Supplement Analysis
for the
Columbia Estuary Ecosystem Restoration Program EA
(DOE/EA-2006/SA-08)

West Sand Island Tidal Restoration Project
BPA project number 2010-004-00
BPA contract number 82217

Bonneville Power Administration
Department of Energy

Introduction

Bonneville Power Administration (BPA) and the U.S. Army Corps of Engineers (USACE) are partners in the Columbia Estuary Ecosystem Restoration Program (Program), which is a collaboration intended to evaluate, protect, monitor, and restore fish and wildlife habitat in the Columbia River Estuary. In July 2016, BPA and USACE completed the Columbia Estuary Ecosystem Restoration Program Environmental Assessment (DOE/EA-2006) (Programmatic Estuary EA). The Programmatic Estuary EA streamlines the environmental review of routine actions with well understood and predictable environmental impacts common to restoration projects in the Columbia River estuary. The purpose of this Supplement Analysis (SA) is to provide site-specific information about an individual restoration project proposed under the Program.

Consistent with the Programmatic Estuary EA, this SA analyzes the proposed West Sand Island Tidal Restoration Project, which would restore off-channel fish habitat on West Sand Island which is located along the northern edge of the Oregon state boundary in Baker Bay within Clatsop County. This SA analyzes the site-specific impacts of the project to determine if the project is within the scope of the analysis considered in the Programmatic Estuary EA. It also evaluates whether the proposed project presents significant new circumstances or information relevant to environmental concerns that were not addressed by the EA. The findings of this SA determine whether additional NEPA analysis is needed pursuant to 40 Code of Federal Regulations (CFR) § 1502.9(c).

Proposed Action

West Sand Island has historically been substantially and consistently altered by natural forces on the Columbia River (e.g., storm surges, winds, freshets, etc.). The island was stabilized as a result of anthropogenic disturbances such as jetty and pile dike construction and artificial berm development. Currently, the interior of the island contains complex microtopography, including over 100 acres of freshwater wetlands that have very little to no connection (except during extreme high tide events) to the Columbia River on either side (Baker Bay or the mainstem). An artificial berm on the north and eastern end of the island has prevented hydrological connectivity and fish access to quality wetlands on the interior areas of the island. Invasive species such as gorse (*Ulex europaeus*), Scotch broom (*Cytisus scoparius*), yellow flag iris (*Iris pseudacorus*), and Japanese knotweed (*Polygonum cuspidatum*) have also reduced the habitat quality on the island and threaten important coastal dune prairie habitat on the southeastern side of the island.

BPA proposes to fund the community organization, Columbia River Estuary Study Taskforce (CREST), to reconnect the interior of West Sand Island with the tidal hydrology of the estuary, providing aquatic organisms access to high quality, off-channel habitat at the mouth of the Columbia River. Improving access and enhancing the naturally functioning, dynamic wetland system would help to address the key limiting factors for habitat needs of juvenile salmonids and wildlife species in the region. A naturally functioning wetland system would have immediate habitat benefits for a variety of aquatic species, as well as provide habitat areas resilient to a changing climate and a rising sea level. This would be achieved by expanding and enhancing the available intertidal marshplain habitat and creating/protecting a diversity of elevations that can act as transition zones to allow the evolution of intertidal wetlands in the wake of rising sea levels. The goal also involves reestablishing native plant communities and protecting existing coastal grassland/prairie habitat on the island.

The proposed project has three overarching objectives, which are shown below. The bullets below each objective demonstrate what actions would be taken to ensure each objective is met.

Objective 1: Increase wetland habitat capacity

- Expand/enhance natural tidal processes to West Sand Island by removing portions of the existing levee.
- Increase fish ingress/ egress to off-channel tidal wetland habitat through the creation of 23 tidal channels.
- Expand total acreage of intertidal wetland areas to increase overall habitat availability for juvenile salmonids and other aquatic species.
- Increase and improve intertidal wetland habitat diversity and function to improve foraging and food web productivity to support wildlife and juvenile salmonids.
- Increase estuarine wetland function through increased nutrient exchange and improved estuarine food web productivity.

Objective 2: Enhance and manage native vegetation communities consistent with the proposed hydrological regime

- Reduce the extent of invasive plant species, specifically terrestrial plant species, on the island through both mechanical removal and herbicide treatment.
- Re-establish native wetland vegetation communities, expand intertidal wetland habitat areas.
- Protect existing coastal grassland/prairie vegetation communities from encroaching invasive plants.

Objective 3: Increase the resilience of tidal habitats on West Sand Island to climate change

- Protect existing areas that may be utilized in providing diverse intertidal habitat as sea-level rises.
- Create new and diverse transition/expansion zones that can be utilized as developing intertidal habitat as sea-level rises through strategic placement of excavated material to create topographic diversity.
- Restore and enhance riparian habitats that may act as a buffer to the effects of climate change.

The proposed actions would improve habitat for salmon and steelhead listed under the Endangered Species Act (ESA), as well as other fish and wildlife. The proposed actions are consistent with those considered in the Programmatic Estuary EA, including the following categories of action:

- Removal of invasive emergent and upland plants and weeds by chemical or mechanical means (chemical treatment for control of floating-leaved or submerged invasive plants is not included).
- Plant and protect native vegetation.

- Channel excavation and grading with localized effects on hydrology. Channel work would usually include excavation in floodplains to restore historical tidal channels previously modified through grading, drainage tiles, and linear drainage ditch networks.
- Long-term maintenance of completed estuary restoration projects.
- Levee and dike removal and breaching. This work entails the removal of water-excluding structures that results in the flooding of previously dewatered lands. It also includes the removal of flow-controlling structures not associated with dewatered sites. These actions restore hydrologic processes during high flow (riverine or tidal) and may include entire removal, or strategically located breaches, with the intent that natural erosional processes would complete the action.
- Restoration related ground disturbance and earthwork associated primarily with levee removal, ditch filling, and tidal channel creation.
- Construction-related in-water work.

The proposed action is also consistent with the Columbia River Estuary (CRE) Module management actions, developed by National Marine Fisheries Service to aid in the recovery of salmon and steelhead throughout the region listed below.

- CRE-1: Protect intact riparian areas in the estuary and restore riparian areas that are degraded.
- CRE-9: Protect remaining high-quality off-channel habitat from degradation and restore degraded areas with high intrinsic potential for high-quality habitat.
- CRE-10: Re-establish or improve access to off-channel habitats.
- CRE-15: Reduce the introduction and spread of invasive plants.

West Sand Island presents an opportunity to increase access to intertidal estuarine habitat and increase food-web connections and nutrient exchange by increasing tidal inflow and ebb flow to the interior wetland complex on a portion of the island. The site does not currently support the breadth of estuarine habitat-forming processes and functions necessary for survival of juvenile salmonids and other estuarine-dependent species due to the lack of hydrological connection with the Columbia River.

The West Sand Island Tidal Restoration Project has been in the planning and design stage for the last three years. The design was developed by CREST with input from the following agencies and technical groups: the Oregon Department of Fish and Wildlife (ODFW); the National Marine Fisheries Service (NMFS); the U.S. Fish and Wildlife Service (USFWS); the Expert Regional Technical Group (ERTG); BPA; and USACE. The consensus by these various agencies is that the project would provide an overall environmental benefit through the excavation of new tidal channels to establish tidal connectivity between the Columbia River and the interior West Sand Island wetland complex, and increase estuarine wetland habitat on approximately 104 acres.

Proposed work for this restoration project include the chemical removal of invasive yellow flag iris (*Iris pseudacorus*) from exterior tidal wetlands, removal of portions of the berm along the northern and eastern island perimeter, mechanical removal of invasive gorse (*Ulex europaeus*) and Scotch broom (*Cytisus scoparius*) along the berm and island interior, excavation of approximately 23 tidal channel connections between the island interior and the exterior tidal marsh, mechanical and chemical removal of yellow-flag iris, gorse, Scotch broom, and other invasive species, and revegetation of estuarine wetlands with native species.

The first application of herbicide treatment of invasive species would target gorse and Scotch broom in the depressional wetlands and upland/riparian sites on the interior of the island (approximately 78 acres), and yellow flag iris in the estuarine high marsh on the exterior of the island (approximately 8 acres, 2.5 linear miles on the north and eastern end of the island). Herbicide application would be

conducted with backpack sprayers using approved methods to target specific plants only, using approved herbicide type, and using concentrations as outlined in BPA's Habitat Improvement Plan (HIP) Biological Opinion (BiOp). Rates and concentrations would be used at the minimal rate possible to still be effective. All herbicide application actions would be performed by a licensed and experienced applicator.

Heavy construction equipment for berm removal and tidal channel excavation would be delivered to the island by spud barge and off-loaded on the northwest side of the island. The temporary access route would follow on top of the gorse-cleared earthen berm except for a 750-foot section on the north side of the island, where the berm contains relatively healthy and native riparian tree species. To avoid impacts to the trees and native understory, the temporary access route is proposed to go across a high marsh portion of the tidal wetlands on the exterior of the island. Equipment and vehicles would only pass through on this route during low tides. In areas along the 750 feet of the temporary access route where muddy conditions may be present, the use of steel plates (or similar material) are proposed to allow access for tracked machinery and vehicles carrying personnel and supplies. After construction is completed, the steel plates would be removed and the access route reseeded with native high marsh species.

Mechanical treatment of gorse and Scotch broom along the berm and areas adjacent to the berm would follow. Vegetation would be cut down and mulched to the roots, with root wads left in place. Areas that cannot be reached with machinery, i.e., surrounded by sensitive wetland areas, would be hand-cut with chainsaws and other manual equipment. Mechanical treatment of the gorse on the berm would also prepare the berm to be the temporary access route for the excavation machinery to construct the tidal connections through the berm to the island interior.

After invasive species are treated, the berm would be utilized as a temporary access route for tracked machinery, including excavators. A total of 7 temporary staging areas (1 primary and 6 interim) would be utilized along/adjacent to the berm to stage and fuel tracked machinery and equipment. Limits and location of the staging areas would be surveyed and a sediment fence installed around all staging areas.

Tidal connection pathways would be surveyed and are planned to avoid sensitive areas such as mature tree stands to the extent practicable. However, some tree cutting (generally, 8-10 dbh) (primarily *Alnus rubra*) may be unavoidable. In potential muddy wetland conditions, log mats would be used to ensure equipment passage through wetland areas and limit equipment impacts to the wetland. Access from one tidal connection pathway to another in the island interior would require additional temporary access routes beyond the tidal connection pathways. All such access routes would be surveyed and flagged to avoid sensitive wetland areas and tree species.

After the tidal connections on the interior of the island are excavated, machinery would then begin at the southern-most extent of the project site and work on the tidal connections through the berm and on the exterior marshplain. Excavators would utilize tidal connection pathways as the temporary access routes and work from the berm towards the terminus of the excavated tidal connection in the tidal marshplain to minimize ground-disturbing impacts. The construction crew and equipment would coordinate with the tides to minimize turbidity issues. Siltation curtains would be implemented to capture potential sediment.

All excavated material would be placed on the interior of the island, adjacent to the remaining berm footprint and in topographic complexity mounds along the tidal connection footprint. Mounds placed in wetland areas would be shaped to mimic the natural topographical complexity of the interior island. Mound creation and subsequent planting of elevation appropriate native species would expand quality edge habitat on the interior of the island.

Post-construction, a licensed applicator would apply herbicide treatment to invasive species management areas before implementing native revegetation on disturbed areas. The short-term native revegetation effort is planned to use plant species appropriate for different elevation bands. The replanting effort would encompass all temporary access routes, topographic mounds, the berm, and the excavated tidal connections. Short-term stabilization measures may include the use of sterile seed mix and weed-free certified straw, jute matting, hydro seeding/tackifier and other similar techniques during any periods of inactivity or between phases until the planting and seeding plan is implemented. Re-sprouted invasive species would continue to be manually and chemically treated throughout the invasive species management areas for two years following the short-term stabilization and revegetation effort.

Areas on the interior of the island treated for invasive species, but not directly impacted by the construction effort, would be replanted two years post-construction with native vegetation. During that two years, an effort to continue to manually and chemically treat re-sprouted invasive species would occur.

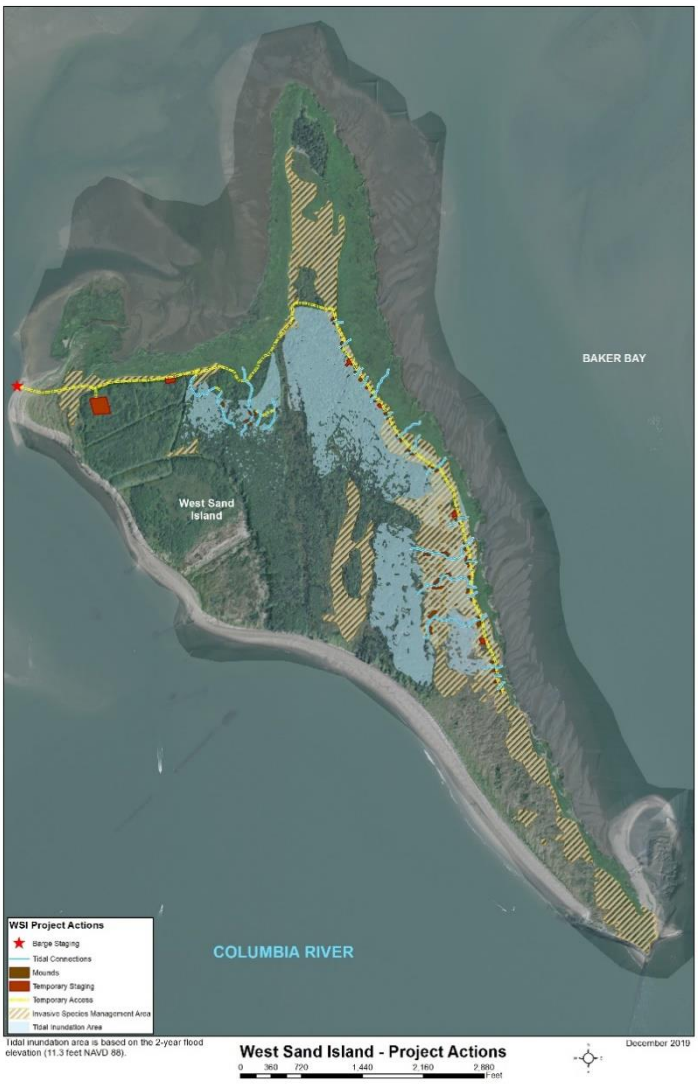

Figure 1. West Sand Island Tidal Restoration Project

Environmental Effects

The typical environmental impacts associated with the Columbia Estuary Ecosystem Restoration Program are described in Chapter 3 of the Programmatic Estuary EA, and are incorporated by reference and summarized in this document. Below is a description of the potential site-specific impacts of the West Sand Island Tidal Restoration Project and an assessment of whether these impacts are consistent with those described in the Programmatic Estuary EA.

Much of the site-specific analysis cited in the environmental impacts section below comes from several sources: Habitat Restoration Design and Implementation Project Application for the Expert Regional Technical Group (ERTG), Biohabitats' West Sand Island Restoration 100% Design Plan Set, and CREST's Final Basis of Design Report.

1. Fish

While the proposed action would have temporary, short-term adverse impacts to individual fish, overall the action would result in a net benefit to individual fish, fish populations, and fish habitat. ESA-listed fish in the project area include chum, coho, Chinook, steelhead, eulachon, and green sturgeon. In the project vicinity, the Columbia River is designated critical habitat for chum, coho, Chinook, steelhead, and sockeye, and is essential fish habitat for coho and Chinook, per the Magnuson-Stevens Fishery Conservation and Management Act. The following paragraphs describe the impacts to fish and fish habitat in more detail.

Temporary, short-term impacts to fish and fish habitat could occur due to in-water construction work, including increased turbidity from the establishment of temporary access routes, excavation of exterior and interior tidal connection pathways, and berm removal. During or immediately after construction is completed, when rainfall or surface flow first enters onto newly disturbed soil in the temporary access routes, tidal connection pathways, and berms removal area, turbidity could be elevated temporarily in the interior wetland, tidal connections, and the Columbia River. Efforts to avoid and minimize construction-related turbidity would include timing all in-water work to be completed during the in-water work window in coordination with ebbing and low tides to minimize turbidity impacts, and the use of siltation curtains to capture potential sediment plumes. Additionally, temporary access routes would be designed to minimize distances between tidal connection pathways. Steel plates and log mats would be placed temporarily in locations where muddier and wetter conditions persist at low tides. As a result of these efforts, fish injury or mortality is unlikely to occur due to the limited duration and spatial extent of the impact, the erosion control measures used to limit sediment discharges, and the high dilution levels that would be provided by the Columbia River. Therefore, turbidity impacts to fish and fish habitat are expected to be temporary and low.

The use of tracked machinery and vehicles during construction could pose a risk of accidental spills of fuel, lubricants, hydraulic fluids, or other contaminants. A spill would have the potential to carry contaminants to the interior wetland complex, tidal connection pathways, and the Columbia River, exposing fish and fish habitat to toxic substances. However, Best Management Practices (BMPs) would be employed to avoid or minimize the potential for construction-related spills or discharges. These BMPs would include, but not be limited to: implementation of a Spill and Pollution Containment and Control Plan, adherence to terms and conditions of permits and other environmental authorizations, daily inspections of powered equipment for leaks, equipping tracked machinery and vehicles with 'diapers' and vegetable-based non-toxic hydraulic fluid, and washing tracked machinery and vehicles prior to arrival on site. Since the work would use BMPs and adhere to permit conditions, construction-related water quality impacts to fish and fish habitat would be temporary and low.

The project proposes to establish a full hydraulic connection between the island's interior wetland complex and the Columbia River. Water levels in the wetlands would rise and fall with the water levels on the Columbia River. The connection and inundation of the wetlands would be highly variable, with a range of water depths. Some years the hydraulic connection would be established in early spring, other years it would be established in late spring. The wetlands would remain inundated and connected from days to weeks at a time, rather than long periods of time. This variability and frequency would make the wetlands less predictable and dependable as a possible food source for waterbirds, and therefore unlikely to attract colonies of piscivorous waterbirds. In addition, anadromous fish are thought to follow the water levels into and out of off-channel habitat as the water levels fluctuate, so they are not anticipated to be utilizing the lake and wetlands when the water levels are low and more prone to avian predation. Impacts to fish from avian predation are not anticipated to increase measurably from pre-construction levels.

Overall, the project is expected to have moderate, beneficial effects on fish. Beneficial effects would far outweigh the temporary adverse impacts. These include: increased tidal hydrologic connection between the Columbia River and the West Sand Island interior wetland complex; increased access to food, resting, and growth areas for juvenile salmonids and other native fish within the interior wetland complex (104 acres); improved fish passage through removal of sections of the berm preventing connection between the exterior tidal wetlands and island interior; and sediment flushing and increased detrital inputs to the island interior wetland complex.

These impacts are consistent with the analysis in the Programmatic Estuary EA, Section 3.2.4, which concludes that impacts to fish would be moderate and beneficial because of the increased food web support, conversion of vegetation to more natural conditions, restored and improved hydrology, and enhanced water quality.

2. Hydrology and Hydraulics

Hydrology and hydraulic modeling was completed for the project to determine flow paths, water depths, and the inundation duration. The purpose of the modeling was to ensure that the project would achieve the habitat goals while protecting existing resources. In addition to being designed by a professional engineer, this project has been reviewed by a BPA hydrologic engineer to ensure that the design would achieve the restoration goal. Expected impacts to the island interior wetland complex, Baker Bay (west side of the island), and the Columbia River from the modeling results are discussed below.

After project completion, water would enter the West Sand Island interior complex via 23 newly excavated tidal connection pathways. High tides are expected to drive water to the island interior until water-surface elevations are in equilibrium with the Columbia River and the adjacent Ilwaco and Chinook Channels. As the new tidal connection pathways adjust to the increased velocity and flow of estuary water during tidal conveyances, increased erosion, scour, and deposition could occur within the new tidal connection pathways and the interior wetland complex. Channel design elements were incorporated to reduce erosion risk and increase channel resiliency. These design elements include: an increased number (23) of channel connections to distribute hydraulic exchange and reduce the risk of scour-producing shear stresses; increased channel widths to accommodate heavy bank vegetation growth, improve functionality, and mitigate future channel sedimentation; and in-channel placement of small woody debris. Temporary erosion control measures would be installed prior to construction to protect newly excavated streambeds, streambanks, and riparian areas and would remain in place until the site is stabilized following construction. These measures would include, but not be limited to, fiber wattles, silt fences, jute matting, wood fiber mulch and soil binder, geotextiles, and placement of native

vegetative slash produced during clearing and grubbing along tidal connections bottoms. Adverse impacts to hydrology and hydraulics within the restoration area are therefore expected to be moderate.

Impacts from construction-related turbidity and potential sediment plumes would be mitigated by timing all in-water work to be completed during the in-water work window in coordination with ebbing and low tides, and the use of siltation curtains. The amount of sediment would be negligible relative to the vast area, high dilution levels, and existing sediment loading of the Columbia River, and adverse impacts would therefore be temporary and low.

These impacts are consistent with the analysis in the Programmatic Estuary EA, Section 3.3.3, which concludes that impacts to hydrology and hydraulics would be moderate. These adverse impacts discussed in the Programmatic Estuary EA, Section 3.3.3 include: erosion, scour, and in-channel deposition; increased frequency and duration of inundation; localized changes in velocity, flow, and circulatory patterns; reconnection of channel habitats; and increased instream flows.

3. Water Quality

Over the long term, water quality in the West Sand Island interior wetland complex is expected to improve due to the 23 new tidal connection pathways created with the exterior tidal wetlands and surrounding Columbia River. Establishing tidal connections is expected to result in a transition from a freshwater wetland habitat type in the island interior to a tidal estuarine wetland habitat. It is anticipated that 104 acres of the existing 175 acres of freshwater wetlands would transition as a result of the project, with a patchy mosaic of freshwater wetlands remaining without a tidal hydrologic connection. The proposed planting plan and anticipated migration of native estuarine marsh species from the island exterior would allow the interior island wetlands to establish plant community assemblages that are more tolerant to increased levels of salinity and regular tidal inundation. The increase in daily brackish tidal inundation would increase detrital export and flux that contributes to the food web for native fish species in and around West Sand Island. This increased flow and flushing effect should also enhance nutrient exchange, increase wetland types, and increase habitat complexity for juvenile salmon and other estuarine aquatic species. Additionally, the improved circulation is expected to reduce algal blooms and to improve dissolved oxygen and pH conditions.

The use of tracked machinery and vehicles during construction could pose a risk of accidental spills of fuel, lubricants, hydraulic fluids, or other contaminants. A spill would have the potential to carry contaminants to the interior wetland complex, tidal connection pathways, and the Columbia River. Since the work would use BMPs and adhere to permit conditions, construction-related water quality impacts to water quality would be temporary and low. In the short term, during first re-watering after construction, slight, localized increases in suspended sediment could occur in the interior wetland complex, new tidal connection pathways, and the Columbia River, but these impacts would be short in duration, diluted by high flows, and mitigated by following an erosion and sediment control plan developed in accordance with the regulations specified by the Oregon Department of Environmental Quality (DEQ).

The temporary and low impacts to water quality associated with the project are consistent with those described in the Programmatic Estuary EA, Section 3.4.3, which concludes that effects to water quality would be low to moderate and mitigated by sediment and erosion control practices. The impacts discussed in the Programmatic Estuary EA, Section 3.4.3 include: increased composition of native vegetation; increased riparian buffer width; increased vegetation cover; increased flows, tidal exchange, and flushing; increased channel complexity and alignment; and decreased composition, distribution, and quantity of invasive species.

4. Geomorphology, Soils, and Topography

Direct impacts to soils would result from temporary construction activities, including vegetation clearing, grading, and compaction of soils by heavy equipment during construction. Clearing and grading would remove both vegetation and topsoil. Compaction from heavy equipment degrades soil structure, reducing pore space needed to retain moisture and promote gas exchange.

Short-term construction-related impacts would include a temporary increase in soil erosion or temporarily elevated suspended sediments within the interior wetland complex, new tidal connection pathways, or the Columbia River. With the exception of the exterior marshplain, the entire project area is located on sandy soils/organics. Working in low hydraulic velocity systems on sandy soils vastly reduces turbidity impacts compared to working in alluvial soils. To minimize temporary and localized turbidity during excavation of the tidal connections, particularly in the exterior marshplain where more alluvial soils predominate, all work would be conducted during ebbing tides. Construction-related impacts would be additionally mitigated by the use of an erosion and sediment control plan designed in accordance with the regulations specified by the Oregon DEQ and implemented by a certified erosion control specialist.

Over the long term, impacts would be beneficial due to the restoration of the natural hydrological regime, soil-forming process, sediment flushing, and estuarine ecosystem function to the interior of West Sand Island.

Based on the impacts above, the project would have moderate temporary impacts in the short-term and long-term beneficial impacts to geomorphology, soils and topography. Project impacts are consistent with those described in the Programmatic Estuary EA, Section 3.5.3, which predicted that construction would have moderate temporary effects, and that long-term impacts would be beneficial. The impacts discussed in the Programmatic Estuary EA, Section 3.5.3 include: temporary erosion and sedimentation; altered channel form, structure, and density; localized changes in velocity, flow, and circulatory patterns; restored sediment transport; and restored spatial and temporal connectivity of streams and wetlands.

5. Sediment Quality

Approximately 2,651 cubic yards of material from the artificial berm and the 23 tidal connection pathways would be excavated and placed strategically on the interior of the island, immediately adjacent to the berm and along either side of each tidal connection pathway. The material would be contoured and shaped into “mounds” to mimic the natural topographical complexity of the island interior. This action could temporarily loosen sediment within the interior wetland complex, tidal connection pathways, and Columbia River, which would later be suspended in the water column and redistributed within the estuary upon re-watering.

The impacts to sediment quality from the project would be low and are less than those described in the Programmatic Estuary EA, Section 3.6.3, which concluded that effects to sediment quality would be moderate. The impacts discussed in the Programmatic Estuary EA, Section 3.6.3 include: changing hydrologic flow patterns; floodplain and tidal reconnection; increasing organic materials in sediments; and introduction of pollutants.

6. Air Quality

Vehicle emissions during the transportation and operation of construction equipment could cause a minor temporary decrease in air quality for the duration of on-the-ground work. Impacts would be low and would not result in violations of state air-quality standards. As described in the Programmatic Estuary EA, Section 3.7.3, impacts on air quality would be low both in concentration and duration. The impacts discussed in the Programmatic Estuary EA, Section 3.7.3 include: temporary and localized increase in dust and pollutants, such as carbon monoxide, nitrogen dioxide, particulates, sulfur dioxide, ozone, or lead.

7. Wildlife

In the short term, noise and visual disturbance during construction would likely cause wildlife to avoid the project area during the construction period. If present during construction, nesting birds, smaller ground-dwelling mammals, reptiles, and amphibians could be harmed or killed incidentally during construction. Herbicide application has the potential to affect migratory birds during and post-construction; however, impacts to migratory birds and other wildlife would be minimized or avoided by observing herbicide-buffer zones, timing restrictions, and other measures developed by CREST, Oregon Parks & Recreation Department, BPA, and NMFS. These measures were included in BPA's ESA consultation with NMFS concerning impacts to listed fish (concurrence received December 4, 2019).

West Sand Island is within the range of streaked horned larks, but the only suitable habitat (large, open, flat areas with extensive bare ground) is found along the western edge of the island and not within the project area. There are no known occurrences of ESA-listed terrestrial wildlife species or critical habitat on West Sand Island. BPA consulted with U.S. Fish and Wildlife Service about impacts to ESA-listed species, and received concurrence on October 5, 2017.

Bald eagles are known to occur throughout the estuary and likely use the project area for nesting, roosting, and foraging. Biological surveys documented one bald eagle nest on the island. Short-term impacts to individuals and/or potentially occupied nests would be avoided, minimized, or mitigated through adherence to measures developed in consultation with the U.S. Fish and Wildlife and described in a short-term eagle incidental take permit received March 13, 2019.

Long-term effects to wildlife are expected to be beneficial. The proposed action would improve breeding and feeding habitat for semi-terrestrial animals such as river otters, amphibians, waterfowl, shorebirds, and insect-eating birds. Likewise, wildlife that use riparian areas would benefit from the planting of native trees and shrubs in the interior wetland complex and new tidal connection pathways. The wetlands that would transition to tidal brackish marsh would continue to provide habitat for many resident and migratory birds and small mammals; however, daily brackish tidal inundation is anticipated to change some of the current plant assemblages and would ultimately make such habitat unsuitable for salt-intolerant species such as frogs and other amphibians. However, these species would continue to have suitable habitat in the pockets of non-tidal freshwater wetlands on the island interior.

These impacts from the project on wildlife would be moderate and beneficial and are consistent with the Programmatic Estuary EA, Section 3.8.3, which concluded that effects to wildlife would be moderate and beneficial. The impacts discussed in the Programmatic Estuary EA, Section 3.8.3 include: noise or visual disturbance to wildlife, displacement of individual animals, and habitat conversion.

8. Wetlands, Floodplains, and Vegetation

In the short term, construction would directly affect regulated waters in the project area. Approximately 2,651 cubic yards of material from the artificial berm and the 23 tidal connection pathways would be placed strategically on the interior of the island, immediately adjacent to the berm and along either side

of each tidal connection pathway. The material would be contoured and shaped into “mounds” to mimic the natural topographical complexity of the island interior. Establishing tidal connections with the Columbia River is expected to result in a transition from a freshwater wetland habitat type in the island interior to a tidal estuarine wetland habitat. It is anticipated that 104 acres of the existing 175 acres of freshwater wetlands would transition as a result of the project, with a patchy mosaic of freshwater wetlands remaining without a tidal hydrological connection. The proposed planting plan and anticipated migration of native estuarine marsh species from the island exterior would allow the interior island wetlands to establish plant community assemblages that are more tolerant to increased levels of salinity and regular tidal inundation. Additionally, wetland quality would improve due to the restoration of natural flow patterns and the replacement of invasive species with native trees, shrubs, grasses, and sedges.

Short-term impacts to vegetation are anticipated due to targeted herbicide application to yellow flag iris, and mechanical treatment of gorse, Scotch broom, and other invasive species. Temporary, short-term impacts to vegetation are anticipated for the creation of staging areas and temporary access routes. Although temporary access routes and staging areas would be surveyed and flagged for sensitive wetland areas and mature tree stands and avoided to the extent practicable, some removal of vegetation would be unavoidable. Vegetation within the new tidal connection pathways would be permanently removed. Following construction, a short-term native revegetation effort would replant appropriate species for different elevation bands within temporary access routes, staging areas, topographic mounds, the berm, and along the newly excavated tidal connections. Interior portions of the island treated for invasive species, but not directly impacted by the construction would be replanted with native vegetation two years post construction. Overall, the project would result in beneficial impacts due to the reduction of invasive species and an increase in native vegetation in riparian and wetland areas.

These impacts are consistent with the Programmatic Estuary EA, Section 3.9.3, which predicted beneficial effects. The impacts discussed in the Programmatic Estuary EA, Section 3.8.3 include: alteration of wetland hydrology; restoration of wetland-forming processes; increased wetland area, habitat complexity, composition of native vegetation, riparian buffer area, vegetation cover, and quantity of tidal marsh habitat flows, tidal exchange, and flushing; and decreased composition, distribution, and quantity of invasive species.

Chapters 3, 4, and 5 of the Programmatic Estuary EA provide an assessment of impacts to floodplains and wetlands. Consistent with the Programmatic Estuary EA (including Section 3.9.9), the West Sand Island project would restore floodplain connectivity and function and improve wetland function and value, as described above. Additionally, the project would not result in floodplain development. While the project may impact wetlands in the short term, the overall long-term impacts would be beneficial, because the goal of the project is to create more wetland acreage and improve wetland quality, compared to the current condition. This Floodplain Statement of Findings was prepared in accordance with the Department of Energy’s NEPA implementing regulations and in compliance with Floodplain and Wetland Environmental Review Requirements (10 Code of Federal Regulations 1021 and 1022).

9. Land Use and Recreation

Project construction would temporarily affect small areas of recreational uses. To allow for construction access, some of the lands currently managed as wildlife habitat would be temporarily transformed into temporary access roads and staging areas.

Disposal sites are not required for this project. All excavated material is planned to be placed strategically on the interior of the island, contoured and shaped into “mounds” to mimic the natural

topographical complexity of the interior wetland complex. Remaining native vegetative slash produced during clearing and grubbing would be placed along tidal connection bottoms to create channel roughness. USACE currently manages the island as an important navigational feature, and would continue to work with the project sponsor and partners post-project to adaptively manage invasive species until native vegetation is well established. The proposed project would therefore not encourage or influence land use changes on the island or in the vicinity.

Recreational boaters currently utilize an actively dredged channel between Cape Disappointment and West Sand Island for access to the mouth of the Columbia River and the Pacific Ocean on the north and west side of the island. The proposed project takes place in the tidal wetlands on the northeast and east side of the island and would have no effect on recreational use in the adjacent dredged channel.

Improvements to West Sand Island may have long-term beneficial effects to recreation. Since the action would benefit fish, waterfowl, and other recreationally-managed species, fishing opportunities in the vicinity of West Sand Island could improve over time.

Based on the impacts above, the project would have low, temporary impacts in the short-term and long-term beneficial impacts to land use and recreation. These impacts are consistent with the Programmatic Estuary EA, Section 3.10, which described low to moderate impacts to land use and recreation. The impacts discussed in the Programmatic Estuary EA, Section 3.10.3 include: changes in land ownership, removal of drainage structures, and changes in access to recreational opportunities.

10. Cultural Resources

In a letter dated December 10, 2018, BPA initiated Section 106 consultation with the Confederated Tribes of Siletz Indians, the Cowlitz Indian Tribe, the Confederated Tribes of Grand Ronde, USACE, and the Oregon State Historic Preservation Office (SHPO). BPA received responses from Oregon SHPO and the Confederated Tribes of Grand Ronde in January 2019 indicating their concurrence with the Area of Potential Effects (APE) and BPA's determination that a cultural resource survey would be required, and requested a copy of the cultural resource report once completed.

Archaeological consulting firm Willamette CRA conducted background research using the Oregon Archaeological Records Remote Access (OARRA) database followed by an intensive field survey of the Area of Potential Effects (APE). Background research conducted by WCRA indicated that seven previous archaeological surveys had been conducted within one mile of the West Sand Island project. A total of nine previously recorded cultural resources are located within one mile of the project. As a result of the archaeological field survey, no historic properties were located in the APE. Willamette CRA conducted a field survey and prepared a cultural resources report with the determination of no historic properties affected. While two isolated artifacts were identified in the project area, both were deemed ineligible for inclusion in the National Register of Historic Places. Oregon SHPO concurred with BPA's determination in a letter dated August 26, 2019.

Cultural resources impacts are consistent with the analysis in the Programmatic Estuary EA, Section 3.11.3. That is, the action would not impact historic sites, and impacts to cultural resources uncovered during construction would be mitigated by the use of Inadvertent Discovery Protocols. The impacts discussed in the Programmatic Estuary EA, Section 3.11.3 include: reestablishment of tidal channels, reestablishment of wetland and riparian plant communities, and removal of structures.

11. Socioeconomics

The project would result in small, temporary, beneficial impacts to socioeconomics by providing jobs for construction workers. Long-term benefits could result from the improvement of fish runs and natural scenery. The action would not displace residents or degrade residential suitability; nor would it cause changes to the tax base. The island is solely under the USACE's jurisdiction, with no other landowners present on, or adjacent to the island. The new stream channel would be considered a water of the State, and thus would be open to the public.

The expected socioeconomic impacts would be low, consistent with those described in the Programmatic Estuary EA, Section 3.12.3. The impacts discussed in the Programmatic Estuary EA, Section 3.12.3 include: short-term employment opportunities, local short-term traffic or lifestyle disruptions due to construction, land use conversion, and improvements to fisheries.

12. Visual Resources

The project area can be seen from observation points in the cities of Ilwaco and Chinook, WA, State Route 101, Baker Bay, and the Columbia River. Temporary visual impacts could occur during construction due to construction equipment being visible to individuals in boats on the river and residents and commuters north of the island in Washington along the Columbia River. In the short term, construction would temporarily leave areas of bare soil visible to people in boats in Baker Bay and the Columbia River. However, this impact would be mitigated by the installation of erosion and sediment control devices, removal of invasive species, and replanting of all areas impacted during project construction.

In the long term, completion of the West Sand Island project would increase hydrological connectivity with the Columbia River, resulting in an increase in the quality and size of the wetland within the island interior. The project area would be revegetated with native plants and woody riparian vegetation, resulting in a more natural looking environment.

This impact is consistent with the visual resources analysis in the Programmatic Estuary EA, Section 3.13.3, which characterized these effects as low to moderate. The impacts discussed in the Programmatic Estuary EA, Section 3.13.3 include: short-term visual impacts related to construction, and long-term impacts associated with changing the visual condition from a managed state to a more natural landscape.

13. Noise, Hazardous Waste, Public Health, and Safety

Noise level is expected to increase intermittently above ambient conditions during the construction period. The project would not result in any long-term effects to ambient noise levels during operation. Requirements to minimize these effects would be considered during the development of construction specifications.

Potential safety risks could be associated with increased area, elevation, and duration of flowing water in West Sand Island. The public could potentially access this water by small water craft during high flows. However, because water levels are expected to rise and fall slowly with the natural tides, safety risks are anticipated to be low.

This is consistent with the analysis in the Programmatic Estuary EA, Section 3.14.3, which described low effects to noise, hazardous waste, public health, and safety. The impacts discussed in the Programmatic Estuary EA, Section 3.14.3 include: short-term noise during construction and maintenance, potential encounters with contaminated media during construction, and risks to safety due to change in hydrologic regime after construction.

14. Transportation and Infrastructure

A commercial fishing fleet and recreational boaters currently utilize an actively dredged channel between Cape Disappointment and West Sand Island for access to the mouth of the Columbia River and to the Pacific Ocean on the north and west side of the island. The Coast Guard also utilizes the same channel from their base on Cape Disappointment. The proposed project takes place in the tidal wetlands on the northeast and east side of the island and would have no effect on boat navigation through the dredged harbor channel.

This is consistent with or less than the effects in the Programmatic Estuary EA, Section 3.15.3, which described low effects to navigation. The impacts discussed in the Programmatic Estuary EA, Section 3.15.3 include: changes in navigation, and potential damage to infrastructure due to changes in flow patterns.

15. Climate Change

Vehicles and equipment operating during construction and maintenance of the project could have negative impacts to climate change. However, over the long term, effects are expected to be positive, as the restoration would create a carbon sink that would store carbon dioxide and help mitigate for the release of greenhouse gases.

Plantings would be adaptively managed to address long-term changes in climate (and resulting effects to salinity, surface-water elevation, and groundwater elevation). Temporary access routes, topographic mounds, the berm, staging areas, and riparian areas along newly excavated tidal connections would be replanted following construction, and would include short term stabilization measures during any periods of inactivity or between construction phases until the planting and seeding can occur. These areas would be planted with a variety of native species appropriate for different elevation bands to allow plants to adapt to a range of water levels, salinities, and other fluctuating environmental conditions. USACE, CREST, and project partners would monitor and maintain the plantings over the long term, replanting if necessary, and continuing to treat invasive species. Although climate change may increase temperatures, change precipitation patterns, cause more extreme weather events, and raise sea levels, these impacts would likely occur regardless of the West Sand Island project. As previously described, the project sponsor incorporated channel design elements to reduce erosion risk and increase channel resiliency, including an increased number (23) of channel connections. This would more effectively distribute hydraulic exchange and reduce the risk of scour-producing shear stresses; resulting in an estuarine wetland complex capable of handling future larger and more frequent flows. Likewise, improving access to, and the quality of, the island's interior wetland complex would provide refuge areas to juvenile fish during more extreme flows in the Columbia River.

Overall, the long-term impacts on climate change from the project are expected to be low and beneficial, consistent with the impacts described in the Programmatic Estuary EA, Section 3.16.3. The impacts discussed in the Programmatic Estuary EA, Section 3.16.3 include: both the release and sequestration of greenhouse gases, and the buffering of sea-level rise, particularly during extreme flows.

Findings

This SA finds that the types of actions and the potential impacts related to the proposed West Sand Island Restoration Project have been examined, reviewed, and consulted upon and are similar to those analyzed in the Columbia Estuary Ecosystem Restoration Program Environmental Assessment (DOE/EA-2006) and Finding of No Significant Impact. There are no substantial changes in the proposed action and no significant new circumstances or information relevant to environmental concerns bearing on the proposed action or its impacts within the meaning of 10 CFR § 1021.314(c)(1) and 40 CFR §1502.9(c). Therefore, no further NEPA analysis or documentation is required.

/s/ Zachary Gustafson
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SalientCRGT

Reviewed by:

/s/ Chad Hamel
Chad Hamel
Supervisory Environmental Protection Specialist

Concur:

/s/ Sarah T. Biegel Date: *April 28, 2020*
Sarah T. Biegel
NEPA Compliance Officer