



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

## **Final Environmental Assessment**

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# **Columbia River Federal Navigation Channel Operations and Maintenance Dredging and Dredged Material Placement Network Update**

## **Rice Island Shoreline Placement and Howard Island In-Water Dredged Material Rehandling Site (Sump)**

**September 2015**

## **Executive Summary**

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This Environmental Assessment (EA), prepared by the U.S. Army Corps of Engineers, Portland District (Corps), was submitted for public review under applicable laws and regulations, including the National Environmental Policy Act (NEPA). The purpose of this EA is to evaluate the effects of improvements to the strategic management of the 43-foot deep-draft Columbia River Federal Navigation Channel (CR FNC) Operations and Maintenance (O&M) program by adding dredged material placement actions at two sites. The purpose of the CR FNC O&M program is to provide a continuous, safe, reliable commercial shipping channel by periodically removing unsafe and restricting shoals. In order to maintain the channel at its authorized depth, material from maintenance dredging is placed in-water outside of the channel or within the dredged material placement network consisting of upland and/or beach nourishment/shoreline placement sites and supporting sumps (in-water holding basins created outside the main channel for temporary material storage before it is pumped to adjacent upland sites). Management of dredged material is dependent on geographic and temporal variability of shoal development within the CR FNC, and dredged material placement is implemented strategically throughout the system to balance placement and dredging needs along the CR FNC. The need for improved placement actions is recognized as a key element for successful continual maintenance of the CR FNC. Specific project actions include:

- 1) Adding shoreline placement to rebuild and protect an existing upland placement site at Rice Island.
- 2) Adding a dredged material rehandling sump off Howard Island to maximize efficiency of material placement at the existing Howard Island upland placement site.

The project actions would be implemented after the Corps has received all required environmental clearances, and assuming that the Corps makes a Finding of No Significant Impact (FONSI) for the Proposed Actions. The Corps is the lead federal agency for this EA.

# Table of Contents

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1.	Introduction .....	1
1.1.	Location, Scope and Nature of the Proposed Action.....	1
1.2.	Authority and Funding.....	2
1.3.	Required Consultations and Certifications .....	3
2.	Purpose and Need .....	4
3.	Existing Conditions .....	5
3.1.	Navigation Channel Maintenance.....	5
3.2.	Dredged Material Storage and Rehandling.....	5
3.2.1	Overview.....	5
4.	Alternatives.....	9
4.1.	No Action Alternative.....	9
4.2.	Proposed Actions (Preferred Alternative).....	11
4.2.1.	Shoreline Placement at Rice Island.....	11
4.2.2.	Dredging of Howard Island Sump .....	11
4.3.	Alternatives not considered for further evaluation .....	13
5.	Affected Environment .....	14
5.1.	Project Area .....	14
5.2.	Biological Environment.....	1
5.2.1.	Vegetation.....	1
5.2.2.	Aquatic and Terrestrial Wildlife Species .....	2
5.2.3.	Endangered Species Act Listed Species .....	2
5.2.4.	Invasive Species.....	6
5.3.	Physical Environment .....	8
5.3.1.	Air Quality .....	8
5.3.2.	Climate Change.....	9
5.3.3.	Geology and morphology .....	10
5.3.4.	Hydrology .....	11
5.3.5.	Water Quality.....	12
5.3.6.	Wetlands .....	14
5.4.	Socio-Economic Environment and Columbia River Resources .....	14
5.4.1.	Archaeological and Historic Resources .....	16
5.4.2.	Visual Quality .....	16
5.4.3.	Hazardous Materials .....	17
5.4.4.	Construction.....	17
6.	Environmental Impacts.....	28
6.1.	Biological Impacts .....	28
6.2.	Vegetation Impacts .....	29
6.3.	Wildlife Impacts .....	29
6.4.	Endangered Species Impacts .....	30
6.5.	Invasive Species Impacts .....	32
6.6.	Air Quality Impacts .....	32
6.7.	Climate Change Impacts.....	33
6.8.	Geologic Impacts .....	33
6.9.	Water Quality.....	34
6.10.	Hydrology .....	35
6.11.	Wetlands .....	35
6.12.	Archeological and Historic Resources Impacts .....	36

6.13.	Socioeconomic Impacts .....	36
6.14.	Visual Impacts .....	37
6.15.	Impacts of Hazardous Materials .....	37
6.16.	Impacts of Construction and Dissuasion.....	37
6.17.	Cumulative Impacts .....	38
6.17.1.	Cumulative Impacts Analysis Temporal and Spatial Scope .....	39
6.17.2.	Past Actions .....	39
6.17.3.	Present Actions .....	39
6.17.4.	Future Actions.....	39
6.17.5.	Anticipated Combined Effects of Past, Present, and Future Actions.....	40
7.	Compliance with Environmental laws.....	42
7.1.	Environmental Evaluation and Compliance .....	42
7.1.1.	National Environmental Policy Act .....	43
7.1.2.	Bald and Golden Eagle Protection Act .....	43
7.1.3.	Clean Air Act.....	43
7.1.4.	Clean Water Act.....	43
7.1.5.	Coastal Zone Management Act.....	44
7.1.6.	Comprehensive Environmental Response, Compensation, and Liability Act and Resource Conservation and Recovery Act .....	44
7.1.7.	Endangered Species Act .....	44
7.1.8.	Executive Order 13175, Consultation and Coordination with Indian Tribal Governments	45
7.1.9.	Executive Order 12898, Environmental Justice.....	45
7.1.10.	Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance.....	45
7.1.11.	Executive Order 11988, Floodplain Management .....	46
7.1.12.	Executive Order 13112, Invasive Species.....	46
7.1.13.	Executive Order 13186, Migratory Birds .....	46
7.1.14.	Executive Order 11990, Protection of Wetlands .....	46
7.1.15.	Farmland Protection Policy Act.....	47
7.1.16.	Fish and Wildlife Coordination Act.....	47
7.1.17.	Magnuson-Stevens Fishery Conservation and Management Act .....	47
7.1.18.	Marine Mammal Protection Act .....	47
7.1.19.	Marine Protection, Research, and Sanctuaries Act .....	48
7.1.20.	Migratory Bird Treaty Act.....	48
7.1.21.	Wild and Scenic Rivers Act.....	48
7.2.	Cultural Resources.....	48
7.2.1.	National Historic Preservation Act .....	49
7.2.2.	Native American Graves Protection and Repatriation Act .....	49
7.2.3.	The Archaeological Resources Protection Act .....	49
8.	Coordination and Distribution .....	50
8.1.	Public Comments Received and Responses .....	51
9.	Literature Cited.....	53

## LIST OF FIGURES

Figure 1.	Map current network of placement sites. The network would remain unchanged under the No Action Alternative.....	10
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Figure 2. Map of Proposed Action to add shoreline placement at Rice Island. The placement area is noted by white arrows indicating the location of shoreline erosion on the eastern end of the island.....	11
Figure 3. Proposed Howard Island sump will be specified within the general location box outlined in yellow. Bathymetric survey dated 24 July 2014. ....	12
Figure 4: Placement network with the addition of the Howard Island sump and Rice Island shoreline placement. ....	13
Figure 5: Rice Island with Oregon/Washington state line. ....	15
Figure 6: Howard Island sump upstream of marine facilities at confluence of Columbia River, Cowlitz River, and Carrolls Channel .....	1
Figure 7. Typical High and Low Flows for Columbia River at Vancouver, Washington. ....	12
Figure 8: Typical hopper dredge schematic.....	19
Figure 9: Typical pipeline dredge schematic .....	20
Figure 10. Staging equipment on top of the bank at Sand Island beach nourishment site.....	22
Figure 11: Active shoreline placement at Sand Island (looking upstream) .....	22
Figure 12: Active shoreline placement at Sand Island (looking downstream) .....	23
Figure 13: Site preparations and dike building for placement of dredged materials (at Northport) ..	23
Figure 14. Typical build out of a barge landing (Rice Island).....	24
Figure 15. Grading slope for incoming dredged material pipe. ....	24
Figure 16. Weir and berm structure, in operation (Rice Island upland placement site). ....	25
Figure 17. Outfall pipes discharging water back to river after dredged material has settled out (Rice Island upland placement site).....	26
Figure 18: Active dredged material placement at Martin Bar Upland Site .....	27

**LIST OF TABLES**

Table 1: List of Consultations and/or Certifications needed. ....	3
Table 2. ESA-listed Anadromous Salmonids under NMFS Jurisdiction.....	3
Table 3. ESA-listed Fish Species under NMFS Jurisdiction. ....	3
Table 4. EFH in the Action Area. ....	4
Table 5: ESA-listed Wildlife Species under USFWS Jurisdiction. ....	4
Table 6. Most common Invasive Species. ....	7
Table 7. Proposed Minimization Practices and BMPs for Dredging.....	20

## ABBREVIATIONS AND ACRONYMS

ACHP	Advisory Council on Historic Preservation
AMD	Advanced Maintenance Dredging
ARPA	Archaeological Resources Protection Act
BA	Biological Assessment
BiOp	Biological Opinion
BMP	Best Management Practice
C&LW	Columbia and Lower Willamette Rivers
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CR	Columbia River
Corps	U.S. Army Corps of Engineers
CRD	Columbia River Datum
CRCIP	Columbia River Channel Improvement Project
CWA	Clean Water Act
CY	cubic yard(s)
CZMA	Coastal Zone Management Act
DEQ	Oregon Department of Environmental Quality
DLCD	Oregon Department of Land and Conservation
DMEF	Dredged Material Evaluation Framework
DNR	Washington Department of Natural Resources
DOE	Washington Department of Ecology
DPS	Distinct Population Segment
DSL	Oregon Department of State Lands
DWS	Deep Water Site
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	U. S. Environmental Protection Agency
ER	Engineering Regulation
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
FNC	Federal Navigation Channel
FONSI	Finding of No Significant Impact
FR	Federal Register
ft	foot or feet
FWCA	Fish and Wildlife Coordination Act
IWW	in-water-work
kcf	thousand cubic feet per second
MBTA	Migratory Bird Treaty Act
MCR	Mouth of the Columbia River Project
MCY	million cubic yard(s)
MHHW	mean higher high water
MLLW	mean lower low water
MPRSA	Marine Protection, Research, and Sanctuaries Act
MSA	Magnusson-Stevens Fishery Management and Conservation Act

NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
Network	Dredged Material Placement Network
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
O&M	operation and maintenance
ODFW	Oregon Department of Fish and Wildlife
ODMDS	Ocean Dredged Material Disposal Site
OHW	ordinary high water
RCRA	Resource Conservation and Recovery Act
RHA	Rivers and Harbors Act
RM	river mile
ROD	Record of Decision
ROE	Right of Entry
RPM	reasonable and prudent measures
SE	Supplemental Evaluation
SEF	Sediment Evaluation Framework for the Pacific Northwest
SEIS	Supplemental Environmental Impact Statement
SIP	State Implementation Plan
TMDL	Total Maximum Daily Load
USC	U.S. Code
USGCRP	U.S. Global Change Research Program
USFWS	U.S. Fish and Wildlife Service
VTD	Vancouver to The Dalles Project
WDFW	Washington Department of Fish and Wildlife
WQC	Water Quality Certification
WRDA	Water Resources Development Act

## **1. INTRODUCTION**

This environmental assessment (EA) addresses the environmental impacts of modifying the current dredged material placement network to include dredged material placement actions at Rice Island and outside the Federal Navigation Channel (FNC) near Howard Island. The objective of these actions is to improve overall efficiency and strategic management of the Columbia River Federal Navigation Channel Operations & Maintenance (CR FNC O&M) program and allow for greater flexibility, which will minimize impacts to the terrestrial and aquatic environment.

### **1.1. Location, Scope and Nature of the Proposed Action**

The CR O&M dredged material placement network consists of 25 specific sites where the Corps performs upland and/or shoreline placement, and/or submerged dredged material storage/rehandling actions. These sites are collectively referred to as the Network. In addition to the named placement sites in the Network, the Corps also places dredged material in-water outside of the FNC along the length of the CR and at designated ocean placement areas. The Corps strategically balances material placement methods and locations to minimize future CR FNC O&M need (avoid overwhelming any one site with dredged material) while also maintaining an available sediment budget for the river system ecology, and in some instances, aid the Corps in achieving environmental goals such as habitat restoration and development. Periodically, new placement sites need to be added to the Network and placement activities at existing sites may need to be modified to accommodate dredging needs and/or adapt to changing conditions, which is the case for the proposed activities addressed in this document. The two actions covered under this analysis are considered minor modifications to the existing Network that would help maintain the balanced approach the Corps employs for planning dredged material placement along the CR FNC.

The proposed actions would occur on the eastern shoreline of Rice Island (46.25436°N, -123.68909°W) and on the FNC side of Howard Island between RM 68 and 69 (46.08685°N, -122.91473°W). Rice Island straddles the Washington/Oregon state line; however, placement activity would take place only on the Washington side of the island. Howard Island is located in the State of Washington; however, the proposed sump is located on the opposite side of the FNC in the State of Oregon. The sump is commonly referred to as the “Howard Island sump” to provide an approximate river location, and because material placed temporarily at the sump will ultimately be dredged and pumped onto the existing Howard Island upland placement site.

#### *Rice Island Shoreline Placement*

The Corps has determined that the proposed action to add shoreline placement as a dredged material placement method at Rice Island is needed to: 1) restore upland site capacity to the 2001 surveyed footprint, 2) protect the eastern shoreline of Rice Island from future erosion, and 3) to create suitable forage areas for streaked horned larks, which were listed under the Endangered Species Act in 2013. The addition of shoreline dredged material placement at Rice Island is part of a five year dredge material placement plan to create suitable habitat for streaked horned larks. This five year plan includes strategic placement of dredged material on several islands within the CR FNC intended to help rebuild the streaked horned lark population. The Corps intends to place approximately 375,000 cubic yards (CY) of fill on the upstream end of Rice Island (all in Washington) to initially restore the upland site. As placed material is eroded away by natural processes, shoreline placement will continue to be conducted periodically to protect the integrity of the upland site. The total area covered by the fill material is expected to be approximately three acres. The effects of shoreline

placement at Rice Island, including the benefits, are consistent with existing shoreline placement actions in the Columbia River estuary.

#### Howard Island Sump

The Howard Island upland placement site was approved in the 2003 Columbia River Navigation Improvement Project Final Supplemental Integrated Feasibility Report and Environmental Impact Statement and is critically needed for minimum channel maintenance due to limited in-water placement capacity between RM 62 and RM 72. A sump is now required at Howard Island upland placement site because shoaling is consistently forming beyond the reach of the pipeline dredge to pump material directly from the shoals to the upland site. Temporary storage of dredged material at the sump also provides flexibility for dredges to be redirected to unexpected, urgent shoaling needs elsewhere in the Columbia River system. The Howard Island sump will be created in the flowlane outside the navigation channel where depths generally range from 30-52 ft. The addition of a 30-40 acre sump capable of storing 400,000 cubic yards (CY) of material, would improve efficiency of placing material upland and improve overall channel maintenance.

## **1.2. Authority and Funding**

The Corps has been the governmental agency responsible for maintaining navigable waters since 1824. The Commerce Clause in the Constitution and subsequent Court decisions have established the Federal right and obligation to regulate navigation and commerce and to make necessary improvements. Congress has furthered this obligation by authorizing projects such as CR FNC through various Rivers and Harbors Acts (RHA), the earliest one being enacted in 1878. The RHAs gave way to the Water Resources Development Acts (WRDA) starting in 1973. Congress also provides annual appropriations for maintenance of the CR FNC.

In-water placement of dredged material is governed by Section 404 of the Clean Water Act (CWA). The Corps does not issue itself a Section 404 permit for authorization of dredged material placement in-water; however, the Corps does apply the Section 404(b)(1) guidelines and other substantive requirements under the CWA.

The Corps is also authorized to place material dredged from RM +3.0 to 30 in ocean disposal sites. The Ocean Dredged Material Disposal Site (ODMDS) Deep Water Site (DWS) was designated by the U.S. Environmental Protection Agency (EPA) in 2005 under Section 102 of the Marine Protection, Research and Sanctuaries Act (MPRSA) to provide sufficient capacity for current and anticipated future ocean disposal needs at the MCR and lower CR (EPA 2005). The DWS occupies a total area of 17,000 by 23,000 ft and lies 6 miles offshore from the MCR. However, the portion of the DWS site used for disposal is 11,000 by 17,000 ft.

Maintenance dredging and in-water placement of dredged sediments to maintain authorized navigation channels is conducted under the provisions of Sections 102 and 103 of the MPRSA of 1972, Sections 401 and 404 of the CWA of 1977, and in accordance with regulations at 33 Code of Federal Regulations (CFR) parts 335 through 338 (“Operation and Maintenance of Army Corps of Engineers Civil Works Projects Involving Discharge of Dredged or Fill Material into Waters of the U.S. or Ocean Waters” and affiliated procedures, etc).

### 1.3. Required Consultations and Certifications

Table 1 outlines the required consultations and/or certification required prior to updating the project:

*Table 1: List of Consultations and/or Certifications needed.*

Agency	Consultation/Certifications	Status
Oregon Department of Environmental Quality (DEQ)	CWA 401 Water Quality Certificate Amendment (Howard Island Sump)	Water Quality Certificate received September 8, 2015
Washington Department of Ecology (DOE)	CWA 401 Water Quality Certificate Amendment (Rice Island placement)	Water Quality Certificate Amendment Received July 15, 2015
Oregon Department of Land Conservation and Development (DLCD)	CZMA Consistency Determination Concurrence (Howard Island Sump)	N/A Beyond the CZMA consultation boundary
DOE	CZMA Consistency Determination Concurrence (Rice Island Placement)	Application submitted May 21, 2015, no response received within the 60-day review period; therefore, concurrence is presumed.
National Marine Fisheries Service (NMFS)	ESA – (Rice Island Placement and Howard Island Sump)	Consultation response received July 16, 2015
US Fish and Wildlife Service (USFWS)	ESA – Memorandum to the file (Rice Island Placement and Howard Island Sump)	Memorandum for the record Dated May 20, 2015
Cultural Resources (Section 106 Historic Preservation Act) Compliance	Memorandum for the Record (Rice Island Placement and Howard Island Sump)	Memoranda for the record completed May 28, 2015, and June 26, 2015

## **2. PURPOSE AND NEED**

The purpose of these actions is to improve dredged material placement network function to accommodate dredging activities intended to maintain the CR FNC at the requisite depth for safe passage of shipping traffic.

The need for the proposed actions is to ensure safe and reliable passage of shipping traffic along the CR FNC by supplementing the dredge material placement network, which is nearing capacity. The actions are also needed to prevent further erosion of the Rice Island placement site, and to facilitate efficient movement of dredged material to the Howard Island upland placement site.

### Discussion

Modifications to the current placement Network are required for continued maintenance of the CR FNC. The 2014 *Columbia River Federal Navigation Channel Operations and Maintenance Dredging and Dredged Material Placement Network Update – Environmental Assessment* briefly discussed the need for additional dredged material placement actions but did not further evaluate specific sites because there was not sufficient information available at the time. Since then, shoreline placement has been identified as a means to address erosion of the eastern shoreline of Rice Island and to restore critical upland site capacity. A sump at Howard Island is needed to allow for efficient placement of dredged material onto the existing Howard Island upland placement site. This EA is intended to analyze the potential impacts of these modifications to the Network on the human environment, including biological, physical, cultural, socioeconomic, and cumulative impacts. This document will be made available for a 30-day public comment period beginning August 7, 2015, and will be accessible via the Corps' Portland District Office Web site <http://www.nwp.usace.army.mil/Media/Announcements.aspx>.

### **3. EXISTING CONDITIONS**

#### **3.1. Navigation Channel Maintenance**

The rapidly changing and uncontrollable shoaling conditions within the CR FNC require continual operations and maintenance. Segments of the CR FNC are dredged on an annual or semi-annual basis due to reoccurring shoals. Shoals may require more or less dredging depending on intensity and timing of flows and seasons. Some shoals may form spontaneously without warning and may not be identified until the annual dredging is underway. The Columbia River is still self-adjusting to the deepened channel.

The FNC has been maintained using a combination of dredging and hydraulic control works, such as pile dikes. Prior to construction of the -30 ft channel in 1912, dredging was limited to a few very shallow reaches of the river where the natural controlling depths were in the -12 to 15 ft range. From 1912 to 1935, the channel was deepened to -35 ft by 500 ft wide and realigned at many reaches. It was also during this time that many hydraulic control structures were built and dredging became necessary to maintain the authorized channel. From 1936 to 1957, channel alignment adjustments were made that added to the dredging requirements. During this period, dredging averaged 6.7 million cubic yards (MCY) annually. By 1958, the channel alignment had stabilized but dredging was augmented to increase the AMD depth from 2 to 5 ft to allow the channel to infill for a year and still provide full project dimensions. The -40 ft channel was constructed in stages between 1964 and 1976. Construction of the channel followed the river's thalweg (the deepest part of the river channel). From 1976 to the onset of the most recent channel improvement (completed in 2010), maintenance dredging has averaged approximately 5.5 to 6.5 MCY per year, excluding emergency dredging related to the 1980 eruption of Mount St. Helens (Corps 1999). The construction of the -43 ft channel between 2006 and 2010 overlaid the same footprint as the -40 ft channel. Most of the channel is naturally controlled at depths deeper than the required -43 ft. Shoals tend to form in channel reaches where natural controlling depths are less than -43 ft. Maintenance dredging of the 43-ft channel to date has averaged 7 MCY (average quantity for 2011-2014) per year. Dredging methods are described in detail in Section 5.4.4.

Each channel deepening may be viewed as low intensity disturbances that impact long reaches of the river. The riverbed slowly adjusted its side-slopes adjacent to each new dredge cut. With each deepening, it takes several years for the side-slopes to approach equilibrium with the deeper channel. Maintenance dredging increased throughout the river during these adjustment periods, typically lasting approximately 5-7 years. In addition to deepening the channel, development actions have included constrictions, realignments, and in-water fills. Channel constrictions, realignments, and fills are high intensity, localized disturbances in the river. These practices cause immediate changes in flow patterns that can result in local erosion. Although the impacts are generally limited to a short reach of the river, it may be years before equilibrium conditions become reestablished throughout the project area. As a result of the deepening completed in 2010, there has been a recent increase in maintenance dredging. The CR FNC has yet to stabilize since the completion of the deepening.

#### **3.2. Dredged Material Storage and Rehandling**

##### **3.2.1 Overview**

The Dredged Material Placement Site Network presently consists of 25 specific sites strategically located throughout the Columbia River where material from FNC maintenance dredging is placed upland and/or along the shoreline or where the Corps performs submerged dredged material storage/rehandling actions outside the navigation channel. The Corps also utilizes Ocean placement at strategic locations outside of the CR FNC.

Fifteen of the sites are located in the State of Oregon, and twelve are located in the State of Washington (Rice Island and the Puget Island sump extend into both Oregon and Washington). One of those sites, the Fazio Sand and Gravel site, does not receive material directly from Corps upland placement action, however, the landowner does pump material placed in-water by the Corps to the upland site by separate permitted action. The Northport (W-71.9) site which was included in the 2014 *Columbia River Federal Navigation Channel Operations and Maintenance Dredging and Dredged Material Placement Network Update – Environmental Assessment* has since been removed from the Network after the landowner withdrew right of entry for placement. Sections 3.2.1.1 – 3.2.1.4 discuss the material placement methods used at sites located within the Network.

In addition to the named placement sites in the Network, the Corps also places dredged material in-water and at designated ocean placement areas. Section 3.2.1.5 discusses in-water placement, which occurs along the length of the CR FNC.

### **3.2.1.1. Shoreline Placement**

The combination of Columbia River flows, waves, and tidal effects erodes material from shorelines. Shoreline placement of dredged material can be used to restore and protect assets such as upland dredged material placement sites which can become compromised by rapidly eroding shorelines. Where shoreline placement replenishes the material previously eroded on a regular basis, the placement action is commonly referred to as beach nourishment. Shoreline placement and beach nourishment are used interchangeably throughout this document; the effects and methods of the actions are the same.

Shoreline placement is currently practiced at 4 dredged material placement sites in the Network: Miller Sands Island in Oregon (RM 23.5), Pillar Rock Island in Oregon (RM 27.2), Skamokawa-Vista Park in Washington (RM 33.4), and Sand Island in Oregon (RM 86.2). Pillar Rock Island and Skamokawa-Vista Park are also used for upland placement.

Shoreline placement involves pumping dredged material through a floating discharge pipe from the pipeline or hopper dredge to an existing shoreline at the sand/water interface. The dredge first pumps a landing on the shoreline to establish a point from which further material placement occurs. Dredged material is pumped out in a mixture of sand and water slurry (about 20 percent sand) and as it exits the shore pipe, sand settles out on the shoreline while the water returns to the river. Settling rates of Columbia River sands are very quick and turbidity from the operation is minimal. After sufficient sand has settled out and begins to increase in height, the settled sand is moved by bulldozers to match the elevation and profile of the existing shoreline at approximately the high water line. During placement, a temporary sand berm is constructed to retain sand on the beach; otherwise, much of the sand would immediately be lost to the river. The temporary berms typically are approximately 5 ft high and 12 ft wide at the base. The berms are built gradually by earth-moving equipment as pump-out continues and are created from existing beach sand, pumped sand, or both.

A typical shoreline placement operation lasts from 5 to 15 days and the width of the shoreline created approximately 100 to 150 ft. The process continues by adding to the shore pipe and proceeding longitudinally along the shoreline. The length of shoreline replaced is dependent on the quantity of material to be dredged from the shoal in the channel. After placement, the slope of the shoreline is groomed by mechanical equipment (bulldozers) to a steepness of 10 to 15 percent to prevent the possibility of creating areas where juvenile fish could be stranded from vessel wakes on the new shoreline.

In the last four years, the Corps has placed 200,000 to 700,000 CY of material annually using the shoreline placement method. The future volume of material that might be placed along shorelines is difficult to predict because channel shoaling is still stabilizing after the recent deepening and because of the variable capacity at any given site; which could range from annual placement capacity to placement capacity once every three to ten years.

### **3.2.1.2. Upland Placement**

Upland placement of dredged material removes that material from the river system so it is no longer a source for future shoaling, reducing the overall channel maintenance dredging need and quantity. At some sites, placed material is beneficially used for purposes like construction fill. The Corps currently practices upland placement at 21 sites in the Network.

Upland placement of dredged material is conducted from clamshell, hopper, and pipeline dredges and is pumped or barged to upland sites. Upland placement utilizes earth-moving equipment (bulldozers, backhoes, etc.) regardless of type of dredge used; these types of equipment may be barged in or driven in, depending on site accessibility. When equipment is barged in, the barge(s) is maneuvered to the shoreline and anchored for the duration of the operation. A wide sand berm is constructed from the barge to land for movement of equipment. Clamshell-dredged material deposited onto a barge is off-loaded at a transfer point for placement at an upland site. Hopper and pipeline dredges pump dredged material in a sand and water slurry directly into a diked, upland site located near the dredge site. Discharge of water from upland sites back into the river is controlled by the use of weirs. The landward end of the pipe is moved by a bulldozer at regular intervals to minimize unintentional mounding on the site.

Site height and capacity is typically limited by the range of the pipeline dredge from a shoal to a dredged material placement site. The pipeline dredge's capability to pump to higher elevations is reduced the further the pipeline dredge is situated from a site. Additionally, the site footprint may constrain the capacity of a site; the slope of a site must be graded at a slope of no greater than 2 Rise:1 Run. Elevation of placed dredged material varies by site. The volume of material calculated for each site is an approximation and not a maximum limit. The pipeline dredge is currently capable of placing material at a site up to about two miles away from the shoal without a booster pump. If a booster pump is available, the pipeline range is increased to over two miles.

Sometimes a hopper dredge works in tandem with a pipeline to improve efficiency by placing dredged material in-water in front of a working pipeline dredge so the material will be subsequently pumped to an upland placement site.

In the last four years, the Corps has placed 0.3 to 1.5 MCY of material annually using the upland placement method.

### **3.2.1.3. In-Water Rehandling**

A sump, as it relates to dredging, is an in-water holding basin created for temporary storage of dredged material until it is rehandled to an upland placement site. Sumps are used to maximize the efficient use of an upland placement site when shoaling is not located within direct pipeline dredge pumping distance. Temporary storage of dredged material at a sump also provides flexibility for dredges to be redirected to unexpected, urgent shoaling needs elsewhere in the Columbia River system. Currently there are two sumps within the network, Harrington Point Sump from RM 20 to 22 and Puget Island Sump from RM 44 to 45.

Sumps are located in the flowlane outside the navigation channel which is also where in-water placement typically occurs. A sump is initially created by dredging when a pipeline dredge removes material from the river bottom to create the temporary storage basin. The material dredged is typically placed at an upland site using the routine upland placement method described in Section 3.2.1.2. The basin is then filled by routine in-water placement of material dredged from CR FNC shoals (usually by hopper dredges that can transport material from shoals located a few miles away from the site). In-water placement methods are described in detail in Section 3.2.1.5. When the basin is filled to design (the sump runs out of capacity), a pipeline dredge will typically re-dredge (rehandle) the material from the sump basin and pump it into the upland placement site. This restores capacity in the sump and the entire cycle is repeated. The final in-water placement will restore the sump site to the original river bottom depths.

On average, a total of approximately 0.2 to 1 MCY of sand may be removed from Harrington Point Sump each time it is dredged and placed upland. Up to approximately 0.4 MCY per event may be dredged from Puget Island sump.

### **3.2.1.4. In-Water Placement**

In-water placement of dredged material in the active Columbia River flowlane helps keep sediment available in the river system, which also makes it the most likely to contribute to future shoaling. Therefore, locations for in-water placement are selected carefully and vary depending on the condition of the channel each year. As deeper flowlane areas are filled with dredged material, new deep areas are formed elsewhere as a result of natural river processes.

In-water dredged material placement is conducted in or adjacent to the CR FNC throughout its length from RM +3.0 to RM 106.5. Locations are typically selected at depths between 35 to 65 ft, with occasional exceptions where geologic features situated throughout the Columbia River constrain the channel and require in-water placement in water depths as shallow as 20 ft or deeper than 65 ft.

In-water placement can be conducted by mechanical (clamshell) or hydraulic dredges (pipeline, hopper). Hopper dredges collect material in the hopper of the vessel until it is near capacity. Once filled, the vessel moves to a flowlane site. When in place above an appropriate dredged material placement site, the hopper moves forward while displacing dredged material through the hopper doors on the bottom of the ship or through the hull of a split-hull hopper dredge which opens along the entire length of the hopper. Material can be deposited from the hopper at varying rates based on

how far and quickly the hopper doors or split hull are/is opened. The dredge controls these rates while moving forward in order to avoid mounding of material on the river bottom. Once the hopper is empty, the dredge maneuvers back to the shoal and resumes dredging. In-water discharge from pipeline dredges differs from hoppers in that material pumped by the pipeline is continuously placed in the flowlane during dredging operations. Placement of material at flowlane sites is done using a down-pipe with a diffuser plate at the end. This down-pipe extends 20 ft below the water surface to minimize or avoid impacts to migrating juvenile salmonids. During placement of dredged material, the downpipe is moved often so that mounding on the bottom is minimized.

The construction of the CR FNC was completed in 2010. The average annual quantity of material placed in-water since 2010 is 5.7 MCY (average quantity for 2011-2014). As a result of the construction of the deep-draft channel, it was expected that there would be an increased quantity of materials to be dredged and placed. The Corps projects that the volume to be dredged and placed would decrease over time as the channel re-stabilizes to its new depth.

### **3.2.1.5. Ocean Placement**

In addition to previously mentioned placement methods, the Corps may utilize ocean placement for material dredged downstream of RM 30 in the Columbia River. Ocean placement would occur at specific sites designated by the U.S. Environmental Protection Agency (EPA) in 2005 under Section 102 of the Marine Protection, Research and Sanctuaries Act (MPRSA). Nearshore placement sites are highest priority and the offshore Deep Water Site (DWS) is used only when the nearshore sites are unavailable or unsafe for placement. The Corps anticipates that the Deep Water Site (DWS) would be used for material dredged from this project because the nearshore sites are routinely filled to annual capacity by material dredged from the Mouth of the Columbia River (bar/entrance) channel.

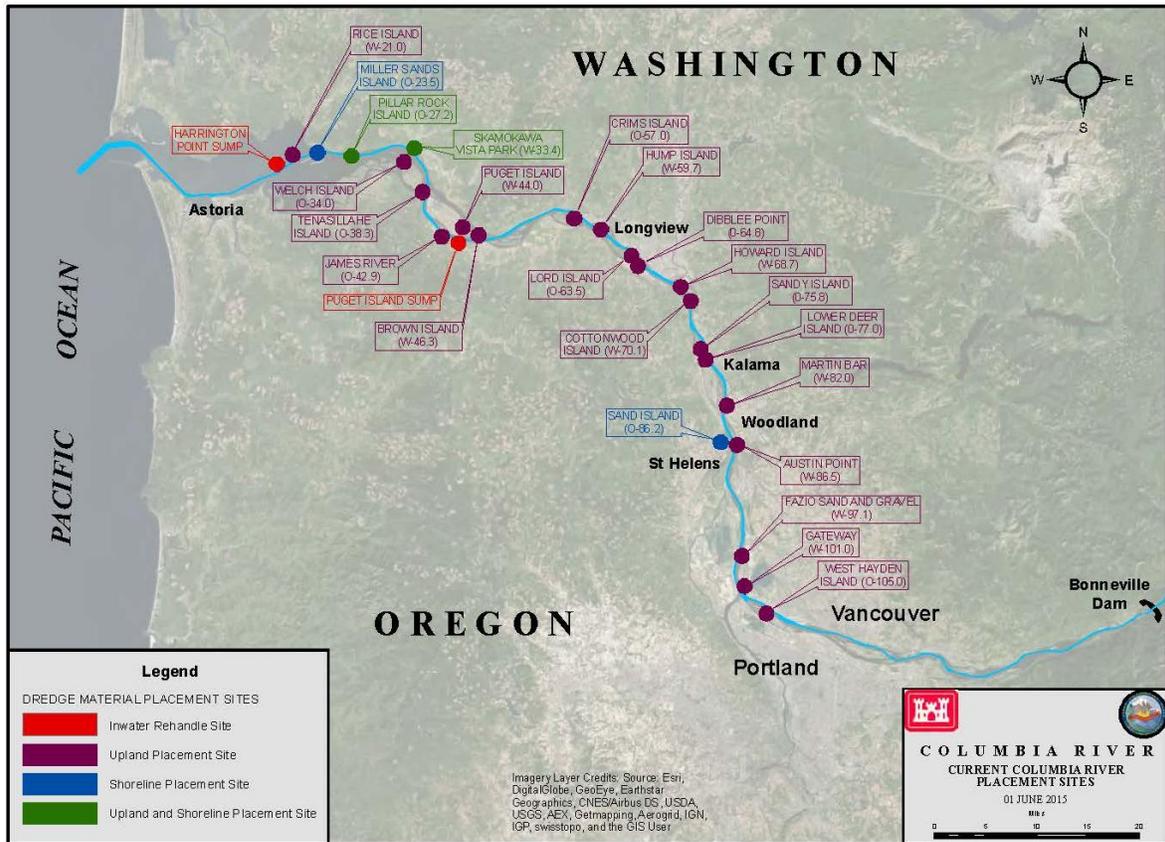
The physical process of ocean placement is usually by hopper dredge or mechanical dredge placement barge (scow) and generally the same as in-water placement. Due to the depth of water at the DWS (180-300 feet), there are no requirements for spreading material evenly through the site. Since construction of the CR FNC was completed in 2010, ocean placement has not yet been used for O&M dredged material. However, capacities for upland, shoreline, and in-water placement change over time, and ocean placement will be needed in the future to ensure a balanced approach to channel maintenance.

## **4. ALTERNATIVES**

### **4.1. No Action Alternative**

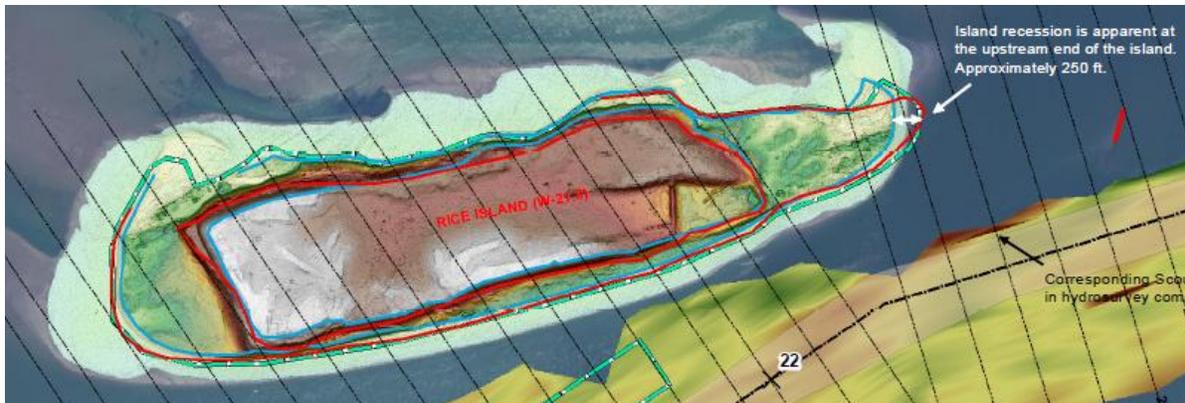
The No Action alternative assumes that the CR FNC would continue to be maintained with dredging to its existing dimensions within its existing system of placement methods and Network sites. The east end of Rice Island would not be re-nourished to prevent further erosion of the eastern shoreline, and a sump would not be used within the flowlane of the FNC to facilitate upland placement of dredged material onto Howard Island.

*Columbia River Federal Navigation Channel Operations and Maintenance Dredging Placement Network Modifications: Rice Island and Howard Island– Final Environmental Assessment*



**Figure 1. Map current network of placement sites. The network would remain unchanged under the No Action Alternative.**

## 4.2. Proposed Actions (Preferred Alternative)



*Figure 2. Map of Proposed Action to add shoreline placement at Rice Island. The placement area is noted by white arrows indicating the location of shoreline erosion on the eastern end of the island.*

### 4.2.1. Shoreline Placement at Rice Island

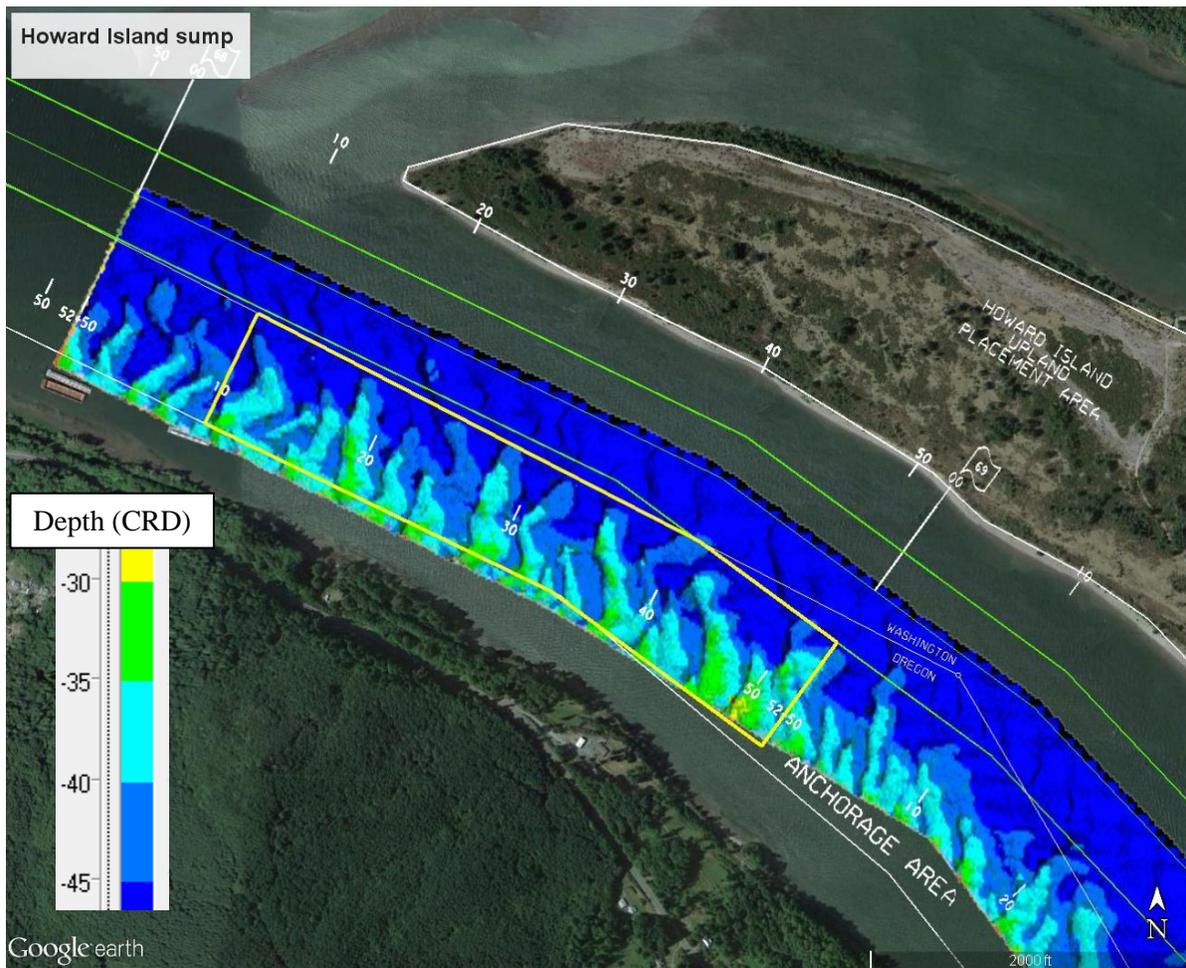
Shoreline placement is required at Rice Island (RM 22) to restore upland site capacity to the 2001 surveyed footprint and to protect the eastern shoreline of Rice Island from future erosion. This placement capacity is critically needed for material frequently dredged from several large shoals in this reach of the CR FNC. Additionally, the restored placement site increases suitable habitat and forage areas for streaked horned larks, which were listed as “threatened” under the Endangered Species Act in 2013. The chosen shoreline placement location on Rice Island is part of a five year strategic dredged material placement plan intended to encourage development of streaked horned lark habitat within the Lower CR network. The species was listed as threatened under the ESA in 2013. . Habitat preservation is a key element of the streaked horned lark recovery plan. The five year placement plan may be found in the Corps’ Biological Assessment (BA) for the Continued Operations and Maintenance Dredging Program for the Columbia River Federal Navigation Channel (March 2014), which is hereby incorporated by reference.

Shoreline placement at Rice Island would consist of placing approximately 375,000 cy of fill on the upstream end of Rice Island (all in Washington) to initially restore the upland site. As placed material is eroded away by natural processes, shoreline placement will continue to be conducted periodically to protect the integrity of the upland site. The total area covered by the fill material is expected to be approximately three acres. Shoreline placement at Rice Island is a minor change to Network placement activities relative to all other placement actions conducted therein; however, it is a necessary modification to the Network intended to control erosion of the Rice Island shoreline and preserve key habitat for threatened streaked horned larks.

### 4.2.2. Dredging of Howard Island Sump

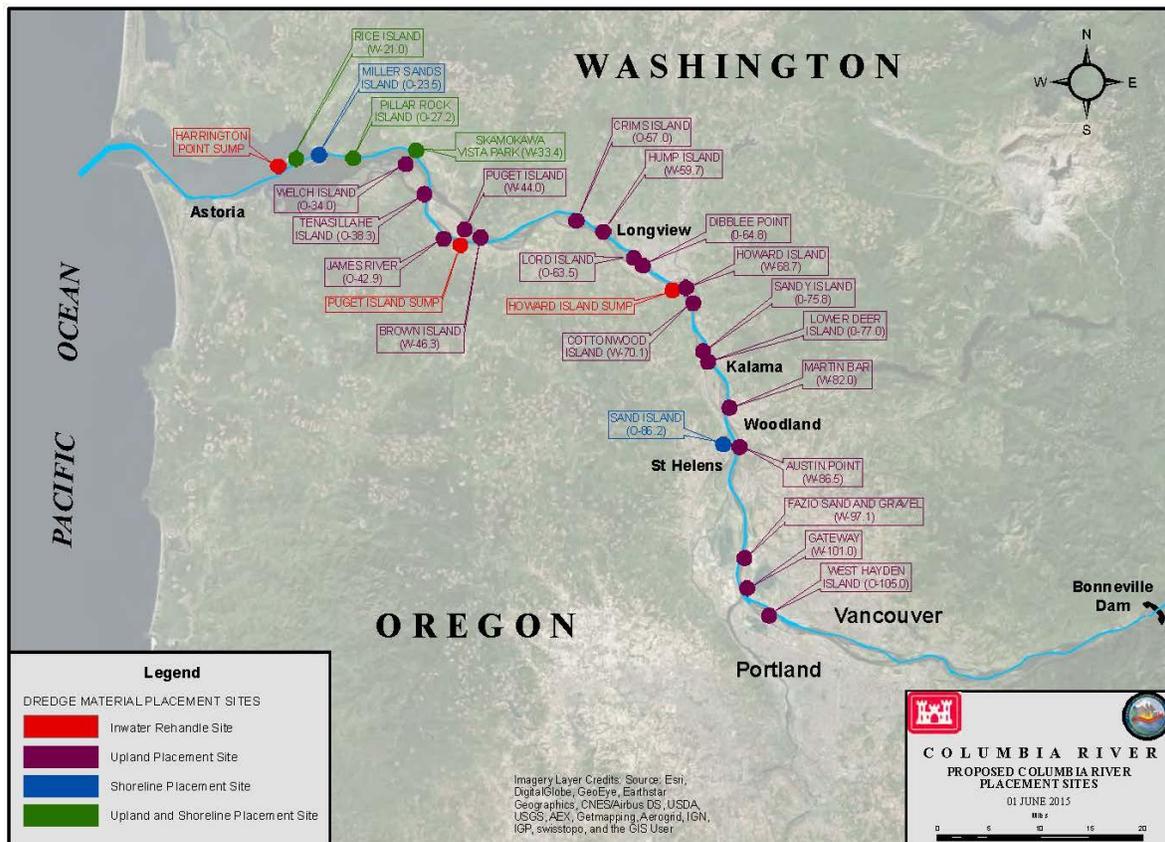
The proposed Howard Island sump (Figure 3) is located on the Oregon side of the CR FNC at RM 68 – RM 69 entirely within the State of Oregon. The total sump acreage is 30-40 acres and has a maximum capacity of 400,000 cy at any given time. The Howard Island upland placement site was

approved in the 2003 Columbia River Navigation Improvement Project Final Supplemental Integrated Feasibility Report and Environmental Impact Statement and is critically needed for minimum channel maintenance due to limited in-water placement capacity between RM 62 and RM 72. A sump is now required at Howard Island upland placement site because shoaling is consistently forming beyond the reach of the pipeline dredge to pump material directly from the shoals to the upland site. Temporary storage of dredged material at the sump also provides flexibility for dredges to be redirected to unexpected, urgent shoaling needs elsewhere in the Columbia River system. For the reasons listed above, the addition of a 30-40 acre sump between RM 68 and RM 69 to the network for this reach of the river would improve efficiency of placing material upland and overall channel maintenance.



**Figure 3. Proposed Howard Island sump will be specified within the general location box outlined in yellow. Bathymetric survey dated 24 July 2014.**

Below is a revised map showing the Columbia River placement network with the addition of shoreline placement on Rice Island and the sump off Howard Island.



**Figure 4: Placement network with the addition of the Howard Island sump and Rice Island shoreline placement.**

### 4.3. Alternatives not considered for further evaluation

Alternative placement locations were discussed among the project planning team members and project managers. The sites chosen were determined to be the most appropriate for each location based on many factors including environmental impact, cost, ease of use, navigational needs, and river characteristics at each location.

Alternate site locations for Rice Island were considered as part of that action during development of the BA. The placement areas outlined in the BA are those most likely to result in suitable lark habitat over time. Shoreline placement to restore Rice Island is one of several strategic placement actions that were identified in the BA. The USFWS issued a Biological Opinion in June 2014. The Opinion concluded the continued operation and attendance dredging program for the CR FNC is not likely to jeopardize the continued existence for the streaked horned lark nor is it likely to destroy or adversely modify the lark’s designated critical habitat.

The Corps selected a sump site located between RM 68 and RM 72 based on dredged material quantity, area depth, pumping capability of the dredge, coordination with the River Pilots, and stability of temporarily placed material. According to a recent hydrosurvey, the river depth at the sump location in the flowlane outside the navigation channel ranges between 30-52 ft Columbia River

Datum (CRD). Additionally, the proposed sump site is located downstream and away from any bends in the channel. In the project area, adequate sump elevations can be attained while keeping the dredged material at depths below 30 ft CRD. Other areas outside the navigation channel were discussed by the Corps for sump placement; however, no other sites were considered viable alternatives as they would have unacceptable effects to the environment, commercial shipping, or navigation channel maintenance program, or were not operationally feasible for the dredging equipment.

## **5. AFFECTED ENVIRONMENT**

### **5.1. Project Area**

#### RICE ISLAND (O/W-21.0)

Rice Island, which is located in the lower Columbia River estuary, is composed of approximately 365 acres, including approximately 100 acres of intertidal mudflats along the western and northern shorelines. The linear bar island is generally oriented from east-northeast to west-southwest, and it is bisected by the Oregon-Washington state line. The eastern tip of the island is within the State of Washington. The states of Washington and Oregon own their respective portions of the island. The Harrington Point Sump is located adjacent to Rice Island, between RM 20 and 22.

Rice Island was created with dredged material from the CR FNC, using first in-water and shoreline placement to create a land feature and then upland placement of dredged material which increased the elevation of the island. The dredged material placement site (Figure 5) covers approximately 264 acres. The portion of the placement site in the State of Washington is approximately 37 acres; the remaining portion of the placement site in the State of Oregon and is approximately 227 acres. The entire placement site is located from approximate RM 21 to 22.3 and at its closest point; the site is 1,000 ft. north of the CR FNC.

The Washington ports' easement from the Washington DNR expires in 2037. Approximately 400,000 CY of dredged material was last placed on the western tip and top center of the Oregon side of the island in 2014. In 2013, approximately 400,000 CY of dredged materials were placed upland on the Washington (eastern) portion of the site. Almost the entire upland portion of the island is above elevation 10 ft (CRD), up to 73 ft in the southwest portion of the placement area. The vast majority of the placement site is unvegetated, bare sands.



**Figure 5: Rice Island with Oregon/Washington state line.**

Several bird species have been observed on the site, with nesting by gulls along the northwest portion of the site in 2013. The island is an especially important streaked horned lark nesting site. Streaked horned larks are discussed in detail in Section 5.2 Biological Environment. Fishermen use the island for shoreline fishing.

#### HOWARD ISLAND AND HOWARD ISLAND SUMP (W-68.7)

Historically, the Howard Island site was used as an upland and beach nourishment site. This site has been used for approximately 50 years. Currently, the Corps has a 315-acre site (Figure 6) for upland placement on the downstream end of the larger island. The Howard Island upland site is located from RM 68.2 to 70, in Cowlitz County, Washington. At its closest point, the site is 450 ft northeast of the CR FNC.

The sump would be located on the Oregon side of the FNC within the flowlane in close proximity to the island in order to facilitate upland placement of material temporarily held in the sump.

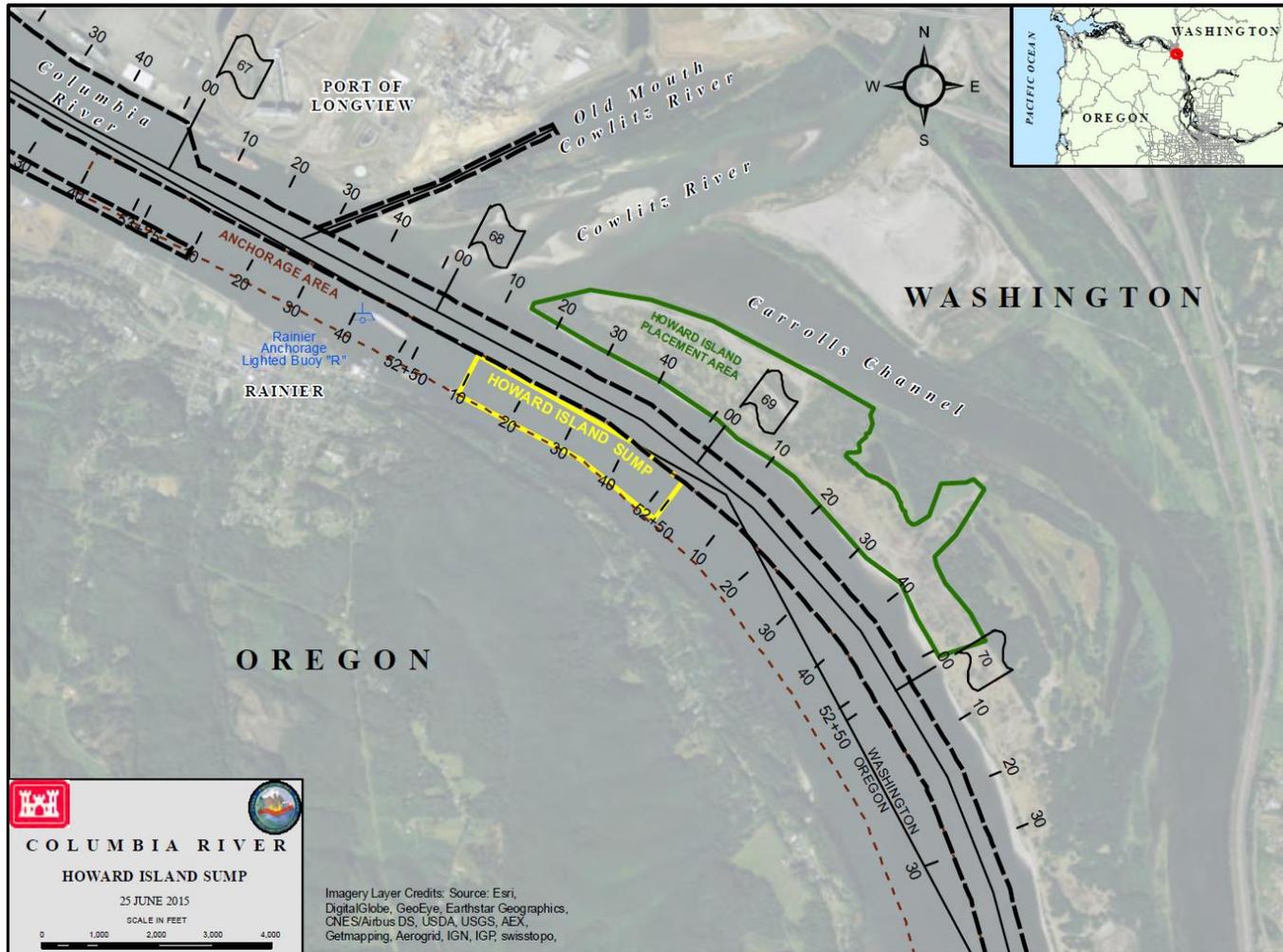


Figure 6: Howard Island sump upstream of marine facilities at confluence of Columbia River, Cowlitz River, and Carrolls Channel

The sump is located in and near waterways that are used for commercial shipping and barge traffic, commercial and recreational fishing, and recreational boating. Northwest (downstream) of the proposed sump site is the Port of Longview, which has eight marine terminals and waterfront industrial property spanning 835 acres on the deep-draft Columbia River, 66 miles from the Pacific Ocean in Southwest Washington state (Port of Longview 2015). There is also a private chip barge facility located in the entrance to the Old Mouth Cowlitz just downstream of the Cowlitz River. Downstream of the proposed sump site on the Oregon side of the river, there is a private vessel construction and repair shipyard and the City of Rainier marina and boat launch.

The sump is located entirely within an anchorage area designated by the U.S. Coast Guard and upstream of a stern anchor buoy for deep draft vessels. Ongoing coordination with the Columbia River Pilots will ensure that sump operations are compatible with anchorage operations.

Northwest (downstream) of where the sump would be located is the confluence of the Cowlitz River, Carrolls Channel, and the Columbia River. Carrolls Channel, is located on the north side of Howard Island and separates the island from the state of Washington mainland. The convergence of these three waterways makes the area around Howard Island a dynamic hydraulic environment.

## **5.2. Biological Environment**

### **5.2.1. Vegetation**

The Columbia River system supports a wide range of aquatic and terrestrial vegetative communities. Vegetation information was obtained from the USFWS, NMFS, ODFW, and WDFW. There are no new sites added to the Network or changes to the CR FNC alignment. The capacity adjustments remain within the footprint already mitigated for in 2003 SEIS.

The channels and banks of the Columbia River are deeply incised river valleys, with banks typically vegetated and consist of basalt, silt, and clay deposit. The river thalweg is primarily comprised of fine and medium grained sand. Current thalweg depths are typically around 50 ft deep with deeper spots occurring along outside bends. Upland placement sites are typically very sandy and do not support a robust, diverse vegetation community. If vegetation is evident on upland or beach nourishment site, several possible vegetation community types occur. Within the proposed project area, the two predominant vegetation community types are Columbia River estuarine and Columbia River riparian.

Native estuarine vegetation habitat within the Lower Columbia River is typically comprised of fringing intertidal marshes and intertidal island marshes. From RM 11 to RM 35, over 14,000 acres of land adjacent to the river have been diked, primarily for agricultural resources. Rice Island, Miller Sands Island, Pillar Rock Island, and Tenasillahe Island are sandy islands, either created as a result of natural shoaling processes, or intentionally developed via placement of dredged material. Active dredged material placement sites typically do not support robust, woody established plant communities, due to lack of nutrients and the xeric composition of placed dredged material. Patches of invasive vegetation like scotch broom and European beach grass may be interspersed across a site (management of invasive species are discussed in section 4.2.5). High tide lines on the perimeter of upland dredged material placement sites are more likely to support vegetative communities due to naturally occurring nutrient and debris deposition within this zone. Established estuarine riparian habitats commonly found in this part of the Columbia River are stands of cottonwoods and alders.

Riverine vegetation habitat upstream of RM 35 consists of fragmented, reduced riparian habitat. Approximately 162,000 acres of land have been converted for agricultural and industrial purposes. Unless modified or developed, a narrow band of vegetation lines the banks of the Columbia River. Cottonwood and Oregon ash stands are likely to populate areas that have not yet been developed or altered for use. There are a number of refuges and wildlife management areas located within the Columbia River basin. These areas provide established natural and man-made wetland and riparian forest habitat for a variety of wildlife species. Upland placement sites are typically bare sand with pockets of cottonwoods and alders and may be sparsely covered with grasses and forbs.

### **5.2.2. Aquatic and Terrestrial Wildlife Species**

The Columbia River system supports a wide variety of aquatic and terrestrial wildlife species. Species information was obtained from the USFWS, National Marine Fisheries Service (NMFS), Oregon Department of Fish and Wildlife (ODFW), and Washington Department of Fish and Wildlife (WDFW). Aquatic and terrestrial wildlife species inhabit or periodically utilize the Rice Island site, the deep-draft channel, the Network, and adjacent waters. Aquatic species found adjacent to the island include: smallmouth bass, largemouth bass, bullhead, carp, catfish, channel crappie, crawfish, eulachon, yellow perch, northern pike minnow, Chinook salmon, chum salmon, coho salmon, sockeye salmon, American shad, steelhead trout, white and green sturgeon, suckerfish, coastal cutthroat trout, and walleye. Terrestrial species that utilize the island include streaked horned larks, terns, cormorants, gulls, pelicans, migratory songbirds, eagles, osprey, crows, mice, nutria, waterfowl, and shore birds.

Aquatic species found along the Howard Island sump reach include: corbicula clams, largemouth bass, smallmouth bass, bullhead, carp, catfish, channel crappie, crawfish, eulachon, yellow perch, northern pike minnow, Chinook salmon, coho salmon, chum salmon, sockeye salmon, American shad, steelhead trout, green and white sturgeon, suckerfish, coastal cutthroat trout and walleye. Terrestrial wildlife species that utilize the sump waters include terns, cormorants, gulls, pelicans, eagles, osprey, and waterfowl.

The dredged material placement Network may be utilized by a wide variety of aquatic and terrestrial species. A full assessment of species present within the Network and CR FNC has been evaluated in the 2003 SEIS and is considered representative of what species may be present within the project area. The 2003 SEIS analysis is hereby incorporated by reference.

### **5.2.3. Endangered Species Act Listed Species**

The federal law protecting threatened and endangered species is the Endangered Species Act (ESA). See 16 United States Code (USC) 1531, et seq. and implementing regulations at 50 CFR Part 402. The ESA and its subsequent amendments provide for the conservation and recovery of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of the ESA, federal agencies are required to consult with USFWS and/or NMFS to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take statement, a Letter of Concurrence and/or documentation of a no effect finding. Section 3 of the ESA defines

Take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1976 (Reauthorized in 2006), was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States. This act is implemented by exercising (a) sovereign rights for the purposes of exploring, exploiting, conserving and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated 10 March 1983, and (b) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources and fishery resources in special areas. Essential Fish Habitat (EFH) is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” (50 CFR 600.10). Adverse effects include the “direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH.” (50 CFR 600.810).

### ESA-Listed Species Under NMFS Jurisdiction

The federally listed threatened and endangered species or managed fisheries under the jurisdiction of the NMFS that may occur in the proposed project area are shown in Tables 2- 4.

**Table 2. ESA-listed Anadromous Salmonids under NMFS Jurisdiction.**

Evolutionarily Significant Unit	Status	Critical Habitat	Federal Register (FR) Citation
<b>Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)</b>			
Snake River spring/summer run	Threatened	Yes	70 FR 37160; 28 June 2005
Snake River fall run	Threatened	Yes	70 FR 37160; 28 June 2005
Lower Columbia River	Threatened	Yes	70 FR 37160; 28 June 2005
Upper Columbia River spring run	Endangered	Yes	70 FR 37160; 28 June 2005
Upper Willamette River	Threatened	Yes	70 FR 37160; 28 June 2005
<b>Coho Salmon (<i>Oncorhynchus kisutch</i>)</b>			
Lower Columbia River	Threatened	Proposed	70 FR 37160; 28 June 2005 78 FR 2725; 14 January 2013
<b>Chum Salmon (<i>Oncorhynchus keta</i>)</b>			
Columbia River	Threatened	Yes	70 FR 37160; 28 June 2005
<b>Sockeye Salmon (<i>Oncorhynchus nerka</i>)</b>			
Snake River	Endangered	Yes	70 FR 37160; 28 June 2005
<b>Steelhead (<i>Oncorhynchus mykiss</i>)</b>			
Snake River Basin	Threatened	Yes	71 FR 834; 1 January 2006
Lower Columbia River	Threatened	Yes	71 FR 834; 1 January 2006
Middle Columbia River	Threatened	Yes	71 FR 834; 1 January 2006
Upper Columbia River	Threatened	Yes	71 FR 834; 1 January 2006
Upper Willamette River	Threatened	Yes	71 FR 834; 1 January 2006

**Table 3. ESA-listed Fish Species under NMFS Jurisdiction.**

Species	Status	Critical Habitat	Federal Register (FR) Citation
Southern DPS* Green Sturgeon ( <i>Acipenser medirostris</i> )	Threatened	Yes	71 FR 17757; 7 April 2006
Southern DPS* Pacific Eulachon ( <i>Thaleichthys pacificus</i> )	Threatened	Yes	75 FR 13012; 18 March 2010

*Columbia River Federal Navigation Channel Operations and Maintenance Dredging Placement  
Network Modifications: Rice Island and Howard Island– Final Environmental Assessment*

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\*DPS = Distinct Population Segment

**Table 4. EFH in the Action Area.**

<b>Fishery Management Plan with EFH</b>	<b>EFH affected</b>	<b>EFH conservation plan</b>
Pacific Coast Salmon	Yes	Yes
Pacific Coast Groundfish	Yes	Yes
Coastal Pelagic Species	Yes	Yes

The Corps has previously consulted with NMFS on the CR FNC O&M program addressing effects to the ESA-listed species and EFH stated above.

National Marine Fisheries Service. 2012. *Reinitiation of Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Columbia River Navigation Channel and Operations and Maintenance, Mouth of the Columbia River to Bonneville Dam, Oregon and Washington (HUCs 1708000605, 1708000307, 1708000108)*. NMFS No. 2011/02095. Northwest Region. Seattle, Washington, 11 July 2012. (2012 BiOp)

The NMFS 2012 Biological Opinion outlines Reasonable and Prudent Measures (RPMs) that, if followed, would avoid jeopardizing the continued existence of ESA-listed species or adverse modifications to their critical habitats within the jurisdiction of the NMFS. The RPMs includes measures for timing of work conducted, water quality monitoring sampling and monitoring, operational constraints, and construction requirements for in-water, upland, and shoreline dredged material placement sites.

The NMFS 2012 BiOp concluded that the CR FNC O&M program is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of their designated critical habitats. The 2012 BiOp included Terms and Conditions to carry out RPMs to avoid and minimize the extent of take (see appendix one for the Terms and Conditions). The 2012 BiOp included conservation recommendations to offset potential adverse effects on EFH.

### **ESA-Listed Species Under USFWS Jurisdiction**

The federally listed threatened and endangered species under the jurisdiction of USFWS that may occur in the proposed project area are shown in Table 5.

**Table 5: ESA-listed Wildlife Species under USFWS Jurisdiction.**

<b>Species</b>	<b>Status</b>	<b>Critical Habitat</b>	<b>Federal Register</b>
Short-tailed Albatross ( <i>Phoebastria albatrus</i> )	Endangered	(none)	65 FR 46643 46654; 31 July 2000
Marbled Murrelet ( <i>Brachyramphus marmoratus</i> )	Threatened	Designated	57 FR 45328 45337; 1 October 1992
Western Snowy Plover ( <i>Charadrius nivosus nivosus</i> )	Threatened	Designated	58 FR 12864 12874; 5 March 1993
Columbian White-tailed Deer ( <i>Odocoileus virginianus leucurus</i> )	Endangered	(none)	32 FR 4001; 11 March 1967
Northern Spotted Owl ( <i>Strix occidentalis caurina</i> )	Threatened	Designated	55 FR 26114 26194; 26 June 1990
Oregon Silverspot Butterfly ( <i>Speyeria zerene hippolyta</i> )	Threatened	Designated	45 FR 44935; 15 October 1980
Bull Trout ( <i>Salvelinus confluentus</i> )	Threatened	Designated	63 FR 31693 31710; 10 June 1998

*Columbia River Federal Navigation Channel Operations and Maintenance Dredging Placement  
Network Modifications: Rice Island and Howard Island– Final Environmental Assessment*

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Streaked Horned Lark ( <i>Eremophila alpestris strigata</i> )	Threatened	Designated	78 FR 61506; 3 October 2013
Yellow-billed Cuckoo ( <i>Coccyzus americanus</i> )	Threatened, proposed	(none)	78 FR 61621; 3 October 2013
Water Howellia ( <i>Howellia aquatilis</i> )	Threatened	(none)	58 FR 19795 19800; 16 April 1993

The Corps has previously consulted with USFWS on the O&M dredging program of the CR FNC to address effects to many ESA-listed species in their jurisdiction. Several species have been delisted and no longer require ESA consultation, which include the bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus*), brown pelican (*Pelecanus occidentalis*), and the Aleutian Canada goose (*Branta canadensis leucopareia*).

United States Fish and Wildlife Service. 2002. *Biological and Conference Opinions for the Columbia River Channel Improvement Project*. Tracking number 02-1743, 02-4943. Oregon State Office. Portland, Oregon. 20 May 2002.

United States Fish and Wildlife Service. 2010. *Letter of Concurrence for Operations and Maintenance of the Columbia River Federal Navigation Project*. Reference number 13420-2010-I-0165. Oregon State Office. Portland, Oregon. 29 September 2010.

United States Fish and Wildlife Service. 2014. *Biological Opinion for Continued Operations and Maintenance Dredging Program for the Columbia River Federal Navigation Channel in Oregon and Washington (2014 – 2018)*. Reference number 01EOFW00-2014-F-0112. Oregon Fish and Wildlife Office. Portland Oregon. 6 June 2014.

The effects of CR FNC O&M dredging program to Columbia River bull trout (*Salvelinus confluentis*), marbled murrelet (*Brachyramphus marmoratus*), and Columbian white-tailed deer (*Odocoileus virginianus leucurus*) from the CR FNC O&M program were previously addressed in the 29 September 2010 informal ESA consultation with the USFWS (USFWS reference #13420-2010-I-0165).

The Corps’ 2010 BA for the Columbia River dredging and dredged material placement program, for which the dredging and placement action and range of effects is very similar to the Proposed Action, received a USFWS Letter of Concurrence on 29 September 2010, as listed above. The potential effects of the Proposed Action alternative for bull trout, marbled murrelet, and Columbian white-tailed deer are consistent with the previous determination of likely to affect, not likely to adversely affect and do not require re-initiation of informal consultation. In addition, the Corps determined the Proposed Action would have “no effect” to western snowy plover (*Charadrius nivosus nivosus*), northern spotted owl (*Strix occidentalis caurina*), short-tailed albatross (*Phoebastria albatrus*), Oregon silverspot butterfly (*Speyeria zerene*), and water howellia (*Howellia aquatilis*). Therefore, these species do not require ESA consultation.

Placement activities can facilitate the development and/or maintenance of suitable streaked horned lark habitat. The Corps has worked with USFWS and its partners to minimize potentially adverse effects and maximize the beneficial effects of dredged material placement actions throughout the lower Columbia River for streaked horned lark.

Beginning in April 2013, the Corps sought active participation from USFWS on ways to avoid and minimize potential adverse effects to streaked horned larks and its habitats. On 4 March 2014, the Corps re-initiated ESA consultation with USFWS and submitted a BA to address potential adverse effects to streaked horned larks and its designated critical habitat in the lower Columbia River from the CR FNC O&M dredging program. The BA included the addition of shoreline placement at Rice Island and revised capacities of the Network for the next five years. The Corps completed Section 7 consultation BA for effects to streaked horned larks, which concluded the actions may affect and are likely to adversely affect streaked horned larks. Subsequent to receipt of the Corps BA, the USFWS issued a Biological Opinion with an incidental take statement, dated 6 June 2014. The Biological Opinion concluded that the proposed action will not jeopardize the continued existence of streaked horned lark nor will it adversely modify or destroy designated critical habitat for the species.

During the 2015 nesting season, Caspian terns showed increased interest in using the western end of Rice Island as a nesting site. Though Caspian terns are not utilizing the same areas as larks for nesting purposes, they do create increased competition for resources and heavily predate salmonids in the Columbia River estuary. For this reason, and in compliance with NMFS and USFWS Biological Opinions, and the NMFS Federal Columbia River Power System Biological Opinion (NMFS 2014), the Corps intensified its use of hazing and dissuasion of terns on Rice Island during the 2015 nesting season. Because Caspian terns are utilizing different areas of the island than streaked horned larks, hazing efforts by island monitors were able to successfully prevent tern nesting on Rice Island without negatively impacting nesting streaked horned larks. USFWS and Corps avian specialists believe the increased tern presence is due to several factors affecting the estuary including a severe drought situation, poor prey abundance in other areas, and tern hazing efforts at islands both upstream and downstream of Rice Island implemented under the most recent NMFS Biological Opinion intended to limit avian predation of juvenile salmonids in the estuary. Currently, NMFS, USFWS, the Caspian Tern Adaptive Management Team, and the Corps are exploring modified dredged material placement options that would continue to encourage development of streaked horned lark habitat without attracting more Caspian terns to important streaked horned lark critical habitat areas.

The USFWS announced the proposed listing of the western distinct population of yellow-billed cuckoos (*Coccyzus americanus occidentalis*) as threatened under the ESA on 3 October 2013 (FR 78 61622). The proposal applies to the western yellow-billed cuckoo throughout its entire breeding range. The decline of the western yellow-billed cuckoo is primarily the result of habitat loss and degradation. The USFWS found that no critical habitat was present in Oregon or Washington and as a result, no critical habitat was proposed for designation in this region. The Rice Island placement site is composed of open, sandy areas and if riparian vegetation is present, it does not consist of large, extensive riparian forests preferred by the cuckoo (greater than 100 x 300m). For this reason, the proposed action is highly unlikely to affect individual cuckoos or their preferred habitats because these conditions are not present in the action area. As a result, the Corps has determined the proposed action would have “no effect” to the western yellow-billed cuckoo.

#### **5.2.4. Invasive Species**

Executive Order 13112 requires federal agencies to “prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.” The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that

ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to the human health.”

WDFW and ODFW along with regional invasive species management groups have identified the top priority invasive species for prevention from establishment or eradication efforts. Invasive species once established have the potential for widespread native ecological disruption by displacement of native plants and animals, reduction in habitat and species biodiversity, competition with native organisms for limited resources, and degradation of habitats. Once an introduced species becomes established, the species becomes increasingly difficult and expensive to control; invasive species has the potential to negatively affect the environmental and economic viability of a region.

High priority invasive species have been identified as the species most likely to generate ecological and economic losses within the Lower Columbia River system, consequently causing relatively high impacts to the human and ecological environment. Some species are already established within the system; other species have been discovered but are yet established, while other species are not within the system. Table 6 outlines which species are established or if established, likely to disrupt the Lower Columbia River system. The Corps may come across these species during dredging and placement operations.

**Table 6. Most common Invasive Species.**

Species	Status
<b>Terrestrial Plants</b>	
Butterfly bush ( <i>Buddleja davidii</i> )	Present
Common crupina ( <i>Crupina vulgaris</i> )	Present
Garlic mustard ( <i>Alliaria petiolata</i> )	Present
Giant hogweed ( <i>Heracleum mantegazzianum</i> )	Present
Himalayan blackberry ( <i>Rubus armeniacus</i> )	Present
Kudzu ( <i>Pueraria montana var. lobata</i> )	Eradicated
Scotch broom ( <i>Cytisus scoparius</i> )	Present
<b>Aquatic plants</b>	
Caulerpa seaweed ( <i>Caulerpa taxifolia</i> )	Eradicated
Common reed ( <i>Phragmites australis</i> )	Present
Eurasian water milfoil ( <i>Myriophyllum spicatum</i> )	Present
Parrot’s feather ( <i>Myriophyllum aquaticum</i> )	Present
Purple loosestrife ( <i>Lythrum salicaria</i> )	Present
Spartina ( <i>Spartina patens</i> )	Present: not established
Water chestnut ( <i>Trapa natans</i> )	Not present
<b>Terrestrial animals</b>	
Feral swine ( <i>Sus scrofa</i> )	Present
White garden snail ( <i>Theba pisana</i> )	Not present
<b>Aquatic animals</b>	
American Bullfrog ( <i>Lithobates catesbeianus</i> )	Present
Chinese Mitten Crab ( <i>Eriocheir sinensis</i> )	Reported sightings, not confirmed
Common Snapping turtle ( <i>Chelydra serpentina serpentina</i> )	Present
Crayfish ( <i>Orconectes neglectus, O. rusticus, Procambarus clarkii</i> )	Present
Green crab ( <i>Carcinus maenas</i> )	Present
New Zealand mud snail ( <i>Potamopyrgus antipodarum</i> )	Present
Nutria ( <i>Myocastor coypus</i> )	Present

	Red-Eared Slider ( <i>Trachemys scripta elegans</i> )	Present
	Zebra/quagga mussel ( <i>Dreissena polymorpha</i> , <i>D. rostriformis bugensis</i> )	Not present
<b>Fish</b>		
	Asian carp ( <i>Hypophthalmichthys nobilis</i> , <i>H. molitrix</i> , <i>Mylopharyngodon piceus</i> )	Present
	Atlantic salmon ( <i>Salmo salar</i> )	Present: not established
	Northern snakehead ( <i>Channa</i> spp.)	Not present
	Oriental Weatherfish ( <i>Misgurnus anguillicaudatus</i> )	Present

None of the species on the list are used by the Corps for erosion control or pest management. All equipment and materials would be inspected for the presence of invasive species. In compliance with the Executive Order 13112, the Corps would exercise precaution if invasive species are found in or adjacent to construction areas. Proper inspection and cleaning of construction equipment and eradication strategies would be implemented should an invasive species be present.

### **5.3. Physical Environment**

#### **5.3.1. Air Quality**

The Clean Air Act (CAA) established a comprehensive program for improving and maintaining air quality throughout the United States. The focus of the CAA is to reduce ambient concentrations of air pollutants and toxins that degrade air quality; the reduction of air pollution in turn improves the human and biologic environment. The intent of the act is achieved through permitting of stationary sources, restriction of toxic substance emissions from stationary and mobile sources, and the establishment of National Ambient Air Quality Standards (NAAQS) as set by EPA. The CAA prohibits federal agencies from funding, authorizing, or approving plans, programs, or projects that do not meet or conform to the NAAQS requirements.

EPA sets the national air quality standards for six common pollutants as emitted by any stationary and mobile (marine and/or terrestrially based) source (as referred to as “criteria” pollutants). These standards consist of threshold levels for carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter 2.5 and 10, and sulfur dioxide. EPA transferred primary implementation and enforcement of the CAA authority for federal air quality standards to state, local, or tribal regulatory agencies. The delegated agency is responsible for establishing State Implementation Plan (SIP) specific to their region. The contents of a typical SIP fall into several categories: (1) State-adopted control measures which consists of either rules/regulations or source-specific requirements (e.g., orders and consent decrees); (2) State-submitted comprehensive air quality plans, such as attainment plans, maintenance plans rate of progress plans, and transportation control plans demonstrating how these state regulatory and source-specific controls, in conjunction with federal programs, will bring and/or keep air quality in compliance with federal air quality standards; (3) State-submitted "non-regulatory" requirements, such as emission inventories, small business compliance assistance programs; statutes demonstrating legal authority, monitoring networks, etc.); and (4) additional requirements promulgated by EPA (in the absence of a commensurate State provision) to satisfy a mandatory requirement. If the NAASQ is exceeded, the region is designated as a nonattainment area and mandated to implement measures to improve the region air quality through the implementation of a stricter SIP.

The Columbia River from RM +3.0 to 106 bisects Washington and Oregon, and the majority of the river runs through areas removed from direct sources of air pollution. The cities of Longview,

Kalama, and Vancouver of Washington state and the cities of Portland and St. Helens are the primary contributors to air pollution along the lower Columbia River. For this region, the CAA, as delegated by EPA, is regulated by Oregon Department of Environmental Quality (DEQ) and Washington Department of Ecology (DOE) for the majority of air pollution contributors.

The lower Columbia River currently meets the NAAQS.<sup>1</sup> In 1996, Portland of Oregon and Vancouver of Washington were listed as not meeting NAAQS; EPA designated these areas nonattainment status. Both Portland and Vancouver implemented a stricter SIP. In 2011, the region was removed from the nonattainment list. The region is currently meeting NAAQS; the maintenance SIP provides the region strategy for ensuring attainment status with a focus on emission reductions from on-road vehicles, non-road vehicles, paints and household products, and industry. Recently the Corps replaced the older combustion engines on their dredges in order to meet California Air Quality standards, which are stricter than those of Oregon and Washington. The Port of Portland also recently replaced the engine on the contract pipeline dredge which greatly reduced its emissions.

### **5.3.2. Climate Change**

Climate is governed by incoming solar radiation and greenhouse effects that influence short-term, seasonal, and long-term weather patterns. The greenhouse effect is the result of certain naturally occurring atmospheric gases absorbing long-wave radiation emitted from the Earth. Absorption of this long-wave radiation in the atmosphere, as opposed to allowing it to be emitted back into space, warms the Earth. Greenhouse gases include (in the order of importance to the greenhouse effect): water vapor, carbon dioxide, methane, nitrous oxide and ozone. Anthropogenic activities such as the burning of fossil fuels (adding more greenhouse gases to the atmosphere) and clearing of forests (removing a natural sink for carbon dioxide), have intensified the natural greenhouse effect, causing climate change. Carbon dioxide emissions from the burning of fossil fuels are the most substantial source of anthropogenic greenhouse gases. Global atmospheric concentrations of carbon dioxide have risen almost 100 parts per million (ppm) since pre-industrial value of 280 ppm (OCCRI 2010).

Natural factors, which include solar variation and volcanic activity, also contribute to climate change. However, strong scientific evidence suggests that these factors alone do not fully explain the observed accelerated climate change within the past few decades.

Climate change is likely to play an increasingly important role in determining the fate for wildlife species and the conservation value of habitats in the Columbia River. Climate change could exacerbate long-term problems related to temperature, stream flow, habitat access, predation, and marine productivity (CIG 2004, ISAB 2007). According to the U.S. Global Change Research Program (USGCRP), the average regional air temperatures have increased by an average of 1.5°F over the last century (up to 4°F in some areas), with warming trends expected to continue into the next century (2009). Warming is likely to continue during the next century as average temperatures increase another 3 to 10°F (USGCRP 2009).

These changes would not be spatially homogeneous across the Columbia River. Areas with elevations high enough to maintain temperatures well below freezing for most of the winter and early spring would be less affected. Low-lying areas that historically have received scant precipitation contribute little to total stream flow and are likely to be more affected. Overall, about one-third of the current cold-water fish habitat in the Pacific Northwest is likely to exceed key water temperature

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<sup>1</sup> <http://www.deq.state.or.us/aq/forms/annrpt.htm>

thresholds by the end of this century (USGCRP 2009). Precipitation trends during the next century are less certain than for temperature but more precipitation is likely to occur during October through March and less during summer months, and more of the winter precipitation is likely to fall as rain rather than snow (ISAB 2007, USGCRP 2009). Where snow occurs, a warmer climate would cause earlier runoff so stream flows in late spring, summer, and fall would be lower and water temperatures would be warmer (ISAB 2007, USGCRP 2009).

Higher winter stream flows increase the risk that winter floods in sensitive watersheds would damage spawning redds and wash away incubating eggs (USGCRP 2009). Earlier peak stream flows would also flush some young salmon and steelhead from rivers to estuaries before they are physically mature, increasing stress and the risk of predation (USGCRP 2009). Lower stream flows and warmer water temperatures during summer would degrade summer rearing conditions, in part by increasing the prevalence and virulence of fish diseases and parasites (USGCRP 2009). Other adverse effects are likely to include altered migration patterns, accelerated embryo development, premature emergence of fry, variation in quality and quantity of tributary rearing habitat, and increased competition and predation risk from warm-water, non-native species (ISAB 2007).

The earth's oceans are also warming, with considerable interannual and inter-decadal variability superimposed on the longer-term trend. Historically, warm periods in the coastal Pacific Ocean have coincided with relatively low abundances of salmon and steelhead, while cooler ocean periods have coincided with relatively high abundances (USGCRP 2009). Ocean conditions adverse to salmon and steelhead may be more likely under a warming climate. According to the EPA (2015), global average sea level rose throughout the 20<sup>th</sup> century, and the rate of change has accelerated in recent years. When averaged over all the world's oceans, absolute sea level increased at an average rate of 0.06 inches per year from 1880 to 2013. Since 1993 average sea level has risen at a rate of 0.11 to 0.14 inches per year—roughly twice as fast as the long-term trend. However, relative sea level fell at some locations in Alaska and the Pacific Northwest. At those sites, even though absolute sea level has risen, land elevation has risen more rapidly.

### **5.3.3. Geology and morphology**

Channels and banks of the Columbia River are deeply incised river valleys, where banks are typically vegetated and consist of basalt, silt, and clay deposit. The river thalweg is primarily comprised of fine and medium grained sand. The Columbia River has been highly modified by anthropogenic sources since the 1890s. Pre-1890s, the shore edge of the Columbia River was dynamic; there were sections of the Columbia River where sand dominated the morphology and other parts where silt/hardpan dominated. Present topography is a result of both the excavation of a portion of the deposited gravels by the Columbia River prior to the post-glacial 300 ft sea level rise. The lower Columbia River valley flooded during the sea level rise causing extensive deposition of silt and clay materials in a low energy estuarine-lacustrine environment. These deposits form the majority of the bank materials that are found in the present-day Columbia River lowlands. Present river morphology is controlled by these erosion-resistant silt and clay materials (Dodge, 1971). Current thalweg depths are typically around 50 ft deep with deeper spots occurring along outside bends.

Since the 1890s the river has been highly modified by dredging operations and the installation of dams, pile dikes, and other structures that altered the movement of sediment. The Columbia River estuary (RM +3.0 to RM 25) is four to five miles wide bisected into two main channels, the north

and south channel. The south channel is an extension of the main river channel upstream of the estuary and carries most of the upland river discharge. The navigation channel follows the south channel through the estuary. The river channel varies from 1,700 to 3,000 ft in the upper reaches of the lower Columbia (RM 35 to RM 145) in width and has minor side channels. Portions of the river have been modified by pile dikes and relic dredged material placement areas. River bends within the Columbia River system are typically very long and gradual. There are several tight bends that occur as a result of basalt cliff impediments. There still are back-bay areas and some shore areas that have silty/hardpan shore edge; however, many shore areas since the 1890s have received dredged sand. Areas of pile dike placement have accumulated migrated sand that may have otherwise not accumulated in absence of pile dikes. The dams provide flood protection measures, and as a result, natural scour and depositional processes have decreased in the lower Columbia River.

Several different types of shoaling occur within the CR FNC. The most common shoals occur in the mainstem Columbia River are continuous cutline shoals or sand wave (continuous or limited) formations. Cutline shoals are defined by bedload material that is moving in from the side slopes (parallel edges) of the channel, typically longer than 1,000 ft in length (upstream to downstream); shoaling is more continuous and stable. These kinds of shoals are more common in lower river. Sand waves shoals are where bedload material forms peaks and troughs perpendicular across the channel, around 15 ft in height and 200 ft long (upstream to downstream); shoaling is more intermittent and unstable. These kinds of shoals are typically found in the upper reaches of the river. Low-energy accretionary depositional shoals (shoals formed by settling of sediment out of the water column due to low water movement through the area) are typically found in the lower energy side channels.

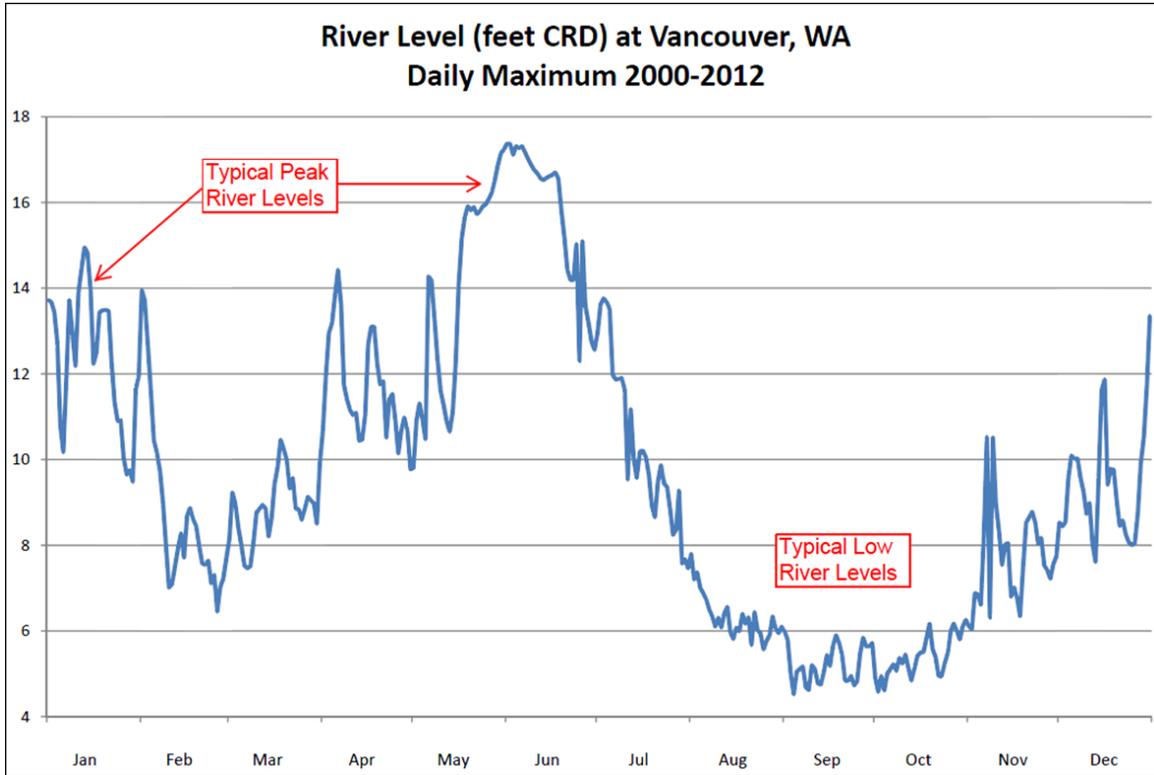
The natural riverbanks consist of 10- to 20-ft of clay-silt, overlying much deeper sand deposits. Sandy beaches occur only where dredged material has been placed along the shore. There has been little change in the river's location in the last 100 years.

#### **5.3.4. Hydrology**

Executive Order 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. Additionally, the Corps follows guidelines as set by Engineering Regulation (ER) 1165-2-26 for the operations and maintenance programs conducted by the Corps. Columbia River flows are maintained by spill regulation of upstream reservoirs; however, flow events can be affected by seasonal increases or decreases of rain/snow events. The Columbia River drains over 259,000 square miles. The average annual discharge at the Mouth of Columbia River is over 210,000 cfs. Winter and spring rain events are heavy and have caused winter/spring freshets to occur, with a late spring freshet occurring as the result of snow melt. Reservoirs upstream of RM 145 (Bonneville Dam) regulate the volume of water moving through the system.

Columbia River discharges are dependent on weather, reservoir operations, and ocean tides. The highest flows generally occur in May or June as a result of snowmelt in the upper watershed. Upstream reservoirs store water during this high flow period, which has reduced the 2-year flood peak at the Dalles, Oregon (RM 192) from 580,000 cubic ft per second (cfs) under natural conditions to 360,000 cfs with regulation. Low flows, typically in the 100,000 cfs range, occur in September and October, after the snowmelt but before the winter rains. Water stored during the spring freshet is released during low flow periods to increase hydropower generation.

The lower river tributaries, such as the Willamette River, are highly influenced by rain and reach high sharp peak flows several days following storms and low-level snowmelt between November and March. Minimum flow occurs in the late summer months.



**Figure 7. Typical High and Low Flows for Columbia River at Vancouver, Washington.**

Peak river levels in the lower Columbia River generally occur in January and June, and minimum river levels occur August through October.

Tidal influences on the Columbia River occur as far upstream as RM 145. The tidal range at the Mouth of Columbia River is approximately 8 ft and about 2.5 ft at the Port of Vancouver. High tide entering the Columbia River from the Pacific Ocean takes about 5.5 hours to progress up the Columbia River from Astoria (RM 15) to the confluence of the Willamette River (RM 100). The tidal effect is greatest in the reaches downstream of RM 33 and during low flow periods. The instantaneous flow in the lower reaches changes constantly due to the effects of ocean tides, and can range from twice the mean daily value to negative values (upstream flow). Flow reversal can occur as far upstream as RM 90 during low flow periods.

### **5.3.5. Water Quality**

The Clean Water Act (CWA) governs the release of pollutants into waterways. There are three applicable sections to the Proposed Action: section 401, section 404, and section 303(d). Section 401 requires certification from the state where the discharge to waters of the U.S. will occur. The certification is granted by the state certifying that the discharge will not violate the states' water quality standards. EPA retains jurisdiction in limited cases. Water Quality Certification (WQC) or

amendments to the current WQCs will be required from both Oregon and Washington. Section 404 prohibits the discharge of dredged or fill material into navigable waters without a permit from the Corps of Engineers. The Corps does not issue itself a 404 permit to authorize Corps project discharges of dredged or fill material but does apply the 404(b)(1) guidelines when determining project impacts. Only when there is no practicable alternative would any discharge of fill material occur. A 404(b)(1) analysis would be conducted prior to initiation of any new dredging and placement actions.

Section 303(d) of the CWA establishes that states are to list waters which are not meeting applicable water quality standards. The list includes priority rankings set by the states for the listed waters. Once the impaired waters are identified, Section 303(d) requires that the states establish total maximum daily loads (TMDLs) that would meet water quality standards for each listed waterbody. The Columbia River within the project area has been inventoried by the Washington DOE and the Oregon DEQ as having impaired water quality and is listed on the 303(d) list. The Columbia River is listed at some point along the Columbia River from RM 3 to 145 for these following elements: 1,2,4-Trichlorobenzene; 1,2-Dichlorobenzene; 2,3,7,8-Tetrachlorodibenzo-p-Dioxin; 2,3,7,8-Tetrachlorodibenzo-p-Dioxin Toxic Equivalent; 2,4,6-Trichlorophenol; 2,4-Dichlorophenol; 2-Methylnaphthalene; 4,4'- Dichlorodiphenyl dichloroethane; 4,4'- Dichlorodiphenyldichloroethylene; 4,4'- Chlorodiphenyl Trichloroethane; Alpha-BHC; Anthracene; Arsenic; Beta-BHC; Bis(2-chloroisopropyl)ether; Chlordane; Dibenzofuran; Dieldrin; Dioxin; Dissolved Oxygen; Endosulfan I; Endosulfan II; Endosulfan Sulfate; Endrin; Endrin Aldehyde; Fecal Coliform; Fluoranthene; Fluorene; Gamma-bhc (Lindane); Heptachlor; Heptachlor Epoxide; Hexachlorobenzene; Hexachlorobutadiene; Hexachloroethane; Invasive Exotic Species; Low Molecular Weight Polycyclic Aromatic Hydrocarbons; Mercury, Nitrobenzene; Polychlorinated biphenyl; pH; Phenanthrene; Phenol; Pyrene; Temperature; Total Chlordane; Total Dissolved Gas.

Sediments from the FNCs are evaluated to determine if they are acceptable for in-water unconfined placement according to the requirements of the CWA and the MPRSA. The Corps has characterized sediments to be dredged in accordance with the regional and national dredge material testing manual protocols, Ocean Testing Manual, Inland Testing Manual, 2009 Northwest Regional Sediment Evaluation Framework (SEF), and previously under the 1998 Dredge Material Evaluation Framework (DMEF).

Project sediment testing is typically performed on the mainstem Columbia River on a 10-year rotational cycle unless an event occurs that would warrant more frequent sampling. The 10-year rotation allows for the continued, even management of both budget and labor while providing sediment quality information to allow dredging to proceed unobstructed. Projects dredged less frequently, such as the auxiliary side channel projects, are evaluated, sampled, and tested as required by the SEF. A brief description of recent sediment quality sampling results is provided below for the Project area.

Columbia River FNC, deep-draft channel and associated turning basins (RM +3.0 to RM 106.5) – The 2008 analyses indicated a mean grain-size of 92% sand. Total organic carbon averaged 0.25%. The Oregon Slough reach of the deep-draft channel was tested in 2005. Mean grain size for all the samples is 0.40 mm, with .037% gravel, 48.15% sand, 41.925% silt, and 9.875% clay.

The detailed results of the characterizations highlighted above are available upon request.

Operations and Maintenance of the Network is currently covered by DOE WQC Order #9765 and DEQ WQC File Number NWPOP-CLA-F05-001-FR. The Corps submitted a Joint Aquatic Resources Permit Application to Washington DOE (May 22, 2015) and on July 15, 2015, DOE amended WQC Order #9765 to include shoreline placement activity at Rice Island. The Corps also submitted a Joint Permit Application to Oregon DEQ (May 27, 2015) for use of the sump off Howard Island. DEQ published a 30-day Public Notice of receipt of the Corps' application on July 31, 2015. The Corps received a WQC for the Howard Island sump dated September 3, 2015.

### **5.3.6. Wetlands**

Executive Order 11990 directs federal agencies to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. In planning their actions, federal agencies are required to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. Only when there is no practicable alternative would any discharge of fill material occur. It would not be known whether there is a practicable alternative to the placement in what might be a wetland until the dredged material placement site is identified for placement action the preceding season. A 404(b)(1) analysis would be conducted for all discovered wetlands and individual site practicable alternative(s) would be developed prior to placement action.

As a part of the CRCIP, a wildlife/wetland mitigation plan was developed for offsetting anticipated impacts to agricultural, wetland, and riparian environments. The mitigation plan was developed for planned impacts incurred during the channel deepening and for the first 20 years of CR O&M dredging/placement actions. In the 2008 SE, the anticipated wetland impacts were reduced to from 20 acres to 16.20 acres. To offset 16.20 acres of anticipated wetland impact, the Corps completed 89.60 acres of wetland mitigation in 2010.

In 2013, routine wetland delineations identified a 0.06 acre wetland which had developed in the Rice Island placement site. These wetlands were subsequently filled with dredged material in 2014, resulting in a remaining future wetland impact balance of 15.97 acres.

There are no wetlands remaining within the footprint of the Rice Island placement site. The Howard Island sump is not considered wetland habitat. It is classified as open deep-water, riverine habitat. The Corps plans to conduct additional wetland delineations on upland placement areas prior to their use over the next five years.

## **5.4. Socio-Economic Environment and Columbia River Resources**

The project area includes Wahkiakum County, in Washington State, and Columbia County, in Oregon lying directly adjacent to the Columbia River. Neither placement site is populated; however, approximately 1.3 million people live along the lower Columbia River. The river runs through the Pacific Northwest's second largest population center, the Portland/Vancouver metro area. The metro area spans the Oregon/Washington border and includes counties not directly adjacent to the Columbia River. The racial composition of the counties that border the Columbia River (with the exception for Multnomah County of Oregon) as a whole are underrepresented when compared to the national statistics.

A wide range of property uses and activities are observed along the Columbia River and associated upland sites, such as: agricultural, commercial, ecosystem restoration, industrial, recreational,

residential, etc. A fair amount of properties adjacent to the Columbia River rely on the river for important and critical components of agricultural and commercial operations on their property. The CR is the gateway for global imports from the Columbia-Snake River navigation system. The federal deep-draft navigation channel is important to the regional, national, and global economy. It is estimated that in 2011, the CR FNC supported an annual \$30 billion import/export industry, transporting approximately 55 million metric tons of goods (U.S. Department of Transportation, Maritime Administration, 2011). Approximately \$16 billion worth of U.S. products was exported to the world markets. Currently, approximately \$14 billion annually are imported and exported from the CR and Snake River system. More than 12,000 commercial vessels and 100,000 recreational/charter vessels navigate through the CR FNC annually. According to the Pacific Northwest Waterways Association, more than 40,000 jobs along the lower Columbia River are directly dependent on seaport activity.

The Columbia River and its tributaries support treaty, non-treaty commercial, and recreational fisheries. These fisheries are highly regulated by state, federal, and tribal entities. A wide range of fish and aquatic species are harvested from the Columbia River. There are 13 ESA-listed Evolutionary Significant Units (ESU) of salmon that migrate into the Columbia River system. Additionally, five other ESA-listed fish species use the Columbia River system in some capacity. Overall, there are over 120 species of fish and aquatic species that are harvested from this region. The Columbia River supports a 410 million dollar fish industry (salmon, crab, groundfish, etc.).

The Columbia River is major recreational resource for a variety of shoreline, on-water and in-water activities. Recreational use of the Columbia River occurs year-round; river-based tourism and recreational activities are the driving economic force for a lot of the towns situated along the Columbia River. Fishing, hunting, swimming, water sports, and sightseeing are among the most popular activities to engage in with the Columbia River. Many attempts have been undertaken by various agencies to quantify the recreational opportunity spectrum for the Columbia River. Given the wide range of recreational opportunities and large geographic range the Columbia River encompasses, it is difficult to fully encapsulate the extrinsic and intrinsic value of recreation for this region.

Land ownership in the lower Columbia River is comprised of holdings by private, corporate, and governmental entities (local, state, and federal). Primary categorization of holdings is forest and farmlands in the lower Columbia River, interspersed with urban and industrial areas in the upper reaches of the lower Columbia River. Land uses immediately adjacent to the river have not changed dramatically since the 2003 SEIS. There are five deep-draft and three smaller ports situated along the lower Columbia River. These eight ports own, operate and lease holdings for marine based commerce and industry along the river. Various governmental entities own, operate, and lease holdings for various uses along the river.

Approximately 6% of the Columbia River water is diverted for agricultural use. Additionally, municipal and industrial users draw on the Columbia River for use. Dams on the Columbia River (upstream of the proposed project area) generate inexpensive hydroelectric power. Approximately 60% of the Pacific Northwest electricity is generated by hydropower.<sup>2</sup> There are multiple recreational uses along and on the Columbia River. A few of the popular activities on the Columbia include boating, hunting/fishing, windsurf sports, swimming, and bird watching. All of these uses in turn contribute to the regional and national economic base. Beach nourishment and upland placement

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<sup>2</sup> [http://www.bpa.gov/power/pg/fcrps\\_brochure\\_17x11.pdf](http://www.bpa.gov/power/pg/fcrps_brochure_17x11.pdf)

sites are mixed use and ownership sites. Some beach nourishment and upland sites are publicly accessible and utilized as recreational areas. Other sites are closed off to the public, while other sites are maintained as restoration areas.

Access to Rice Island can only be gained by boat so it is not easily accessible by the public, but it may be used as a recreational area. Maritime and recreational activities may occur within the vicinity of the project area. Access and use of the Network has already been analyzed in the 2014 EA, and has not substantially changed since that time; therefore, access and land use is not further evaluated in this section.

#### **5.4.1. Archaeological and Historic Resources**

The National Historic Preservation Act of 1966 (NHPA), as amended, sets forth national policy and procedures regarding historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places (NRHP). Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on those undertakings, following regulations issued by the ACHP (36 CFR Part 800). The Archaeological Resources Protection Act (ARPA) applies when a project may involve archaeological resources located on federal or tribal land. ARPA requires that a permit be obtained before excavation of an archaeological resource on such land can take place.

A detailed description of cultural resources within the various project areas are provided in the 1999 EIS and 2003 SEIS (Corps 1999 and Corps 2004), Gilbow (et al, 1981), and Minor and Musil (1998). Two additional actions presented in this EA were not analyzed for cultural resources in the EIS or SEIS. These are the Howard Island Sump and the modification of Rice Island material placement site.

The proposed Howard Island sump location is a dynamic area of shifting sand wave shoals. These sand waves grow in height while they migrate downstream, which occurs as sediment erodes from the upstream face, then deposits in the downstream trough and is buried by additional material eroded from the upstream face. This movement occurs in a layer only a few sand grains thick. Through this mechanism, all the individual grains in a sand wave are exposed to flow, eroded, transported, deposited, buried, and then eventually exposed again as the sand wave migrates downstream. When the river discharge is less than 300,000 cfs, bedload transport is small and sand waves move only a few feet per day. However, bedload transport increases rapidly when the discharge exceeds 400,000 cfs and sand wave movement can be in the range of 20 ft per day or higher. Multi-beam bathymetry data taken in July 2014 from a Corps survey vessel of proposed area shows no anomalies on the river bottom.

Rice Island is a manmade island formed from dredge material placements. No cultural resources are located on Rice Island.

#### **5.4.2. Visual Quality**

The NEPA of 1969 establishes that the federal government use all practicable means to ensure all Americans access to safe, healthful, productive, and *aesthetically* and culturally pleasing surroundings (42 USC 4331(b)(2)).

The physiographic setting of the Columbia River is varied from RM +3.0 to 106.5; the two primary geographic settings along this river are estuarine and riverine. Undeveloped, rural, and urban environments interface with the physiographic settings upon which they are situated. The undeveloped environment along the Columbia River has been indirectly and directly modified since the advent of regional industrialization in the 1800s.

As situated at any point within the river, the scenery may be comprised of completely natural elements, a mixture of natural and anthropogenic features, and anthropogenic features. Depending on a particular stretch of the river, natural elements of the viewshed may be comprised of well-established riparian vegetation, naturally occurring sandy shorelines and islands, tidal mudflats, basaltic cliffs hemming in the river, and low-lying plains and shallow vegetated embayments. A combination of natural and anthropogenic features may include the natural elements of the viewshed interspersed among agricultural fields (fences), human settlement (houses, docks, dike fields), industrial complexes (mills, dredged material placement sites), transportation corridors (roads, railways), and human created sandy shorelines. These elements are surrounded by or partially blocked from view by riparian vegetation or vegetated dikes. The anthropogenic setting occurs most frequently in places with a sizable population that supports industry. These stretches of the river are often sparsely vegetated and lined with concrete riprap, houses and businesses, industrial complexes, and transportation amenities (railroads, roads, docks, piers).

#### **5.4.3. Hazardous Materials**

Hazardous materials including hazardous substances and wastes are regulated by many federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and the investigation and mitigation of waste releases, air and water quality, human health, and land use.

The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA). The purpose of CERCLA, often referred to as “superfund,” is to identify and clean up abandoned contaminated sites so that public health and welfare are not compromised. RCRA provides for “cradle to grave” regulation of hazardous waste generated by operating entities.

No hazardous waste sites are known to be present in the project area, and the likelihood of undiscovered hazardous waste sites in the project area is very low. If hazardous materials are discovered during construction, the appropriate federal, state, and local agencies would be notified.

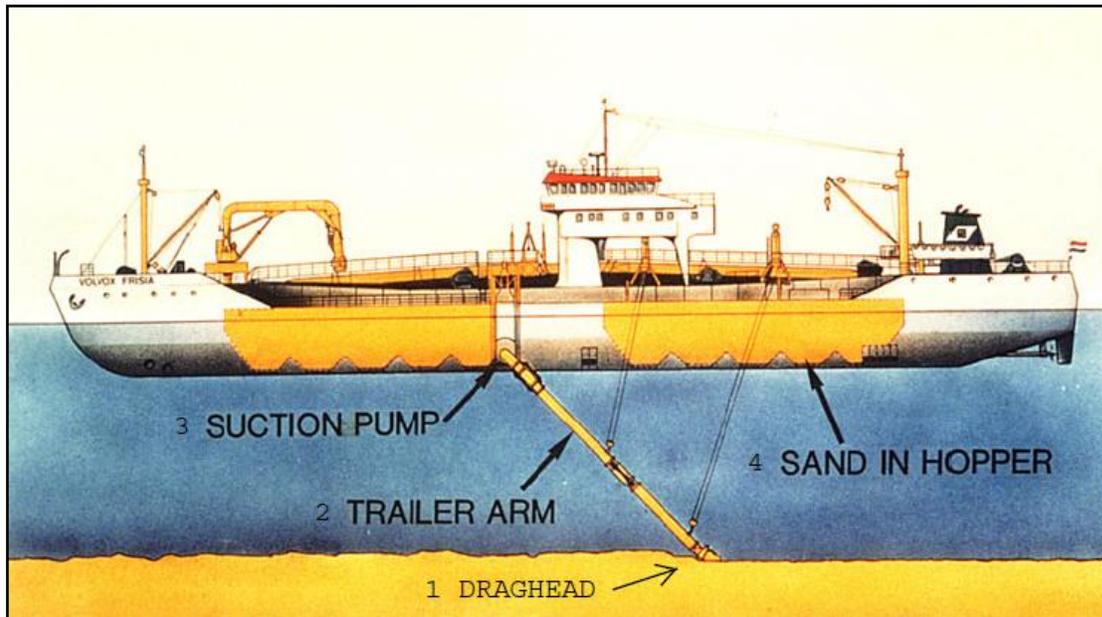
#### **5.4.4. Construction**

Construction impacts including timing of action, location of construction, and duration, are highly variable for the Corps’ CR O&M program. Various statutes govern the impact of construction and dissuasion on human and wildlife environment. Air and water quality, human health, and land use must be taken into consideration during construction of a project.

The Corps CR O&M program uses two general types of dredging equipment: hydraulic dredges and mechanical dredges. Hydraulic dredging is typically conducted by either a hopper dredge or a pipeline dredge. Mechanical dredging includes clamshell or backhoe dredging. Hopper and pipeline dredges currently handle the majority of O&M dredging needs for the CR FNC. The Corps

anticipates using hopper and pipeline hydraulic dredges to conduct the construction and O&M dredging for Howard Island sump and placement of material on Rice Island shoreline.

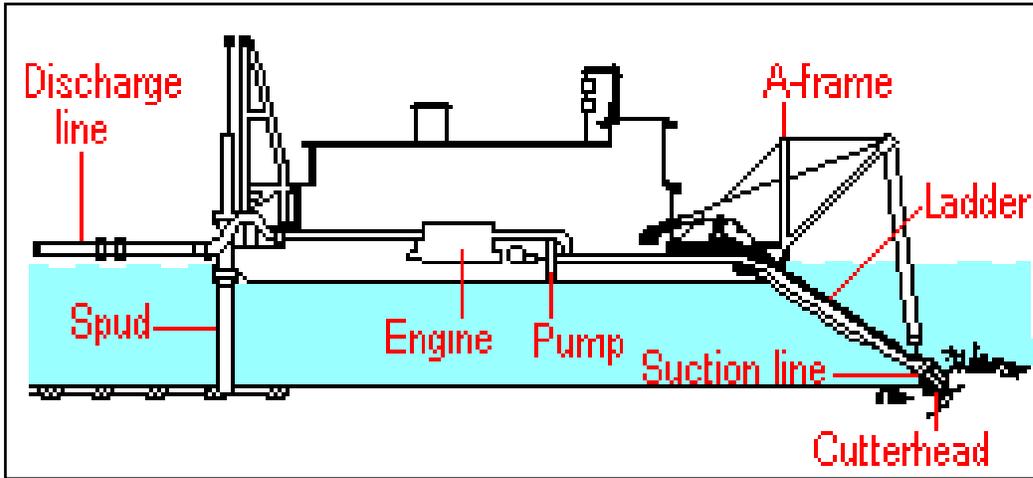
Hopper dredges are typically self-propelled vessels that provide flexibility for dredging operations because of their maneuverability. They are most often used on small-volume sand wave shoals in the river, on large shoals in the estuary, and in the high-current areas at the mouths of rivers. As shown in Figure 8, hopper dredges use dragheads (1) at the end of drag- or trailer arms (2) located on both sides of the dredge. The dragheads are lowered to the channel bottom, and suction from the pump (3) is used to transport material through the dragarm and into the “hopper” or holding area of the dredge (4). The Corps dredging procedures for hopper dredging (and pipeline dredging below) call for the draghead to be buried in the riverbed during operations or raised no more than three ft off the bottom when the pumps are running to prevent fish entrainment. Hopper dredges would likely be used to place material in-water into the proposed Howard Island Sump. Placement and dredging at the Howard Island sump would have the same effect as the action disclosed in the 2003 SEIS for Harrington Point sump and the Puget Island sump analyzed in the 2014 EA.



*Figure 8: Typical hopper dredge schematic*

Pipeline dredges are used for large cutline shoals and areas with continuous sand wave shoals. Pipeline dredging in the Columbia River is typically used to remove material from the navigation channel between river mile (RM) 21 to 106.5. Only those shoals that have formed in a reach are dredged, not the entire reach. A typical shoal would include an area that is 250 to 300 ft wide by 2,000 to 4,000 ft long, though shoals vary in length, width and depth depending on flow conditions. Although many reaches of the navigation channel are annually dredged by pipeline, other reaches may require dredging on a less frequent basis depending upon the hydrographic surveys and flow conditions.

As shown in Figure 9, a pipeline dredge uses a “cutterhead” on the end of an arm that is buried three to six ft deep in the river bottom and swings in a 250- to 300-ft arc in front of the dredge. Spuds extend from the back of the dredge to the river bottom to anchor the dredge in place while the cutterhead and suction arm are in operation. Dredged material is sucked up through the cutterhead and continues being pumped directly through the pipes to placement areas. In addition to in-water placement, pipeline dredges place material upland or along the shoreline. These placement methods are described in detail in Section 3.2. Dredging of material for the Rice Island shoreline placement and the construction and operation dredging of the Howard Island sump would be conducted by this type of dredge. Impacts from dredging channel shoaling have already been evaluated in the 1999 EIS, 2003 SEIS, and the 2014 EA, and are not further evaluated in this EA for the overall Network. Impacts from dredging at the Howard Island sump would have the same effect as the dredging action disclosed in the 2003 SEIS for Harrington Point Sump and the Puget Island sump analyzed in the 2014 EA.



**Figure 9: Typical pipeline dredge schematic**

There is potential for hazardous material spills to occur during any construction or operations and maintenance actions conducted for the CR O&M program. If a spill occurs, the Corps follows a Spill Response Plan (the Plan). The Plan provides a single consolidated document to meet multiple spill response planning requirements as identified under Occupational Safety and Health Administration’s Standard, RCRA’s Contingency Plan, Superfund Amendment and Reauthorization Act - Title III’s Emergency Planning and Community Right To Know Act, the Oil Pollution Act, the CWA, and the State, Area, Regional, and National Contingency Plans (NCP) for spill response. Implementation of the NCP requires a nationwide network of regional response plans. This Plan is a part of that nationwide network. Operations Project Managers, Dredge Incident Commanders, and emergency-system First Responders use this plan as their primary guidance for responding to oil and hazardous substance spill emergencies in the Portland District. The following Best Management Practices (BMPs) and Spill Control (Table 7) measures are currently in place for the CR O&M program and would be applicable for the Proposed Action.

**Table 7. Proposed Minimization Practices and BMPs for Dredging.**

Measure	Justification	Duration	Management Determination
<b>Hopper Dredging</b>			
Reverse purging of intake lines shall not be done with dragheads more than 3 ft off the bottom. If water is pumped through the dragheads to clean the hopper, the dragheads must be -20 ft below the surface while dredging at the Mouth of the Columbia River, and the Columbia River RM 3 to RM 106.5; and -9 ft for RM 106.5-145 and the shallow-draft side channels.	This restriction minimizes or eliminates entrainment of juvenile salmon during normal dredging operations.	Continuous during dredging operations.	Maintain until new information becomes available that would warrant change.
Dredging in shallow water areas (less than 20 ft) outside of the Columbia River mainstem should occur only during the recommended ESA in-water work periods for the Columbia	The top 20 ft of the water column is considered salmon migratory habitat. Dredging or disposal in these areas could	Continuous during dredging and disposal operations.	Maintain until new information becomes available that would warrant change.

*Columbia River Federal Navigation Channel Operations and Maintenance Dredging Placement  
Network Modifications: Rice Island and Howard Island– Final Environmental Assessment*

<b>Measure</b>	<b>Justification</b>	<b>Duration</b>	<b>Management Determination</b>
River.	adversely impact salmonids, delay migration or reduce or eliminate food sources.		
<b>Pipeline Dredging</b>			
Maintain dragheads and/or cutterheads such that they do not exceed an elevation of 3 ft off the river bottom for dredging at the Mouth of the Columbia River, and the Columbia River RM 3 to RM 106.5; -9 ft for RM 106.5-145; and -9 ft for the shallow-draft side channels.	This restriction minimizes or eliminates entrainment of juvenile salmon during normal dredging operations.	Continuous during dredging operations.	Maintain until new information becomes available that would warrant change.
Typically, dredging in shallow water areas (less than 20 ft) only occurs during the recommended ESA in-water work periods for the Columbia River.	The top 20 ft is considered salmon migratory habitat. Dredging or placement in these areas could adversely impact salmonids, delay migration or reduce or eliminate food sources.	Continuous during dredging and placement operations.	Maintain until new information becomes available that would warrant change.
<b>General Provisions for All Dredging</b>			
The contractor shall not release any trash, garbage, oil, grease, chemicals, or other contaminants into the waterway.	The provision is enacted for the protection of water resources.	Life of contract or action.	If material is released, it shall be immediately removed and the area restored to a condition approximating the adjacent undisturbed area. Contaminated ground shall be excavated and removed and the area restored as directed. Any in-water release shall be immediately reported to the nearest U.S. Coast Guard Unit for appropriate response.
The contractor, where possible, will use, or propose for use, materials that may be considered environmentally friendly in that waste from such materials is not regulated as a hazardous waste or is not considered harmful to the environment. If hazardous wastes are generated, disposal shall be done in accordance with 40 CFR parts 260-272 and 49 CFR parts 100-177.	The provision describes the accepted disposal of hazardous wastes.	Life of contract or action.	If material is released, it shall be immediately removed and the area restored to a condition approximating the adjacent undisturbed area. Contaminated ground shall be excavated and removed and the area restored as directed. Any in-water release shall be immediately reported to the nearest U.S. Coast Guard Unit for appropriate response.

Shoreline placement requires staging shore equipment, vehicles and pipes above the scarp of the existing dredged material placement footprint prior to actual sediment placement (Figure 10). These staging areas are typically 50 ft by 90 ft (~0.10 acre) and are located as close to the shoreline as

safely feasible. During placement inspections, the exact location of the 0.10-acre staging area can be located to avoid or minimize impacts. As described in detail in Section 3.2.1.2, shoreline placement discharges dredged material at the sand/water interface (Figures 11 and 12). Shoreline placement at Rice Island would have the same effect as the shoreline action disclosed in the 2003 SEIS at other placement sites within the Network.



**Figure 10.** Staging equipment on top of the bank at Sand Island beach nourishment site.



**Figure 11:** Active shoreline placement at Sand Island (looking upstream)



**Figure 12: Active shoreline placement at Sand Island (looking downstream)**

Upland placement involves terrestrial site preparation, which may include the construction of landing ramps, shoreline grading, physical demarcation of the footprint (flagging, berm building, etc.), and vegetation removal that is necessary to facilitate dredged material placement. Where site preparations are deemed necessary, earth-moving equipment (bulldozers, tractors, etc.) is used to construct berms and dikes around the perimeter of upland dredged material placement areas to contain the slurry mixture as it is discharged from the outfall pipe (Figure 13). In addition, the site is graded to maximize the capacity of the dredged material placement footprint and provide space for the settling ponds.



**Figure 13: Site preparations and dike building for placement of dredged materials (at Northport).**

If there is not sufficient water depth for the equipment barge to land at an existing shoreline, a landing ramp and access road is constructed from material on the placement site to gain access to the island (Figure 14). Some shoreline grading at the landing location may also be necessary to facilitate equipment access to other portions of the island. Typical site preparations at upland sites include grading a slope for the incoming dredged material pipe (Figure 15).



*Figure 14. Typical build out of a barge landing (Rice Island).*



*Figure 15. Grading slope for incoming dredged material pipe.*

Site preparations may take anywhere from several days to several weeks to complete, depending on the existing condition of the site. If a site has little-to-no vegetation, was used recently where some

berms or dikes remain in place, the necessary site preparations would be minimal and could be completed within 1-3 days. Conversely, if a site has substantial vegetation and/or has not been used recently, preparations could take several weeks to clear vegetation, construct dikes and re-grade the area for dredged material placement.

Prior to placement of sediments, additional site preparations at all sites would include the staging, stockpiling and placement of pipes and valves for sediment discharge. When pipes and other material are not stockpiled on the landing barge, they are stockpiled in the staging area within or near the placement footprint. Unless there are permanent weirs (i.e. Gateway and West Hayden Island) and outfall pipes on site, temporary weirs and outfall pipes are re-used as the dredge moves from site to site (Figures 16 and 17). At upland sites requiring the installation of temporary weirs and outfall pipes, these actions would occur immediately prior to placement and disassembly would occur immediately after placement.



*Figure 16. Weir and berm structure, in operation (Rice Island upland placement site).*



*Figure 17. Outfall pipes discharging water back to river after dredged material has settled out (Rice Island upland placement site).*

Figure 18 shows the overall upland placement action as described in detail in Section 3.2.1.2. Impacts from upland placement at Howard Island (in this case, upland placement of material dredged from the Howard Island sump) have already been evaluated in the 1999 EIS and 2003 SEIS and are not further evaluated in this EA.



**Figure 18: Active dredged material placement at Martin Bar Upland Site**

Dissuasion actions implemented pre-breeding-season (February-March) during site preparations are intended to minimize site use by streaked horned larks and other migratory birds where active dredged material placement would occur during the breeding season. These dissuasion practices are intended to discourage nesting, roosting, and/or foraging behaviors, with the ultimate intent to avoid, minimize, and reduce impacts to adults, juveniles, and/or nestlings during the breeding season. No active dissuasion of streaked horned lark or migratory birds (other than piscivorous birds as described below) would occur during the breeding season (15 April through 15 August).

As a requirement of the NMFS 2012 BiOp, Terms and Conditions 1(k), if avian predators (piscivorous birds) are identified in the action area, hazing actions would be implemented to intentionally flush birds and discourage nesting on upland placement sites. If nesting activity is observed on placement sites, the Corps would actively discourage these behaviors, including egg collection (as authorized by USFWS take permit). Alternates to intentional hazing and dissuasion actions include the use of physical barriers (nets and fencing, flagging, etc.) and habitat modifications (vegetation removal, trenching, mounding, etc.) would be implemented to minimize the extent and suitability of habitat available for foraging and nesting. These activities would include human presence and may involve the use of vehicles.

Currently, dissuasion of piscivorous birds only occurs on portions of Rice, Miller Sands and Pillar Rock islands, which are potential habitat for Caspian terns. In these areas, vegetation is manipulated (planted), silt fences are constructed to reduce preferred tern habitat and terns are hazed from the island to prevent occupation and nesting (Stinson 2005). These actions accelerate the development of dense vegetation, reducing the availability of bare ground and precluding the use of these areas as nesting and foraging habitat for terns or streaked horned lark. Similarly, hazing actions directed at

terns can have adverse effects to larks, when active dissuasion occurs in suitable streaked horned lark nesting habitat. Currently, the Corps does not dissuade terns from suitable streaked horned lark nesting habitat on Rice Island, Miller Island, and Pillar Rock Islands.

## **6. ENVIRONMENTAL IMPACTS**

### **6.1. Biological Impacts**

#### No Action Alternative

The No Action alternative includes the continued O&M dredging of the CR FNC with the existing placement Network. Shoreline placement at Rice Island and the Howard Island sump would not be available.

Shoreline erosion at the upstream end of Rice Island would continue. Without shoreline placement to restore and protect the upland area, river currents would quickly begin to cut away the island, which is an important nesting ground for streaked horned larks. Overtime, the loss of intertidal shallow water and shoreline at Rice Island would reduce the amount of terrestrial and shallow water aquatic habitats in the lower Columbia River estuary. The conversion of this placement area to deeper water would increase deepwater habitat in the Columbia River estuary. These refuge islands and marshes are heavily used during waterfowl migration. Additionally, Rice Island was created by dredged material to function as a channel training structure that helps stabilize the navigation channel in this reach. Without the addition of shoreline placement at Rice Island, dredging needs and resulting effects to species would be expected to increase.

Without the proposed sump off Howard Island, the CR O&M program would need to explore alternative, less efficient placement methods in order to use the Howard Island upland placement site (if feasible) or be forced to differ from the balanced approach to placement activities and place dredged material in-water. Too much in-water placement keeps too much sediment in the river system, where it is the most likely to contribute to future shoaling and increased dredging needs and resulting effects to species. Additionally, without upland placement at Howard Island, there would not be an opportunity for streaked horned lark habitat to develop as planned.

#### Preferred Alternative-Proposed Action

The Proposed Action includes the continued O&M dredging of the CR FNC with the addition of shoreline placement at Rice Island and dredging at a sump within the flowlane off Howard Island. Placement of dredged material on the eastern shoreline of Rice Island would protect high-quality streaked horned lark habitat that has formed over time on the upland portion of the island. The placed material may develop into useful forage areas for streaked horned larks. Rice Island is home to approximately 50% of the lower CR estuary streaked horned lark population. Therefore, any action that would encourage the establishment of additional habitat and forage areas for this threatened species would likely contribute to rebuilding efforts. Additionally, the new shoreline edge and its associated shallow water habitat would be available for use by aquatic species after placement and the action would restore shallow water habitat on the eastern end of the island to its prior location in the river. Rice Island would continue to function as a training structure to stabilize the navigation channel in this reach and minimize dredging needs and resulting effects to species.

Dredging and placement of dredged material in the Howard Island sump may temporarily disrupt the deepwater aquatic habitat during and immediately after work. There would be a temporary loss of

benthic habitat but it is expected that the benthic community would re-establish itself after dredging and placement activities. No significant direct or indirect impacts on the biological environment are expected. There would be no permanent removal of aquatic habitat at or adjacent to the project area. No indirect impacts are expected to the deepwater migratory corridor. Use of the sump supports the Corps' balanced placement approach, which would minimize future dredging needs and resulting effects to species. Additionally, the sump would allow upland placement onto Howard Island, which would support the development of streaked horned lark habitat.

## **6.2. Vegetation Impacts**

### No Action Alternative

The No Action alternative includes continued O&M dredging of the CR FNC without shoreline placement on Rice Island or an in-water rehandling area off Howard Island. There would be no changes to the dredge material placement network under the No Action alternative.

If no shoreline placement occurs on the east end of Rice Island, the shoreline would continue to erode. As erosion progresses, upland or riparian vegetation would be washed away, and critical habitat for streaked horned larks may eventually be compromised. No impacts on vegetation would occur if a sump off Howard Island is not dredged and used as a dredge material rehandling site.

### Preferred Alternative-Proposed Action

The Proposed Action includes continued O&M dredging of the CR FNC with the addition of a sump off Howard Island and shoreline placement at the eastern shoreline of Rice Island. Shoreline placement on Rice Island would not affect any vegetative communities. Shoreline placement would require placement of sediments at the shore-water interface where vegetation does not exist. The placement action would occur on an eroding sandy shoreline. It is unlikely that vegetation would become established along this shoreline due to tidal and wave erosion. As the shoreline is rebuilt to the baseline footprint, vegetation has the potential to become re-established in uplands after several years. The restoration of the island's footprint would allow future upland placement on the site.

There is no aquatic vegetation present at the Howard Island sump site. Therefore dredging and placement of dredged material in the sump would have no significant direct or indirect effects to vegetative communities.

## **6.3. Wildlife Impacts**

### No Action Alternative

The No Action alternative includes continued O&M dredging of the CR FNC without Rice Island shoreline placement or a sump located in the flowlane off Howard Island. There would be no changes in impacts to aquatic species. Impacts to terrestrial species under the No Action alternative remain within the range of effects considered in the 2003 SEIS and the 2014 EA. The No Action alternative would result in continued erosion of the eastern end of Rice Island and subsequent loss of shallow water habitat in that area; however, direct and indirect impacts on non-ESA-listed wildlife would not be significant.

### Preferred Alternative- Proposed Action

The Proposed Action includes continued O&M dredging of the CR FNC with shoreline placement at Rice Island and a sump off Howard Island. The Proposed action would restore the eastern shoreline

footprint of Rice Island, which will increase the area of potential shoreline and shallow water wildlife habitat. The restoration of the eastern shoreline of Rice Island could, over time, also develop into suitable foraging areas for threatened streaked horned larks. Because the shoreline will continue to be eroded away, even after periodic shoreline placements, it is unlikely that the eastern shore of Rice Island would become suitable nesting habitat for streaked horned larks; however, the possible creation of forage areas on that part of the island would benefit the individuals and/or pairs that nest on the upland portion of the island.

Dredging the Howard Island sump would not permanently alter which wildlife species may utilize the Howard Island reach because it would maintain its deepwater habitat characteristics. Temporary disturbances to wildlife during use of the sump are expected to dissipate quickly once work is completed. Those temporary disturbances may take the form of noise generated by dredge equipment and increased turbidity in the immediate work area while dredging and sediment pumping onto the Howard Island upland site takes place.

#### **6.4. Endangered Species Impacts**

##### *No Action Alternative Impacts on NMFS ESA-Listed Species*

The No Action alternative would result in continued erosion and recession of shallow water habitat along the eastern Rice Island shoreline. Additionally, under the No Action alternative, the Howard Island sump would not be dredged and the sump would not be used to temporarily hold dredge material until equipment is available to pump it onto the Howard Island upland site. With no way to store dredged material near Howard Island for later upland placement, the Corps would be forced to place the material in other areas that may be more difficult to access with appropriate equipment when necessary. No significant direct or indirect effects on NMFS ESA-listed species, which have not already been discussed in the 2012 BiOp, are expected within the project area. The No Action alternative would not differ in effects already disclosed in the 2012 BiOp for NMFS ESA-listed species.

The impacts to NMFS ESA-listed species under the No Action alternative were calculated by assessing the magnitude, timing, duration and severity of effects during shoreline placement and dredging activities. The effects on NMFS ESA-listed species did not reach the level of jeopardy. NMFS issued terms and conditions to be followed when conducting the CR FNC O&M program. The Corps will follow these terms and conditions.

##### *No Action Alternative Impacts on USFWS ESA-Listed Species*

The No Action alternative would continue status quo dredging and placement activities in the CR FNC which would continue to affect ESA-listed species within the jurisdiction of the USFWS. Effects of dredging and placement activities on listed species were addressed in the USFWS 2010 Letter of Concurrence and in the 2014 Biological Opinion.

The No Action alternative would result in the continued loss of shoreline habitat at Rice Island. Rice Island is designated critical habitat for threatened streaked horned larks. Shoreline placement at Rice Island is part of a five year placement plan where dredged material will be strategically placed on various islands in the lower Columbia River estuary to encourage the development of streaked horned lark habitat. Rice Island is used by streaked horned larks for foraging, breeding, and rearing young in sparsely vegetated uplands. The island may be used as over-wintering and nesting habitat by streaked horned larks. Without shoreline placement on the eastern tip of Rice Island, no new streaked horned lark habitat or forage areas would develop, the status quo habitat situation for larks

would continue to exist, and shoreline erosion would persist. Potential adverse and beneficial effects to streaked horned larks from shoreline placement within the existing Network are addressed in the 2014 ESA consultation with the USFWS. Effects on streaked horned larks under the No Action alternative are considered neither adverse nor beneficial.

No additional direct or indirect effects on USFWS ESA-listed species, including bull trout, would be expected by not utilizing the Howard Island sump.

*Preferred Alternative- Proposed Action Impacts on NMFS ESA-Listed Species*

The duration of effects may range from a few hours during dredging and placement, to a few years on shoreline placement sites. The level of disturbance would continue at its current rate. Dredging at the sump site and shoreline placement of dredged materials may have adverse and beneficial effects to NMFS ESA-listed species and their habitats. The NMFS 2012 BiOp on the CR FNC O&M dredging program effects to NMFS ESA-listed provides detailed effects analysis of the dredging and placement action and is hereby incorporated by reference. The NMFS 2012 BiOp concluded that the CR FNC O&M program is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of their designated critical habitats. Placement at the Rice Island shoreline site would indirectly protect shallow water habitat.

Defined EFH within the project area consists of habitat for the 13 ESA- listed salmon species, Pacific Coast groundfish, and coastal pelagic species. The primary adverse effect of dredging and placement operations under the proposed action is the potential for entrainment of juvenile salmon or their prey. Additionally, there may be some temporarily increased turbidity in the water column caused by the proposed activities.

The proposed action would restore the shoreline footprint of Rice Island through shoreline placement, which would shift shallow water habitat east to its previous extent. The minor direct and indirect effects from shoreline placement at Rice Island are within the range of effects considered in the NMFS 2012 Biological Opinion. The Corps consulted with NMFS and on July 16, 2015 NMFS determined that the proposed action does not alter the effects conclusions outlined in the 2012 Biological Opinion for the CR FNC O&M Program.

Dredging at the Howard Island sump would not permanently affect ESA-listed species or their habitat because the site would maintain its deepwater habitat characteristics. Temporary effects to listed species during placement and removal of dredged materials of the sump are expected to dissipate quickly once work is completed. Like shoreline placement at Rice Island, the direct and indirect effects on ESA-listed species are also within the range of effects considered in the NMFS 2012 Biological Opinion. NMFS concurred with this determination on July 16, 2015.

*Preferred Alternative - Proposed Action Impacts on USFWS ESA-Listed Species*

The proposed action alternative would restore the eastern shoreline footprint of Rice Island through shoreline placement, which could increase the available forage area for streaked horned larks over time. Shoreline placement would shift shallow water habitat east to its previous extent. The effects of shoreline placement to aquatic species listed by the USFWS, including bull trout, were addressed in the 2010 Letter of Concurrence.

The effects of shoreline placement including construction activities at Rice Island on streaked horned larks are addressed in the 2014 ESA consultation with USFWS, which is hereby incorporated by reference. The Corps' 2014 BA on the CR FNC O&M dredging program effects on streaked horned

larks provides a detailed effects analysis of the 2014-2018 dredging years. The subsequent USFWS Biological Opinion states that shoreline placement is unlikely to have any effect on the primary constituent elements (PCEs) needed to designate critical habitat for the species. This conclusion is based on the assumption that placement will occur on beaches, where larks may forage, but where there is likely too much bare ground and insufficient vegetation to provide the PCEs. The USFWS Biological Opinion provides terms and conditions that will include RPMs to avoid and minimize take of streaked horned larks. The terms and conditions and reasonable and prudent measures are included in the USFW Biological Opinion and are hereby incorporated by reference. In summary, the terms and conditions are actions the Corps must take to minimize impacts of incidental take of streaked horned larks such as monitoring placement projects and reducing the likelihood that placement sites will act as habitat sinks for breeding.

The anticipated direct and indirect effects on USFWS species, excluding streaked horned larks, that may result from dredging at the Howard Island sump were previously addressed in the 2010 informal ESA consultation with the USFWS. The Howard Island sump is not likely to adversely affect USFWS species or designated critical habitat. Dredging at the sump would not permanently affect ESA-listed species or their habitat because it would maintain its deepwater habitat characteristics. Temporary effects to listed species during use of the sump are expected to dissipate quickly once work is completed. The direct and indirect effects from use of in-water placement on streaked horned larks are addressed in the aforementioned 2014 ESA consultation with USFWS. The Corps' 2014 BA states, in-water work is expected to have no effects on streaked horned larks or their critical habitat. Dredging activities at the sump would have no effect on terrestrial species and therefore, were not evaluated in the BA analysis.

## **6.5. Invasive Species Impacts**

### No Action Alternative

There are no direct or indirect impacts expected under the No Action alternative. The Corps implements strategies that minimize the likelihood of invasive species movement from project to project. Under the status quo CR O&M activities, those strategies would continue to be implemented.

### Preferred Alternative - Proposed Action

Shoreline and aquatic storage of dredged materials may provide avenues for invasive aquatic species to be re-distributed in the lower Columbia River. The rate or intensity of invasive dispersal is not expected to increase from the re-distribution of dredged material from the CR FNC to the existing Network or aquatic rehandling sites. The in-water temporary storage of materials dredged from the CR deep-draft channel is not expected to create a net increase or decrease in invasive species. Based on Corps' sediment sampling, organic materials typically account for less than one percent of the dredged sediments from the CR FNC deep-draft channel between RM +3.0 to 106.5. Removed vegetation is typically buried on site in berms or under dredged materials. No direct or indirect impacts as a result of the proposed action would be expected.

## **6.6. Air Quality Impacts**

### No Action Alternative

The No Action alternative would not change the project ability to meet air quality standards. If the No Action alternative were implemented, status quo air quality impacts due to current CR O&M

dredging and placement activities would not change. There would be no additional release or reduction of chemical constituents that contribute to air pollution under the No Action alternative.

*Preferred Alternative - Proposed Action*

The Proposed Action would not change the project's ability to meet air quality standards. There would be a temporary and localized reduction in air quality during placement due to emissions from the dredge during dredging and aquatic placement of dredged materials, and from any earth-moving equipment used at upland/shoreline/beach nourishment sites. There also would be temporary and localized increases in noise levels from this equipment. These impacts would be minor and temporary in nature, and would cease once dredging and placement is completed.

## **6.7. Climate Change Impacts**

*No Action Alternative*

The No Action alternative would not change direct or indirect effects on climate change caused by status quo dredging and placement activities. The Corps implements strategies that minimize the project actions that could contribute to climate change. These strategies would continue to be implemented under the No Action alternative.

*Preferred Alternative - Proposed Action*

The effects of climate change as they relate to the proposed action could lead to a change in the timing of shoal formation from current changes due to precipitation, the extent of snowpack, and rain-on-snow events. Changes in weather patterns could influence seasonal river flows, subsequently affecting the presence of size of shoaling in the lower Columbia River, thereby influencing the timing of dredging and placement of materials. The Corps assumes that any effects climate change might have across the project area during this timeframe would be negligible and effects on any aquatic or terrestrial habitat would be immeasurable. The proposed action would not result in significant direct or indirect effects on climate change. The Corps would continue to implement strategies that minimize the project's contribution to climate change.

## **6.8. Geologic Impacts**

*No Action Alternative*

The No Action alternative would continue O&M dredging of the CR FNC in the absence of shoreline placement at Rice Island and a sump off Howard Island. Continued maintenance dredging would remove shoals that impair navigation within the channel and place those sediments in Network or ocean placement sites. The eastern shoreline of Rice Island would continue to be eroded by river currents, which would eventually begin cutting away at the upland area of the island.

Under the No Action alternative the Howard Island sump would not be dredged or used for temporary storage of dredged material prior to placement onto the Howard Island upland site. Therefore, Howard Island may not be used as effectively as it could be as a material placement site. Without periodic upland placement Howard Island may become more flat as weather and wind disperse previously placed sediment throughout the system. The Corps would need to find alternate locations to place dredged material from that stretch of the Columbia River, which could alter the geology of other islands in the area. No significant adverse or beneficial direct or indirect impacts would be expected under the No Action alternative.

*Preferred Alternative - Proposed Action*

The Proposed Action would continue O&M dredging of the CR FNC to maintain a safely navigable deep-draft channel with the addition of shoreline placement at Rice Island and dredging and dredged material temporary storage off Howard Island. Current driven geological effects to the system would continue as described under the No Action alternative.

The Proposed Action would restore the eastern shoreline of Rice Island to its former footprint via shoreline placement of approximately 375,000 CY of dredged material covering approximately 3-4 acres. Columbia River sands from adjacent shoals would be placed to restore the island's footprint. The restoration of the shoreline would maintain the shallow water habitat on the east side of the island.

A sump is now required at Howard Island upland placement site because shoaling is consistently forming beyond the reach of the pipeline dredge to pump material directly from the shoals to the upland site. Temporary storage of dredged material at the sump also provides flexibility for dredges to be redirected to unexpected, urgent shoaling needs elsewhere in the Columbia River system. For the reasons listed above, the addition of a 30-40 acre sump between rm 68 and rm 69 to the network for this reach of the river would improve efficiency of placing material upland and overall channel maintenance.

The proposed action at the Howard Island sump would result in temporary excavation of the riverbed to create the sump, followed by the temporary placement and subsequent removal of dredged materials within the sump to the Howard Island upland placement site. These actions would not permanently change the deep-water or physical sediment characteristics of the riverbed. The proposed action alternative at the Rice Island would result in an overall increase in shoreline along this reach and the lower estuary. The anticipated geological direct and indirect effects under the no action and the proposed action alternatives are not expected to be significant.

## **6.9. Water Quality**

*No Action Alternative*

Under the No Action alternative there would be no modification to the placement network. Shoreline placement of dredged material on the Rice Island would not occur. The Howard Island sump would not be dredged or used for temporary storage of dredged material. There would be no direct impacts to water quality for the No Action alternative. Loss of Rice Island upland area and the ability to rehandle material upland at Howard Island reduces capacity at these sites, requiring more placement of dredged material in-water than is currently planned as part of the Corps' balanced approach. In-water placement could, in-turn, result in temporary decreases in water quality as the result of more instances of increased turbidity.

*Preferred Alternative - Proposed Action*

Placement of dredged material on the Rice Island would cause temporary water quality impacts where the material is discharged onto the beach. This discharge would increase turbidity at the water/shore interface zone as sediment is placed both directly into the shore and/or subsequently moved by earth-moving equipment into the water to create the shoreline profile. The turbidity plume is not expected to extend outside of the immediate placement area because the material is sand with minimal fines, which settles to the bottom very quickly. It is expected that the shoreline would be subsequently eroded by the hydraulic processes along this reach. All construction equipment would follow a spill management plan. The use of construction equipment and materials is not likely to adversely impact water quality. Shoreline placement has previously been evaluated in prior WQCs

from the states of Washington and Oregon. Current WQCs have been updated to include the Rice Island shoreline placement activity and the Howard Island sump.

There may be a temporary and localized reduction in water quality during dredging operations at the Howard Island sump. These impacts would be minor and temporary in nature, and would cease once dredging/placement is completed. Although there is some evidence that disposal of fine sediments can create a situation that decreases dissolved oxygen in the water column, that situation does not occur in the mainstem Columbia River. The sediment dredged is primarily sand (<2% fines) and therefore, it is unlikely that dissolved oxygen would be impacted by dredging and placement of this sandy material in the proposed sump. It is also true that toxins found in the sediment adhere to fine-grained material, not sand (EPA 1991). Because toxins have not been detected during sediment testing under the Sediment Evaluation Framework, there is no expectation of water quality being impacted by re-suspension of toxins during placement.

Any construction and the use of equipment during dredging and placement on Rice Island and at the Howard Island sump would not measurably affect water quality beyond levels disclosed in the current WQCs. No significant direct or indirect impacts are anticipated as a result of implementation of the proposed action.

## **6.10. Hydrology**

### No Action Alternative

Under the No Action alternative, no direct or indirect impacts on the hydrologic regime are expected. Shoreline placement at Rice Island would not take place and the eastern shoreline would continue to erode. The Howard Island sump would not be dredged and shoaling would continue form beyond the reach of the pipeline dredge. Therefore, material in that area would not be able to be stored temporarily, and material could not be pumped directly from shoaling areas onto the Howard Island upland placement site.

### Preferred Alternative - Proposed Action

No direct or indirect impacts on hydrology in the project area are expected from the proposed action. Shoreline placement at Rice Island and dredging the Howard Island sump would not significantly alter the hydrologic environment. Shoreline placement at Rice Island would restore the eastern shoreline to its former footprint, and the sump would be dredged to a level that would not modify water flow in that reach of the river.

## **6.11. Wetlands**

### No Action Alternative

The No Action alternative would not place dredged materials on Rice Island. The Howard Island sump would not be used for re-handling dredged material and no effects on wetlands would occur. Under the No Action alternative, the Corps would continue to delineate wetlands on upland placement sites prior to placement for the first 20 years of the CR O&M program since deepening was completed in 2010. The Corps would follow all applicable laws, regulations, manuals, and regional supplements for delineating wetlands as sites are planned for placement. The Corps would determine the need to fill any wetlands delineated in the future. If additional wetlands would need to be filled, the Corps would update the wetland impact balance.

*Preferred Alternative - Proposed Action*

Previous placement of dredged material at Rice Island permanently filled the 0.06-acre wetland that existed. No other wetlands exist on the island. Therefore, adding dredged material (375,000 cy) over 3-4 acres of the eastern shoreline of the island would not impact wetlands on the island. The Howard Island sump is situated below the water line within the flowlane, but outside of the channel. The sump would have no direct or indirect effect on wetlands within the project area.

## **6.12. Archeological and Historic Resources Impacts**

*No Action Alternative*

There would be no changes to Columbia River cultural resources as a result of the No Action alternative. Not using Rice Island for shoreline placement or a sump off Howard Island for temporary storage of dredged material would have no direct or indirect impacts on historic or archeological resources. The geology of the project area would continue to change with the erosion of Rice Island and shoaling near Howard Island; however, these natural events in the river environment would not result in adverse effects on cultural resources.

*Preferred Alternative - Proposed Action*

Rice Island is a man-made dredge material island. No human habitation or other use of the island with the exception of dredge disposal has occurred. Therefore, using the eastern shoreline for material placement does not have the potential to cause direct or indirect effect on cultural resources.

Multi-beam bathymetry data taken in July 2014, and reviewed by Corps cultural resources staff, revealed no anomalies on the river bottom at the proposed sump location. There is no potential for historic properties, particularly shipwrecks or related material, eligible for listing to the NRHP to exist. Due to these conditions, this action has no potential to effect cultural resources.

## **6.13. Socioeconomic Impacts**

*No Action Alternative*

There would be no change to socioeconomic environment as a result of the No Action alternative. Not using Rice Island for shoreline placement or a sump off Howard Island for temporary storage of dredged material would have no direct or indirect impacts on social or economic resources. The geology of the project area would continue to change with the erosion of Rice Island and shoaling near Howard Island; however, these natural events in the river environment would not result in significant adverse effects on the socioeconomic environment.

*Preferred Alternative – Proposed Action*

The project area is used by recreational anglers, mostly in a day-use capacity. During placement on Rice Island, fishing near the island may be difficult resulting in a minor adverse social impact. The same is true in the area of the Howard Island sump. During work, fishing and in or around the project area may not be possible. However, these non-significant disruptions to recreational fishing would be temporary. Fishing and other recreational activities would be able to resume after the work is completed. No other economic or social impacts are anticipated as a result if implementation of the proposed action.

## **6.14. Visual Impacts**

### No Action Alternative

Under the No Action alternative, no significant direct or indirect impacts on the visual landscape would be anticipated. The eastern shoreline of Rice Island would continue to erode, decreasing the visible portion of the eastern shoreline. Because the Howard Island sump would be located well below the water line no visual change to that portion of the project area would be detected under either the No Action or the proposed action alternatives. There are no additional unique visual resources that would be impacted by the No Action alternative.

### Preferred Alternative - Proposed Action

Minor visual changes to the overall landscape would result from shoreline placement activity on Rice Island. The shoreline is likely to appear larger in size and the functional shoreline boundary would shift slightly eastward. Additionally, the use of equipment during dredging and placement activities is a sporadic and temporary visual disturbance on the landscape. Dredges and associated equipment move within the Network and rarely remain in one location more than two to three weeks. The use of this equipment is considered a temporary detractor from the viewshed, but does not permanently affect the aesthetic properties of the project area.

The two locations of the proposed action are away from highly trafficked corridors and large population centers and are not within areas of high scenic value or visible from scenic highways. The Howard Island sump is located within an active ship anchorage area. The two actions analyzed here constitute minor updates to the Network, and would not add or detract from the overall visual landscape created by ongoing CR O&M activities. Shoreline placement of material on Rice Island is not expected to change the visual landscape of the island. With exception of temporary visual disturbance during the use of the sump, there would be no prolonged impact on the Howard Island sump viewshed.

## **6.15. Impacts of Hazardous Materials**

### No Action Alternative

There are no hazardous waste sites within the project area. There would be no new direct or indirect impacts to the human or wildlife habitat from hazardous materials under the No Action alternative.

### Preferred Alternative - Proposed Action

There are no hazardous waste sites within the proposed action project area. No new direct or indirect impacts on humans or wildlife habitat from hazardous materials are anticipated as a result of implementing the proposed action.

## **6.16. Impacts of Construction and Dissuasion**

### No Action Alternative

Under the No Action alternative, there would be no construction taking place beyond the status-quo maintenance dredging along the CR FNC within and around the project area. Therefore, no additional direct or indirect impacts of construction activities or associated dissuasion are expected under the No Action.

*Preferred Alternative - Proposed Action*

As described in Section 5.4.4, shoreline dredged material placement activities generally include access and equipment staging and set-up in a small area above the scarp just prior to placement using earth-moving equipment. The staging area location is selected to avoid nesting streaked horned larks, if any are identified. Temporary berm construction and discharge of the dredged material sand-water slurry is limited to the shore-water interface. Based on the results of sediment quality testing, no effects to streaked horned lark or their habitat are expected as a result of the quality of the dredged sediments placed on the shoreline site. Following placement of dredged materials, all equipment is removed from the site.

Dissuasion of avian predators (piscivorous birds) is not expected to result in direct mortality of adult streaked horned larks; rather, dissuasion and hazing activities could directly affect or alter adult behavior. Direct effects include flushing of adults, flushing adults from nests, increased exposure of eggs/young to environmental conditions, increased risk of nest predation, accident injury to eggs/young, nest abandonment, and nest failure from activity in nesting habitats. In addition, any habitat modifications (grading, trenching, mounding) that is prescribed for Rice Island would be implemented immediately following placement of materials. The Corps anticipates direct and indirect effects on streaked horned larks resulting from habitat modification actions would be negligible, as no birds are expected to be present in the placement footprint at the conclusion of a placement event.

Individuals in areas adjacent to the placement footprint (but outside of the placement boundary) are expected to experience effects including flushing adults and/or young, increased exposure of individuals to weather and predation, and/or nest abandonment. In addition, juveniles and young-of-the-year birds that move into the dredged material placement footprint are expected to have sufficient flight capabilities to flush from the area upon initiation of active material placement or other disturbances. Prior to placement activities, including staging for placement, the Corps surveys the area for presence of protected species to ensure ESA-listed species are not in the project area before work begins.

Dredging of the sump off Howard Island would also involve the movement of material out of and into the placement area using dredge equipment. To utilize the sump, all work would be in-water and no upland areas would be affected by the action. Some direct and indirect disturbance in the form of presence of equipment, noise, and sediment mobilization are likely during the construction and use phases for the sump. However, creation of the sump and subsequent use during the dredging season will result in short duration disturbances and are not likely to result in significant direct or indirect impacts on the environment.

## **6.17. Cumulative Impacts**

Cumulative effects are defined as, “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.” (40 CFR 1508.7). Cumulative impacts can result from individually minor, but can collectively become a measureable impact actions taking place over a period of time. Resources determined not to have the potential to result in measurable cumulative effects were not addressed in this analysis. These resources include: geology, coastal processes, hydrology, sediment quality, cultural / historic and recreation.

### **6.17.1. Cumulative Impacts Analysis Temporal and Spatial Scope**

The temporal scope for this Cumulative Impacts Analysis (CIA) spans from the most recent major action in 2003 for the Columbia River Navigation Improvement Project Oregon and Washington (Final Supplemental Environmental Impact Statement) through the next ten years (2025). The spatial scope for this CIA includes the area directly and indirectly impacted by the CR O&M program activities, and includes the many tributaries, streams, and side channels influenced by this stretch of the Columbia River (RM +3.0 to RM 106.5 of the Columbia River).

### **6.17.2. Past Actions**

The past actions considered are those that continue to have present effects on affected resources. Past actions are summarized below. Together these actions create the conditions currently present within the action area.

- Construction, maintenance and periodic reconstruction of the jetties at the MCR by the Corps.
- Construction, maintenance and periodic reconstruction of pile dikes, levees, and bridges in, over, or adjacent to the Columbia River.
- Continued use, maintenance, and operation of multi-purpose dams in the Columbia River and Willamette River basins.
- Navigation facilities (including both commercial and recreational docks and marinas) constructed and maintained by various ports along the Columbia River.
- Corps' annual maintenance dredging and placement activities.
- Recreational facilities established by federal, state, and local agencies.
- Federal permits for aquatic and wetland impacts within the lower Columbia River, lower Willamette Rivers, and tributaries.
- Commercial and residential development that has occurred in the area.

### **6.17.3. Present Actions**

Present actions include those projects that are currently being scoped, developed, planned, and implemented within the next year.

- Pile dike repairs along the Columbia River basin.
- Ongoing operations and maintenance of dam/hydropower facilities.
- Management of a piscivorous bird colony on East Sand Island.
- Ongoing placement actions to rebuild the lower Columbia River estuary streaked horned lark population.

### **6.17.4. Future Actions**

The following actions were identified as being reasonably foreseeable to occur over the next ten years:

Corps actions:

- Maintenance of Columbia River pile dike system, specifically pile dike systems upstream of Rice Island (that will also help protect Rice Island eastern tip from erosion) and across channel along Howard Island.

Port actions:

- Port of Kalama
  - Construction of new (?) industrial manufacturing facility and dock
  - Maintenance dredging sampling and analysis plan
  - Overwater maintenance activities
  - Construction(?) of long-term additional dock or berth
- Port of Longview:
  - Berth 4 redevelopment
  - Wetland and log pond fill
  - Deepening of Berth 6 and 7
  - Berth 1 and 2 repair
  - Wetland fill and construction at Barlow Point
- Port of Portland
  - WHI and TRIP Phase 1 wetland mitigation modification
  - HIO wetland delineation and permit
  - Wetland fill on NE 33<sup>rd</sup> development
  - Wetland fill for PDX runway 3/21 project
  - Terminal wide maintenance
  - Terminal wide sediment sampling
  - PDX fire boat dredging and sediment characterization
  - Fender piling replacement
  - T6 (Terminal) maintenance dredging
- Port of Vancouver
  - Fender piling maintenance
  - Maintenance dredging
  - T4 bank stabilization
  - T5 Potash facility modifications
  - T5 West
- Other Corps permit actions
  - City of Warrenton Hammond Boat Basin dredging
  - City of Portland Parks and Recreation in-water placement of dredged materials
  - Port of St Helens in-water placement of dredged materials
  - Oregon LNG terminal (FERC) at the mouth of Skipanon Channel
  - Karlson Island Restoration Project
  - Reconstruction/Upgrade of Westport Ferry Terminal

### **6.17.5. Anticipated Combined Effects of Past, Present, and Future Actions**

#### Water Quality

The identified past, present, and future reasonably foreseeable actions, when combined with the effects of the No Action or the proposed action, could incrementally increase water turbidity and suspended sediments during dredging and placement activities within Columbia River and at placement sites. New development projects would also result in long-term increases in impervious

surfaces and associated runoff into the watershed. However, the identified present and future actions are required to adhere to local, state, and federal surface and stormwater control regulations and best management practices, which are designed to limit negative impacts to surface waters from both construction and ongoing operations. Compliance of present and future projects with these regulations, which are subject to change based on regional assessments, would minimize adverse cumulative impacts. No significant cumulative direct or indirect effects on water quality are expected when the anticipated effects of proposed action are combined with the effects of past, present, and future actions. The cumulative effects on water quality under the proposed action are likely to be *de minimus* in magnitude.

Air Quality:

The identified past, present and future reasonably foreseeable actions, when combined with the effects of the No Action or the proposed action, could incrementally increase in-air and in-water noise levels within Columbia River. However, these impacts would be temporary in nature (reaching highest levels during construction). Both upland and in-water noise levels must meet specific thresholds during construction activities to avoid and minimize impacts to ESA-listed species. Any future project in the area would also need to assess, minimize and/or mitigate for both construction and operational in-air noise levels that could impact nearby residents. While ongoing maintenance dredging takes place throughout the Columbia River basin, additive increases in noise are unlikely to impact nearby residents as most of the reasonably foreseeable future projects are not located immediately adjacent to residential areas. Therefore, cumulative noise impacts from the proposed action, in combination with past, present and reasonably foreseeable actions, are less than what would be considered a measureable impact.

The geographical boundary for cumulative air quality effects is the NAAQS Air Quality monitoring area. Current and future projects, as well as this project, would have to comply with EPA standards and the Air Quality Program. The Air Quality Program protects the region's air through program planning development and guidance, industrial source control, major new source review, coordination of permit and plan review programs, data analysis and reporting, and regulation. Compliance with these regulatory agencies would minimize cumulative impacts from the Project.

No significant cumulative direct or indirect effects on air quality are expected when the anticipated effects of proposed action are combined with the effects of past, present, and future actions. The cumulative effects on air quality under the proposed action are likely to be *de minimus* in magnitude.

Biological:

The geographical boundary for this resource is the lower Columbia River Basin. Past development within the Columbia River basin has resulted in losses of aquatic and riparian habitats, which has caused adverse impacts to fish and wildlife resources. Most of the losses were due to filling, hydrologic alterations (including channelization, diking and draining of wetlands), and upland forestry practices to support development, industry and agriculture uses. In-water biological resources have been impacted by commercial and recreational fishing activities. These actions occurred in a regulatory landscape very different from what exists today.

Completion of present reasonably foreseeable projects has the potential to cumulatively impact biological resources in the Columbia River when combined with effects of the proposed action. Direct impacts include the physical removal of habitat through dredging, burial of habitat or conversion of a habitat. Indirect cumulative impacts to biological resources are a result of temporary increases in turbidity, in-air noise and in-water noise. For example, dredging or filling in areas

previously undisturbed, and at the same time, could fragment shallow water habitat used for feeding, shelter and migration by ESA-listed salmon and other aquatic species. However, many of the foreseeable projects are already working with federal, state and local resource agencies to adhere to conservation measures and BMPs (in-water work windows to avoid key migration times for salmonids, etc.); and, developing mitigation plans to offset adverse impacts on biological resources. Future land users are also required to comply with local land use and shoreline plans and even more specific local area plans (i.e. the local comprehensive land use plans for counties in Washington and Oregon; these plans provide policies to guide management and planning of land activities that may affect the Columbia River). Compliance of future development with these plans and applicable BMPs and conservation measures would minimize direct and indirect cumulative impacts to biological resources.

#### Socioeconomic:

Cumulative impacts on the socioeconomic environment are expected when the anticipated effects of the proposed action are combined with the effects of past, present, and future actions. Overall, the cumulative impacts are expected to benefit socioeconomic resources in the region by providing continued reliable navigational access within the Columbia River. The Corps estimates the Columbia River FNC currently supports a 30 billion dollar import/export industry, transporting approximately 55 million metric tons of goods. Growth in the volume of export bulk within the Pacific Northwest is expected to increase at a rate of 5.2% through 2030.<sup>3</sup> Reliable access would allow existing maritime commerce to continue and would continue to support growth of new or improved facilities to expand the maritime industry in the region. The current regulatory framework ensures compliance of future development with applicable laws and implemented conservation measures would minimize direct and indirect cumulative impacts to natural and cultural resources while supporting a robust import/export industry. No significant cumulative direct or indirect effects on the socioeconomic environment are expected when the anticipated effects of proposed action are combined with the effects of past, present, and future actions. The cumulative effects on under the proposed action are likely to be *de minimus* in magnitude.

This CIA considers the effects of implementing the proposed action in combination with effects of past, present, and reasonably foreseeable future actions. Cumulative impacts could result for the resources identified above, these impacts would be minimized through BMPs, conservation measures, and federal and state requirements to avoid, minimize and mitigate measurable impacts. Required regulatory reviews also results in coordination between many of the resource agencies and between those agencies proposing action(s).

## **7. COMPLIANCE WITH ENVIRONMENTAL LAWS**

### **7.1. Environmental Evaluation and Compliance**

The following laws provide environmental standards for operation and maintenance activities at Corps civil works projects, associated lands, and outgrant, and are related to environmental stewardship. The Proposed Action must also comply with these environmental laws and executive orders.

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<sup>3</sup> <http://www.wsdot.wa.gov/NR/rdonlyres/E1743FB8-9376-4A4C-8316-14283E42A5F7/0/PNW2011PortRailForecastFinalReport.pdf>

### **7.1.1. National Environmental Policy Act**

This EA satisfies the requirements of the National Environmental Policy Act of 1969 (NEPA), as amended (42 USC 4321 et seq.).

### **7.1.2. Bald and Golden Eagle Protection Act**

This Act provides for the protection of bald and golden eagles by prohibiting the taking, possession, and commerce of such birds, except under certain specified conditions. The Corps uses BMPs to avoid effects to bald eagles. The proposed project does not involve forestry practices, use of aircraft or other motorized equipment, blasting, or other work that can result in loud or intermittent noises within 660-ft of an active or alternate eagle nest between 1 January and 15 August. The Proposed Action would not disturb bald or golden eagles and therefore *complies with* the Bald and Golden Eagle Protection Act.

### **7.1.3. Clean Air Act**

The Clean Air Act of 1970 (CAA), as amended, established a comprehensive program for improving and maintaining air quality throughout the United States. The intent of the Act is achieved through permitting of stationary sources, restriction of toxic substance emissions from stationary and mobile sources, and the establishment of National Ambient Air Quality Standards. Noise pollution is addressed through Title IV of the Act. The Proposed Action would have short-term intermittent reduction in air quality during construction from construction equipment. There would also be short-term intermittent increase of noise levels from the operation of construction equipment. Noise impacts would be minor and temporary in nature and would immediately return back to background levels at the completion of the project. The Proposed Action would be *in compliance* with the CAA.

### **7.1.4. Clean Water Act**

The Clean Water Act (CWA) governs the release of pollutants into waterways.

**Section 401** – Requires certification from the state that a discharge to waters of the U.S. in that state would not violate the states’ water quality standards. EPA retains jurisdiction in limited cases. Oregon DEQ posted the Water Quality Certificate (WQC) on Public Notice. Operations and Maintenance of the Network is currently covered by DOE WQC Order #9765 and DEQ WQC File Number NWPOP-CLA-F05-001-FR. The Corps submitted a Joint Aquatic Resources Permit Application to Washington DOE (May 22, 2015), and DOE amended WQC Order #9765 to include shoreline placement at Rice Island. A Joint Permit Application was submitted to Oregon DEQ (May 27, 2015) for the use of the sump off Howard Island. The Corps received a WQC for the sump dated September 3, 2015.

**Section 404** – Regulates the discharge of dredged or fill material into waters of the United States. The Corps has permitting responsibility under Section 404 of the CWA. However, the Corps does not issue itself a 404 permit for discharges of dredged or fill material, but the Corps does apply the 404(b)(1) guidelines (40 CFR Part 230). Only when there is no practicable alternative would any discharge of fill material occur in waters of the U.S., including wetlands. Alternatives to the placement sites/ placement activities analyzed in this EA were considered; however, under all

alternatives discharge of fill material into the ocean, the flowlane, onto beaches, onto upland sites, or into sumps, would still be necessary. Because dredge material storage sites within the Network are nearing capacity, and after taking into account cost, existing technology, and logistics, the Corps determined the sites and placement activities chosen as the preferred alternative are the most appropriate for meeting the needs of the dredge program while minimizing adverse impacts on water quality. There are no wetlands on Rice Island, shoreline placement on the island would not require fill of wetlands. Rehandling dredged material in-water has no net loss of aquatic functions and values and the temporary effects of in-water placement comply with the guidelines. Therefore, the proposed action complies with the 404(b)(1) guidelines. The Corps prepared a 404(b)(1) evaluation for this project. The report is on file at the Portland District Office and is available upon request.

#### **7.1.5. Coastal Zone Management Act**

The Coastal Zone Management Act (CZMA) encourages coastal states to develop and implement coastal zone management plans that are consistent with national policies to preserve, protect, develop, and where possible, restore or enhance, coastal zone resources. Section 307 of the CZMA requires that any federal action occurring in or outside of the coastal zone which affects coastal land or water uses or natural resources must be consistent to the maximum extent practicable with the state's Coastal Management Program. Only the Rice Island shoreline placement activities would occur within the coastal zone of Washington state. The Corps submitted a request for a CZMA consistency determination to DOE on May 21, 2015, for use of the Rice Island shoreline placement site. The Corps has determined actions analyzed within this EA are *in compliance* with CZMA to the maximum extent practicable. DOE did not respond to the Corps CZMA determination within the 60-day review period; therefore, concurrence is presumed.

#### **7.1.6. Comprehensive Environmental Response, Compensation, and Liability Act and Resource Conservation and Recovery Act**

This Act established a method to assign liability to parties responsible for the release of hazardous wastes, and established a trust fund to pay for their cleanup to reduce associated dangers to public health and the environment.

The proposed action is not within the boundaries of a designated Superfund site as identified by the EPA or the states of Oregon or Washington for a response action under CERCLA, nor are the project sites on the National Priority List (<http://www.epa.gov/superfund/sites/npl/index.htm>); therefore, this Act is *not applicable* to the proposed action. There is no indication that any hazardous, toxic, and radioactive wastes are in the vicinity of the Network. Any presence of these types of wastes would be responded to within the requirements of the law and Corps' regulations and guidelines.

#### **7.1.7. Endangered Species Act**

In accordance with Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed or proposed species within NMFS and USFWS jurisdiction. Any incidental take as a result of the construction and operation and maintenance of the CR FNC and Network has been coordinated between NMFS, USFWS, and the Corps.

The NMFS issued a Biological Opinion with an incidental take statement on 11 July 2012, as reviewed in section 5.2.3. The proposed action would not result in impacts on NMFS ESA-listed species that were not previously analyzed in the 2012 Biological Opinion; therefore, the species effects determinations in the 2012 Biological Opinion remains unchanged. NMFS concurred with this determination on July 16, 2015.

The Corps received a Letter of Concurrence from the USFWS on 29 September 2010 for non-streaked horned lark species, as reviewed in section 5.2.3. The Corps completed Section 7 consultation for effects to streaked horned larks with the USFWS, culminating in the USFWS Biological Opinion with an incidental take statement, dated 6 June 2014. The Biological Opinion concluded that continued O & M of the CR FNC will not jeopardize the continued existence of streaked horned lark nor will it adversely modify or destroy designated critical habitat for the species. The anticipated effects of the proposed action analyzed in this EA are not different from other CR O&M activities included in the 2010 and 2014 Biological Opinions; therefore, the species effects determinations in those opinions remain unchanged. NMFS concurred with this determination on July 16, 2015. The USFWS concurred with this determination during a phone call with Ms. Cat Brown on May 4, 2015, and the Corps/USFWS determination is recorded in a memorandum to for the record dated May 20, 2015.

#### **7.1.8. Executive Order 13175, Consultation and Coordination with Indian Tribal Governments**

Federal agencies shall establish regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications, and strengthen the United States government-to-government relationships with Indian tribes. Government-to-government coordination for cultural and natural resources was coordinated via letter correspondence June 3, 2015, with the Confederated Tribes and Bands of the Yakama Nation, the Cowlitz Indian Tribe, the Confederated Tribes of Grand Ronde, the Confederated Tribes of Siletz Indians of Oregon, the Confederated Tribes of the Umatilla Indian Reservation, the Nez Perce Tribe, and the Confederated Tribes of the Warm Springs. The Confederated Tribes of Grand Ronde responded to the Corps letter on July 8, 2015. The response indicated the Confederated Tribes of Grand Ronde have no concerns with the proposed action.

#### **7.1.9. Executive Order 12898, Environmental Justice**

This order requires federal agencies to minimize adverse impacts on subsistence, low-income or minority communities, ensuring no persons or group of people bear a disproportionate burden of negative environmental impacts resulting from the execution of this country's domestic and foreign policies. No subsistence, low-income or minority communities would be affected by the proposed activities because the project area is uninhabited and therefore there would be no change in population, economics or other indicator of social well-being. Consequently, the proposed action is *in compliance* with this Order because no environmental justice implications exist for the proposed project.

#### **7.1.10. Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance**

Federal agencies shall increase energy efficiency; measure, report, and reduce their greenhouse gas emissions from direct and indirect activities; conserve and protect water resources through efficiency, reuse, and stormwater management; eliminate waste, recycle, and prevent pollution; leverage agency acquisitions to foster markets for sustainable technologies and environmentally preferable materials, products, and services; design, construct, maintain, and operate high performance sustainable buildings in sustainable locations; strengthen the vitality and livability of the communities in which federal facilities are located; and inform federal employees about and involve them in the achievement of these goals. The proposed activities are *in compliance* with this Order because all actions would be conducted in a manner that would prevent pollution and chemical spills by following construction, operations and maintenance BMPs.

#### **7.1.11. Executive Order 11988, Floodplain Management**

Executive Order 11988, Floodplain Management requires federal agencies to consider how their actions may encourage future development in floodplains, and to minimize such development. The proposed action does not further affect development of floodplains or the management of floodplains; therefore, the activities are *in compliance* with this Order.

#### **7.1.12. Executive Order 13112, Invasive Species**

Federal agencies are required to combat the introduction or spread of invasive species in the United States. This order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, this is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” The Corps would follow BMPs to minimize the spread of invasive species.

#### **7.1.13. Executive Order 13186, Migratory Birds**

This order further strengthens the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Protection Act, the Fish and Wildlife Coordination Act (FWCA), the ESA and the NEPA. Federal actions resulting in the “take” of a migratory bird are required to develop Memoranda of Understanding with USFWS to promote the conservation of migratory bird populations and resources. Activities related to dissuasion of piscivorous species have been coordinated with USFWS. Activities related to the handling and consideration of ESA-listed(?) migratory species under the CR O&M program were coordinated with USFWS in 2014 are documented in the subsequent, previously referenced, 2014 USFWS Biological Opinion. There is no anticipated take of any migratory birds resulting from the proposed activities; therefore, the actions are *in compliance* with this Order.

#### **7.1.14. Executive Order 11990, Protection of Wetlands**

The purpose of this executive order is to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. In planning their actions, federal agencies are required to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. The proposed action would not impact wetlands as discussed in Section 6.11 of this document.

#### **7.1.15. Farmland Protection Policy Act**

This Act, without authorizing federal agencies to regulate the use of private or non-federal lands, encourages federal agencies to minimize the impact of federal programs on the unnecessary and irreversible conversion of farmland (prime or unique) to nonagricultural uses. It follows that federal programs shall be administered in a manner that, as practicable, would be compatible with state and local government and private programs and policies to protect farmland. The proposed action is *in compliance* with this Act because the activities would not occur on lands utilized for agricultural purposes, nor would the landscape be converted to alternative land uses.

#### **7.1.16. Fish and Wildlife Coordination Act**

The Fish and Wildlife Coordination Act (FWCA) (16 U.S.C. 661 *et seq.*) directs federal agencies to prevent the loss and damage to fish and wildlife resources in; specifically, wildlife resources shall be given equal consideration in light of water-resource development programs. Consultation with the USFWS is required when activities result in the control of, diversion or modification to any natural habitat or associated water body, altering habitat quality and/or quantity for fish and wildlife. For the Corps, all coordination under this Act is in accordance with the 2003 SEIS FWCA analysis developed by federal and state resource agencies. The USFWS FWCA Report was finalized by USFWS. This report was reviewed June 9, 2015. All actions related to the proposed project are included in this Coordination Agreement and because the proposed action will not modify any new natural habitats or water bodies, there will be *no negative effect* to fish and wildlife habitat. This activity is consistent with the act, therefore no further action or coordination was necessary.

#### **7.1.17. Magnuson-Stevens Fishery Conservation and Management Act**

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) is designed to actively conserve and manage fishery resources found off the coasts of the United States, and to support international fishery agreements for the conservation and management of highly migratory species. The MSA established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for fisheries regulated under a federal fisheries management plan. Federal agencies must consult with the NMFS on all federal actions authorized, funded, or carried out by the agency that may adversely affect EFH .

The NMFS 2012 Biological Opinion provided two conservation recommendations to avoid and reduce adverse effects to EFH, as reviewed in section 5.2.3; the Corps intends to implement those recommendations under the proposed action. Therefore, the project is *in compliance* with the MSA.

#### **7.1.18. Marine Mammal Protection Act**

This Act established a federal responsibility to conserve marine mammals within waters of the United States. With certain specified exceptions, the Act establishes a moratorium on the taking and importation of marine mammals, as well as products taken from them, and establishes procedures for waiving the moratorium and transferring management responsibility to the states. Marine mammals (or their parts) could potentially occur in the project area. It is possible that the proposed action could disturb the federally listed Steller sea lion and other pinnipeds with the movement of dredges through the Network as material is placed. However, it is unlikely the effects would rise to the level of harm or harassment. No adverse impacts are expected to Steller sea lions from the proposed action.

### **7.1.19. Marine Protection, Research, and Sanctuaries Act**

This Act, also known as the Ocean Dumping Act, prohibits the dumping of materials into the ocean that would degrade or endanger human health or the marine environment. As part of the overall, ongoing CR FNC O&M program, dredged material may be placed into the Deep Water Site; however, the proposed action would not include ocean placement of dredged material; therefore, this act is not applicable for the purposes of this analysis.

### **7.1.20. Migratory Bird Treaty Act**

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. The dredge program contractors will practice BMPs for the protection of migratory bird, part, nest, egg or product. Under the MBTA, “migratory birds” essentially include all birds native to the U.S. and the Act pertains to any time of the year, not just during migration. The proposed action could displace birds by causing flushing, altering flight patterns, or cause other behavioral changes; however, it is not expected that effects would rise to the level of “taking” any migratory bird. Dissuasion of birds from particular placement sites has been evaluated. Adverse effects to streaked horned larks were evaluated in the 2014 USFWS Biological Opinion. The anticipated effects of the proposed action on streaked horned larks falls within the scope of actions covered under the 2014 Biological Opinion; therefore, the effects determination for streaked horned larks remains unchanged relative to the proposed activities.

### **7.1.21. Wild and Scenic Rivers Act**

This Act applies only to rivers designated by Congress as “wild and scenic” in order to safeguard the special character of these rivers. Under this Act, federal agencies may not assist the construction of a water resources project that would have a direct and adverse effect on the free-flowing, scenic, and natural values of a federally designated wild or scenic river. The Columbia River along this reach is not designated as a Wild and Scenic River<sup>4</sup>; as a result, this Act is *not applicable* to the proposed action.

## **7.2. Cultural Resources**

The following laws govern the identification, designation, and protection of historic and archeological resources whenever an action is authorized, funded or carried out by the federal government. Coordination of any investigations and determinations, and recommendations regarding preservation procedures are the sole responsibility of a Corps district archeologist. The archeologists primarily conduct their reviews for compliance with the following:

- Antiquities Act of 1906, 16 U.S.C. 431, 432, 433.
- Archeological and Historical Preservation Act of 1960, 16 U.S.C. 469-469c.
- National Historic Preservation Act of 1966, 16 U.S.C. 470 et seq. (NHPA)

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<sup>4</sup>As verified through this link: <http://www.rivers.gov/wildriverslist.html>

- Protection and Enhancement of the Cultural Environment, Executive Order 11593 (36 FR 8921; 13 May 1971).
- American Indian Religious Freedom Act of 1978, 42 U.S.C. 1996.
- Archaeological Resources Protection Act of 1979, 16 U.S.C. 470aa-470mm. (ARPA)
- Native American Graves Protection and Repatriation Act of 1990, 25 U.S.C. 3001. (NAGRPA)
- Indian Sacred Sites, Executive Order 13007 (61 FR 26771; 29 May 1996)

The project has a monitoring plan in place in order to ensure that there will be no impacts to any resources that may be discovered or in place. NHPA, NAGPRA, and ARPA specify the need to work with SHPO prior to and during the duration of the project.

### **7.2.1. National Historic Preservation Act**

Section 106 of the NHPA requires agencies to consider the potential effects of their projects and undertakings on historic properties eligible for, or listed on, the National Register of Historic Places. Historic properties include archaeological sites or historic structures or the remnants of sites or structures. To determine the potential effect of the project on known or unknown historic properties, the following items are analyzed: the nature of the proposed activity and its effect on the landscape; the likelihood that historic properties are present within a project area; whether the ground is disturbed by previous land use activities and the extent of the disturbance; reviewing listings of known archeological or historic site locations, including site data bases and areas previously surveyed or listings of sites on the NRHP. The Corps professional cultural resources staff has made a determination of no potential to effect for the proposed action following these findings and recommendations.

### **7.2.2. Native American Graves Protection and Repatriation Act**

This Act provides for the protection of Native American and Native Hawaiian human remains and cultural items. It also establishes requirements for the disposition of Native American human remains and sacred or cultural objects found on federal lands. The Act also provides for the protection, inventory, and repatriation of Native American human remains and cultural items (funerary objects, sacred objects, and objects of cultural patrimony). Tribal coordination regarding the current project has been conducted, and in the unlikely event that any human remains are encountered during construction of the project, the tribal groups and the appropriate SHPO will be notified immediately and the NAGPRA process followed.

### **7.2.3. The Archaeological Resources Protection Act**

This Act establishes criminal penalties for individuals who excavate or remove archaeological resources from public lands without a permit. In the event that there is discovery of any archaeological resources, activity will cease in the immediate area of discovery, and Portland District staff archaeologists will be informed. District archaeologists will then initiate consultation with the State Historic Preservation Office and associated tribes in accordance with NHPA and/or the provisions of the ARPA and/or the NAGPRA.

## **8. COORDINATION AND DISTRIBUTION**

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential impacts and avoidance, minimization, and/or related environmental requirements. Agency consultation for this project has been accomplished through a variety of formal and informal methods

This EA was issued for a 30-day public review period. Review comments were requested from federal and state agencies, as well as various interested parties. Responses to public comments follow.

In addition to the posting of the EA on the Corps website, a notice requesting comments regarding this EA was sent to the following agencies and groups:

- U.S. Fish and Wildlife Service
- National Marine Fisheries Service
- U.S. Environmental Protection Agency
- U.S. Coast Guard

- Confederated Tribes of Siletz
- Confederated Tribes of the Grand Ronde
- Confederated Tribes of the Warm Springs
- Cowlitz Indian Tribe
- Confederated Tribes of the Umatilla Indian Reservation
- Nez Perce Tribe
- Confederated Tribes of the Yakama Nation

- Columbia County, Oregon
- Wahkiakum County, Washington

- Oregon State Historic Preservation Office
- Oregon Department of Land Conservation and Development
- Oregon Department of State Lands
- Oregon Department of Fish and Wildlife
- Oregon Department of Parks and Recreation
- Oregon Department of Environmental Quality
- Oregon Department of Geology and Mineral Industries
- Oregon Department of Fish and Wildlife
- State of Oregon Governor's Office

- Washington State Historic Preservation Office (Washington Department of Archaeology and Historic Preservation)
- Washington Department of Ecology
- Washington Department of Fish and Wildlife
- Washington Department of Natural Resources
- State of Washington Governor's Office

American Rivers  
Columbia River Bar Pilots Columbia River Business Alliance  
Columbia River Channel Coalition  
Columbia River Estuary Study Taskforce  
Columbia River Crab Fishermen’s Association  
Columbia River Fishermen’s Protective Union  
Columbia River Inter-Tribal Fish Commission  
Lower Columbia River Estuary Partnership  
Lower Columbia Ports Coalition  
Northwest Environmental Advocates  
Oregon State University  
Oregon Natural Resources Council  
Oregon Charter Boat Association  
Oregon Sea Grant  
Oregon Coastal Management Program  
Pacific States Marine Fish Commission  
Pacific Northwest Waterways Association  
Portland Audubon Society  
Salmon for All  
Save Our Wild Salmon  
Washington Public Ports Association  
Wahkiakum Port District #1 and #2

## **8.1. Public Comments Received and Responses**

The Corps received one comment on the draft EA. A summary of the comment and the Corps’ response appears below:

**Comment:** Oregon State Historic Preservation Office (SHIPO). The Oregon SHIPO submitted a letter dated September 8, 2015. The letter reminds the Corps that because no previous surveys have been completed near the project area, the Corps should use extreme caution during ground disturbing activities. Additionally, the Corps should consult with all appropriate Indian Tribes regarding the project, and complete a National Historic Preservation Act Section 106 consultation, if required.

**Response:** Rice Island is a man-made dredge material island. No human habitation or other use of the island with the exception of dredge disposal has occurred. Therefore, using the eastern shoreline for material placement does not have the potential to cause direct or indirect effect on cultural resources. Multi-beam bathymetry data taken in July 2014, and reviewed by Corps cultural resources staff, revealed no anomalies on the river bottom at the proposed sump location. There is no potential for historic properties, particularly shipwrecks or related material, eligible for listing to the NRHP to exist. Due to these conditions, this action has no potential to effect cultural resources. The Corps will exercise extreme caution during ground disturbing activities, and if archeological objects or sites are discovered during construction, all activities will cease immediately until a professional archeologist can evaluate the discovery. The Corps’ professional cultural resources staff has made a determination of no potential to effect for the proposed action under Section 106 of the National Historic Preservation Act, which is documented in a memorandum for the record on file at the Corps Environmental Resources Branch, Portland District Office. Additionally, the following Indian Tribes having an interest in the project area were notified of the project in a letter dated June 3, 2015:

- Confederated Tribes of Siletz
- Confederated Tribes of the Grand Ronde
- Confederated Tribes of the Warm Springs
- Cowlitz Indian Tribe
- Confederated Tribes of the Umatilla Indian Reservation
- Nez Perce Tribe
- Confederated Tribes of the Yakama Nation

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