

**FINDING OF NO SIGNIFICANT IMPACT (FONSI)  
 FERNDALE LEVEE REPAIR PROJECT  
 WHATCOM COUNTY, WASHINGTON**

The U.S. Army Corps of Engineers, Seattle District (USACE) has conducted an environmental analysis in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended. The Final Environmental Assessment (EA) dated June 2023, for the Ferndale Levee Repair Project addresses flood damage to the levee near the city of Ferndale, Washington.

The Final EA, incorporated herein by reference, evaluates various alternatives to restore flood protection to the damaged levee. There are two major Federal actions requiring NEPA compliance and analysis in the Final EA summarized below. The two Federal actions consist of three events which include the emergency response activities during the November 2021 flood fight, signing of the Cooperation Agreement (CA) on April 3, 2023, and the proposed 2023 levee repairs.

**Proposed Action:** The preferred alternative is the Repair In-Place alternative. This alternative will repair the Ferndale Levee within the horizontal and vertical profiles as it was designed and as they existed when first built. All riverward repairs will remain within the pre-damage levee footprint, i.e., the levee will not encroach farther into the river. Repair activities for this alternative are summarized in section 2.5 of the Final EA and are hereby incorporated by reference.

**Alternatives:** In addition to a “no action” plan, four alternatives were evaluated. While the No Action Alternative is not recommended, it is carried forward for further evaluation to serve as a base condition for evaluation of other alternatives. The other four alternatives included the Nonstructural, Layback, Levee Setback, and the Repair In-Place. The Nonstructural, Layback, and Setback alternatives were considered and were not carried forward for further evaluation as described in Section 2 of the EA. The Repair In-Place alternative was identified as the preferred alternative compared to the other alternatives (Nonstructural, Layback, Setback) because it meets the purpose and need of the proposed project, which is to restore the pre-damage level of flood protection of the Ferndale Levee. The potential effects were evaluated for the No Action and the Repair In-Place alternatives. See section 2 of the Final EA for alternative formulation and selection. A summary assessment of the potential effects of the recommended plan are listed in Table 1:

**Table 1: Summary of Potential Effects of the Proposed Action**

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Vegetation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Wetlands	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Threatened and Endangered Species	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Fish and Wildlife	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cultural Resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hazardous, Toxic, and Radiological Waste	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Air Quality and Noise	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land Use, Utilities, and Infrastructure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Justice	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Recreation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Impact Minimization:** All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan. Best management practices (BMPs) and conservation measures, as detailed in section 2.7 the Final EA, will be implemented to minimize impacts. Measures include water quality monitoring, restricting in-water work to June 15 to August 31 to minimize construction related impacts to protected salmon, and mitigate impacts to vegetation.

**Mitigation:** The recommended plan will result in unavoidable adverse impacts to water quality and vegetation due to construction activities. To mitigate for these unavoidable adverse impacts, the USACE will install 30 willows and 90 shrubs on an adjacent levee bench just upstream of the levee repair. See section 2.6 in the Final EA for more mitigation details.

**Public Review:** Public review and comment of the Notice of Preparation for the proposed Ferndale Levee Repair Project was completed on March 18, 2023. Comments and responses are included in Appendix G of the Final EA.

**Treaty Tribes:** The Samish Indian Nation, Lummi Nation, Nooksack Indian Tribe, Suquamish Indian Tribe, Swinomish Indian Tribal Community, and Tulalip Tribes were contacted regarding the levee repairs and the USACE will continue to coordinate throughout the project to meet Tribal Treaty obligations. To date, no comments have been received from the contacted Tribes.

**Compliance:**

**a. Endangered Species Act:**

The National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), and the U.S. Fish and Wildlife Service (USFWS) are responsible for the Endangered Species Act of 1973 (ESA). The USACE evaluated potential effects to endangered species in a Biological Assessment (BA). ESA consultation was initiated

with submission of a BA to the USFWS and NMFS on February 24, 2023. Consultation is not yet concluded. The USACE reached the following effect determinations for ESA-listed species from the project in the BA:

- May affect, likely to adversely affect Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*) and Puget Sound Chinook salmon critical habitat.
- May affect, likely to adversely affect Puget Sound steelhead (*O. mykiss*) and Puget Sound steelhead critical habitat.
- May affect, likely to adversely affect Coastal/Puget Sound bull trout (*Salvelinus confluentus*) and Coastal/Puget Sound bull trout critical habitat.
- May affect, not likely to adversely affect southern resident killer whale (*Orcinus orca*) and southern resident killer whale critical habitat.
- May affect, not likely to adversely affect marbled murrelet (*Brachyramphus marmoratus*) and no effect to marbled murrelet critical habitat

Due to the urgent nature of completing the emergency action to protect human safety and property and the effort to limit impacts to listed species by working within the work window, and because the repair is time-critical in light of the ensuing flood season, the USACE may proceed with construction prior to completion of the consultation with the Services pursuant to the “emergency circumstances” provisions of the ESA consultation regulations. The USACE will commit to fully funding and performing all Reasonable and Prudent Alternatives necessary to avoid the likelihood of jeopardy to listed species or destruction or adverse modification of designated critical habitat, as well as Reasonable and Prudent Measures necessary and appropriate to minimize the impact of Incidental Take, that are described if a Biological Opinion is received from USFWS and NMFS. The EA will be reevaluated at the time that consultation is complete. If necessary, the EA will be supplemented with necessary and applicable corresponding modifications to the scope and/or nature of the project, the procedures and practices used to implement the project, and/or the type and extent of compensatory mitigation associated with the project, and this Finding of No Significant Impact will be reassessed.

**b. Magnuson-Stevens Fishery Conservation and Management Act:**

The USACE determined that the proposed action may adversely affect Essential Fish Habitat (EFH) for Chinook and coho (*O. kisutch*) salmon. This determination was included in the BA sent to the NMFS. Consultation is not yet included. The USACE intends to proceed with construction prior to completion of consultation with NMFS pursuant to the “emergency Federal actions” provision of the EFH regulations, and to complete EFH consultation after the fact pursuant to 50 CFR Section 600.920(a). The USACE will reevaluate the EA at the time that EFH consultation is complete. If necessary, the USACE will supplement the EA with necessary and applicable corresponding modifications to the scope and/or nature of the project, the procedures and practices used to implement the project, and/or the type and extent of compensatory mitigation associated with the project, and this FONSI will be reassessed.

**c. Clean Water Act:**

The USACE has determined that the proposed repairs are exempt from the Clean Water Act. The proposed project does not include fill regulated under Section 404 Clean Water Act (CWA) because the repairs meet the parameters of the maintenance exemption under Section 404(f)(1)(B) (33 U.S.C. 1344(f)(1)(b), 33 CFR 323.4(a)(2)). Section 402 of the CWA is triggered when a construction site would have greater than 1 acre of ground disturbance. Proposed repairs at the levee do not exceed 1 acre of ground disturbance.

**d. Coastal Zone Management Act:**

The USACE has determined that the proposed repairs are consistent to the maximum extent practicable with the enforceable policies of the approved Washington Coastal Management Program. The USACE sent a Coastal Zone Management Act Consistency Determination to Ecology on April 7, 2023, requesting concurrence that the proposed repairs are consistent to the maximum extent practicable with the enforceable policies of the approved Coastal Zone Management Program. Ecology concurred with the USACE's consistency determination on June 2, 2023.

**e. National Historic Preservation Act:**

The USACE initiated consultation with the Washington State Historic Preservation Officer (SHPO) on the Area of Potential Effect (APE) on February 6, 2023. The SHPO agreed with the APE on the same day. The USACE also coordinated with the Lummi Indian Nation, Nooksack Indian Tribe, Samish Indian Nation, Suquamish Indian Tribe of the Port Madison Reservation, Swinomish Indian Tribal Community, and the Tulalip Tribes seeking information on historic properties of cultural or religious significance that may be affected. USACE has not received any responses from Tribes.

A USACE archaeologist reviewed available information and identified that portions of the APE, that would be disturbed, have been previously surveyed and that there are no historic properties present within the APE. On March 13, 2023, the USACE sent a letter to the SHPO documenting the USACE's proposed finding of no historic properties affected. The SHPO responded by letter dated March 14, 2023, concurring with the USACE's finding with the stipulation that for an unanticipated find plan in case historic properties are encountered during construction

**Determination:**

**a. Summary of Impacts and Compliance:**

Impacts of the proposed work will be minor, short-term, and temporary. This project is undergoing ESA consultation; a BA has been prepared and transmitted to NMFS and USFWS. Impacts to ESA listed fish and their prey will be minimized by construction during the in-water work window of June 15 to August 31. Consultations under the Section 7 and EFH regulations are not complete, but the USACE will proceed with urgently needed repairs under the emergency circumstances provisions of those regulatory regimes, as described above.. Coastal Zone Management Act coordination with Ecology is complete. This project does not require a Section 404(b)(1) Evaluation

or a Water Quality Certification under the Clean Water Act since the repair does not include the discharge of regulated fill into the waters of the U.S. The project complies with the National Historic Preservation Act and the USACE has coordinated the work with the Washington SHPO and affected Indian Tribes.

**District Engineer’s Conclusion:** All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on the analysis presented in the Final EA, which has incorporated or referenced the best information available; the reviews by other Federal, State and local agencies, Tribes; input of the public; and the review by my staff, it is my determination that the recommended plan will not cause significant effects on the quality of the human environment and does not require preparation of an environmental impact statement.

6/16/23

Date

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Alexander “Xander” L. Bullock  
Colonel, Corps of Engineers  
District Commander

# ENVIRONMENTAL ASSESSMENT

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## *FERNDALE LEVEE REPAIR PROJECT WHATCOM COUNTY, WASHINGTON*



June 2023



Seattle District  
Corps of Engineers

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# Ferndale Levee Repair Project Environmental Assessment

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## ACRONYMS AND ABBREVIATIONS

AEP	Annual Exceedance Probability
APE	Area of Potential Effects
AQI	Air Quality Index
BA	Biological Assessment
BMP	Best Management Practices
CA	Cooperation Agreement
CEQ	Council on Environmental Quality
CSBC	Crushed Source Base Course
CFR	Code of Federal Regulation
cfs	cubic feet per second
CO <sub>2</sub>	Carbon Dioxide
CWA	Clean Water Act
CY	Cubic yards
CZMA	Coastal Zone Management Act
dB	Decibel
DPS	Distinct Population Segment
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	Environmental Protection Agency
ER	Engineer Regulation
EO	Executive Order
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FONSI	Finding of No Significant Impacts
HI	Hazard Index
Hp	Horsepower
H:V	Horizontal to Vertical ratio, measured in feet
Min	Minimum
Lbs	Pounds

LF	Linear Feet
LOP	Level of Protection
LWM	Large Woody Material
MMPA	Marine Mammal Protection Act
MSA	Magnuson – Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOP	Notice of Preparation
NRHP	National Register of Historic Places
NLD	National Levee Database
NMFS	National Marine Fisheries Service / NOAA Fisheries
OHWM	Ordinary High-Water Mark
PIR	Project Information Report
PL	Public Law
RPM	Reasonable and Prudent Measures
Sp., Spp	species (singular and plural)
SHPO	Washington State Historic Preservation Officer
SRKW	Southern Resident Killer Whale
USACE	U.S. Army Corps of Engineers, Seattle District
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WIRA	Water Resource Inventory Area

# 1 INTRODUCTION

The purpose of an Environmental Assessment (EA), as reflected in CFR sections 1500.1(c) and 1508.9(a)(1) of the Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act of 1969 (as amended) (NEPA), is to *“provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact”* on actions authorized, funded, or carried out by the Federal government, and *“to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.”* Pursuant to Section 102(C) of NEPA, this assessment evaluates environmental consequences of the proposed rehabilitation action to be implemented by the U.S. Army Corps of Engineers (USACE) at the Ferndale Levee located in the city of Ferndale, Washington. This environmental assessment includes analysis of five alternatives including the No Action Alternative and Nonstructural, Layback, Setback, and Repair In-Place Alternatives.

## 1.1 BACKGROUND

The Ferndale Levee, built in the 1930s, is a non-federally constructed, operated, and maintained levee system in Whatcom County, Washington (Figure 1). The non-federal Sponsor for the levee is the city of Ferndale. The Ferndale levee is one segment of a 5-segment levee system located on the right bank of the Nooksack River. The Ferndale Levee segment is approximately 3,300 linear feet (LF) long. The levee embankment consists of compacted local borrow material with Class IV armor rock on the riverward slope beginning approximately 10 feet below the levee crown. The levee height is approximately 2 to 6 feet high on the landward side. The crest of the levee is approximately 10 feet wide. The landward and riverward slopes vary between 1.5 Horizontal: 1 Vertical (1.5H:1V) and 2H:1V, respectively. The levee toe is typically submerged, and a narrow-vegetated bench is located between the Ferndale Levee crown and the Nooksack River. In its undamaged state, the Ferndale Levee provides a 100-year level of flood protection, and the National Levee Database (NLD) estimates that the levee system, of which Ferndale is a part, protects approximately 747 people, 327 buildings, and \$90.4 million worth of property value (NLD 2022). According to U.S. Geological Survey, a 1 percent annual exceedance probability (AEP) flood has a 1 in 100 chance of being equaled or exceeded in any 1 year and has an average recurrence interval of 100 years. In the damaged state, the Ferndale Levee’s level of protection (LOP) is diminished from 1 percent to a 99.9 percent AEP (USACE 2022a). Therefore, a 99.9 percent AEP flood has a 99.9 in 100 chance of being exceeded in any 1 year. Public Law (PL) 84-99 repairs have been performed on segments of this levee in 1996, 2009, and 2018.



Figure 1. Ferndale Levee site vicinity, right bank of the Nooksack River.

**1.1.1 Disaster Incident**

On November 16, 2021, the Nooksack River crested at a flow of 54,000 cubic feet per second (cfs) and a river gage height of 23.7 feet as measured at the Nooksack River at Ferndale stream gage (12213100; USGS 2022). Figure 2 shows the hydrograph at the Ferndale stream gage for the event. This is between a 0.05 (20-year return interval) and 0.02 (50-year return interval) AEP event. The minor flood stage is 18 feet, and the river was above this for 2 days in mid-November and another 1.5 days at the end of November. The major flood stage is 23 feet, and the river was above this for less than 1 day in mid-November. The flooding event resulted in damage to the Ferndale Levee.

The high river flows, as well as impacts from floating logs in the Nooksack River, resulted in scour of the Ferndale Levee’s riverward slope between Stations 7+00 and 9+50 (250 LF), including several feet of lost riprap and embankment material extending beyond high flow water levels (Appendix A). In the damaged state, the LOP is diminished from a 1 percent to a 99.9 percent AEP (i.e., protection from a 100-year to 1-year event). In December 2021, forecasts projected the Nooksack River to reach or exceed flood stage multiple times. In response, the USACE completed flood fight activities on the Ferndale Levee along 300 feet of

the levee crest and upper riverward slope. Flood fight activities consisted of placing 600 tons of pit-run rock and 180 tons of quarry spalls along the levee crest and upper 1/3 of the riverward slope to address 250 LF of scour between Stations 7+00 and 9+50, the location of the scour described above (Appendix A). All work was completed by December 13, 2021. No in-water work occurred during flood fight activities and all material was placed within the pre-damage levee footprint.

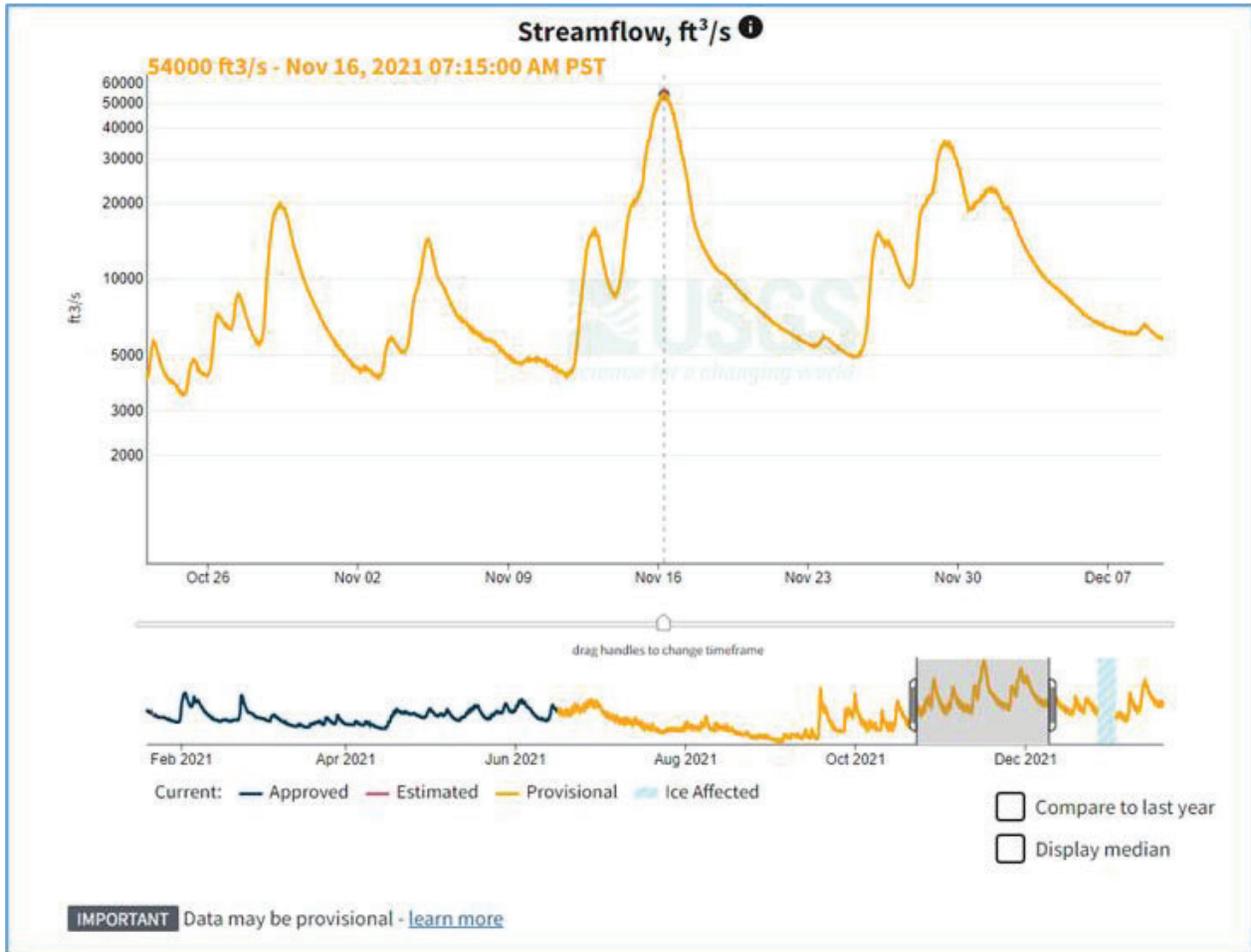


Figure 2. Streamflow at the U.S. Geological Survey (USGS) gage 122113100 on the Nooksack River near Ferndale, Washington.

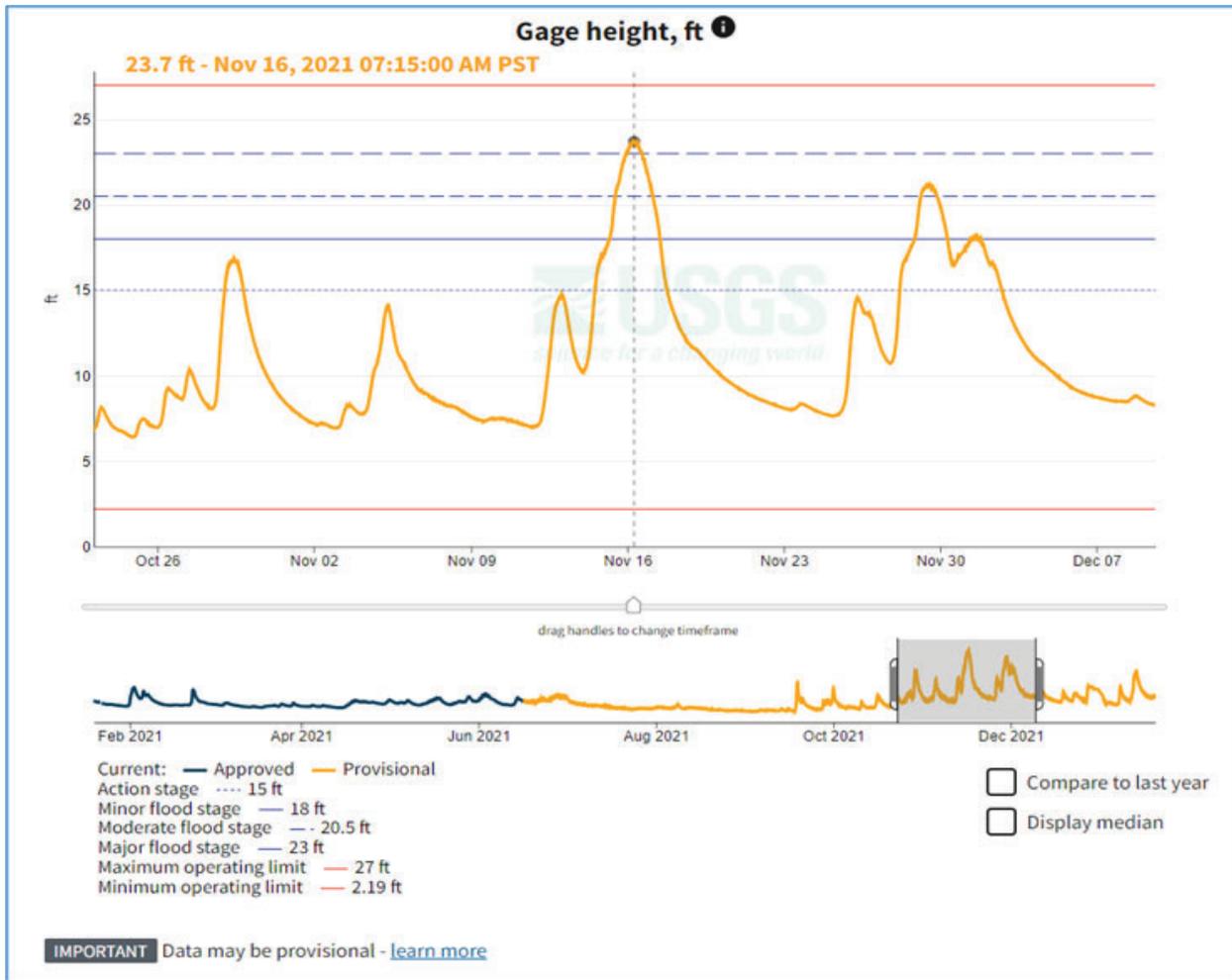


Figure 3. Gage height at the USGS gage 12213100 on the Nooksack River near Ferndale, WA.

## 1.2 AUTHORITY

Public Law 84-99 (33 U.S. Code [U.S.C.] § 701n) provides the USACE the authority for “the repair or restoration of any flood control work threatened or destroyed by flood, including the strengthening, raising, extending, realigning, or other modification thereof as may be necessary in the discretion of the Chief of Engineers for the adequate functioning of the work for flood control and subject to the condition that the Chief of Engineers may include modifications to the structure or project, or in implementation of nonstructural alternatives.”

The USACE’s repair work under this authority is limited to the repair of flood control works damaged or destroyed by floods. The statute authorizes rehabilitation to the LOP exhibited by the flood control work prior to the damaging event.

This authority is delegated to Seattle District through 33 CFR, Part 203 and Engineering Regulation (ER) 500-1-1. From ER 500-1-1: “Improvements to design and equipment (e.g., geomembranes) that are a result of state-of-the-art technology, and are commonly

incorporated into current designs in accordance with sound engineering principles, are permissible, and are not considered betterments."

### 1.3 PROJECT LOCATION

The Ferndale Levee repair site is located on the right side of the Nooksack River, South of Ferndale, Washington. The proposed action includes repair of a total of 300 LF of levee, this includes the 250 LF of damage as well as 25 LF of transition at both the upstream and downstream ends of the repair (Appendix B). The mitigation area is located upstream of the repair on an adjacent levee bench (Figure 4). Staging area locations are behind the levee in previously disturbed areas as indicated in the design drawings (Appendix B). Area totals for the staging, repair, and mitigation areas are shown in Table 1.

Table 1. Approximate project area in acres.

Project Area	Ferndale
Staging	0.29
Repair	0.34
Mitigation	0.18
<b>Total</b>	<b>0.81</b>

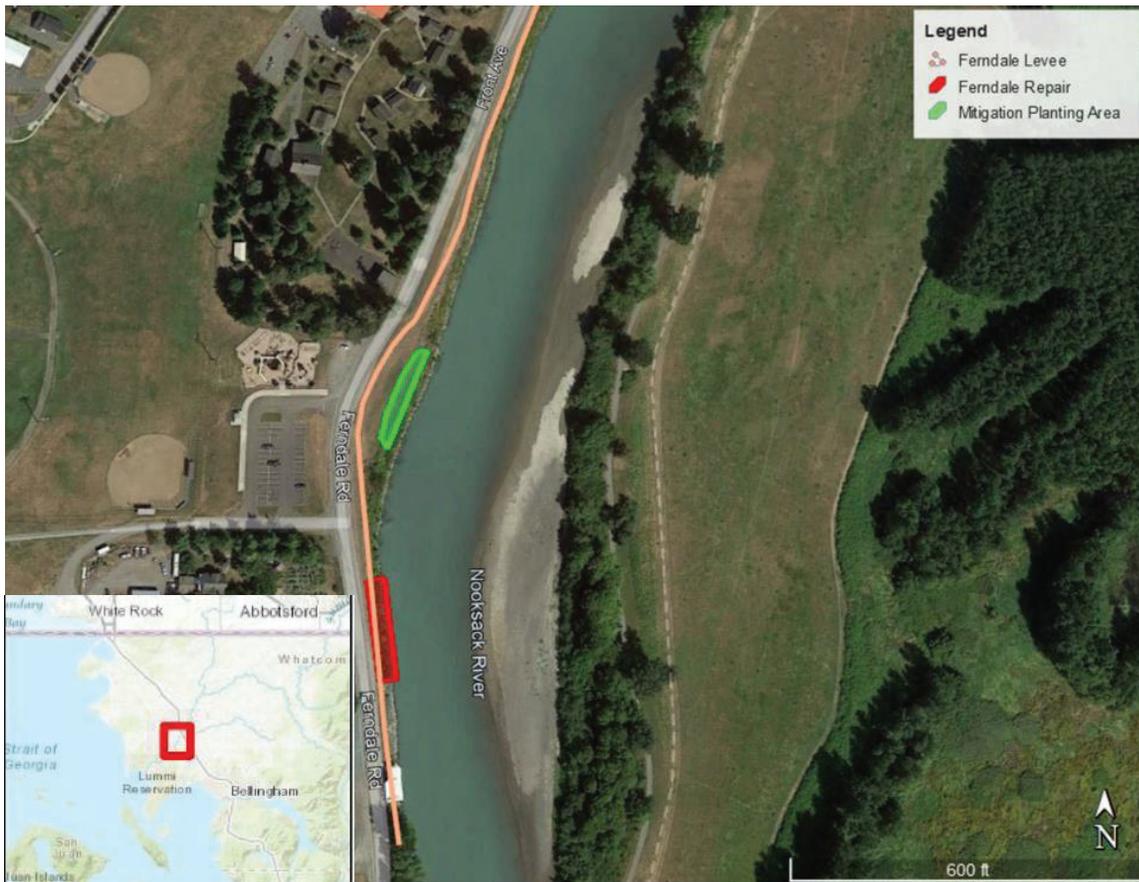


Figure 4. Project Area Map - Ferndale Levee.

## **1.4 PURPOSE AND NEED**

This EA addresses two Federal actions. The need for conducting emergency repair activities in November 2021 has been presented in Section 1.1.1; the need for implementing a permanent repair in 2023 has also been presented in Section 1.1.1. The purpose of the November 2021 work was to provide temporary supplemental protection to meet an immediate threat in light of the structure's condition as damaged by 2021 flooding, to prevent levee failure. However, even with the addition of armor rock, part of the levee prism remains compromised and scour protection was not fully restored by the flood fight action due to high water level. In the damaged condition, the levee presently provides an approximate 1-year LOP. If the levee were to fail, there would be an increased risk to life safety, improved property, and the existing wastewater treatment facility, as well as roadways, utility lines and other public infrastructure such as the ConocoPhillips Sports Complex. The purpose of the permanent repair is to restore the pre-damage LOP exhibited prior to the 2021 flood event to protect lives and property from subsequent flooding. The completed flood fight and the proposed levee repairs addressed in this EA are the result of city of Ferndale's request for assistance.

## **2 PROPOSED ACTION AND ALTERNATIVES**

A preliminary evaluation has been conducted on the alternatives for fulfilling the purpose of permanently restoring the LOP, as discussed below. Viable alternatives must restore reliable flood protection to the LOP prior to the next damaging event, must be environmentally acceptable, and should address the identified flood risk by being capable of being constructed prior to the next flood season. The preferred alternative must be the least cost alternative that restores the LOP while fulfilling all legal, technical, and environmental requirements. Below are five alternatives including the No-action Alternative and the preferred alternative (Repair In-place). Three other alternatives were considered but excluded from further evaluation because they did not meet the proposed project's purpose and need.

Under Public Law 84-99, the USACE has limited discretion over repair alternatives. USACE may deviate from the original design of the non-federal levee (e.g., setback levee) with the participation of the non-federal sponsor who must agree to meet various obligations, including land acquisition and additional cost-share funding, to execute any alternative.

### **2.1 ALTERNATIVE 1: NO ACTION ALTERNATIVE**

Under the No Action Alternative, the levee would remain in its damaged condition. This alternative would not meet the project purpose because the levee would likely be further damaged in future flood events and could fail, which would endanger homes, businesses, the existing wastewater treatment facility, and other public infrastructure. During any flood event that threatens the integrity of the levee system, the USACE or other Federal and non-federal agencies may act under emergency authorities to preserve the levee system and, to the extent possible, maintain protection of life and property behind the levee. Any response to damages during a flood event would be temporary, less certain of success, potentially more expensive, and could be less protective of environmental and cultural resources. A response would also

take time to activate and execute, so there is risk that it would not prevent levee failure, such as overtopping or breaching.

The No Action Alternative is not recommended because it would maintain the increased likelihood of damages or breaching of the levee, presenting a risk to residents' safety and property. It does not meet the project purpose and need, nor is it acceptable to the non-federal Sponsor. While the No Action Alternative is not recommended, it is carried forward for further evaluation to serve as a base condition for evaluation of other alternatives.

## **2.2 ALTERNATIVE 2: NONSTRUCTURAL ALTERNATIVE**

This alternative consists of floodplain management strategies generally involving changes in land use offered by other Federal and State programs. Such strategies would include zoning, easements, flood warning, floodplain evacuation, and flood insurance. Nonstructural strategies involve acquisition, relocation, elevation, and flood proofing existing structures. The costs and timeframe for implementing this alternative make it impractical. Furthermore, the participation of the non-federal Sponsor would be required to implement a non-structural alternative, and the Sponsor has not agreed to meet its various obligations in executing a non-structural alternative. In addition, physical construction has already taken place during the flood fight and thus structural elements of the project have already been implemented. Therefore, this alternative is not carried forward for further evaluation.

## **2.3 ALTERNATIVE 3: LAYBACK ALTERNATIVE**

This alternative would shift the levee centerline landward to allow more stable slopes and provide additional space for water conveyance. In this instance, a layback levee may be more costly than other alternatives due to the need for additional embankment material and real estate requirements. This approach could also encroach on existing structures, privately-owned land, and public infrastructure. In this case, a layback would require alterations to Ferndale Road, which abuts the levee on the landward side. Additionally, the layback and alterations to Ferndale Road may encroach on the ConocoPhillips Sports Complex and the wastewater treatment plant infrastructure located landward of the levee. Implementing this alternative would similarly require a substantial commitment and participation from the non-federal Sponsor. While a layback levee would address the flood damage, the participation of the non-federal Sponsor would be required to implement this alternative, and the Sponsor has not agreed to meet its various obligations in executing a layback alternative. In addition, physical construction has already taken place within the existing footprint during the flood fight, reflecting a commitment of resources to the present alignment and thus reducing the viability of this alternative for the proposed 2023 repair. Such an option is also considered to be far from the least cost option and therefore is not an acceptable alternative. Therefore, this alternative is not carried forward for further evaluation.

## **2.4 ALTERNATIVE 4: SETBACK ALTERNATIVE**

This alternative would shift the alignment of the levee embankment landward by the necessary distance to avoid or minimize direct contact with the river current. While a setback levee would provide benefits to environmental and natural resources within the floodplain, in this instance,

a setback levee may not be able to be completed prior to the next flood season and may be more costly than other alternatives due to more extensive embankment material requirements. Such an approach would also encroach on structures such as the private residences, businesses, wastewater treatment plant, ConocoPhillips Sports Complex, Pioneer Pavilion Community Center, and Central Elementary School. The costs and timeframe for implementing this alternative make it impractical. Furthermore, the participation of the non-federal Sponsor would be required to implement a non-structural alternative, and the Sponsor has not agreed to meet its various obligations in executing a non-structural alternative. In addition, physical construction has already taken place during the flood fight and thus structural elements of the project have already been implemented. Therefore, this alternative is not carried forward for further evaluation.

## **2.5 ALTERNATIVE 5: REPAIR IN-PLACE ALTERNATIVE (PREFERRED ALTERNATIVE)**

This alternative would repair the levee within the horizontal and vertical profile as designed and built. Repairing the levee in-place is recommended to restore it to the pre-damaged LOP. Design plans for the repairs under this alternative are included in Appendix B and described in detail below. This alternative is preferred above the other alternatives (Nonstructural, Layback, Setback) because it meets the purpose and need of the proposed project most efficiently.

### **2.5.1 Detailed Ferndale Levee Repair Description (Preferred Alternative)**

The proposed action includes repair of a total of 300 LF of levee, including 250 LF of the original scour location, 25 LF of transition at both upstream and downstream ends of the repair, embankment, and toe at one continuous site between Stations 7+00 to 9+50 (Appendix A). The repair would establish the levee to the pre-flood LOP by re-grading the slope to approximately 1.5H:1V on the downstream end of the levee segment and would gradually transition the slope to a 2H:1V on the upstream end of the levee (Appendix B). A 12-inch layer of bedding spalls (4-8 inches) and filter spalls (2-4 inches) would be placed over the existing riverward embankment soils, and the slope would be re-armored with a 4-foot-thick blanket of Class V riprap. The weighted toe would be constructed as indicated on the plans also using Class V riprap (Appendix B). Some excavation and placement of repair materials would take place below the ordinary high-water mark (OHWM). The repair site would transition to match the existing riverward slope alignment and elevation at the upstream and downstream ends. Topsoil would be placed as indicated on the design plans and hydroseeded (Appendix B). Additionally, concrete jersey barriers would be placed on the landward side of the levee along the shoulder line of Ferndale Road. The landward side of the levee would slope down at approximately 4H:1V to meet the top of the concrete jersey barriers, which would serve as a permanent retaining wall.

Large rock would be placed and manipulated using the thumb attachment on the excavator. Small rock that is impracticable to manipulate with the thumb attachment, such as quarry spalls, would be transferred from the bucket to the levee slope using a pouring motion. To achieve good compaction and tight interlocking, an excavator would “plate” the slope. Plating works by mechanically working the rock by applying pressure from the excavator bucket to the

rock and moving the bucket back and forth until the rock locks up. This action occurs after all the riprap has been placed on the slope.

Table 2. Estimated Materials and Quantities for the Ferndale Levee 2023 repair.

Material	Quantity	Location	Use
Embankment Material <sup>1</sup> (cubic yards [CY])	N/A	Levee profile, landward and riverward of the levee centerline	levee structure
Quarry Spalls <sup>2</sup> (CY)	413	levee slope between riprap and levee embankment material	bedding course
Class V Riprap <sup>3</sup> (CY)	1,936	levee slope	levee armor
Topsoil (CY)	225	with willow stakes at existing vegetation line	soil medium for willows
Crushed Surface Base Course (CSBC) <sup>4</sup>	64	levee crown	access road
Willows / Shrub (Plugs or 1-gallon pots) container)	120	Riparian planting area on levee bench adjacent to Ferndale repair site	Planting willows for riparian habitat
<sup>1</sup> Embankment material consists of soil mixed with unsorted small rock. Existing bank material would be reused. <sup>2</sup> Quarry spalls are between 4 and 8 inches in diameter. <sup>3</sup> Class V riprap is between 13 and 34 inches diameter, weight between 188 and 3,000 lbs. <sup>4</sup> CSBC is small gravel material, typically sized at 1 ¼ inches.			

Repairs to the Ferndale levee would occur within the horizontal and vertical profile and within the original levee footprint with no modifications to the original design based on best professional engineer judgment. The Ferndale Levee is a non-federal project for which no as-builts or drawings from the original construction (initial fill design) are available. Project documentation and best professional engineering judgment indicate the existing riprap size along the Ferndale levee system is estimated as predominantly Class IV and Class V rock. Data on file, and consultation with the local Sponsor were used in estimating the pre-damage levee conditions. Data includes past inspection reports, site visits, historical maps, and review of project documentation from other levee repairs along the Nooksack River. Post-flood field conditions upstream and downstream of the damaged site were also analyzed. Riprap sizing from the hydraulic calculations indicate that Class V riprap is the minimum acceptable size under current USACE sizing guidelines after taking into account the hydraulic analysis. Based on

the information available and best professional engineering judgement, the proposed repair is not expected to increase the rock size of the levee.

Due to the emergency need to construct the repair, construction is scheduled to start in the summer of 2023. From start to completion, the repair is expected to take from 4 to 6 weeks, and any in-water work for the repairs would occur within the in-water work window between June 15 and August 31 (USACE 2022b). A typical work week includes 6 days of construction, 8 to 10 hours a day depending on available daylight.

Shoreline and river areas impacted by construction activities would be restricted to the access routes, staging areas (0.29 acres), damaged levee sections (250 LF), transitions to undamaged upstream and downstream sections of the levees (50 LF total), and mitigation areas (0.18 acres). Work would require removing vegetation, i.e., approximately 10 small willows from the Ferndale levee within the construction project footprint along the riverbank (Photograph 1, Appendix A). No additional fill material volume would be added on the riverward levee slope below the OHWM or beyond the pre-flood levee footprint.

Equipment would be similar to those employed during previous levee repair projects and includes a hydraulic excavator, dump truck, and bulldozer (Table 3). Construction is planned to occur the summer of 2023 between June 15 and August 31 (the in-water work window) and is expected to take approximately 4 to 6 weeks. Construction vehicles would access the site by existing levee access ramps and the levee crown, which are accessible from public rights-of-way. Excavated materials would be staged within the levee footprint and the designated staging area (Appendix B). Best management practices (BMPs) would be employed to minimize project impacts (Section 2.7.2).

Materials would be purchased from local, privately owned companies. However, any borrow site, quarry, or gravel mine would be fully permitted by the State. Armor rock pieces would be inspected upon delivery and prior to placement for quality, integrity, and absence of excessive imported sediments. During the designated work window, in-water work would include the salvage and replacement of riprap on the toe and riverward face of the levee. Some excavation and placement of repair materials would take place below the OHWM elevation at the repair site. BMPs would be employed to minimize impacts associated with the work below the OHWM (Section 2.7.2). Salvaged riprap would be temporarily stockpiled on the levee crown or staging area to enable sorting for reuse. Material that is not suitable for reuse would be disposed of offsite at an approved upland site.

Table 3. Anticipated Equipment Utilized in the proposed Ferndale Levee 2023 repairs.

Equipment	Equipment Notes	Number	Location	Activities	General Description	In-water?
<b>Bulldozer</b>	Blade length 12 feet	1	Throughout the repair footprint	Manipulates materials. Move and place rock, vegetation, and other materials	Move and place material	No, placement from levee toe
<b>Grader</b>	Similar to 12H, minimum (min) horsepower (hp) 140, min pounds (lbs), 30,000, min blade length 12 feet	1	Haul route	Road grading, blade levels dirt or grave for roads	Road construction	No
<b>Excavator</b>	Track-mounted hydraulic excavator w/hydraulic thumb, similar to 300 series, min hp 200, min lbs 70,000, min reach 30 feet	2	Throughout the repair footprint	Workhorse of the repair. Manipulates materials. Move and place rock, vegetation, and other materials.	Move and place material	Only bucket and thumb attachment
<b>Vibratory Compactor</b>		1	Levee top	Compact fill material	Compact material	No
<b>Water truck</b>	Holds up to 3,000 gallons	1	Haul route Existing roads	Wets road surface to control dust	Dust control	No
<b>Dump truck</b>	10-12 CY Solo Dump truck, haul up to Class V riprap	TBD*	Haul route Existing roads	Transport of materials to and from the project	Material transport	No

\*To be determined (TBD) dependent on delivery.

### 2.5.2 Construction Sequence

Construction would occur in a single construction period within the approved construction window and would consist of the major components described below. Construction refers only to those activities associated with the deconstruction and reconstruction of the levee prism. Mitigation plantings are not considered part of the levee construction and would be installed as

described in Sections 2.6. Specific existing conditions for the location where the fill material would be purchased are largely unknown, existing suitable material onsite will be reused where possible. The remainder of the materials would be purchased from local, privately owned companies. The site would be chosen through a contract bidding process prior to construction. However, any borrow site, quarry, or gravel mine would be fully permitted by the State.

**Site Preparation:** The first component of construction includes the preparation of access routes and the existing levee prisms for material removal. A pre-construction meeting would be held. The project limits would be clearly marked using stakes and flagging, and the repair area cleared and grubbed as necessary. Invasive vegetation, including Japanese knotweed and Himalayan blackberry, would be disposed of off-site in a manner to prevent the spread of invasive vegetation. Staging activities would consist of temporarily stockpiling rock, supplies, equipment, and vehicles. Staging, storage, and work activities would be limited to the areas shown in the design plans (Appendix B).

**Deconstruct Damaged Levee:** The damaged portion of the levee would be deconstructed by removing, salvaging, and stockpiling remnant riprap and other existing material as practicable. As necessary, sloughed embankment material would be excavated from the scoured riverward slope. Salvaged and stockpiled materials would be stored in approved areas for reuse in the repair or disposed of at a permitted disposal site. All deconstruction of the damaged levee would follow design plans (Appendix B).

**Construct Levee Repair:** Construction would commence at the toe, starting upstream and working downstream, to deflect flows and minimize turbidity in the construction area. The construction would adhere to the design plans (Appendix B). The weighted toe, levee prism, and slope would be constructed per design requirements. The repair would smoothly transition at the upstream and downstream limits of construction into the adjacent slopes.

**Complete Construction:** Upon completion of all construction activities, areas disturbed by levee construction, staging activities, and road access would be restored to pre-construction condition as necessary. The non-federal Sponsor and the USACE would complete mitigation as described below.

## **2.6 ENVIRONMENTAL MITIGATION**

All environmental mitigation discussed in this section applies to execution of the preferred alternative.

At the repair site, the USACE estimates that up to 10 small willows ranging from 3 to 5 feet tall and less than 3 inches in diameter may be removed (Photograph 1, Appendix A). To offset impacts to ESA species associated with the Ferndale Levee repair, the USACE would mitigate for the removal of the 10 willows at a 3:1 ratio, which accounts for temporal habitat loss due to the time lag for the trees to reach maturity and accounts for the possibility that not all plantings would survive. The 30 willow plantings would consist of Sitka willow, Hooker's willow, and Scouler's willow. Additionally, 90 shrubs consisting of snowberry (*Symphoricarpos albus*),

Nootka rose, and ocean spray would be included to add structural diversity to the 0.18-acre mitigation site, which is located on the levee terrace upstream of the repair site. Depending on availability from plant nurseries, plantings may be plugs, 1-gallon pots, or a combination of the two planting types. Growth in good conditions can reach 6-8 feet a year for willows. Site conditions are not ideal so growth at this rate is not expected to occur. Mitigation planting site selection was limited due to real-estate requirements and proximity to the levee repair. Although vegetation removal is known to affect water temperatures due to reduced shading in many locations, river temperatures are not expected to discernibly change due to this project; thus, the mitigation planting provides other habitat values in addition to shading.

Monitoring and adaptive management, including replacement and maintenance, after the first year would be conducted by the USACE. If after the first year less than 80 percent of the plantings survive, all the dead plantings would be replaced. In preparation for any required adaptive management replanting, the USACE would evaluate why the plantings failed and plan the best path forward for successful replacement. Within the first 1 to 2 years of the initial planting installation, the USACE would engage with the non-federal Sponsor to assist in identifying the problem and alternative planting practices for successful replanting. These may include planting different species, augmenting water, changing the planting location, or adding pest control or exclusion devices. If replacement occurs after the first year, the plantings would be monitored for an additional year (second year after initial planting) by the USACE. The USACE would report the success of the mitigation plantings to the resource agencies with which it coordinated for the repair. The plantings would be evaluated by USACE in September of each year before leaf drop for the first 1 to 2 years after initial planting. Due to time restrictions in the USACE's PL 84-99 operation and maintenance requirements, the USACE would be unable to access the mitigation planting area to conduct any monitoring or maintenance of mitigation plantings beyond 2 years after the mitigation plantings are in place. After the 2-year period, the mitigation plantings are the responsibility of the non-federal Sponsor. The USACE would have no control over activities in the mitigation planting area that could affect the success of the mitigation planting area after this 2-year period and cannot guarantee mitigation planting success in perpetuity.

## **2.7 CONSERVATION, BEST MANAGEMENT PRACTICES, AND MITIGATION**

Mitigation for effects of proposed actions is evaluated as part of the NEPA process. Mitigation can take any of the following forms:

- Avoiding effects altogether by not taking a certain action or parts of an action.
- Minimizing effects by limiting the degree or magnitude of the action and its implementation.
- Rectifying effects by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating effects over time by preservation and maintenance actions during the life of the action.
- Compensating for effects by replacing or providing substitute resources or environments.

The preferred alternative is planned and designed to avoid and minimize project impacts to the maximum extent feasible. All access would be over existing roads and trails, and all staging

would be in previously developed or disturbed uplands. All in-water activity would be timed to use construction timing windows established to protect fish (June 15 through August 31). Conservation measures and BMPs listed below include measures to protect the Nooksack River from sediment and turbidity originating from construction at the site. All mitigation measures developed in cooperation with the State Historic Preservation Officer and affected Tribes would be implemented to protect cultural resources.

### **2.7.1 Conservation Measures**

Section 7(a)(1) of the Endangered Species Act (ESA) directs Federal agencies to use their authorities to further aid the purpose of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. For the preferred alternative, the USACE developed a list of conservation measures and incorporated these into the project design to reduce environmental impacts of the project to endangered and threatened listed species and designated critical habitat. For the preferred alternative, the measures are the following:

- a. Native shrub plantings would be included in the repairs as described above and shown in the design plans (Appendix B). Conduct planting, maintenance, monitoring, and adaptive management as necessary to achieve successful plant establishment.
- a. All disturbed areas would be hydroseeded with an appropriate erosion control hydroseed mix that is tested to be free of prohibited noxious weeds.
- b. Follow-up post-construction review of conservation measures. The repair site would be examined after the repair is completed. If conservation measures and repairs are different from described here or what is depicted in the plans, they would be recorded and described.

### **2.7.2 Best Management Practices**

The USACE developed a list of BMPs and would incorporate these into the action to reduce environmental impacts. Some are integrated into the repair, while others are guides to operation and care of equipment. These measures are as follows:

- a. All construction activities would occur during daylight hours to minimize noise impacts to the surrounding community.
- b. In-water work would be limited to the in-water work window (June 15 – August 31) and minimized to the extent possible.
- c. Water quality monitoring for turbidity would be performed as outlined in the Water Quality Monitoring Plan (Appendix C). If a potential exceedance is detected at the early warning sample locations, on-site personnel would evaluate construction activities and take measures to minimize turbidity generation. Examples include slowing down a specific in-water activity and changing the amount of material that is moved below the waterline.
- d. Temporary erosion control measures will be installed for all phases of work as required to prevent the discharge of accumulation of sediment into the river, adjacent swales, catch basins, storm drains, or off-site. A certified Erosion and Sediment Control Lead will choose and install erosion control materials for specific site conditions as necessary. These may include silt fencing, mats, blankets, check dams, bonded fiber matrix, and

straw. Accumulation of sediment in any adjacent swales or storm drains will be monitored daily and cleared to ensure continued service throughout construction.

- e. Vegetation removal would be limited to the repair sites.
- f. Should any large woody material (LWM) be generated or found on site during repairs, it shall be salvaged and placed along the shoreline above the OHWM. This includes any tree trunks, rootwads, and large shrubs. The LWM may be placed after a section of levee is completed or after the entire repair. Depending on the water height, the material may be placed above or below the willow stakes. Rootwads would be oriented upstream (into the flow).
- g. Noxious weeds would be disposed of separately from other organic materials at an approved off-site location.
- h. Equipment that would be used near or in the water would be cleaned prior to construction.
- i. Drive trains would not operate in the water. Only the excavator bucket with thumb attachment would extend into the water.
- j. Biodegradable hydraulic fluids would be used in machinery where appropriate.
- k. Fueling would occur on the back side of the levee 100 feet away from the waterline, and biodegradable hydraulic fluids would be used as appropriate in any portion of the equipment that would work in the water. A Fueling and Spill Recovery Plan would be developed prior to construction and would include specific BMPs to prevent spills and react quickly should a spill occur.
- l. Construction equipment would be regularly checked for vehicle-fluid drips or leaks, and immediately removed from service until corrected.
- m. At least one fuel spill kit with absorbent pads would be on site at all times.
- n. Material placed into the water would be placed individually or in small bucket loads. No end dumping of rock into the water or on the levee slope would occur.
- o. Rock placement would occur only within the project footprint. Repairs would not expand the footprint of the levee riverward or below OHWM.
- p. Rock placement and underwater excavation would occur from the upstream end of the project to the downstream end. Rock is placed shortly after excavation so it would act as a localized flow deflector and help manage flows in the installation areas.
- q. After construction is complete, all disturbed soils above the OHWM not covered by riprap would be topped with topsoil and hydroseeded mix that is tested to be free of prohibited noxious weeds. This includes the staging areas.
- r. All trash and unauthorized fill would be removed from the project and staging area, including concrete blocks or pieces, bricks, asphalt, metal, treated wood, glass, floating debris, and paper that is waterward of the ordinary high-water line, and disposed of properly after work is completed.
- s. A pre-construction meeting would be conducted to look at existing conditions to determine any possible fine-tuning that can be done for these BMPs or other

environmental requirements. The pre-construction meeting may include outside resource agencies (U.S. Fish and Wildlife and/or National Marine Fisheries Service).

- t. Mitigation plantings would be installed between late-October and early-November.
- u. Coir or arborous wood chips would be mixed into the planting soil (10 percent by weight), as well as, placed on top of the soil around the plantings (approximately 3-foot diameter, 4-inch depth) to improve water retention.
- v. During the construction period, all plantings would be watered at the time of installation, as needed.
- w. Mitigation plantings would be watered by the non-federal Sponsor for the first year, post installation.
- x. The mitigation planting area would be marked in a way to identify the new plantings. Markers may include flags, stakes, or similar. If markers are removed or lost in the first year, the non-federal Sponsor would replace them.

### **3 ENVIRONMENTAL RESOURCES OF CONCERN AND EFFECTS**

This section evaluates impacts to various resources by the different alternatives carried forward for evaluation against the levee's designed condition.

#### **3.1 VEGETATION**

##### **3.1.1 Existing Conditions Pre-flood**

Today, the lower Nooksack River watershed is characterized by fragmented patches of mixed deciduous and conifer forest scattered among long agricultural reaches. The agricultural reaches are ditched and dominated by pasture grasses and blackberry vines. Human impacts to the floodplain include intensive agriculture and dairy operations, forestry, rural residential developments, recreation, wastewater treatment plants, and other human developments. Infrastructure and land use in the project area include agricultural fields, vegetated areas, levees, stormwater features, roads, recreational paths, and residential homes. Infrastructure and land use in the project area include agricultural fields, vegetated areas, levees, stormwater features, roads, recreational paths, and residential homes.

The shoreline at the repair site is heavily modified. The embankment of the Ferndale Levee consists of compacted local borrow material with armor rock scour protection extending below the waterline. Because of human disturbances, the proposed construction and staging area is relatively free of vegetation. Willows, small bushes (less than 3-inch diameter), and grass are also present along much of the levee. Additionally, there are no wetlands located within the repair site.

##### **3.1.2 No Action**

Depending upon the magnitude and duration of future flood events, the levee at the damaged site may start to erode and fail. Under these circumstances, a flood fight would likely be conducted to try to save the levee and protect properties, facilities, and lives from threat. Construction during a flood event is difficult and is completed as quickly as possible; therefore, vegetation would be removed or buried as needed to accomplish the levee repair under

difficult construction conditions, regardless of the type of vegetation. Levees typically are not revegetated following the flood fight actions. If flood fights were unsuccessful and the levee failed, inundation and possible channel migration could have considerable impacts on vegetation.

### **3.1.3 Flood Fight (November 2021)**

The emergency flood fight activities occurred on the upper 1/3 of the levee located within the footprint of the previously existing rocked levee structure (Appendix A). No woody vegetation was removed as a result of the flood fight activities.

### **3.1.4 Repair In-place Alternative (Preferred Alternative)**

Minimal vegetation is present within the construction area as a result of the 2021 flood events and human disturbance. The area that would be disturbed for repairs including the repair site and the staging area are described in Table 1. Once the repair is complete, topsoil and hydroseed would be placed as described in the design plans (Appendix B). Approximately 10 willows (3-5 feet tall) would be removed from the waterward side of the levee during the repair as described in Section 2.6. The willows provide minimal shade to the Nooksack River and its bank as the willows are only 3-5 feet tall. Shrubs affected are regularly reduced in size on the levee by the local non-federal Sponsor. Mitigation plantings would consist of 30 native willows and 90 shrub plantings, which would disturb approximately 0.18 of an acre on an adjacent levee bench upstream of the repair (Figure 3). As the mitigation plantings grow, they would regain ecological functions, providing food and substrate for insects and contributing organic material to the river. Shading and other functions along the levee could be limited by maintenance trimming and clearing to protect levee integrity and allow inspection through the non-federal Sponsor's maintenance regimen. Effects on vegetation would be temporary and negligible. Additionally, USACE does not anticipate the repairs affecting wetlands because none are found within the project site.

## **3.2 WATER RESOURCES**

### **3.2.1 Existing Conditions Pre-flood**

The mainstem Nooksack River is designated for aquatic life uses as core summer salmonid habitat (Washington Administrative Code [WAC] 173-201A-602). The core summer habitat designation is characterized by salmonids using the river from June 15 to September 15 for spawning and emergence, adult holding, summer rearing habitat, and foraging habitat by adult and sub-adult native char. Other common characteristic aquatic life uses for waters in this category include spawning outside of the summer season, rearing, and migration by salmonids. Water quality standards (e.g., temperature, dissolved oxygen, and turbidity) are established based on this aquatic life use designation.

The Washington Department of Ecology (Ecology) has listed various segments of the lower mainstem Nooksack River as 303(d) impaired waters (Ecology 2022). The Nooksack River adjacent to the Ferndale levee repair site is listed as a 303(d) category 5 impaired water for temperature and dissolved oxygen.

### **3.2.2 No Action**

Under this alternative, the damaged levee could sustain further damage, which may lead to flood fighting measures and fill placement during future high-water events. This would increase sediment and turbidity in the river, which may be a minor concern during a flood event. Levee failure, if flood fighting efforts were unsuccessful, could allow floodwater to transport debris, sediment, and pollutants back into the river from adjacent properties, namely the wastewater treatment plant, with substantial impacts to water quality and potential for sediment contamination. Adjacent areas include industrial, recreational, agricultural, and residential properties.

### **3.2.3 Flood Fight (November 2021)**

The November 2021 emergency flood repair occurred on the upper 1/3 of the levee with no material placed in the water (Appendix A). The emergency repair was completed in the dry (no in-water work) at a time when the Nooksack River was highly turbid due to flooding. Effects on water resources and water quality were negligible.

### **3.2.4 Repair In-Place Alternative**

Under this alternative, the Ferndale Levee would be repaired within the pre-damage levee footprint (i.e., the levee would not encroach farther into the river).

Repairing the levee in-place would require work in the active channel with some work below the OHWM. Construction could be expected to cause minor, temporary, and localized increases in turbidity. BMPs, including restrictions on fueling and prevention of fluid leaks from construction equipment, would be employed to minimize and prevent discharge of pollutants into the river. Materials used for the repair would be clean and contaminant free and would be purchased through a contract bidding process from vendors fully permitted by the State. Turbidity would be monitored upstream and downstream of the project sites during construction (Appendix C). If turbidity exceeds State water quality standards, the USACE would modify or stop particulate-generating activities and commence contingency sampling requirements as outlined in the water quality monitoring plan (Appendix C).

This alternative would remove shoreline vegetation at the repair location and replace it with rock armor. The vegetation removal is expected to have negligible effects to shading and localized water temperatures along the shoreline as the vegetation to be removed is low in stature. To mitigate for the vegetation removal, hydroseeding would be incorporated into the repair and off-site mitigation plantings would be installed as described in Section 2.6. This alternative would not have measurable effects to pH, bacteria, and dissolved oxygen levels in the river. Only clean, uncontaminated materials would be used, and no pollutants are expected to be introduced to the river. Effects to water quality from this alternative would be temporary and localized.

## **3.3 THREATENED AND ENDANGERED SPECIES**

In accordance with Section 7(a)(2) of the ESA, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species. The species listed in Table 4 are protected under the ESA

and may occur in the project area. The following sections briefly summarize relevant information about the protected species; current knowledge on the presence and use of the project and action areas by these species; and then evaluates how the proposed project may affect the species, concluding with a determination of effect. Pursuant to Section 7 of the ESA, the USACE submitted a Biological Assessment (BA) to the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). See Section 8.5 for compliance details with the ESA consultation.

Table 4. ESA-listed species and designated or proposed critical habitat found in the action area of the proposed action.

Species (Common Name and Scientific Name)	Distinct Population Segment (DPS) or Evolutionarily Significant Unit (ESU)	Federal Listing	Critical Habitat in Action Area	Potential Occurrence (Likely, Unlikely, or Absent) in Action Area
<b>Fish</b>				
Chinook salmon ( <i>Oncorhynchus tshawytscha</i> )	Puget Sound ESU	Threatened, Critical Habitat Designated	Yes	Likely
Steelhead ( <i>O. mykiss</i> )	Puget Sound ESU	Threatened, Critical Habitat Designated	Yes	Likely
Bull Trout ( <i>Salvelinus. confluentus</i> )	Coastal/ Puget Sound DPS	Threatened, Critical Habitat Designated	Yes	Likely
<b>Mammals</b>				
Southern Resident Killer whale ( <i>Orcinus orca</i> )	Southern Resident DPS	Endangered, Critical Habitat Designated	Includes all waters in Puget Sound deeper than 20 feet	Absent
Gray Wolf ( <i>Canis lupus</i> )	Mountain Prairie Region (Region 6)	Endangered, Critical Habitat not designated	N/A	Absent

Species (Common Name and Scientific Name)	Distinct Population Segment (DPS) or Evolutionarily Significant Unit (ESU)	Federal Listing	Critical Habitat in Action Area	Potential Occurrence (Likely, Unlikely, or Absent) in Action Area
North American Wolverine ( <i>Gulo gulo luscus</i> )	N/A	Proposed Threatened, Critical Habitat not designated	N/A	Absent
Birds				
Marbled murrelet ( <i>Brachyramphus marmoratus</i> )	N/A	Threatened, Critical Habitat Designated	Designation not included in Action Area	Unlikely
Yellow-billed Cuckoo ( <i>Coccyzus americanus</i> )	N/A	Threatened, Critical Habitat Designated	Designation not included in Action Area	Unlikely
Streaked Horned Lark ( <i>Eremophila alpestris strigata</i> )	N/A	Threatened, Critical Habitat Designated	Designation not included in Action Area	Unlikely

The proposed action would have “no effect” on gray wolf, North American wolverine, yellow-billed cuckoo, or streaked horned lark and their designated critical habitat. The closest gray wolf pack is on the east side of the Cascade mountains and the closest North American wolverine observations are in high elevation areas of eastern Whatcom County (Wiles et al. 2011; Lewis et al. 2020). According to the USFWS, Whatcom County is included in the North American wolverine’s current species range; however, the wolverine requires persistent cold temperature and deep snow into the summer months for successful denning (USFWS 2022; WDFW 2022a), which is absent within the action areas. The current range of streaked horned lark in Washington is limited to south Puget Sound, the coast, and lower Columbia River islands (Anderson and Pearson 2015). The Washington Department of Fish and Wildlife (WDFW) priority habitats database does not record the presence of streaked horned lark occurring in or near the action area, and no suitable habitat for this species occurs in the project action area or vicinity (WDFW 2022b). There are no records of yellow-billed cuckoo near the repair sites (USFWS 2014; WDFW 2022b). The riparian habitat at the project site is limited to a narrow strip of shrubs and some trees along the riverward side of the levee. The surrounding area includes

agricultural fields and roadways that do not support yellow-billed cuckoo. No critical habitat for these four species is designated in the action area. Thus, these species and their critical habitat would not be affected by the proposed action and so will not be discussed further in this document.

### 3.3.1 Existing Conditions Pre-flood

#### 3.3.1.1 Puget Sound Chinook

The Puget Sound Chinook salmon ESU was listed as threatened on March 24, 1999, and revised on June 28, 2005 (NMFS 1999, NMFS 2005a).

Chinook salmon are most often found in large streams or rivers, and many stocks spawn far inland. Chinook salmon are considered main channel spawners, although they may use smaller channels and streams with sufficient flow.

Two different stocks of Chinook salmon occur in the Nooksack River, described by differences in return, or run timing (NMFS 2007a; Anchor 2003). Spring Chinook salmon are the early returning stocks and fall Chinook salmon are the late-returning stocks (Ruckelshaus et al. 2006). Spring Chinook salmon adults migrate upstream as early as February and spawn from July through October as described in Table 6 below. Juveniles of this stock remain in freshwater up to a full year before migrating to the ocean. Fall Chinook salmon adults typically migrate upstream in between July and October, and spawn between mid-September and late-November (NMFS 2007a; Anchor 2003).

Table 5. Preliminary WRIA 1 Nooksack Basin Chinook Periodicity (Anchor 2003).

<b>Spring Chinook</b>	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
River Entry												
Upstream Migration / Holding												
Spawning												
Intragravel Development												
Age-0 rearing <sup>a</sup>												
Age-0 outmigration <sup>a</sup>												????
Age-1+ rearing <sup>b</sup>												
Age-1+ outmigration <sup>b</sup>									????	????	????	????
<b>Fall Chinook</b>												
River Entry						????					????	
Upstream Migration / Holding						????						????
Spawning												????
Intragravel Development												
Fry <~55mm												
Juvenile Rearing												
Outmigration	????											???
<p>Notes: (a) Age-0 refers to fish that outmigrate as subyearlings.            (b) Age-1+ refers to fish that outmigrate as yearlings or older.</p> <p>Legend: <span style="background-color: #008000; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Months in which the species lifestage occurs in WRIA 1.  <span style="background-color: #cccccc; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Months in which the species lifestage has not been documented in WRIA 1, but Technical Team and area biologist input suggest there is a question whether the species lifestage may occur.</p>												

Spring Chinook spawn in all three forks of the Nooksack River, as well as the mainstem as far downstream as the confluence of the forks. The Ferndale Levee repair site is downstream of the spring Chinook spawning area. Fall Chinook spawn throughout the upper mainstem almost to the estuary, and in the North and South Forks. Chinook salmon are present in the action area. Spawning is unlikely to occur within the Ferndale action area (WDFW 2022c; SWIFD 2022).

Chinook salmon have two types of juvenile rearing behaviors: “ocean-type” and “stream-type.” Ocean-type fry leave for the estuary within a few months of emergence from gravel. Stream-type juveniles remain in freshwater for several months to a year before migrating to the ocean (Healey 1991). Once at sea, Chinook salmon usually spend 2 to 5 years feeding and growing before returning to freshwater to spawn (Anchor 2003).

Chinook salmon fry dominate the sub-yearling outmigration until late February or March when individual fish expressing the parr migrant life history type begin to move through the lower river. By March, a mixture of fry and parr make up the outmigration until late-April. After April, fry have generally moved through the freshwater system. Parr continue to out-migrate until late November and usually peak in June. Yearlings have out-migrated from the river by late April (Anchor 2003).

### **3.3.1.2 Puget Sound Steelhead**

The Puget Sound steelhead trout Distinct Population Segment (DPS) was listed in 2007 (NMFS 2007b). Puget Sound steelhead has three major population groups of steelhead: the Central and South Puget Sound, the Hood Canal and Strait of Juan de Fuca, and the North Cascades (NMFS 2019).

Steelhead trout exhibit considerable diversity in age at smoltification, age at return or maturation, and spawning timing. Steelhead can also be repeat spawners (iteroparity). Steelhead trout in the Puget Sound DPS exhibit two distinct life history strategies: summer run and winter run migrations. They generally reside longer in freshwater than salmon species (commonly 1 to 4 years) and use diverse tributary habitats with cool, clean water. Channel features such as side channels, adjacent small tributaries and floodplains, and abundant large wood and coarse substrate (boulders and cobble) provide important habitat for juvenile steelhead, including as cover from predators and as refuge from fall and winter floods (NMFS 2019).

Both summer-run and winter-run steelhead trout stocks are documented in the Nooksack River, however, only the winter-run steelhead are documented to spawn in the mainstem Nooksack River. Summer run (stream-maturing) steelhead trout return to freshwater during late spring and early summer in a relatively immature state and hold there until spawning in the following winter/spring (Anchor 2003; Myers et al. 2015). Historically, summer steelhead migrations were limited by migration barriers in upstream falls that were impassable except during low flows of summer and fall. Generally, their return timing coincides with river flow patterns that allow access past barriers to headwater spawning areas. Summer steelhead trout spawn in the South Fork, well upstream of the repair sites (WDFW and WWTIT 1994). Winter

run steelhead trout numerically represent the predominant life history type in Puget Sound. Winter run steelhead trout, also known as ocean-maturing steelhead, return to freshwater during the late fall and early spring months and spawn relatively soon after entering freshwater (Anchor 2003; Myers et al. 2015). Mainstem/North Fork Nooksack winter steelhead spawn in the mainstem from early winter to midsummer and could be present during the beginning of the work window (WDFW and WWTIT 1994).

### **3.3.1.3 Coastal/Puget Sound Bull Trout**

The Coastal-Puget Sound bull trout DPS was listed as threatened on November 1, 1999 (USFWS 1999). The Coastal-Puget Sound DPS is thought to contain the only anadromous form of bull trout in the coterminous United States.

Bull trout prefer cold streams, but are occasionally found in larger, warmer river systems and may use certain streams and rivers in the fall and winter when water temperatures seasonally drop. Because bull trout inhabit side channels and the margins of streams, they are highly sensitive to flow patterns and channel structure. They need complex forms of cover such as LWM, undercut banks, boulders, and pools to protect them from predators and to provide prey. Unlike other salmonids like Chinook salmon that are semelparous, bull trout are iteroparous surviving to spawn year after year. Since many populations of bull trout migrate from their natal tributary streams to larger water bodies such as rivers, lakes, and saltwater, bull trout require two-way passage for repeated spawning as well as foraging (NMFS 2007a). Bull trout express both resident and migratory life history strategies (Rieman and McIntyre 1993). Resident forms complete their entire life cycle in the tributary or nearby streams in which they spawn and rear. Migratory bull trout spawn in tributary streams, where juvenile fish rear before migrating to either a lake (adfluvial form; Downs et al. 2006), river (fluvial form; Fraley and Shepard 1989), or to saltwater in certain coastal areas (amphidromous; Brenkman and Corbett 2005). Juvenile bull trout from fluvial populations spend 1 to 4 years in their natal streams and then migrate to larger streams or rivers (Goetz et al. 2004; Goetz 2016).

Bull trout spawning occurs in the North, Middle, and South Fork Nooksack Rivers and their tributaries. Adult and subadult bull trout likely use the lower river segments for foraging, overwinter and migration from November to July. Anadromous fish exit the lower river to Puget Sound in late winter and return to the river in June and July (Goetz et al. 2004, 2007; Goetz 2016).

### **3.3.1.4 Southern Resident Killer Whale**

Southern Resident Killer Whales (SRKWs) were listed as endangered on February 16, 2006 (NMFS 2005b). Their customary range is thought to be primarily within Puget Sound, and through and within the Georgia and Johnstone Straits. SRKWs occasionally migrate as far south as Monterey Bay, California and as far north as the northern Queen Charlotte Islands in Canada (Krahn et al. 2004).

SRKWs are large mammals requiring abundant food sources to sustain metabolic processes throughout the year. Prey availability changes seasonally, and SRKW appear to depend on

different prey species and habitats throughout the year. The seasonal timing of salmon returns to southern Puget Sound River systems likely influences the movements of SRKWs out of core summer areas. Whales may travel significant distances to locate prey aggregations sufficient to support their numbers (NMFS 2006).

SRKWs spend large amounts of time in “core” inland marine waters coinciding with congregations of migratory salmon returning from the Pacific Ocean to spawn in U.S. and Canadian Rivers (NMFS 2006). The topographic and oceanographic features in these core areas include channels and shorelines that congregate prey and assist with foraging. Their core range during the spring, summer, and fall includes the inland waterways of Puget Sound, Strait of Juan de Fuca, and Southern Georgia Strait. Their occurrence in the coastal waters off Oregon, Washington, Vancouver Island, and more recently off the coast of central California in the south and off the Queen Charlotte Islands to the north has been documented. Little is known about the winter movements and range of the SRKW (NMFS 2005b).

Even though SRKWs do not directly occupy the shallow waters of the rivers, they show a strong preference for Chinook salmon (primarily Fraser River Chinook salmon), with chum salmon as the second most preferred (NMFS 2008). The survival of these whales positively correlates with Chinook salmon abundance (Ford et al. 2010). Seventy-two percent of the 396 salmon taken by killer whales sampled from 1974 to 2004 were Chinook, despite the much higher abundance of the other species (Ford et al. 2005). SRKW may occasionally include Nooksack River Chinook salmon in their diet.

#### **3.3.1.5 Marbled Murrelet**

The marbled murrelet was listed as threatened on October 1, 1992 (USFWS 1992). The major factors in marbled murrelet decline from historical levels in the early 1800s (or earlier) are loss of nesting habitat and poor reproductive success in the habitat that does remain (USFWS 1997). Other threats include gill-net fishing operations, oil spills, marine pollution, possible changes in prey abundance and distribution, overfishing, and disease (USFWS 1997).

The marbled murrelet is a robin-sized, diving seabird that spends most of its time on the ocean and flies inland to nest in old growth forest stands. The range of the marbled murrelet is defined by breeding and wintering areas that extend from the northern terminus of Bristol Bay, Alaska, to the southern terminus of Monterey Bay in central California. In Washington, this species occurs in the greatest numbers in the Puget Sound and Strait of Juan de Fuca.

Marbled murrelets nest inland in forests of large trees with large branches or deformities for use as nest platforms. Most nests are in conifers over 150 years old, and trees with a diameter at breast height greater than 55 inches. Potential suitable nesting habitat for marbled murrelets includes large trees with 4-inch platforms that typically occur at least 33 feet off the ground (USFWS 2012). Murrelets nest in mixed conifer stands varying in size from several acres to thousands of acres. However, larger, unfragmented stands of old growth appear to be the highest quality habitat.

### **3.3.2 No Action Alternative**

The No Action Alternative could result in continued erosion of the bank, especially in a flood event, and could leave the levee vulnerable to continued damage and breaching. A breach would result in inundation behind the levee with associated turbidity and potential pollution impacts to the river. A flood fight would likely be undertaken to prevent a breach and could require in-water work that could affect Chinook, steelhead, and bull trout near the emergency action site. Emergency actions would entail more in-water work and could have greater impact on aquatic dependent ESA-listed species habitat than a scheduled repair action. Flood fight actions that remove vegetation and disturb the river would have negative impacts, the severity of which is determined by timing, location, and extent, which cannot be accurately predicted. If flood fights were unsuccessful and the levee failed, inundation and possible channel migration could have considerable impacts on ESA-listed species. The size of the flood and the degree of levee failure would determine the magnitude of impacts to ESA-listed species and their critical habitat.

### **3.3.3 Flood Fight (November 2021)**

The primary effect of the 2021 emergency flood repair was disturbance related to construction noise and human activity. The emergency flood repair was limited to the upper 1/3 of the levee (Appendix A). There was no riprap placed in the water and no woody vegetation was removed to complete the emergency flood repairs. Additionally, since the construction work occurred during the peak of a flood, any impact from construction was minimized due to the flood conditions of rapidly moving, noisy and highly turbid waters. Most species of fish are not expected to occur in waters immediately adjacent to the levee during the short duration of the emergency repair. This is because this was a high energy and turbulent location that was actively eroding, which are conditions that most species of fish tend to avoid. Therefore, the emergency repairs had no effect to aquatic ESA species in the Nooksack River.

Effects on terrestrial wildlife likely included displacement of birds and other small vertebrates as a result of construction activities. Construction would have also caused temporary displacement of birds in the project area due to noise and the presence of human activity. Construction may have temporarily displaced small mammals and may have injured or caused mortality of reptiles and rodents.

### **3.3.4 Repair In-Place Alternative**

Pursuant to Section 7 of the ESA, the USACE submitted a BA to the USFWS and NMFS regarding effects of this alternative to the ESA-listed species and their critical habitat listed in Table 6. See section 8.5 for compliance details with the ESA consultation. Effects on ESA-listed species and their critical habitat would be negligible.

Table 6. Summary of Effects Determinations for ESA-listed species and designated critical habitat.

<b>Species</b>	<b>Species Effect Determination</b>	<b>Critical Habitat Determination</b>
Puget Sound Chinook salmon	May affect, likely to adversely affect	May affect, likely to adversely affect
Puget Sound Steelhead	May affect, likely to adversely affect	May affect, likely to adversely affect
Coastal/ Puget Sound Bull Trout	May affect, likely to adversely affect	May affect, likely to adversely affect
SRKW	May affect, not likely to adversely affect	May affect, not likely to adversely affect
Marbled Murrelet	May affect, not likely to adversely affect	No effect

#### **3.3.4.1 Puget Sound Chinook**

Construction activities in the work area may affect juvenile Chinook salmon if they are rearing in the project area. Impacts to Chinook salmon from the proposed levee repair would be similar to those from previous repairs. The 300 feet of Ferndale Levee repair would be completed over 4 to 6 weeks when average river flows are typically lowest. All in-water work would be completed during the in-water work window (June 15 to August 31).

Impacts from in-water work may include elevated turbidity, physical disturbance, and noise from the excavation and placement of material that could result in interruption of foraging and migration behavior, elevated stress levels, and physical damage. In general, juvenile Chinook would be the most vulnerable because of their tendency to seek refuge along the shoreline.

Physiological effects of increased turbidity can include gill trauma (Noggle 1978; Servizi and Martens 1987; Redding and Schreck 1987), and affect osmoregulation, blood chemistry (Sigler, 1988), growth, and reproduction. Behavioral responses include feeding disruption from olfactory and visual impairment (Sigler 1988), gill flaring, and curtailment of territorial defense (LaSalle 1988). Turbidity would be monitored (Appendix C, Water Quality Monitoring Plan) during in-water work to track compliance with water quality standards, thereby minimizing its effects on aquatic biota.

The proposed action could produce underwater sound from the removal and placement of rock along the shoreline. The construction activity's greatest underwater sound levels would be generated by removal and placement of rock below the waterline. Work conducted above the waterline could create sound that propagates through the ground to the water, albeit at a lower level than the source (Reinhall and Dahl 2011; Hawkins and Johnstone 1978). Studies directly measuring underwater sound from underwater rock placement are lacking (Wyatt 2008; Kongsberg Maritime Limited 2015). Underwater sound generated from rock placement

along a riverbank has not been studied. One study did measure sound from rock placement from a vessel through a steel/high-density polyethylene pipe in an open-water marine environment. This study measured sound levels up to 120 decibels (dB), which were attributed primarily to the vessel (Nedwell and Edwards 2004). Underwater removal of rock conducted under the proposed action has similarities with backhoe dredging with respect to the equipment and material involved. A backhoe dredge is significantly larger and more powerful than excavators that would be used to conduct work under the proposed action, so the sound created by a backhoe would be louder than what would occur from the proposed action. Sound from backhoe dredging was measured between 124 and 148 dB at 60 meters by Reine et al. (2012). The authors estimated a maximum intensity at 1 meter of 179 dB.

NMFS fish injury thresholds for both continuous and pulsed sound are 183 dB for cumulative sound and 206 dB for peak sound (NMFS et al. 2008). The limited data available suggests sound potentially created by the proposed action would not exceed these thresholds and therefore not cause fish injury. Popper et al. (2014) and Reine et al. (2012) both indicate there is no direct evidence for fish mortality or mortal injury from continuous sound such as that resulting from the proposed action.

The NMFS threshold for fish harassment is 150 dB (NMFS et al. 2008). It is possible this harassment threshold could be exceeded by the proposed in-water excavation work based on Reine et al. (2012) discussed above. If this were to occur, it would result in salmon moving away from the immediate project site. This behavior is likely to occur regardless simply due to the ground and water disturbance associated with removing and placing rock along the levee. Since the river is approximately 230 feet wide at the Ferndale site, it is anticipated that the harassment threshold would extend across the river during rock placement activities. Exceedance of this threshold would be intermittent and would occur only during rock placement activities below the waterline. It is anticipated that intermittent passage would occur during breaks in the in-water rock placement work and at night when work is not occurring. Potential noise impacts would be minimized by operating within the approved fish window, which is based on a time when migrating salmonids are least likely to be present.

Bank excavation and placement of rock in the water may lead to elevated turbidity levels downstream. Suspension of sediments can increase biochemical oxygen demand and reduce dissolved oxygen levels in the water. Juvenile salmonids are naturally exposed to some elevation in suspended sediment levels in estuaries and in streams carrying heavy loads of glacial silt (Gregory and Northcote 1993). Therefore, juvenile salmonids have some tolerance to such levels of turbidity, but ideal conditions tend toward lower turbidity levels. For the proposed action, rock that looks “clean” of soil or sediment (no clumps of soil material evident or sloughing off the rock when it is moved) would be used, and turbidity during project construction would be continually monitored as outlined in the water quality monitoring plan (Appendix C). All in-water construction work would take place during the established in-water work window (June 15 to August 31) to reduce temporary increases in turbidity and potential

related effects on juvenile salmonids. Construction techniques, sequencing, and timing would minimize soil disturbance to the extent practical to reduce the generation of turbidity during construction. Similarly, implementation of BMPs such as placement of staging areas in uplands, minimizing the number of trips heavy equipment makes through the site, and revegetation of disturbed areas would further reduce the duration and magnitude of the temporary increases in turbidity. If a plume is noted, measurements would be taken 300 feet downstream of the project at the downstream point of compliance, which allows for permissible mixing and dilution of any released sediment (Appendix C). It is anticipated that effects of increased turbidity would be insignificant. If rain occurs during construction, it is possible that soil would be washed into the river thereby increasing turbidity, although this should be minimized by BMPs and construction timing during summer months when rainfall is less frequent.

The shoreline at the Ferndale repair site is heavily modified and lacks a natural riparian buffer. The temporary loss of 300 LF of riparian vegetation at the Ferndale site could decrease organic input to the river and decrease shading. This would negatively impact foraging opportunities from insect fall for fish that juvenile Chinook forage on. This loss can be offset by the mitigation described in Section 2.6. The plantings would mitigate impacts to aquatic species (including ESA-listed salmonids) and water quality in the Nooksack River, which the Ecology has placed on the 303(d) list for pH, dissolved oxygen, and temperature.

#### **3.3.4.2 Puget Sound Steelhead**

Potential effects to Puget Sound steelhead trout from the proposed repairs to the Ferndale Levee are similar to those listed above for Chinook salmon. However, there is a reasonable expectation that more steelhead adults and juveniles would be present in the action area than Chinook salmon because steelhead can be present in freshwater year-round as compared to the more transitory Chinook salmon.

#### **3.3.4.3 Coastal/Puget Sound Bull Trout**

Potential effects from the proposed repairs to the Ferndale Levee are similar to those listed above for Chinook salmon.

#### **3.3.4.4 Southern Resident Killer Whale**

Repairs to the Ferndale Levee would not directly affect SRKW, as they do not inhabit the project or action area. There is potential for indirect impacts through project effects to their prey base, which includes Chinook and chum salmon, but effects would have no influence on population levels of the prey species. Construction related impacts to these prey species would be minor and temporary and would be partially mitigated as described in Section 2.6. Because the percentage of Nooksack River Chinook and chum salmon that make up the SRKW diet is likely small, the USACE expects little to no discernable effect to their food base.

#### **3.3.4.5 Marbled Murrelet**

The action area does not have suitable habitat that supports consistent, long-term breeding, rearing, and foraging by marbled murrelets. Marbled murrelets rely on old-growth forest for successful nesting. Vehicle traffic, urban and suburban development, and agriculture are all nearby. Noise and activity from project construction would resemble that already present. Given the project location between Puget Sound and inland nesting areas to the east, there is the potential that marbled murrelets could fly over the action area while transiting between the inland and marine areas. The additional noise and disturbance generated by the project for 4 to 6 weeks of construction is not expected to affect marbled murrelets flying over the area. Because marbled murrelets are unlikely to detect any change while flying past the construction sites, effects are expected to be discountable.

### **3.4 FISH AND WILDLIFE**

#### **3.4.1 Existing Conditions Pre-flood**

In addition to the ESA-listed species identified in Section 3.3, the Nooksack River is home to numerous aquatic and terrestrial species. Of all the drainages in Water Resource Inventory Area (WRIA) 1 (Nooksack Basin), the Nooksack is the largest and produces the greatest abundance of salmonids and the greatest number of salmonid stocks (Smith 2002). Additionally, other freshwater aquatic species that may occur within the project area include but are not limited to various species of sculpins, minnows, suckers, smelt, and dace (WDFW 2023). Recent species observations in the Nooksack River include threespine stickle back, pumpkinseed, largemouth bass, bluegill, and black crappie (iNaturalist 2023). Impacts to species would be similar to those discussed above for the ESA-listed salmonid species. Primary impacts to aquatic species would include vibration and noise disturbance because of the heavy equipment, as well as turbidity during active excavation and/or placement of rock. Species would likely be displaced from the project area during in-water work; however, species are expected to return to the area once construction is complete. The majority of individuals are expected to avoid the area during construction, however, some individuals of bottom dwelling species, such as sculpins, could be killed during active excavation and rock placement.

Washington Birder (2022) lists 369 species in Whatcom County, which covers approximately 2,210 square miles with a vast diversity of habitats throughout the county. Local birders have recorded observations of 338 different species within Whatcom County (eBird 2022). Birders at Pioneer Park, located South of the Ferndale repair site, have recorded 53 different species (eBird 2022). Observed species include a variety of passerines, waterfowl, swallows, raptors, and others that may use the project area and riparian habitat for nesting, feeding, and other life requirements (eBird 2022). Recent observations within the project area include but are not limited to golden-crowned sparrow, yellow-rumped warbler, tree swallow, mallard, trumpeter swan, red-tailed hawk, and bald eagle. Primary impacts to local birds would include noise and human disturbance during construction. Birds are expected to temporarily avoid the project area during construction but would be expected to return to the area when construction is complete.

The repair site is surrounded by human development, including agricultural fields, parks, residential homes, roads, railroads, and industrial businesses. Terrestrial species inhabiting the area are limited to those acclimated to co-existing with humans in disturbed and developed areas. Mammal species using the action area include but are not limited to black-tailed deer, raccoons, coyote, ground squirrels, and shrews (iNaturalist 2023). Primary impacts to local mammals would include noise and human disturbance during construction. Individuals may temporarily avoid the project area during construction but would be expected to return to the area when construction is complete.

### **3.4.2 No Action**

The No Action Alternative could result in continued erosion of the bank, especially in a flood event, and could leave the levee vulnerable to continued damage and breaching. A breach would result in inundation behind the levee with associated severe turbidity and potential pollution impacts to the river. A flood fight would likely be undertaken to prevent a breach. Such activities would likely cause fish and wildlife to leave the area. Emergency actions would entail more in-water work and vegetation clearing that would have greater impact on fish and wildlife than a scheduled repair action. The exact effect to fish and wildlife associated with emergency flood actions is difficult to quantify or predict but does have the potential to be considerable if the flood event warrants repairs at a damaged site.

### **3.4.3 Flood Fight (November 2021)**

The November 2021 emergency flood repair was limited to the upper 1/3 of the levee (Appendix A). There was no riprap placed in the water and no woody vegetation was removed to complete the emergency flood repairs. Additionally, since the construction work occurred during the peak of a flood, any impact from construction was minimized due to the flood conditions of rapidly moving, noisy and highly turbid waters. Most species of fish are not expected to occur in waters immediately adjacent to the levee during the short duration of the emergency repair. This is due to the fact that this was a high energy and turbulent location that was actively eroding, which are conditions that most species of fish avoid. Therefore, the emergency repairs had no effect to aquatic species in the Nooksack River.

Effects on terrestrial wildlife likely included displacement of birds and other small vertebrates as a result of construction activities. Construction would have also caused temporary displacement of birds in the project area due to noise and the presence of human activity. Construction may have temporarily displaced small mammals and may have injured or caused mortality of reptiles and rodents.

### **3.4.4 Repair In-Place Alternative**

Repairs under this alternative would cause short-term impacts to fish and wildlife. Impacts to fish would be similar to those described in section 3.3.3. The primary impacts would be a temporary increase in turbidity and noise, vibration, and human activity caused by heavy equipment use. These impacts may temporarily displace fish and wildlife during the 4 to 6 weeks of construction, but fish would be expected to return as soon as construction is complete. Effects to fish and wildlife due to this alternative would be temporary and localized.

## **3.5 CULTURAL RESOURCES**

### **3.5.1 Existing Conditions**

The USACE initiated consultation with the Washington State Historic Preservation Officer (SHPO) on the Area of Potential Effect (APE) on February 6, 2023. The SHPO agreed with the APE on the same day. The USACE also coordinated with the Lummi Indian Nation, Nooksack Indian Tribe, Samish Indian Nation, Suquamish Indian Tribe of the Port Madison Reservation, Swinomish Indian Tribal Community, and the Tulalip Tribes seeking information on historic properties of cultural or religious significance that may be affected. USACE has not received any responses from Tribes.

### **3.5.2 No Action**

The No-Action Alternative would have no impact on cultural resources within the APE. Under this alternative, the USACE would not repair the levee, and the threat of future levee failures would increase. As the no action would not be considered an undertaking, as defined in 36 CFR 800, this alternative would be considered to have no potential to effect cultural resources. This alternative would result in continued degradation of the levees through natural processes. It is likely that at an unknown time the levees would fail causing irreparable damage to the structure potentially causing an adverse effect to historic structures behind the levee that are potentially eligible for inclusion on the National Register of Historic Places (NRHP).

### **3.5.3 Flood Fight (November 2021)**

Actions taken were those needed to temporarily maintain the structural integrity of the levee until such time that full emergency repairs could be completed. In the aggregate, the November 2021 flood fight, considered in conjunction with the prospective permanent repair (Repair In-Place Alternative at Ferndale Levee), would have no impacts to Historical and Cultural Resources as there are no historic properties within the project APE.

### **3.5.4 Repair In-Place Alternative**

A USACE archaeologist reviewed available information and identified that portions of the APE that would be disturbed have been previously surveyed and found that there are no historic properties present within the APE. On March 13, 2023, the USACE sent a letter to the SHPO documenting the USACE's proposed finding of no historic properties affected. The SHPO responded by letter dated March 14, 2023, concurring with the USACE's finding with the stipulation that for an unanticipated find plan in case historic properties are encountered during construction. Under this alternative, the Ferndale levee would be repaired and would result in no historic properties affected, as there are no historic properties within the project APE (Appendix D).

## **3.6 AIR QUALITY AND NOISE**

### **3.6.1 Existing Conditions Pre-flood**

Air quality in Whatcom County and at the site is regulated by the Northwest Clean Air Agency (Ecology 2023a). The main sources of outdoor air pollution include, but are not limited, to agricultural activities, wood stoves, motor vehicles, and burning (US EPA 2023).

Under the Clean Air Act, the Environmental Protection Agency (EPA) sets standards for air quality to regulate harmful pollutants. National ambient air quality standards are set for six common air pollutants: ozone, carbon monoxide, nitrogen dioxide, particulate matter (solid and liquid particles suspended in the air), sulfur dioxide, and lead. Areas that do not meet the national ambient air quality standards are designated non-attainment areas. The EPA sets de minimis thresholds for pollutants in non-attainment areas. National ambient air quality standards are met across Washington State, but Ecology and other clean air agencies continue to monitor air quality at 55 locations (Ecology 2023b).

The EPA established the Air Quality Index (AQI) as a simplified tool for communicating daily air quality forecasts and near real-time information to people for planning their daily activities. The AQI indicates how clean or polluted air is and what associated health effects might be a concern. It focuses on health effects that may be experienced within a few hours or days after breathing polluted air. An AQI value of 100 generally corresponds to the air quality standard for the pollutant set to protect public health. A higher AQI indicates higher levels of air pollution and greater health concern.

The project site and its surroundings have been developed with a wide variety of human activities contributing to ambient noise levels. Human-related existing noise sources at the project site include traffic, construction, internal combustion engines, and agricultural activities.

### **3.6.2 No Action**

The No Action Alternative would have no direct effect on air quality or noise. Emergency actions may be required to maintain safety and protect property in the event of a flood. These actions would likely have similar air emissions and noise effects as the preferred alternative but could differ depending on timing and scope of the emergency action. Effects to air quality and noise would be temporary and within the range of intensity of noise produced by on-going activities in the area. Effects on air quality and noise would be negligible.

### **3.6.3 Flood Fight (November 2021)**

Construction vehicles and heavy equipment used during the emergency repair resulted in a short-term localized increase in gasoline and diesel exhaust fumes. The small area of construction and the short duration of the work limited the impact to air quality. Emissions generated by the activity were minor and short-term and well below the *de minimis* threshold. Unquantifiable but insignificant exacerbation of effects of carbon dioxide (CO<sub>2</sub>) emissions on global climate change would be anticipated from the completed flood fight activities.

Construction-related traffic may have caused temporary increases to, and disruption of, local traffic. Flaggers and signs were used, as needed, to direct traffic safely around the construction site.

### **3.6.4 Repair In-Place Alternative**

Construction vehicles and heavy equipment used in construction would temporarily and locally generate increased gasoline and diesel exhaust fumes. The small area of construction and the

short duration of the activities would limit the impact to air quality. The proposed project would constitute routine repair of an existing facility, generating an increase in direct emissions of a criteria pollutant or its precursors that would be *de minimis*, and would therefore be exempt by 40 CFR Section 93.153(c)(2)(iv) from the conformity determination requirements. Emissions generated by the construction activity are expected to be minor, short-term, and would not affect the implementation of Washington's Clean Air Act implementation plan. Unquantifiable but negligible exacerbation of effects of CO<sub>2</sub> emissions on global climate change would be anticipated.

During construction activities, there would be a localized increase in ambient noise levels from equipment operation. Proposed repairs would be conducted during daylight hours from 7 AM to 7 PM to limit noise impacts on surrounding properties. Construction-related traffic may cause temporary increases to local traffic, which is expected to cause a minor increase vehicle emissions. Effects on air quality and noise would be negligible.

### **3.7 LAND USE, UTILITIES, AND INFRASTRUCTURE**

#### **3.7.1 Existing Conditions Pre-flood**

Land use in the vicinity of the levee is a mix of residential, commercial, and agricultural. The city of Ferndale is north of the Ferndale Levee. Landward of the Ferndale Levee is Ferndale Road, the Ferndale Wastewater Treatment Plant, and the ConocoPhillips Sports Complex. The repair footprint does not include public roads; however, Ferndale Road is located behind the levee, and the levee crest, are used by the public and non-federal Sponsor. The treatment plant receives and treats domestic sewage from residential, institutional, and commercial businesses. The plant also accepts and treats some trucked landfill leachate (Wilson Engineering, LLC 2016).

#### **3.7.2 No Action**

Under the No Action Alternative, a higher risk exists for flood damage to land use, utilities, and infrastructure. If the levee isn't repaired, and flooding occurs due to breaches in weak sections of the levee, public infrastructure could be damaged or lost and local area traffic could be affected. This could affect commercial traffic, access to private residences, evacuations, and emergency response services. Depending on the severity of flooding, emergency flood fight efforts may occur to protect lives and property. These activities and local efforts to maintain the levees are expected to be sufficient to maintain existing land use, utilities, and infrastructure. Effects on land use, utilities, and infrastructure would be negligible.

#### **3.7.3 Flood Fight (November 2021)**

The 2021 flood fight prevented the potential disruption of utilities, public services, and infrastructure if the levee had failed. During construction activities, vehicles and equipment associated with the project may have disrupted local traffic due to merging, turning, and traveling together. These construction effects were temporary in nature, and once repairs were completed, traffic returned to normal use.

#### **3.7.4 Repair In-Place Alternative**

Under this alternative there would be minor and temporary impacts to land use, utilities, and

infrastructure. Land use in the project area would not change but may be disrupted temporarily from construction activities and equipment. Repair activities avoid the drain field behind the Pilchuck Levee. Before work is started, a utility locate would be completed to verify the presence and absence of utilities in the construction footprints. Construction-related traffic may cause temporary increases to, and disruption of, local traffic. Flaggers and signs would be used, as needed, to direct traffic safely around the construction site. Existing infrastructure would not be altered to prevent their intended purpose and use. Damaged utilities and infrastructure would be replaced or repaired as necessary. Effects to land use, utilities, infrastructure, and traffic would be negligible.

### **3.8 ENVIRONMENTAL JUSTICE; EXECUTIVE ORDER 12898, ENVIRONMENTAL JUSTICE IN MINORITY POPULATIONS AND LOW-INCOME POPULATIONS, AND EXECUTIVE ORDER 14008, TACKLING THE CLIMATE CRISIS; EO 13985 & 14091, ADVANCING RACIAL EQUITY AND SUPPORT FOR UNDERSERVED COMMUNITIES THROUGH THE FEDERAL GOVERNMENT; EO 14096, REVITALIZING OUR NATION’S COMMITMENT TO ENVIRONMENTAL JUSTICE FOR ALL**

“Environmental Justice” is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income regarding the development, implementation, and enforcement of environmental laws, regulations, and policies, with no group bearing a disproportionate burden of environmental harms and risks. Environmental justice and disproportionate impacts to disadvantaged communities shall be considered throughout the civil works programs and in all phases of project planning and decision-making, consistent with the goals and objectives of various Administration policies.

Executive Order (EO) 12898 directs Federal agencies to take the appropriate steps to identify and address any disproportionately high and adverse human health or environmental effects of Federal programs, policies, and activities on minority and low-income populations. Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, and Pacific Islander. A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than in the general population. EO 14008 updates EO 12898 and has expanded Federal agencies’ responsibilities for assessing environmental justice consequences of their actions. EO 13985, EO 14091, and EO 14096 charge the Federal Government with advancing equity for all, including communities that have long been underserved, and addressing systemic racism in our Nation's policies and programs.

#### **3.8.1 Existing Conditions Pre-flood**

An analysis of demographic data was conducted to derive information on the approximate locations of low-income and minority populations in the community of concern. Since the analysis considers disproportionate impacts, three areas were defined to compare the area affected by the project and a larger regional area that serves as a basis for comparison and includes the area affected. The larger regional area is defined as the smallest political unit that includes the affected area and is called the community of comparison. For purposes of the

analysis, the affected area is approximately a 5-mile radius around the project area, and the city of Ferndale, Washington is the community of comparison. Demographic information was also compared against the State of Washington for reference. The EPA's Environmental Justice (EJ) Screening and Mapping tool, also known as the EJScreen tool, was used to obtain the study area demographics (EPA 2023a).

The aggregate minority population is estimated at 23 percent in the affected area, 23 percent in the city of Ferndale, and 33 percent in the State of Washington (EPA 2023a, Appendix E). The aggregate population percentage in the affected area does not exceed 50 percent and is less than the state average. The EO does not provide criteria to determine if an affected area consists of a low-income population. For purposes of the assessment, the Council on Environmental Quality (CEQ) criterion for defining low-income population was adapted to identify whether the population in an affected area constitutes a low-income population. An affected geographic area is considered to consist of a low-income population (i.e., below the poverty level, for purposes of this analysis) where the percentage of low-income persons: 1) is greater than 50 percent, or 2) is meaningfully greater than the low-income population percentage in the general population or other appropriate unit of geographic analysis. The U.S. Census Bureau poverty assessment weighs income before taxes and excludes capital gains and non-cash benefits (such as public housing, Medicaid, and food stamps). The aggregate low-income population is estimated at 28 percent in the affected area, 27 percent in the city of Ferndale, and 24 percent in the State of Washington (EPA 2023a, Appendix E). The percentage in the affected area (28 percent) does not exceed 50 percent. Therefore, affected area is not considered to have a high concentration of low-income population.

The EPA's EJScreen tool also provides an index on environmental indicators (EPA 2023a). The EJ index is a combination of environmental and demographic information. There are 12 EJ Indexes in EJScreen reflecting the 12 environmental indicators. The EJ Index uses the concept of "excess risk" by looking at how far above the national average the block group's demographics are. EPA considers a project to be in an area of potential EJ concern when an EJScreen analysis for the impacted area shows one or more of the 12 EJ Indexes at or above the 80<sup>th</sup> percentile in the nation and/or state. The area containing the repair and 5-mile buffer is over the 80<sup>th</sup> percentile for two of the EJ indexes. The Air Toxics Cancer Risk is between the 80<sup>th</sup> and 90<sup>th</sup> percentile and the Air Toxics Respiratory Hazard Index (HI) is between the 70<sup>th</sup> and 80<sup>th</sup> percentile (EPA 2023a, Appendix E). The area containing the city of Ferndale is over the 80<sup>th</sup> percentile for two of the EJ indexes. The Air Toxics Cancer Risk and the Air Toxics Respiratory HI is between the 80<sup>th</sup> and 90<sup>th</sup> percentile for both indexes (EPA 2023a, Appendix E).

According to the EPA, air toxics are defined as airborne substances that cause or may cause serious health, environmental, or ecological effects (EPA 2023b). EPA has identified 188 pollutants as air toxics in Section 112 of the Clean Air Act (EPA 2023b). The EPA's AirToxicScreen Mapper was used to identify cancer risk by air toxic and source type in the city of Ferndale, Whatcom County, Washington (EPA 2023c, Appendix E).

Additionally, as part of the environmental justice analysis, the CEQ's Climate and Economic

Justice Screening Tool was examined for disadvantaged communities. Communities are considered disadvantaged if they are in a census tract that meets the threshold for at least one of the tool's categories of burden and corresponding economic indicator or are on the lands of a Federally Recognized Tribe. The project site is not located within a disadvantaged track (CEQ 2023).

### **3.8.2 No Action**

The NLD estimates that the levee system, of which Ferndale is a part, protects approximately 747 people, 327 buildings, and \$90.4 million worth of property value (NLD 2022). In the damaged condition, the levee presently provides an approximate 1-year LOP. The levee would likely be further damaged in future flood events and could fail, which would endanger homes, businesses, the wastewater treatment facility, and other public infrastructure.

### **3.8.3 Flood Fight (November 2021)**

The emergency flood repair provided protection to homes, businesses, the wastewater treatment facility, and other public infrastructure. Without the emergency repair, the levee would have continued to erode during the flood, which could have resulted in levee failure. Construction vehicles and heavy equipment used during the emergency repair resulted in a short-term localized increase in gasoline and diesel exhaust fumes. The small area of construction and the short duration of the work limited the impact to air quality. Construction-related traffic may have caused temporary increases to, and disruption of, local traffic. Flaggers and signs were used, as needed, to direct traffic safely around the construction site. However, construction occurred during peak flooding when the levee was actively being damaged. It is likely that the public would have avoided this area at this time regardless of construction due to safety concerns. Overall, the emergency repair provided a benefit to persons, including disadvantaged minority, low-income, and Tribal communities, residing in the floodplain who may have otherwise been affected by flooding. Thus, there are no disproportionate adverse impacts imposed on those communities, as compared with the larger reference population, through repair of the levee.

### **3.8.4 Repair In-Place**

The preferred alternative of repair of existing levee system does not involve a facility siting decision and would not disproportionately affect minority or low-income populations nor have any adverse human health impacts. The area is over the 80<sup>th</sup> percentile for two of the EJ indexes. The project would not cause long-term increases to any of the 12 EJ indexes. Only minor and temporary increases related to construction equipment emissions are anticipated. Other EJ Indexes unrelated to emissions would remain unaffected (e.g., Superfund proximity, wastewater discharge indicator, etc.). The project maintains flood protection for the affected area. If the preferred alternative is not implemented, communities would experience greater flood risk. Flooding could impact the existing wastewater treatment facility as well as numerous residences and businesses located behind the levee. Any potential damage to the existing infrastructure behind the levee would negatively impact local disadvantaged communities. No interaction with other projects would result in any such disproportionate impacts. No cumulative impact to environmental justice is expected from interaction of the proposed levee repairs with other past, present, and reasonably foreseeable projects. Further, Tribal

governments that are also environmental justice communities in the project area have been engaged and informed about the proposed action. The proposed action would not directly or through contractual or other arrangements, use criteria, methods, or practices that discriminate on the basis of race, color, or national origin, nor would it have a disproportionate effect on minority or low-income communities.

Because the levee protects the area from overflowing of the Nooksack Rivers, the area of analysis for environmental justice purposes also includes the floodplain for these rivers. The preferred alternative, which repairs the Ferndale Levee to its pre-damage LOP, would provide a universal benefit to persons, including disadvantaged minority, low-income, and Tribal communities, residing in the floodplain. Thus, there are no disproportionate adverse impacts imposed on those communities, as compared with the larger reference population, through repair of the levee.

### **3.9 RECREATION**

#### **3.9.1 Existing Conditions Pre-flood**

Several outdoor recreational activities occur within the project vicinity. A walking trail along the levee crest is accessible for public use. Additionally, the ConocoPhillips Sports Complex, located landward of the proposed repair site, is a multi-million-dollar sports facility consisting of four softball fields, two soccer fields, and numerous walking paths that wind throughout the complex (City of Ferndale 2023).

#### **3.9.2 No Action**

Under the No Action Alternative, a higher risk exists for flood damage to recreation. If the levee isn't repaired, and flooding occurs due to breaches in weak sections of the levee, recreational use behind the levee could be interrupted or damaged. Depending on the severity of flooding, emergency flood fight efforts may occur to protect lives and property. These activities and local efforts to maintain the levees are expected to be sufficient to maintain existing recreation. Effects on recreation would be negligible.

#### **3.9.3 Flood Fight (November 2021)**

The November 2021 emergency flood repair temporarily impacted recreational access to the levee trail and ConocoPhillips Sports Complex. However, construction occurred during peak flooding when the levee was actively being damaged. It is likely that the public would have avoided this area at this time regardless of construction due to safety concerns.

#### **3.9.4 Repair In-Place**

Under this alternative there would be minor and temporary impacts to recreation. Construction would not prevent recreational activities or change recreational facilities and property. However, due to its proximity to various recreational facilities in the area, construction operations may cause temporary and minor impacts from construction related traffic and noise, which would not persist after repairs are completed. Effects to recreation would be negligible.

## **4 UNAVOIDABLE ADVERSE EFFECTS**

Unavoidable adverse effects associated with the preferred alternative at each site would be the following: (1) temporary and localized increases in noise, activity, and emissions that may affect fish and wildlife in the area; (2) temporary and localized disruption of local traffic by construction activity and vehicles; (3) irretrievable commitment of fuels and other materials for repairs; (4) temporary and localized increase in turbidity levels during in-water construction, which may affect aquatic organisms in the area; and (5) removal of vegetation from within the proposed construction areas in the riparian zone. The vegetation removal has the longest duration of impact due to the length of time needed for vegetation to regrow to a similar size. Vegetation loss would be mitigated by the proposed plantings.

## **5 COMPENSATORY MITIGATION**

As mitigation for loss of vegetation on the riverward slope due to construction activities, the USACE would complete the mitigation described in Section 2.6. The plantings would provide a source of organic input to the Nooksack River and would offset project impacts to aquatic and terrestrial species.

The USACE would inform the non-federal Sponsor that the mitigation is part of the repair and should only be trimmed to the minimal amount necessary to retain adequate visual fields for inspection. The USACE would maintain and monitor the plantings for 1 year after construction to ensure 80 percent survival. If less than 80 percent survival is recorded after one year, the USACE would replace all the dead plants (via mechanical installation or hand installation) and would monitor for an additional growing season.

## **6 CUMULATIVE EFFECTS**

The CEQ regulations implementing NEPA defines cumulative effects 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 in the project vicinity, regardless of what agency (Federal or non-federal) or person undertakes such other actions (40 CFR §1508.7).

The Nooksack River Basin has been substantially modified in the last 150 years. Dams, levees, irrigation projects and other water extraction and control projects have confined the river, impacted water quality, and altered flows. Riparian habitat has been lost, side channel and other floodplain features have been cut-off, salmonid populations have steeply declined. The proposed repairs contribute to these impacts by maintaining the negative effects of a stabilized riverbank, disallowing river meandering, and cutting off connection to the floodplain.

As the local non-federal Sponsor, the city of Ferndale continues to maintain the levee system and conducts periodic repairs and vegetation maintenance to the levees it oversees. These actions by the local Sponsor maintain the status quo of degraded riverine habitat. Future

flooding on the Nooksack River and its tributaries is likely to damage non-federal structures. Non-federal entities would likely undertake at least some repair actions under those circumstances and may seek Federal assistance with repairs or emergency responses. In November 2021, the Nooksack River experienced record flooding. It is possible that additional damage sites were created by this event and the local Sponsor could request Federal assistance from the USACE for additional repairs. If the USACE determines that the damages are eligible for assistance under the Public Law 84-99 Levee Rehabilitation Program, then additional repairs would take place. The scope and effects of those actions would likely be similar to those of the present action.

Historic modifications within the watershed have included commercial and residential development, farming, and extensive road development, which have substantially modified the river, watershed hydrology and water quality, and the habitat in the floodplain. Agricultural practices would continue to occur throughout the basin in the foreseeable future, consistent with current practices. Future development, including residential or commercial construction, road development, and expansion of water, sewer, and other utilities, is expected as the surrounding community and regional population grow, and these would add to the effects of past activities.

Repairs to the Ferndale Levee, as addressed in this EA, would maintain but not appreciably add an increment of ecological losses in the active floodplain at the repair in-place site. When evaluated in the context of past, present, and reasonably foreseeable future actions, the proposed project would not result in significant incremental detrimental effects when considered in conjunction with other past and present actions, and future proposals.

## **7 COORDINATION**

The following agencies and entities have been contacted during the environmental coordination of the proposed project:

- U.S. Fish and Wildlife Service
- National Marine Fisheries Service
- Washington Department of Ecology
- Washington State Historic Preservation Officer
- Samish Indian Nation
- Lummi Nation
- Nooksack Indian Tribe
- Suquamish Indian Tribe
- Swinomish Indian Tribal Community
- Tulalip Tribes

A notice of preparation (NOP) was issued on February 16, 2023, inviting the public, interested agencies, and Tribes to comment on the proposed levee repair. The comment period ended on

March 18, 2023. Two comments were received (Appendix G).

## **8 ENVIRONMENTAL COMPLIANCE**

This EA is being prepared pursuant to Sec. 102(C) of the NEPA, and includes compliance with other laws, regulations, and EOs as discussed below.

### **8.1 BALD AND GOLDEN EAGLE PROTECTION ACT**

The Bald and Golden Eagle Protection Act (16 U.S.C. § 668-668d) prohibits the taking, possession or commerce of bald and golden eagles, except under certain circumstances. Amendments in 1972 added to penalties for violations of the act or related regulations.

A USACE biologist attended a site visit during the alternatives formulation phase and did not observe any eagle nests at the project sites (USACE 2022a). Additionally, as recommended by the USFWS, the biologist examined iNaturalist, which did not show any eagle nests within the project vicinity (iNaturalist 2023). No take of either bald or golden eagles is likely through any of the proposed actions, since there are no known nests near any of the work locations.

### **8.2 CLEAN AIR ACT OF 1972**

The Clean Air Act as Amended (42 U.S.C. § 7401 et seq.) prohibits Federal agencies from approving any action that does not conform to an approved State or Federal implementation plan. The operation of heavy equipment, removal and placement of rock, and the operation of vehicles during construction would result in increased vehicle emissions and a slight increase in fugitive dust. These effects would be localized and temporary. The project area is not part of a non-attainment area (Ecology 2023b). The USACE has determined that the proposed repairs constitute a routine facility repair generating an increase in emissions that is clearly *de minimis*, and thus a conformity determination is not required, pursuant to 40 CFR 93.153 (c)(2)(iv).

### **8.3 CLEAN WATER ACT**

The Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.) is more commonly referred to as the Clean Water Act (CWA). This act is the primary legislative vehicle for Federal water pollution control programs and the basic structure for regulating discharges of pollutants into waters of the U.S. The CWA was established to “restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” The CWA sets goals to eliminate discharges of pollutants into navigable waters, protect fish and wildlife, and prohibit the discharge of toxic pollutants in quantities that could adversely affect the environment.

This EA evaluates possible impacts to water quality, primarily with respect to suspended solids, turbidity, and temperature. The proposed permanent repair action would require work in the active channel with some work below OHWM for most of the repair along the Ferndale Levee, approximately 300 feet including necessary transitions at the upstream and downstream ends of the repair. Construction could cause minor, temporary, localized increases in turbidity. BMPs, including restrictions on fueling and prevention of fluid leaks from construction equipment, would be employed to minimize and avoid discharge of pollutants into the river.

Three sections of the CWA are pertinent to the proposed actions: Section 401 covers water quality standards and evaluation of the effects discharges would have on those standards; Section 402 addresses non-point discharges including, but not limited to, stormwater runoff from construction sites; and Section 404 addresses discharge of fill into Waters of the U.S. Requirements of those three CWA sections are briefly discussed below.

**Section 404 and 401:** The USACE does not issue Section 404 permits to itself for its own civil works activities, but the USACE accepts responsibility for the compliance of its civil works projects with substantive requirements of Sections 401 and 404 under the CWA. Pursuant to 404(f)(1)(B) (33 U.S.C. 1344(f)(1)(B)), “[T]he discharge of dredged or fill material . . . for the purpose of maintenance, including emergency reconstruction of recently damaged parts, of currently serviceable structures such as dikes, dams, levees, groins, riprap, breakwaters, causeways, and bridge abutments or approaches, and transportation structures...is not prohibited by or otherwise subject to regulation under this section....” Pursuant to 33 CFR323.4(a)(2), the implementing definition of “maintenance” is: “Maintenance, including emergency reconstruction of recently damaged parts, of currently serviceable structures such as dikes, dams, levees, groins, riprap, breakwaters, causeways, bridge abutments or approaches, and transportation structures. Maintenance does not include any modification that changes the character, scope, or size of the original fill design. Emergency reconstruction must occur within a reasonable period of time after damage occurs in order to qualify for this exemption.” This project remains within the same prism, profile, and footprint of the original project, and is replacing a rock armor layer with another rock armor layer. As such, it does not present a change in the character, scope, or size of the original fill design. Therefore, the proposed project does not include fill requiring consideration under Section 404, and the project is not subject to regulation under Section 404 of the CWA. Since the project does not result in any discharge into waters of the U.S. regulated under Section 404, Section 401 Water Quality Certification is not required.

**Section 402:** Section 402 of the CWA is triggered when a construction site would have greater than 1 acre of ground disturbance. The proposed repair would not exceed 1 acre of ground disturbance (Table 1).

#### **8.4 COASTAL ZONE MANAGEMENT ACT OF 1972**

The Coastal Zone Management Act (CZMA) of 1972 as amended (16 U.S.C. §1451-1464) requires Federal agencies to conduct activities in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved State Coastal Zone Management (CZM) Program, which includes several State laws. USACE has determined that this project is substantively consistent with the enforceable policies of the State Clean Air Act, State Water Pollution Control Act, and State Shoreline Management Act, which is locally implemented through the City of Ferndale’s Shoreline Master Program. The USACE sent a CZMA Consistency Determination to Ecology requesting concurrence that the proposed repairs are consistent to the maximum extent practicable with the enforceable policies of the approved CZM Program on April 7, 2023. Ecology concurred with the USACE’s consistency determination on June 2, 2023 (Appendix F).

## 8.5 ENDANGERED SPECIES ACT

In accordance with Section 7(a)(2) of the ESA of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed or proposed threatened or endangered species and their critical habitats. Table 6 lists the USACE's determinations made for ESA-listed species and critical habitat that would be affected by the proposed repair (Section 3.3). A Biological Assessment (BA) outlining these determinations was sent to the USFWS and NMFS on February 23, 2023.

Due to the urgent nature of completing the repair, the USACE may proceed with construction prior to completion of the consultation with the Services pursuant to the "emergency circumstances" provisions of the ESA consultation regulation and may complete ESA consultation after the fact rather than delaying the urgent work in order to complete ESA consultation before construction begins. The applicable regulation is set out at 50 CFR § 402.05 (a) and (b) and provides as follows:

- a) Where emergency circumstances mandate the need to consult in an expedited manner, consultation may be conducted informally through alternative procedures that the Director determines to be consistent with the requirements of sections 7(a)-(d) of the Act. This provision applies to situations involving acts of God, disasters, casualties, national defense or security emergencies, etc.
- b) Formal consultation shall be initiated as soon as practicable after the emergency is under control. The Federal agency shall submit information on the nature of the emergency action(s), the justification for the expedited consultation, and the impacts to endangered or threatened species and their habitats. The Service would evaluate such information and issue a biological opinion including the information and recommendations given during the emergency consultation.

To facilitate conclusion of consultation prior to the necessary date to commence construction, in submitting its BA, the USACE has also requested institution of expedited consultation pursuant to 50 CFR 402.14(l).

Though consultation is not complete, the USACE has reached an agency determination of species/habitat effect, based on the best factual and technical information available at the time of decision, and following preliminary coordination with the Services. Table 6 summarizes the effect determinations made in the BA for each of the species potentially occurring in the project vicinity. Key measures intended to minimize impacts on listed species and habitat include the conservation measures addressed in section 2.7.1 and the BMPs addressed in section 2.7.2.

The USACE has concluded that the Ferndale levee is part of the baseline condition of the Nooksack River in this reach and that the proposed action, with the best management practices/conservation measures and proposed compensatory mitigation, would minimize impacts on listed species.

The USACE would commit to fully funding and performing all Reasonable and Prudent Alternatives necessary to avoid the likelihood of jeopardy to listed species or destruction or adverse modification of designated critical habitat, as well as Reasonable and Prudent Measures (RPMs) necessary and appropriate to minimize the impact of Incidental Take that are described if documents concluding consultation are received from USFWS and NMFS.

This EA would be reevaluated after consultation is complete. If necessary, the EA would be supplemented with necessary and applicable corresponding modifications to the scope and/or nature of the project, the procedures and practices used to implement the project, and/or the type and extent of compensatory mitigation associated with the project, and the associated FONSI would be reassessed.

## **8.6 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976**

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), (16 U.S.C. § 1801 *et. seq.*), as amended by the Sustainable Fisheries Act of 1996 (PL 104-267) requires Federal agencies to consult with the NMFS regarding actions that may adversely affect essential fish habitat (EFH) for Pacific coast groundfish, coastal pelagic species, and Pacific salmon. The MSA defined EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” EFH is the habitat (waters and substrate) required to support a sustainable fishery and a managed species’ contribution to a healthy ecosystem. Waters include aquatic areas and their associated physical, chemical, and biological properties used by fish. Substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities.

The Pacific Fishery Management Council has designated EFH for the Pacific salmon fishery, federally managed ground fishes, and coastal pelagic fisheries (PFMC 2016). Though primarily focused on marine species, anadromous fishes like the Pacific salmon have EFH that can occupy freshwater habitats critical to their life cycle. Freshwater EFH for Pacific salmon consists of four major components: spawning and incubation, juvenile rearing, juvenile migration corridors, and adult migration corridors. Chinook also require adult holding habitat (PFMC 2016). The project action area includes EFH for Chinook salmon, coho salmon, and odd-year pink salmon. Habitat areas of particular concern within the action area include complex channel, floodplain, and spawning habitat (PFMC 2016).

The USACE determined that the proposed action may adversely affect designated EFH. Effects of the proposed work on EFH would be essentially identical to those discussed above for species in Section 3.3. There could be temporary impacts during construction to include substrate disturbance, increased noise, vibration, and minor turbidity. Additionally, the repairs would perpetuate the existing poor shoreline conditions and limit channel migration and floodplain function. Longer lasting impacts include vegetation removal. The USACE outlined this determination in a BA sent to the NMFS on February 23, 2023.

Potential adverse effects to EFH have been reduced by use of BMPs and conservation measures (sections 2.7.1 and 2.7.2, respectively).

The USACE intends to proceed with construction prior to completion of consultation with NMFS pursuant to the “emergency Federal actions” provision of the EFH regulations, and to complete EFH consultation after the fact pursuant to 50 CFR Section 600.920(a). The USACE will reevaluate this EA at the time that EFH consultation is complete. If necessary, the USACE will supplement the EA with necessary and applicable corresponding modifications to the scope and/or nature of the project, the procedures and practices used to implement the project, and/or the type and extent of compensatory mitigation associated with the project, and the associated FONSI will be reassessed.

Table 7. Essential fish habitat species and their life history stages that may be found in the project area.

Common Name	Adult	Juvenile	Larvae	Egg
Chinook salmon	X	X		
Coho salmon	X	X		
Pink salmon	X	X		

### **8.7 MIGRATORY BIRD TREATY ACT OF 1918 AND EXECUTIVE ORDER 13186, RESPONSIBILITIES OF FEDERAL AGENCIES TO PROTECT MIGRATORY BIRDS**

The Migratory Bird Treaty Act (16 U.S.C. § 703-712) as amended protects over 800 bird species and their habitat and commits that the U.S. would take measures to protect identified ecosystems of special importance to migratory birds against pollution, detrimental alterations, and other environmental degradations. EO 13186 directs Federal agencies to evaluate the effects of their actions on migratory birds, with emphasis on species of concern, and inform the USFWS of potential negative effects to migratory birds.

Birds inhabit the riparian area of the Nooksack River yearlong, and proposed work may overlap with some nesting seasons. Nesting seasons vary by species; however, the majority of local bird species nest February through July (ESCP 2016). The USACE must complete the proposed work during the approved in-water work window (June 15-August 31) to avoid impacts to aquatic ESA-listed species. As a result of the in-water work window, work in the nesting season for some bird species is necessary and unavoidable. To minimize impacts on bird habitat, the project has been designed to minimize vegetation removal and land clearing to the greatest extent practicable. The primary affect would be disturbance because of temporary and periodic equipment noise, which birds are able to avoid by leaving the area. Implementation of the preferred alternative would not have any direct, affirmative and purposeful negative effect to migratory birds. There would be no adverse effect on habitat and the project would only have minimal and temporary incidental effects to a small number of individual birds that may be present in the project area. No permit for the “take” of migratory birds is required.

### **8.8 NATIONAL ENVIRONMENTAL POLICY ACT**

The NEPA (42 U.S.C. § 4321 et seq.) commits Federal agencies to considering, documenting, and

publicly disclosing the environmental effects of their actions. It requires that an EIS be included in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment. The EIS must provide detailed information regarding the proposed action and alternatives, the environmental effects of the alternatives, appropriate mitigation measures, and any adverse environmental effects that cannot be avoided if the proposal is implemented. Agencies are required to demonstrate that decision makers have considered these factors prior to undertaking actions. Major Federal actions determined not to have a significant adverse effect on the quality of the human environment may be evaluated through an EA.

This EA evaluates the environmental effects of two Federal actions representing three events requiring NEPA compliance: 1) emergency response activities during the November 2021 flood fight; 2) signing of the Cooperation Agreement (CA) with the non-federal Sponsor on April 3, 2023; and 3) the proposed permanent levee repair. The USACE's obligation under NEPA must be satisfied to the fullest extent possible prior to implementation of the Federal action. The flood fight activity is evaluated retrospectively, and the execution of the proposed permanent repair is prospectively reviewed in this document. Through a combination of USACE project priority determination and funding timelines, it was not feasible for the USACE to complete all NEPA procedures prior to initiating the temporary flood fight repair measures, and secondly signing the CA with the city of Ferndale for the permanent repair. The following discussion assesses how the USACE has nevertheless complied with NEPA's requirement.

### **8.8.1 NEPA / Flood Fight (November 2021)**

The damaging flood event occurred in November 2021. On December 15, 2021, the USACE received a request for immediate assistance from City of Ferndale due to the imminent risk of flood impacts to life and property. The flood fight activities are described in Section 1.1.1.

It was not feasible for the USACE to complete all NEPA procedures prior to accomplishing the Federal actions of emergency response activities during the flood event in November 2021.

The emergency action taken in November 2021 was an emergency response designed to avert more widespread damage that may have resulted from progressive levee failure originating at the vulnerability points generated by flooding damage. The District Commander made a real-time decision, communicated verbally, to proceed with a major Federal action in the absence of full NEPA evaluation and documentation, in light of the extremely urgent circumstances then presented.

The 2021 temporary flood fight repair effort was considered an "emergency action" because it was necessary to protect human life and property and was time-critical in light of a continuing flood event. Under NEPA, the USACE is required to comply with NEPA to the fullest extent possible (Section 102). The USACE's NEPA regulation regarding "emergency actions" allows for completion of NEPA documentation after the fact in emergency situations. Emergency actions are discussed in 33 CFR 230.8 as follows:

*“Section 230.8 - Emergency actions. In responding to emergency situations to prevent or reduce imminent risk of life, health, property, or severe economic losses, district commanders may proceed without the specific documentation and procedural requirements of other sections of this regulation. District commanders shall consider the probable environmental consequences in determining appropriate emergency actions and when requesting approval to proceed on emergency actions, will describe proposed NEPA documentation or reasons for exclusion from documentation. NEPA documentation should be accomplished prior to initiation of emergency work if time constraints render this practicable. Such documentation may be accomplished after the completion of emergency work, if appropriate. Emergency actions include Flood Control and Coastal Emergencies Activities pursuant to Public Law 84-99, as amended, and projects constructed under sections 3 of the [Rivers and Harbors] Act of 1945 or 14 of the Flood Control Act of 1946 of the Continuing Authorities Program. When possible, emergency actions considered major in scope with potentially significant environmental impacts shall be referred through the division commanders to HQUSACE (CECW-RE) for consultation with CEQ about NEPA arrangements.”*

Completion of the NEPA documentation prior to project implementation of November 2021 emergency repair action – while still fulfilling the agency’s emergency levee rehabilitation authorities and responsibilities under PL 84-99 – was impossible. In the midst of a flooding event, insufficient time was available to formally assess and document the environmental impacts of the proposal in a final EA, particularly in light of the other urgent projects also requiring evaluation under NEPA and other environmental regimes that are further discussed below. It was impossible for the USACE to complete all the following NEPA procedures prior to the date on which Federal action was necessary: promulgate, and evaluate public comments received in response to, a Notice of Preparation; complete and finalize the EA; determine whether a FONSI is appropriate or an EIS must be prepared; and execute and promulgate a FONSI, if deemed warranted.

Therefore, the agency complied with NEPA "to the fullest extent possible" under the circumstances, with respect to emergency response activities during the flood event. The determination to proceed with the emergency repairs was preceded by consideration and a decision to proceed by the District Engineer, reflected through verbal communication. This EA constitutes the after the fact NEPA documentation required by NEPA and the regulation cited above.

### **8.8.2 NEPA / Cooperation Agreement**

The USACE entered into a Cooperation Agreement with the Non-Federal Sponsor, the City of Ferndale, on April 3, 2023. At that time, the USACE had initiated but not yet concluded full NEPA compliance for the levee repair project. The timing of signature of the Cooperation Agreements was critical, because it was the triggering event in a subsequent series of critical-path steps leading to repair project execution. The Determination of Practicability for NEPA Compliance dated April 3, 2023, articulated the minimum time intervals required for each step in the procurement and execution processes leading up to the deadline for completion of in-water construction, some of which are necessarily sequential, and also took into account the

resourcing and sequencing of milestones associated with conducting seven levee repair projects during the summer of 2023 in addition to the Ferndale Levee repair. If the USACE had failed to timely execute the Cooperation Agreements and initiate a sequence of meeting the subsequent critical-path milestones, the Ferndale Levee repair would have been in jeopardy of delay, leaving the levee in its current damaged condition into a fourth flood season. Completion of the NEPA documentation prior to executing the Cooperation Agreements, while still fulfilling the agency's emergency levee rehabilitation authorities and responsibilities under P.L. 84-99, was determined to be not practicable. At the time of execution of the Cooperation Agreements the USACE complied with NEPA "to the fullest extent possible" under the circumstances, considering what was practicable given the exigency of the need of reducing the urgent risk presented by these damaged flood control structures before the next flood season.

### **8.8.3 NEPA / Proposed Action**

The prospective Federal action evaluated in this EA is the proposed repair of the Ferndale Levee as discussed in the body of this EA. The proposed action would include both the levee repair and mitigation for fill in Waters of the U.S. This EA has been prepared pursuant to NEPA Sec. 102(C). Effects on the quality of the human environment as a result of the proposed levee repair are anticipated to be less than significant. The EA has incorporated any necessary and applicable modifications to the scope and/or nature of the project, any effects to the human environment resulting from these modifications, the procedures and practices used to implement the project, and/or the type and extent of compensatory mitigation associated with the project.

### **8.8.4 NEPA Summary**

A NOP was issued on February 16, 2023, inviting the public, interested agencies, and Tribes to comment on the proposed levee repair. The comment period ended on March 18, 2023. Comments were received from the EPA and Jamestown S'Klallam Tribe (Appendix G). To avoid the appearance of segmentation of analysis of related Federal actions, the flood fight activities and the proposed permanent repairs are evaluated collectively in this EA, although some elements of the major Federal action are evaluated after the fact, as previously discussed.

## **8.9 NATIONAL HISTORIC PRESERVATION ACT OF 1966**

Section 106 (54 U.S.C. § 306108) of the National Historic Preservation Act (NHPA) (54 U.S.C. § 300101) requires that Federal agencies evaluate the effects of Federal undertakings on historical, archeological, and cultural resources and afford the Advisory Council on Historic Preservation opportunities to comment on the proposed undertaking if there is an adverse effect to an eligible Historic Property. The lead agency must examine whether feasible alternatives exist that avoid eligible cultural resources. If an effect cannot reasonably be avoided, measures must be taken to minimize or mitigate potential adverse effects.

The USACE has consulted with SHPO and the Lummi Indian Nation, Nooksack Indian Tribe, Samish Indian Nation, Suquamish Indian Tribe of the Port Madison Reservation, Swinomish Indian Tribal Community, and the Tulalip Tribes to identify any concerns and obtain information about properties of religious or cultural significance that might be affected by the project. The USACE determined and documented the APE for both direct and indirect effects, as required at

36 C.F.R § 800.4 and determined there would be no historic properties affected for the projects. The SHPO concurred with these findings on May 14, 2023. Concurrence letters from SHPO are located in Appendix D.

### **8.10 WILD AND SCENIC RIVERS ACT OF 1968**

The Wild and Scenic Rivers Act (16 U.S.C. 1271-1278) requires Federal agencies to protect the free-flowing condition and other values of designated rivers and consult with the Federal agency charged with administering the Act, the U.S. Forest Service. The project would have no impacts to Wild and Scenic Rivers as the Nooksack is not designated as such.

### **8.11 AMERICAN INDIAN RELIGIOUS FREEDOM ACT**

The American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996) (AIRFA) establishes protection and preservation of Native Americans' rights of freedom of belief, expression, and exercise of traditional religions. Courts have interpreted the Act to mean that public officials must consider Native Americans' interests before undertaking actions that might impact their religious practices, including impact on sacred sites.

No alternative is expected to have any effect upon Native Americans' rights of freedom of belief, expression, and exercise of traditional religions. There are no known cultural resources, or any sacred sites, at the project location.

### **8.12 NATIVE AMERICAN TRIBAL TREATY RIGHTS& TRIBAL CONSULTATION UNDER EO 13175, CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS**

The United States has a unique, legally affirmed Nation-to-Nation relationship with American Indians and Alaska Native Tribal Nations, which is recognized under the Constitution of the United States, treaties, statutes, EOs, and court decisions. The United States recognizes the right of Tribal Governments to self-govern and supports Tribal sovereignty and self-determination. The United States also has a unique trust relationship with and responsibility to protect and support Tribal Nations.

Between 1778 and 1871, the United States entered into about 400 treaties with various Indian nations on a government-to-government basis. Under the United States Constitution, treaties are accorded precedence equal to federal law. Treaty rights are binding on all federal and state agencies, and take precedence over State constitutions, laws, and judicial decisions. Treaty terms, and the rights arising from them, cannot be rescinded or cancelled without explicit and specific evidence of Congressional intent – indicating that Congress was aware of the conflict between its intended action on the one hand and Indian treaty rights on the other, and chose to resolve the conflict by abrogating the treaty. A right enumerated in a treaty ratified by the Senate may only be superseded by a subsequent act of Congress.

The USACE has a trust policy to consult with, and consider views of, federally recognized American Indian Tribes when proposing an action that may have the potential to significantly affect tribal rights, resources and lands. See Department of Defense Instruction (DODI) 4710.02, Section 3, Subject: DOD Interactions with Federally Recognized Tribes (24 September 2018).

The USACE discharges that duty by notifying, consulting with, and meaningfully considering tribal concerns that are raised through this consultation process.

In the 1850s, in exchange for the cession of their ancestral lands, numerous tribes in the Pacific Northwest entered into treaties with the United States to secure for themselves, amongst other considerations, the preservation of fishing rights in the ceded areas. These treaties were negotiated and signed by the then-Governor of the Washington Territory, Isaac I. Stevens, and are collectively known as the “Stevens Treaties.”

In 1974, many (but not all) of the Stevens Treaties signatory tribes’ “usual and accustomed grounds” (U&A) within Puget Sound were delineated in a federal court adjudication, *U.S. v. Washington*, 384 F. Supp. 312 (W.D. Wash. 1974). The Stevens treaties reserved the signatory tribes’ right to “take fish at usual and accustomed grounds and stations . . . in common with all citizens of the territory” *U.S. v. Washington*, 384 F. Supp. at 332. Federal case law has recognized that the signatory Tribes also reserved the right to take up to 50 percent of the harvestable anadromous fish runs passing through those grounds (Fair Share). Over the years, the courts have held that this right also comprehends certain subsidiary rights, such as access to their “usual and accustomed” fishing grounds. *See Northwest Sea Farms v. USACE*, 931 F. Supp 1515 (W.D. Wash.1996).

For this proposed project, the USACE has notified the following tribe: Lummi Nation, Nooksack Indian Tribe, Samish Indian Nation, Suquamish Tribe, Swinomish Indian Tribal Community, and the Tulalip Tribes, and evaluated impacts to fish and wildlife in this project and sent letters to the above listed Tribes requesting comments on the proposed project and providing the opportunity to initiate Government-to-Government consultation on January 27, 2023. To date the USACE has received no comments from the contacted Tribes.

### **8.13 EXECUTIVE ORDER 11988 FLOODPLAIN MANAGEMENT**

EO 11988 requires Federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. The proposed project is to repair the existing levee to pre-flood conditions and does not include or support construction of any other structures in the flood plain.

### **8.14 EXECUTIVE ORDER 11990 PROTECTION OF WETLANDS**

EO 11990 encourages Federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands when undertaking Federal activities and programs. No wetlands would be destroyed, lost, or degraded by the proposed action.

### **8.15 ORDER 13175 CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS**

EO 13175 reaffirmed the Federal Government’s commitment to a government-to-government relationship with Indian Tribes and directed Federal agencies to establish procedures to consult and collaborate with Tribal governments when new agency regulations would have Tribal

implications. USACE has a government-to-government consultation policy to facilitate the interchange between decision makers to obtain mutually acceptable decisions. In accordance with this EO, USACE has engaged in regular and meaningful consultation and collaboration with the federally recognized Tribes surrounding the project area.

## 9 SUMMARY OF ASSESSMENT

The No Action Alternative (Alternative 1) does not meet the project's purpose and need. The preferred alternative (Alternative 5) fulfills the project's purpose and need by repairing the Ferndale Levee to the pre-damage LOP and repairs the levee in a more resilient and stable way than its pre-damaged condition. Based on the above analysis, the proposed Ferndale Levee Repair Project would not constitute a major Federal action significantly affecting the quality of the human environment, and therefore does not require preparation of an EIS.

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## **APPENDIX A - PHOTOGRAPHS**

Ferndale Levee



Photograph 1. Damaged Levee slope. View looking north (upstream) from levee crown



Photograph 2. View of existing Class IV riprap on the levee prism and discontinuation/removal of slope below willows.



Photograph 3. View northward (upstream) from levee crown showing the USACE's flood-fight repairs upon levee. Rock removal and shear slope on riverward slope generally below willow elevation.

# **APPENDIX B – DESIGN PLANS**

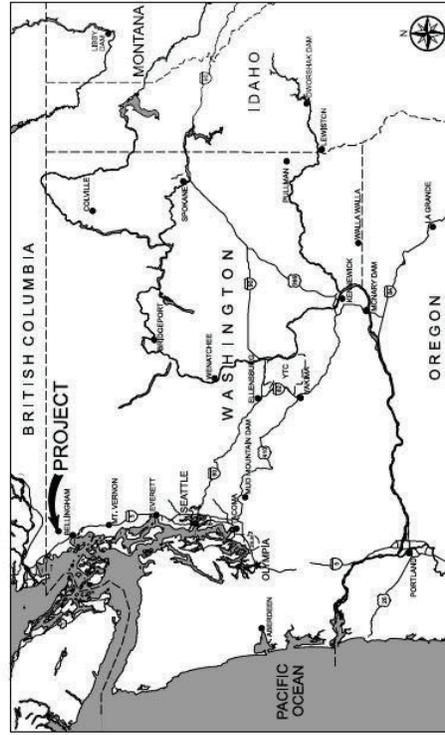
Ferndale Levee Repair



US Army Corps  
of Engineers®  
Seattle District

# FY23 P2-503022 FERN FERNDALE LEVEE REHAB NSK-01-22 WHATCOM COUNTY, WASHINGTON

SHEET ID	TITLE
GENERAL	
G-001	TITLE, LOCATION, INDEX, AND VICINITY MAPS
C-000	SITE ACCESS
C-001	SITE PLAN
C-001	CROSS SECTIONS
L-001	LANDSCAPE
L-001	PLANTING PLAN AND DETAILS



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IF SHEET MEASURES LESS THAN 22" X 34" IT IS  
ARROUNDED UP TO 22" X 34" TO MAINTAIN  
PROPORTION. REDUCE SCALE ACCORDINGLY.

# SAFEWAY PAYS

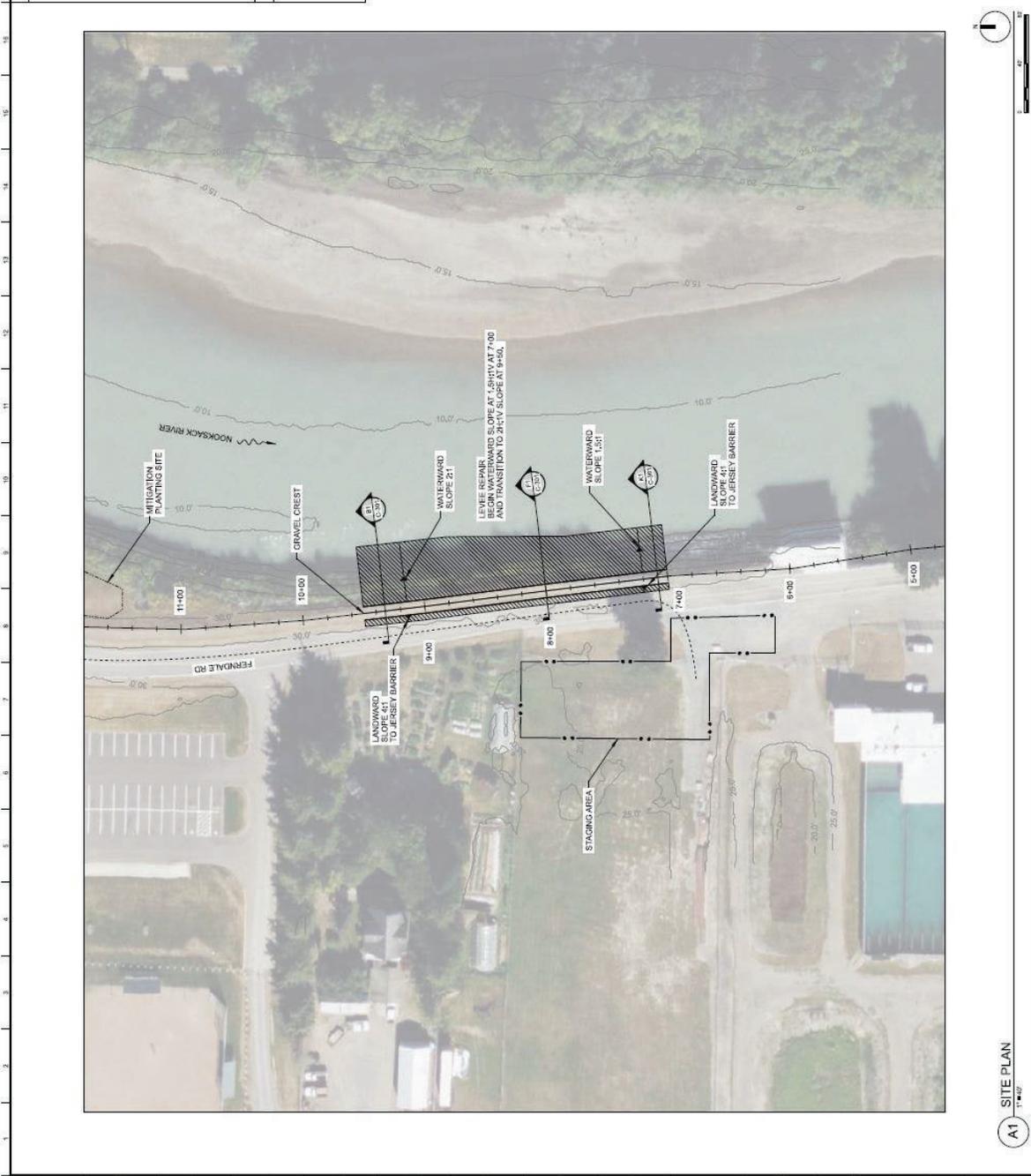


 US Army Corps of Engineers	<b>SITE PLAN</b> F233 P233022 FEEN FENNDALE NORTH-GENERAL LEVER FENNDALE, WASHINGTON	SHEET ID <b>C-101</b>	U.S. ARMY CORPS OF ENGINEERS SEATTLE OFFICE CONTRACT NO. F233 P233022 PROJECT NO. F233 P233022 FEEN	DATE: 01/20/22 DRAWN BY: J. GORDON CHECKED BY: J. GORDON SCALE: AS SHOWN SHEET NO.: C-101	MAIN DESCRIPTION DATE
--	---	--------------------------	--	---	--------------------------

- GENERAL NOTES:**
1. PROJECT SITE EXTENDS FROM STA. 7+00 TO 8+00 FOR 250 FEET ALONG THE RIVER. THE PROPOSED STAGING AREA IS 25 FT ON BOTH ENDS TO THE EXISTING GRADE.
  2. LIMIT CONSTRUCTION ACTIVITIES TO WORK AREAS SHOWN.
  3. TREES AND OTHER WOODY SHRUBS REMOVED AS A RESULT OF THE REPAIR SHALL BE PLACED AT 1' ABOVE ONE ALONG THE RIVER.
  4. THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION AND TRAVEL (WSDOT) HAS PROVIDED THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION AND TRAVEL (WSDOT) WITH THE NECESSARY RESOURCES. CITATION: OCM Partners, 2022. 2022 WA DNR. <https://www.dnr.wa.gov/Portals/0/PDF/2022%20OCM%20Partners.pdf>
  5. HORIZONTAL DATUM IS NAVD83 (GEOID98). VERTICAL DATUM IS NAVD83 (GEOID28). PROJECTION IS WASHINGTON STATE PLANE NORTH, AND UNITS ARE US SURVEY FEET. RESTORE ALL PROPERTY IMPACTED BY CONSTRUCTION ACTIVITIES.

**LEGEND**

-----	ACCESS ROUTE
.....	STAGING AREA
-----	MITIGATION PLANTING SITE



**A1 SITE PLAN**  
1" = 40'

- GENERAL NOTES:**
1. ALL DIMENSIONS ARE APPROXIMATE AND MUST BE VERIFIED BY THE CONTRACTOR.
  2. ALL DIMENSIONS ARE APPROXIMATE AND MUST BE VERIFIED BY THE CONTRACTOR.
  3. ALL DIMENSIONS ARE APPROXIMATE AND MUST BE VERIFIED BY THE CONTRACTOR.
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  11. ALL DIMENSIONS ARE APPROXIMATE AND MUST BE VERIFIED BY THE CONTRACTOR.

**TABLE 1: MATERIAL QUANTITIES**

ITEM	UNIT	QUANTITY
CLASS V RIPRAP	CY	413
GRAVEL	CY	34
TOPSOIL	CY	229

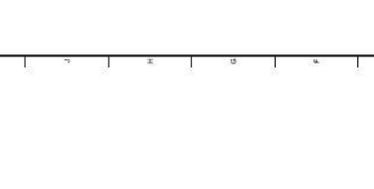
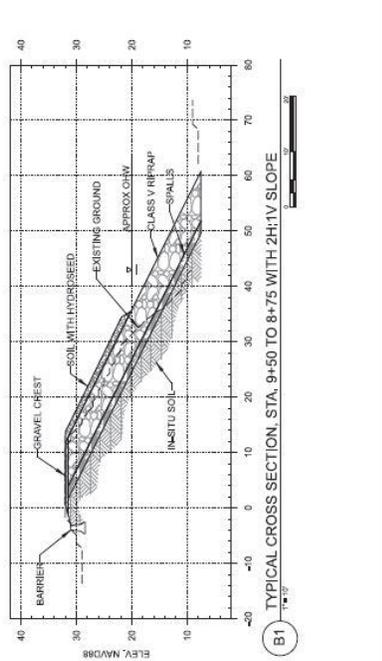
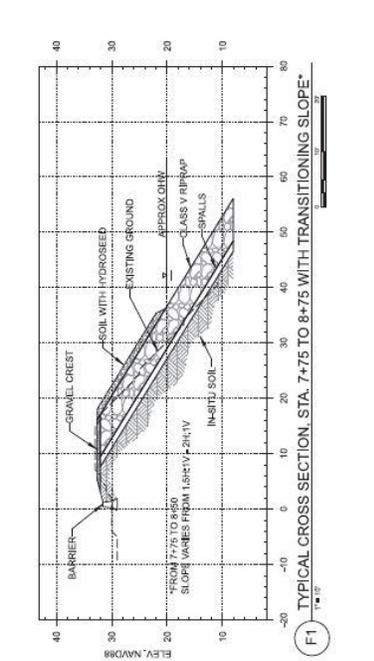
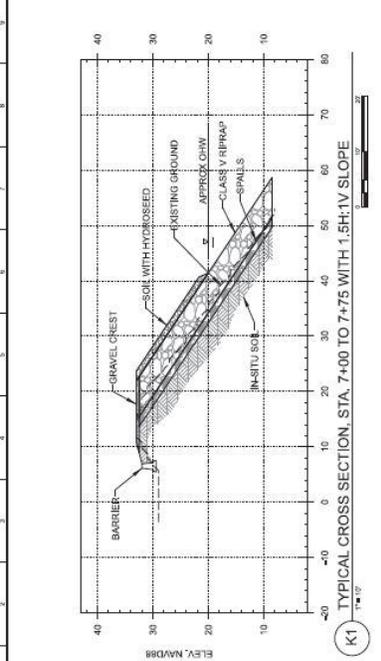
**TABLE 2: MATERIAL QUANTITIES**

ITEM	UNIT	QUANTITY
CLASS V RIPRAP	CY	413
GRAVEL	CY	34
TOPSOIL	CY	229

**TABLE 3: ENHANCED TOPSOIL QUANTITIES**

SIZE	PERCENT PASSED BY WIEBSIT	QUANTITY (CY)
NO. 10	100	229
NO. 20	100	229
NO. 40	100	229
NO. 60	100	229
NO. 100	100	229

- REPAIR STEPS:**
1. EXCAVATE SLOPED MATERIAL FROM TOP OF SLOPE. REMOVE EXISTING RIPRAP AND RETAIN AS PRACTICABLE.
  2. RECONSTRUCT TOP TO PRE-DAMAGE CONDITION USING CLASS V RIPRAP.
  3. RECONSTRUCT THE 4" BLANKET AND 1" SPALL LAYER TO THE TOP OF THE RIPRAP.
  4. TRANSITION UPSTREAM AND DOWNSTREAM ENDS OF RIPRAP TO SMOOTHLY TIE INTO EXISTING SLOPE AND EXISTING ELEVATION.
  5. GROWN WITH CRUSHED GRAVEL CRIST, WHICH ADDS TO SOIL AND HYDRATED LEVIE SLOPES ABOVE OHV WITH LOGICAL MATRIEX AS SPECIFIED.





## **APPENDIX C – WATER QUALITY MONITORING PLAN**

Ferndale Levee Repair

Water quality monitoring will occur during in-water sediment-generating activities. Each new type of sediment generating activity will be monitored.

### **Sediment-Generating Activities Triggering Monitoring Efforts**

Activities that trigger monitoring efforts include but are not limited to the following:

- In-water toe or bank excavation,
- Rock placement for toe rock, and
- Rock placement for bank construction.

### **Monitoring Frequency/Duration**

- Point of Compliance monitoring will occur once per hour for the first three hours after the start of each new sediment-generating activity and then once every three hours, if no exceedance is noted, until the end of the workday.
- The following will be taken at the same frequency as the Point of Compliance samples:
  - a. Early Warning sample
  - b. Background sample
- If, after a minimum of one full day, the monitoring results verify that turbidity levels from a certain sediment-generating activity are remaining consistently below the stated water quality standards, physical monitoring (measurement of parameters using an instrument), may be reduced or stopped for that activity. Physical monitoring will be resumed during new sediment-generating activities or if precipitation events or any other changes will result in higher or lower project-related turbidity. Sampling will resume if visual monitoring indicates possible exceedance at the Early Warning or Point of Compliance sample locations. BMPs will be evaluated to see if additional steps can be taken to reduce and control turbidity.
- Visual monitoring will be done continuously for all in-water work.
- Maximum turbidity levels will meet standards in WAC 173-201A-200. Turbidity must not exceed 5 NTU over background when the background is 50 NTU or less; or a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.

### **Sampling Locations**

Sampling locations are shown in Attachment A and are located at the following points:

- Background – 300 feet upstream of the repair site or the closest safe accessible location.
- Early Warning – 150 feet downstream of the project site.
- Point of Compliance – 300 feet downstream of the project site.

## Sampling Procedures

All water quality monitoring results (visual and physical) will be recorded on the monitoring form (Attachment B). The USACE will keep all project monitoring forms on file. Water samples will be collected and analyzed for the appropriate parameters, per the monitoring frequency described above, following the equipment and sampling guidelines below:

- Continuous visual monitoring will occur to identify the presence of oil or grease on the water's surface.
- Turbidity will be monitored using a Hach turbidimeter or equivalent.
- The onsite USACE Biologist or Quality Construction Assurance Personnel will conduct the water quality monitoring.
- A portable turbidity meter will be used in the field. A representative sample should accurately reflect the true condition of the water source from which the sample was taken. The following protocol will be used to ensure a representative sample is analyzed:
  - Use a clean container to obtain a sample from the source.
  - Collect the sample with care to avoid disturbance of sediments and collecting surface contaminants.
  - Gently but thoroughly mix the sample before pouring it into the small vial used to read the sample in the turbidimeter.
  - Without allowing the sample to settle, take turbidity reading according to turbidimeter manufacturer's instructions.
  - Several measurements can be taken, with the average used as the data for comparison.

A calibration check of the turbidimeter using secondary standards will be carried out regularly (at least once per week). The instrument will be recalibrated using primary standards at least once every 3 months, or more frequently when a calibration check indicates there is a problem. The manufacturer's calibration procedures will be followed.

## Turbidity Exceedances and Exceedance Protocol

If measurements taken at the Point of Compliance show one of the following, the sample shall be recorded as an exceedance:

- turbidity sample exceeds 5 NTU over background when the background turbidity is 50 NTU or less.
- turbidity sample shows a 10 percent increase in turbidity over background when the background turbidity is more than 50 NTU.

The USACE will take the following steps after an exceedance is detected:

### Step 1: Verification

- If monitoring indicates an exceedance, the USACE shall collect, within ten (10) minutes of the initial reading, another reading in the same location.
- If the exceedance still exists, the USACE shall photograph conditions at the POC and then collect another series of readings at the Background sample

location to determine if the exceedance is caused by the project or by a change in background conditions (for example due to a heavy rainfall event).

- The USACE will modify sediment-generating activities to reduce turbidity and increase monitoring (see Step 2).

#### Step 2: Increased Monitoring

- The USACE shall collect another reading no more than one (1) hour after the exceedance is recorded to verify the construction activity or material placement operation has been modified to eliminate the exceedance and return conditions to levels within the acceptable limits.
- If this second reading, taken one (1) hour later, still shows an exceedance, the USACE will implement additional BMPs and evaluate additional alterations to the project to minimize turbidity.
- The USACE shall collect a third reading taken no more than two (2) hours after the first exceedance is recorded.

#### Step 3: Stop Sediment-Generating Activities

- If the third reading, taken two (2) hours after the initial exceedance, still shows an exceedance, the USACE will stop sediment-generating activities.
- The USACE will provide monitoring data to the Washington State Department of Ecology (Ecology) and notify it that there was an exceedance within 24 hours of stopping work.

#### Step 4: Continued Sampling Until Compliance is Achieved

- After work is stopped, the USACE shall collect additional samples at hourly intervals until water quality levels return to background.
- Once compliance has again been achieved, the USACE will resume work and follow the Sampling Procedures outlined above.

### **Oil/Grease Exceedances and Exceedance Protocol**

The USACE will take the following steps if visual monitoring identifies the presence of oil or grease on the water's surface.

#### Step 1: Stop and Contain

- The USACE will stop work and initiate containment and cleanup efforts.
- Equipment will be inspected to determine the source of the oil or grease.
- Equipment that is the source of the spill or leak will immediately be removed from the site.

#### Step 2: Report

The following entities will be contacted immediately in the event of an oil or grease spill.

- Ecology
  - Washington Emergency Management Division, 1-800-258-5990
  - Additional details available online: <https://ecology.wa.gov/About-us/Get-involved/Report-an-environmental-issue/Report-a-spill>

- Ecology's Regional Spill Response Office  
Doug Allen, Spills Manager, 360-255-4400, doug.allen@ecy.wa.gov
- U.S. Environmental Protection Agency
  - National Response Center, 1-800-424-8802
- Washington Department of Fish and Wildlife
  - Oil and Spill Prevention Response, 1-800-258-5990

Step 3: Resume Work

- Once the spill or leak has been responded to, the USACE will resume work and continuous visual monitoring.
- Equipment that caused the spill or leak will be removed from the project site to be repaired. The equipment must be repaired and cleaned before allowed back to the project site.

## **APPENDIX D – CULTURAL RESOURCES**

Correspondence – Ferndale Levee Repair



Alyson Brooks Ph.D., Director  
State Historic Preservation Officer

February 8, 2023

Laura A. Boerner  
Environmental Resources Section  
Corps of Engineers – Seattle District  
PO Box 3755  
Seattle, Washington 98124-3755

Re: Ferndale Levee Repair Project  
Log No.: 2022-02-01003-COE-S

Dear Laura Boerner:

Thank you for contacting our department. We have reviewed the materials you provided for the Area of Potential Effect (APE) for the proposed *Ferndale Levee Repair Project*, Ferndale, Whatcom County, Washington

We concur with your determination of the Area of Potential Effect (APE) as described and presented in your figures and text.

We look forward to further consultations as you consult with the concerned tribal governments, the results of your identification efforts, and your determination of effect.

We would also appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4).

These comments are based on the information available at the time of this review and on behalf of the State Historic Preservation Officer in compliance with the Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations 36CFR800.4. Should additional information become available, our assessment may be revised. Thank you for the opportunity to comment.

Sincerely,

Robert G. Whitlam, Ph.D.  
State Archaeologist  
(360) 890-2615  
email: [rob.whitlam@dahp.wa.gov](mailto:rob.whitlam@dahp.wa.gov)





Alyson Brooks Ph.D., Director  
State Historic Preservation Officer

March 14, 2023

Laura A. Boerner  
Planning, Environmental & Cultural Resources  
Seattle District  
Corps of Engineers  
PO Box 3755  
Seattle, Washington 98124

Re: NSK-01-22 Ferndale Levee Repair Project  
Log No.: 2022-02-01003-COE-S

Dear Laura A. Boerner:

Thank you for contacting our department. We have reviewed the information you provided for the proposed *NSK-01-22 Ferndale Levee Repair Project* in the City of Ferndale, Whatcom County, Washington.

We concur with your Determination of No Historic Properties Affected with the stipulation for an unanticipated find plan.

We would appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4). In the event that archaeological or historic materials are encountered during project activities, work in the immediate vicinity must stop, the area secured, and the concerned tribe's cultural staff and cultural committee and this department notified.

These comments are based on the information available at the time of this review and on behalf of the State Historic Preservation Officer in compliance with the Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations 36CFR800.4. Should additional information become available, our assessment may be revised, including information regarding historic properties that have not yet been identified. Thank you for the opportunity to comment and a copy of these comments should be included in subsequent environmental documents.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Rob Whitlam', is written over a horizontal line.

Robert G. Whitlam, Ph.D.  
State Archaeologist  
(360) 890-2615  
email: [rob.whitlam@dahp.wa.gov](mailto:rob.whitlam@dahp.wa.gov)

State of Washington • Department of Archaeology & Historic Preservation  
P.O. Box 48343 • Olympia, Washington 98504-8343 • (360) 586-3065  
[www.dahp.wa.gov](http://www.dahp.wa.gov)



## **APPENDIX E – ENVIRONMENTAL JUSTICE REPORTS**

5 miles Ring around the Area, WASHINGTON, EPA Region 10

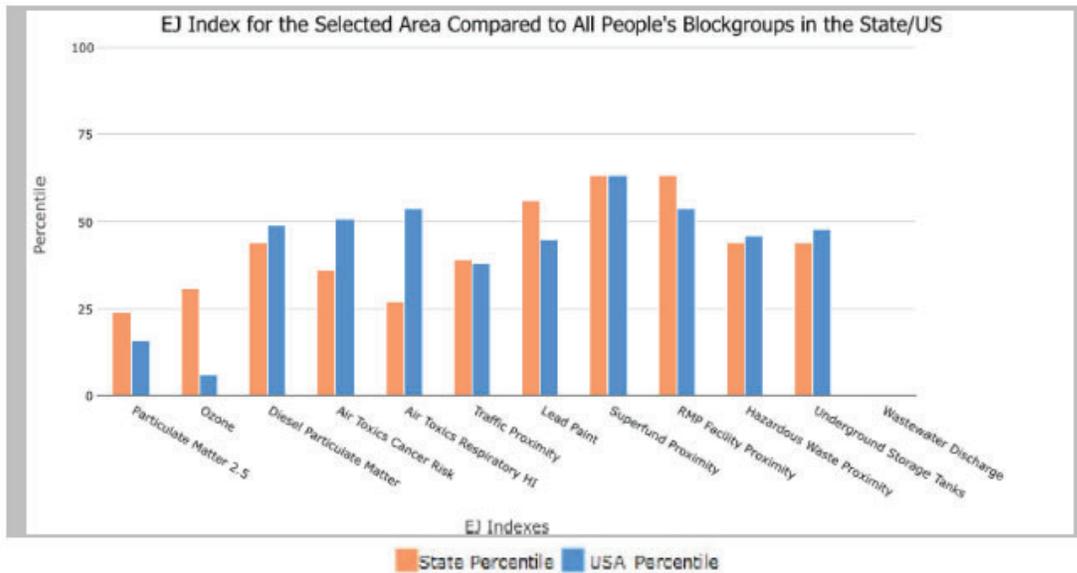
Approximate Population: 33,843

Input Area (sq. miles): 81.62

Ferndale Levee Repair

Selected Variables	State Percentile	USA Percentile
<b>Environmental Justice Indexes</b>		
Particulate Matter 2.5 EJ index	24	16
Ozone EJ index	31	6
Diesel Particulate Matter EJ index*	44	49
Air Toxics Cancer Risk EJ index*	36	51
Air Toxics Respiratory HI EJ index*	27	54
Traffic Proximity EJ index	39	38
Lead Paint EJ index	56	45
Superfund Proximity EJ index	63	63
RMP Facility Proximity EJ index	63	54
Hazardous Waste Proximity EJ index	44	46
Underground Storage Tanks EJ index	44	48
Wastewater Discharge EJ index	N/A	N/A

EJ Indexes - The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.



\*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: <https://www.epa.gov/haps/air-toxics-data-update>.





## EJScreen Report (Version 2.11)



5 miles Ring around the Area, WASHINGTON, EPA Region 10

**Approximate Population: 33,843**

**Input Area (sq. miles): 81.62**

### Ferndale Levee Repair

Selected Variables	Value	State Avg.	%ile in State	USA Avg.	%ile in USA
<b>Pollution and Sources</b>					
Particulate Matter 2.5 ( $\mu\text{g}/\text{m}^3$ )	6.75	7.85	15	8.67	10
Ozone (ppb)	31.8	35.3	27	42.5	4
Diesel Particulate Matter* ( $\mu\text{g}/\text{m}^3$ )	0.215	0.334	34	0.294	<50th
Air Toxics Cancer Risk* (lifetime risk per million)	29	35	45	28	80-90th
Air Toxics Respiratory HI*	0.39	0.51	30	0.36	70-80th
Traffic Proximity (daily traffic count/distance to road)	150	740	39	760	40
Lead Paint (% Pre-1960 Housing)	0.17	0.22	55	0.27	44
Superfund Proximity (site count/km distance)	0.14	0.18	63	0.13	76
RMP Facility Proximity (facility count/km distance)	0.54	0.64	66	0.77	60
Hazardous Waste Proximity (facility count/km distance)	0.52	2.2	40	2.2	45
Underground Storage Tanks (count/km <sup>2</sup> )	1.7	6.3	50	3.9	56
Wastewater Discharge (toxicity-weighted concentration/m distance)	N/A	0.021	N/A	12	N/A
<b>Socioeconomic Indicators</b>					
Demographic Index	26%	28%	52	35%	44
Supplemental Demographic Index	12%	12%	59	15%	46
People of Color	23%	33%	43	40%	43
Low Income	28%	24%	65	30%	51
Unemployment Rate	7%	5%	71	5%	68
Limited English Speaking Households	1%	4%	53	5%	58
Less Than High School Education	6%	8%	53	12%	42
Under Age 5	6%	6%	63	6%	63
Over Age 64	18%	15%	64	16%	61
Low Life Expectancy	18%	18%	53	20%	40

EJScreen is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJScreen documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJScreen outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

5 miles Ring around the Area, WASHINGTON, EPA Region 10

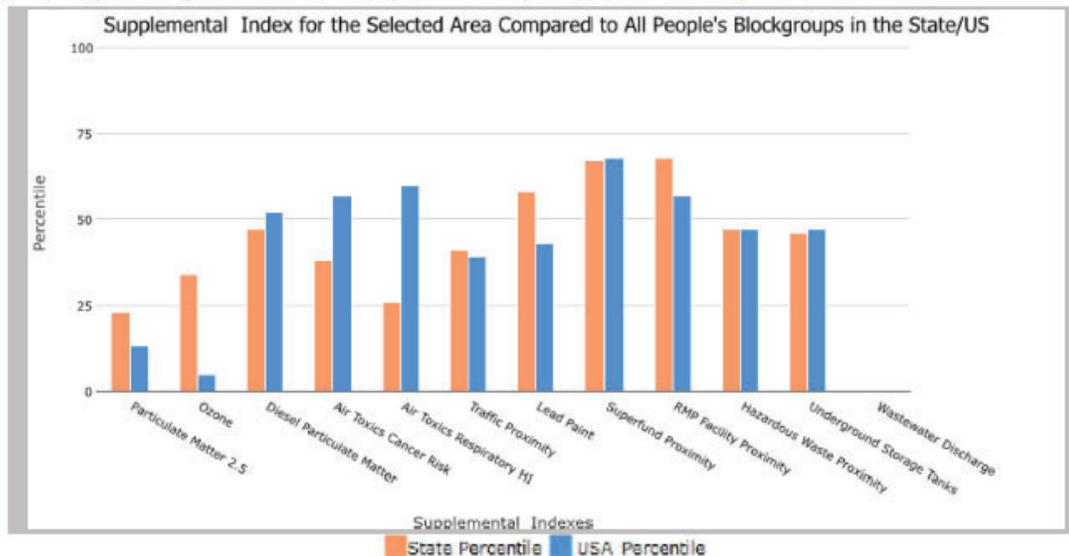
Approximate Population: 33,843

Input Area (sq. miles): 81.62

**Ferndale Levee Repair**

Selected Variables	State Percentile	USA Percentile
<b>Supplemental Indexes</b>		
Particulate Matter 2.5 Supplemental Index	23	13
Ozone Supplemental Index	34	5
Diesel Particulate Matter Supplemental Index*	47	52
Air Toxics Cancer Risk Supplemental Index*	38	57
Air Toxics Respiratory HI Supplemental Index*	26	60
Traffic Proximity Supplemental Index	41	39
Lead Paint Supplemental Index	58	43
Superfund Proximity Supplemental Index	67	68
RMP Facility Proximity Supplemental Index	68	57
Hazardous Waste Proximity Supplemental Index	47	47
Underground Storage Tanks Supplemental Index	46	47
Wastewater Discharge Supplemental Index	N/A	N/A

Supplemental Indexes - The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on low-income, limited English speaking, less than high school education, unemployed, and low life expectancy populations with a single environmental indicator.



This report shows the values for environmental and demographic indicators, EJScreen indexes, and supplemental indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJScreen documentation for discussion of these issues before using reports. For additional information, see: [www.epa.gov/environmentaljustice](http://www.epa.gov/environmentaljustice).



## EJScreen Report (Version 2.11)



City: Ferndale, WASHINGTON, EPA Region 10

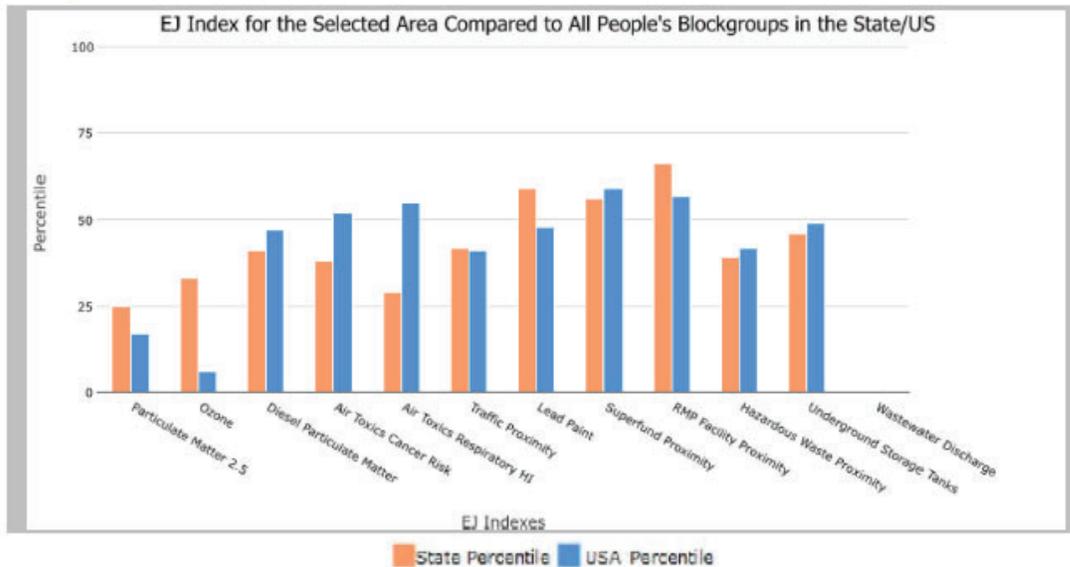
Approximate Population: 14,892

Input Area (sq. miles): 7.13

City of Ferndale

Selected Variables	State Percentile	USA Percentile
<b>Environmental Justice Indexes</b>		
Particulate Matter 2.5 EJ index	25	17
Ozone EJ index	33	6
Diesel Particulate Matter EJ index*	41	47
Air Toxics Cancer Risk EJ index*	38	52
Air Toxics Respiratory HI EJ index*	29	55
Traffic Proximity EJ index	42	41
Lead Paint EJ index	59	48
Superfund Proximity EJ index	56	59
RMP Facility Proximity EJ index	66	57
Hazardous Waste Proximity EJ index	39	42
Underground Storage Tanks EJ index	46	49
Wastewater Discharge EJ index	N/A	N/A

EJ Indexes - The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.



\*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: <https://www.epa.gov/haps/air-toxics-data-update>.

**EJScreen Report (Version 2.11)**

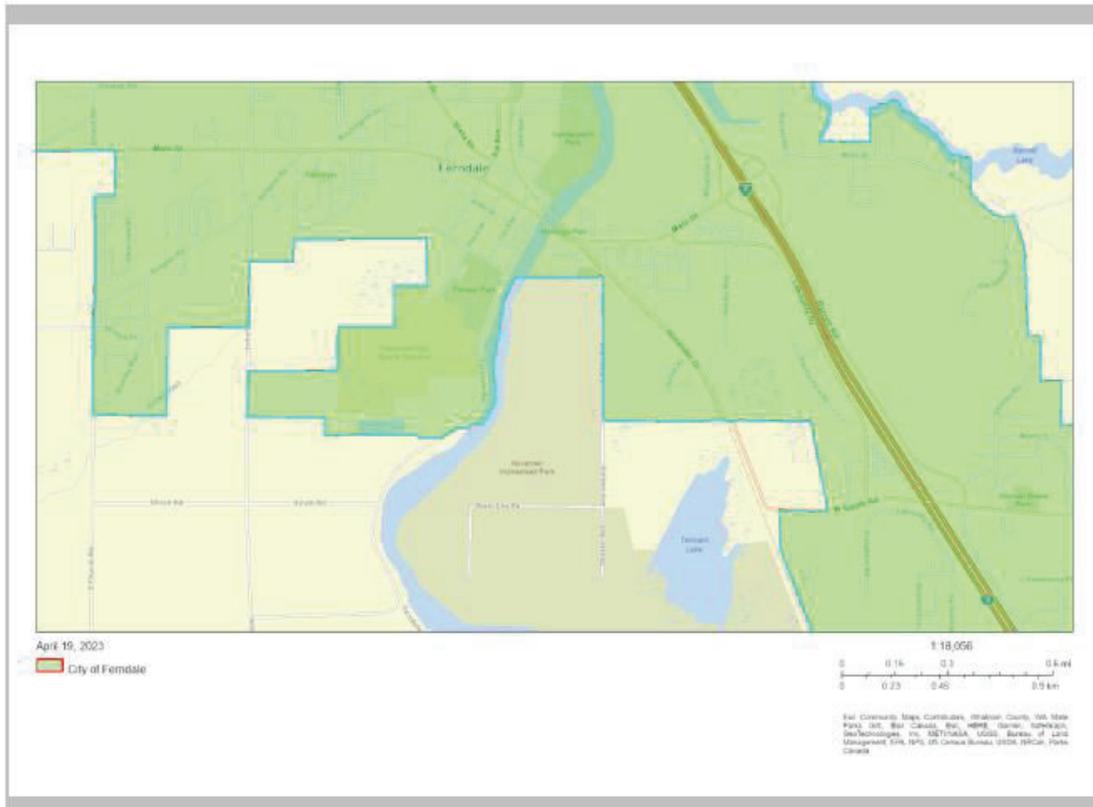


**City: Ferndale, WASHINGTON, EPA Region 10**

**Approximate Population: 14,892**

**Input Area (sq. miles): 7.13**

**City of Ferndale**



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	1



## EJScreen Report (Version 2.11)

City: Ferndale, WASHINGTON, EPA Region 10

Approximate Population: 14,892

Input Area (sq. miles): 7.13

City of Ferndale



Selected Variables	Value	State Avg.	%ile in State	USA Avg.	%ile in USA
<b>Pollution and Sources</b>					
Particulate Matter 2.5 ( $\mu\text{g}/\text{m}^3$ )	6.84	7.85	17	8.67	11
Ozone (ppb)	31.8	35.3	28	42.5	5
Diesel Particulate Matter* ( $\mu\text{g}/\text{m}^3$ )	0.211	0.334	33	0.294	<50th
Air Toxics Cancer Risk* (lifetime risk per million)	30	35	47	28	80-90th
Air Toxics Respiratory HI*	0.4	0.51	32	0.36	80-90th
Traffic Proximity (daily traffic count/distance to road)	170	740	42	760	44
Lead Paint (% Pre-1960 Housing)	0.19	0.22	57	0.27	46
Superfund Proximity (site count/km distance)	0.091	0.18	49	0.13	64
RMP Facility Proximity (facility count/km distance)	0.68	0.64	70	0.77	66
Hazardous Waste Proximity (facility count/km distance)	0.32	2.2	34	2.2	39
Underground Storage Tanks (count/km <sup>2</sup> )	2.5	6.3	55	3.9	63
Wastewater Discharge (toxicity-weighted concentration/m distance)	N/A	0.021	N/A	12	N/A
<b>Socioeconomic Indicators</b>					
Demographic Index	25%	28%	49	35%	42
Supplemental Demographic Index	12%	12%	57	15%	44
People of Color	23%	33%	42	40%	43
Low Income	27%	24%	62	30%	48
Unemployment Rate	7%	5%	75	5%	72
Limited English Speaking Households	1%	4%	54	5%	58
Less Than High School Education	7%	8%	56	12%	44
Under Age 5	6%	6%	59	6%	60
Over Age 64	16%	15%	56	16%	53
Low Life Expectancy	17%	18%	39	20%	28

EJScreen is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJScreen documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJScreen outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

April 19, 2023

3/4

### EJScreen Report (Version 2.11)



City: Ferndale, WASHINGTON, EPA Region 10

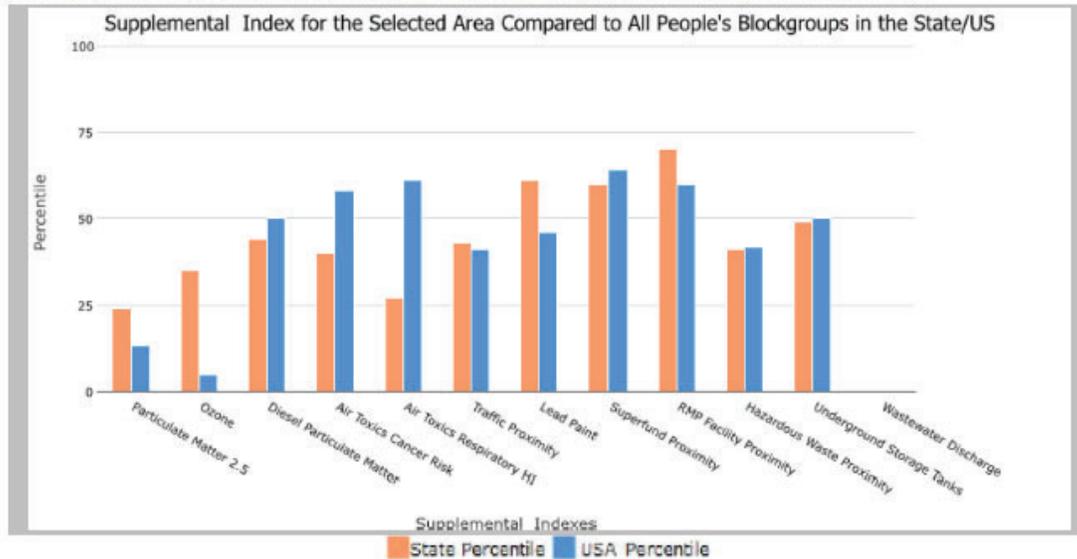
Approximate Population: 14,892

Input Area (sq. miles): 7.13

City of Ferndale

Selected Variables	State Percentile	USA Percentile
<b>Supplemental Indexes</b>		
Particulate Matter 2.5 Supplemental Index	24	13
Ozone Supplemental Index	35	5
Diesel Particulate Matter Supplemental Index*	44	50
Air Toxics Cancer Risk Supplemental Index*	40	58
Air Toxics Respiratory HI Supplemental Index*	27	61
Traffic Proximity Supplemental Index	43	41
Lead Paint Supplemental Index	61	46
Superfund Proximity Supplemental Index	60	64
RMP Facility Proximity Supplemental Index	70	60
Hazardous Waste Proximity Supplemental Index	41	42
Underground Storage Tanks Supplemental Index	49	50
Wastewater Discharge Supplemental Index	N/A	N/A

Supplemental Indexes - The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on low-income, limited English speaking, less than high school education, unemployed, and low life expectancy populations with a single environmental indicator.



This report shows the values for environmental and demographic indicators, EJScreen indexes, and supplemental indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJScreen documentation for discussion of these issues before using reports. For additional information, see: [www.epa.gov/environmentaljustice](http://www.epa.gov/environmentaljustice).

# Explore the map

Share data sources with CEJ

Census tracts that are overburdened and underserved are highlighted as being disadvantaged on the map. Federally Recognized Tribes, including Alaska Native Villages, are also considered disadvantaged communities.

Zooming in and selecting shows information about each census tract.

## Get the data

Download the data with documentation and shapefile from the [downloads](#) page.

+

-

48

AK

HI

PR

GU

AS

MP

VI

**Tract information**

Number: 53073010502  
 County: Whatcom County  
 State: Washington  
 Population: 9,443

**Tract demographics**

Race / Ethnicity [\(show\)](#)  
 Age [\(show\)](#)

Identified as disadvantaged?

NO

This tract is not considered disadvantaged. It does not meet any burden thresholds **OR** at least one associated socioeconomic threshold.

Send feedback

Climate change +

Energy +

Health +

Housing +

Legacy pollution +

Transportation +

Water and wastewater +

Workforce development +

Methodology version 1.0

**AirToxScreen**

2019 Cancer Risk | 2018 Cancer Risk | 2017 Cancer Risk | 2019 Noncancer Hazards

**AirToxScreen Mapping Tool (based on 2019 emissions)**

Zoom to State(s): None | Zoom to County(s): None | Select Minimum Risk to Include: No number selected | Select Only Tracts With Chan...: None

**To get started:**

- Select tract(s) on map using selector tool in upper left corner of map. When tract(s) are selected, associated lists and charts will appear under the map.
- Zoom to a specific area using the search tool in the upper right of map by typing in a place name or by using the State and County selector tools above the map.
- Filter tracts by risk level using the Risk Level selector tool above the map.
- Filter tracts with risk changes since the analysis was performed by using the Risk Change selector tool at the upper right of the dashboard. To display a popup containing more information about the risk change, click on the tract without a selector tool chosen

**Legend**

- > 50 - 75
- > 25 - 50
- 5 - 25
- Zero Population Tracts

**Facility Level Emissions (2019)**

- Facility Shutdown
- Unit Shutdown
- Emission Change
- Facility

**Ambient Monitors (2019)**

- Ambient Monitor

Whatcom County, WA State Parks GIS, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, NRCAN, Parks Canada | ESRI | USEPA Office of ... Powered by Esri



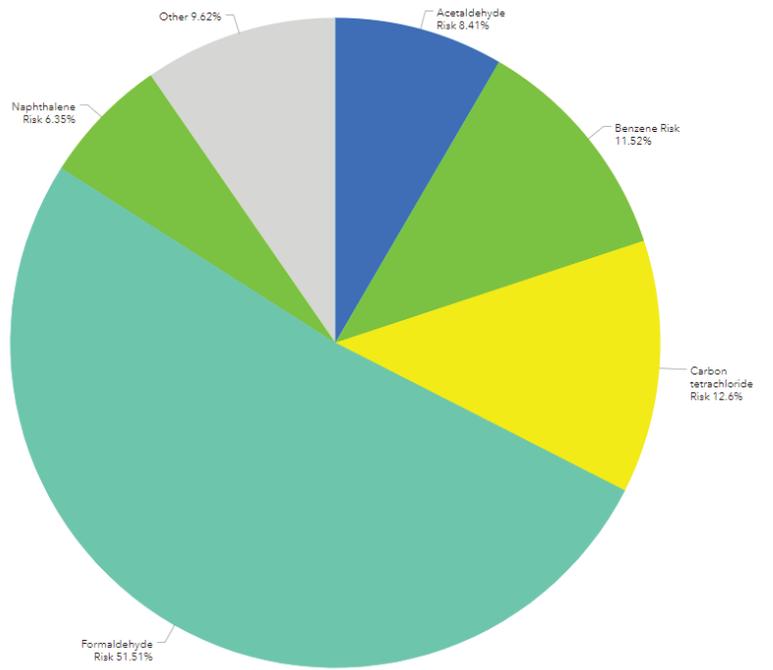
## AirToxScreen Mapping Tool (based on 2019 emissions)

### Tract Source Contribution

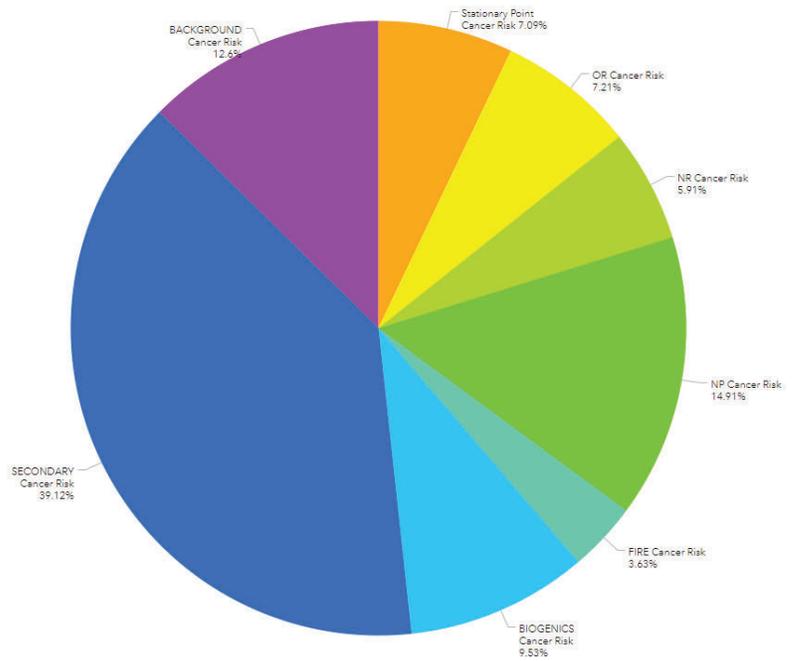
Search...

State: WA  
 County/Parish: Whatcom County  
 Tract ID: 53073010502  
 Total Risk (per million): 30  
 Point Risk (per million): 1.789056  
 Nonpoint Risk (per million): 3.762883  
 Onroad Risk (per million): 1.820458  
 Nonroad Risk (per million): 1.492562  
 Fire Risk (per million): 0.917284  
 Biogenic Risk (per million): 2.407076  
 Secondary Risk (per million): 9.876392  
 Background Risk (per million): 3.180000

### Risk by Air Toxic



### Risk by Source Type



**APPENDIX F – COASTAL ZONE MANAGEMENT ACT**  
Correspondence - Ferndale Levee Repair



STATE OF WASHINGTON  
**DEPARTMENT OF ECOLOGY**  
PO Box 47600, Olympia, WA 98504-7600 • 360-407-6000

June 2, 2023

Department of the Army  
United States Corps of Engineers, Seattle District  
ATTN: Laura A. Boerner  
4735 East Marginal Way South  
Building 1202  
Seattle, WA 98134-2388

Re: Coastal Zone Management Federal Consistency Decision for Activity Undertaken by a  
Federal Agency  
Ferndale Levee Repair  
Ferndale, Whatcom County, Washington

Dear Laura A. Boerner:

On April 7, 2023, the Seattle District, U. S. Army Corps of Engineers (Corps) submitted a Consistency Determination with the Washington State Coastal Zone Management Program (CZMP). Ecology issued a 21-day public notice on April 17, 2023 and received no comments. At Ecology's request, the Corps supplied additional information on May 27, 2023. On June 2, 2023, Ecology requested a 15-day extension pursuant to 15 CFR Part 930.41(b), extending the CZM decision deadline to June 21, 2023.

The proposed federal activity includes repairs to the Ferndale Levee in the City of Ferndale, Whatcom County, Washington. The levee system is approximately 5.43 miles long, of which the Ferndale Levee segment is approximately 3,300 feet long and ties into the Main Street Bridge at the upstream end and the Rayhorst Levee segment at the downstream end.

A November 2021 flood event damaged 250 linear feet (LF) of the Ferndale Levee and the purpose of the project is to repair the levee to its pre-damage level of flood protection. The damaged portion of the levee is located south of downtown Ferndale. Repairs to the Ferndale levee will occur within the horizontal and vertical profile and within the original levee footprint with no modifications to the original design based on best professional engineer judgment. The repair is expected to take from 4 to 6 weeks and any in-water work for the repairs will occur within the in-water work window (June 15 to August 31).

The proposed action includes repair of a total of 300 LF of levee, including 250 LF of the original scour location, 25 LF of transition at both upstream and downstream ends of the repair, embankment, and toe at one continuous site between Stations 7+00 to 9+50. The repair will regrade the slope to approximately 1.5H:1V on the downstream end of the levee segment and will gradually transition the slope to a 2H:1V on the upstream end of the levee. A 12-inch layer of bedding spalls (4-8 inches) and filter spalls (2-4 inches) will be placed over the existing riverward embankment soils, and the slope will be re-armored with a 4-foot-thick blanket of Class V riprap. Some excavation and placement of repair materials will take place below the ordinary high water mark (OHWM). The repair site will transition to match the existing riverward slope alignment and elevation at the upstream and downstream ends. Topsoil will be placed as shown on the plans and hydroseeded. Additionally, concrete jersey barriers will be placed on the landward side of the levee along the shoulder line of Ferndale Road. The landward side of the levee will slope down at approximately 4H:1V to meet the top of the concrete jersey barriers which will serve as a permanent retaining wall.

Large rock will be placed and manipulated using the thumb attachment on the excavator. Small rock that is impracticable to manipulate with the thumb attachment, such as quarry spalls, will be transferred from the bucket to the levee slope using a pouring motion. To achieve good compaction and tight interlocking, an excavator will “plate” the slope. This action occurs after all the riprap has been placed on the slope.

Shoreline and river areas impacted by construction activities will be restricted to the access routes, staging areas (0.29 acres), damaged levee sections (250 LF), transitions to undamaged upstream and downstream sections of the levees (50 LF total), and mitigation areas (0.18 acres). Work will require removing vegetation, i.e., approximately 10 small willows from the Ferndale levee within the construction project footprint along the riverbank. No additional fill material volume will be added on the riverward levee slope below the or beyond the OHWM pre-flood levee footprint.

Pursuant to Section 307(c)(3) of the Coastal Zone Management Act of 1972 as amended, Ecology concurs with the Corps’ determination that the proposed work is consistent with Washington’s CZMP. The proposed action was reviewed for consistency under the applicable enforceable policies found in the state Shoreline Management Act, the State Water Pollution Control Act, and the Washington Clean Air Act. The proposal did not trigger the enforceable policies of the Ocean Resources Management Act or the Marine Spatial Plan for Washington’s Pacific Coast.

If you have any questions regarding Ecology’s consistency determination, please contact Teresa Pucylowski at 360-764-0546.

### **Your right to appeal**

You have a right to appeal this Order to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal, you must do all of the following within 30 days of the date of receipt of this Order:

- File your notice of appeal and a copy of this Order with the PCHB (see filing options below). "Filing" means actual receipt by the PCHB during regular business hours as defined in WAC 371-08-305 and -335. "Notice of appeal" is defined in WAC 371-08-340.
- Serve a copy of your notice of appeal and this Order on the Department of Ecology, in paper form, by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

### **Filing an appeal with the PCHB:**

For the most current information regarding filing with the PCHB, visit:  
<https://elaho.wa.gov/content/11>

### **Address and Location Information**

#### **Street Address:**

**Department of Ecology**  
Attn: Appeals Processing Desk  
300 Desmond Drive SE  
Lacey, WA 98503

**Pollution Control Hearings Board**  
1111 Israel RD SW  
STE 301  
Tumwater, WA 98501

#### **Mailing Addresses:**

**Department of Ecology**  
Attn: Appeals Processing Desk  
PO Box 47608  
Olympia, WA 98504-7608

**Pollution Control Hearings Board**  
PO Box 40903

*Ferndale Levee Repair*  
*Aquatics ID No. 136799*  
*June 2, 2023*  
*Page 4 of 4*

Olympia, WA 98504-0903

**E-Mail Address:**

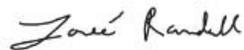
**Department of Ecology**

Not currently available (see WAC 371-08)

**Pollution Control Hearings Board**

Pchb-shbappeals@eluhc.wa.gov

Sincerely,



Loree' Randall, Section Manager  
Federal Permitting Section  
Shorelands and Environmental Assistance Program

Sent via e-mail: Laura.A.Boerner@usace.army.mil

E-cc: fedconsistency@ecy.wa.gov  
Caren Crandall, Corps  
Kylie Webb, Corps  
Teresa Pucylowski, Ecology  
Loree' Randall, Ecology  
Joe Burcar, Ecology  
Misty Blair, Ecology  
Stephanie Barney, Ecology

## **APPENDIX G - PUBLIC COMMENTS**

The USACE published an NOP for the Ferndale Levee repair Project on February 16, 2023, for a 30-day public review and comment period. Two comments were received.

### **Comment 1:**

**From:** [Sissi Bruch](#)  
**To:** [Webb, Kylie M CTV USARMY CFNWS \(USA\)](#)  
**Subject:** [URL Verdict: Neutral][Non-DoD Source] RE: Notice of Preparation for Ferndale PL 84-99 Non-federal Levee Repair Project  
**Date:** Thursday, February 16, 2023 1:39:52 PM

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It appears to me that that the option to let the river breath by finding areas where it can flood naturally to take the pressure off the levies was not included as an option. Please add it.

Please see <https://www.clallamcountywa.gov/184/Dungeness-Floodplain-Restoration> and <https://srp.rco.wa.gov/project/180/3093> This project is now complete, restoring habitat and spreading and slowing down the water in the river during flood events.

*Sissi*

---

Sissi P. Bruch, PhD  
Environmental Planning Biologist  
Jamestown S'Klallam Tribe  
360-461-3006  
[sbruch@jamestowntribe.org](mailto:sbruch@jamestowntribe.org)

### **Comment 1 Response:**

Thank you for your comment. A levee setback alternative has been incorporated into the alternatives analysis (Section 2.4).

## Comment 2:



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10  
1200 Sixth Avenue, Suite 155, 14-D12  
Seattle, WA 98101-3144

REGIONAL  
ADMINISTRATOR'S  
DIVISION

March 17, 2023

Kylie M. Webb, Project Manager  
U.S. Army Corps of Engineers  
4735 East Marginal Way South, Bldg. 1202  
Seattle, WA 98134

Dear Kylie M. Webb:

The U.S. Environmental Protection Agency has reviewed U.S. Army Corps of Engineer's Notice of Preparation of an Environmental Analysis for the Ferndale Levee Repair Project (EPA Project Number 23-0010-USACE). EPA has conducted its review pursuant to the National Environmental Policy Act and our review authority under Section 309 of the Clean Air Act. The CAA Section 309 role is unique to EPA and requires EPA to review and comment publicly on any proposed federal action subject to NEPA's environmental impact statement requirement.

The Notice of Preparation (NOP) discusses four initial alternatives for consideration in the NEPA analysis. Of those initial four alternatives, the NOP identifies two to be evaluated in the Environmental Analysis (EA): a no action alternative (Alternative 1) and the preferred repair-in-kind alternative (Alternative 4). The preferred alternative consists of repairing 300 feet of levee that was damaged during high flow events in 2021 by reconstructing and re-armoring the bank. A six-inch layer of gravel would be placed on top of the levee to restore the levee crest and all disturbed areas would be hydroseeded.

EPA did not find significant environmental concerns to be addressed in the EA. EPA does have recommendations for the NEPA analysis, which include considerations for Environmental Justice, the incorporation of climate change and reasonably foreseeable future conditions, and a more robust discussion of the alternatives that were not carried forward for consideration. EPA also has recommendations green infrastructure technologies and avoiding impacts to water quality. Please see the enclosure for additional details regarding EPA's recommendations.

Thank you for the opportunity to review the NOP for this project. If you have questions about this review, please contact Scott Schlieff of my staff at (206) 553-4032 and [Schlieff.scott@epa.gov](mailto:Schlieff.scott@epa.gov), or me, at (206) 553-1774 or at [chu.rebecca@epa.gov](mailto:chu.rebecca@epa.gov).

Sincerely,

REBECCA CHU Digitally signed by REBECCA CHU  
Date: 2023.03.17 13:26:35 -0700

Rebecca Chu, Chief  
Policy and Environmental Review Branch

Enclosure

**U.S. EPA Detailed Comments on the  
Notice of Preparation for Ferndale Levee Repair Project  
Whatcom County, Washington  
March 2023**

**Climate Change**

On January 9, 2023, the Council on Environmental Quality (CEQ) published interim guidance to assist federal agencies in assessing and disclosing climate change impacts during environmental reviews. CEQ developed this guidance in response to EO 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*. This interim guidance is effective immediately. CEQ indicated that agencies should use this interim guidance to inform the NEPA review for all new proposed actions and may use it for evaluations in process, as agencies deem appropriate, such as informing the consideration of alternatives or helping address comments raised through the public comment process. EPA recommends the NEPA analysis apply the interim guidance as appropriate, to ensure robust consideration of potential climate impacts, mitigation, and adaptation issues.

In evaluating the impacts of the proposed project on climate change, EPA recommends the NEPA analysis include:

- An assessment of the extent to which the proposed project is consistent with U.S. and global policy to limit GHG emissions.
- An assessment of the additive and synergistic impacts of climate change upon local natural resources, seasonal water patterns, and wildfires.
- An assessment that relates climate change to environmental justice and human health impacts.

When considering climate change impacts, EPA recommends the NEPA analysis assess the proposed project's climate resiliency given reasonably foreseeable future conditions of projected regional and local climate change impacts. The long-lived nature of infrastructure makes consideration of the ongoing and projected impacts of climate change even more important. Considering potential climate change impacts helps ensure that proposed investments continue to function and provide benefits in the years to come, as climate conditions change.

In assessing the proposed project's climate resiliency, EPA recommends that NEPA analysis include:

- Existing and reasonably foreseeable environmental trends related to a changing regional and local climate.
- Reasonably foreseeable effects that a currently changing climate will have on the proposed project purpose (e.g., its abilities to function properly and provide flood protection).
- Identification of how climate resiliency has been considered in the proposed action and alternatives.

**Environmental Justice**

Executive Order 12898 directs federal agencies to identify and address the disproportionately high and adverse human health effects of federal actions on minority and low-income populations, to the greatest extent practicable and permitted by law. EO 13985 on *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government* should also be incorporated into the NEPA analysis because it includes a modern definition of equity that clarifies a broader approach.

To identify potential EJ concerns, EPA recommends utilizing the web-based Environmental Justice Screening and Mapping (EJScreen, Version 2.1) Tool.<sup>1</sup> EJScreen is EPA's nationally consistent environmental justice screening and mapping tool.<sup>5</sup> EJScreen offers a variety of powerful data and mapping capabilities that enable users to understand details about the population of an area and the environmental conditions in which they live. The tool provides information on environmental and socioeconomic indicators as well as pollution sources, health disparities, critical service gaps, and climate change data. The data is displayed in color-coded maps and standard data reports which feature how a selected location compares to the rest of the nation and state.

Assessing EJScreen information is a useful first step in understanding or highlighting locations that may be candidates for further review or outreach. EPA considers a project to be in an area of potential EJ concern when an EJScreen analysis for the project area shows one or more of the twelve EJ Indices at or above the 80th percentile in the nation and/or state. Another available tool is the Climate and Economic Justice Screening Tool (CEJST).<sup>2</sup> The CEJST shows information about the burdens that communities experience. It uses datasets to identify indicators of burdens and highlights Census Tracts as being disadvantaged due to them being overburdened and underserved. EJScreen and CEJST are complementary tools.

An additional available tool for identifying potential EJ concerns is the State of Washington Environmental Health Disparities Map (WEHD, Version 2.0).<sup>3</sup> The WEHD can also be used to assist Federal agencies compare communities across the state for environmental health disparities. WEHD displays measures, such as poverty, health risks and diseases, and exposures to certain types and sources of pollution.

It is important to consider all areas impacted by the proposed action(s). Areas of impact can be a single block group or span across several block groups and communities.<sup>4</sup> When assessing large geographic areas, consider the individual block groups within the project area in addition to an area-wide assessment. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators.<sup>5</sup> As the screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location and/or proposed project, consider additional information in an EJ analysis to supplement EJScreen outputs. Further review or outreach may be necessary for the proposed action.

To address these potential concerns, EPA recommends:

- Applying methods from "Environmental Justice Interagency Working Group Promising Practices for EJ Methodologies in NEPA Reviews" report to this project.<sup>6</sup> This report compiles

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<sup>1</sup> Accessed at: <https://www.epa.gov/ejscreen>. Accessed 3/15/2023.

<sup>2</sup> Accessed at: <https://screeningtool.geoplatform.gov/en/#13.2/48.85004/-122.58197>. Accessed 3/17/2023.

<sup>3</sup> Accessed at: <https://doh.wa.gov/data-and-statistical-reports/washington-tracking-network-wtn/washington-environmental-health-disparities-map>. Accessed 3/15/2023.

<sup>4</sup> Agencies should define community as "either a group of individuals living in geographic proximity to one another, or a geographically dispersed set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions" (Interim Justice40 Guidance – Executive Order 14008 on Tackling the Climate Crisis at Home and Abroad, January 27, 2021).

<sup>5</sup> Accessible at: <https://www.epa.gov/ejscreen/technical-documentation-ejscreen>. Accessed 3/15/2023.

<sup>6</sup> Accessible at: [https://www.epa.gov/sites/default/files/2016-08/documents/nepa\\_promising\\_practices\\_document\\_2016.pdf](https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf). Accessed 3/15/2023.

methodologies from current agency practices for integrating EJ considerations in NEPA processes.

- Characterizing project site(s) with specific information or data related to EJ concerns.<sup>7</sup>
- Describing potential EJ concerns for all EJ Indexes at or above the 80th percentile in the state and/or nation.
- Describing block groups that contain the proposed action and at a minimum, a one-mile radius around those areas.
- Describing individual block groups within the project area in addition to an area-wide assessment.
- Supplementing data with county level reports and local knowledge (e.g., traditional ecological knowledge).

### **Alternatives Analysis**

When discussing the alternatives that were considered for this project, EPA recommends the NEPA document provide additional context and explanation as to why certain alternatives were not carried forward for further consideration. This could include discussions of regional and watershed management plans that already address some of the objectives that might have been achieved in the nonstructural alternative (Alternative 2), or the specific infrastructure and space limitations that prevent the bank layback alternative (Alternative 3). A robust discussion of ongoing management strategies in the watershed and limitations that preclude certain alternatives provide more clarity for the public to better understand the NEPA process and improves the public involvement.

### **Green Infrastructure Technologies**

EPA recommends the NEPA analysis discuss efforts to minimize the use of pollution generating materials during construction. For example, if the project involves generating new impervious surfaces, consider de-paving areas to achieve no net increase in pollution generating impervious surface. EPA recommends the NEPA analysis include opportunities to minimize impacts from storm water such as green infrastructure technologies. EPA has information on technologies including permeable paving systems, rainwater harvesting ideas, and bioswales that may be useful for reducing the impacts of development.<sup>8</sup>

EPA also has information on pollution generating materials, such as products with inadvertently generated PCBs (iPCBs), and information on products and pollution prevention solutions to reduce the release of iPCBs into the environment.<sup>9</sup>

### **Impacts to Water Quality and Aquatic Resources**

#### *Clean Water Act (CWA) Section 402*

In Washington, EPA issues National Pollutant Discharge Elimination System (NPDES) permits for federally owned facilities and permits on tribal lands; EPA has delegated authority to issue other NPDES permits to the Washington Department of Ecology.<sup>10</sup>

<sup>7</sup> For more information about potential EJ concerns, refer to the July 21, 2021, Memorandum for the Heads of Departments and Agencies Interim Implementation Guidance for the Justice40 Initiative. Accessible at: <https://www.whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf>. Accessed 3/15/2023.

<sup>8</sup> Accessed at: <https://www.epa.gov/green-infrastructure/what-green-infrastructure>. Accessed 3/17/2023.

<sup>9</sup> Accessed at: <https://www.epa.gov/sites/default/files/2021-04/documents/p2-pcb-factsheet-508.pdf>. Accessed 3/17/2023.

<sup>10</sup> Accessed at: <https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits>. Accessed 3/17/2023.

EPA recommends the NEPA analysis identify any discharges to waters of the U.S. (WOTUS) that are known, or are likely, to occur during construction and operation of the project and how these discharges would be managed and minimized. Identify the NPDES permits that will be obtained for the construction phase, new (or modifications to) existing permits for operations, and how any previous permit exceedances could be prevented by incorporating pollution prevention measures into the project.

## **Comment 2 Response:**

### **Climate Change:**

Construction related impacts on air quality are discussed in Section 3.6 of this EA. Construction vehicles and heavy equipment used during the emergency, however, the small area of construction and the short duration of the work limited the impact to air quality. Emissions generated by the activity were minor and short-term and well below the *de minimis* threshold. Unquantifiable but insignificant exacerbation of effects of carbon dioxide (CO<sub>2</sub>) emissions on global climate change would be anticipated from the completed flood fight activities. Air quality impacts for the proposed repair would be similar to those discussed for the completed emergency flood repair.

Additionally, as part of the environmental justice analysis, the CEQ's Climate and Economic Justice Screening Tool was examined for disadvantaged communities (Section 3.8 and Appendix E).

### **Environmental Justice:**

As recommended, the USACE used the EJScreen tool in its environmental justice (EJ) assessment but used a five-mile radius around the project area. The EA has been updated to state that all twelve EJ Indexes are at or above the 80<sup>th</sup> percentile in the nation and State. However, due to the nature of the project, it is not expected to cause long-term increases to any index. See section 3.8 of the EA for additional details. Due to the scale and scope of the proposed action under PL 84-99 the USACE is conducting an EA and not an EIS. As such, the level of analysis is commensurate with the type of impacts of the proposed federal action, which is the repair of the flood control structure; not the existence of the flood control structure itself or the siting of facilities that would cause long-term impacts, such as increases to EJ Indexes.

### **Alternatives Analysis:**

Both the emergency and proposed levee repair are authorized by Public Law 84-99 (33 U.S. Code Section 701n). The USACE's rehabilitation and restoration work under this authority is limited to the repair of flood control works damaged or destroyed by floods. The statute authorizes permanent rehabilitation to the LOP exhibited by the flood control work prior to the damaging event. In addition, USACE assistance is authorized under 33 CFR 203.32, in support of State and local response activities, to provide temporary assistance to meet an immediate threat in order to preserve: life; residential, commercial, and industrial property; and public facilities and services.

Viable alternatives must restore reliable flood protection to the LOP prior to the next damaging event, must be environmentally acceptable, and should address the identified flood risk by being capable of being constructed prior to the next flood season. The preferred alternative must be the least cost alternative that restores the LOP while fulfilling all legal, technical and environmental requirements.

The nonstructural strategies (alternative 2) involve acquisition, relocation, elevation, and flood proofing existing structures. Given the emergency nature and then need to complete repairs before the next flood season, the costs and timeframe for implementing this alternative makes it impractical. Furthermore, the participation of the non-federal sponsor would be required to implement a non-structural alternative, and the Sponsor has not agreed to meet its various obligations in executing a non-structural alternative.

The layback (alternative 3) and setback (alternative 4) could encroach on existing structures, privately owned land, and public infrastructure. In this case, a layback would require alterations to Ferndale Road which abuts the levee on the landward side. Additionally, the layback and alterations to Ferndale Road may encroach on the ConocoPhillips Sports Complex and the existing wastewater treatment plant infrastructure located landward of the levee. Implementing these alternatives would similarly require a substantial commitment and participation from the non-federal sponsor.

#### **Green Infrastructure Technologies:**

The proposed project would not result in an increase in impervious surface as the repair would take place within the footprint of the completed emergency flood repair. The project would employ a number of BMPs to reduce potential stormwater and water quality impacts (Section 2.7.2). These BMPs include, but are not limited to:

- *Temporary erosion control measures would be installed for all phases of work as required to prevent the discharge or accumulation of sediment into the river or offsite. A Certified Erosion and Sediment Control Lead would choose and install erosion control materials for specific site conditions as necessary. These may include silt fencing, mats, blankets, check dams, bonded fiber matrix, and straw. Accumulation of sediment in any adjacent swales or storm drains would be monitored daily and cleared to ensure continued service throughout construction.*
- *Biodegradable hydraulic fluids would be used in machinery where appropriate.*
- *Fueling would occur on the back side of the levee 100 feet away from the waterline, and biodegradable hydraulic fluids would be used as appropriate in any portion of the equipment that would work in the water. A Fueling and Spill Recovery Plan would be developed prior to construction and would include specific BMPs to prevent spills and react quickly should a spill occur.*
- *Construction equipment would be regularly checked for vehicle-fluid drips or leaks, and immediately removed from service until corrected.*
- *At least one fuel spill kit with absorbent pads would be on site at all times.*

#### **Clean Water Act Section 402:**

The total ground disturbance associated with the project including the staging, repair, and mitigation areas is cumulatively less than 1-acre (Table 1). Therefore, the project does not trigger Section 402 of the Clean Water Act (Section 8.3).