this is a reasonable expectation for future frequency of restoration activity occurrence. Using the Olympia oyster, restoration methods are similar to activities the Corps proposes to authorize for commercial shellfish aquaculture, but in some cases may also include substrate enhancement with gravel or shell to establish natural reefs at a restoration location. Substrate enhancement is not authorized over eelgrass beds[8] or kelp.[9] Commercial shellfish growers may also grow the Olympia oyster for harvest and transplant to a native restoration location.

The Corps is <u>not</u> proposing to include the following commercial shellfish aquaculture activities in Oregon under this programmatic consultation because these actions have less predictable effects or are infrequently practiced or not of widespread use in Oregon (as noted), making them unsuitable for a programmatic consultation in Oregon. Site-specific, individual consultation is available for the following actions as needed for commercial shellfish aquaculture operations. Future inclusion in a programmatic revision may be considered for the less common or less prevalent activities, if their frequency of use increases, as NMFS and the Corps gain a complete

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[7] Personal communication from Megan Callahan-Grant, Program Coordinator with NMFS Habitat Restoration Center (July 3, 2014).

[8] For the purpose of this programmatic consultation, an eelgrass bed and edge are defined per the Washington State Department of Natural Resources Technical Memorandum, Operational Definition for Determining Edge of Eelgrass Presence (Donoghue 2012). From review of the scientific literature considering minimum eelgrass presence criteria for delineating a vegetated edge that demonstrate ecological function, and examination of available field data (from Puget Sound sites), the following criteria will be used as an operational definition. Persistent bed interior: ≥3 shoots per 0.25 square meter. Persistent bed edge: begin at a point within the interior of the bed (where ≥3 shoots per 0.25 square meter within 1 meter of adjacent shoots) and move along any radial transect. Find the last shoot that is within 1 meter of an adjacent shoot along that transect. Continue 0.5 meter beyond this shoot, this is the bed edge. Both exterior and interior edges of bed can exist. Eelgrass is defined as native eelgrass (*Zostera marina*). These definitions are for use with this consultation only and do not set precedent for other consultations by NOAA's NMFS.

[9] Kelp are defined as non-mobile native kelp species that are attached to benthic substrate.

understanding of the frequency of use and the extent, predictability, and repeatability of their effects.

- raft culture[10]
- use of pesticide-treated wood or other materials containing toxic compounds including creosote, wood preservatives, paints, etc. that come into contact with the marine environment
- cultivation of new species (i.e., species not indigenous to the area or species not previously cultivated in the waterbody)
- attendant features such as docks, piers, boat ramps, stockpiles, staging areas, or the deposition of shell material back into waters of the United States as waste
- mechanical harvest of clams[11]
- use of predator netting[12]
- hydraulic harvest[13]
- use of chemicals to remove pests[14]
- use of gravel to modify the substrate[15] (except as needed for native shellfish restoration)
- on-water Floating Upwelling Systems or similar nursery rafts[16]

## Proposed Design Criteria (PDC)

The Corps proposes to apply the following design criteria, in relevant part, to every action authorized under this programmatic consultation. Measures described under "Administration" apply to the Corps as it manages the actions proposed for the Oregon commercial shellfish aquaculture and native shellfish restoration programmatic consultation. Measures described under "General" apply, in relevant part, to each action that involves a commercial shellfish aquaculture or a native shellfish restoration activity. The Corps will ensure that all PDC apply to each party that is given authorization for, or carries out, an action under the Oregon commercial shellfish aquaculture and native shellfish restoration programmatic letter of concurrence.

### Program Administration

1. **Initial rollout.** The Corps will cooperate with NMFS to provide an initial rollout of this programmatic consultation for Corps staff to ensure that these conditions are considered at the onset of each action, incorporated into all phases of design, and that any constraints are resolved early on and not under-designed as add-on features.

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[10] The singularity of raft culture in Oregon makes it better suited for individual consultation tailored to serve an individual grower and the site-specifics of an individual location.

[11] Mechanical harvest of clams on commercial aquaculture beds is not practiced in Oregon (Environ 2009).

[12] Use of netting is associated with clams and is not a typical practice in Oregon, E-mail from Bill Abadie, Corps, to Bridgette Lohrman, NMFS (June 9, 2010) (responding to technical questions about shellfish aquaculture operations).

[13] Use of hydraulic harvest for commercial shellfish aquaculture is not known to occur in Oregon.

[14] Oregon aquaculture operations remove pests (e.g., oyster drills, etc.) by hand; burrowing shrimp are also not generally considered a problem for shellfish aquaculture operations in Oregon (Environ 2009).

[15] Aquaculture operation in Oregon does not require altering the substrate (Environ 2009).

[16] The use of these systems for commercial shellfish aquaculture is not known to occur in Oregon.

2. **Failure to report may trigger reinitiation.** The NMFS may recommend reinitiation of this consultation if the Corps fails to provide full reports or attend the annual coordination meeting.

3. **Electronic action notification.** The Corps will initiate NMFS review by submitting a completed Action Notification Form (Appendix B) to NMFS for each action to be completed under this programmatic consultation at least 30 days prior to authorization by the Corps, with sufficient detail for NMFS to ensure that the proposed action is consistent with all provisions of this consultation. All action notifications are to be submitted electronically to NMFS at shellfish.oregon@noaa.gov.

4. **Review and approval.**
    a. The Corps will review each action to be covered under this programmatic consultation to ensure that:
        i. The action is within the present or historic range of an OC coho salmon, SDPS green sturgeon, SDPS eulachon, or designated critical habitat for these species.
        ii. The action effects are likely to be within the range of effects considered in this programmatic consultation.
        iii. Any practitioner[17] receiving Corps authorization will comply with all of the following conditions, including obtaining NMFS review and approval, as appropriate (see b below).
        iv. Any action authorized under the Oregon commercial shellfish aquaculture and native shellfish restoration programmatic consultation will not cultivate a new species (i.e., species not indigenous to the area or species not previously cultivated in the waterbody).
    b. The Corps will also ensure that NMFS reviews and approves any action with any of the following elements for consistency with this programmatic consultation before the action is authorized (see i-iii). For any actions with these elements (i.e., new farm, requirement of an access plan, or requirement of fueling and staging plan), the Corps will provide a notification and any additional plan or other required information (described below) to NMFS at least 30 days prior to Corps authorization. Within 30 days of the receipt of the notification and additional plan or information, NMFS will notify, via e-mail, the Corps as to whether the notification included sufficient detail for NMFS to ensure that the proposed action is consistent with all provisions of this consultation and, if the notification is sufficient, whether the project is approved for coverage or is not eligible for coverage under this consultation. Additionally, at least 30 days prior to implementation of any modifications to an access plan or a fueling and staging plan, as described below, the practitioner must notify the Corps and the Corps must notify NMFS of the modifications. Within 30 days of receiving these modification notifications NMFS will inform the Corps by e-mail of whether the action is still eligible for coverage under this consultation.
        *i. New farm*
            1. Action notifications will be submitted for review and approval at least 30 days prior to Corps authorization.

[17] For the purpose of this programmatic consultation, a practitioner is defined as a shellfish grower, or restoration practitioner, and all individuals associated with the shellfish activity. Practitioner is used interchangeably with grower.

2. If eelgrass is present within a new farm area, eelgrass bed locations must be documented on a map or sketch which must be submitted by the Corps to NMFS with the action notification. The following information must be included to scale: plat boundaries, eelgrass bed locations and boundaries, and shellfish seeding/planting locations. Surveys to determine presence and location of eelgrass beds should be done during times of peak above-ground biomass: June-August.
3. For expansion into Alsea Bay: Documentation will be provided (by the Corps or the shellfish grower) that the proposed species has previously been cultivated in Alsea Bay or is indigenous to the area.

ii. *Use of motorized vehicles (i.e., ATVs, tractors) in eelgrass beds, grounding or anchoring of watercraft in eelgrass beds, and walking paths through eelgrass beds to access commercial shellfish aquaculture or restoration site may be approved by NMFS for individual actions under the following conditions.*

1. Action notifications must be submitted for review and approval at least 30 days prior to Corps authorization and must include an access plan as described below.
2. If a plat or restoration site cannot be accessed without use of vehicles in eelgrass beds or without grounding/anchoring watercraft in eelgrass beds or without walking through eelgrass beds, then the practitioner must provide an access plan to the Corps describing specific measures and/or best management practices used to minimize negative effects to eelgrass from activities and must implement the plan. The access plan must 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.

iii. *Fueling, storing, daily leak inspection, maintenance, and repair of vehicles < 150 feet away from any stream, waterbody, or wetland may be approved by NMFS for individual actions under the following conditions.*

1. Action notifications must be submitted for review and approval at least 30 days prior to Corps authorization and must document the site constraints that prevent compliance with the PDC and include a fueling and staging plan. The fueling and staging plan must include a spill prevention plan describing specific measures and/or best management practices used to maintain and protect vehicles, contain fuel and other vehicle fluids, and prevent leaks and spills from entering the water. The plan must include the following components: (a) description of a items in a spill prevention kit and how the kit will be kept readily available, (b) description of employee training in use of the spill prevention kit, (c) use of 5 gallon (or smaller) EPA-compliant portable fuel containers, (d) use of funnels or spill-proof spouts and polypropylene pads or similar materials during fueling, (e) daily inspection routines for leaks or improper functioning prior to

vehicle/boat use, (f) dockside fueling containment measures, and (g) description and location of vehicle/boat maintenance and repair site, including distance away from a waterbody and how chemical contaminants will be prevented from leaving the site.

5. **Permit conditions.** The Corps will include each of the relevant project design criteria (see below 9-16) as an enforceable condition of every action authorized under this programmatic consultation. Failure to comply with all applicable conditions for a specific project may lead NMFS to a different conclusion regarding the effects of that project.
6. **Site access.** The Corps will retain the right of reasonable access to each action site to monitor the use and effectiveness of these conditions.
7. **Annual program report.** The Portland District Corps' Regulatory Branch will submit an annual monitoring report to NMFS by February 15 each year that describes the Corps' efforts to carry out this program. The annual report will include an assessment of overall program activity; the number of authorizations issued; name of the practitioner(s)/permittee(s), location, type of culture, and type of harvest method for each authorized commercial shellfish aquaculture operation; name of the practitioner(s)/permittee(s) and location for each authorized restoration operation; a map showing the location of each action authorized; the total acreage of leases authorized that overlap with the areal extent of eelgrass beds; and any notification of completed forage fish spawn surveys. The Corps will submit annual reports to NMFS by email at this address: shellfish.oregon@noaa.gov.
8. **Annual coordination meeting.** The Portland District Corps' Regulatory Branch will attend an annual coordination meeting with NMFS by March 31 each year to discuss the annual report and any actions that can improve conservation under this programmatic consultation, or make the program more efficient or accountable.

**Project Design Criteria – General**

9. Equipment storage and pump requirements.
    a. Practitioners will not use intertidal areas as storage areas for bags, marker stakes, rebar, nets, empty pallets, etc.
    b. Practitioners will move all aquaculture materials that are not immediately needed to an off-site storage area.
    c. Practitioners will remove all aquaculture debris from the leasehold at least once every three months. This design criterion is not meant to apply to the wet storage of harvested shellfish.
    d. Any natural debris (i.e. large wood) encountered during shellfish bed preparation shall not be removed from the aquatic environment but rather shall be relocated within the intertidal portion of the leasehold.
    e. All pump intakes (for washing down gear, vehicles, etc.) that pump water from bays, estuaries, streams, or other waterbody shall be screened in accordance with NMFS criteria[3] and ODFW criteria. Note: This does not apply to work boat motor intakes (jet pumps).
10. Toxic compounds, chemicals, and other contaminants.
    a. Practitioners will prevent direct or indirect contact of toxic compounds including creosote, wood preservatives, paints, etc., with the marine environment.

b. Vehicles and power equipment shall be stored, fueled, and maintained in a vehicle staging area placed 150 feet or more from any stream, waterbody, or wetland.
   i. *Where this is not possible,*
      1. Practitioners must provide documentation to the Corps as to why not.
      2. The practitioner shall transfer fuels in Environmental Protection Agency-compliant portable fuel containers 5 gallons or smaller at a time during refilling. A polypropylene pad or other appropriate spill protection and a funnel or spill-proof spout will be used when refueling to prevent possible contamination of surface waters.
      3. The practitioner must submit and implement a fueling and staging plan (See 4(b)(iii)(2)), including a spill prevention plan, as described above in 4(b)(iii).
      4. Vehicle/equipment operators shall have with them the spill prevention plan and maintain a spill prevention kit, which shall be readily available and used in case of accidental spills.
      5. In the event a spill occurs, practitioners will contain, remove, and mitigate such spills immediately. All waste oil or other clean up materials contaminated with petroleum products will be properly disposed of off-site.

c. When washing land vehicles (e.g. all-terrain vehicles, trucks) used in aquaculture or native shellfish restoration practices, washing shall take place on uplands such that wash water is not allowed to enter any stream, waterbody, or wetland. Disposal of wash water from land vehicles shall occur upland in a location where all water is infiltrated into the ground (*i.e.*, no overland flow into a waterbody or wetland).

d. 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 and documented in a record that is available for review on request by the Corps and NMFS.

e. All synthetic flotation material used for floats shall be permanently encapsulated to prevent breakup into small pieces and dispersal into water.

**11.** Native shellfish bed restoration.

a. Gravel or shell shall only be applied in minimal amounts (less than 1 inch depth of applied material) and may not be directly dumped from a hopper barge. If gravel is to be used in substrate enhancement, gravel shall be washed prior to placement.

b. If shell is to be used for substrate enhancement, it will be procured from clean sources that do not deplete the existing supply of shell bottom. Shells will be steam cleaned, left on dry land for a minimum of one month, or both, before placement in the aquatic environment. Shells from the local area will be used whenever possible.

c. No substrate enhancement shall occur over eelgrass beds or kelp.

d. Molluscan shellfish and any co-planted submerged aquatic vegetation used for restoration will be species native to the project area.

**12.** Eelgrass[8] avoidance.

a. No motorized vehicles (i.e. ATVs, tractors) shall be used within eelgrass beds unless there is no other alternative for site access. If there is no other access to the site, an access plan shall be submitted to the Corps/NMFS describing specific measures and/or best management practices that will be undertaken to minimize negative effects to eelgrass from vehicle operation (See 4(b)(ii)), and the plan shall be implemented.

b. No grounding or anchoring of watercraft within eelgrass beds will occur unless there is no other alternative for site access. If there is no other access to the site, a plan shall be submitted to the Corps/NMFS describing specific measures and/or best management practices that will be undertaken to minimize negative effects to eelgrass (See 4(b)(ii)) and the plan shall be implemented.

c. No walking paths through eelgrass shall be established unless there is no other alternative for site access. If there is no other access to the site, a plan shall be submitted to the Corps/NMFS describing specific measures and/or best management practices that will be undertaken to minimize negative effects to eelgrass (See 4(b)(ii)), and the plan shall be implemented.

**13.** Newly positioned equipment and operations within existing farms.

a. Newly positioned aquaculture racks, stakes, flip bags, or on-bottom aquaculture operations will not be placed within a buffer distance of 16.5 feet (five meters) from existing native eelgrass beds.[8]

b. Only newly positioned shellfish long-lines spaced five feet apart can be located above existing native eelgrass beds or within a buffer distance of 16.5 feet (five meters) of existing native eelgrass beds. Alternate spacing e.g. two to four lines spaced at one foot to 2.5 feet and an open row of 10 feet, and then repeated, may also be considered above existing native eelgrass beds or within a buffer distance of 16.5 feet (five meters) of existing native eelgrass beds.[18] Documentation must be provided to the Corps describing the location of newly-positioned long-lines within existing farms including their proximity to eelgrass and spacing pattern(s).

c. Newly positioned operations will not conduct mechanical harvesting or harrowing in existing eelgrass beds.

d. Before conducting newly positioned shellfish culturing (e.g., culturing by rack and bag, raft, long-line, ground methods) occurring in potential spawning habitat for sand lance, or surf smelt, practitioners or the Corps must conduct a spawn survey. This must occur prior to undertaking bed preparation, net/tube removal, and harvest activities. 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 NMFS 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 NMFS.

**14.** New/expanded farms.

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[18] Rumrill, S.S. and V.K. Poulton. 2004. Ecological role and potential impacts of molluscan shellfish culture in the estuarine environment of Humboldt Bay, CA. Annual Report to the Western Regional Aquaculture Center, November 2004. 79 pp.

a. If eelgrass is present within a new/expanded farm area, eelgrass bed[8] locations must be documented on a map or sketch which must be submitted by the Corps to NMFS at least 30 days prior to Corps' authorization. The following information must be included to scale: plat boundaries, eelgrass bed locations and boundaries, shellfish seeding/planting locations. Surveys to determine presence and location of eelgrass beds should be done during times of peak above-ground biomass: June-August.
b. Action notifications will be submitted to NMFS for review at least 30 days prior to Corps authorization.
c. New commercial shellfish aquaculture farms will not occur within a buffer distance of 16.5 feet (five meters) from existing eelgrass beds.

**15.** Forage Fish.

a. Between January 15 and April 15, prior to conducting: (1) mechanical harvesting; (2) raking; (3) harrowing; or (4) tilling or other bed preparation activities, the work area shall be surveyed for the presence of herring spawn. Vegetation, substrate, and aquaculture materials must be inspected. If Pacific herring spawn[19] 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 NMFS 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 NMFS.
b. Newly positioned shellfish culturing (e.g., culturing by rack and bag, raft, long-line, ground methods ) shall not be placed above the tidal elevation of +7 feet Mean Lower Low Water if the area is known surf smelt spawning habitat.
c. Newly positioned shellfish culturing (e.g., culturing by rack and bag, raft, long-line, ground methods) shall not be placed above the tidal elevation of +5 feet Mean Lower Low Water if the area is known Pacific sand lance spawning habitat.
d. Newly positioned shellfish culturing (e.g., culturing by rack and bag, raft, long-line, ground methods) occurring in potential spawning habitat for sand lance, or surf smelt must conduct a spawn survey prior to undertaking bed preparation, net/tube removal, and harvest activities. 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 NMFS 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 NMFS.

**16.** The practitioners will adjust the dredge bag to 'skim' the surface during mechanical harvest activities to minimize suspended sediment contributions to the water column.

The NMFS relied on the foregoing description of the proposed action, including all PDCs, to complete this consultation.

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[19] Herring are an important forage item for OC coho salmon (Healey 1982, Murphy *et al.* 1988, Higgs *et al.* 1995).

For this consultation, the overall program action area consists of the combined areas for each action to be authorized by the Corps in the following sixth-field U.S. Geological Service hydrologic unit code (HUC) sub-watersheds: Tillamook Bay (171002030801), Netarts Bay (171002030901), Lower Yaquina River (171002040303), Lower Siuslaw River (171002060804), Winchester Bay (171003030803), Coos Bay including South Slough (171003040303 and 171003040306), and Alsea Bay (171002050405). All actions authorized by this programmatic consultation will occur within the jurisdiction of the Corps Portland District in Oregon.

Each individual sixth-field sub-watershed is within the range of OC coho salmon, green sturgeon, and eulachon. The action area encompasses all direct and indirect effects, including area affected by minor amounts of substrate disturbance and suspended sediment, minor amounts of unintentional chemical contamination, limited withdrawal of water from the estuaries by pumps, and moderate harvest with mechanical oyster dredges.

**Action Agency's Effects Determination**

On May 2, 2014, we received a formal consultation request from the Portland District Corps for southern distinct population segment (SDPS) Pacific eulachon (*Thaleichthys pacificus)* (hereafter referred to as 'eulachon') and their designated critical habitat. They determined the proposed action was likely to adversely affect SDPS eulachon and their critical habitat due to entrainment in pumps used for water withdrawal. As part of consultation, we gathered additional information regarding pump usage by growers and accordingly concluded that the proposed action is not likely to adversely affect SDPS eulachon and their designated critical habitat.

The Corps also determined that Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*) and SPDS North American green sturgeon (*Acipenser medirostris*) (hereafter referred to as 'green sturgeon') and their designated critical habitats may be affected by the proposed action, but the proposed action is not likely to adversely affect these species and critical habitats. NMFS concurs with the Corps' finding that the proposed action is not likely to adversely affect these species and critical habitats.

*OC coho salmon.* The NMFS issued a final determination to retain the threatened listing for the OC coho salmon on June 20, 2011 (76 FR 35755). The NMFS designated OC coho salmon critical habitat and issued protective regulations on February 11, 2008 (73 FR 7816). The action area is used by adult OC coho salmon for sexual maturation, preparation for freshwater entry, upstream migration, and holding. The action area is used by smolt OC coho salmon for growth, development, and seaward migration. West Coast coho salmon smolts typically leave freshwater in the spring (April to June), moving through the estuary and into the ocean, and when sexually mature reenter freshwater from September to November and spawn from November to December and occasionally into January (Sandercock 1991). In Oregon, juveniles typically are in the action area from February through mid-July and adults from August through February. Additional juvenile life history diversity and estuary use does occur with fry migrants, age-0 parr migrants, and fall/winter migrants; however, individuals displaying these variations typically use the upper estuary in the saltwater/freshwater ecotones (Miller and Sadro 2003, Koski 2009, Bass 2010, Jones *et al.* 2011, Bennett *et al.* 2011, Roni *et al.* 2012, Bennett *et al.* 2014), and are unlikely to occur where commercial shellfish aquaculture is taking place. The entire action area

is designated critical habitat for OC coho salmon. The primary constituent elements (PCEs) of critical habitat within the action area are listed in Table 3.

**Table 3.** PCEs of critical habitat designated for OC coho salmon and corresponding life history events in the action area.

| Primary Constituent Elements | | Species Life History Event |
|---|---|---|
| Site Type | Site Attribute | |
| Estuarine areas | Forage<br>Free of artificial obstruction<br>Natural cover<br>Salinity<br>Water quality<br>Water quantity | Adult sexual maturation and "reverse smoltification"<br>Adult upstream migration and holding<br>Fry/parr/smolt growth, development, and seaward migration |

*SDPS green sturgeon.* The NMFS listed green sturgeon as threatened under the ESA on April 7, 2006 (71 FR 17757), designated critical habitat on November 9, 2009 (74 FR 52300), and issued protective regulations on June 2, 2010 (75 FR 30714). The action area is used by adult and sub-adult SDPS green sturgeon from June until October as habitat for growth, feeding, development to adulthood, and migration (Moser and Lindley 2007). In the action area, Yaquina River, Winchester Bay (Umpqua River), and Coos Bay are designated as critical habitat for green sturgeon. The primary constituent elements (PCEs) of critical habitat within the action area are listed in Table 4.

**Table 4.** PCEs of critical habitats designated for SDPS green sturgeon and corresponding species life history events in the action area.

| Primary Constituent Elements | | Species Life History Event |
|---|---|---|
| Site Type | Site Attribute | |
| Estuarine areas | Food resources<br>Migratory corridor<br>Sediment quality<br>Water depth<br>Water flow<br>Water quality | Juvenile growth, development, seaward migration<br>Sub-adult growth, development, seasonal holding and movement between estuarine and marine areas<br>Adult growth, development, seasonal holding, movements between estuarine and marine areas, upstream spawning movement, and seaward post-spawning movement |

*SDPS eulachon.* The NMFS listed eulachon as threatened under the ESA on March 18, 2010 (75 FR 13012). We have not issued protective regulations for eulachon, but we did designate critical habitat for eulachon on October 20, 2011 (76 FR 65324). Eulachon larvae and adults use the action area for migration and feeding. Adult SDPS eulachon are likely only present in the action area from mid-December through May and larvae are likely only present from February through June. Attempts to evaluate the status of eulachon have been difficult challenging due to the lack of reliable long-term data. Interpretations of available abundance data for eulachon are confounded by intermittent reporting, fishery-dependent data, and the lack of directed sampling (USDC 2013). However, for estuaries in the action area, the status of SDPS eulachon is either (1)

not found (Tillamook Bay, Netarts Bay, Yaquina River, Alsea Bay; Gustafson *et al.* 2010), (2) observed but on an infrequent basis and in small numbers (Siuslaw River, Coos Bay; Monaco *et al.* 1990, Emmett *et al.* 1991, Gustafson *et al.* 2010), or (3) common but depressed and not yet rebounded to previous abundance (Umpqua River; Monaco *et al.* 1990). Until recently, most fish biologists have not specifically targeted SDPS eulachon during surveys and were unlikely to be sampling with the appropriate gear or at the appropriate times. SDPS eulachon runs also vary annually, thus making directed sampling even more necessary. Based on this information, we cannot conclude that SDPS eulachon are not present in estuaries in the action area, but their likely presence and abundance are sporadic and low. In the action area, Winchester Bay (Umpqua River) is designated as critical habitat for eulachon. The physical and biological features of critical habitat within the action area are listed in Table 5.

**Table 5.** Physical or biological features of critical habitats designated for SDPS eulachon and corresponding species life history events.

| Physical or biological features | | Species Life History Event |
|---|---|---|
| Site Type | Site Attribute | |
| Freshwater and estuarine migration | Flow<br>Water quality<br>Water temperature<br>Food<br>Migratory corridor | Adult and larval mobility<br>Larval feeding |

Also, the Corps determined that the proposed action "would adversely affect" areas designated by the Pacific Fisheries Management Council as EFH for Pacific salmon (PFMC 1999), groundfish (PFMC 2005), and coastal pelagic species (PFMC 1998), including estuarine areas and submerged aquatic vegetation designated as Habitat Areas of Particular Concern (HAPC).

## Consultation History

In 2006, the U.S. Army Corps of Engineers (Corps) proposed to issue a new nationwide permit (NWP) for existing commercial shellfish aquaculture activities (known at the time as NWP D). At the same time, the Corps proposed to modify NWP 4 by removing the provision authorizing shellfish seeding. The Corps also proposed modifying NWP 27 (aquatic habitat restoration, establishment, and enhancement activities) to authorize the construction of oyster habitat over unvegetated bottom in tidal waters, and shellfish seeding. The Corps announced these proposals and requested public comment on NWP D on September 26, 2006 (71 FR 56258). In December 2006, NMFS provided comments to the Corps on NWP D at a national level. These comments documented that submerged aquatic vegetation (e.g., eelgrass) habitat provides valuable ecological functions and is sensitive to disturbance. NMFS also recommended that the Corps modify the pre-construction notification requirements to add protection of submerged aquatic vegetation.

The proposed NWP D was issued with modifications as NWP 48 in 2007 to authorize ongoing shellfish aquaculture activities (72 FR 11092). Existing shellfish aquaculture operations previously authorized by another NWP or another form of a Corps permit, such as a regional

general permit or an individual permit, are covered by those permits until the expiration of the original permit. Nationwide permits automatically expire and become null and void if they are not modified or reissued within 5 years of their effective date.

In August 2008, we began pre-consultation activities in Oregon for the 2007 NWP 48. We received a biological assessment (Environ 2009) and formal consultation was initiated in March 2010. However, consultation was never completed and on March 19, 2012, the Corps reissued NWP 48 which also included new and expanded operations in addition to existing shellfish aquaculture operations. The 2012 NWP 48 superseded the 2007 version. On April 11, 2012, the Corps withdrew their consultation request for NWP 48 in Oregon.

We continued to coordinate and collaborate with the Corps, at both the Portland District level and at the Regional level. We met with the Portland District Corps on June 5, 2012, for clarification of commercial shellfish aquaculture activities in Oregon and Corps regional permit conditions. In 2012 the Corps suspended regional consultation efforts while working with NMFS at a national level on NWPs.

At a regional level (previously the Northwest Region and now the Oregon Washington Coastal Area Office of the West Coast Region), NMFS worked internally to develop a set of recommendations for commercial shellfish aquaculture and native shellfish restoration with the goal of internal agency consistency and for sharing with the Corps Districts for coastal Oregon and Washington. On April 30, 2013, we met with the Portland District Corps and discussed a programmatic consultation strategy similar to the standard local operating procedure programmatic consultations (i.e., SLOPES) between NMFS and the Corps, which have been very successful. Both agencies agreed to pursue the SLOPES-style consultation framework for shellfish activities in Oregon including shellfish restoration. The SLOPES-style consultation framework would include activities for which the Corps could issue individual permits, NWPs for shellfish activities other than aquaculture (i.e., restoration), or NWP 48. However, there are some activities authorized under NWP 48 that are not included in the proposed action for the SLOPES-style Oregon Commercial Shellfish Aquaculture and Native Restoration programmatic consultation because those activities are not used by growers in Oregon or because they have less predictable effects and are not suitable for a programmatic consultation.

In October 2013, we asked the Portland District Corps for feedback on preliminary recommendations, which they provided in November 2013. In January 2014, we provided a complete set of recommendations for review by the Portland District Corps and a general description of activities the agencies were considering for programmatic consultation. We collaborated with the Portland District Corps for the next 3 months to discuss and revise this information.

Consultation for the Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration was initiated on May 2, 2014 when the Portland District Corps formally submitted a request for consultation with proposed design criteria.

Actions that do not fall within the parameters of the current programmatic consultation procedures, or are not found to be within the range of effects, are not covered by this

programmatic letter of concurrence but the Corps can request consultation with NMFS for individual actions.

## ENDANGERED SPECIES ACT

### Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). The applicable standard to find that a proposed action is not likely to adversely affect listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

Under the administrative portion of this action, the Corps will evaluate each individual action to ensure that the following conditions are complied with: (a) The PDC are applied where ESA-listed OC coho salmon, SDPS green sturgeon, or SDPS eulachon, or their designated critical habitat, or some combination, are present; (b) the anticipated range of effects is within the range considered in this letter of concurrence; (c) the action is carried out consistent with the PDC; and (d) action and program level monitoring and reporting requirements are met. These procedures are a central part of the program and function to ensure that individual actions remain within the scope of effects considered here, and to ensure that the aggregate or program-level effects of those individual actions are also accounted for. Activities that fall within the Oregon Commercial Shellfish and Native Shellfish Restoration proposed action, and otherwise comply with this letter of concurrence, do not require further consultation. Activities that do not meet these criteria, including those that are expressly identified as exclusions, are not covered by this letter of concurrence, but can be the subject of future individual consultations.

The direct physical and chemical effects of each action on the environment will vary depending on the type of action being performed and location, but this discussion identifies a common set of effects related to shellfish aquaculture and restoration. The Corps proposes to authorize both existing operations and new or expanded operations. Basic shellfish aquaculture activities are the same for each type of operation. Effects from on-going, continued operation of existing farms are analyzed in this consultation as are new or expanded farm operations. The Corps proposes to apply similar PDC to both new, or expanded, farms and to newly positioned operations within existing farms.

An important component of the proposed action is the PDC, including program administration. The Corps will provide PDC for likely users of this consultation to ensure the PDC are incorporated into all phases of design for each authorized action, and that any unique action or site constraint related to site suitability is resolved early on. Then, the Corps will review each proposed action to ensure that each action includes the appropriate PDCs and is otherwise consistent with this consultation. The Corps will also obtain additional approval from NMFS for: (1) new/expanded farms; (2) access that cannot avoid eelgrass; and (3) vehicle storage, fueling,

and inspections that occur closer than 150 feet to a waterbody. These activities require NMFS' expertise to determine whether the proposal is consistent with the letter of concurrence. The Corps will also retain the right of reasonable access to each project site so that the use and effectiveness of these PDC can be monitored if necessary. Furthermore, the Corps will notify NMFS before permitting/authorizing each action. As an additional program-level check on the continuing effects of the action, the Corps and NMFS will meet at least annually to review implementation of this consultation and opportunities to improve conservation, or make the program overall more effective or efficient.

Existing commercial shellfish aquaculture activities have been ongoing in the action area for many years, with the exception of Alsea Bay. The existence of commercial shellfish aquaculture, in addition to other factors in managed areas, has influenced prevailing conditions (as described above for each estuary) in the action area. The spatial extent of existing commercial shellfish aquaculture plats ranges from less than 1% and up to 28% of the estuary for the individual estuaries in the action area (Table 6). Nearly all intertidal commercial shellfish aquaculture activities in Oregon occur on low-gradient mud and sandflats, which are habitats that naturally have little habitat structure except where eelgrass occurs.

**Table 6.** Estuary acreages with extent existing commercial shellfish aquaculture.

| Estuary | Total estuary size (acres)‡ | Total existing commercial shellfish aquaculture (acres)* | Estimated portion of estuary with existing commercial shellfish aquaculture |
|---|---|---|---|
| Tillamook Bay | 9,216 | 2,606 | 28% |
| Netarts Bay | 2,743 | 531 | 19% |
| Yaquina River | 4,329 | 519 | 12% |
| Siuslaw River | 3,060 | 9 | <1% |
| Umpqua River | 6,544 | 120 | 2% |
| Coos Bay<br>South Slough<br>Combined | 13,348 | 1,062<br>240<br>1,302 | 10% |
| TOTAL | 39,240 | 5,087 | |

‡ Estuary size from Oregon Coastal Atlas[20]
* Estimates taken from Table 1.

[20] Available at: http://coastalatlas.net/index.php/learn/places/6-estuaries. Last Accessed June 2014.

*Effects on Listed Species*

The effects of the proposed action are reasonably likely to include minor amounts of substrate disturbance and suspended sediment, minor amounts of unintentional chemical contamination, limited withdrawal of water from the estuaries by pumps, and moderate harvest with mechanical oyster dredges. However, the effects of the proposed action on listed species will be discountable or insignificant. For this programmatic consultation, we anticipate that every individual action will share some of the effects on the environment described here in proportion to the project's complexity, footprint, and proximity to species and critical habitat, but that neither any individual action nor all the actions covered by this opinion taken together will have effects that are greater than the full range of effects described here, because every action is based on the same set of underlying shellfish aquaculture seeding, maintenance, harvest, access, bed preparation, and water withdrawal activities or elements, and each element is limited by the same PDC. We present our rationale below.

*Substrate disturbance and suspended sediment.* None of the estuaries in the action area are water-quality-limited for suspended sediment (ODEQ 2010).[21] However, many shellfish aquaculture activities will have direct physical effects on the environment and the potential to result in increased suspended sediment. These activities commonly begin with placing pre-set cultch bags, or clean cultch on intertidal areas, and site preparation. Pre-set cultch bags are commonly placed on pallets. Clean cultch for natural recruitment of shellfish larvae are placed in bags or individually on stakes, lines, racks, pallets, etc. Both types of cultch remain in place until the larvae are large enough and have firmly attached to the cultch. Site preparation includes clearing natural debris. It also includes placement of buoys, floats, racks, trays, lines, or other equipment necessary for commercial shellfish aquaculture operations. These activities all disturb the substrate to some extent. However, these activities occur during low tides that expose the beds so operations can be performed by workers on foot. These activities will only occur for several days during each lunar month based on the availability of low tides. Substrate disturbed by these activities will be moved by the incoming tide and distributed through the water column resulting in suspended sediment.

Additionally, seeding bottom culture beds with mature cultch typically occurs by hand seeding from a boat at high tide or by shoveling or flushing the mature cultch from the deck of the boat. Mature cultch landing on the substrate will also disturb the substrate and suspend disturbed sediment, but hand seeding is likely to cause less of a disturbance than mechanical methods that drop cultch in bulk to the substrate. Although shellfish remove suspended particles from the water column via filter feeding, most studies focus on mature or larger shellfish, such that we are unable to quantify the amount of suspended sediment seeded larvae will remove from the water column. Oysters in advanced stages of maturity will be present locally and will contribute to removal of suspended sediment.

Harrowing and harvest will also disturb the substrate. Hand harvest typically occurs during low tide and the effects are similar to cultch placement and site preparation. Hand harvest of clams is likely to create more substrate disturbance than hand harvest of oysters as clams live in the substrate while oysters are on top of the substrate. Oyster harrowing and mechanical oyster dredge harvest occur during high tide and interact with the substrate by using a boat to drag a

[21] Oregon Department of Environmental Quality (ODEQ) uses turbidity in their water quality standards.

harrow, similar to a plow, through the top layer of substrate to lift oysters to the top of the substrate or to drag an oyster dredge along the surface of the substrate. Both activities are likely to disturb a larger amount of substrate across the shellfish bed, as compared to hand harvest. However, growers typically conduct dredge harvesting at high tide and on beds with a sandy bottom, thus producing less suspended sediment compared to beds with finer substrates that are more typically hand-picked during low tides (Dumbauld 2008 as cited in NMFS 2009). Dumbauld also related that when dredge harvesting, operators attempt to keep the dredge from engaging deeply into the substrates, preferring to operate as efficiently as possible by just skimming the surface and harvesting the oyster crop (NMFS 2009). Furthermore, the Corps requires growers to adjust the oyster dredge bag to skim the surface during mechanical harvest to minimize suspended sediment contributions to the water column. Harrowing is typically done only during winter, which is a season when there are elevated levels of suspended sediment in the estuaries due to storms, thus the contribution of suspended sediment from harrowing is likely to be minor. Furthermore, assuming harrowing occurs on all bottom-cultured shellfish areas in Coos Bay, Yaquina Bay, and Tillamook Bay, the extent of harrowing likely only occurs over 10-28% of any individual estuary (Table 6). Harrowing on new/expanded farm areas is unlikely to substantially increase the proportion of estuary affected given the small extent proposed in Table 2. Due to the winter timing, only eulachon, adult OC coho salmon, and OC coho smolts are likely to be present in the action area when harrowing occurs. Eulachon are of very low abundance in Coos Bay, Yaquina Bay, and Tillamook Bay and it is extremely unlikely that they would be exposed to minor increased elevations of suspended sediment from harrowing, which would only occur over approximately one quarter of the estuary or less, during a time when suspended sediment levels are elevated. Adult and outmigrating OC coho salmon, although more abundant in the action area, are likely to avoid exposure by moving to other areas of the estuary.

Oyster harrowing and mechanical oyster dredge harvest requires the use of boats, just as, in some circumstances, does access to beds. Growers accessing the beds by means of boats may generate propwash and ground out the boats, which would also cause sediment particles to be suspended into the water column. If boats operate in less than 7.2 feet of water, sediment resuspension is substantial (Klein 2007). Asplund (2000) evaluated the literature on boating effects to the aquatic environment and found that impacts were few in waters greater than 10 feet. However, these studies were conducted in small tidal creeks $\leq$ 8 feet deep and lakes or rivers, which are different environmental settings than the estuaries of the action area. Given that the action area is an unconstrained estuarine environment where tidal flushing is occurring regularly, and background suspended sediment concentrations are generally high, the overall effects of any increases in suspended sediment from boat propwash in shallow areas or grounding out will be localized and minimal, and of short-duration (minutes to hours).

Growers may also temporarily place pumps into the estuaries to withdraw water as needed for hatchery and nursery operations or shellfish processing or storage. Pumps may be attached to existing dock structures or temporarily placed on the substrate, resulting in minimal substrate disturbance and sediment suspension.

Long-lines, racks, bags, stakes, and pallets used in commercial shellfish aquaculture are frictional, structural elements that slow the water, allowing suspended sediment to drop from the water column and accumulate on the substrate. Accumulated sediments are generally resuspended and redistributed by storm events.

Native shellfish restoration methods are similar to activities proposed by the Corps for commercial shellfish aquaculture. In some cases native shellfish restoration may include substrate enhancement with gravel or shell to establish natural reefs at a restoration location. Typically in Oregon, native shellfish restoration activities are conducted by hand placement of native oysters, or bags of oysters, on the substrate. Hand placement of shell as authorized by the Corps will minimize the overall amount of substrate disturbance and sediment suspension. PDC also restrict the amount of washed gravel that can be placed for restoration and prevents dumping by hopper barge which will also minimize the overall amount of substrate disturbance and sediment suspension associated with this activity.

In summary, all of the culture and restoration activities mentioned above are likely to produce short-term resuspension of some fine sediments in the water column. The frequency and intensity of disturbance activities on a bed will vary, depending on the area being cultivated, crew size, equipment used, and crop rotations. However, given that these activities will occur in an unconstrained estuarine environment where tidal flushing is occurring regularly, and background suspended sediment concentrations are generally high, the overall effects of any increases in suspended sediment will be localized and minimal, and of short-duration (minutes to hours). Application of the PDC will also limit the exposure of OC coho salmon, SDPS green sturgeon, and SDPS eulachon to these effects. The overall duration of exposure and intensity of effects are likely to be low such that there will be no measurable effects on individual OC coho salmon smolts or adults, on SDPS green sturgeon adults or sub-adults, or on SDPS eulachon larvae or adults. Furthermore, these activities only occur in certain portions of the estuaries, ranging in extent from <1% and up to 28% of the total estuary, such that species with very low abundance (i.e., eulachon) are unlikely to be exposed and other species present are likely to avoid exposure by moving to other undisturbed areas of the estuary. Therefore, there will only be insignificant effects on these species from substrate disturbance and suspended sediment generated by the proposed action.

*Unintentional chemical contamination.* Some growers, but not all, frequently access their shellfish beds at low tides by using boats, all-terrain vehicles, or trucks. Oyster harrowing, mechanical oyster dredge harvest, and seeding also requires the use of boats. Boats or barges, all-terrain vehicles, and trucks all require fuel, oil, and other chemical fluids. Larger boats or barges, such as ones used for oyster harrowing, for mechanical oyster dredge harvesting or for transporting harvested shellfish, contain greater volumes of these hazardous fluids, but only a few growers in Oregon likely use larger boats for dredge harvest and harrowing. Boating can result in discharges of many pollutants from boats and related facilities (USEPA 1993, Carrasquero 2001). Boats, and vehicles operated along the shore line, inherently bring fuel, oil, hydraulic fluids, and lubricants in closer contact with and increases the potential for unintentional chemical contamination into the action area from exhaust, fuel spills, or release of petroleum lubricants (Mosisch and Arthington 1998, Warrington 1999, Asplund 2000). As described in the proposed action section, crews are only able to access shellfish beds for approximately 29 days per year, and those dates are spread throughout the year, as crews are dependent on low tide cycles. Harrowing, mechanical oyster dredge harvest, and seeding likely do not occur as frequently.

Petroleum-based contaminants (such as fuel, oil, and some hydraulic fluids) contain polycyclic aromatic hydrocarbons (PAHs), which are acutely toxic to listed fish species and other aquatic

organisms at high levels of exposure and cause sublethal adverse effects on aquatic organisms at lower concentrations (Heintz *et al.* 1999, Heintz *et al.* 2000, Incardona *et al.* 2004, Incardona *et al.* 2005, Incardona *et al.* 2006). To minimize the probability of contamination from accidental spills that result from leaks and ruptured hydraulic hoses, equipment, and vehicles, the Corps will require use of staging areas at least 150 feet from surface waters, and regular inspection and cleaning before operation to ensure that vehicles remain free of external oil, grease, and other visible contaminants. Where use of staging areas at least 150 feet from surface waters is not possible, the Corps will require additional information describing site constraints and a spill prevention plan including best management practices to: (1) Maintain and protect vehicles; (2) contain fuel and other vehicle fluids; and (3) prevent leaks and spills from entering the water; and approval from NMFS. For all gas-powered vehicles or power equipment that cannot be refueled in a staging area at least 150 feet away from a stream or waterbody (i.e., boats), the Corps will require the grower to: (1) transfer fuels in EPA-compliant portable fuel containers $\leq 5$ gallons during refilling; (2) use a polypropylene pad or other appropriate spill protection; and (3) use a funnel or spill-proof spout when refueling to prevent possible contamination of surface waters. The Corps will also require the grower to keep a spill kit available in case of accidental spills, and, in the event a spill occurs, require growers to contain and remove such spills immediately. Plans that include the mandatory components (see PDC 4(b)(iii) will ensure that practitioners will reduce the probability and frequency of accidental spills and also minimize the magnitude of contamination from accidental spills. Overall, PDC will minimize the probability and magnitude of unintentional chemical contamination and limit the overall volume of pollutants entering the water. Furthermore, the estuaries in the action area are well-flushed systems, because of tidal, wave, wind, and freshwater inputs, which will rapidly reduce and disperse the small amounts of contaminants from unintentional releases to unmeasurable concentrations, even if multiple small spills occur in the same estuary.

Although SDPS eulachon larvae are likely to be susceptible to effects from PAHs, they are not present in the action area in large numbers. Therefore, given the size of the estuaries, the limited amount of activities occurring associated with unintentional chemical contamination, and the quick dispersion of introduced contaminants, it is extremely unlikely that any individual SDPS eulachon larvae will be exposed to levels of unintentional chemical contaminations that would result in measurable effects on these individual larvae.

Furthermore, SDPS eulachon adults, OC coho salmon adults and smolts, and SDPS green sturgeon adults and sub-adults are not nearly as susceptible to injury by exposure to cardiotoxic PAHs as embryos and larvae. Therefore, considering the accidental release of toxic compounds will likely be small in magnitude and disperse rapidly from tidal exchange, exposure will only be to concentrations low enough to be insignificant on individual OC coho salmon smolts or adults, on individual SDPS green sturgeon adults or sub-adults, or on adult SDPS eulachon. Therefore, due to the small magnitude and rapid dispersal of chemical contaminants, the effects from unintentional contamination from the proposed activities will be insignificant on OC coho salmon, SDPS green sturgeon, and adult SDPS eulachon.

*Pumps.* The Corps is proposing to authorize the use of pumps to withdraw water from the estuaries for rinsing shellfish prior to processing, for wet storage, or for activities associated with hatchery and nursery operations. In Oregon, water withdrawal only occurs for remote setting. Only small pumps are used and intake diameter is also small. Pumps are operated in the estuary

when SDPS eulachon larvae are being transported through to the ocean, including the months of April, May, and June. OC coho smolts and sub-adult and adult green sturgeon will also be present in the action area when pumps are operated; we do not expect that adult eulachon will be present in the action area when pumps are operated (April - September).

Although the PDC require that all pumps be screened in accordance with NMFS criteria, NMFS criteria are based on salmon fry swimming performance. Eulachon larvae are transparent, very small (0.16-0.31 inch), and are passively transported by the tidal currents, waves, and wind in and through the estuary (Parente and Snyder 1970, Hay and McCarter 2000). Salmon fry have far greater swimming performance and are larger than SDPS eulachon larvae (at least 3 times as large) so NMFS criteria are not sufficient to protect SDPS eulachon larvae from being entrained by pumps. However, no more than 6 pumps will be operated at any one time by existing operations and the maximum number of pumps likely to be used within an estuary by existing operations is 3 (in Coos Bay). New/expanded farms have the potential to add additional pump use. Given the small amount of new/expanded farms proposed, it is unlikely that they will use as many pumps as currently used by existing operations, however, as a conservative estimate, we will assume this is the case, such that pump use will double and up to 12 pumps will be operated at any one time within the action area by existing farms and new/expanded farms. We do not know how long each batch of oyster larvae remain in tanks or how many batches growers grow each year in Oregon. There are 90 days per year (April through June) when SDPS eulachon larvae are exposed to pump operation and risk entrainment. However, pumps are not operated 24 hours a day and maybe not even every day. Seawater may be pumped for as short of a time as 15 minutes or as long as 4 hours when they are used. Considering that adult presence and abundance are likely to be sporadic and low in the estuaries, it is unlikely that SDPS eulachon larvae are present in the action area in large numbers, and when also considering the overall large estuary sizes and that a small number of pumps are used, are not run continuously, their small size, and that pumps are not placed in the middle of the estuary, it is extremely unlikely that any individua SDPS eulachon larvae will be exposed to pumps during their operation.

We do not anticipate very young juvenile coho salmon to be present in the areas where pumps will be used, only outmigrating smolts or adult coho salmon. Only adult or sub-adult SDPS green sturgeon will be present in the action area. Both OC coho salmon and SDPS green sturgeon are much stronger swimmers or are larger in size than the eulachon larvae or adults. Yearling coho salmon/coho smolts are approximately 5 inches in length when they move through the estuaries to the ocean and their burst swimming speed is estimated at 4 to 5 fps (Bell 1990). Niggemeyer and Duster (2003) estimated cruising speed, a sustained swimming speed, for green sturgeon at one body length per second. Burst speeds would likely be higher than this, possibly twice as fast. Adult green sturgeon captured in various research studies range from 3.9 to 7.4 feet in length (Erickson and Webb 2007, Moser and Lindley 2007). Juvenile green sturgeon may enter the ocean environment when they are 2- to 3-years old and possibly 2 feet long (Adams *et al.* 2002). Based on the body lengths, burst speed for adult green sturgeon of this reported size would be 8 to 15 fps (2 body lengths per second) and 4 fps for small sub-adults. Overall, it is extremely unlikely that either species will be entrained or otherwise injured by properly-screened pumps used in the estuaries.

*Mechanical oyster dredge harvest.* Adult and juvenile SDPS eulachon are incidentally captured in several west coast fisheries, including the pink shrimp trawl fishery, limited entry bottom

trawl fishery, and Pacific hake/whiting off-shore fisheries (Emmett *et al.* 2001, Bellman *et al.* 2008, NWFSC 2008). However, fishing methods and equipment are very different in these commercial fisheries as compared to harvest methods used in the shellfish aquaculture industry. In the shellfish aquaculture industry, as proposed, oyster bags are used in oyster mechanical dredge harvest. It is unlikely that adult SDPS eulachon would be captured by a mechanical oyster dredge. Langer *et al.* (1977) estimated that burst swimming speed of eulachon (30 second duration) was 4.9 fps and ranged from 6.6 fps for large eulachon to 3.3 fps for smaller eulachon. Therefore, adult eulachon burst swimming speeds exceed the tow speed of the mechanical oyster dredge (<3.3 fps), thus their size and mobility allows them to avoid the oyster dredge. Additionally, the burst swimming speeds of yearling OC coho salmon/coho smolts, adult OC coho salmon, and adult and sub-adult SDPS green sturgeon all exceed the tow speed of the mechanical oyster dredge and therefore it is extremely unlikely that either species will be entrained or otherwise injured by an oyster dredge, or that any individuals will experience behavioral disturbance that will result in a measurable change in survival, breeding, feeding, or sheltering.

However, eulachon larvae are extremely weak swimmers. They are also captured deep in the water column in the lower Columbia River (Howell *et al.* 2001). In spite of the low tow speed, some SDPS eulachon larvae are likely to be swept up by the oyster dredge. However, the large size of the mesh, compared to small larvae size, would allow larvae to pass through the dredge bag. Therefore, it is extremely unlikely that eulachon larvae will be entrained or otherwise injured by the oyster dredge.

***Effects on Critical Habitat***

The action area includes designated critical habitat for OC coho salmon, SDPS green sturgeon, and SDPS eulachon; the PCEs and biological and physical features of their critical habitat are described above in Tables 3-5. We analyzed the potential impacts of the proposed action on critical habitat and determined that the proposed action will only affect the water quality and the migratory corridor/free of artificial obstruction features of critical habitat. However, as described above, these effects to critical habitat from the proposed action will be discountable or insignificant.

1. Water quality. Instances of increased suspended sediment and unintentional chemical contamination will be localized and minor due to PDC and undetectable due to the limited magnitude and unconstrained estuarine environment where tidal flushing is occurring regularly. Therefore, effects on the water quality feature of critical habitat from the proposed action will be insignificant due to their localized and temporary nature.
2. Migratory corridor/free of artificial obstruction. Pumps and mechanical oyster dredge harvest have the potential to interfere with the migratory corridor or create artificial obstructions to migration. These would be temporary effects as pumps are only operated during April through September and mechanical oyster dredge harvest will only occur for a moderate number of hours per day as needed. Critical habitat for SDPS eulachon is most susceptible, but pumps are not used in the Umpqua estuary, which is the only critical habitat designated for SDPS eulachon in the action area. The migratory corridor/free of artificial obstruction feature of critical habitat for outmigrating OC coho smolts, adult OC coho salmon, and adult or sub-adult SDPS green sturgeon is extremely unlikely to be affected because of their larger size and greater swimming speeds and

because of the scarcity and small size of pumps in the action area. In terms of mechanical oyster dredge harvest, the activity is insufficient to interfere with this feature of critical habitat because burst swimming speeds of adult SDPS eulachon, yearling OC coho salmon/coho smolts, adult OC coho salmon, and adult and sub-adult SDPS green sturgeon all exceed the tow speed of the mechanical oyster dredge. For SDPS eulachon larvae, the large size of the mesh, compared to small larvae size, would allow larvae to pass through the dredge bag, such that the migratory corridor feature of critical habitat for SDPS eulachon larvae is also extremely unlikely to be affected. Overall, effects on the migratory corridor/free of artificial obstruction feature of critical habitat will be discountable or insignificant.

**Conclusion**

Based on this analysis, NMFS concurs with the Corps that the proposed action is not likely to adversely affect OC coho salmon and SDPS green sturgeon and designated critical habitats. We also concluded that the proposed action is not likely to adversely affect SDPS eulachon and their designated critical habitat.

**Reinitiation of Consultation**

Reinitiation of consultation is required and shall be requested by the Corps or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this concurrence letter; or if (3) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). This concludes the ESA portion of this consultation.

## MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION

Under the MSA, this consultation is intended to promote the protection, conservation and enhancement of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10), and "adverse effect" means any impact which reduces either the quality or quantity of EFH (50 CFR 600.910(a)). Adverse effects may include direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

The action area is designated as EFH for Pacific salmon (PFMC 1999), five coastal pelagic species (PFMC 1998), and 22 groundfish species (PFMC 2005; Table 7).

**Table 7.** Species with designated EFH in the action area.

| Species | | Lifestage | Activity* | Prey |
|---|---|---|---|---|
| Groundfish[22] | | | | |
| Arrowtooth Flounder | Atheresthes stomias | larvae | | |
| | | eggs | | |
| Black rockfish | Sebastes melanops | juveniles | feeding | amphipods, barnacle cypriots, copepods, crustacean zoea, fish larvae, mysids, polychaetes |
| Blue rockfish | Sebastes mystinus | larvae | | |
| Bocaccio | Sebastes paucispinis | larvae | | |
| Brown rockfish | Sebastes auriculatus | larvae | feeding | |
| California skate | Raja inornata | adults | all | |
| | | eggs | | |
| Copper rockfish | Sebastes caurinus | larvae | feeding | |
| English sole | Parophrys vetulus | juveniles | feeding | amphipods, copepods, cumaceans, molluscs, mysids, polychaetes |
| | | adults | all | amphipods,crustaceans, cumaceans, molluscs, ophiuroids, polychaetes |
| | | eggs | | |
| | | larvae | feeding | |
| Kelp greenling | Hexagrammos decagrammus | larvae | | |
| Lingcod | Ophiodon elongates | eggs | | |
| Longnose skate | Raja rhina | eggs | | |
| Pacific cod | Gadus macrocephalus | eggs | | |
| Pacific rattail | | eggs | | |
| | | larvae | | |
| Pacific sanddab | Citharichthys sordidus | larvae | feeding | |
| Sablefish | Anoplopoma fimbria | eggs | | |
| Sand sole | Psettichthys melanostictus | larvae | | |
| | | eggs | | |
| Soupfin shark | Galeorhinus galeus | adults | all | fish, invertebrates |
| | | juveniles | growth to maturity | fish, invertebrates |
| Spiny dogfish | Squalus acanthias | adults | all | |
| | | juveniles | feeding | |

[22] Groundfish species list created using the following materials used to support the EFH designations (amendment 19) within the 2005 groundfish fishery management plan: 1) habitat use database; 2) habitat suitability probability maps; and 3) groundfish life history descriptions (PFMC 2005).

| Species | | Lifestage | Activity* | Prey |
|---|---|---|---|---|
| Splitnose rockfish | | larvae | | |
| Starry flounder | Platichthys stellatus | adults | all | crabs, fish juveniles, molluscs, polychaetes |
| | | juveniles | feeding | amphipods, copepods, polychaetes |
| | | eggs | | |
| | | larvae | | |
| Whiting (Pacific hake) | Merluccius productus | adult | | |

*Activities include: breeding, feeding, growth to maturity, spawning, unknown

| | |
|---|---|
| Pacific Salmon | |
| Chinook salmon | Oncorhynchus tshawytscha |
| Coho salmon | Oncorhynchus kisutch |
| Coastal Pelagics | |
| Northern anchovy | Engraulis mordax |
| Jack mackerel | Trachurus symmetricus |
| Pacific sardine | Sardinops sagax |
| Pacific (chub) mackerel | Scomber japonicas |
| Market squid | Loligo opalescens |

Estuaries and submerged aquatic vegetation are two types of habitat designated by the Pacific Fishery Management Council (PFMC) as Habitat Areas of Particular Concern (HAPC) for groundfish species because estuaries are nutrient-rich and biologically-productive, providing critical nursery ground for many groundfish species managed by the PFMC. Eelgrass is a vital component to the life history cycle of fish, particularly young fish, as it is a rich source of benthic invertebrate production and provides cover from predators.

Eelgrass is an ecosystem engineer that provides estuarine functions including structural complexity for predator refugia, detritus for the basis of the food web (Zieman and Wetzel 1980, Emmett *et al.* 1991, Hoss and Thayer 1993, Herke and Rogers 1993), nutrient regeneration (Klug 1980, Twilley *et al.* 1986), sediment stabilization (Fonseca and Fisher 1986), and habitat for many fish and marine invertebrates (Thayer and Phillips 1977, Heck and Orth 1980, Zieman 1982, Heck and Thoman 1984, Phillips 1984, Thayer *et al.* 1984, Hoffman 1986, Wilson *et al.* 1990). In the intertidal estuarine environment, it is a foundational element, supporting the base of the food web. Eelgrass also provides an invertebrate and vertebrate prey base and shelter from predation for smaller individuals in their more susceptible life stages and is a key component of functioning estuarine ecosystems. Eelgrass patches support spawning, feeding, and growth of herring (Blackmon *et al.* 2006, Penttila 2007) as well as harpacticoid copepods. These are both items on which juvenile salmon feed (Simenstad *et al.* 1979, Healey 1982, Murphy *et al.* 1988, Higgs *et al.* 1995) and groundfish also prey on herring.

Chinook salmon and groundfish species have a greater affinity for eelgrass than the ESA-listed species. Adequate cover and marine vegetation in estuarine and nearshore habitats have been identified as important elements in Pacific salmon marine EFH in estuarine habitats. Loss of eelgrass beds is specifically identified as a habitat concern. Eelgrass provides shelter and food for juvenile salmon (Phillips 1984) and the Pacific salmon FMP (PFMC 1999) suggests alterations to eelgrass beds may result in loss of cover from predators, loss of primary

productivity, and loss of prey. Laboratory studies of Chinook salmon smolt behavior indicated that *Zostera marina* may provide a better refuge than other habitat types. Larger juveniles preferred the structure of *Zostera marina* as a refuge over oysters or open sand substrate when exposed to a mock heron predator (Dumbauld 2005). Additionally, Chinook smolts had a strong preference for remaining in *Zostera marina*, while no preference existed for other structured benthic habitats, such as oyster beds, non-native eelgrass (*Zostera japonica*), and non-native smooth cordgrass, in an enclosure study in Willapa Bay (Semmens 2008).

Estuaries are also important rearing habitat for juvenile flatfish, rockfish, and elasmobranchs. Eelgrass is also specifically mentioned in the life history descriptions of cabezon, bocaccio, lingcod, brown rockfish, grass rockfish, quillback rockfish, black rockfish, copper rockfish, and English sole within the groundfish FMP (PFMC 2005). Additional literature also supports the use of eelgrass by some groundfish species (Love *et al.* 1991, Murphy *et al.* 2000, Nightingale and Simenstad 2001, Johnson *et al.* 2003). English sole, copper rockfish, and rockfish larvae/juveniles are considered "resident" users of eelgrass beds; black rockfish, quillback rockfish, lingcod, and cabezon are considered "transient" users, as described in Phillips' (1984) description of eelgrass meadows in the Pacific Northwest. Many rockfish juveniles settle into shallow, vegetated (e.g., kelp and eelgrass) habitats to meet critical juvenile rearing needs. These habitats provide both predation refuge and increased access to prey resources.

Eelgrass distribution overlaps directly with the estuarine area where most shellfish aquaculture occurs (Committee 2010). Groundfish species and Chinook salmon will be exposed to a reduction in *Zostera marina* density and spatial cover resulting from proposed activities disturbing eelgrass. For this reason, NMFS has determined that the proposed action would adversely affect EFH designated for groundfish species and Pacific salmon as follows.

1. Natural Cover/Forage/Seagrass HAPC. Managed shellfish beds cyclically reduce and disturb the density and development of eelgrass that provides habitat functions for Pacific salmon and groundfish species and their forage species. Where sufficient rhizome nodes remain intact following disturbance, eelgrass can recover (Cabaco *et al.* 2005), although recovery may take an extended period of time and eelgrass density may be initially lower. Eelgrass may also recover via a seed source. Eelgrass respond to the addition of oysters by reducing the density of shoots and by decreasing the size (length) of shoots (Wagner *et al.* 2012). Eelgrass regrowth can occur on a shellfish bed following aquaculture activities that have reduced existing eelgrass, but cyclical management activities limit the density and functional condition of eelgrass on commercial shellfish aquaculture plats.

   Typical seeding density for bottom culture beds in in Pacific Northwest bays and estuaries is approximately 200 to 250 bushels/bags per acre although density may vary depending on site productivity (Rumrill 2013). At this seeding density, NMFS expects there to be an approximate 60-75% decline in *Zostera marina* density if seeding occurs on eelgrass beds (Rumrill 2013). Although *Zostera marina* can recover following disturbance (i.e., during grow-out prior to harvest), the proposed action will likely maintain conditions limiting *Zostera marina* beds in the action area. The Corps will require all new/expanded farms and all newly positioned equipment (i.e., racks, stakes, flip bags, or on-bottom culture) and operations within existing farms to avoid existing *Zostera marina* beds. For newly positioned shellfish long-lines, the Corps will only allow

a spacing that has been demonstrated to minimize impacts to eelgrass (Rumrill and Poulton 2004). Therefore, only existing shellfish aquaculture beds and equipment are likely to continue to maintain disturbances to *Zostera marina* density.

Mechanical oyster dredge harvest occurs in Tillamook Bay (553 acres), Yaquina River (512 acres), and Coos Bay/South Slough (1,062 acres). Available research supports the conclusion that dredge harvesting of oysters reduces the spatial extent and density of eelgrass beds by physically damaging the plants. Tallis *et al.* (2009) conducted a large-scale simulated mechanical harvest experiment in Willapa Bay, Washington. The authors found 70% fewer eelgrass plants in dredged beds as compared to uncultivated areas. Eelgrass loss was attributed to removal of and physical damage to plants, as reflected in these statements: "The direct effect of dredging reduces the density of eelgrass via breakage of shoots and rhizomes. The dredge implement and steel mesh bag physically overturn the sediment, cut eelgrass blades or rhizomes or entangle, whole plants, removing blades and rhizomes with oysters" (Waddell (1964) and personal observation by Brett Dumbauld, as cited in Tallis *et al.* (2009)). Another study conducted a few years earlier in Willapa Bay, Washington, also found that the density of adult eelgrass shoots was significantly lower in areas that had been dredge harvested (Wisehart *et al.* 2007). Harrowing likely causes similar negative effects to eelgrass and, to our best knowledge, occurs in the same estuaries in which mechanical oyster dredge harvest occurs. However, the Corps requires growers to avoid *Zostera marina* when establishing new/expanded farms and for all newly positioned bottom culture. Therefore, only mechanical oyster dredge harvest and harrowing of existing shellfish aquaculture beds are likely to continue to maintain disturbances to *Zostera marina* density.

Accessing shellfish bed by boats, all-terrain vehicles, trucks, or by foot, also disturbs eelgrass. However, the Corps requires growers to avoid using motorized vehicles in eelgrass beds, avoid grounding or anchoring boats in eelgrass beds, and avoid establishing walking paths through eelgrass beds. Where this is not possible, the Corps will require the grower to submit an access plan describing site constraints, specific measures and best management practices to minimize eelgrass disturbance from access. Approval from NMFS will be required prior to authorization. Access plans that include the mandatory components (see PDC 4(b)(ii)) will ensure that practitioners will only disturb eelgrass for access when necessary and minimize eelgrass disturbance from vehicle use, grounding/anchoring boats, and walking paths.

Overall, the proposed action would adversely affect EFH designated for Pacific salmon and groundfish by reducing eelgrass density and spatial cover, thus reducing the quality and quantity of natural cover and forage. The proposed action would also adversely affect the seagrass HAPC.

**Essential Fish Habitat Conservation Recommendations**

NMFS determined that the following conservation recommendation is necessary to avoid, mitigate, or offset the impact of the proposed action on EFH.

1. Minimize adverse effects due to authorizing shellfish activities by ensuring that all actions use the design criteria described in the proposed action, as appropriate. Fully

implementing this EFH conservation recommendation would protect, by avoiding or minimizing the adverse effects, approximately 5,277 acres of designated EFH for Pacific coast groundfish, coastal pelagic species, and Pacific salmon, including seagrass and estuarine HAPCs.

Within 30 days after receiving this recommendation, you must provide NMFS with a detailed written response (50 CFR 600.920(k)(1)). The number of conservation recommendations accepted should be clearly identified in that response. If your response is inconsistent with the EFH conservation recommendations, you must explain why the recommendations will not be followed, including the scientific justification for any disagreements over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects.

The Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600. 920(l)). This concludes the MSA portion of this consultation.

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. The Corps also has the same responsibilities, and informal consultation offers action agencies an opportunity to address their conservation responsibilities under section 7(a)(1).

Please direct questions regarding this letter to Michelle McMullin, fisheries biologist, in the Oregon Coast Branch of the Oregon Washington Coastal Area Office, at 541.957.3378 and Michelle.McMullin@noaa.gov.

Sincerely,

William W. Stelle, Jr.
Regional Administrator

Enclosure: Appendices

cc: John Byers, ODA
Judy Linton, Corps
Steve Rumrill, ODFW

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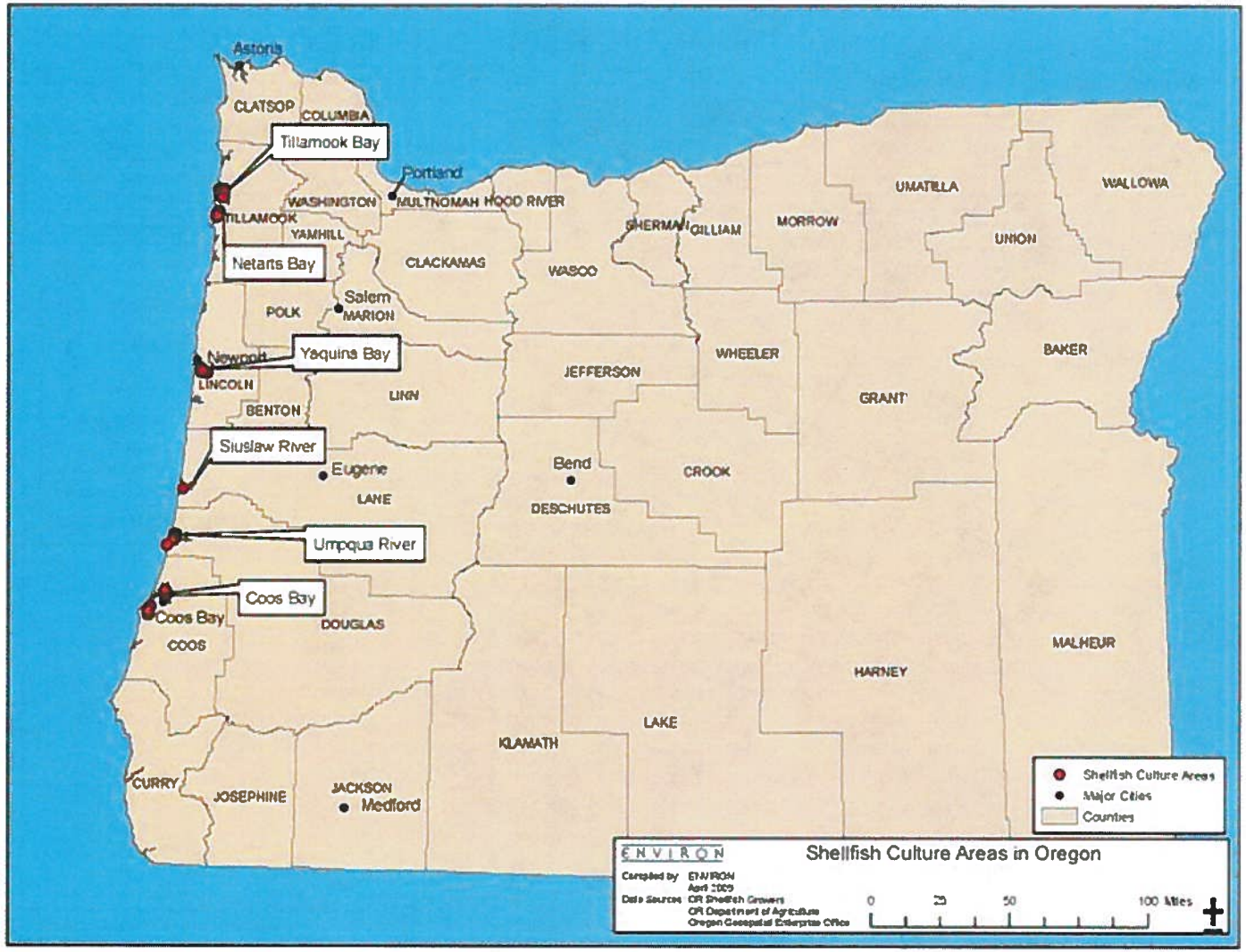
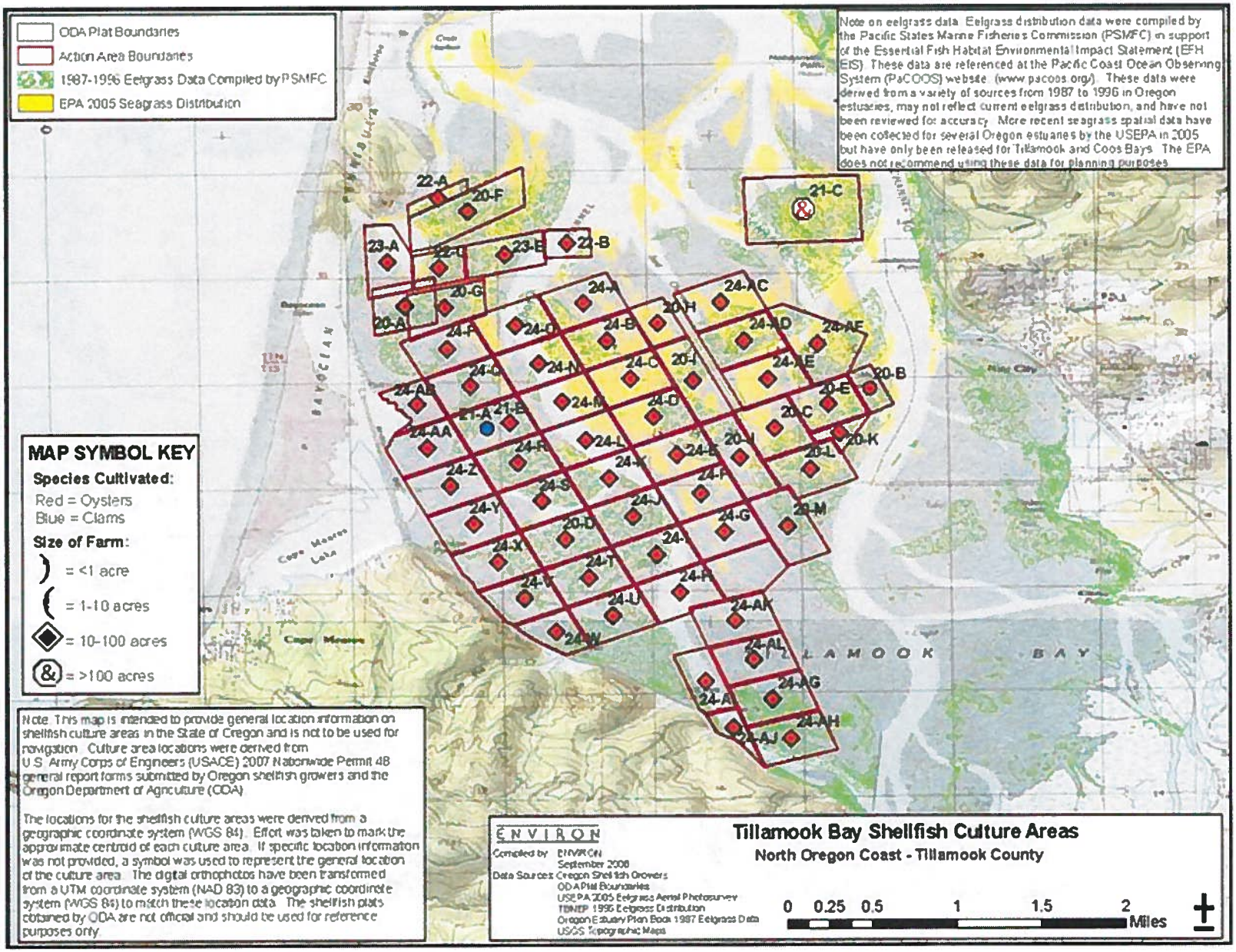
## APPENDIX A: Maps




ODA Plat Boundaries
Action Area Boundaries
1987-1996 Eelgrass Data Compiled by PSMFC
EPA 2005 Seagrass Distribution
Note on eelgrass data: Eelgrass distribution data were compiled by the Pacific States Marine Fisheries Commission (PSMFC) in support of the Essential Fish Habitat Environmental Impact Statement (EFH EIS). These data are referenced at the Pacific Coast Ocean Observing System (PaCOOS) website. (www.pacoos.org). These data were derived from a variety of sources from 1987 to 1996 in Oregon estuaries, may not reflect current eelgrass distribution, and have not been reviewed for accuracy. More recent seagrass spatial data have been collected for several Oregon estuaries by the USEPA in 2005 but have only been released for Tillamook and Coos Bays. The EPA does not recommend using these data for planning purposes.
MAP SYMBOL KEY
Species Cultivated:
Red = Oysters
Blue = Clams
Size of Farm:
= <1 acre
= 1-10 acres
= 10-100 acres
= >100 acres
Note: This map is intended to provide general location information on shellfish culture areas in the State of Oregon and is not to be used for navigation. Culture area locations were derived from U.S. Army Corps of Engineers (USACE) 2007 Nationwide Permit 48 general report forms submitted by Oregon shellfish growers and the Oregon Department of Agriculture (ODA).
The locations for the shellfish culture areas were derived from a geographic coordinate system (WGS 84). Effort was taken to mark the approximate centroid of each culture area. If specific location information was not provided, a symbol was used to represent the general location of the culture area. The digital orthophotos have been transformed from a UTM coordinate system (NAD 83) to a geographic coordinate system (WGS 84) to match these location data. The shellfish plats obtained by ODA are not official and should be used for reference purposes only.
ENVIRON
Compiled by: ENVIRON
September 2008
Data Sources: Oregon Shellfish Growers
ODA Plat Boundaries
USEPA 2005 Eelgrass Aerial Photosurvey
TBNEP 1995 Eelgrass Distribution
Oregon Estuary Plan Book 1987 Eelgrass Data
USGS Topographic Maps
Tillamook Bay Shellfish Culture Areas
North Oregon Coast - Tillamook County
0 0.25 0.5 1 1.5 2 Miles
TILLAMOOK BAY
Cape Meares
Cape Meares Lake
Bayocean
22-A
20-F
23-A
22-C
23-E
21-B
21-C
20-G
20-A
24-A
24-AC
20-H
24-F
24-D
24-B
24-AD
24-AE
24-N
24-C
20-I
24-AE
20-B
24-AB
24-M
24-O
20-E
21-A
21-B
20-C
24-AA
24-L
24-E
20-J
20-K
24-Z
24-K
20-L
24-S
24-J
24-Y
20-D
24-G
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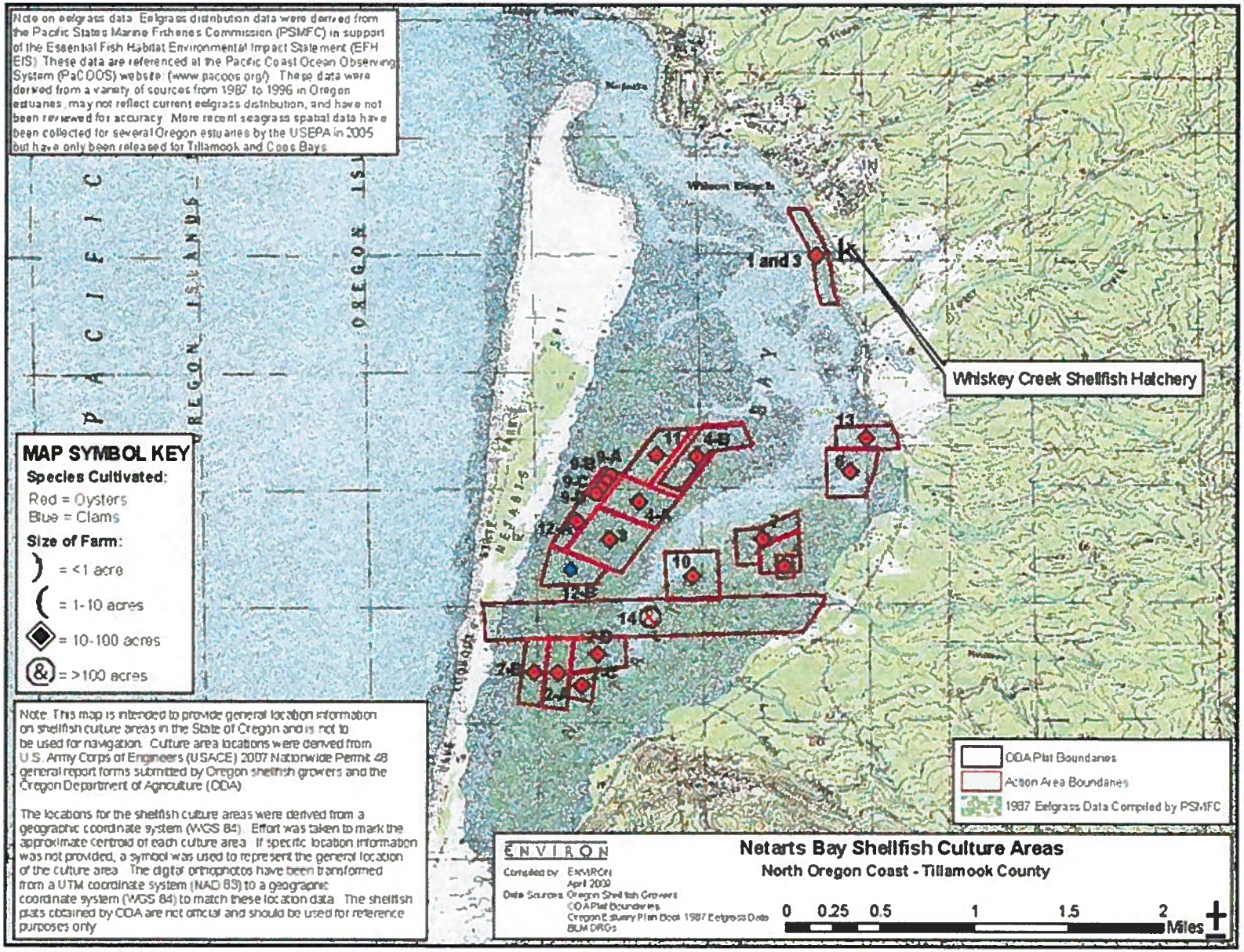
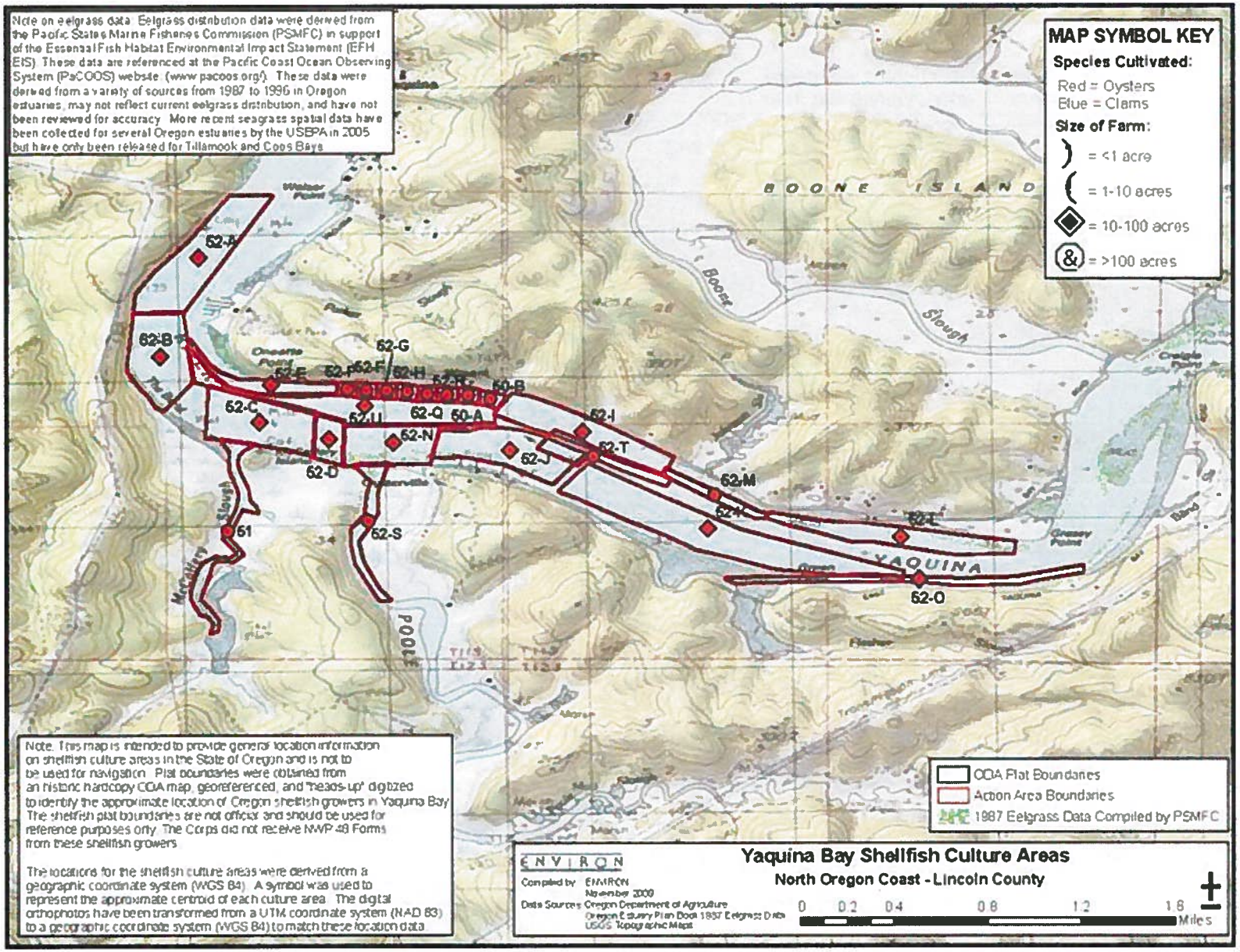

Note on eelgrass data: Eelgrass distribution data were derived from the Pacific States Marine Fisheries Commission (PSMFC) in support of the Essential Fish Habitat Environmental Impact Statement (EFH EIS). These data are referenced at the Pacific Coast Ocean Observing System (PaCOOS) website (www.pacoos.org). These data were derived from a variety of sources from 1987 to 1996 in Oregon estuaries, may not reflect current eelgrass distribution, and have not been reviewed for accuracy. More recent seagrass spatial data have been collected for several Oregon estuaries by the USEPA in 2005 but have only been released for Tillamook and Coos Bays.
PACIFIC
OREGON ISLANDS
Whiskey Creek Shellfish Hatchery
1 and 3
MAP SYMBOL KEY
Species Cultivated:
Red = Oysters
Blue = Clams
Size of Farm:
= <1 acre
= 1-10 acres
= 10-100 acres
= >100 acres
Note: This map is intended to provide general location information on shellfish culture areas in the State of Oregon and is not to be used for navigation. Culture area locations were derived from U.S. Army Corps of Engineers (USACE) 2007 Nationwide Permit 48 general report forms submitted by Oregon shellfish growers and the Oregon Department of Agriculture (ODA).
The locations for the shellfish culture areas were derived from a geographic coordinate system (WGS 84). Effort was taken to mark the approximate centroid of each culture area. If specific location information was not provided, a symbol was used to represent the general location of the culture area. The digital orthophotos have been transformed from a UTM coordinate system (NAD 83) to a geographic coordinate system (WGS 84) to match these location data. The shellfish plats obtained by ODA are not official and should be used for reference purposes only.
ODA Plat Boundaries
Action Area Boundaries
1987 Eelgrass Data Compiled by PSMFC
ENVIRON
Compiled by: ENVIRON
April 2009
Data Sources: Oregon Shellfish Growers
ODA Plat Boundaries
Oregon Estuary Plan Book 1987 Eelgrass Data
BLM DRGs
Netarts Bay Shellfish Culture Areas
North Oregon Coast - Tillamook County
0 0.25 0.5 1 1.5 2
Miles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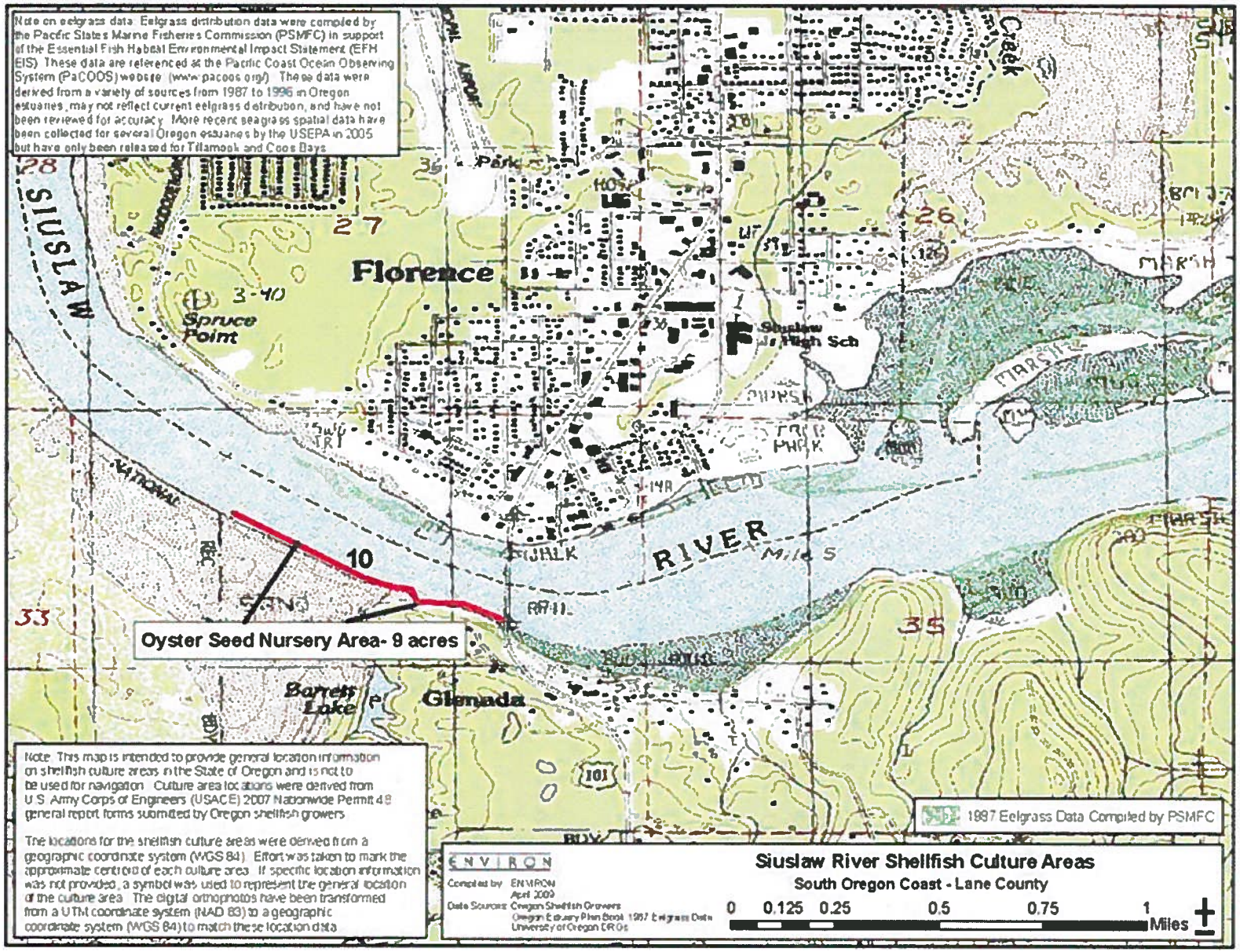
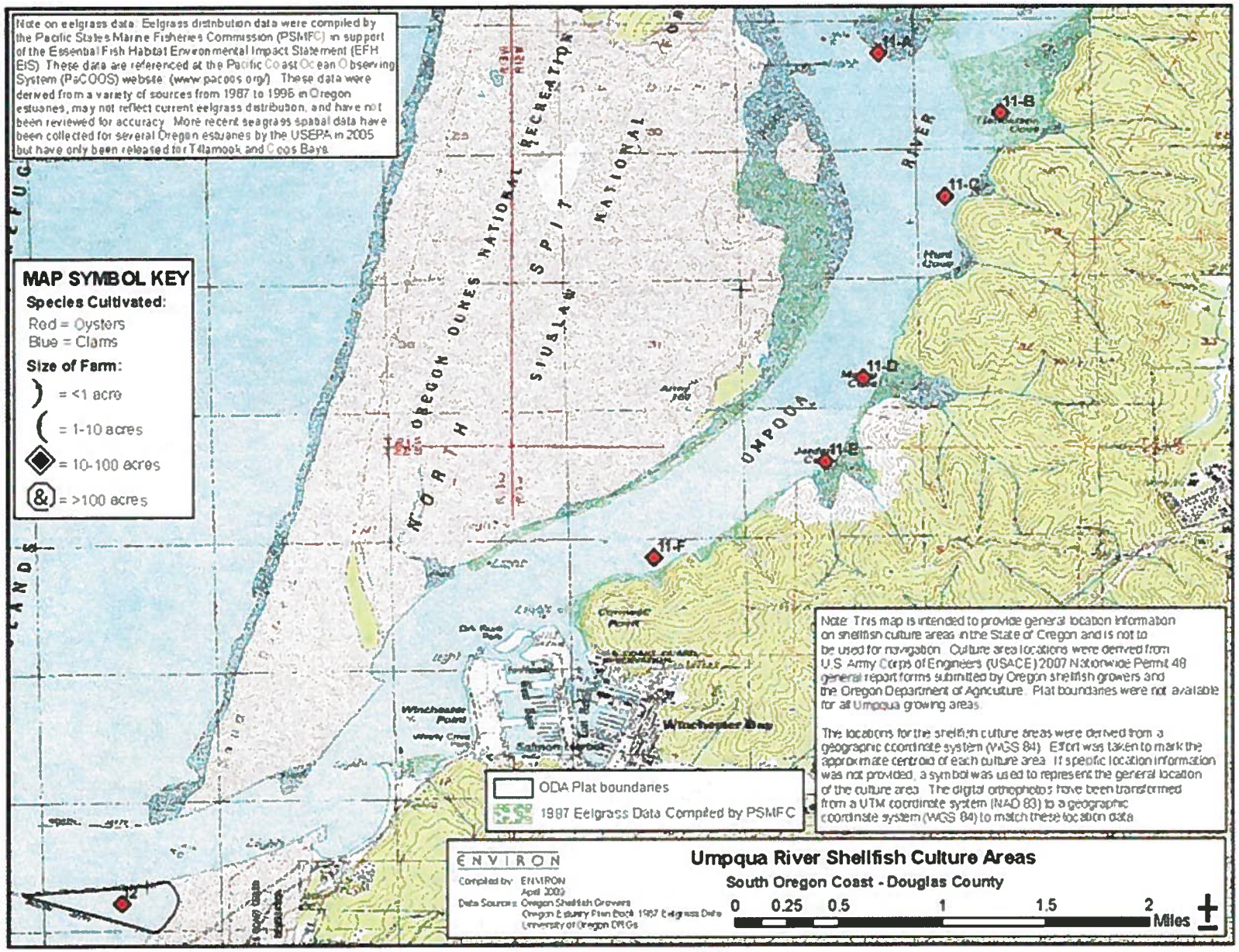
MAP SYMBOL KEY
Species Cultivated:
Red = Oysters
Blue = Clams
Size of Farm:
= <1 acre
= 1-10 acres
= 10-100 acres
= >100 acres
BOONE ISLAND
Boone Slough
YAQUINA
52-A
52-B
52-C
52-D
52-E
52-F
52-G
52-H
52-I
52-J
52-K
52-L
52-M
52-N
52-O
52-Q
52-S
52-T
50-A
50-B
51
Note: This map is intended to provide general location information on shellfish culture areas in the State of Oregon and is not to be used for navigation. Plat boundaries were obtained from an historic hardcopy COA map, georeferenced, and 'heads-up' digitized to identify the approximate location of Oregon shellfish growers in Yaquina Bay. The shellfish plat boundaries are not official and should be used for reference purposes only. The Corps did not receive NWP 48 Forms from these shellfish growers.
The locations for the shellfish culture areas were derived from a geographic coordinate system (WGS 84). A symbol was used to represent the approximate centroid of each culture area. The digital orthophotos have been transformed from a UTM coordinate system (NAD 83) to a geographic coordinate system (WGS 84) to match these location data.
COA Plat Boundaries
Action Area Boundaries
1987 Eelgrass Data Compiled by PSMFC
ENVIRON
Compiled by: ENVIRON
November 2009
Data Sources: Oregon Department of Agriculture
Oregon Estuary Plan Book 1987 Eelgrass Data
USGS Topographic Maps
Yaquina Bay Shellfish Culture Areas
North Oregon Coast - Lincoln County
0 0.2 0.4 0.8 1.2 1.6
Miles


Note on eelgrass data: Eelgrass distribution data were compiled by the Pacific States Marine Fisheries Commission (PSMFC) in support of the Essential Fish Habitat Environmental Impact Statement (EFH EIS). These data are referenced at the Pacific Coast Ocean Observing System (PaCOOS) website (www.pacoos.org). These data were derived from a variety of sources from 1987 to 1996 in Oregon estuaries, may not reflect current eelgrass distribution, and have not been reviewed for accuracy. More recent seagrass spatial data have been collected for several Oregon estuaries by the USEPA in 2005 but have only been released for Tillamook and Coos Bays.
Florence
Spruce Point
Siuslaw High Sch
SIUSLAW RIVER
10
Oyster Seed Nursery Area- 9 acres
Barrett Lake
Glenada
101
Note: This map is intended to provide general location information on shellfish culture areas in the State of Oregon and is not to be used for navigation. Culture area locations were derived from U.S. Army Corps of Engineers (USACE) 2007 Nationwide Permit 48 general report forms submitted by Oregon shellfish growers.
The locations for the shellfish culture areas were derived from a geographic coordinate system (WGS 84). Effort was taken to mark the approximate centroid of each culture area. If specific location information was not provided, a symbol was used to represent the general location of the culture area. The digital orthophotos have been transformed from a UTM coordinate system (NAD 83) to a geographic coordinate system (WGS 84) to match these location data.
1987 Eelgrass Data Compiled by PSMFC
ENVIRON
Compiled by: ENVIRON
April 2009
Data Sources: Oregon Shellfish Growers
Oregon Estuary Plan Book, 1987 Eelgrass Data
University of Oregon ERGIS
Siuslaw River Shellfish Culture Areas
South Oregon Coast - Lane County
0 0.125 0.25 0.5 0.75 1 Miles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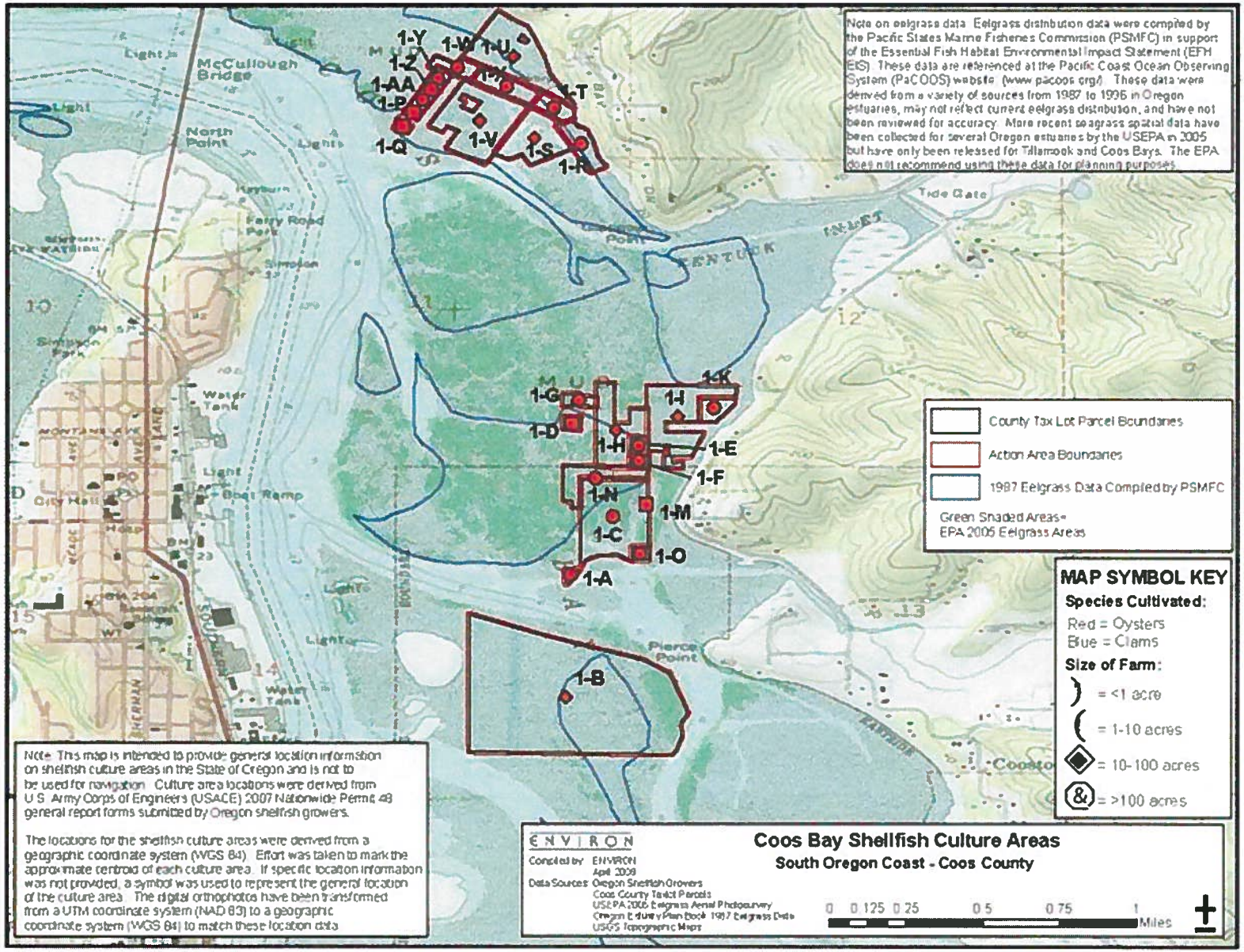
MAP SYMBOL KEY
Species Cultivated:
Red = Oysters
Blue = Clams
Size of Farm:
= <1 acre
= 1-10 acres
= 10-100 acres
= >100 acres
11-A
11-B
11-C
11-D
11-E
11-F
NORTH OREGON DUNES NATIONAL RECREATION
SIUSLAW SPIT NATIONAL
UMPQUA RIVER
Winchester Point
Winchester Bay
Salmon Harbor
ODA Plat boundaries
1987 Eelgrass Data Compiled by PSMFC
Note: This map is intended to provide general location information on shellfish culture areas in the State of Oregon and is not to be used for navigation. Culture area locations were derived from U.S. Army Corps of Engineers (USACE) 2007 Nationwide Permit 48 general report forms submitted by Oregon shellfish growers and the Oregon Department of Agriculture. Plat boundaries were not available for all Umpqua growing areas.
The locations for the shellfish culture areas were derived from a geographic coordinate system (WGS 84). Effort was taken to mark the approximate centroid of each culture area. If specific location information was not provided, a symbol was used to represent the general location of the culture area. The digital orthophotos have been transformed from a UTM coordinate system (NAD 83) to a geographic coordinate system (WGS 84) to match these location data.
ENVIRON
Compiled by: ENVIRON
April 2009
Data Sources: Oregon Shellfish Growers
Oregon Estuary Plan Book 1987 Eelgrass Data
University of Oregon OMGs
Umpqua River Shellfish Culture Areas
South Oregon Coast - Douglas County
0 0.25 0.5 1 1.5 2 Miles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1-Y
1-W
1-U
1-Z
1-AA
1-P
1-Q
1-V
1-S
1-T
1-R
1-K
1-J
1-G
1-D
1-H
1-E
1-F
1-N
1-M
1-C
1-O
1-A
1-B
McCullough Bridge
North Point
Ferry Road Park
Simpson Park
Water Tank
City Hall
Boat Ramp
Pierce Point
Tide Gate
County Tax Lot Parcel Boundaries
Action Area Boundaries
1987 Eelgrass Data Compiled by PSMFC
Green Shaded Areas=
EPA 2005 Eelgrass Areas
MAP SYMBOL KEY
Species Cultivated:
Red = Oysters
Blue = Clams
Size of Farm:
= <1 acre
= 1-10 acres
= 10-100 acres
= >100 acres
Note: This map is intended to provide general location information on shellfish culture areas in the State of Oregon and is not to be used for navigation. Culture area locations were derived from U.S. Army Corps of Engineers (USACE) 2007 Nationwide Permit 48 general report forms submitted by Oregon shellfish growers.
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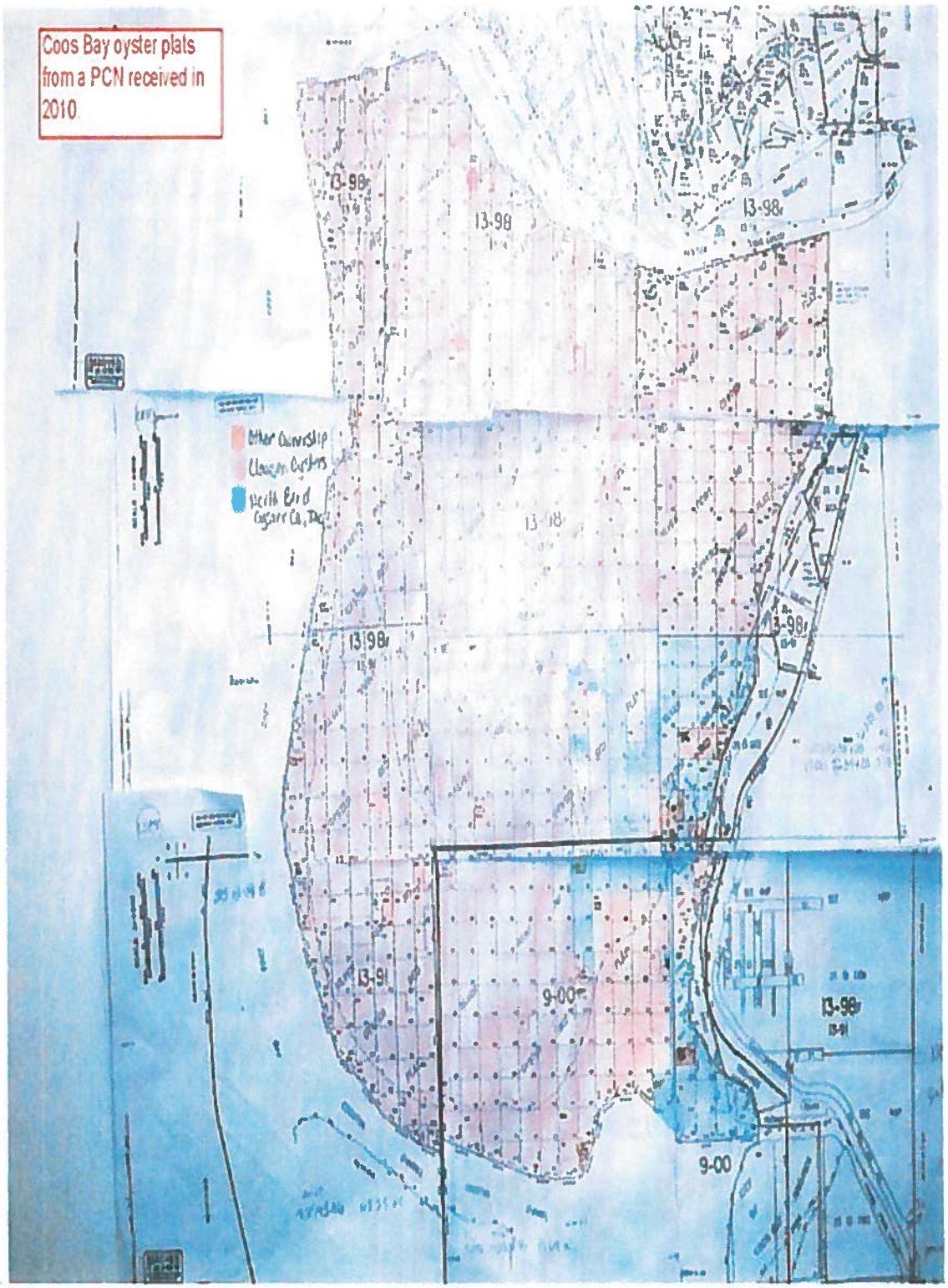
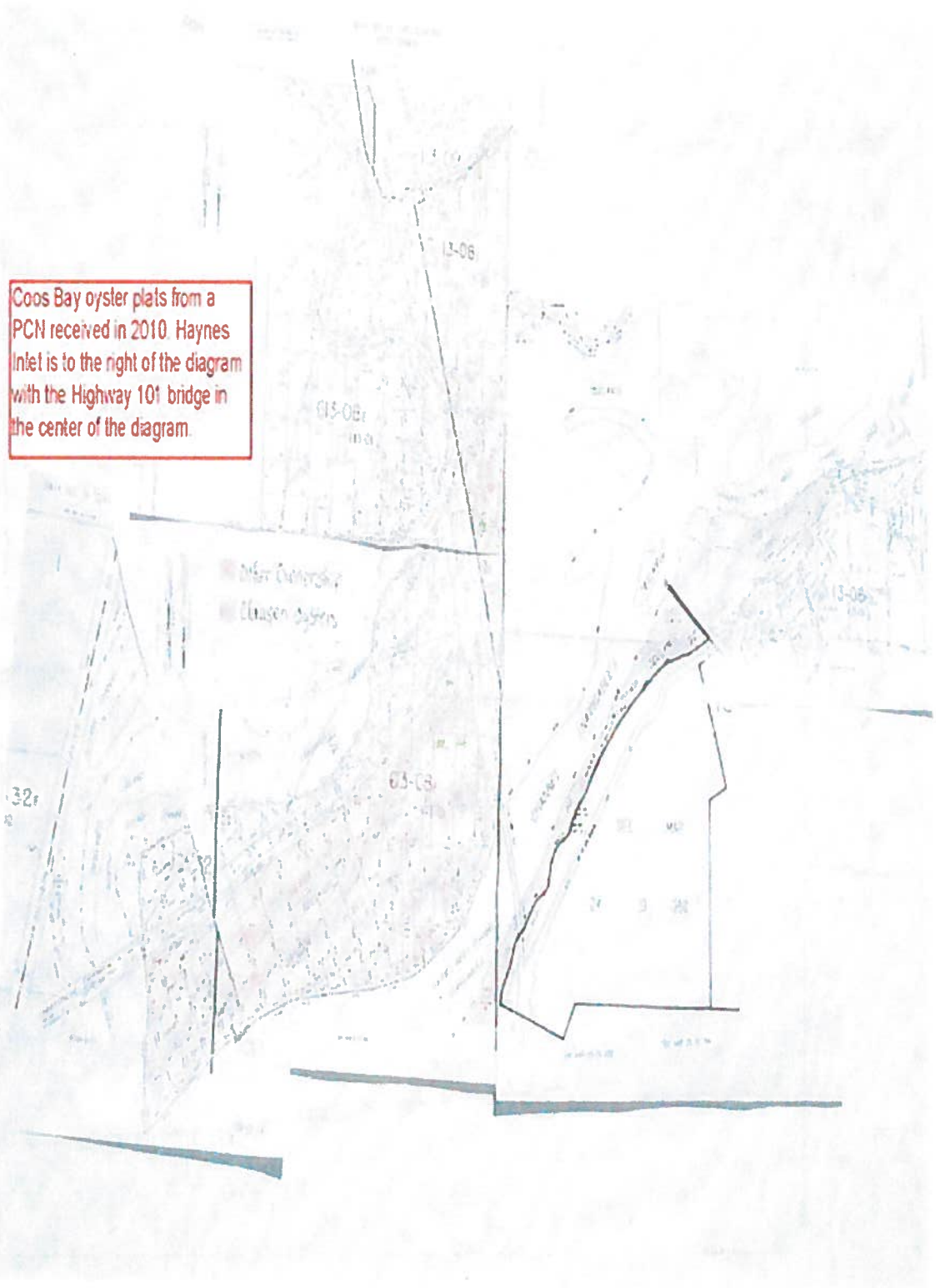
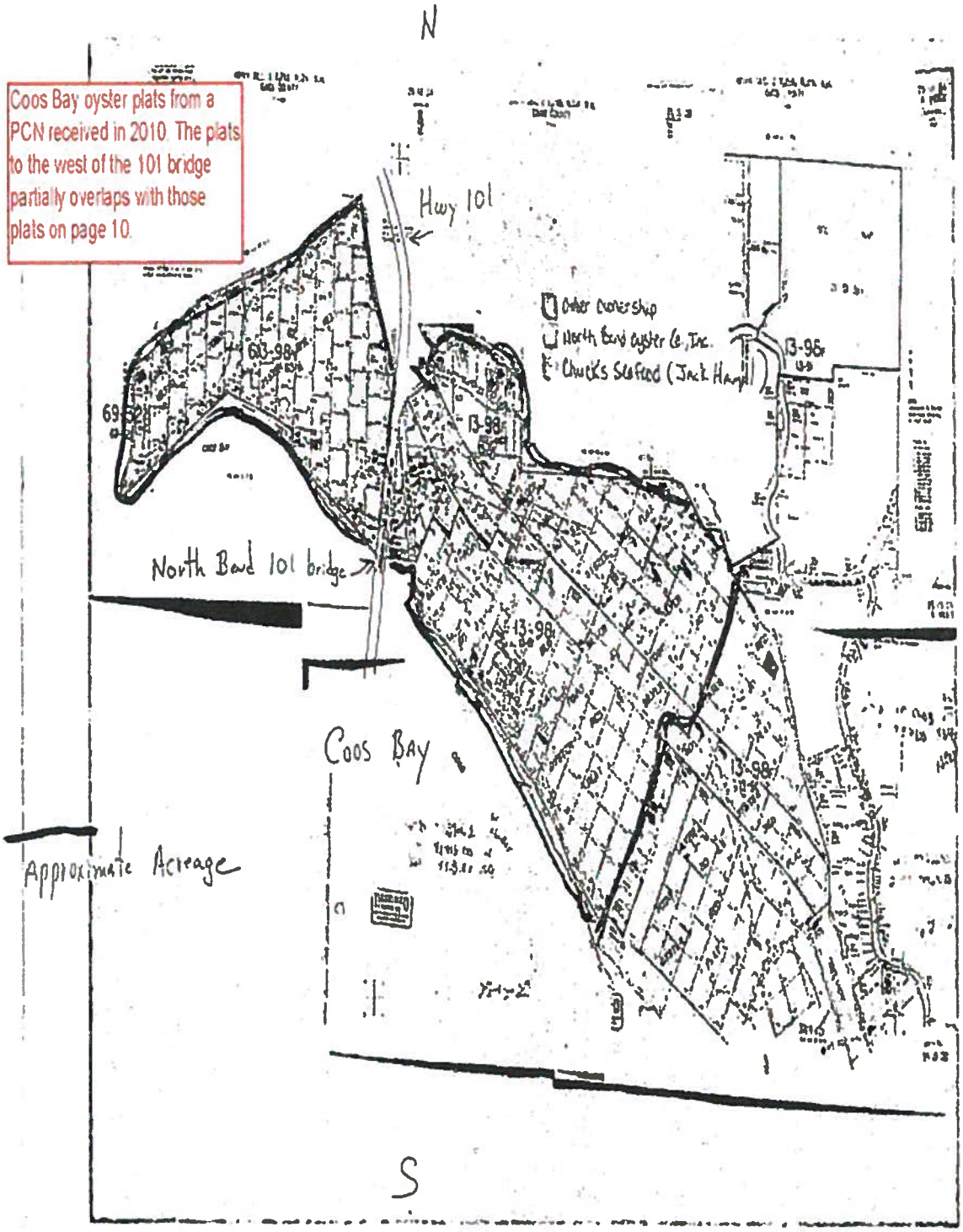
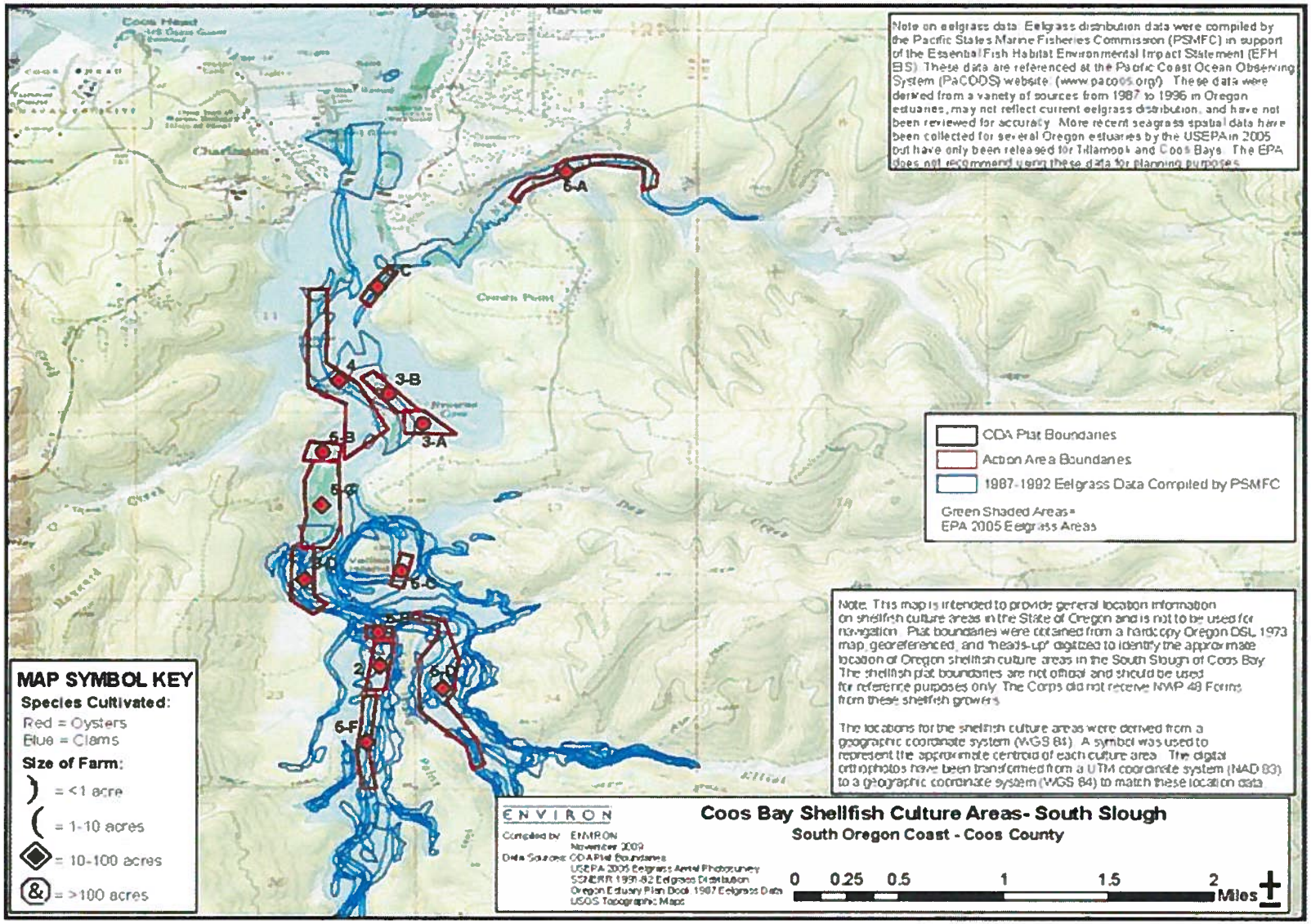
ENVIRON
Compiled by: ENVIRON
April 2009
Data Sources: Oregon Shellfish Growers
Coos County Tax Lot Parcels
USEPA 2005 Eelgrass Aerial Photosurvey
Oregon Estuary Plan Book 1987 Eelgrass Data
USGS Topographic Maps
Coos Bay Shellfish Culture Areas
South Oregon Coast - Coos County
0 0.125 0.25 0.5 0.75 1 Miles


Coos Bay oyster plats from a PCN received in 2010
13-98
13-98
13-98
13-98
13-98
13-98
13-91
9-00
9-00
13-98


Coos Bay oyster plats from a PCN received in 2010. Haynes Inlet is to the right of the diagram with the Highway 101 bridge in the center of the diagram.


N
Coos Bay oyster plats from a PCN received in 2010. The plats to the west of the 101 bridge partially overlaps with those plats on page 10.
Hwy 101
Other Ownership
North Bend Oyster Co. Inc.
Chuck's Seafood (Jack Hargil
13-96
69-98
13-98
North Bend 101 bridge
Coos Bay
Approximate Acreage
S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CDA Plat Boundaries
Action Area Boundaries
1987-1992 Eelgrass Data Compiled by PSMFC
Green Shaded Areas = EPA 2005 Eelgrass Areas
Note: This map is intended to provide general location information on shellfish culture areas in the State of Oregon and is not to be used for navigation. Plat boundaries were obtained from a hard copy Oregon DSL 1973 map, georeferenced, and 'heads-up' digitized to identify the approximate location of Oregon shellfish culture areas in the South Slough of Coos Bay. The shellfish plat boundaries are not official and should be used for reference purposes only. The Corps did not receive NWP 48 Forms from these shellfish growers.
The locations for the shellfish culture areas were derived from a geographic coordinate system (WGS 84). A symbol was used to represent the approximate centroid of each culture area. The digital orthophotos have been transformed from a UTM coordinate system (NAD 83) to a geographic coordinate system (WGS 84) to match these location data.
MAP SYMBOL KEY
Species Cultivated:
Red = Oysters
Blue = Clams
Size of Farm:
= <1 acre
= 1-10 acres
= 10-100 acres
= >100 acres
ENVIRON
Compiled by: ENVIRON
November 2009
Data Sources: CDA Plat Boundaries
USEPA 2005 Eelgrass Aerial Photosurvey
SOMERR 1991-92 Eelgrass Distribution
Oregon Estuary Plan Book 1987 Eelgrass Data
USGS Topographic Maps
Coos Bay Shellfish Culture Areas- South Slough
South Oregon Coast - Coos County
0 0.25 0.5 1 1.5 2 Miles
Coos Head
Charleston
Cronin Point
6-A
6-C
4
3-B
3-A
6-B
6-D
6-G
6-E
2
6-F
6-H

## APPENDIX B: Guidelines and Forms

**E-mail Directions and Action Notification Form for Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration Programmatic Consultation.**

The **Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration** programmatic e-mail box (*shellfish.oregon@noaa.gov*) is to be used for actions submitted to the National Marine Fisheries Service (NMFS) by the Portland District Army Corps of Engineers (Corps) for consultation.

The Corps must ensure the final project is being submitted to avoid multiple submittals and withdrawals. In rare occurrences, a withdrawal may be necessary and unavoidable. In this situation, please specify in the e-mail subject line that the project is being withdrawn. There is no form for a withdrawal, simply state the reason for the withdrawal and submit to the e-mail box, following the email titling conventions. If a previously withdrawn notification is resubmitted later, this resubmittal will be regarded as a new action notification.

An automatic reply will be sent upon receipt, but no other communication will be sent from the programmatic e-mail box; this box is used for **Incoming Only**. All other pre-decisional communication should be conducted **outside** the use of the *shellfish.oregon@noaa.gov* e-mail.

The Corps will send only **one** project per e-mail submittal, and will attach all related documents. These documents will include the following:

1. Action Notification Form.
2. New Farm Map(s) (if applicable).

E-mail "Subject Line" Titling Conventions
In the subject line of the email (see below for requirements), clearly identify the information as stated in numbers 1-7 below. Use caution when entering the necessary information in the subject line. **If these titling conventions are not used, the e-mail will not be accepted.**

Ensure that you clearly identify the following in the subject line of the e-mail:

1. Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration Programmatic;
2. The specific submittal category (30-day approval, no approval, or withdrawal);
3. Corps Permit number;
4. Plat number;
5. Practitioner Name (you may use last name only, or **commonly used** abbreviations);
6. County; and
7. Estuary or Waterway.

Example of E-mail "Subject Line" Titling Requirements:

Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration_Specific Submittal Category, Corps Permit #, Plat #, Practitioner Name, County, Estuary/Waterway.

*Example of E-mail "Subject Line" Titling with Submittal Categories*. Below are examples of the two different types of Submittal Categories using the e-mail "Subject Line" format:

Action Approval – e-mail subject line examples

Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration_No Approval, NWP-XXXX-XXXX, Plat 52, Crenshaw, Tillamook, Netarts Bay

Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration_30-day Approval, NWP-XXXX-XXXX, Plat 52, Crenshaw, Tillamook, Netarts Bay

Withdrawal – e-mail subject line example

Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration_Withdrawal, NWP-XXXX-XXXX, Plat 52, Crenshaw, Tillamook, Netarts Bay

Project Description:

Please provide enough information for NMFS to be able to determine the effects of the action and whether the project meets the Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration criteria. Attach additional sheets if necessary. The project description should include information such as (but not limited to):

- Type of activity: Native shellfish restoration, existing commercial shellfish aquaculture, or new/expanded commercial shellfish aquaculture
- # acres
- Eelgrass presence
- Species cultivated
- Documentation species that has been previously cultivated in that bay or is indigent to the area (Alsea expansion only).
- Type of culture
- Seeding density (for bottom culture only)
- Harvest method
- Use of harrowing
- Long-line spacing
- access method (foot, ATV, or boat or other watercraft)
- additional support activities
- additional details such as the frequency of each activity and the total number of acres of each activity, if known
- the total number of acres aquaculture overlaps with eelgrass
- Forage fish presence
- Water withdrawal activities including pipes and pump locations, general timing, approximate amount withdrawn, and screens designed to meet NMFS and ODFW criteria
- Total hours of pump operation from April through June annually
- Total days of boat and vehicle operation from February through June, annually

- Description of native shellfish bed restoration, including species and amount placed, proximity to eelgrass, need for and depth of substrate enhancement, and type of material used (i.e., gravel or shell)

**Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration Programmatic**

**Action Notification Form**

**NMFS Review and Approval.** The Corps project manager shall submit this form with the Action Notification portion completed to NMFS at *shellfish.oregon@noaa.gov* for notification or approval at least 30 days prior to Corps authorization.

**Approval from NMFS.** Any action that involves a **new or expanded farm or a required access plan or a required fueling and staging plan** must be individually reviewed and approved by NMFS as consistent with the Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration programmatic before that action is authorized by the Corps. NMFS will notify the Corps within 30 calendar days if the action is approved or disqualified.

Additionally, at least 30 days prior to implementation of any modifications to an access plan or a fueling and staging plan, as described below, the practitioner must notify the Corps and the Corps must notify NMFS of the modifications. Within 30 days of receiving these modification notifications NMFS will inform the Corps by e-mail of whether the action is still eligible for coverage under this consultation.

Attach the following supplemental information to e-mail message as required for NMFS approval:

- If eelgrass is present *within a new farm area*, growers must document eelgrass bed locations on a map or sketch which must be submitted to NMFS at least 30 days prior to authorization. The following information must be included to scale: plat boundaries, eelgrass bed locations and boundaries, shellfish seeding/planting locations. Surveys to determine presence and location of eelgrass beds should be done during times of peak above-ground biomass: June-August.
- *For expansion into Alsea Bay*: Documentation must be provided that the proposed species has previously been cultivated in Alsea Bay or is indigent to the area.
- *Use of motorized vehicles (i.e., ATVs, tractors) in eelgrass beds, grounding or anchoring of watercraft in eelgrass beds, and walking paths through eelgrass beds to access commercial shellfish aquaculture or restoration site* also **Requires Approval from NMFS**. If a plat or restoration site cannot be accessed without use of vehicles in eelgrass beds or without grounding/anchoring watercraft in eelgrass beds or without walking through eelgrass beds, the action must be individually reviewed and approved by NMFS as consistent with the Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration programmatic before that action is authorized. The practitioner must provide an access plan to the Corps describing specific measures and/or best management practices used to minimize negative effects to eelgrass from activities and must implement the plan. The access plan must 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.

- *Fueling, storing, daily leak inspection, maintenance, and repair of vehicles < 150 feet away from any stream, waterbody, or wetland* also **Requires Approval from NMFS**. If a practitioner is unable to fuel, store, inspect, maintain, or repair vehicles in a location greater than ≥ 150 feet from any stream, waterbody, or wetland, the action must be individually reviewed and approved by NMFS as consistent with the Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration programmatic before that action is authorized. The practitioner must provide documentation describing the site constraints that prevent compliance with the PDC and include a fueling and staging plan. The fueling and staging plan must include a spill prevention plan describing specific measures and/or best management practices used to maintain and protect vehicles, contain fuel and other vehicle fluids, and prevent leaks and spills from entering the water. The plan must include the following components: (a) description of a items in a spill prevention kit and how the kit will be kept readily available, (b) description of employee training in use of the spill prevention kit, (c) use of 5 gallon (or smaller) EPA-compliant portable fuel containers, (d) use of funnels or spill-proof spouts and polypropylene pads or similar materials during fueling, (e) daily inspection routines for leaks or improper functioning prior to vehicle/boat use, (f) dockside fueling containment measures, and (g) description and location of vehicle/boat maintenance and repair site, including distance away from a waterbody and how chemical contaminants will be prevented from leaving the site and entering the water.

## Oregon Commercial Shellfish Aquaculture and Native Shellfish Restoration Programmatic
# Action Notification Form

| | | | |
|---|---|---|---|
| **Date of Request:** | | NMFS Tracking #: WCR-2014-825 | |
| **Type of Request:** | ☐ Action Notification (No Approval)<br>☐ Action Notification (Approval required) | | |
| **Statutory Authority:** | ☐ ESA only ☐ EFH only ☐ ESA & EFH COMBINED | | |
| **Lead Action Agency:** | Corps of Engineers | | |
| **Action Agency Contact:** | | Corps Action ID #: | |
| **Practitioner Name:** | | Individual DSL Permit #: | |
| **Project Name:** | | | |
| **Plat Number(s) and Acres (include map numbers if applicable):** | | Is this a NEW or EXPANDED area? | |
| **6th Field HUC & Name:** | | | |
| **Latitude & Longitude (including degrees, minutes, and seconds)** | | | |
| **Proposed Aquaculture Duration:** | | | |
| **Species cultivated:** | | | |
| **Culture method(s):** | | | |
| **Long-line spacing (if using long-line culture methods):** | | | |
| **Harvest method(s):** | | | |
| **Access method(s):** | | | |
| **Is harrowing conducted?** | | | |
| **Water withdrawal activities – be sure to include total hours operated April through June annually:** | | | |
| **Total days of boat and vehicle operation from February through June annually** | | | |
| **Is eelgrass present?** | | Amount of overlap between eelgrass and aquaculture (acres): | |
| **Proposed Native Shellfish Restoration Duration:** | | Species and Amount Placed: | |

Project Description:

refer to e-mail instruction for relevant information to include

Actions Requiring **Approval** from NMFS:
Identify if any of these actions are proposed:

- ☐ New/Expanded Commercial Shellfish Aquaculture Area*
- ☐ Use of motorized vehicles (i.e., ATVs, tractors) in eelgrass beds, grounding or anchoring of watercraft in eelgrass beds, and walking paths through eelgrass beds to access commercial shellfish aquaculture or restoration site
- ☐ Fueling, storing, daily leak inspection, maintenance, and repair of vehicles < 150 feet away from any stream, waterbody, or wetland

**For expansion into Alsea Bay*: Documentation must be provided that the proposed species has previously been cultivated in Alsea Bay or is indigent to the area.

NMFS Species/Critical Habitat Present in Action Area:
Identify the species found in the action area:

| **ESA Species:** | **ESA Critical Habitat** | **EFH Species** |
|---|---|---|
| ☐ Oregon Coast coho salmon | ☐ Oregon Coast coho salmon | ☐ Pacific salmon |
| ☐ SDPS green sturgeon | ☐ SDPS green sturgeon | ☐ Groundfish |
| ☐ SDPS eulachon | ☐ SDPS eulachon | ☐ Coastal Pelagics |

Design Criteria:
Check the Design Criteria that will be included as conditions on the permit issued for this proposed action. Please attach the appropriate plan(s) for this proposed action.

| **Administrative:** | **Action:** |
|---|---|
| ☐ Electronic notification (3)<br><br>☐ Site access (6) | ☐ Native shellfish restoration<br><br>☐ Existing commercial shellfish aquaculture<br><br>**Activities Needing NMFS Approval**<br>*(supplemental information required)*<br>☐ New/Expanded commercial shellfish aquaculture (4bi)<br><br>☐ Use of motorized vehicles (i.e., ATVs, tractors) in eelgrass beds, grounding or anchoring of watercraft in eelgrass beds, and walking paths through eelgrass beds to access commercial shellfish aquaculture or restoration site (4bii)<br><br>☐ Fueling, storing, daily leak inspection, maintenance, and repair of vehicles <150 feet away from any stream, waterbody, or wetland (4biii) |
| **General:** | |
| ☐ Equipment storage and pump requirements (9a-d)<br>☐ Toxic compounds, chemicals, and other contaminants (10a-f)<br>☐ Native shellfish bed restoration (11a-d)<br>☐ Eelgrass avoidance (12a-d)<br>☐ Newly positioned equipment/operations within existing farms (13a-e)<br>☐ New/expanded area (14a-c)<br>☐ Forage fish (15a-d)<br>☐ Dredge bag adjustment (16)<br>☐ Includes total hours of pump operation April through June, annually | |

bcc: F/NWR4 - File copy, K. Phippen, M. McMullin (electronic — Word and pdf copies)

K:\Document Read File (Signed)\Programmatic Consultations\2014\COE_WCR-2014-825_Oregon Commercial Shellfish Aquaculture Programmatic\2014_9-23_final_Oregon Shellfish_WCR-2014-825.docx

**NMFS No.: WCR-2014-825**

Addressee email:

Shawn H. Zinszer
Shawn.H.Zinszer@usace.army.mil

cc(s) emails:

John Byers
jbyers@oda.state.or.us

Judy Linton
Judy.L.Linton@usace.army.mil

Steve Rumrill
Steven.S.Rumrill@state.or.us