



**US Army Corps
of Engineers** ®
Portland District

Crims Island Section 536 Habitat Restoration Project Lower Columbia River and Estuary

APPENDIX A SECTION 404(B)(1) EVALUATION

Project Partners:

**U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
Bonneville Power Administration
U.S. Geological Survey
Columbia Land Trust**

April 2004

Crims Island

Section 536 Habitat Restoration Project

Section 404(b)(1) Evaluation

I. Introduction

Section 404 of the Clean Water Act of 1977 requires that all Civil Works projects involving the discharge of dredged or fill material into waters of the United States be evaluated for effects prior to making the discharge. This evaluation assesses the effects of fill, consisting of native soil, greater than incidental fallback during the placement of a tidal channel plug and culvert with tidegate and associated backfill, on the existing streams and adjacent habitats. The proposed project includes a total excavation of 75 acres of tidal marsh and 17 acres of tidal channel habitat on Crims Island and subsequent disposal of excavated materials onto 115 acres of adjacent pastureland.

The Portland District Corps of Engineers (Corps), in coordination with the U.S. Fish and Wildlife Service (USFWS), Bonneville Power Administration, U.S. Geological Survey, and the Columbia Land Trust, has initiated a Section 536 restoration project within the Lower Columbia River estuary.

The purpose of the Crims Island Section 536 Habitat Restoration Project is to restore tidal emergent marsh, tidal channel, and riparian forest habitats on the island to benefit many fish and wildlife species in the lower Columbia River and estuary. Crims Island is located within the Columbia River between river miles 54-57. It is separated from the Oregon shoreline by Bradbury Slough. The island was historically homesteaded and used for agriculture (dairy and beef cattle grazing). The island was later acquired by commercial forest product companies, and is now owned and operated by the Columbia Land Trust, Oregon Division of State Lands, USFWS, RSG Products, and 2 private landowners.

The proposed project specifically provides juvenile salmonid rearing/foraging habitat for threatened lower Columbia River fall chinook (*Oncorhynchus tshawytscha*) sub-yearlings and threatened chum salmon (*Oncorhynchus keta*), both Endangered Species Act (ESA) listed Evolutionarily Significant Units (ESUs), as well as coho salmon (*Oncorhynchus kisutch*), a candidate species for listing. Other Columbia River salmonids including endangered Snake River sockeye salmon (*Oncorhynchus nerka*), threatened steelhead trout (*Oncorhynchus mykiss*), and coastal cutthroat trout (*Oncorhynchus clarki*), are expected to benefit from habitat restoration at Crims Island through detrital export to the river and estuary and associated benefits for benthic invertebrates.

The proposed project is expected to provide habitat for waterfowl, bald eagles (*Haliaeetus leucocephalus*), and neotropical migratory birds, and will contribute to the recovery of the endangered Columbian white-tailed deer (*Odocoileus virginianus leucurus*). The project also will increase the export of detrital nutrients to the estuary. A monitoring program will measure the response of fish, especially juvenile salmon, and vegetation to the restoration measures.

The need for habitat restoration at Crims Island results from the significant historic losses of tidal marsh and riparian forest habitat along the lower Columbia River. Over the last 100 years, the amount of available tidal marsh and wetland habitat in this region has decreased significantly over historical levels because of dike and levee building, hydrosystem operations, and other activities. Riparian forests of Oregon ash and cottonwood and Sitka spruce-dominated wetland forest also have declined dramatically from historic levels. Restoration of habitat for juvenile salmonids migrating through the lower Columbia River and estuary is an important component of regional recovery plans.

The lower Columbia River and estuary are critical areas in the migration corridor for Columbia Basin anadromous fish, especially chum and chinook, because these areas provide refugia from predators, feeding grounds, and areas to transition physiologically from freshwater to saltwater.

II. Description of the Proposed Activity

The preferred alternative includes restoration of tidal connectivity to emergent and forested marsh habitat and restoration of tidal marsh and riparian forest habitats. The selected plan would restore 75 acres of tidal wetland, 17 acres of tidal channels, and 115 acres of riparian forest habitat on Crims Island. Tidal exchange would be restored to an additional 88 acres of forested swamp/wetland habitat if one inholding is acquired prior to project construction.

Components of the restoration would include the following:

- Reshaping of existing tidal channels and excavation of new tidal channels to improve tidal ingress and egress to 75 acres of tidal marsh habitat, create additional salmonid rearing and refugia habitat, and increase nutrient exchange between marsh and river.
- Excavation of high tidal marsh dominated by reed canarygrass to a lower elevation to facilitate the formation of more natural tidal estuary/marsh plant communities and conditions.
- Removal of an earthen dam, or plug, which has disconnected a forested wetland from daily tidal inundation.
- Disposal of excavated materials throughout 115 acres of upland pasture to provide a substrate for establishment of native riparian species via natural recruitment and/or plantings, if necessary.

Tidal marsh restoration would occur in the late summer/early fall. Tracked excavators and trucks would be used to excavate up to 2 feet in depth throughout the existing wetland. A temporary earthen dam would be used to block tidal flow from entering the site through the T-channel and allow for construction in the dry. A pump or culvert with tidegate would be used to dewater (interior drainage) the T-channel and upstream wetland sites. The temporary dam would be removed upon completion of the tidal marsh habitat restoration.

Excavated soils from the tidal marsh and channel construction measures would be placed on adjacent pasturelands and these lands subsequently restored to riparian forest. Borrow material from other project elements would be spread out over the designated riparian reforestation area after excavation. It is anticipated that these soils would be tilled and treated with herbicide the following spring, if necessary, to control reed canarygrass and herbaceous weeds and prepare the site for riparian forest establishment. Natural seed dispersal from adjacent cottonwoods and willows would be relied upon for riparian forest establishment on approximately 65 acres. Plantings of cuttings and/or seedlings to establish riparian forest would be implemented on approximately 50 acres, and would be implemented if natural stand establishment was unsatisfactory.

Plug removal (downstream location) would be accomplished by a tracked excavator with borrow material sidecast onto an open area on the existing berm. Borrow material would be spread out with a small cat. Equipment access would be by barge. No restoration actions are planned for the forested wetland since tidal inundation and circulation dynamics are expected to provide sufficient restoration to the area to achieve objectives. Either natural seeding or planting of cuttings and seedlings would be used to restore the small disposal area where borrow materials are placed.

Approximately 262,000 total cubic yards (CY) of island substrate will be removed for creation of tidal channels and lowering of wetland elevation. All of this material would be disposed of on-site around the newly excavated tidal marsh. An additional 800 CY will be removed at the earthen plug. This material will be sidecast and leveled.

Table 1. Summary of Project Excavation and Fill Quantities within Waters of the United States and State of Oregon

Item	Description	Quantity (CY)	Acres
Tidal Marsh and Channel Excavation	Create tidal channels and lower high tidal marsh dominated by reed canarygrass to allow formation of a natural tidal estuarine marsh.	262,000	75
On-Site Disposal	Place excavated material on pasturelands currently used for cattle grazing located around the restored tidal marsh habitat. Materials will be deposited up to 2 feet in depth and leveled.	262,000	115
Earthen Plug Removal	Materials excavated from the forested wetland inlet will be sidecast and distributed over existing ground.	800	0.1

III. Description of the Fill Sites

The proposed project is located on Crims Island within the upper Columbia River Estuary. Crims and Gull Island form a small island complex on the Oregon side of the navigation channel between river miles (RM) 54-57 in Columbia County. Crims Island is approximately 2.5 miles long and 0.5 miles wide at its widest point. The islands are approximately 743 acres in size, including claimable tide lands, with land holdings belonging to Oregon Division of State Lands, USFWS, RSG Products, and two private families. The Columbia Land Trust has acquired fee title ownership to 393 acres on Crims Island, plus 80 acres of claimable tidal lands, which were previously owned by Jefferson Poplar. Ownership of those acres will be transferred to the USFWS at the end of May 2004 and will become an addition to the Julia Butler Hansen National Wildlife Refuge. The USFWS also may acquire additional acres at Gull and Crims Islands in the future.

Crims Island is bordered by the Columbia River to the north and Bradbury Slough to the south and has several acres of open water that vary in depth throughout the year. According to the National Wetland Inventory, the island is comprised largely of palustrine tidal emergent, scrub-shrub, and forested wetlands. The island is beyond the salinity gradient, but is still subject to tidal fluctuations. Smaller areas of riparian and upland habitat are present typically along the outside edge of the island, with the largest expanse of upland at the upstream end of Crims Island. Over time, the island has been altered through homesteading, wetland drainage, agricultural production, berm construction, and grazing by cattle. Land owners do not reside on the island. A small herd of cattle are still held on the island and graze throughout the island, principally in the high marsh and the pasture at the upstream end.

The potential project area footprint is comprised of forested wetlands on the west end and high tidal marsh and upland pasture that is grazed by cattle on the east end. An inlet channel enters the island from Bradbury Slough at the south end of the island. It extends north for approximately 1,000 feet and divides into a channel that is perpendicular to the inlet channel, extending both west and east for approximately 2000 feet along each leg, forming a 'T.' The T-channel was constructed for

drainage purposes and at one time included a tidegate that has subsequently failed, allowing for tidal inundation to reoccur. This T-channel provides the only significant conveyance of tidal inundation into the project area. Several small dendritic tidal channels have formed off the T-channel.

Few mature riparian trees are present around the high tidal marsh area, although an extensive forested wetland occurs on the west side of the island. The main inlet to the forested wetland has been closed with an earthen plug, blocking interchange of tidal waters. Overall, tidal inundation into the island has been significantly reduced by construction of low berms, impairment of flows by the T-channel, and placement of inlet plugs, one now lost due to erosion. Vegetation in the high tidal marsh and pastureland has been extensively grazed and trampled. Riparian buffers around the high tidal marsh are narrow or nonexistent. Few immature trees are present for successional replacement of riparian forests. Several non-native species have become established, including reed canarygrass, Himalayan blackberry, and purple loosestrife.

Areas to be filled include pastureland surrounding the existing high tidal marsh. These areas range through a variety of elevations, from approximately 9.5 to 17 feet. The highest elevations occur where berms have been constructed along the edge of the island. Currently, pastureland is occupied by cattle that trample and graze the area. The maximum area that may be filled by the excavated materials is 115 acres. Excavation of tidal marsh and channels entails 75 acres of high tidal marsh and 17 acres of tidal channel. As it is redistributed in a variety of depths in the pasture lands (at depths from 1-2 feet), it may cover as much as 115 acres.

IV. Factual Determinations

a. Physical Substrate Determinations

Substrate within the existing T-channel will be removed to size the channel appropriately for ingress and egress of tidal waters post-restoration of the tidal marsh habitat. Several outwardly radiating tidal channels will be excavated in the tidal marsh acreage to increase off-channel fish habitat. A 2-foot overall excavation of the existing high tidal marsh will lower the habitat and make it subject to more natural and frequent tidal inundation. Excavated materials will be placed atop the existing pastureland around the newly excavated tidal marsh and will provide a substrate for natural and/or artificial establishment of native riparian forest species. Substrate conditions will not be altered in structure or composition as a result of this excavation or deposition of materials. Overall, no significant adverse effects are expected to geology, soils, sediments, or any other physical substrate conditions.

b. Water Circulation and Fluctuation Determinations

Restoration of unimpeded tidal flows through the newly excavated tidal marsh will improve water circulation and allow more frequent natural fluctuations of tidal flows over the area. Increased tidal fluctuation will result in formation of additional tidal channels and more natural establishment of native wetland species. If the earthen plug is removed, tidal flow into the forested wetland will dramatically improve flushing of the nutrient rich wetlands. Within the localized project area, water circulation and fluctuation will be greatly improved and more closely resemble expected natural conditions. There are not expected to be any significant adverse effects, however, on the larger water circulation and fluctuation patterns within the Columbia River.

c. Suspended Particulate/Turbidity Determination

During construction, suspended particulate and turbidity levels may increase as a result of construction activity and restoration. The use of appropriate best management practice erosion control measures are expected to avoid and minimize any temporary impacts to the T-channel and forested wetland. Furthermore, an earthen dam will be placed at the entrance of the T-channel, which will restrict mixing of turbid water with Columbia River mainstem flows. Following excavation, the dam will be removed during low tide, which may result in slight increases in turbidity within the Columbia River. However, turbidity will be localized and rapidly dispersed, resulting in little affect on the instream habitat. Turbidity will be monitored before, during, and following construction. Minor increases in turbidity within the T-channel waters may occur as a result of excavation activities, but would be managed to prevent significant increases above background levels.

d. Contaminant Determinations

There are several recorded occurrences of hazardous or toxic waste in the project area. However, none of the sites are continued contamination threats, according to the Oregon Department of Environmental Quality (DEQ), Washington Department of Ecology, and the U.S. Environmental Protection Agency. In all cases, appropriate action has been taken to address contamination or sites have been assessed to have no continued impact to fish and wildlife in the area. Recent surveys revealed the continued presence of rusty metal containers and debris near the abandoned house. These items will need to be removed from the site during construction. If additional suspicious containers or materials are encountered during construction, Oregon DEQ will be notified immediately to determine what actions to take. Overall, sources hazardous and toxic materials are not expected to be encountered and will have no significant adverse effect.

e. Aquatic Ecosystem and Organism Determinations

Excavation and fill may cause some temporary turbidity and disturbance or loss of bottom dwelling organisms within the existing tidal channels. However, once construction is complete, the natural nutrient cycling is expected to be enhanced as a result of improved tidal circulation. Temporary losses of benthic organisms will be recouped and should increase following improvement in circulation and increases in the area of tidal channels. Improved nutrient cycling benefits productivity of benthic invertebrates, which subsequently improves overall productivity of the estuary. The earthen dam will be placed during the lower water period to reduce the volume of organisms that may be present within the T-channel during construction.

The 75 acres of existing high tidal marsh habitat will be denuded of vegetation during excavation. Terrestrial, avian and amphibious organisms are expected to move out of the area as construction begins. If sensitive organisms are present prior to construction, they will be removed under the supervision of the appropriate regulatory agencies. Sensitive plant species will be avoided if found and the Oregon State Natural Heritage Program will be contacted for guidance on protecting the species. None are forecast to be present. Tidal marsh vegetation is expected to develop naturally from seeds in the soil bank and propagules brought in by the tides following construction. The tidal marsh habitat should have a more natural tidal inundation regime post-construction, resulting in improved habitat for both aquatic and terrestrial native fish and wildlife species. Post-construction riparian areas will have a greater percentage of native species, since non-native species will be addressed initially and three years of operations and maintenance activities are anticipated. Overall, the project is designed and intended to benefit fish and wildlife species that are part of or rely upon the aquatic ecosystem.

f. Proposed Disposal Site Determinations

The fill material placed in the pastureland regions would not violate Environmental Protection Agency or State water quality standards or violate the primary drinking water standards of the Safe Drinking Water Act (42 USC 300 et seq.), through introduction of substances into surrounding waters or exacerbation of existing contaminant conditions. Project design, standard construction provisions, and erosion practices would preclude the introduction of substances into surrounding waters. The disposal site is currently in poor condition, as a result of grazing and trampling by cattle. Disposal of excavated materials onto the site is intended to convert poor quality pasturelands to high quality riparian forests that would act as buffers and improve the condition of native vegetation communities on the island.

g. Determination of Cumulative Effects on the Aquatic Ecosystem

The excavation and fill actions are not expected to have significant adverse cumulative effects on the aquatic ecosystem. Modification of the T- channel configuration, creation of additional tidal channels, and restoration of tidal marsh habitat will have a beneficial effect on the aquatic ecosystem, listed species utilizing the area, and their habitats. The project is expected to incrementally reverse adverse cumulative effects that have previously occurred in the general project area.

h. Determination of Secondary Effects on the Aquatic Ecosystem

The proposed work would increase the area of productive tidal marsh habitat in the Lower Columbia River Estuary. Fish and wildlife populations that rely completely or incidentally upon estuary habitats may benefit from this restoration. A reduction in the presence of invasive plant species is expected, since they will be removed and site elevation decreased to favor native tidal marsh plant species.

V. Coordination

An integrated Feasibility Report and Environmental Assessment (EA), describing the proposed action, has been prepared and will be circulated for public and agency review. The overall proposed action was coordinated with appropriate federal, state, and local resource agencies, organizations, and interested members of the public. Comments on the EA were requested from:

U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
NOAA Fisheries
Oregon Department of Environmental Quality
Washington State Department of Ecology
Oregon Division of State Lands
Oregon Department of Fish and Wildlife
Washington State Department of Fish and Wildlife
Oregon Parks and Recreation
Oregon State Historic Preservation Office
Columbia County
Cowlitz County

VI. Findings of Compliance or Non-Compliance with the Restrictions on Discharge

No significant modifications of the guidelines were made relative to this evaluation.

The 'no action' alternative was considered and rejected because it would not satisfy the objective of restoring tidal marsh and riparian habitats in the lower Columbia River. No practicable alternative to the proposed action exists that provides the short- and long-term environmental, water quality, habitat and listed species benefits provided by the proposed alternative.

The proposed action is in compliance with applicable State of Oregon water quality standards. The Oregon DEQ has issued a water quality certification (August 16, 2002) for actions implemented under Nationwide Permit #27 for which this project qualifies.

The proposed action would not violate the toxic effluent standards of Section 307 of the Clean Water Act. State water quality certification will be received prior to construction.

The proposed action does not jeopardize the continued existence of species federally listed as threatened or endangered, or destroy or adversely modify their critical habitat. The following preliminary effects determinations have been made related to proposed and listed species within or affected by the proposed action.

DETERMINATION OF EFFECTS ON FEDERALLY LISTED SPECIES

There are not expected to be significant adverse effects on any federally listed species of fish, wildlife, or plant within the project area as a result of the proposed project. The following determinations have been made for species in the project area:

All Listed Fish	<i>May affect, but not likely to adversely affect</i>
Chum salmon (Lower Columbia River), Threatened	
Steelhead (Middle Columbia River), Threatened	
Steelhead (Upper Columbia River), Endangered	
Steelhead (Upper Willamette River), Threatened	
Steelhead (Lower Columbia River), Threatened	
Steelhead (Snake River Basin), Threatened	
Snake River Sockeye Salmon (Salmon River tributary to the Snake River, Idaho) Endangered	
Snake River Chinook Salmon (Fall runs in the Snake River), Threatened	
Snake River Chinook Salmon (Spring/summer runs in the Snake River), Threatened	
Chinook Salmon (Lower Columbia River), Threatened	
Chinook Salmon (Upper Columbia River), Endangered	
Chinook Salmon (Upper Willamette River), Threatened	
Bald Eagle, Threatened	<i>May affect, but not likely to adversely affect</i>
Columbia White-tailed Deer	<i>May affect, but not likely to adversely affect</i>
Howellia, Threatened	<i>No effect</i>
Bradshaw's Lomatium, Endangered	<i>No effect</i>
Nelson's Checker-mallow, Threatened	<i>No effect</i>

The proposed fill would not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, and wildlife. Significant adverse effects on aquatic ecosystem diversity, productivity, stability, recreational, esthetic, and economic values would not occur. The proposed action does not cause or contribute to significant degradation of waters of the United States.

Appropriate and practicable steps will be taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem. Appropriate steps to minimize potential adverse impacts would be specified in the construction contracts.

With the inclusion of appropriate and practical conditions to minimize pollution and adverse effects to the aquatic ecosystem during construction, the proposed action is specified as complying with the requirements of the Section 404(b)(1) Guidelines.

Date: _____

CHARLES S. MARKHAM
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Acting Commander