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

Refer to NMFS No.:
2008/04549

February 12, 2010

Erik S. Petersen
Acting Chief, Regulatory Branch
Portland District, Corps of Engineers
P.O. Box 2946
Portland, Oregon 97208-2946

Re: Endangered Species Act Section 7 Informal Consultation and Conference Report and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Conservation Recommendations for the Oregon Resources Corporation for Mining of Heavy Minerals from Beach Sand Deposits in the Cape Arago Frontal (6th field HUC: 171003040307), and associated activities in the Coos Bay (6th field HUC: 171003040303) and Coalbank and Isthmus Sloughs (6th field HUC: 171003040302), Coos County, Oregon (Corps No.: NWP-2007-538)

Dear Mr. Petersen:

Prior to consultation, the National Marine Fisheries Service (NMFS) transmitted a general correspondence letter on July 8, 2008, to the Corps of Engineers (Corps), which identified general concerns regarding the effects of issuing a permit to Oregon Resources Corporation (ORC) to mine heavy minerals from beach sands, in response to the Corps Public Notice NWP-2007-538 issued on June 9, 2008. Then, on July 21, 2008, NMFS received your request for informal consultation under the Endangered Species Act (ESA) and under section 305 of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) for the effects of authorizing a permit to ORC to mine heavy minerals from beach sand deposits and associated activities under the Corps authority found in section 404 of the Clean Water Act. However, this request for informal consultation did not include a biological assessment (BA). Staff from NMFS also attended a meeting to discuss the proposed project on August 20, 2008.

The NMFS transmitted a letter dated February 6, 2009, stating that consultation would not proceed until NMFS received a BA for the proposed action. The NMFS received the BA on March 13, 2009, and NMFS also received information regarding hexavalent chromium on April 20, 2009. Upon review of the provided information, NMFS sent a second letter on June 29, 2009, that outlined the following points: (1) Statement of non-concurrence with the Corps' "may affect, not likely to adversely affect" (NLAA) determination for Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*), southern distinct population segment (southern) North American green sturgeon (*Acipenser medirostris*), and designated critical habitats; (2) request for project information and effects analysis relating to certain activities with the potential to affect ESA-listed marine mammals and turtle species; and (3) request for additional information necessary for consultation relating to culvert design, fish passage, culvert installation, groundwater and

surface water monitoring, flocculent toxicity, metals ecotoxicology, the use of treated wood, pile driving, stormwater treatment at the processing plant, hydroseeding, and canopy removal.

The NMFS received a packet with additional information, including NLAA determinations for Southern Resident killer whale distinct population segment (*Orcinus orca*), Eastern Distinct Population Segment of Steller Sea Lion (*Eumotoias jubatus*), and other ESA-listed marine mammals and sea turtles on October 19, 2009. A site visit was held on December 14, 2009, at the mining sites and was attended by representatives from the applicant, their consultant, and legal staff, NMFS, and the Oregon Department of Fish and Wildlife (ODFW) to assess the project action area, discuss the proposed action, examine habitat conditions, and to evaluate potential impacts of the proposed project. At this site visit NMFS received a stormwater assessment for West Beaver Hill Road and haul roads document. The NMFS also sent a general correspondence letter documenting the consultation status on December 22, 2009. On January 7, 2010, NMFS received a letter from Stoel Rives LLP on behalf of ORC identifying changes to the proposed action in response specifically to NMFS' concerns of take resulting from the proposed designs for the stream crossings at the North Seven Devils mine site and from pile driving. On January 26, 2010, NMFS received another letter from Stoel Rives LLP on behalf of ORC identifying additional changes to the proposed action also in response specifically to NMFS' concerns of take resulting from the proposed designs for the stream crossings at the North Seven Devils mine site and from pile driving.. The consultation included numerous telephone conversations and electronic mail between NMFS staff, the Corps, and the permit applicant/consultant/legal staff. Also included in this consultation is the recently proposed southern distinct population segment (southern) of Pacific eulachon (*Thaleichthys pacificus*). The NMFS also received sufficient information necessary to complete an essential fish habitat (EFH) assessment under the MSA.

This response to your letter 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,[1] and concludes that the action, as proposed, is NLAA OC coho salmon and their designated critical habitat, southern green sturgeon and their designated critical habitat, southern eulachon, Steller sea lions, blue whales, fin whales, humpback whales, Sei whales, sperm whales, Southern Resident killer whales, green sea turtles, leatherback sea turtles, olive ridley sea turtles, and loggerhead sea turtles.

This letter also transmits the results of our analysis of the effects of the proposed action on EFH 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,[2] and concludes that the action, as proposed, would not adversely affect EFH designated for Pacific salmon, groundfish, and coastal pelagic species. Therefore, no conservation measures are provided at this time and no further response is necessary.

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[1] Memorandum from D. Robert Lohn, Regional Administrator, to ESA Consultation Biologists (guidance on informal consultation and preparation of letters of concurrence) (January 30, 2006).

[2] Memorandum from William T. Hogarth, Acting Administrator for Fisheries, to Regional Administrators (national finding for use of Endangered Species Act section 7 consultation process to complete essential fish habitat consultations) (February 28, 2001).

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is the issuance of a permit by the Corps to ORC for mining of heavy minerals from beach sand deposits on elevated terraces at four locations in Coos County, Oregon, to extract the minerals chromite, garnet, and zircon (Table 1; Figure 1). The mineral-rich sand layer lies underneath non-heavy mineral sand deposits (which comprise overburden and topsoil) but above a basal clay layer. The proposed mines are located entirely within commercial timberlands owned by Weyerhaeuser Company and leased to ORC. The mine sites listed in Table 1 account for approximately 8.9% of the total leased acreage. Trees within the mine sites have been harvested or will be harvested by Weyerhaeuser Company prior to mining activities. Harvest will occur regardless of the proposed mining activities and therefore this activity, timber harvest, is not considered interdependent with nor interrelated to the proposed action. No perennial streams are located on the surface of the terraces where mining is proposed.

Table 1. Proposed mine site size and locations.

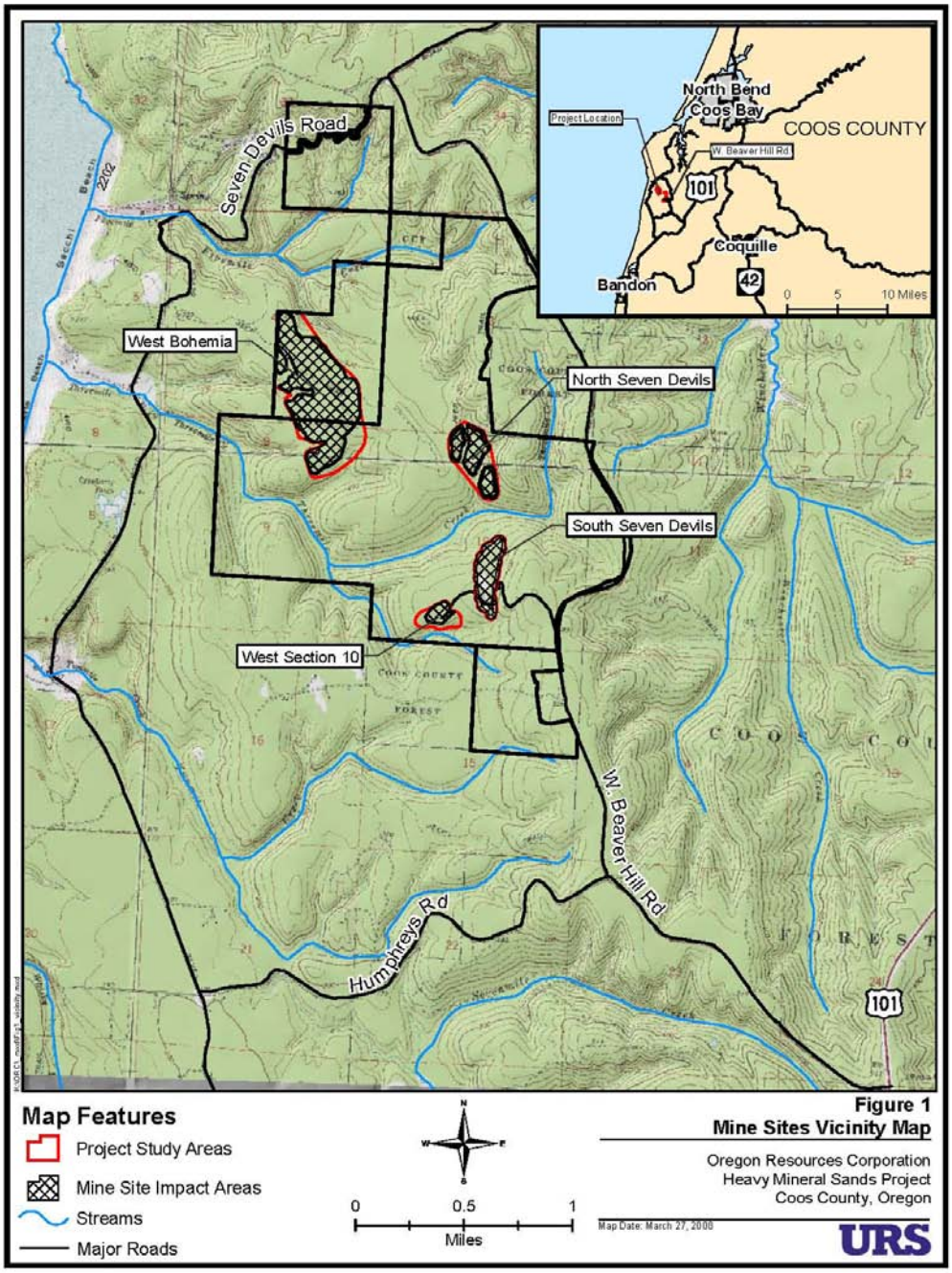
Mine Site	Area (Acres)	Township	Range	Section	¼ Section
West Bohemia	92.36	27S	14W	4	SE
		27S	14W	9	NE
North Seven Devils	20.98	27S	14W	3	SW
		27S	14W	10	NW& NE
South Seven Devils	23.09	27S	14W	10	SW& SE
West Section 10	4.68	27S	14W	10	SW

The proposed action consists of four general components: (1) Access roads and roadwork, (2) mining, (3) construction and operation of the processing plant in the city of Coos Bay, and (4) reclamation. The ORC has conducted baseline groundwater monitoring and intends to conduct additional groundwater monitoring at active mine sites prior to mining, during mining, and for at least two winters following reclamation of the site. In addition, NMFS considers the waterway transportation of the mineral resources by the buyer from the processing plant to be interdependent with and interrelated to the action.

Access Roads and Roadwork. Access to mine sites will require the improvement of two existing gravel roads and construction of two temporary gravel roads. Modifications and improvements are proposed for the access roads that serve the four mine sites including installation of gravel truck turnout areas and safety berms. The safety berms will also modify drainage conditions of the roadway. Under existing conditions runoff generated along the haul roads sheet flows directly from the road surface and discharges to the adjacent roadside vegetation in these areas. The berms proposed for safety purposes along steep embankments adjacent to the roadway alignment will also route road stormwater runoff away from wetland locations and surface water drainages within the mine sites and will minimize runoff from discharging directly to the adjacent vegetation. Instead the roadway will serve as the conveyance channel and runoff will discharge towards the adjacent roadside vegetation when the grade and berm configuration allow. Enhanced vegetation areas are also proposed at the low-lying locations along the existing haul road alignments where the indirect roadway runoff will likely

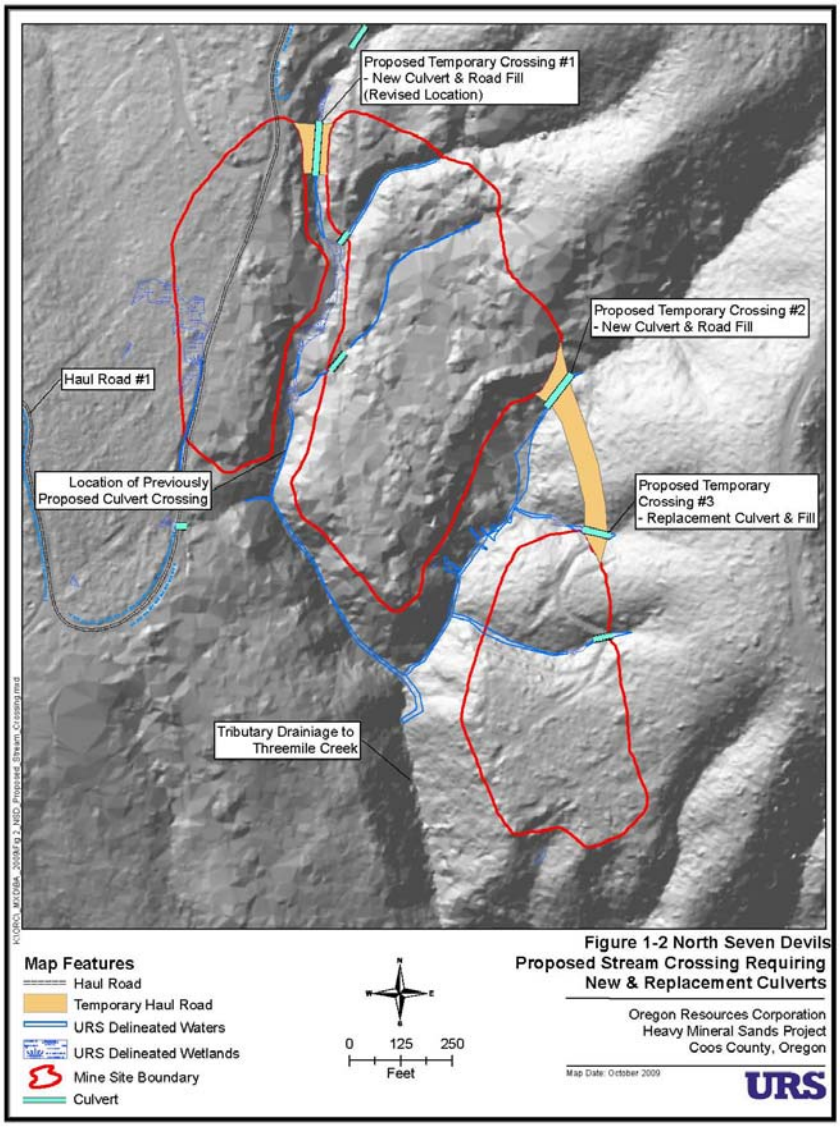
discharge following the berm installation. Structural controls are proposed along the access roads, and include vegetation enhancements and vegetated stormwater treatment and conveyance systems (bioswales).

Figure 1. Location of the four proposed mine sites in Coos County, Oregon.



Two temporary, gravel access roads are proposed to be installed to allow truck traffic access to each of the three individual mining units that comprise the North Seven Devils mine site (Figure 2). The total new gravel surface area associated with these roads is estimated to be approximately 7,200 square feet (0.17 acres). Temporary access roads will be constructed by placing fill over several existing and proposed roadbeds and will require the replacement of one existing culvert and the installation of two new culverts (Figure 2). All three stream crossings are located in the upper headwaters of tributaries to Threemile Creek and are all intermittent and high gradient (4.7%, 20.8%, and 30.4%) stream channels. The temporary culverts at these crossings will span the channel width that corresponds to the water surface elevation of the 100-year design storm (equivalent to the 100-year floodplain).

Figure 2. The three units of North Seven Devils mine site and locations of the three stream crossings.



To minimize sediment transport downstream and turbidity, the culverts will be closed-bottom and not embedded into the stream channel. Additionally, each culvert will be constructed with a stilling basin at the outlet with a pool to minimize scour of the stream channels. The culverts will be installed or replaced when there is no active flow in the stream channels. Additional best management practices (BMPs) are proposed for culvert installation and duration to minimize erosion and sediment transportation into the streams. Structural erosion and sediment control measures (*e.g.*, silt fences, diversion of run-on, straw bale dikes) will be installed during road construction and maintained throughout the duration of roadway usage. Each temporary access road will be installed with a berm along both sides to contain and divert the runoff down the road surface to the mine site instead of sheet flow over the sides towards surface drainages. Once diverted to the mine site, the stormwater will be managed with mine site stormwater (see Mining below). All fill and culverts associated with the installation of the two temporary access roads will be removed and the road footprints will be revegetated following mining. The culvert footprints will be filled with native streambed material preserved during placement; stream slopes and channel cross section and shape will be restored to the original conditions; any sediment depositions built up behind the culverts will be removed from the channels; rootwads and biodegradable, rolled erosion control products will be placed within the restored channels; and all constructed and visibly disturbed soils will be seeded by native grass and shrub species.

Mining. The applicant estimates that the smaller mine sites (North Seven Devils, South Seven Devils, and West Section 10) will be completely mined and reclaimed within a year each. The largest mine site (West Bohemia) will require about four years to mine and reclaim. In total, the proposed action will have a duration of between six and eight years, with mining activity occurring continuously throughout any given year. Mining will be conducted as a moving open pit operation by excavating the leading edge of the pit and backfilling the trailing edge of the pit and the excavation cell will be limited to a maximum area of ten acres. In general, the pit will be initially excavated at one end of the mine site. The pit will then progress across the impact site via excavation of the leading face of the mine pit, and backfilling of the trailing face of the mine pit with processing plant tailings, overburden, and topsoil. Thus site reclamation will be concurrent with mining operations, with site restoration being conducted as an ongoing part of mining operations, including backfilling, contouring, and grading of mined areas. A mine site erosion and sediment control plan has been prepared that describes erosion control measures proposed to minimize the amount of soil disturbed throughout the duration of the proposed action and is included in Appendix D of the BA.

A minimum undisturbed setback of 100 feet will be implemented on all perennial streams located outside of the mine sites, except for the three stream crossings at North Seven Devils. There will also be a minimum setback of 1.5 times the proposed mining depth between terraces and steep slopes and the applicant will not excavate slopes steeper than 1H:1V along setbacks.

Site preparation will include the following steps: (1) Equipment staging; (2) routing of surface waters (where needed); (3) establishment of work area perimeter and erosion control measures; (4) removal of timber slash and woody debris; (5) removal and stockpiling of topsoil; and (6) removal and stockpiling of overburden soils. Standard excavation equipment such as excavators, dozers, and front-end loaders will remove the overburden and topsoil to expose the mineral resource. Large woody debris, rock, and gravel will be removed from the mineral rich

sands by an in-pit mechanical sizing/sorting process. Material separated by mechanical sizing as undesirable will be set aside with the overburden and used for backfilling the mine pit during reclamation. The mineral rich layer will then be stockpiled within the mine site to allow excess water to dissipate from the material before transport.

During mining, surface water run-on will be conveyed around the mine pit, using dam and pump diversion methods for the North Seven Devils and South Seven Devils sites as these two mine sites both have small seasonal surface waters that enter (run-on) the mine sites from upslope areas. These intermittent streams are first order tributaries located on the uplifted terrace that drop off the plateau to their receiving waters at greater than 50° slopes. Water will be conveyed from diversion dams, constructed from sandbags unless there is substantial surface water flow, in which case other methods (*e.g.*, large rock, sheet pile) will be employed as needed, or pumps (if diversion cannot be achieved through gravity flow alone) to a downstream discharge point via piping. Discharge will occur downslope of the mine pit to ensure stream flow is maintained during mining, and to minimize the amount of water that will have to be managed in the mine pit through upland infiltration. Energy dissipaters will be used at all locations where stormwater run-on and/or diverted streams will be discharging to stream capture areas or prior to discharging off site. Run-on water may be directed through vegetation to avoid adding sediment to the stream. If necessary, a sediment trap will be installed to remove sediment from the stream. Following completion of mining and reclamation, new channels will be constructed and streams returned to their pre-construction location. These channels will reconnect the existing, undisturbed drainages upstream of the mine sites to their existing, undisturbed counterparts located downstream of the mine sites. The sections of stream channel in between will be mined but reconstructed (see Reclamation below).

A perimeter work area will be established around each mine site. The size of the perimeter work area will vary based on site constraints, but generally will be 100 feet in width, although in areas identified as minimal buffer areas this width will be less than 100 feet due to the absence of the traffic area and safety berm within the perimeter (refer to BA Appendix D for perimeter detail diagrams 1-6). These areas are primarily located at the North Seven Devils mine site and are on the edges of terraces (refer to BA Appendix D, Figures A-1 through Figure A-5 for perimeter detail locations). Located within the perimeter work area will be the following, from the perimeter inward to the pit:

- Erosion control BMPs at the perimeter will include perimeter controls (*e.g.*, silt fencing, secondary perimeter controls for sensitive areas, mulch, windrowed brush), run-on control, runoff discharge facilities, instream sediment management (such as sand bag barriers), and revegetation and vegetation maintenance. Silt fencing will be established at the extent of each mine disturbance area. Erosion controls will be inspected daily and these measures will be repaired and enhanced, as necessary, to maintain compliance. Collected slash and woody debris from the mine site will be chipped and applied as surface mulch on the perimeter to aid in trapping fugitive sediment that might escape silt fencing. Application will favor boundaries buffering streams, wetlands, or other sensitive resources. Slope stabilization measures will be installed at drainages and steep hillsides to avoid soil sloughing off site.

- A graveled area approximately 25-feet wide between the perimeter erosion control BMPs and the soil stockpiles will serve as an equipment staging and traffic area.
- Topsoil stockpiles and overburden stockpile will comprise a safety berm between the traffic area and mine pit. The B and C horizons soil stockpiles will be kept separate from the A horizon stockpiles for reclamation purposes. The constructed berm will assist in controlling fugitive sediment transport from the mine site and maintain hydrologic containment of infiltration water and precipitation in the pit for subsequent management.

Once the perimeter work area has been established, any stumps, root wads, and slash in the mine site will be collected for chipping. Then remaining biomass, anticipated consisting primarily of herbaceous material, and topsoil will be stripped in a single event using heavy equipment such as dozers. The combined material will be stockpiled within the perimeter work areas, approximately 25 feet away from the erosion control BMPs at the edge of the perimeter work area, and in a linear fashion following the shape of the boundary area (*i.e.*, windrowed). Following slash and topsoil removal, the next soil layer, consisting of overburden, will be excavated using heavy equipment to expose the underlying heavy mineral sand deposits. The ORC has identified overburden only at the North Seven Devils site, where it is approximately 15 to 70 feet deep. Overburden will be placed adjacent to the topsoil stockpile in the perimeter work area, and windrowed around the site perimeter. At the North Seven Devils site, where the resource is relatively deep and there is not sufficient space at the boundary perimeter for soil stockpiles, overburden and topsoil may be temporarily stored at the neighboring West Bohemia mine site.

Mining activities will remove multiple low- and high-gradient intermittent and ephemeral surface water channels that flow across the terrace surfaces. During mining, those surface water conveyances with active flow will be redirected around mining activities, but will be directed to discharge back into their downstream channels. Following mining activities, these stream channels will be reconstructed in their previous locations during reclamation (see below for more information).

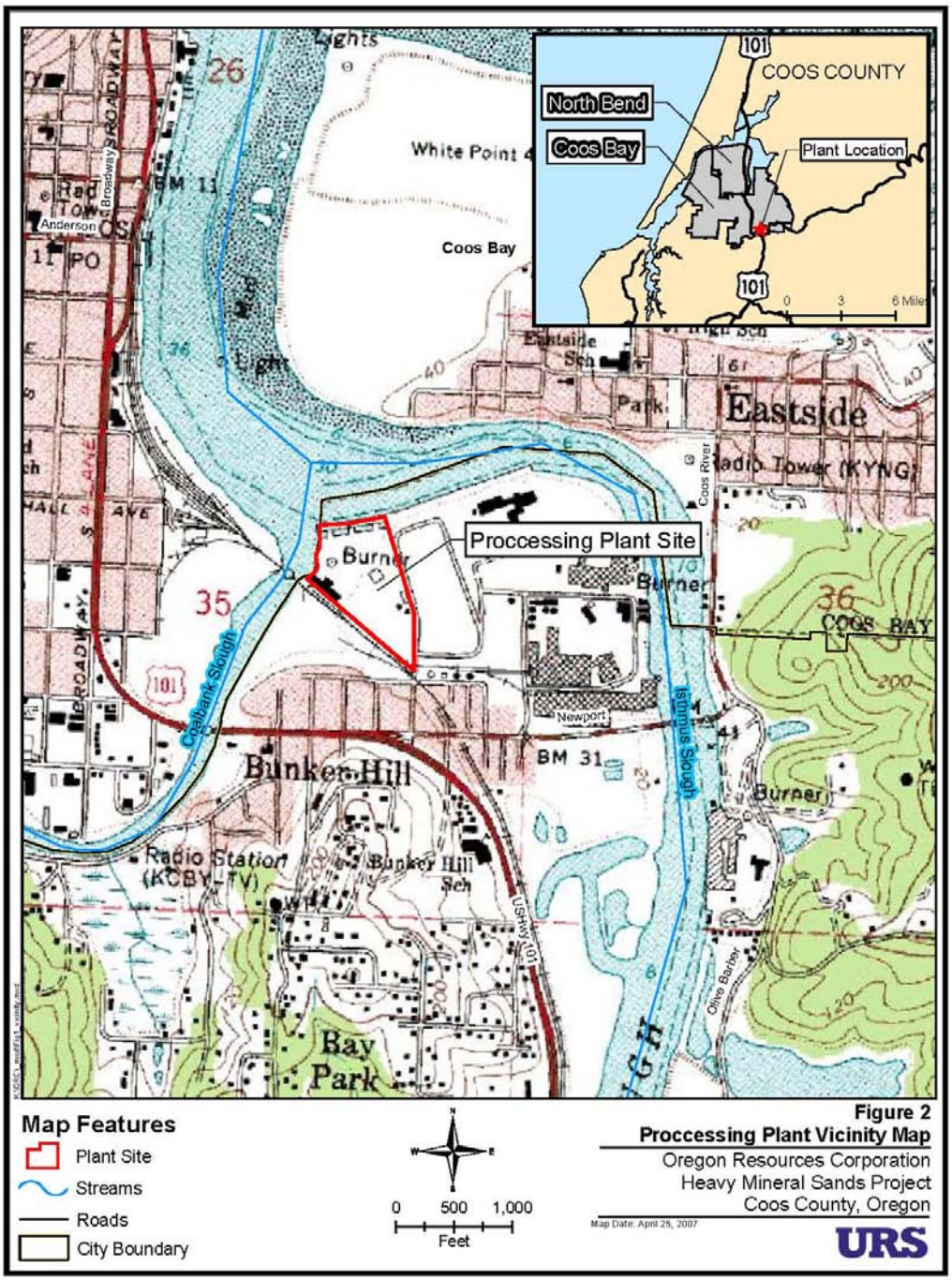
The ORC proposes that the active cell (up to 10 acres) will be dewatered during excavation. The static water levels measured in piezometers and monitoring wells suggest that the water would range from 6 to 21 feet deep in the winter if no dewatering occurred.[3] The ORC proposes to manage mine site stormwater and mine pit groundwater via upland application and infiltration to avoid discharges of sediment-laden water to off-site surface waters. Methods proposed to apply the pumped water to the ground include perforated pipes and sprinklers. Groundwater pumped from the mine pits during mining will be infiltrated and returned to the same perched aquifers from which the water was removed.

Processing Plant. Extracted mineral resources will be hauled to a newly-constructed processing plant located adjacent to Coos Bay, Isthmus Slough, and Coalbank Slough, approximately 9 to 12 miles away from the mine sites. Construction of the processing plant will require grading, installation of steel piles, concrete foundations and pads, and construction of

[3] Note from Chip Andrus, Oregon Department of Geology and Mineral Industries, to Reviewing Agencies (December 14, 2009) (reviewing 06-0073 - New Application for ORC Mine Sites in Coos County)

steel structures and processing equipment. The proposed processing plant will be constructed on an industrial parcel abutting the confluence of Coalbank Slough and Isthmus Slough (Figure 3).

Figure 3. Location of the proposed processing plant in the city of Coos Bay, Oregon.



Existing structures at the site include a warehouse/maintenance building, office, and mineral storage silo. Other existing facilities include the pilot processing plant and a stormwater treatment facility. With the exception of the office building, all structures and facilities will be maintained during site redevelopment. Existing stormwater collection ditches surrounding the perimeter of the construction site and the existing stormwater treatment facility will be maintained or expanded and used during and after construction. The existing treatment system includes a settling pond and additional measures to remove sediment and metals from stormwater. The pond is cleaned when the accumulated sediment reaches a thickness of one foot. During construction, stormwater will be conveyed, as needed, to the stormwater treatment system and treated stormwater will be discharged through the existing outfall to Coalbank Slough at River Mile 0.2.

Once operations begin at the processing plant, stormwater that is not used as make-up water for the plant will be treated and discharged to Coalbank Slough, in accordance with the National Pollutant Discharge Elimination System individual permit. The existing ditches, stormwater treatment facility, and outfall will continue to manage site stormwater during construction and operation of the processing plant. Currently, there are 3.17 acres of existing impervious surface areas that discharge to the stormwater treatment facility. The ORC proposes to remove 0.14 acre of impervious surface areas for a total of 3.03 acres of impervious surfaces that will discharge to the stormwater treatment facility post-construction. Additionally, 3.30 acres of impervious surfaces will be constructed that will discharge to the processing plant for use rather than the stormwater treatment facility. Therefore, there will be a decrease in the volume of stormwater that will be discharged to the stormwater treatment facility and Coalbank Slough. The ORC does not propose any modification to the existing shoreline or nearshore environment nor do they propose to repair or replace the existing dock structure.

Construction of the processing plant will require excavation and grading of soils at the site. Prior to construction, silt fence will be placed. Construction activities will occur both within and outside the footprint of the existing cap (below which nickel-ore is buried), with the majority of the construction activity occurring within the cap footprint. Soils and nickel-ore will be managed to ensure that future exposure of ecological receptors to the nickel-ore does not occur. Excavated soils will be stockpiled temporarily within the footprint of the future ore pad, which is within the footprint of the cap. At no time will soils or nickel-ore excavated from within the footprint of the cap be placed outside the cap footprint as part of their final disposition on site. All exposed soils will be capped following completion of construction, with the exception of areas where exposed soils will be capped by future structures. A processing plant stormwater, erosion, and sediment control plan has been prepared that describes erosion control measures proposed to minimize the amount of soil disturbed throughout the duration of the proposed action and is included in Appendix I of the BA.

Heavy equipment used for mineral processing will be constructed on foundations supported by steel pile requiring pile driving. The ORC proposes to install 586 piles for their processing plant. All piles will be located at least 250 feet upland of the closest aquatic resources (Coalbank Slough and Isthmus Slough). The piles will be 12.75-inch steel tube piles with a wall thickness of 0.25 inches. Early construction estimates by ORC assume that up to 15 piles will be installed daily, with construction occurring for ten hours per day, five days per week. By this estimate,

pile installation will require 40 working days, over an eight-week period. The ORC is proposing to use a vibratory hammer to install piles to refusal followed by pile proofing to design tolerances with an impact hammer. To install 15 piles per day, ORC estimates that 75 proofing strikes will be required per pile for a total of 1,125 hammer strikes per day. The ORC also assumes that soils intervening between pile installation and the aquatic environment will provide the functional attenuation equivalent to a bubble curtain (approximately 15 decibels (dB)). A conservative estimate for this method assumes that less than 20% of pile installation time would be completed with an impact hammer for proofing. This corresponds to a total of eight days of pile driving interspersed over the 40 days of pile installation. The ORC is proposing pile driving at any time of year; however, to minimize effects to sensitive life history stages they propose a restricted pile driving schedule beginning February 15 through July 15, in which impact strikes will be limited to a two-hour daily window between 11 am and 1 pm. The ORC also proposes to monitor noise levels from pile driving in Coalbank and Isthmus Sloughs to assess the attenuation assumptions used in the analysis and to further inform any needed adjustments. Following completion of the initial monitoring, ORC will submit the findings to NMFS via e-mail and phone.[4]

The processing plant is designed to separate the desired minerals from the excavated materials and will have a storage area with a maximum holding capacity of 6,000 tons, which comprises about a three-day supply for the plant operations. Mineral resource separation relies on the application of water to form a slurry and gravity in screening and cyclones to separate the heavier minerals for capture. Separation of mineral constituents will also rely on the application of an inert, non-toxic flocculent. Water demand will be satisfied with stormwater collected on-site and with municipal water provided by the City of Coos Bay. The processing plant will include additional facilities to capture water from the tailings for reuse as process water. Of the mined resource delivered to the processing plant, approximately 25% will be retained as desired minerals while the remaining 75% of material will be returned to the mine sites as tailings for use as backfill during reclamation of each mine site. All proposed haul between the mine locations and the processing plant will use existing logging roads, state and county roads, and the two newly constructed temporary access roads.

Reclamation of Mine Sites. After the excavated areas are backfilled with tailings from the processing plant, the stockpiled B and/or C horizon soils will be spread across the area in a relatively uniform layer, followed by a uniform spreading of the A horizon soil, thereby resulting in capping of the tailings with the overburden and topsoil. Topsoil will also be used for construction of wetland mitigation sites and will provide a seed bank for both reclamation and wetland mitigation activities. Site reclamation will be concurrent with mining operations, with site restoration being conducted as an ongoing part of mining operations, including backfilling, contouring, and grading of mined areas. Light detection and ranging (LIDAR) based topographic surface models of each site will be developed to allow final grading to match original grading to the greatest possible degree, and to provide for a smooth transition between the existing landscape and the restored mining areas. Following backfilling of a mine pit, site reclamation will be carried out to restore three distinct habitat types: surface water conveyances, wetlands, and uplands. At the West Bohemia, South Seven Devils, and North Seven Devils sites,

[4] Electonic mail from Brad Rawls, URS Corporation, to Michelle McMullin, NMFS (February 10, 2010) (presenting hydroacoustic monitoring plan and planned coordination between ORC and NMFS).

mining will remove or divert existing wetlands and other waters occurring generally at the upper headwaters of the three separate watersheds of Threemile Creek and Fivemile Creek. Accordingly, site reclamation will include establishment of new conveyances to replace those removed or diverted. The conveyances will be designed to meet or exceed the functions currently provided by the drainages that will be removed or diverted.

The ORC identified approximately 0.57 acre of streams in Threemile Creek watershed and Fivemile Creek watershed that will be temporarily removed by mining, and subsequently reconstructed, at the West Bohemia, South Seven Devils, and North Seven Devils sites and 7.51 acres of wetlands (Table 2). There are no surface water drainages within the footprint of the West Section 10 mine site. The number of disrupted stream channels will be limited at any given time because the proposed mining method minimizes the mine footprint and site reclamation will occur concurrently. Sections of streams removed and then reconstructed are located on the flat-top terraces, are seasonal in nature with no flows occurring during the dry season (summer), and are upstream from coho salmon distribution. Reconstruction of these sections of stream channels are designed to meet or improve existing ecological functions. The ORC proposes a total of 12.13 acres of wetland creation following the proposed mining. Wetland restoration and creation will occur at three locations within the project area. The mitigation sites were selected at three separate locations so that replacement of wetland functions for impacted wetlands will be located within the upper headwaters of the Threemile and Fivemile Creek watersheds. These mitigation sites will be constructed during reclamation of the mines and will happen concurrently with the ongoing mining process. Wetland impacts and mitigation will occur within the same watersheds (Table 2). Upland areas will be revegetated in a manner to continue merchantable timber production.

Table 2. Total area of streams and wetlands removed or diverted by mining activities and the proposed amount of wetland creation by fifth-field watershed.

Watershed	**Impact Area (Acres)**			**Mitigation Amount (Acres)**		
	Wetlands	Waterways	Total	Mitigation Site	Acres Created	Total per watershed
Threemile Creek	4.61	0.51	5.12	Site A	3.91	7.69
				Site B	3.78	
Fivemile Creek	2.9	0.06	2.96	Site C	4.44	4.44
Total	7.51	0.57	8.08	***Total***	12.13	

Waterway Transport. The three final products that ORC's processing facility will produce are chromite, garnet, and zircon. All three products are dry and granular in their bulk form, will be sold by dry weight, and will be stored in silos at the processing plant pending purchase. The ORC will require purchasers to arrange for transportation of the product from the processing facility, thus, the selection of shipping method, the quantities ordered, and the timing of shipments will all be arranged by the purchaser. Barging is one possible shipment method.

The ORC anticipates that the majority of the mineral resources will be shipped by barge from the processing facility to ports along the West Coast. Super Sacks will be loaded into standardized shipping containers delivered to the processing facility by the mineral sands purchaser. A

maximum of 24 tons can be loaded in each container. Therefore, a typical barge delivery could vary in load between 5,000 to 20,000 tons of material. Barges would be delivered to ORC's facility by a local tug/guide vessel operator and secured to the existing dock at the processing facility. The ORC determined the existing dock is suitable for this purpose and ORC is not proposing to repair/replace the dock structure or dredge the portion of Isthmus Slough in front of the dock. A mobile, land-based crane will be used to load all containers on barges. Once a barge has been loaded, ORC's interaction with and responsibility for the mineral sands product would be complete. Then, the tug/guide vessel operator would tow the barge from ORC's dock, located at approximate Channel Marker 15, through Coos Bay, across the Coos Bay Bar, and out into the Pacific Ocean shipping lanes. The ORC assumes barged product could be transported to any of the following container ports: Port of Long Beach, California; Port of San Francisco, California; Port of Portland, Oregon; Port of Tacoma, Washington; Port of Seattle, Washington. The ORC estimates that market demand may result in up to 20 shipments by barge annually, although ORC cannot predict whether such shipments will be additive to or take advantage of existing barge traffic. Thus, the range of increase in barge/guide vessel traffic within Coos Bay is likely bounded between 0 and 5%. Various manufacturers of articulated tug/barge units advertise speeds at around 12 knots.

The NMFS relied on the foregoing description of the proposed action, including all conservation measures, to complete this consultation. To ensure that this consultation remains valid, the applicant and/or the action agency should keep NMFS informed of any changes to the proposed action.

ACTION AREA

'Action area' means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area is defined as Threemile and Fivemile watersheds from the mining sites to the ocean; estuarine areas within Coalbank and Isthmus Sloughs and Coos Bay extending out to a diameter of 1,119 feet from the processing plant (Figure 4) and from the processing plant to the ocean; and coastal marine waters (within the 60 fathom depth bathymetry line) from Coos Bay to as far south as Long Beach, California and as far north as Seattle, Washington. The extent of the action area has been determined based on the extent of mining activities, waterway transportation, and pile driving and has been extended to incorporate the likely area of noise levels, groundwater contamination, and turbidity and sediment dispersion. Coho salmon, southern green sturgeon, southern eulachon, marine mammals, and marine turtles are present in the coastal marine water component of the action area. Only coho salmon are present within Threemile and Fivemile Creek watersheds and only coho salmon, southern eulachon, and southern green sturgeon are present within the estuarine component of the action area. Although Steller sea lions may occur in Coos Bay, they infrequently occur in this estuary.

The mineral processing plant will be constructed within the city limits of Coos Bay. The proposed site is an existing industrial site, which will be redeveloped to meet ORC's facility needs, located at 63776 Mullen Street. The site lies within Township 25 North, Range 13 West, Sections 35/35DB, Willamette Meridian. This component of the action area (*i.e.*, Coalbank

Slough, Isthmus Slough, and Coos Bay) is used by adult and juvenile OC coho salmon as a migration corridor and to transition between fresh and saltwater. OC coho salmon smolt outmigration begins in mid-February and continues through mid-July (ODFW 2003a). Adult OC coho salmon return through Coos Bay from the beginning of September to the end of January and will be passing through the action area during operations, but do not spend time in the action area (ODFW 2003a). Coos Bay is designated OC coho salmon critical habitat (fifth-field HUC: 1710030403). Specific ESA-listing information for OC coho salmon and designated critical habitat is located in Table 3.

Southern green sturgeon are known to occupy Coos Bay, however they only spawn in the Sacramento River basin in California; therefore juvenile southern green sturgeon are not present in Coos Bay. Adult and sub-adult southern green sturgeon use estuarine areas for foraging and growth and development outside of the natal river system, including non-natal estuaries, such as Coos Bay (Moser and Lindley 2007). Data from Washington studies indicate that southern green sturgeon will only be present in estuaries from June until October (Moser and Lindley 2007). While in Coos Bay, they likely seek out the deepest habitats to rest during low tides and feed on invertebrates in shallow water during high tides. The Coos Bay estuary is included as designated critical habitat for southern green sturgeon. Specific ESA-listing information for southern green sturgeon and designated critical habitat is located in Table 3.

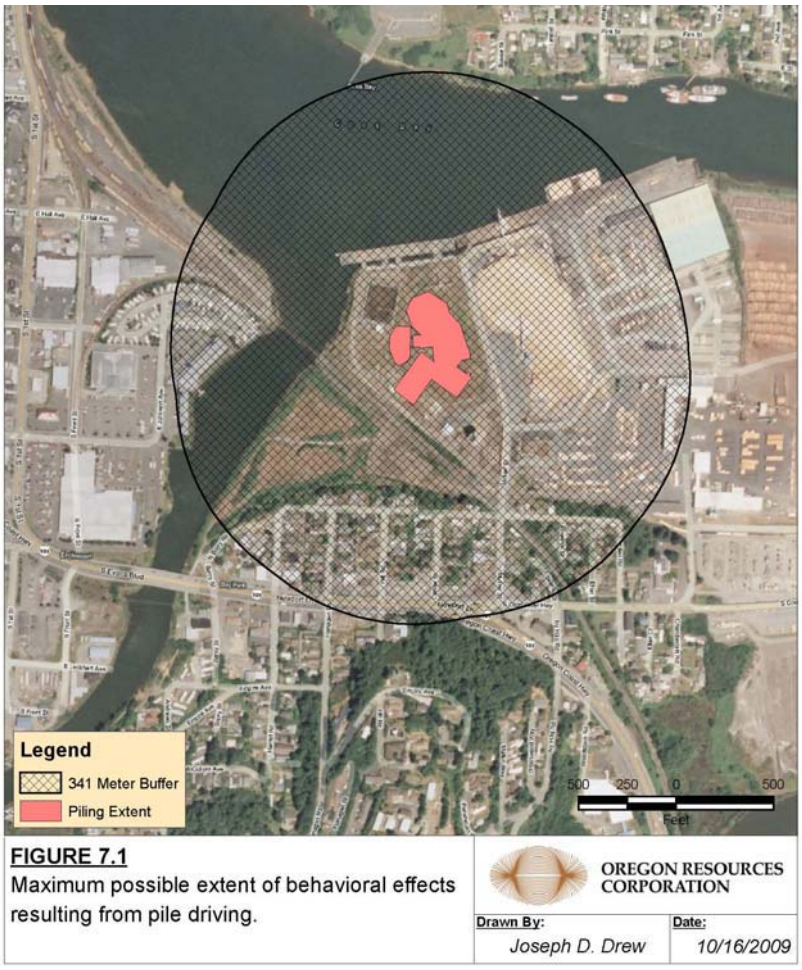
The southern eulachon range from the Mad River in northern California to the Skeena River in British Columbia, Canada. They inhabit several riverine and estuarine systems along the west coast and population sizes vary between these systems. Coos Bay is considered to be a population with rare relative abundance. Southern eulachon adults return to freshwater from January to March and adult southern eulachon may return as early as December to spawn. Adult southern eulachon are reasonably unlikely to be present in the estuary during October and November, but may become present in December with higher numbers in January and February. When eggs hatch in 20 to 40 days southern eulachon larvae are immediately washed downstream to estuarine and ocean areas where they feed on phytoplankton and zooplankton. Adult and larval southern eulachon are likely to be present in the estuarine action area during project implementation. Critical habitat has not been designated or proposed for southern eulachon. Specific ESA-listing information for southern eulachon is located in Table 3.

The Threemile Creek and Fivemile Creek watersheds (fifth-field HUC: 1710030403) are used by OC coho salmon for spawning, rearing, and migration. Upstream migration for adult OC coho salmon in these drainages begins in September and continues through January, with spawning occurring from mid-November through February. However, upstream migration timing is constrained by the annual "bar bound" condition of the streams. The timing of egg incubation to fry emergence is from November through mid-April, while juvenile OC coho salmon rearing occurs year-round. Downstream juvenile OC coho salmon migration occurs from mid-February through May, peaking in mid-March through mid-May (ODFW 2003b). However, current usage of OC coho salmon in these watersheds is extremely low, based on ODFW surveys, although historical use is believed to have been much higher. Additionally, while there are no known natural barriers in the watersheds, most of the mining sites are located on terraces deeply dissected by the incised channels of Threemile Creek and Fivemile Creek and their associated tributary drainages. Specifically, at the stream crossings for the North Seven Devils sites, NMFS

evaluated the need for fish passage at these locations and determined that the upper limits of OC coho salmon distribution are located approximately 0.25 mile downstream of the proposed stream crossings.[5] Neither Threemile Creek nor Fivemile Creek are designated as critical habitat for OC coho salmon.

The action area also includes habitat which has been designated as EFH for various life stages of 20 species of groundfish (PFMC 2006), five species of coastal pelagics (PFMC 1998), and two species of Pacific salmon (PFMC 1999).

Figure 4. Extent of the action area for pile driving activities in estuarine areas.



[5] Electronic mail from Aaron Beavers, NMFS, to Michelle McMullin, NMFS (January 8, 2010)(providing fish passage evaluation and supporting information, fish passage analysis results, and comments for 2008/04549).

Table 3. Federal Register notices for final rules that list threatened and endangered species, designate critical habitats, or apply protective regulations to listed species considered in this consultation. Listing status: 'T' means listed as threatened under the ESA, 'E' means listed as endangered, 'P' means proposed.

Species	Listing Status	Critical Habitat	Protective Regulations
Marine and Anadromous Fish			
Coho salmon (*O. kisutch*)			
Oregon Coast	T 2/11/08; 73 FR 7816	2/11/08; 73 FR 7816	2/11/08; 73 FR 7816
North American Green Sturgeon (*A. medirostris*)			
Southern Distinct Population Segment	T 4/07/06; 71 FR 17757	10/9/09; 74 FR 52300	P 5/21/09; 74 FR 23822
Southern Eulachon (*T. pacificus*)			
Southern Distinct Population Segment	PT 3/13/09; 74 FR 10857	Not applicable	
Marine Mammals			
Steller sea lion (*Eumetopias jubatus*)			
Eastern Distinct Population Segment	T 5/5/1997; 63 FR 24345	8/ 27/93; 58 FR 45269	11/26/90; 55 FR 49204
Blue whale (*Balaenoptera musculus*)			
	E 12/02/70; 35 FR 18319	Not applicable	
Fin whale (*B. physalus*)			
	E 12/02/70; 35 FR 18319	Not applicable	
Humpback whale (*Megaptera novaeangliae*)			
	E 12/02/70; 35 FR 18319	Not applicable	
Killer whale (O*rcinus orca*)			
Southern Resident Distinct Population Segment	E 11/18/05; 70 FR 69903	11/26/06; 71 FR 69054	
Sei whale (*B. borealis*)			
	E 12/02/70; 35 FR 18319	Not applicable	
Sperm whale (*Physeter macrocephalus*)			
	E 12/02/70; 35 FR 18319	Not applicable	
Sea Turtles			
Green sea turtle (*Chelonia mydas*)			
	E 7/28/78; 43 FR 32800	9/02/98; 63 FR 46693	
Leatherback sea turtle (*Dermochelys coriacea*)			
	E 6/02/70 ; 39 FR 19320	3/23/79; 44 FR 17710; P 1/5/10; 75 FR 319	
Loggerhead sea turtle (*Caretta caretta*)			
	T 7/28/78; 43 FR 32800	Not applicable	7/28/78; 43 FR 32800
Olive ridley sea turtle (*Lepidochelys olivacea*)			
	E 7/28/78; 43 FR 32800	Not applicable	

ENDANGERED SPECIES ACT

In the request for concurrence, the Corps determined that the action, as proposed, may affect but is NLAA OC coho salmon and designated critical habitat, southern green sturgeon and proposed critical habitat, and multiple marine mammals and marine turtles (Table 3). Also included in this consultation is the proposed southern eulachon (Table 3).

For purposes of 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 NLAA ESA-listed species or critical habitats is that all of the effects of the action are expected to be discountable, insignificant or completely beneficial.[1] Discountable effects cannot be reasonably expected to occur. Insignificant effects are those effects that cannot be meaningfully measured, detected or evaluated. Beneficial effects are contemporaneous positive effects without any adverse effect to the listed species or critical habitat, even if the long-term effects are beneficial.

Species Determinations

OC Coho Salmon, Southern Green Sturgeon, and Southern Eulachon. OC coho salmon, southern green sturgeon, and southern eulachon are reasonably certain to be present in the action area during the proposed action. The effects of the action, as proposed, on OC coho salmon, southern green sturgeon, and southern eulachon are reasonably likely to include elevated levels of underwater sound from pile driving, groundwater and surface water contamination, and increased turbidity and sediment from construction and removal of culverts on high gradient streams. Elevated levels of underwater sound from pile driving activities will occur within the estuarine component of the action area (*i.e.*, Coalbank Slough, Isthmus Slough, and Coos Bay) while all other effects will occur within the Threemile Creek and Fivemile Creek watersheds as they are associated with activities at the mine sites. Neither southern green sturgeon nor southern eulachon will be exposed to any activities at the mining sites or in Threemile and Fivemile creeks because they are not present in this component of the action area. Although these three species are present in the coastal marine waters component of the action area, the NMFS concluded the waterway transportation activities will not affect these three species because NMFS does not anticipate any interaction between barge traffic and these three species.

Pile driving results in elevated underwater noise. Injury from elevated underwater noise is expected if sound pressure waves exceed a single strike threshold of 206 dB;(re: 1 micro pascal (μPa)) or for cumulative strikes either a 187 dB (re: 1 $\mu Pa^2 \cdot$second) sound exposure level (SEL) where fish are larger than 2 grams or a 183 dB (re: 1 $\mu Pa^2 \cdot$second) SEL where fish are smaller than 2 grams (Stadler and Woodbury 2009). The applicant used the NMFS hydroacoustic model to evaluate the effects from the proposed pile driving for fish over two grams (*i.e.*, OC coho salmon, southern green sturgeon, adult southern eulachon) and for fish less than two grams (*i.e.*, larval southern eulachon). The model is likely overly conservative as it treats sound pressure transmission through soil identical to transmission through water, however in this case the applicant assumed that the soils between pile installation and the aquatic environment will provide the functional attenuation equivalent to a bubble curtain (approximately 15 dB).

Considering that dewatering cofferdams to decouple the pile from the surrounding water is a commonly accepted method of reducing sound pressures for in-water pile driving and because noise levels dampen as piles are driven further into the ground compared to the initial part of the drive, this is likely a valid assumption regarding attenuation. Furthermore, the initial monitoring proposed will validate these assumptions or disprove them. If sound levels do exceed the threshold noise levels for onset of physical injury ORC will contact NMFS to discuss adaptive management or consultation reinitiation. No death or injury to fish will occur as a result of impact hammer use because sound pressure levels will exceed the injury thresholds listed above only at 30 feet or 56 feet, depending on fish size, away from the pile. As the closest pile is located 200 feet from the water, the injury thresholds effectively occur on soil where no fish will be present.

Fish will be exposed to some noise from this activity because the sound pressure waves are expected to extend to the surrounding water. Threshold noise levels for behavioral effects are expected to be reached and these noise level thresholds are predicted to extend out to a distance of 1,119 feet from the piles and therefore will enter Coalbank Slough, Isthmus Slough, and Coos Bay. The magnitude of these behavioral effects for each species present in the noise impact area are discussed below.

OC coho salmon smolts and larval southern eulachon. During the OC coho salmon smolt outmigration and the time when larval southern eulachon are expected to be present in the estuarine action area, impact hammer strikes will only occur during a two-hour time period during the middle of the day. This activity will occur during the middle of the day and allow for 22 hours where no noise will be generated from the pile strikes. Therefore, migration of OC coho salmon smolts will be unimpeded for 22 hours on a daily basis. While migration of OC coho salmon smolts will be delayed for two hours by elevated noise levels, these individuals will be able to resume their migration once impact strikes stop for the day. Furthermore, the NMFS is reasonably certain that only a portion of the coho smolts will be migrating during the day while an equivalent portion will be outmigrating at dusk, dawn, and night. Overall, the NMFS is reasonably certain that a two-hour migration delay will be an insignificant effect to OC coho salmon smolts and will not adversely affect smolt growth, development, transitioning from freshwater to marine water, seaward migration, or otherwise affect survival or mortality.

Similarly, essential behaviors of southern eulachon larvae will be unaffected by elevated noise levels for 22 hours on a daily basis. Larvae are dispersed by currents in the estuarine areas and feed mainly on copepod larvae and other plankton. Larvae are small (4-8 millimeters long), are rapidly carried by currents to the sea, and rear in the pelagic zone (NMFS 2008). At this time larvae are small and are mainly dependent on currents and tides for dispersal to the ocean. It is likely that tides and currents will transport the larvae through the relatively small area of estuarine area affected by elevated noise levels. However, because larval southern eulachon cannot actively avoid elevated noise levels during the two hours of daily pile driving and are dependent on tides and currents, their feeding is likely to be disturbed by elevated noise levels for the two hour daily duration if the they are present in the noise impact area. Even if they are not transported beyond the noise impact area during the two hours of elevated noise levels, the larvae will resume their feeding once impact strikes stop for the day. Overall, the NMFS is

reasonably certain that a two-hour affect to feeding behaviors will be an insignificant effect to larval southern eulachon and will not adversely affect feeding or other essential behaviors.

Adult OC coho salmon and adult southern eulachon. Pile driving could also occur during adult OC coho salmon migration from September through January and when adult southern eulachon are expected to present in Coos Bay from December to mid-February. Adults are expected to migrate through the action area during the day and the night. Although noise levels from pile driving during the day will delay migration, once pile driving ceases for the day migration during the night will remain unobstructed. Although some adults would normally migrate through the action area during the day NMFS is reasonably certain that these individuals could migrate through the action area during the night or early morning hours when there are no elevated underwater noise levels for those eight days. As a result, adult coho salmon migration and adult eulachon migration is reasonably certain to be delayed for a minimum of several hours. These migration delays will be insignificant because adult OC coho salmon and adult eulachon are expected to migrate through the action area overnight when there are no elevated underwater noise levels and the NMFS is reasonably certain that a two-hour migration delay will be an insignificant effect to adult OC coho salmon or adult southern eulachon and will not adversely ect migration, spawning, or sexual maturation.

Adult and sub-adult southern green sturgeon. Because southern green sturgeon are present in Coos Bay from June until October they overlap the OC coho salmon smolt outmigration from June through mid-July. During this time period they will only be exposed to elevated noise levels for two hours daily if they are within the pile driving impact area. For the remainder of their occupancy they will be exposed to elevated sound levels daily for a maximum of eight days if they are within the pile driving impact area. It is reasonable to conclude that the pile driving impact area will be unavailable to green sturgeon for migration or feeding daily for a maximum of eight days. Unlike coho salmon, green sturgeon are not dependent on migration through the area of pile driving impacts to fulfill essential behaviors. Additionally, while in Coos Bay, green sturgeon likely seek out the deepest habitats to rest during low tides and feed on invertebrates in shallow water during high tides and there are other locations in Coos Bay other than the pile driving impact area that meet these criteria for green sturgeon feeding. Based on their ability to use estuarine areas other than the pile driving impact area for essential behaviors NMFS is reasonably certain that effects to migration, feeding, and growth of southern green sturgeon will be insignificant as a result of elevated underwater noise levels from pile driving.

Mining activities are proposed in beach sand deposits containing high percentages of chromite, a chromium bearing mineral. Under certain environmental conditions chromium oxidizes from its less toxic trivalent form to a more toxic and carcinogenic hexavalent form (Bain 2008). Additionally, hexavalent chromium is typically more mobile than trivalent chromium in natural groundwater systems. In general, chromium in groundwater in the hexavalent state is stable in an oxidizing alkaline (high oxidation/reduction potential (Eh), high pH) environment, whereas the trivalent state is stable in a reducing acidic (low Eh, low pH) environment (Godgul and Sahu 1995). Acidic and reducing environments associated with sandy, sub-wetland conditions similar

to the proposed mine sites[6] have been shown to naturally limit hexavalent chromium due to the natural reductants (*e.g.*, organic carbon, certain iron, manganese species) present in the system (Hellerich *et al.* 2008) although the authors recommend instituting a long-term, site-specific monitoring of aqueous geochemical parameters to detect sudden changes in the system that could lead to mobilization of hexavalant chromium. Furthermore, the ORC conducted two groundwater sampling events in January 2008 and September 2008 and verified that groundwater in the vicinity of the mining sites was slightly acidic and that Eh ranged from slightly reducing to slightly oxidizing.

The ORC's groundwater sampling events did detect hexavalent chromium although these baseline concentrations did not exceed screening values for aquatic life or fish-specific benchmark values; they also detected baseline concentrations of several metals (*i.e.*, aluminum, copper, barium, lead, and manganese) exceeding ecological screening criteria protective of aquatic life and/or exceeding fish specific benchmarks. Therefore, the existing baseline concentrations of hexavalent chromium do not pose a risk to coho salmon. Furthermore, the NMFS is reasonably certain that there is no causal mechanism in the excavation and processing of the mineral resources that will increase baseline concentrations of hexavalent chromium or heavy metals because excavation uses only standard heavy equipment and processing involves gravity and inert, non-toxic chemical at an off-site location. Additionally, the ORC also conducted leaching tests and their results indicate that metals are unlikely to leach from the tailings, which is consistent with the proposed action of removing the minerals containing metals of concern.

The NMFS also acknowledges that there is a potential for hexavalent chromium to be generated in a post-mining environment following the proposed action (Godgul and Sahu 1995, Fantoni et al. 2002, Oze et al. 2007). However, the environmental conditions of the site seem to favor formation and persistence of trivalent chromium rather than hexavalent chromium. Therefore, the NMFS is reasonably certain that generation and dispersal of hexavalent chromium and heavy metals as a result of the proposed mining action is discountable. Overall, the NMFS is reasonably certain the magnitude of the adverse effects from groundwater or surface water contamination by metals or hexavalent chromium will not rise to a level that will cause mortality, reduced feeding and growth, delayed migration, increased disease susceptibility or decreased survival and fitness of aquatic life. Therefore, NMFS is reasonably certain that effects to OC coho salmon from groundwater or surface water contamination resulting from the mining activities in the Threemile Creek or Fivemile Creek watersheds will be insignificant.

Increased turbidity and sediment is reasonably certain to increase in the high gradient stream channels below the three stream crossings at the North Seven Devils mine site for the following reasons: (1) Construction and removal of culverts, (2) failure of these culverts because environmental conditions pose an increased risk and probability of plugging and failure especially considering the historic timber harvest activity in the watershed, and (3) the probability of failure increases with the number of culverts in a watershed.[4] However, restricting construction to periods when the channels are dry and implementing additional BMPs including

[6] Electronic memorandum from Bill Mason, Oregon Department of Environmental Quality, to Michelle McMullin, NMFS (June 18, 2009) (evaluating the potential of hexavalent chromium generation by mining heavy mineral resources from beach sand deposits as proposed by ORC).

structural erosion and sediment control measures will minimize sediment transport and turbidity plumes to where OC coho salmon are present downstream. Additionally, runoff from the road surfaces will be diverted to the mine site preventing additional erosion and scour. Furthermore, the culverts will be designed to span the channel width that corresponds to the water surface elevation of the 100-year design storm thus increasing the ability of the crossings to pass wood and decreasing the probability of failure. All culverts will only be installed temporarily for access to the mine sites and will be removed once mining and reclamation is complete.

Increases in suspended sediment concentrations as low as 17 milligrams per liter (mg/L) can increase inflammation of the gills and lead to respiratory stress when juvenile coho salmon are exposed for periods as short as 4 hours (Berg and Northcote 1985). Increases in suspended sediment concentrations as low as 30 mg/L can result in behavioral responses (e.g., changes in territorial behavior) of juvenile coho salmon exposed to suspended sediment pulses for periods as short as four hours (Berg and Northcote 1985). However, the NMFS is reasonably certain that suspended sediment concentrations generated from the stream crossings will not meet either of these thresholds for physiological stress and changes in behavior where OC coho salmon are present for the following reasons: (1) Erosion and scour will be minimized by BMPs, (2) turbidity and sediment will only be transported upon rewatering of the channels when the rains occur which is normally a period of increased baseline levels of sediment and turbidity, and (3) there is a discountable occurrence of culvert failure based on the design criteria. Therefore, NMFS acknowledges that some measurable turbidity may reach coho salmon and habitat 0.25 mile downstream from the crossings but the magnitude of the effect will not be significant because turbidity levels will be diluted and will not rise to the level of physiological stress or behavioral effects. The NMFS is also reasonably certain that significant amounts of sediment will not be transported downstream and decrease available spawning or rearing habitat for these same reasons. Therefore, while some OC coho salmon may be exposed to project-related increased turbidity and sediment the magnitude of effects is considered insignificant.

Summary of Effects to OC coho salmon, southern green sturgeon, and southern eulachon. The NMFS concludes that the effects of the action, as proposed, are insignificant and therefore are NLAA OC coho salmon, southern green sturgeon, and southern eulachon. The NMFS is reasonably certain effects from elevated underwater noise levels will be insignificant to larval southern eulachon and OC coho salmon smolts because noise levels will remain below injury thresholds and because migration delays and other behavioral effects will only be impacted for two hours on a daily basis during their presence. Elevated underwater noise levels will also have insignificant effects on adult OC coho salmon and adult and subadult green sturgeon because of their ability to migrate during the evening hours when pile driving is ceased, and in the case of green sturgeon, their ability to use other estuarine areas outside of the area affected by pile driving. The effects to OC coho salmon from groundwater or surface water contamination resulting from the mining activities in the Threemile Creek or Fivemile Creek watersheds are also reasonably certain to be insignificant because there is no causal mechanism in the excavation and processing of the mineral resources that will increase baseline concentrations and because the environmental conditions of the mine sites are not favorable for the formation and persistence of hexavalent chromium. The NMFS is reasonably certain that suspended sediment levels will not exceed the threshold for physiological stress and changes in behavior where OC coho salmon are present and the NMFS is also reasonably certain that

significant amounts of sediment will not be transported downstream and decrease available spawning or rearing habitat because erosion and scour will be minimized by BMPs, turbidity and sediment will only be transported upon rewatering of the channels when the rains occur which is normally a period of increased baseline levels of sediment and turbidity, and because there is a discountable occurrence of culvert failure based on the design criteria. Therefore, the effects to OC coho salmon from increased turbidity and transported sediment from the stream crossings at the North Seven Devils mine site are considered to be insignificant.

Based on the above analysis the NMFS concludes that all effects of the action, as proposed, are discountable or insignificant and therefore are NLAA OC coho salmon, southern green sturgeon, and southern eulachon.

Marine Mammals and Sea Turtles (Steller sea lions, blue whales, fin whales, humpback whales, Sei whales, sperm whales, Southern Resident killer whales, green sea turtles, leatherback sea turtles, olive ridley sea turtles, and loggerhead sea turtles). Steller sea lions infrequently occur in Coos Bay (Brown 2009), and there are no consistently used haulouts within 5 miles of Coos Bay (the most proximate haulout is Cape Arago on the outer coast; Wright 2008). Given the short-term nature of construction that would affect underwater noise levels in the project vicinity (*i.e.*, 8 days of pile driving), and the infrequent nature of Steller sea lion occurrence in the project vicinity, the NMFS concludes that potential affects from construction activities are discountable because it is extremely unlikely that a Steller sea lion would be present during or exposed to construction activities in Coos Bay.

The above ESA-listed marine mammal species including Steller sea lions and sea turtle species may occur outside of Coos Bay in the marine portion of the action area which is within the U.S. west coast EEZ; however, ESA-listed marine mammal species would occur in low densities and would therefore be unlikely to encounter a tug/barge associated with the proposed project (NMFS 2008 a, b, c, d, e, f, g). Sea turtle occurrence is rare (*i.e.*, NMFS 2007 a, b, c, d). Barge transport associated with the proposed action (in transit from Coos Bay to any of the west coast ports) would result in a minimal increase in current estimated levels of barge traffic in Coos Bay. The applicant estimates a 0-5 percent increase in barge traffic within Coos Bay, which represents 20 shipments out of Coos Bay annually. Twenty annual shipments would be hardly distinguishable over the broad expanse of the west coast, and barges would have a transitory and short-term presence in any specific location. Therefore, barge traffic associated with the proposed action would have a discountable potential for interaction with any of the above marine mammal or sea turtle species.

In the unlikely event of an interaction, any temporary disturbance would be short-term and localized, with no lasting effects. NMFS is not able to quantify existing traffic conditions across the west coast EEZ to provide context for the addition of 20 shipments annually across this vast area. However, the available information does not indicate that the additional 20 shipments annually would result in anything other than insignificant effects. Vessel strikes by barge-type vessels are extremely unlikely. Available data indicate that vessel strikes are more likely with vessel types that travel at speeds greater than 13 knots (Laist *et al*. 2001, Jensen and Silber 2003). Barges are slow moving (~12 knots or less), follow a predictable course, do not target

marine species, and should be easily detected and avoided by marine mammals. Potential effects from vessel strikes are therefore discountable.

Additionally, the proposed action is not likely to adversely affect the quantity of salmon and other ESA-listed or proposed fish, as described above, and therefore will not affect the quantity of prey available to marine mammals. The quality of prey available to marine mammals will not be adversely affected by the proposed action, because there is no causal mechanism for the mineral excavation and processing activities to increase the concentration of metals above baseline levels, as described in more detail above.

NMFS concludes that effects of the action are either insignificant or discountable and therefore are NLAA Steller sea lions, blue whales, fin whales, humpback whales, Sei whales, sperm whales, Southern Resident killer whales, green sea turtles, leatherback sea turtles, olive ridley sea turtles, and loggerhead sea turtles.

Effects on Critical Habitat

The specific critical habitat that will be affected by the proposed action is the designated critical habitat for OC coho salmon and southern green sturgeon in the Coos Bay Frontal fifth-field watershed (HUC: 1710030403). The designated critical habitat provides adult and juvenile OC coho salmon migration corridors, provides habitat to transition between fresh and saltwater conditions, and provides juvenile rearing areas with all of the associated essential features for these habitat types that provide for the conservation of the Coos OC coho salmon population. Thus, the affected critical habitat is an estuarine area free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh and saltwater; natural cover such as aquatic vegetation; and juvenile and adult forage, including aquatic invertebrates and fishes, that support growth and maturation. The primary constituent elements (PCEs) that incorporate the habitat characteristics listed above are substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage. Of these, only water quality has the potential to be affected by the proposed action.

For southern green sturgeon, the designated critical habitat provides adult and sub-adult feeding for growth and development, with all of the associated features for these habitat types that provide for the conservation of the southern green sturgeon population. The PCEs that incorporate the habitat characteristics listed above are forage, safe passage, substrate quality, and water quality. Of these, only water quality has the potential to be affected by the proposed action. Although coastal marine waters within the action area are also designated as critical habitat for southern green sturgeon, waterway transportation by barging will not affect this component of designated critical habitat or the PCEs that incorporate safe passage, water quality, and forage.

The negative effects to water quality by elevated sound levels will be minor, localized, and short-term as detailed above. These effects are reasonably unlikely to result in any significant modification or disruption to normal OC coho salmon and southern green sturgeon behavior or degradation in the functional value of the water quality PCE. Because all negative effects are

minor, localized, short-term, and insignificant NMFS is reasonably certain that the effects from the proposed action are not likely to negatively change the conservation value of the PCEs within the Coos Bay Frontal fifth-field watershed and is NLAA designated OC coho salmon critical habitat and southern green sturgeon critical habitat.

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 [see, 50 CFR 402.16]. This concludes the ESA portion of this consultation. ORC will provide the results of the proposed groundwater monitoring and hydroacoustic monitoring to the regulatory agencies. The NMFS will consider this to be new information and will require reinitiation or modification of the proposed action if the monitoring results reveal that the effects of the action may affect listed species or critical habitat in a manner or to an extent not previously considered.

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

As part of the information provided in the request for ESA concurrence, the Corps made a determination of "would not adversely affect" for the action, as proposed, on EFH designated for groundfish, coastal pelagic species, and Pacific Coast salmon (Table 4).

For purposes of MSA, "adverse effect" means any impact, which reduces quality and/or quantity of EFH. Adverse effects may include direct (*e.g.,* contamination or physical disruption), indirect (*e.g.*, loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions [50 CFR 600.910(a)]. Avoidance and minimization measures are analyzed by NMFS as part of the action, as proposed. However, NMFS will not consider proposed compensatory mitigation as part of the effects analysis, although completing sufficient compensatory mitigation for the effects of action may make the net effect of that action neutral or positive for EFH.

The effects of the action, as proposed, on EFH are the same as those described above in the ESA portion of this document and NMFS concurs with the findings in the EFH assessment.

EFH Conservation Recommendations

Because the properties of EFH that are necessary for the spawning, breeding, feeding or growth to maturity of managed species in the action area are the same or similar to the biological requirements of ESA-listed species as analyzed above, and because the conservation measures that the Corps included as part of the proposed action are adequate to avoid, minimize, or otherwise offset those adverse effects to designated EFH, NMFS has no conservation recommendations to make at this time and no reporting is necessary. This concludes the EFH portion of this consultation.

The Corps is required to complete a supplemental EFH consultation with NMFS if it substantially revises its plans for this action in a manner that may adversely affect EFH or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations [50 CFR 600.920(k)].

Table 4. Species with designated EFH found in waters of Oregon and Washington.

Groundfish Species	Blue rockfish (*S. mystinus*)	Rougheye rockfish (*S. aleutianus*)	Flathead sole (*Hippoglossoides elassodon*)
Leopard shark (*Triakis semifasciata*)	Bocaccio (*S. paucispinis*)	Sharpchin rockfish (*S. zacentrus*)	Pacific sanddab (*Citharichthys sordidus*)
Soupfin shark (*Galeorhinus zyopterus*)	Brown rockfish (*S. auriculatus*)	Shortbelly rockfish (*S. jordani*)	Petrale sole (*Eopsetta jordani*)
Spiny dogfish (*Squalus acanthias*)	Canary rockfish (*S. pinniger*)	Shortraker rockfish (*S. borealis*)	Rex sole (*Glyptocephalus zachirus*)
Big skate (*Raja binoculata*)	Chilipepper (*S. goodei*)	Silvergray rockfish (*S. brevispinus*)	Rock sole (*Lepidopsetta bilineata*)
California skate (*R. inornata*)	China rockfish (*S. nebulosus*)	Speckled rockfish (*S. ovalis*)	Sand sole (*Psettichthys melanostictus*)
Longnose skate (*R. rhina*)	Copper rockfish (*S. caurinus*)	Splitnose rockfish (*S. diploproa*)	Starry flounder (*Platyichthys stellatus*)
Ratfish (*Hydrolagus colliei*)	Darkblotched rockfish (*S. crameri*)	Stripetail rockfish (*S. saxicola*)	
Pacific rattail (*Coryphaenoides acrolepsis*)	Grass rockfish (*S. rastrelliger*)	Tiger rockfish (*S. nigrocinctus*)	**Coastal Pelagic Species**
Lingcod (*Ophiodon elongatus*)	Greenspotted rockfish (*S. chlorostictus*)	Vermillion rockfish (*S. miniatus*)	Northern anchovy (*Engraulis mordax*)
Cabezon (*Scorpaenichthys marmoratus*)	Greenstriped rockfish (*S. elongatus*)	Widow Rockfish (*S. entomelas*)	Pacific sardine (*Sardinops sagax*)
Kelp greenling (*Hexagrammos decagrammus*)	Longspine thornyhead (*Sebastolobus altivelis*)	Yelloweye rockfish (*S. ruberrimus*)	Pacific mackerel (*Scomber japonicus*)
Pacific cod (*Gadus macrocephalus*)	Shortspine thornyhead (*Sebastolobus alascanus*)	Yellowmouth rockfish (*S. reedi*)	Jack mackerel (*Trachurus symmetricus*)
Pacific whiting (Hake) (*Merluccius productus*)	Pacific Ocean perch (*S. alutus*)	Yellowtail rockfish (*S. flavidus*)	Market squid (*Loligo opalescens*)
Sablefish (*Anoplopoma fimbria*)	Quillback rockfish (*S. maliger*)	Arrowtooth flounder (*Atheresthes stomias*)	
Aurora rockfish (*Sebastes aurora*)	Redbanded rockfish (*S. babcocki*)	Butter sole (*Isopsetta isolepsis*)	**Salmon**
Bank Rockfish (*S. rufus*)	Redstripe rockfish (*S. proriger*)	Curlfin sole (*Pleuronichthys decurrens*)	Coho salmon (*O. kisutch*)
Black rockfish (*S. melanops*)	Rosethorn rockfish (*S . helvomaculatus*)	Dover sole (*Microstomus pacificus*)	Chinook salmon (*O. tshawytscha*)
Blackgill rockfish (*S. melanostomus*)	Rosy rockfish (*S. rosaceus*)	English sole (*Parophrys vetulus*)	

Please direct questions regarding this letter to Michelle McMullin, fisheries biologist in the Southwest Oregon Habitat Branch of the Oregon State Habitat Office, at 541.957.3378. If questions pertain to the marine mammal or turtle analysis, please contact Alison Agness of the Protected Resources Division, at 206.526.6152.

Sincerely,

for Barry A. Thom
Acting Regional Administrator

cc: Chip Andrus, DOGAMI
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