DEPARTMENT OF THE ARMY
SEATTLE DISTRICT. CORPS OF ENGINEERS
P. O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

REPLY TO
ATTENTION OF

CENWS-PM-PL-ER

REHABILITATION OF FLOOD CONTROL WORKS, BERTRAND CREEK LEVEE, WHATCOM COUNTY, WASHINGTON

FINDING OF NO SIGNIFICANT IMPACT

1. Background. The Seattle District, U.S. Army Corps of Engineers (Corps) repaired and reconstructed five sections of the Bertrand Creek levee, located at River Mile 12.5 of the Nooksack River near Ferndale, Washington in September 2004. The levees protect 1,790 acres of agricultural land, residential properties, and associated public infrastructure, such as roads. The Corps repaired the following project as an emergency action, under authority of Public Law 84-99 (33 USCA 701n).

The Nooksack River rose above the zero damage flood stage in October 2003, resulting in severe erosion to approximately 450 linear feet of the levee in this area. In November 2003, Whatcom County Public Works Department requested assistance under the PL 84-99 Program in implementing a repair project at this location. The Corps determined that the levee was in need of permanent repair and repaired approximately 450 linear feet of the levee.

2. Purpose and Need. The purpose of this project is to provide protection to the community and infrastructure from flood damage. This section of the levee sustained significant damage by erosion during a flood event in October 2003, and was in need of permanent repair.

There was a high potential that during the upcoming flood season, the river would overflow the levee again, posing a major threat to community, if no action was taken to contain the floodwaters.

3. Action. The project consisted of rehabilitating five damaged levee sections totaling 450 linear feet. The project included pulling the riverward slopes back to a 2.0 H: 1.0 V, reshaping the back slopes, armoring the riverward slopes, incorporating willow plantings as well as a fish bench into the design.

4. Summary of Impacts. The primary impacts of this action were the temporary and localized increase in noise in the construction area, the temporary and highly localized increase in turbidity and the temporary removal of vegetation from the bank. Turbidity was monitored during construction and construction activities were altered or temporarily halted whenever turbidity exceeded 5 NTU over background. To minimize the project impacts to vegetation, the project area was replanted with native willow plantings.

CENWS-PM-PL-ER
SUBJECT: Rehabilitation of Flood Control Works Bertrand Creek Levee, Whatcom County, Washington

The attached environmental assessment provides an evaluation of the levee rehabilitation project and its effects on the existing environment.

No significant adverse impacts to fish and wildlife habitat, air quality, noise, esthetics, historical resources, cultural resources, or the social or economic environment were anticipated or documented as a result of the project.

5. Finding. For the reasons described above, I have determined that the levee rehabilitation project did not result in significant adverse environmental impacts. The project did not constitute a major Federal action with significant impacts on the human environment and, therefore, did not require an environmental impact statement.

30 June 05
Date

Debra M. Lewis
Colonel, Corps of Engineers
District Engineer

Final Environmental Assessment

Nooksack River – Bertrand Creek Levee

Rehabilitation of Flood Control Works
Whatcom County, Washington

April 2005

US Army Corps
of Engineers®
Seattle District

Nooksack River Bertrand Levee
Rehabilitation of Flood Control Works
Final Environmental Assessment
April 2005

Responsible Agency: The responsible agency for rehabilitation of flood control works is the U.S. Army Corps of Engineers, Seattle District.

Abstract:

This Environmental Assessment (EA) evaluates the environmental effects of the repair and reconstruction of the Bertrand Creek levees in September 2004. Bertrand Creek is a tributary of the Nooksack River which empties into the Nooksack River at River Mile 12.5 near Ferndale, Washington. The levees protect 1,790 acres of agricultural land, and associated public infrastructure, such as roads. The U.S. Army Corps of Engineers, Seattle District, constructed the following project under the authority of Public Law 84-99 (33 USCA 701n). The project consisted of pulling the riverward slopes back to 2 Horizontal: 1Vertical, reshaping the back slopes, armoring the riverward slopes, and incorporating willow plantings and a fish bench into the design.

The Nooksack River and Bertrand Creek rose above the zero damage flood stage in October 2003, resulting in damage to five separate areas (two on the left bank and three on the right bank) along the levees. In November 2003, Whatcom County Public Works Department requested assistance under the PL84-99 Program in implementing a repair project at this location. The Corps determined that the levee was in need of permanent repair and repaired five sections of the levee totaling approximately 450 feet in September 2004. The majority of the vegetation along the repaired sections of the levee including the back, top, and riverward slope consisted of Himalayan blackberry, Japanese knotweed and a few red alders. Landward of the levees the vegetation consists of agricultural land; primarily corn and seed potatoes.

The proposed project did not constitute a major federal action significantly affecting the quality of the human environment.

This document is also available online at:
http://www.nws.usace.army.mil/ers/envirdocs.html

Please send questions and requests for additional information to:

Mr. Chuck Ebel
Environmental Resources Section
U.S. Army Corps of Engineers
P.O. Box 3755
Seattle, Washington 98124-3755
Charles.j.ebel@usace.army.mil
206-764-3626

TABLE OF CONTENTS

1. INTRODUCTION 1

1.1 LOCATION AND SETTING 1
1.2 BACKGROUND 2
1.3 PROJECT PURPOSE AND NEED 3
1.4 AUTHORITY 3
1.5 ACTION AREA 3

2. DESCRIPTION OF THE ALTERNATIVES 3

2.1 PREFERRED ALTERNATIVE 3
2.2 NON-SELECTED ALTERNATIVES 5
2.2.1 No Federal Action 5
2.2.2 Non-Structural Alternative 5

3. AFFECTED ENVIRONMENT 5

3.1 GENERAL 5
3.2 HYDROLOGY, SOILS AND TOPOGRAPHY 6
3.3 VEGETATION 6
3.4 FISH AND WILDLIFE 7
3.5 THREATENED AND ENDANGERED SPECIES 7
3.6 CULTURAL RESOURCES 10
3.7 WATER QUALITY 10
3.8 AIR QUALITY AND NOISE 11
3.9 UTILITIES AND PUBLIC SERVICES 11
3.10 LAND USE 11
3.11 RECREATION 11
3.12 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE 12
3.13 AESTHETICS 12

4. EFFECTS OF THE ALTERNATIVES 12

4.1 GENERAL 12
4.1.1 Proposed Alternative 12
4.1.2 No-Action Alternative 12
4.2 HYDROLOGY, SOILS AND TOPOGRAPHY 12
4.2.1 Proposed Alternative 12
4.2.2 No-Action Alternative 13
4.3 VEGETATION 13
4.3.1 Proposed Alternative 13
4.3.2 No-Action Alternative 13
4.4 FISH AND WILDLIFE 13
4.4.1 Proposed Alternative 13
4.4.2 No-Action Alternative 13
4.5 THREATENED AND ENDANGERED SPECIES 14
4.5.1 Proposed Alternative 14
4.5.2 No-Action 15
4.6 CULTURAL RESOURCES 15
4.6.1 Proposed Alternative 15
4.6.2 No-Action Alternative 15
4.7 WATER QUALITY 15
4.7.1 Proposed Alternative 15
4.7.2 No-Action Alternative 16
4.8 AIR QUALITY AND NOISE 16
4.8.1 Proposed Alternative 16
4.8.2 No-Action Alternative 16
4.9 UTILITIES AND PUBLIC SERVICES 16
4.9.1 Proposed Alternative 16

4.9.2 No-Action Alternative *16*
4.10 LAND USE 16
4.10.1 Proposed Alternative *16*
4.10.2 No-Action Alternative *17*
4.11 RECREATION 17
4.11.1 Proposed Alternative *17*
4.11.2 No-Action Alternative *17*
4.12 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE 17
4.12.1 Proposed Alternative *17*
4.12.2 No-Action Alternative *17*
4.13 AESTHETICS 17
4.13.1 Proposed Alternative *17*
4.13.2 No-Action Proposed Alternative Aesthetics *17*

5. UNAVOIDABLE ADVERSE EFFECTS 17

6. COORDINATION 17

7. CUMULATIVE EFFECTS 18

8. ENVIRONMENTAL COMPLIANCE 18

8.1 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) (42 USC 4321 ET SEQ.) 18
8.2 ENDANGERED SPECIES ACT OF 1973, AS AMENDED (16 USC 1531-1544) 18
8.3 CLEAN WATER ACT, AS AMENDED (33 USC 1251 ET SEQ.) 19
8.4 RIVERS AND HARBORS ACT (33 U.S.C. 403) 19
8.5 COASTAL ZONE MANAGEMENT ACT (16 U.S.C. 1451-1465) 19
8.6 NATIONAL HISTORIC PRESERVATION ACT) (16 USC 470 ET SEQ., 110) 19
8.7 CLEAN AIR ACT AS AMENDED (42 USC 7401, ET SEQ.) 20
8.8 WILD AND SCENIC RIVERS ACT (16 U.S.C. 1271-1287) 20
8.9 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT (16 USC 701-715) 20
8.10 FISH AND WILDLIFE COORDINATION ACT, AS AMENDED (16 USC 661 ET SEQ.) 20
8.11 WATERSHED PROTECTION AND FLOOD PREVENTION ACT, AS AMENDED (16 U.S.C. 1001 ET SEQ.) 21
8.12 FARMLAND PROTECTION POLICY ACT (7 U.S.C. 4201, ET SEQ.) 21
8.13 RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) (42 USC 6901 ET SEQ.) 21
8.14 EXECUTIVE ORDER 11988, FLOODPLAIN MANAGEMENT (24 MAY 1977) 21
8.15 EXECUTIVE ORDER 12898, ENVIRONMENTAL JUSTICE 22
8.16 EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS, MAY 24, 1977 22
8.17 TREATY RIGHTS 22

9. CONCLUSION 24

10. REFERENCES 25

11. APPENDICES 26

APPENDIX A 1
REQUESTS FOR CORPS ASSISTANCE 1
APPENDIX B 1
ESA CONSULTATION DOCUMENT 1
APPENDIX C 1
VEGETATION MONITORING 1
APPENDIX D 1
PROJECT DRAWING 1
APPENDIX E 1
FINDING OF NO HISTORIC PROPERTIES AFFECTED 1
APPENDIX F 1
EXEMPTION FROM THE SHORELINE MANAGEMENT PROGRAM SUBSTANTIAL DEVELOPMENT PERMIT REQUIRMENT 3

1. INTRODUCTION

This Environmental Assessment (EA) evaluates the environmental effects of the repair and reconstruction of 5 sections of the Bertrand Creek Levees. Bertrand Creek is a tributary of the Nooksack River which empties into the Nooksack River at River Mile 12.5 near Ferndale, Washington. There were 3 damaged areas on the right bank (looking downstream) and 2 damaged areas on the left bank. The area is within the historic floodplain of the Nooksack River, and contains several small farms, single-family residences, and over 1,700 acres of agricultural land. The Nooksack River and Bertrand Creek rose above the zero damage flood stage in October 2003, resulting in damage to five separate areas (two on the left bank and three on the right bank) along the levees. Four of the damaged areas experienced severe erosion resulting in the levee top nearly at grade with the existing ground, and vertical riverward slopes. The other damaged area experienced a catastrophic right bank breach. In November 2003, Whatcom County Public Works Department requested assistance under the PL84-99 Program in implementing a repair project at this location. The Corps determined that the levees were in need of permanent repair. The project consisted of returning the damaged levee sections to pre-flood conditions by pulling the riverward slopes back to 2H: 1V, reshaping the back slopes, armoring the riverward slopes, incorporating willow plantings as well as a fish bench into the design. The total cumulative length of all five of the repairs for this levee rehabilitation project was approximately 450 feet.

This project was constructed under the PL 84-99 Program, which is a Corps Emergency Authority which affords the Corps to complete appropriate NEPA documentation, when necessary, after-the-fact. Although every effort is made to coordinate with the appropriate agencies, tribes and stakeholders, and complete a Finding of No Significant Impact prior to initiating construction, it is sometimes not possible to complete the NEPA process provided the need to reduce the imminent risk to life, health, property, and to minimize severe economic loss.

1.1 Location and Setting

The levees are located along both the left and right banks of Bertrand Creek at approximate river mile 1. Bertrand Creek is a tributary of the Nooksack River near Ferndale, located in Section 34, Township 40 North, Range 2 East, in Whatcom County, Washington. The confluence of Bertrand Creek is at Nooksack River mile 12.5. The levee protects agricultural and residential property and associated public infrastructure. A location map can be found in Figure 1.

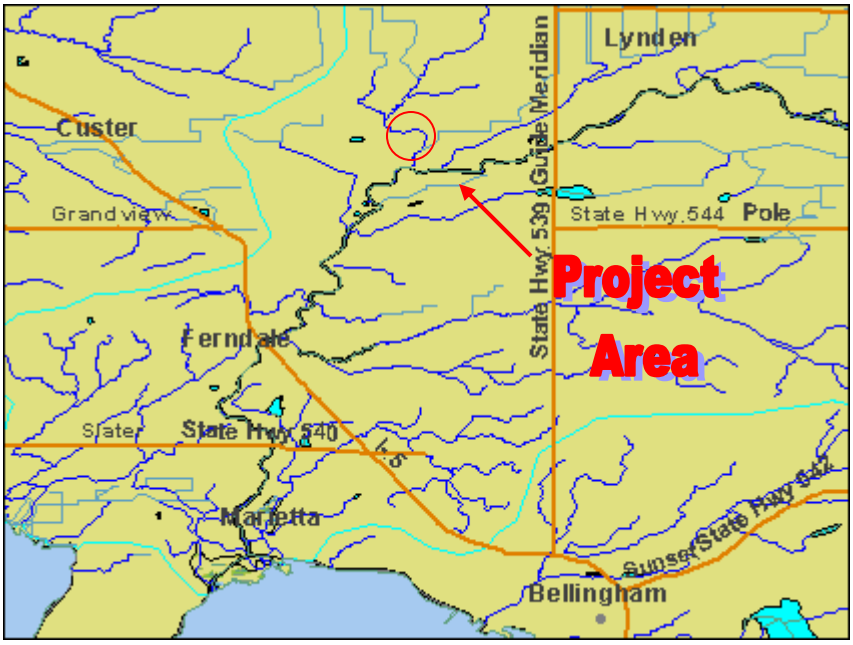


Figure 1. Project Location

1.2 Background

The project was originally constructed in the early 1900's by local farmers to protect crops, roads, and structures. Over the years, separate segments became interconnected to form a contiguous levee segment. The estimated completion of a contiguous segment is prior to 1936 when the Corps performed levee upgrades using Works Progress Administration (WPA) funding. After the WPA upgrades, Corps involvement has been limited to flood fights and levee rehabilitation.

The County performs annual maintenance including the removal of blackberries and thinning or removal of trees that would jeopardize levee integrity.

Moderately strong rains from a series of frontal systems from the eastern Pacific Ocean hit Western Washington on 16 and 17 October 2003. Flooding on the Nooksack River and Bertrand Creek occurred on 16 October when the river rose above National Weather Service zero damage flood stage of 12 feet (20,000 cfs) on several gauges along the river. On 17 October, 2003, the Nooksack River proceeded to rise to its eventual crest of 13.55 feet (40,400 cfs).

During this flood event the levee sustained significant damage by erosion, resulting in damage to five separate areas (two on the left bank and three on the right bank) along the levees. Four of the damaged areas experienced severe erosion resulting in the levee top nearly at grade with the existing ground, and vertical riverward slopes. The other damaged area experienced a catastrophic right bank breach.

In November 2003, Whatcom County Public Works Department requested assistance under the PL84-99 Program in implementing a repair project at this location (Appendix A). The Corps determined that the levee was in need of permanent repair and repaired approximately 450 lineal feet of the levee.

1.3 Project Purpose and Need

The purpose of this project is to provide protection to the community and infrastructure from flood damage. This section of the levee sustained significant damage by erosion during a flood event in October 2003, and was in need of permanent repair.

There was a high potential that during the upcoming flood season around October, the river would overflow the levee again, posing a major threat to community, if no action was taken to contain the floodwaters.

1.4 Authority

The Bertrand Creek Levee Rehabilitation is authorized by Public Law 84-99 (33 USCA 701n). Corps rehabilitation and restoration work under this authority is limited to flood control works damaged or destroyed by flood. The rehabilitated structure was normally designed to provide the same degree of protection as the original structure. The Corps determined that if the levee was not repaired by the next flood event, a threat of loss of private and/or public property existed.

1.5 Action Area

The action area included both banks of Bertrand Creek from the confluence with the Nooksack up to 1.0 River Mile upstream of the confluence. The action area for the project extends from the most downstream project site on downstream approximately 500 feet for aquatic species and includes a 3/4-mile radius from all of the project areas for terrestrial species. Staging was accomplished at the work site, and access was obtained using existing levee access roads from existing paved roads.

2. DESCRIPTION OF THE ALTERNATIVES

2.1 Preferred Alternative

The Seattle District Corps of Engineers permanently repaired five sections of the levee that were damaged during the October 2003 flood event (Figure 2). Four of the five repairs consisted of simply armoring and pulling the above water portion of the near vertical riverward slopes back to 2H: 1V. The riverward slope was reshaped and a three foot blanket of class III riprap was placed for armor rock. The armor rock caught at the river bottom, and no buried toe was constructed (Appendix D). Material removed from the front slope was placed back over the armor, down to the ordinary high water mark, allowing for hydroseeding, and willow planting.

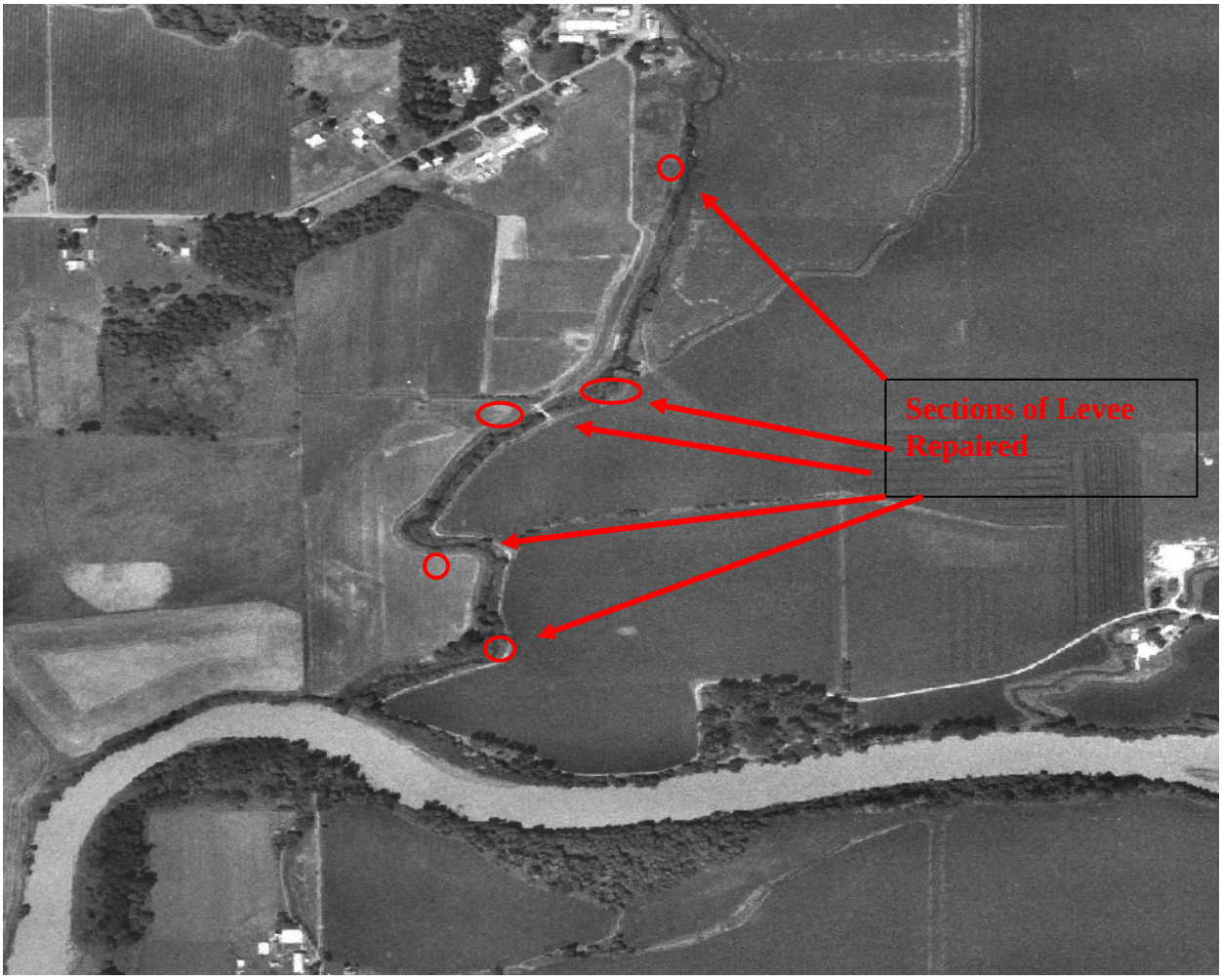


Figure 2. **Project Sites**

The levee rehabilitation at the catastrophic breach site included setting the in-water portion of the levee back a distance of 1-12 feet, and the above water portion a distance of 3-30 feet back from the pre-flood condition. This included reshaping this section of the levee from the straight linear pre-flood configuration to a crescent shape, as well as adding a fish bench. This repair like the others consisted of armoring and pulling the riverward slope back to 2H: 1V, as well as placing a foot thick blanket of class III riprap for armor rock. All project sites also included reshaping the back slope, and adding willow plantings. To summarize, the levee rehab resulted in having four sites (350 lineal feet of the levee) returned to the pre-flood condition, and 100 lineal feet of the levee having both the in-water (fish bench) and the above water portion of the levee set back a distance of approximately 1-30 feet, totaling 450 lineal feet of levee being rehabilitated. The project was constructed between September 1 and September 10, 2004.

The fish bench was incorporated into levee rehabilitation design to provide rearing habitat for juvenile salmonids. This "bench" consisted of additional excavation of the accumulated sediment bench to provide a more gradual slope for juvenile salmonid refuge. This was incorporated into design where the width of the sediment bench allowed for the more gradual slope, so that the integrity of the levee would not be compromised. All areas for "benches" were assessed (approved or denied) by team hydraulic and geotechnical engineers.

A project drawing is located in Appendix D. Access to the site did not require the construction of a road as a road already existed. However, during the October flood fight the dirt road that connects Rathbone Road to the levee was damaged. This road is approximately 1500 feet long and required approximately 8-10 inches of gravel placed upon it to reduce erosion and provide stable access.

2.2 Non-Selected Alternatives

Several other alternative actions were considered before the recommended alternative was selected. These alternatives include:

- No Federal Action (the No-Action Alternative),
- the Non-Structural Alternative,

In order for any alternative to be acceptable for consideration it must meet certain objectives. The alternative must be economically justified, it should be environmentally acceptable, and it should minimize costs for both the sponsor and the Federal government. In addition, it should meet the project purpose and need.

2.2.1 No Federal Action

The No-Action alternative would provide no federal action and leave the levee in its currently damaged condition with no further action to repair the levee damage. This alternative was quickly discarded because of the high potential of additional flood damages.

2.2.2 Non-Structural Alternative

The Non-Structural alternative would buy out the existing residential and agricultural property and would also relocate any necessary public infrastructure. This alternative was discarded because the costs were deemed too high compared to the costs for other alternatives. In addition, the PL84-99 Authority dictates that the levee will be repaired to its pre-flood condition.

3. AFFECTED ENVIRONMENT

3.1 General

Near the project area the Nooksack River is a confined, single channel, low gradient system. The river provides spawning and rearing for all salmon species utilizing the upper mainstem Nooksack. These species include Chinook (*Oncorchynchus tshawytscha*), chum (*O. keta*), pink (*O. gorbuscha*), perhaps sockeye (*O. nerka*), steelhead (*O. mykiss*) and large numbers of coho (*O. kisutch*). Juvenile rearing could occur through the reach. Much of the riparian zone adjacent to the levees along this section of the Nooksack is well developed with medium age cottonwoods, alders, and Douglas fir. The riparian vegetation serves as habitat for a variety of raptors, woodpeckers, passerines and water-oriented mammals.

The following threatened species are expected to be found near the project area in the Nooksack River and Bertrand Creek:

Puget Sound Chinook salmon (2 essential stocks)
Bull trout (*Salvelinus confluentus*)
Bald eagle (*Haliaeetus leucocephalus*)

In the project area Bertrand Creek is a confined, single channel, low gradient system. The creek may provide spawning and rearing for all salmon species utilizing the upper mainstem Nooksack. The species that have been documented utilizing Bertrand Creek include Fall Chinook, coho, chum, sockeye, and steelhead. It is also anticipated that marbled murrelet (*Brachyramphus marmoratus marmoratus*) could transit the area going to nesting areas in the upper watershed, or feeding areas in Puget Sound.

3.2 Hydrology, Soils and Topography

Flood frequency curves were developed using the published drainage area (40 sq. miles) for the historic USGS Bertrand creek stream gage and USGS regional regression equations (WA Zone 2). The historic gage has only one high flow data point and is not suitable for gage analysis. Because portions of the watershed are in Canada, topography and rainfall data are limited to that published for the US. The drainage area for the historic gage does not include the tributary area of Lynden. It is felt that this area is less than 10% of the total catchment area--if it is greater, the discharge estimates would be affected accordingly. If the upper watershed topography is influenced by orographic precipitation, then the mean annual precipitation would be higher than that used for the hydraulic analysis for this project (45”/year). As a result the analysis would underestimate discharge. The calculated discharges for the 2, 10, 25, 50 and 100-year flood events on Bertrand Creek are 722, 1258, 1534, 1788, 1999 cfs respectively.

Topography of the project site is generally flat river floodplain, changing to a gently rolling landscape away from the river. The on-site soils are Mt. Vernon fine sandy loam, 0 to 2 percent slope (SCS, 1992), which is a very deep, moderately well drained soil found on river terraces and flood plains. Included in this unit are small areas of Briscot, Puyallup, Eliza, and Oridia soils; Shalcar soils in depressions, Riverwash, and Mt. Vernon Soils that have slopes greater than 2 percent. Of these soils, Briscot, Eliza, Oridia, Shalcar, and Riverwash soils are listed as hydric soils. Average precipitation is about 45 inches; average temperature is 50 degrees F. This soil usually has a seasonally high water table, and is at risk for flooding.

3.3 Vegetation

The project site is located in a coastal upland agricultural area. Vegetation at and near the vicinity of the project site is limited to that which occurs near the river. These include:

- cottonwood (*Populus angustifolia)*
- red-osier dogwood (*Cornus sericea*),
- Nootka rose (*Rosa nutkana*),
- snowberry (*Magnoliopsida dilleniida*),
- red alder (*Alnus rubra*),
- Japanese knotweed (*Fallopia japonica*)
- Himalayan blackberry (*Rubus discolor*),

- evergreen blackberry (*Rubus laciniatus*),
- Douglas fir (*Pseudotsuga menziesii*)
- willow (*Salix* spp.) and
- a variety of native and non-native grasses.

At four of the five project sites the vegetation consisted of primarily Japanese knotweed, Himalayan blackberry, interspersed with a few red alder and cottonwood trees. At the up-stream most site the vegetation was much more consistent with a healthy native riparian zone with the prominent species at this project site consisting of Nootka rose, red-oiser dogwood, salmonberry, willow, and a few red alder.

3.4 Fish and Wildlife

The Nooksack River supports several species of salmon and trout. Trout species occasionally present include bull trout, Dolly Varden, steelhead and cutthroat trout. The salmon species are Chinook, coho, chum, pink, and perhaps sockeye.

The species that have been documented utilizing Bertrand Creek include Fall Chinook, coho chum, sockeye, and steelhead.

The agricultural area surrounding the project site along Bertrand Creek and the Nooksack River is frequented by a variety of wildlife species. Mammals include raccoon (*Procyon lotor*), Douglas squirrel (*Tamiasciurus douglasi*), little brown myotis (*Myotis lucifugus*), mink (*Carnivora mustelidae)* and Columbia black-tailed deer (*Odocoileus hemionus*). Bird species could include bald eagles, marbled murrelets, and chestnut-backed chickadee (*Parus rufescens*).

3.5 Threatened and Endangered Species

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species. Three species listed as either threatened or endangered are potentially found in the area of the project, and are listed in Table 3-1.

Table 3-1. Endangered Species in the Project Vicinity

Scientific Name	Common Name	Status
Haliaeetus leucocephalus	Bald Eagle	Threatened
Oncorhynchus tshawytscha	Puget Sound Chinook Salmon	Threatened
Salvelinus confluentus	Bull Trout	Threatened
Brachyramphus marmoratus marmoratus	Marbled murrelets	Threatened

Information on known occurrences of candidate and threatened species in the project vicinity, and the impacts of the proposed projects on these species are addressed in Appendix B, Nooksack River Bertrand Creek Levee Repair ESA documentation, dated December 2004. This EA includes a revegetation plan requiring the vegetative plantings be monitored and maintained, and replanted if necessary, for up to five years. The plan also requires monitoring and maintenance for invasive species to ensure that the riparian plantings are able to survive and enable the damaged riparian area to recover back to its original pre-flood condition.

Bald eagle is listed as threatened in Washington pursuant to the Endangered Species Act and can be found in coastal areas. The project area is approximately 1/2 mile away from a nest and the nest is not visible from the project area. Nesting territory extends along much of the Nooksack River, as far north as Pioneer Park.

Marbled murrelet is listed as threatened and is found in coastal old-growth forest areas of Washington. Marbled murrelets do not nest or feed in the project area. The project site lacks old-growth forest and does not contain suitable marbled murrelet habitat.

Bull trout and Dolly Varden have been found to co-exist in streams in this region. Because these two species are closely related and have similar biological characteristics, the WDFW manages bull trout and Dolly Varden in the Nooksack together as "native char." Bull trout and Dolly Varden are very difficult to distinguish based on physical features and share similar life history traits and habitat requirements. Dolly Varden were not listed as a threatened species in the Coastal/Puget Sound Distinct Population segment when the USFWS listed bull trout was listed in November 1999. However, the USFWS indicated on January 9, 2001 that Dolly Varden are being considered for listing as threatened due to their similarity of appearance to bull trout.

Bull trout was designated on June 10, 1998, as threatened in the contiguous U.S.A. (lower 48 states). Anadromous and resident bull trout spawn in the upper forks of the Nooksack River. Although bull trout have not been documented as utilizing Bertrand Creek it is possible that bull trout could use Bertrand Creek for juvenile rearing and larger bull trout could transit through the project area to upstream salmon spawning areas to feed. Existing habitat suitability for char along this length of shoreline is low during summer months as the water temperatures are likely quite high.

Puget Sound Chinook Salmon, an anadromous fish run in the Nooksack River area, is listed as threatened under the ESA. Chinook salmon in the Nooksack Basin are considered part of the Puget Sound Chinook salmon Evolutionarily Significant Unit (ESU) that was listed as threatened in March 1999. Three Chinook stocks have been identified in the Nooksack River basin: the North Fork spring-run, the South Fork spring-run and the Samish/Mainstem fall-run. The two spring-runs are distinct wild stocks of native origin while the Samish/Mainstem fall-run is a non-native introduced hatchery stock from the Green River.

Spring-run Chinook generally enter the Nooksack River between late March and early August, migrate rapidly upstream to the forks and hold there until July through early August, and spawn generally from August through October (Williams et al. 1975). Fall-run Chinook enter the river beginning in mid July and migrate upriver to the spawning grounds or hatchery of origin through the end of September, and generally spawn from mid September through mid November (Williams et al. 1975). Juvenile salmonid smolts and Chinook fry migrate downstream in the Nooksack River and likely through the project reach from mid March through mid July (Williams et al. 1975).

Only fall-run-Chinook are known to inhabit Bertrand Creek (Smith 2002). The Nooksack Salmon Enhancement Association has been conducting spawning surveys on Bertrand Creek for at least two years. The survey reach includes River Miles 7.5-9.7 (project locations approximately River Mile 0.25-1.0). In 2002, 0 Chinook and 0 redds were identified and in

2003, 9 Chinook and 7 redds were identified in Bertrand Creek. In the project area Bertrand Creek is backwater area during high and low flows. Water velocities are extremely low as evidenced by the lack of gravel substrate and the presence of fines, thus the immediate project area does not provide adequate water velocities for Chinook spawning. Aquatic vegetation is virtually non-existent and the entire channel in the project area is covered with a layer of fine sediment. Visual and olfactory observations of the large quantities of manure spread on the surrounding fields and comparisons with sediment in the channel suggest that the channel substrate (silt) also partially comprises manure. Department of Ecology Investigations indicate that wastewater or manure is likely contributing to poor water quality in Bertrand Creek (Dickes 1992). Although no gravels or sand substrate appear to be present in the project area, and water quality is at times poor, the existing riparian vegetation, and occasional small woody debris may provide rearing, feeding, and predator avoidance habitat in the project reach.

Coho salmon within the Puget Sound/Strait of Georgia ESU are presently classified as a "candidate" for ESA listing. Candidate species are species that may be proposed or are under review for possible listing as a threatened or endangered species in the future. In its ESA status review, the Biological Review Team stated that although many coho populations within this ESU are abundant and apparently stable, there are a number of factors (high harvest rates, habitat degradation, and hatchery production) that may lead to substantial risks to whatever native production remains. The Biological Review Team stated that if the population continues to decline, this ESU is likely to become endangered in the foreseeable future.

Coho salmon of the Nooksack are dominant Puget Sound contributors to U.S. and Canadian sport and commercial fisheries. Nooksack River coho salmon are harvested in pre-terminal fisheries, Bellingham Bay terminal fisheries, and Lummi, Nooksack tribal river net fisheries, and river sport fisheries. The fish have been managed as a hatchery management unit under the Puget Sound Management Plan for nearly 27 years. Run size each year is large enough to provide both a harvestable surplus and a sufficient hatchery escapement. Between 1989 and 1999 the estimated total number of Nooksack coho salmon returning to Puget Sound has ranged from 43,300 to 244,600 with escapement estimates ranging from 7,950 to 99,000.

Three naturally spawning stocks of coho salmon were tentatively identified by WDFW (1992) in the Samish/Nooksack Basin region. These are the Nooksack, Samish, and North Puget Sound Tributary stocks. Stock separation was primarily based on geographic distribution. Life history timing or morphological differences between the groups of fish do not exist or have not been observed. Within the Nooksack basin, it is uncertain whether a naturally spawning Nooksack coho population exists that is sufficiently distinct from the hatchery population to be considered a native stock. In the Nooksack River basin, natural escapement has been estimated to range from 500 to 5,500 since 1966. The highest escapement in this period (1987) corresponds to the second highest hatchery release to the system (6.2 million in 1985). Some biologists believe the native Nooksack coho stock is extinct, while others argue that there is high likelihood that a segment of the naturally spawning population retains sufficient genetic distinction to warrant its classification as a native stock. The NMFS has deferred any decisions on this ESU while additional information is gathered.

The Nooksack River coho stocks are typical of the Puget Sound/Strait of Georgia ESU with regard to their life history. Following emergence, the majority of stream-rearing juveniles spend eighteen months in fresh water before migrating downstream to saltwater as river flows increase

with annual spring snowmelt and runoff. Following eighteen months in salt water, adult coho return to the Nooksack River and migrate upstream from August through early January. Spawning occurs in the upper mainstem and the accessible portions of the Forks from mid-November through January.

Coho habitat and life history functions in the project area include adult and juvenile migration and juvenile rearing (Whatcom County 1994). It is highly unlikely that coho spawning occurs in the project area. Adults migrate in the Nooksack River and likely through the project reach from mid July though mid November (Williams et al. 1975). Juveniles migrate downstream through the reach from mid April through mid August (Williams et al. 1975).

The Nooksack Salmon Enhancement Association has been conducting spawning surveys on Bertrand Creek for at least two years. The survey reach includes River Miles 7.5-9.7 (project locations approximately River Mile (0.25-1.0). In 2002, 88.0 coho and 6.0 redds were identified and in 2003, 78.0 coho and 20.0 redds were identified in Bertrand Creek. In the project area Bertrand Creek water velocities are extremely low, thus the immediate project area does not provide adequate water velocities for coho spawning. Aquatic vegetation is virtually non-existent and the entire channel in the project area is covered with a layer of fine sediment. Visual and olfactory observations of the large quantities of manure spread on the surrounding fields and comparisons with sediment in the channel suggest that the channel substrate (silt) is also partially comprised of manure. Department of Ecology investigations indicate that wastewater or manure is likely contributing to poor water quality in Bertrand Creek (Dickes 1992). Although no gravels or sand substrate appear to be present in the project area, and water quality is at times poor, the existing riparian vegetation, and occasional small woody debris may provide rearing, feeding, and predator avoidance habitat in the project reach.

3.6 Cultural Resources

There are no known cultural resources in the project area. The disturbed nature of the levee and bank material (imported fill, sediment deposited from the river, or dredged from the river) significantly reduced the chance of finding cultural resources. A cultural resources survey was conducted in the repair area and a cultural resource report was prepared as part of the Section 106 of the National Historic Preservation Act compliance process. A letter from the State Historic Preservation Officer concurring with the Corps finding of No Historic Properties Affected dated 19 April 2004 was received. The construction contract contained a stop work clause to notify the appropriate officials if evidence of cultural or human artifacts were unearthed.

3.7 Water Quality

Warm water temperatures are a problem in the mainstem Nooksack River. Water temperatures in the Nooksack River near North Cedarville (RM 30.9) were in the “poor” category (warmer than 16° C) for 54% of the samples in 1996 and 1997 (data from USGS 2001). Conditions worsen downstream near Everson (RM 23.2) where 65% of the samples are warmer than 16 degrees Celsius and the peak temperature was 19.0 degrees Celsius. Near the mouth (RM 3.4), 60% of the samples were warmer than 16° C in July and August of 1996 and 1997 (data from USGS 2001). The entire length of the mainstem Nooksack River has severely degraded riparian conditions which contributes to water quality exceedances. Shade levels were remarkably poor

with no mainstem reaches achieving more than 40% of target shade levels, and most reaches had percent canopy cover in the 0 to 20% range (Coe 2001). Other causes include the surrounding agriculture, residential and urban land use and the increased sedimentation from upstream sources. All of these water quality problems pose serious impacts to salmonids and result in a "poor" water quality rating for the mainstem Nooksack River.

Washington State Department of Ecology (DOE) has reported that the water quality in Bertrand Creek itself is poor. Water quality criteria were violated for bacteria and dissolved oxygen, and potentially toxic ammonia concentrations were present when sampled in the spring of 2002.

3.8 Air Quality and Noise

Air quality in the Nooksack Basin is generally good. However, urban areas experience moderately degraded air quality during certain times of the year. Motor vehicles are the largest source of air pollutants in Whatcom County, although wood-burning stoves also contribute. Particulates, sulfur dioxide, ozone, and carbon monoxide are the pollutants of concern. High concentrations of these pollutants generally occur during the dry, late summer months when minimal wind conditions persist for long periods of time or during mid-winter thermal inversions.

Carbon monoxide, a product of incomplete combustion, is generated by automobiles and other fuel burning activities (e.g. residential heating with wood). The highest ambient concentrations of carbon monoxide tend to occur in localized areas such as major roadways and intersections during periods of low temperatures, light winds, and stable atmospheric conditions. Ozone is a highly reactive form of oxygen created by sunlight-activated chemical reactions of nitrogen oxides and volatile organic compounds. Unlike high carbon monoxide concentrations which tend to occur close to emission sources, ozone problems tend to be regional since ozone precursors can be transported far from their sources. Ozone precursors are primarily generated by motor vehicle engines.

This rural area is typically quiet. Typical existing noise consists of those generated by farm machinery, trucks, automobiles, and other internal combustion engines.

3.9 Utilities and Public Services

The levee protects agricultural land, residential properties, and associated public infrastructure, such as roads.

3.10 Land Use

Land use in the project area is primarily rural residential and agricultural. There are scattered homes and farms in the surrounding area.

3.11 Recreation

Recreational uses of Bertrand Creek at the project site are seasonal and moderate. They include, but are not limited to, sightseeing, wildlife observation, hunting, and fishing.

3.12 Hazardous, Toxic, and Radioactive Waste

There are no known sites at the project locations that have any hazardous, toxic, or radioactive waste.

3.13 Aesthetics

Along Bertrand Creek, the landscape elements of landform, vegetation, water, color, and related factors have been impaired by the levees and agricultural use of adjacent land. Scenery and visual attractions are limited to the river corridor over this reach of the river.

4. EFFECTS OF THE ALTERNATIVES

4.1 General

4.1.1 Proposed Alternative

There were short-term impacts from construction of the replacement levee. The primary impact was a temporary increase in turbidity due to fill placement. Because the work was accomplished during the established work window (July 1 – September 30), the potential disruption of salmonid movement in the area was minimized. If present, adult and juvenile salmonids would have been temporarily displaced from this area.

Due to the timing of construction (July 1 – September 30) and design of the levee, no long-term impacts to the environment were anticipated. Any effects to fish and wildlife were temporary and primarily occurred during construction. Additional willow plantings added to the sites may increase some fish habitat values. Unfortunately, the fish bench that was added to one of the repair sites was completely destroyed during the October 2004 flood event. Overall effects, both adverse and favorable, were insignificant.

The U.S. Fish and Wildlife Service (USFWS), Whatcom County Public Works and a biologist representing the Nooksack tribe visited the sites prior to and after construction.

4.1.2 No-Action Alternative

The No-Action alternative would not have temporarily increased turbidity, it would not have disrupted salmonid movement, it would not have resulted in willows being planted and it would not have provided the desired flood protection.

4.2 Hydrology, Soils and Topography

4.2.1 Proposed Alternative

By returning the near vertical riverward slopes to the pre-flood 2.0 Horizontal: 1.0 Vertical, it improved the hydraulics and increased the stability of the repaired levee sections.

Construction activities associated with the proposed project resulted in the repositioning of approximately 500 tons of Class III riprap at the project site. In addition, 1,210 tons of Class III riprap, 1,313 tons of 1.25 inch gravel, and 558 tons of pit run was added to the project area to repair the damage to the levees. Soils were compacted in areas where heavy machinery was operating such as the access road.

4.2.2 No-Action Alternative

The No-Action alternative would not have stabilized the banks, reduced erosion, or improved the hydraulics. It would not have resulted in any rock being repositioned or placed on the site and it would not have provided the desired flood protection.

4.3 Vegetation

4.3.1 Proposed Alternative

The Corps removed vegetation from portions of both the riverward and the back slope of all five of the sites. The vast majority of the vegetation removed consisted of Japanese knotweed and Himalayan blackberry but also included 12 red alder trees with approximately 6-8" diameter girth at the base. However, at the upstream most site, a few snowberry, nootka rose, red-osier dogwood, and willow plants were removed during the repair of this 100-foot section of the levee.

The repaired levee and disturbed areas were hydro-seeded after construction. The riverward slope of the levee incorporated willow cuttings into the design. On all sites except for the blowout site, the levee face was vertical or near vertical prior to rehabilitation, limiting vegetation growth. After rehabilitation of the levees the riverward slope is now 2.0 Horizontal: 1.0 Vertical, allowing vegetation to grow. Overall project effects to vegetation were insignificant. In addition, our replanting efforts increased overall native vegetation in the repaired areas.

4.3.2 No-Action Alternative

The No-Action alternative would have resulted in the majority of the levee repair areas continuing to be populated with Japanese knotweed and Himalayan blackberry. It would also have allowed some native vegetation including a few alder trees to remain.

4.4 Fish and Wildlife

4.4.1 Proposed Alternative

Effects to fish and wildlife, if any, were temporary and occurred primarily during construction. The addition of the willow plantings added to the site may increase some fish habitat values. Overall effects, both adverse and favorable, will be insignificant.

4.4.2 No-Action Alternative

No effects anticipated as a result of the No-Action alternative.

4.5 Threatened and Endangered Species

4.5.1 Proposed Alternative

Bald Eagle

The project impacts were not a concern to nesting behavior due to construction timing. WDFW eagle experts have indicated that the young in nests in this area have typically fledged by the middle of July. No construction activity restrictions are identified in the ESA documentation due to known bald eagle ground feeding or perch areas being within close proximity to the project area. The ESA document (Appendix B) addressed the expected effect of the project on bald eagles and made a “May affect, not likely to adversely affect” determination.

Marbled murrelet

The project did not occur during marbled murrelet nesting season and did not appear to have a detrimental effect on the species. The ESA document addressed the expected effect of the project on marbled murrelet and made a “May affect, not likely to adversely affect” determination.

Bull trout and Dolly Varden

The levee rehabilitation at the catastrophic breach site (fifth site) included setting the in-water portion of the levee back a distance of 1-12 feet, and the above water portion a distance of 3-30 feet back from the pre-flood condition. This included reshaping this section of the levee from the straight linear pre-flood configuration to a crescent shape, as well as adding a fish bench. The fish bench was incorporated into levee rehabilitation design to provide rearing habitat for juvenile salmonids. Unfortunately this section of the levee repair was completely destroyed during an October 2004 flood event.

The repair of the levee sections included replacing the rock that had been lost during the flood event. From the confluence of Bertrand Creek and the Nooksack River to approximately River Mile 1.0 (the stretch of Bertrand Creek in which the levees were repaired) the entire channel was covered with fine sediment and no sand or gravel was observed. The placement of rock on these sites has now provided some complexity and hard surfaces in the river in providing areas for reproduction and juvenile rearing for benthic invertebrates such as stoneflies and mayflies. In addition, all levee repairs included planting willows on the riverward side of the levee and hydro seeding all disturbed area.

Due to constructing the levee during the approved work window, the incorporation of willow plantings into all levee repairs, the increase in channel complexity, the temporary and localized increase in turbidity due to rock placement, and the ability of these mobile species to quickly leave the affected area, the overall effects of the levee rehabilitation on bull trout was insignificant. The ESA document addresses the expected effect of the project on bull trout and Dolly Varden and made a “May affect, not likely to adversely affect” determination.

Puget Sound Chinook salmon

Potential effects to Chinook salmon were very similar to those discussed for bull trout in the previous section. The procedure to repair the levee was designed to avoid or minimize potential "take" during construction, by scheduling the in-water construction period to avoid periods of greatest Chinook vulnerability and highest expected use. In addition, the project included

incorporating willow plantings into the design, and providing substrate other than fine sediment thus increasing channel complexity. The temporary and localized increase in turbidity during construction and the ability of these mobile species to quickly leave the affected area minimized potential effects from construction. Therefore, the overall effect of the levee rehabilitation on Chinook salmon was insignificant. Although the fish bench was destroyed in October 2004, Whatcom County may set back the levees in the summer of 2005 which may result in these repairs becoming temporary. The ESA document addressed the expected effect of the project on Chinook salmon and made a "May affect, not likely to adversely affect" determination.

Coho salmon
Due to constructing the levee during the approved work window, the incorporation of willow plantings into all levee repairs, the addition of stonefly and mayfly habitat, the temporary and localized increase in turbidity due to rock placement, and the ability of these mobile species to quickly leave the affected area, the overall effects of the levee rehabilitation on coho salmon was insignificant.

4.5.2 No-Action

No effects were anticipated as a result of the No-Action alternative.

4.6 Cultural Resources

4.6.1 Proposed Alternative

A cultural resources survey was conducted in the repair area and a cultural resource report was prepared as part of the Section 106 of the National Historic Preservation Act compliance process. A letter from the State Historic Preservation Officer concurring with the Corps finding of No Historic Properties Affected dated 19 April 2004 was received. The construction contract contained a stop work clause to notify the appropriate officials if evidence of cultural or human artifacts was unearthed.

4.6.2 No-Action Alternative

No effects were anticipated as a result of the No-Action alternative.

4.7 Water Quality

4.7.1 Proposed Alternative

Water quality was not significantly impacted by construction activities. Equipment did not enter the water and remained on dry ground at all times. During construction, best management practices for equipment operation and storage and use of hazardous materials were employed. Therefore, no leakage or spills of hazardous materials occurred.

According to the Code of Federal Regulations, Title 33, Section 323.4 (a) (2) levee repair is an activity not prohibited by or otherwise subject to regulation under Section 404 of the Clean Water Act. Therefore, a section 401 Water Quality Certification is not required.

4.7.2 No-Action Alternative

It is likely that if the project was not constructed the levee would fail during the upcoming flood season, resulting in an increase in turbidity in the Nooksack River.

4.8 Air Quality and Noise

4.8.1 Proposed Alternative

Air quality met the standards as set forth by the Washington Department of Ecology and they were not permanently affected by the construction of the project. Noise was intermittent at the site and varied depending on the frequency of trucks arriving with the material and construction of the identified features. Noise disruption factors were considered for their effect on threatened and endangered species in the ESA document.

During construction, there was a temporary and localized reduction in air quality due to emissions from heavy machinery operating during fill placement, and grading. These emissions did not exceed EPA's de minimis threshold levels (100 tons/year for carbon monoxide and 50 tons/year for ozone) or affect the implementation of Washington's Clean Air Act implementation plan. Therefore, impacts were not significant.

Ambient noise levels increased slightly while construction equipment was operating. However, these effects were temporary and localized, and occurred only during daylight working hours. As a result, impacts were insignificant.

4.8.2 No-Action Alternative

No effects were anticipated as a result of the No-Action alternative.

4.9 Utilities and Public Services

4.9.1 Proposed Alternative

Failure to repair the levee could have had a serious impact on local commercial and private citizens through increased flood damage to homes, agricultural operations, roads, and other commercial and residential infrastructure. Construction vehicles associated with the project created a minimal disruption due to increased truck traffic merging, turning and traveling together with local traffic. This disruption was temporary and highly localized, and therefore impacts were insignificant.

4.9.2 No-Action Alternative

The No-Action alternative would not have resulted in an increase in traffic on the local roads, and it would not have resulted in providing the desired flood protection to public infrastructure.

4.10 Land Use

4.10.1 Proposed Alternative

The project did not change any land uses, or cause any significant effects or impacts to land use.

4.10.2 No-Action Alternative

No effects were anticipated as a result of the No-Action alternative.

4.11 Recreation

4.11.1 Proposed Alternative

Effects to recreation values were insignificant because the site has been in a degraded condition compared with other nearby locations. Recreational resource and value uses were not changed.

4.11.2 No-Action Alternative

No effects were anticipated as a result of the No-Action alternative.

4.12 Hazardous, Toxic, and Radioactive Waste

4.12.1 Proposed Alternative

There were no known sites at the project locations that had any hazardous, toxic, or radioactive waste; therefore, the Corps did not anticipate or document any effect.

4.12.2 No-Action Alternative

No effects were anticipated or documented as a result of the No-Action alternative.

4.13 Aesthetics

4.13.1 Proposed Alternative

Restoration of the constructed features of the project did not significantly affect the aesthetics of the site or the river.

4.13.2 No-Action Proposed Alternative Aesthetics

No effects were anticipated or documented as a result of the No-Action alternative.

5. UNAVOIDABLE ADVERSE EFFECTS

Unavoidable adverse effects associated with this project include:

(1) a temporary and localized increase in noise, which may disrupt wildlife in the area,
(2) a temporary and localized disruption of local traffic by construction vehicles,
(3) a temporary and localized increase in turbidity levels in the Nooksack River, which may affect aquatic organisms in the area.

6. COORDINATION

The following agencies and entities have been involved with the environmental coordination of this project:

- Washington Department of Ecology (Ecology)
- National Marine Fisheries Service (NMFS)

- U.S. Fish and Wildlife Service (USFWS)
- Washington Department of Fish and Wildlife (WDFW)
- The Nooksack Tribe
- The Lummi Tribe
- Washington State Office of Archaeology and Historic Preservation
- Whatcom County
- Washington Department of Emergency Management

Coordination with the above listed agencies and tribes ranged from phone conversations, e-mail, to site visits and face to face meetings. Topics discussed during this coordination include project design, project construction timing, effects to listed species, and other environmental concerns.

7. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this evaluation. Future federal actions would require additional NEPA evaluation at the time of their development.

There are no significant cumulative effects that can be identified from the implementation of this project. Because of frequent flooding in the area, the adjacent property is expected to remain agricultural and no development is anticipated in the vicinity of the project. There are no known plans to raise the levees to provide an increased level of flood protection. However, Whatcom County and the Corps are planning on setting back a large portion of these levees in 2006. The proposed setback project is a separate action that will have its own NEPA and ESA coordination conducted and is not being addressed in this EA.

Cumulative impacts from local, short-term disturbances caused by the construction project (noise, emissions, traffic disruptions, etc.) were minor, temporary and not significant.

8. ENVIRONMENTAL COMPLIANCE

8.1 National Environmental Policy Act (NEPA) (42 USC 4321 et seq.)

In accordance with the National Environmental Policy Act, federal projects are required to declare potential environmental impacts and solicit public comment. The purpose of this document is to solicit public comment and fulfill the Corps of Engineers documentation requirements under the National Environmental Policy Act. The draft EA was out for public comment and no comments were received.

8.2 Endangered Species Act of 1973, as Amended (16 USC 1531-1544)

In accordance with Section 7(a)(2) of the Endangered Species Act 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. Prior to construction, ESA documentation was prepared for the project. The project incorporated impact reduction measures including constructing the project during the established construction window, and incorporating a fish bench as well as willow plantings into the design. A finding of May Effect, Not Likely to Adversely Effect was

determined for all potentially occurring threatened or endangered species. The National Marine Fisheries Service (NMFS) and USFWS were notified of the project location and action. The ESA document is contained in Appendix C.

8.3 Clean Water Act, as Amended (33 USC 1251 et seq.)

According to the Code of Federal Regulations, Title 33, Section 323.4 (a) (2) levee repair is an activity not prohibited by or otherwise subject to regulation under Section 404 of the Clean Water Act. Therefore, a section 401 Water Quality Certification is not required.

8.4 Rivers and Harbors Act (33 U.S.C. 403)

The Rivers and Harbors Act of 1899 prohibits the construction of any bridge, dam, dike, or causeway over or in navigable waters of the United States in the absence of Congressional consent and approval of the plans by the Chief of Engineers and the Secretary of the Army. Under Section 10 of the Rivers and Harbors Act, a navigable waterway is defined as those waters that are subject to the ebb and flow of the tide shoreward to the mean high water mark. This act is not applicable to the proposed project because the levee repair does not restrict navigation or access to navigable waters.

8.5 Coastal Zone Management Act (16 U.S.C. 1451-1465)

The Coastal Zone Management Act of 1972 as amended (15 CFR 923) requires Federal agencies to carry out their activities in a manner which is consistent to the maximum extent practicable with the enforceable policies of the approved Washington Coastal Zone Management Program.

The project simply restored the Federal erosion control project to a state comparable to its original condition before damage by the elements occurred. Work extended slightly beyond the footprint of the original project, and did not cause substantial adverse effects to shore resources or the environment. Pursuant to Section 23.50.32 (b) of the Whatcom County Shoreline Management Program, the Corps believes this proposal is exempt from substantial development permit requirements, making it consistent to the maximum extent practicable with the Whatcom County Shoreline Management Program. Exemptions from the Shoreline Management Program Substantial Development Permit from Whatcom County are included in Appendix E.

8.6 National Historic Preservation Act) (16 USC 470 et seq., 110)

Section 106 of the National Historic Preservation Act (36 CFR PART 800) requires that the effects of proposed actions on sites, buildings, structures, or objects included or eligible for the National Register of Historic Places must be identified and evaluated. As required under Section 106 of the NHPA, the Corps is coordinating with the Washington State Office of Archeology and Historic Preservation (OAHP), the Nooksack Tribe, and other interested parties.

There are no known cultural resources in the project area. The disturbed nature of the levee and bank material (imported fill, sediment deposited from the river, or dredged from the river) significantly reduces the chance of finding cultural resources. A cultural resources survey was conducted in the repair area and a cultural resource report was prepared as part of the Section

106 of the National Historic Preservation Act compliance process. A letter from the State Historic Preservation Officer dated 19 April 2004 concurring with the Corps finding of No Historic Properties Affected was received. This is provided in Appendix F.

8.7 Clean Air Act As Amended (42 USC 7401, et seq.)

The Clean Air Act requires states to develop plans, called State Implementation Plans (SIP), for eliminating or reducing the severity and number of violations of National Ambient Air Quality Standards (NAAQS) while achieving expeditious attainment of the NAAQS. The act also required Federal actions to conform to the appropriate SIP. An action that conforms with a SIP is defined as an action that will not: (1) cause or contribute to any new violation of any standard in any area; (2) increase the frequency or severity of any existing violation of any standard in any area; or (3) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The U.S. Army Corps of Engineers has determined that emissions associated with this project did not exceed EPA's *de minimis* threshold levels (100 tons/year for carbon monoxide and 50 tons/year for ozone).

8.8 Wild and Scenic Rivers Act (16 U.S.C. 1271-1287)

The Wild and Scenic Rivers Act (P.L. 90-542, as amended) selected rivers of the Nation, which, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values. The purpose of the Act is to preserve these rivers in their free-flowing condition, and protect them for the benefit and enjoyment of present and future generations.

An inventory, the National Wild and Scenic Rivers System, was established in December 1, 1992 and is published by the Department of the Interior and the Department of Agriculture, Forest Service and can be found at web site http://www.nps.gov/rivers/wildriverslist.html#wa. The Nooksack River as well as Bertrand Creek is not one of the selected rivers.

8.9 Migratory Bird Treaty Act and Migratory Bird Conservation Act (16 USC 701-715)

The project was conducted in such a manner that migratory birds were not harmed or harassed. The work was outside the nesting season for most birds. Riparian vegetation suitable for nesting was avoided, where possible. Any shrub removal was limited to after July 1 to reduce impacts to nesting birds. Where potential nesting vegetation was removed, adequate riparian vegetation for nesting sites exists upstream and downstream from the project site. Increased native vegetative planting may mitigate for riparian vegetation that was removed.

8.10 Fish and Wildlife Coordination Act, as Amended (16 USC 661 et seq.)

The Corps thoroughly coordinated this project with USFWS. USFWS was involved in project design and the Corps has provided the FWS with ESA documentation. The Corps does not transfer funds under the Fish and Wildlife Coordination Act for Emergency Projects. This

project had emergency status when it was constructed therefore funds were not transfered. The project is in compliance with this act.

8.11 Watershed Protection and Flood Prevention Act, as Amended (16 U.S.C. 1001 et seq.)

The Watershed Protection and Flood Prevention Act (Public Law 83-566) is commonly known as the Small Watershed Program. USDA-Natural Resources Conservation Service (NRCS) administers this program. The program authorizes Federal assistance to local organizations for planning and carrying out projects in watershed areas for conservation and use of land and water and flood prevention. This project is not a product of the Small Watershed Program and therefore this act is not applicable to this project.

8.12 Farmland Protection Policy Act (7 U.S.C. 4201, et seq.)

The Farmland Protection Policy Act (Public Law 97-98, Sec. 1539-1549) requires identification of proposed actions that would affect any lands classified as prime and unique farmlands. The project did not affect farmland classified as prime and unique. Repairing the levee was consistent with this act.

8.13 Resource Conservation and Recovery Act (RCRA) (42 USC 6901 et seq.)

RCRA was enacted in 1976 to address the issue of how to safely manage and dispose of municipal and industrial waste, regulate underground storage tanks (USTs) that store petroleum or hazardous substances, establish a system for managing solid (primarily nonhazardous) waste, including household waste, and set forth the framework for EPA's comprehensive waste management program. No abandoned waste was observed during project site visits. No abandoned or buried hazardous waste or pesticides were discovered during construction. If any had been discovered, they would have been managed in accordance with RCRA or CERCLA requirements, as applicable. Contractor hazardous materials and waste would have been managed in accordance with RCRA requirements if they had existed. The project was in compliance with this act.

8.14 Executive Order 11988, Floodplain Management (24 May 1977)

Executive Order 11988 requires federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy of the floodplain, and to avoid direct and indirect support of floodplain development where there is a practicable alternative. In accomplishing this objective, “each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains.”

Section 8 of E.O. 11988 notes that the order does not apply to assistance provided for emergency work essential to save lives or protect public property, health, and safety. The project has not constructed a change that would affect occupancy of the floodplain. By repairing the levee breach, the project is consistent with the act in reducing the risk of flood and minimize the impact of floods on human safety, health, and welfare, while not changing floodplain occupancy conditions.

8.15 Executive Order 12898, Environmental Justice

Executive Order 12898 directs every federal agency to identify and address disproportionately high and adverse human health or environmental effects of agency programs and activities on minority and low-income populations. The project did not involve siting a facility that will discharge pollutants or contaminants, so no human health effects would occur. Therefore the project is in compliance with this act.

8.16 Executive Order 11990, Protection of Wetlands, May 24, 1977

The purpose of this project was to rehabilitate a damaged levee. No wetlands were impacted by this project.

8.17 Treaty Rights

In the mid-1850's, the United States entered into treaties with a number of Native American tribes in Washington. These treaties guaranteed the signatory tribes the 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. 312 at 332 (WDWA 1974)]. In *U.S. v. Washington*, 384 F.Supp. 312 at 343 - 344, the court also found that the Treaty tribes had the right to take up to 50 percent of the harvestable anadromous fish runs passing through those grounds, as needed to provide them with a moderate standard of living (Fair Share). Over the years, the courts have held that this right comprehends certain subsidiary rights, such as access to their "usual and accustomed" fishing grounds. More than *de minimis* impacts to access to usual and accustomed fishing area violates this treaty right [*Northwest Sea Farms v. Wynn*, F.Supp. 931 F.Supp. 1515 at 1522 (WDWA 1996)]. In *U.S. v. Washington*, 759 F.2d 1353 (9th Cir 1985) the court indicated that the obligation to prevent degradation of the fish habitat would be determined on a case-by-case basis. The Ninth Circuit has held that this right also encompasses the right to take shellfish [*U.S. v. Washington*, 135 F.3d 618 (9th Cir 1998)]. Native Americans do harvest salmonids from the Nooksack River system.

The proposed project has been analyzed with respect to its effects on the treaty rights described above. We believe that:

(1) The work did not interfere with access to usual and accustomed fishing grounds or with fishing activities or shellfish harvesting;

(2) The work did not cause the degradation of fish runs and habitat; and

(3) The work did not impair the Treaty tribes' ability to meet moderate living needs

Table 8.1. Summary of Consistency of Project With Applicable Laws, Regulations and Policies.

LAWS AND REGULATIONS RELATING TO THE PROPOSED ALTERNATIVES	REQUIREMENT SUMMARIZED	CONSISTENCY OF PREFERRED ALTERNATIVE
National Environmental Policy Act (NEPA)	Requires all federal agencies to consider the environmental effects of their actions and to seek to minimize negative impacts.	Consistent
Clean Air Act	Requires federal agencies to consult with state air pollution control agencies to assure that construction plans conform with local air quality standards	Consistent
Clean Water Act (CWA)	Requires federal agencies to protect waters of the United States. Disallows the placement of dredged or fill material into waters (and excavation) unless it can be demonstrated there are no reasonable alternatives. Requires federal agencies to comply with state water quality standards.	Covered by 33 CFR 323.4 (a) 2
Rivers and Harbors Act	Prohibits the construction of any bridge, dam, dike, or causeway over or in navigable waters of the U.S. in the absence of Congressional consent and approval of the plans by the Chief of Engineers and the Secretary of the Army.	Not in Section 10 jurisdiction
Fish and Wildlife Coordination Act	Requires federal agencies to consult with the US Fish & Wildlife Service on any activity that could affect fish or wildlife.	Consistent
Endangered Species Act	Requires federal agencies to protect listed species and consult with US Fish & Wildlife or NMFS regarding the proposed action.	Consistent
National Historic Preservation Act	Requires federal agencies to identify and protect historic properties.	Completed
Wild and Scenic Rivers Act	Requires that "In all planning for the use and development of water and related land resources, consideration shall be given by all Federal agencies involved to potential national wild, scenic and recreational river areas."	Consistent
Executive Order 11988, Floodplain Management	Requires federal agencies to consider how their activities may encourage future development in floodplains.	Consistent
Migratory Bird Treaty	Requires not harming or harassing	Consistent

Act and Migratory Bird Conservation Act	migratory birds.	
Watershed Protection and Flood Prevention Act, as Amended	Authorizes Federal assistance for implementing projects in watershed areas and use of land and water and flood prevention.	Consistent
Farmland Protection Policy Act	Requires identification of proposed actions that would affect any lands classified as prime and unique farmlands.	Consistent
Resource Conservation and Recovery Act (RCRA)	Requires managing hazardous materials and waste in accordance with RCRA requirements.	Consistent
Executive Order 11990, Protection of Wetlands	Requires federal agencies to protect wetland habitats.	Consistent
Coastal Zone Management Act (CZMA)	Requires federal agencies to comply with state and local plans to protect and enhance coastal zones and shorelines.	Consistent to the maximum extent practicable
Washington Hydraulic Code	Requires proponents of developments, etc. to protect state waters, wetlands and fish life.	Not Applicable
Whatcom County Flood Hazard Reduction Plan	Requires implementing projects that would result in innovative, comprehensive and permanent solutions to flooding problems using environmentally sensitive techniques.	Not Applicable
Treaty Rights	Require that the project has been analyzed with respect to its effects on the treaty rights.	Consistent

9. CONCLUSION

Based on the above analysis, the levee rehabilitation project was not a major Federal action significantly affecting the quality of the human environment, and therefore did not require preparation of an environmental impact statement.

10. REFERENCES

Coe, T. 2001. Nooksack River watershed riparian function assessment. Nooksack Indian Tribe Report #2001-001.

Corps of Engineers. November 13, 1986. *Final Rule for Regulatory Programs of the Corps of Engineers.* Federal Register 51(219): 41206-41254.

Corps of Engineers and Environmental Protection Agency. August 25, 1993. *Clean Water Act Regulatory Programs*. Federal Register 58(163): 45008-45038.

Dickes, Betsy. 1992. Water Quality Screening in the Dakota, Bertrand, and Fishtrap Creek Watersheds, Whatcom County, Washington. Washington State Department of Ecology Environmental Investigations and Laboratory Services Program, Watershed Assessment Section, Olympia, Washington.

Environmental Protection Agency. November 30, 1993. *Determining Conformity of General Federal Actions to State or Federal Implementation Plans.* Federal Register 58(228): 63214

Environmental Protection Agency. 2000. *SITEINFO Query Form*. < http://www.epa.gov/ r10earth/r10gis/r10site.html>.

Smith, Carol J. July 2002. Salmon and Steelhead Habitat Limiting Factors in WRIA 1, The Nooksack Basin. Washington Conservation Commission. Lacey Washington.

U.S.G.S. 2001. Nooksack River Basin temperature sites. http://wa.water.usgs.gov/pugt/nooksack/nookmap.html

Washington Department of Ecology. 2000. *Ecology's Final 1998 List of Impaired and Threatened Waterbodies - the 303(d) List.* <http://www.wa.gov/ecology/wq/303d/index.html>.

Williams et al. (1975). A Catalog of Washington Streams and Salmon Utilization, Vol. 1, Puget Sound Region. Washington Department of Fisheries. Olympia. W.A.

11. APPENDICES

Appendix A

Requests for Corps Assistance

WHATCOM COUNTY
PUBLIC WORKS DEPARTMENT
JEFFREY M. MONSEN, P.E.
Director

River and Flood Division

322 N. Commercial Street, Suite 120
Bellingham, WA 98225
Phone: (360) 676-6876, (360) 398-1310
Fax: (360) 738-2468

November 14, 2003

Doug Weber
US Army Corps of Engineers
P.O. Box C-3755
4735 E. Marginal Way S.
Seattle, WA 98124-2255

Re: Levee Repair Work in Whatcom County

Dear Mr. Weber:

During the recent flooding in Whatcom County on October 17th – 21st, 2003, multiple levee breaches occurred along the Nooksack River and its tributaries. They include the following:

- The "Ritter Road Levee" - an approximately 150-foot section of this levee located on the left bank of the Nooksack River near Ferndale was damaged.
- The "Sande-Williams Levee" – an approximately 100-foot section of this levee located on the right bank of the Nooksack River near Deming was damaged.
- The "Right Bank Bertrand Creek Levee" – an approximately 100-foot section of this levee located on right bank of Bertrand Creek near Ferndale failed.
- The "Left Bank Bertrand Creek Levee" - two damaged sections, both approximately 25-feet in width, occurred on the left bank of Bertrand Creek near Ferndale.
- The "Hawley Levee" – an approximately 1,000-foot section of this levee located on the left bank of the Nooksack River near Lynden was damaged.

We are officially requesting assistance under the PL84-99 Program in implementing repair projects at these locations. The County will act as the local sponsor and provide all necessary lands, rights-of-way, and easements for these projects.

If you have any questions or need any additional information please don't hesitate to contact me at (360) 676-6876.

Sincerely,

James E. Lee, P.E.
River & Flood Engineer

I:\FLOOD\112 - General Flood Works (Projects)\R & M Proj\2003\Correspondence\ACOE PL84-99 assistance letter.doc

Appendix B

ESA Consultation Document

NOOKSACK RIVER BERTRAND CREEK LEVEE

Rehabilitation of Flood Control Works
Whatcom County, Washington
ESA Consultation Document
February 2005

1.0 Introduction

This document evaluates the environmental effects of the proposed repair and reconstruction of 5 sections of the Bertrand Creek Levees. Bertrand Creek is a tributary of the Nooksack River which empties into the Nooksack River at River Mile 12.5 near Ferndale, Washington. There were 3 damaged areas on the right bank (looking downstream) and 2 damaged area on the left bank. The area is within the historic floodplain of the Nooksack River, and contains several small farms, single-family residences, and over 1,700 acres of agricultural land. The Nooksack River and Bertrand Creek rose above the zero damage flood stage in October 2003, resulting in damage to five separate areas (two on the left bank and three on the right bank) along the levees. Four of the damaged areas experienced severe erosion resulting in the levee top nearly at grade with the existing ground, and vertical riverward slopes. The other damaged area experienced a catastrophic right bank breach. In November 2003, Whatcom County Public Works Department requested assistance under the PL84-99 Program in implementing a repair project at this location. The Corps determined that the levees were in need of permanent repair. The project consisted of pulling the riverward slopes back to 2H: 1V, reshaping the back slopes, armoring the riverward slopes, incorporating willow plantings as well as a fish bench into the design. The total cumulative length of all five of the repairs for this levee rehabilitation project was approximately 450 feet. The project was constructed between September 1 and September 10, 2004.

The project is located along both the left and right banks of Bertrand Creek from locations at River Mile 0.25 to River Mile 1.0 (Figure 1). Bertrand Creek is a tributary of the Nooksack River near Ferndale, located in Section 34, Township 40 North, Range 2 East, in Whatcom County, Washington. The confluence of Bertrand Creek is at Nooksack River mile 12.5.

The potential impacts to species listed under the Endangered Species Act (ESA) and candidate species as a result of the Bertrand Creek Levee Repair project are addressed in this document. There are three species listed by the U.S. Fish and Wildlife Service (USFWS) under the ESA as threatened; bull trout (*Salvelinus confluentus*), bald eagles (*Haliaeetus leucocephalus*), and marbled murrelet (*Brachyramphus marmoratus*). The National Marine Fisheries Service (NMFS) identified one species under ESA listed as threatened; Puget Sound Chinook salmon (*Oncorhynchus twtshawytscha*), and one candidate species: Puget Sound / Georgia Strait ESU of coho salmon (*Oncorhynchus kisutch*) as utilizing the proposed project location.

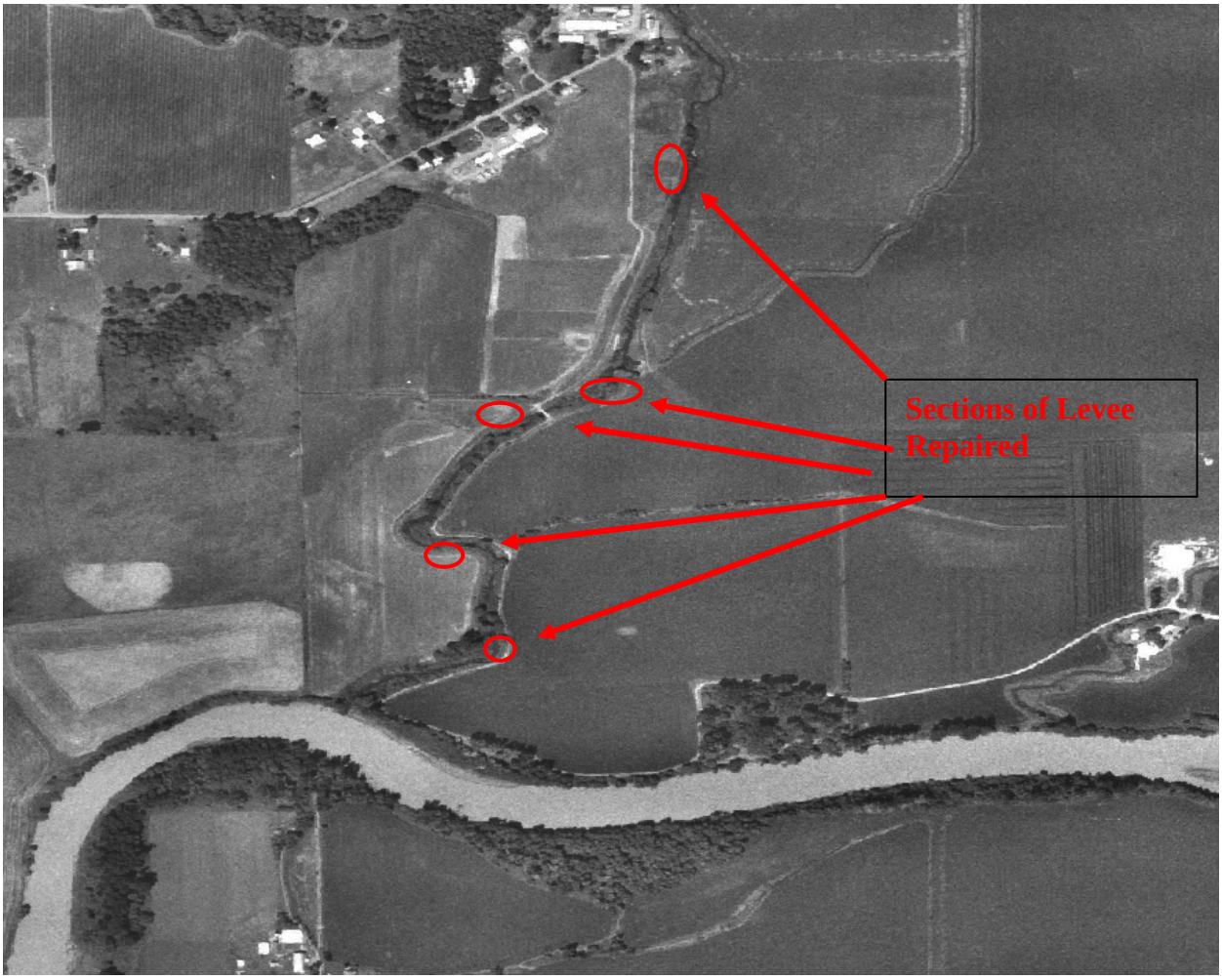


Figure 1. **Project Sites**.

2.0 Effects of the Proposed Action and Effects Determinations

2.1 Chinook Salmon

For this project the Corps has made a "**may affect, but is not likely to adversely affect"** determination for Chinook salmon. The procedure to repair the levee was designed to avoid or minimize potential "take" during construction, by scheduling the in-water construction period to avoid periods of greatest Chinook vulnerability and highest expected use. In addition, the project included incorporating willow plantings into the design, and providing substrate other than fine sediment thus increasing channel complexity. The temporary and localized increase in turbidity and the ability of these mobile species to quickly leave the affected area minimized potential effects from contruction. Therefore, the overall effect of the levee rehabilitation on Chinook salmon was insignificant.

2.2 Bull Trout

For this project the Corps has made a "**may affect, but is not likely to adversely affect"** bull trout determination for the project. Best management practices to reduce or eliminate the possibility of turbidity during construction were implemented. This determination was based upon the low likelihood that bull trout would be present in the action area during construction

activities and the potential positive benefits attributed to the re-sloping (slight above water setback), the fish bench, and willow plantings.

Due to the potential positive benefits attributed to the to the re-sloping (slight above water setback) of the riverward slopes, the fish bench, and willow plantings the levee rehabilitation project **may affect, but is not likely to adversely affect** proposed designated critical habitat for bull trout.

2.3 Bald Eagles

The project area is approximately 1/2 mile away from the closest nest and the nest is not visible from the project area. The project impacts are not a concern to nesting behavior due to construction timing. WDFW eagle experts indicated that the young in nests in this area have typically fledged by the middle of July; therefore, the Corps constructed the project between September 1 and September 15. Since construction activities did not occur during the nesting season, it did not affect nesting habitat or behaviors. Prey (salmonid) production was not affected due to the project construction, and only minor disruptions to foraging activities were expected during construction. As a result the Corps made a **may affect, but is not likely to adversely affect** determination for the bald eagle.

2.4 Marbled Murrelet

Marbled murrelets do not nest or feed in the project area. The project site lacks old-growth forest and does not contain suitable marbled murrelet habitat. The project did not occur during marbled murrelet nesting season and did not have a detrimental effect on the species. As a result the Corps made a **may affect, but is not likely to adversely affect** determination for the marbled murrelet.

2.5 Essential Fish Habitat

The project area has been designated as Essential Fish Habitat (EFH) for various life stages of three species of Pacific salmon.

Freshwater Essential Fish Habitat (EFH) for pacific salmon consists of 4 major components: (1) spawning and incubation; (2) juvenile rearing; (3) juvenile migration corridors; (4) adult migration corridors and adult holding habitat. Important features of essential habitat for spawning, rearing, and migration, and include adequate: (1) substrate composition; (2) water quality (e.g. dissolved oxygen, nutrients, temperature, etc.); (3) water quantity, depth and velocity; (4) channel gradient and stability; (5) food; (6) cover and habitat complexity (e.g. large woody debris, pools, channel complexity, aquatic vegetation, etc.); (7) space; (8) access and passage; and (9) flood plain and habitat connectivity.

The Corps has determined that the project did not reduce the quality and/or quantity of EFH for Pacific salmon. No adverse effects to EFH occurred as result of the project.

Appendix C

Vegetation Monitoring

Nooksack River – Bertrand Creek Levee Repair
Rehabilitation of Flood Control Works
Whatcom County, Washington

Revegetation Plan

Planting – willow stakes were planted on the riverward side of the levee as the levee repair was constructed in the summer of 2004. Approximately 500 willow cuttings were planted on the riverward side of the levee.

Monitoring to ensure survival – when the project is turned over to the sponsor (Whatcom County Flood Control Zone District), there will be a maintenance agreement to ensure the levee is periodically inspected and maintained. Also in that agreement will be the requirement to monitor and maintain the vegetative plantings, and replant if necessary, for up to five years.

Management of invasive species – The monitoring and maintenance of invasive species will also be included in the maintenance agreement. .

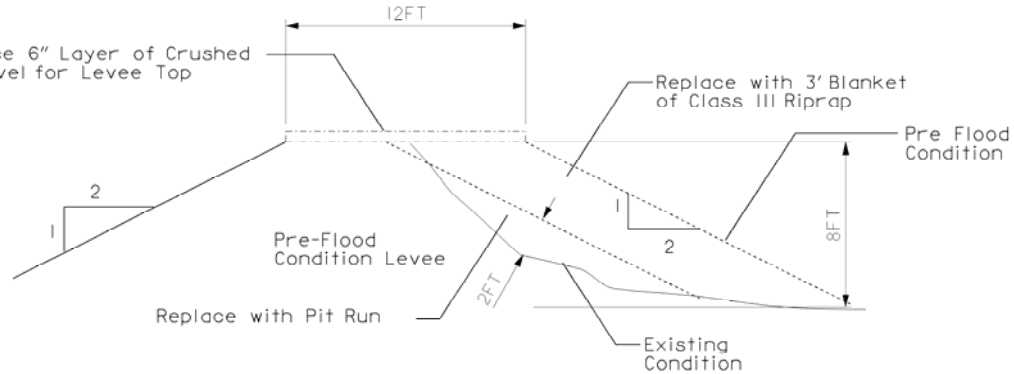
Appendix D

Project Drawing

DESIGN FILE: G:\civ\Noocksack\Bertlt10.dgn
DATE AND TIME PLOTTED: 11-FEB-2004 11:52

U.S. ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT

PROJECT: Nooksack Rehab 2004	COMPUTED BY: DesJardin	DATE: 09 Feb 04
SUBJECT: Bertrand Creek Left Bank	CHECKED BY: Kaiser	SHT. 1 OF PART: 1



150 LF

Bertrand Creek Left Bank Typical Section

Appendix E

Finding of No Historic Properties Affected

Appendix F

Exemption from the Shoreline Management Program Substantial Development Permit Requirment