

Draft Environmental Assessment

Nooksack River – Bylsma Levee Rehabilitation of Flood Control Works Whatcom County, Washington



July, 2005



US Army Corps
of Engineers®
Seattle District

**Nooksack River Bylsma Levee
Rehabilitation of Flood Control Works
Final Environmental Assessment
July 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 proposed repair and reconstruction of Bylsma levee, located on the Nooksack River near Lynden, Whatcom County Washington (Section 30, Township 40 North, Range 03 East, W.M.). This levee is on the left bank at approximately River Mile (RM) 16.20 to RM 17.40 and is approximately 6,400 feet in length. The levee protects agricultural property and associated public infrastructure. The U.S. Army Corps of Engineers, Seattle District, is proposing the following project under the authority of Public Law 84-99 (33 USCA 701n). The proposed project consists of reshaping and armoring 200 linear feet (LF) of the riverward slope and reshaping 400 LF of the damaged backslope. The damaged area of the riverward slope is approximately 100 LF. However, a transition area not to exceed 50 LF at each end is needed to ensure a complete protected structure. The riverward slope will be reestablished to 2:1, and then a three-foot thick blanket of class IV riprap will be placed for armor rock and a 5' high by 10' wide weighted toe will be placed using class V riprap. Improvements to the existing access road and levee ramp will be required to reduce erosion and provide stable vehicular access. The access road and ramp are approximately 1000 LF.

A fish bench will be constructed at the new toe to provide rearing habitat for salmon, two rows of willow-lifts will be installed on 6-inch centers at the fish bench and Ordinary High Water Mark (OHWM), and additional pre-rooted willows will be placed in a dense and random pattern on the levee face. Trees unavoidably removed for construction will be placed on the finished levee face with root wads submerged. Water quality monitoring will occur during in-water work to ensure turbidity does not exceed state water quality standards. The backslope will be reshaped; lost material will be replaced and re-graded to tie into the existing backslope and then hydroseeded for a total of 400 LF.

The Nooksack River stream gage near Ferndale (nearest to site) recorded a 12-year recurrence interval flood event on 26 November 2004 which resulted in severe erosion damage on the riverward slope of levee and 400 LF of damage to the levee backslope.

The proposed project will 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>

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1. INTRODUCTION

This draft Environmental Assessment evaluates the environmental effects of the proposed repair and reconstruction of Bylsma levee located on the Nooksack River near Lynden, Whatcom County Washington. The location is further described as Section 30, Township 40 North, Range 03 East W.M. The levee is on the left bank at River Mile (RM) 16.20 to RM 17.40. The levee protects agricultural property and associated public infrastructure. The levee was damaged during the 24 to 26 November 2004 flood event. There is approximately 100 linear feet (LF) of severe erosion damage on the riverward slope of levee and 400 LF of damage to the levee backslope. Erosion from the flood event resulted in armor rock being lost from the levee toe and riverward slope. This damage has resulted in slumping of the levee face. Overtopping during the flood event resulted in scour damage on the backslope for approximately 400LF. The County and Diking district constructed temporary measures during the flood using sandbags and field material.

The Corps has determined that the levee is in need of emergency repair. The proposed project consists of reshaping and armoring 200 linear feet (LF) of the riverward slope and reshaping 400 LF of the damaged backslope. The damaged area of the riverward slope is approximately 100 LF. However, a transition area not to exceed 50 LF at each end is needed to ensure a complete protected structure. A fish bench will be constructed at the new toe to provide rearing habitat for salmon, two rows of willow-lifts will be installed on 6-inch centers at the fish bench and Ordinary High Water mark (OHWM), and additional pre-rooted willows will be placed in a dense and random pattern on the levee face. Trees unavoidably removed for construction will be placed on the finished levee face with root wads submerged. Water quality monitoring will occur during in-water work to ensure turbidity does not exceed state water quality standards.

If no action is taken to contain the floodwaters, there is a high potential that during the upcoming flood season beginning in October, the river would overflow the levee again, posing a major threat to the agricultural property and associated public infrastructure.

The levee section in need of repair extends on the riverward slope approximately 200 LF and on the backslope approximately 400 LF along an outside bend of the river. The levee was constructed of earthen materials with a riverward slope of about 2H: 1V and landward slope of about 3H:1V. The riverward slope and toe was covered with class IV rip rap. As stated previously, this section has slumped into the river due to loss of material from the levee toe and riverward slopes. The recommended plan consist of reshaping the front and back slopes and armoring the riverward slope for a length of up to 200 LF and reshaping the backslope for 400 LF. The riverward slope will be reestablished to 2:1, and then a three-foot thick blanket of class IV riprap will be placed for armor rock and a 5' high by 10' wide weighted toe will be placed using class V riprap. The damaged area on the riverward slope is approximately 100 LF, however a transition area not to exceed 50 LF at each end may be needed to ensure a complete protected structure. The linear extent of the transition area cannot be specifically determined until construction and efforts will be made to minimize the transition area to the greatest extent possible. Improvements to the existing access road and levee ramp will be required to reduce erosion and provide stable vehicular access. The access road and ramp are approximately 1,000 LF.

A fish bench will be constructed at the new toe for juvenile salmon rearing habitat. The idea for the benches came from research conducted by Roger Peters, U.S. Fish and Wildlife Service (USFWS). The benches consist of additional excavation of the high accumulated sediment bench to provide a more gradual slope at approximately the OHWM for juvenile salmonid refuge, keying on average water surface elevations for the April-May timeframe when the majority of juvenile salmonids are outmigrating. The bench location was approved by team hydraulic and geotechnical engineers using the criteria that levee integrity would not be compromised and hydraulic conveyance would not be reduced. Gravel will be placed on the surface of the bench once the 6:1 slope is established. In addition to the fish bench, two rows of willow-lifts will be installed on 6-inch centers at the fish bench and OHWM, and additional pre-rooted willows will be placed in a dense and random pattern on the levee face. Willows will be obtained from a nursery or suitable collection location approved by the project biologist. Trees unavoidably removed for construction will be placed on the finished levee face with root wads submerged.

The proposed work is not expected to substantially affect the quality of the human environment because the damaged section of shoreline will be returned to the pre-flood condition. Construction will employ best management practices (Table 1) to minimize potential adverse effects to aquatic and terrestrial resources.

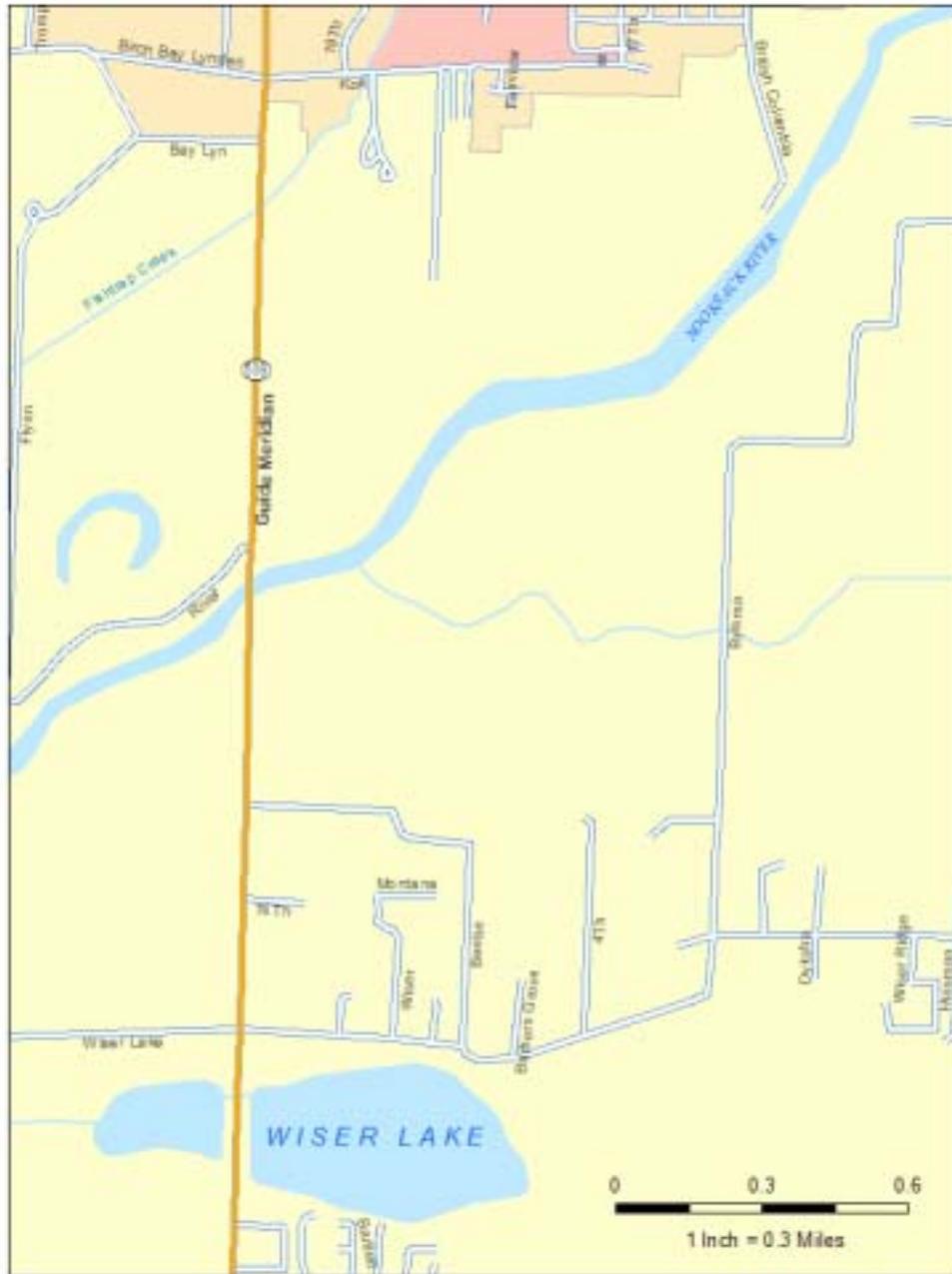


Figure 1 Vicinity Map

1.1 Location and Setting

The Bylsma levee is located on the Nooksack River near Lynden, Whatcom County Washington. The location is further described as Section 30, Township 40 North, Range 03 East W.M. The levee is on the left bank at River Mile (RM)16.20 to RM 17.40. A location map can be found in Figure 1.

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 under the PL 84-99 program in 1976, 1984 and 1992.

Per Corps levee maintenance requirements, the County performs annual maintenance including the removal of blackberries and thinning or removal of trees that would jeopardize levee integrity.

The Nooksack River streamgage near Ferndale (nearest streamgage to site) recorded a 12-year recurrence interval flood event on 26 November 2004. During this flood event the levee sustained significant damage by erosion for approximately 100 LF and damage to the backslope from overtopping for approximately 400 LF. The County and Diking District constructed temporary measures during the flood using sandbags and field material.

On 15 December 2004, Whatcom County Public Works Department requested assistance under the PL84-99 Program in implementing a repair project at this location (Appendix A). The Corps has determined that the levee is in need of permanent repair and is proposing to repair approximately a 200-foot section of the levee.

1.3 Project Purpose and Need

The purpose of this project is to provide protection to the agricultural lands and potentially public infrastructure from flood damage. This section of the levee sustained significant damage by erosion during the November 2004 flood event and was temporarily repaired. The levee is in need of permanent repair.

There is a high potential that during the upcoming flood season the river would overflow the levee again, posing a major threat to agricultural crops and potentially Bylsma Road, if no action is taken to contain the floodwaters. Public infrastructure was not further evaluated in the economic analysis since effects to agricultural lands already justify a federal interest.

1.4 Authority

The Bylsma 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 will normally be designed to provide the same degree of protection as the original structure. This project has been authorized as having *emergency* status as stated under the PL 84-99 regulations. The Corps has determined that if the levee is not repaired by the next flood event, an *imminent threat* of loss of private and/or public property exists.

1.5 Action Area

The action area includes the 400 feet wide left bank of the Nooksack River. The action area for the project extends from the project site on the right bank of the Nooksack River, downstream approximately 500 feet for aquatic species and includes a 3/4-mile radius from the project area for terrestrial species. These distances for terrestrial and aquatic species are based on best professional judgement. Staging will be accomplished at the work site, and access will be obtained using existing levee access roads from existing paved and earthen farm roads.

2. DESCRIPTION OF THE ALTERNATIVES

2.1 Preferred Alternative

The Seattle District Corps of Engineers proposes to permanently repair the section of the levee that was damaged during the November 2004 flood event. The preferred alternative consists of reshaping the front and back slopes and armoring the riverward slope for a length of up to 200 LF. The riverward slope will be reestablished to 2:1, and then a three-foot thick blanket of class IV riprap will be placed for armor rock and a 5' high by 10' wide weighted toe will be placed using class V riprap. The damaged area is approximately 100 LF, however a transition area of up to 50 LF at each end may be needed to ensure a complete protected structure resulting in a 200 LF project area. The linear extent of the transition area cannot be specifically determined until construction and efforts will be made to minimize the transition area to the greatest extent possible.

A fish bench will be constructed at the new toe for juvenile salmon rearing habitat. The idea for the benches came from research conducted by Roger Peters, USFWS. The benches consist of additional excavation of the high accumulated sediment bench to provide a more gradual slope at approximately the OHWL for juvenile salmonid refuge, keying on average water surface elevations for the April-May timeframe when the majority of juvenile salmonids are outmigrating. The bench location was approved by team hydraulic and geotechnical engineers using the criteria that levee integrity would not be compromised and hydraulic conveyance would not be reduced. Gravel will be placed on the surface of the bench once the 6:1 slope is established. In addition to the fish bench, two rows of willow-lifts will be installed on 6-inch centers at the fish bench and Ordinary High Water mark (OHWM), and additional pre-rooted willows will be placed in a dense and random pattern on the levee face. Trees unavoidably removed for construction will be placed on the finished levee face with root wads submerged. Water quality monitoring will be performed for in-water work to ensure turbidity does not exceed state water quality standards. The project will be constructed between July 15- August 15.

Project drawings are located in Appendix D. Access to the site will not require the construction of a new road as an existing farm road and access ramp to the levee are already present. However, the farm and access road will need to be improved for up to 1,000 LF to reduce erosion and provide stable vehicular access. Improvements will include placement of approximately 8-10 inches of gravel on the road and ramp. Earthen material on the existing access ramp may be required for stable vehicle 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,
- the Repair the Scour Alternative
- the Setback Alternative

In order for any alternative to be acceptable for consideration it must meet certain objectives. The alternative must afford flood protection similar to the rest of the levee segment, it must be economically justified, it should be environmentally acceptable, and it should minimize costs for both the sponsor and the Federal government and meet the requirements of the PL 84-99 authority.

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.

2.2.1.1 Effects of No Federal Action.

With no Corps assistance, the bank erosion would continue. There is a high potential that during the upcoming flood season the river would overflow the levee again, posing a major threat to agricultural crops and potentially Bylsma Road, if no action is taken to contain the floodwaters.

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.

2.2.3 Repair-the-Scour Alternative

The Repair-the-Scour Alternative would repair the erosion and return the levee to its pre-flood condition. This alternative was selected because it provides the desired level of protection for the lowest costs and meets the requirements of the PL 84-99 authority.

3. AFFECTED ENVIRONMENT

3.1 General

In 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 (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), 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. The riparian zone adjacent to the levee contains a linear swath of deciduous trees, primarily red alder (*Alnus rubra*) with agricultural land used corn silage and hay production in the floodplain. 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 in the project area:

- Puget Sound Chinook salmon (2 essential stocks)
- Bull trout
- Bald Eagle

It is also anticipated that marbled murrelet could transit the area going to nesting areas in the upper watershed, or feeding areas in Puget Sound.

3.2 Hydrology, Soils and Topography

Currently the river undercuts this section of the levee due to the loss of a rock toe protecting the levee bank. The unprotected toe, combined with moderate water velocities creates a high potential for scour to occur in this section of the levee.

Topography of the project site is flat river floodplain, bordered by higher elevation terraces on both sides. The soils are Puyallup fine sandy loam, 0 to 2 percent slopes (SCS, 1987). Average precipitation is 50 inches; average air temperature is 49 degrees F. The Puyallup series consists of very deep well drained soils formed in alluvium. These soils are on flood plains and low river terraces (SCS, 1987).

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 on the levee. These include:

- cottonwood (*Populus balsamifera*)
- red-osier dogwood (*Cornus sericea*),
- Nootka rose (*Rosa nutkana*),
- salmonberry (*Rubus spectabilis*),
- snowberry (*Symphoricarpos albus*),
- red alder (*Alnus rubra*),
- Himalayan blackberry (*Rubus discolor*),

- Japanese knotweed (*Polygonum cuspidatum*),
- willows (*Salix spp.*) and
- a variety of native and non-native grasses.

The most prominent species at the project site are red alder, willow, Himalayan blackberry, and Japanese knotweed. The agricultural area surrounding the project site is used for commodity crops and was used for corn production during spring 2005.

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 (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), chum (*O. keta*), pink (*O. gorbuscha*), and perhaps sockeye (*O. nerka*).

The agricultural area surrounding the project site along 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 (*Haliaeetus leucocephalus*), marbled murrelets (*Brachyramphus marmoratus marmoratus*), 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
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Threatened
<i>Oncorhynchus tshawytscha</i>	Puget Sound Chinook Salmon	Threatened
<i>Salvelinus confluentus</i>	Bull Trout	Threatened
<i>Brachyramphus marmoratus marmoratus</i>	Marbled Murrelet	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 Bylsma Levee Repair ESA documentation, dated July 2005. This EA includes a revegetation plan of the levee face and fish bench. Maintenance of planted vegetation and control of invasive species will be the responsibility of the sponsor. Maintenance is required 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 3/4 mile away from a nest and the nest is not visible from the project area. Nesting territory extends along much of the Nooksack River.

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 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. Existing habitat suitability for char along this length of shoreline is low as the water velocities are quite high and this reach would likely be used only as a transportation corridor in the immediate project area.

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 fry Chinook migrate downstream through the project reach from mid March through mid July (Williams et al. 1975). Available feeding and predator avoidance habitat in the lower river, during downstream migration to the estuary and marine environment, is usually associated with slow velocities along the shoreline or around woody debris and along shallow margin habitats of cobble and gravel bars. Given the general lack of rearing habitat, high water velocities, and their migratory behavior, residence time of out-migrating Chinook fry in the project reach is likely less than a few hours. Existing habitat suitability for both juvenile and adult Chinook salmon along this length of shoreline is low as the water velocities are very high and this reach would likely be used only as a transportation corridor in the immediate project area

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 Action Area are adult and juvenile migration and juvenile rearing (Whatcom County 1994). Neither coho spawning or extended juvenile rearing occur in the Action Area. Adults migrate through the project reach from mid July through mid November (Williams et al. 1975). Juveniles migrate downstream through the reach from mid April through mid August (Williams et al. 1975). Although limited rearing may occur in the project reach, the habitat is generally not suitable for coho rearing and functions primarily as a transportation corridor to and from saltwater.

3.6 Cultural Resources

Swanton (1952:430) places the stretch of the river containing the project area within the traditional territory of the Nooksack Tribe, who belonged to the coastal division of the Salishan

linguistic family. Ruby and Brown (1992:152-153) provide information that the name Nooksack was originally the name of one of the tribe's villages and is also a corruption of one of the tribe's bands. During the middle of the nineteenth century the tribe was settled in three main villages: one of the villages was located near present-day Deming, one near Goshen, and the third near Everson (Ruby and Brown 1992:153). Suttles provides information that most of the 20 or more Nooksack villages were located in the level valley below the confluence of the north and south forks of the river (1990:456).

The Library of Congress (2003) has several photographs of Indians taken near Lynden. One photograph is titled "Jim Yellakanim: Nooksack chief, ca. 1898" and the caption on the image is labeled "Jim, Chief of the Nooksacks." The notes attached to the photograph state that "Yellakanim homesteaded in the upper Nooksack Valley, just outside the town of Lynden, Washington." Another photograph from the same collection is labeled: "Group of Nooksack Indians near Lynden, Washington, circa 1900." The 1873 General Land Office map for T. 40 N., R. 2 E., W.M., does not show any homesteads, roads or other evidence of settler claims or activity within the entire township.

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 a severely degraded riparian, which contributes to a water quality exceedence. 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.

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 712 acres of agricultural land used for silage corn and grass, 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 the Nooksack River at the project site are seasonal and moderate. They include, but are not limited to, sightseeing, wildlife observation, camping, photography, hiking, fishing and boating.

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 the Nooksack River, 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 will be short-term impacts from construction of the replacement levee. The primary impact will be a temporary increase in turbidity due to in-water work associated with construction of the toe and fish bench. Temporary noise disturbance will also occur due to construction equipment. Unavoidable loss of 20 to 30 year old red alder trees will be off-set by aggressively replanting the levee face with native shrubs and placing the removed trees with retained root wads on the bank. The river will naturally distribute the logs during higher flow conditions. Because the work will be accomplished during the established work window (June 15 – August 31), the potential disruption of salmonid movement in the area will be minimized. If present, adult and juvenile salmonids may be temporarily displaced from this area.

Due to the timing of construction (July 15-August 31) and design of the levee, no long-term impacts to the environment are anticipated. Any effects to fish and wildlife will be temporary and primarily occur during construction. Additional willow plantings, fish bench and LWD added to the site may increase some fish habitat values. Overall effects, both adverse and favorable, are not substantial.

4.1.2 No-Action Alternative

The No-Action alternative would not create any noise or turbidity, and would not remove native trees unless scoured out by the river. The No-Action alternative would not disrupt salmonid movement and it would not result in a fish bench feature for juvenile salmonids, willows being planted or dead tree placement on the riverward slope. The No-Action alternative would not provide the desired flood protection.

4.2 Hydrology, Soils and Topography

4.2.1 Proposed Alternative

By stabilizing the levee toe and removing the slumpage material, the hydraulics and stability of the levee will be increased. In addition, it will likely reduce the deflection of the river, reducing the potential of scour downstream of the project.

Construction activities associated with the proposed project will result in the placement of 2,416 tons of class IV and V rip rap, 500 tons of spall rock and 1000 tons of pit run gravel. This material will be used for construction of the toe and fish bench and repair section of the levee face. Spall rock and pit run will be used for approximately 1,000 LF of access road and ramp improvements. In addition, soils will be compacted in areas where heavy machinery will be operating such as the access road and staging area.

4.2.2 No-Action Alternative

The No-Action alternative will not repair the scour and it will not improve the hydraulics. It would not result in any rock being repositioned or placed on the site and it would not provide the desired flood protection.

4.3 Vegetation

4.3.1 Proposed Alternative

The Corps anticipates removing vegetation from the area including 20 to 30 year old red alder trees and willows in the transition zone. Native understory shrubs and invasive species such as Himalayan blackberry and Japanese knotweed will also be removed. Currently very little vegetation is present on the riverward slope of the levee in the 100 LF failure area. No trees are present, mixed native and invasive shrubs and common grasses comprise the community. The back side of the levee contains no woody vegetation and is dominated by common pasture grasses.

The repaired levee and disturbed areas will be hydro-seeded after construction. The riverward slope of the levee will incorporate dense placement of willow cuttings into the design. In

addition, trees removed for repairs, will be set aside and placed on the levee face for future distribution by the river. Overall project effects to vegetation will be minimized to the greatest extent possible and only occur in the 50 LF transition zones where red alder trees occur. In addition, our replanting efforts will increase vegetation in the project area.

4.3.2 No-Action Alternative

The No-Action alternative would result in the levee scour being temporarily devoid of vegetation. The red alder trees in the transition zone would be retained and no disturbance would occur to native understory shrubs. Invasive species would continue to proliferate.

4.4 Fish and Wildlife

4.4.1 Proposed Alternative

Effects to fish and wildlife, if any, will be temporary and occur primarily during construction. The addition of the willow plantings and placement of intact trees on the levee face may increase some fish habitat values. Overall effects, both adverse and favorable, will not be substantial.

4.4.2 No-Action Alternative

No adverse effects anticipated as a result of the No-Action alternative. The No-Action alternative might include allowing a wider river channel and more vegetation.

4.5 Threatened and Endangered Species

4.5.1 Proposed Alternative

Bald Eagle

Since construction activities will not occur during the nesting season, it will not affect nesting habitat or behaviors, prey, and only minor disruptions to foraging activities during construction. The ESA document 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 would not occur during marbled murrelet nesting season and would not have a detrimental effect on the species. The ESA document addressed the expected effect of the project on marbled murrelet and made a “no effect” determination.

Bull trout and Dolly Varden

No bull trout stocks have been documented utilizing the project area for anything other than a migration corridor. Although bull trout have not been documented using the project area it is possible that they could be utilizing the area for rearing. However, it is unlikely that bull trout would be present in the action area during construction due to the high water temperatures that often occur in the Nooksack River in late July and August. The ESA document addressed 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

Although limited rearing may occur in the project reach, the habitat is generally not suitable for Chinook rearing and functions primarily as a transportation corridor to and from saltwater. The project is scheduled during the in-water construction period to avoid periods of greatest Chinook vulnerability and highest expected use. Specific avoidance and minimization measures have been incorporated into the project design to avoid or minimize potential “take” during construction. The project footprint has been designed to incorporate a fish bench for juvenile salmonid refuge, minimize the linear distance of repairs (thus minimize tree removal) and aggressively plant native willows on the levee face. 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

The procedure to repair the levee was designed to avoid or minimize impacts from construction, including incorporation of a fish bench for juvenile salmonid refuge, minimization of the linear distance of repairs (thus minimize tree removal), placement of trees with retained root wads on the levee face and aggressively planting native willows on the levee face. The construction timing has been scheduled to be conducted during the in-water construction period to avoid periods of greatest coho vulnerability and highest expected use. These impact reduction measures may also benefit coho adults or juveniles during upstream or downstream migration.

4.5.2 No-Action

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

4.6 Cultural Resources

4.6.1 Proposed Alternative

There are no properties listed in the National Register of Historic Places (NRHP) or the Washington Office of Archaeology and Historic Preservation (WOAHP) electronic Historic Sites Inventory Database within the project area. The 10 March 2005 pedestrian archeological survey encountered good ground surface visibility and no evidence of cultural resources was observed. There is an older barn situated on the eastern side of the project area adjacent to the access road, but the project has no apparent potential to cause effects to it. The floodplain in this area is extremely dynamic and historically the Nooksack River’s channel has been constantly migrating back and forth across the floodplain. Comparison of the modern topographic map with the 1873 General Land Office (GLO) map for the township shows that the river channel has migrated north across the present repair site since that time and there is little chance of preserved prehistoric sites within the Area of Potential Effects (APE). Due to these factors it is highly unlikely that cultural resources such as temporary Native American fishing camps, or fish weirs or traps would be preserved within the APE for this project.

In the event of an inadvertent discovery of cultural resources, construction will cease in the area of the find and the protocol detailed in the Corps’ Construction Management Plan will be followed. The Construction Management Plan will contain wording to the effect that activities will cease in that area, a Corps archaeologist will initially identify the findings and if appropriate, Dr. Robert Whitlam of the Washington State OAH, the Nooksack Tribe, and the Lummi Nation will be contacted to arrange for evaluation and treatment of the material.

No-Action Alternative

In many cases levees protect cultural resources located adjacent and inland of them from river erosion. Other than the barn, there are no known cultural resources within or near the project that could be affected should the project not be constructed and the levee fails during the upcoming flood season.

4.7 Water Quality

4.7.1 Proposed Alternative

Water quality will not be substantially impacted by construction activities as only temporary turbidity is expected during in-water construction activities. No permanent affects to water quality area expected. Water quality will be monitored during construction. If monitoring results indicate an exceedence in turbidity, in-water work will be temporarily halted. Equipment will not enter the water and would remain on dry ground at all times. During construction, best management practices for equipment operation and storage and use of hazardous materials would be employed. Therefore, no leakage or spills of hazardous materials are expected to occur.

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 is not constructed the levee will 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 would meet the standards as set forth by the Washington Department of Ecology and would not be permanently affected by the construction of the project. Noise would be 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 would be temporary and localized reduction in air quality due to emissions from heavy machinery operating during fill placement, and grading. These emissions would 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 would not be substantially impacted.

Ambient noise levels would increase slightly while construction equipment was operating. However, these effects would be temporary and localized, and occur only during daylight working hours. As a result, impacts would not be substantial.

4.8.2 No-Action Alternative

No effects 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 a serious impact on local commercial and private citizens through increased flood damage to homes, agricultural operations, roads, and other public infrastructure. Construction vehicles associated with the project would have a minimal disruption due to increased truck traffic merging, turning and traveling together with local traffic. Such a disruption would be temporary and highly localized, and therefore impacts would not be significant.

4.9.2 No-Action Alternative

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

4.10 Land Use

4.10.1 Proposed Alternative

The proposed project will not cause any unique effects or impacts to land use.

4.10.2 No-Action Alternative

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

4.11 Recreation

4.11.1 Proposed Alternative

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

4.11.2 No-Action Alternative

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

4.12 Hazardous, Toxic, and Radioactive Waste

4.12.1 Proposed Alternative

There are no known sites at the project locations that have any hazardous, toxic, or radioactive waste; therefore, the Corps does not anticipate any effect.

4.12.2 No-Action Alternative

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

4.13 Aesthetics

4.13.1 Proposed Alternative

Restoration of the constructed features of the project will not substantially affect the aesthetics of the site or the river.

4.13.2 No-Action Proposed Alternative Aesthetics

No effects anticipated 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

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, limitations of the PL 84-99 program, effects to listed species, and other environmental concerns.

7. CUMULATIVE EFFECTS

Section 6.0 Cumulative effects are environmental effects that may occur when the effects of proposed action are added to other past, present, and reasonably foreseeable future actions of any federal or non-federal entity. In other words, the goal is to predict what additional environmental effects may occur when the effects of this project are analyzed in combination with the actions of others. Cumulative effects from local, short-term disturbances caused by the construction project (noise, emissions, traffic disruptions, etc.) are expected to be minor, temporary and insignificant.

There are no significant cumulative effects that can be identified from 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. The levees would continue to be maintained at their current level.

The Corps is also proposing four other levee rehabilitation projects on the Nooksack River which are being addressed as individual NEPA and Section 7 actions. The total length of shoreline that is being returned to the pre-flood condition is approximately 1.0 mile in a 33.0 mile stretch of the Nooksack River. Approximately 23,000 tons of class III riprap will be added to the banks of the

river to replace the riprap that was eroded during the flood event. Projects that require in-water work may affect water quality. To minimize the effects to water quality all projects requiring in-water work will be monitored for turbidity. Construction will temporarily halt if the water quality standards are exceeded. Riparian vegetation will need to be removed to repair the levees, however, all projects include the planting of native vegetation, which will minimize the impacts to vegetation. Effects to fish and wildlife, if any, will be temporary and occur primarily during construction. The addition of the willow plantings may increase some fish habitat values.

The Corps maintains that cumulative impacts from local, short-term disturbances caused by the construction project (noise, emissions, traffic disruptions, etc.) will be minor and insignificant.

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 (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. 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 three potentially occurring threatened or endangered species and one 'No effect' determination for marbled murrelets. The National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) were notified of the project location and action. The ESA document is contained in Appendix B.

8.3 Clean Water Act (CWA), 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. The project area, access road and staging area were inspected for wetland conditions. No wetlands are present.

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 (CZM) 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 will simply restore the Federal erosion control project to a state comparable to its original condition before damage by the elements occurred. Work will 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 have been requested and will be provided in the Final EA.

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

The proposed project has been determined to be a Federal undertaking of the type that could affect historic properties and must, therefore, comply with the requirements of Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA). Section 106 requires that Federal agencies identify and assess the effects of Federally assisted undertakings on historic properties and to consult with others to find acceptable ways to resolve adverse effects. Properties protected under Section 106 are sites, buildings, structures, or objects included on or eligible for listing on the National Register of Historic Places. Eligible properties must generally be at least 50 years old, possess integrity of physical characteristics, and meet at least one of four criteria for significance. Regulations implementing Section 106 (36 CFR Part 800) encourage maximum coordination with the environmental review process required by the National Environmental Policy Act (NEPA) and with other statutes. The Washington State Archaeological Sites and Resources Act (RCW 27.53) may also apply.

The Area of Potential Effect (APE) was defined as the project boundaries, including access roads and staging areas. Materials used in the repair will come from existing quarries and borrow areas. The OAHP records search indicated that no properties listed in the National Register and no sites or structures listed in the state inventory are located within the APE. A professional pedestrian survey conducted by a Corps archaeologist did not produce any evidence of Native American prehistoric or historic-period activity within the APE. As required under Section 106 of the NHPA the Corps is coordinating with the Washington State Historic Preservation Officer (SHPO) and the Nooksack Tribe and Lummi Nation. The Corps has determined that no historic properties will be affected by the proposed project, but of this date has not received SHPO concurrence with its determination.

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#w>. The Nooksack River 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. Tree and 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 will be 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 transferred. 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 is 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. If any hazardous materials are discovered, they would be managed in accordance with RCRA or CERCLA requirements, as applicable. Contractor hazardous materials and waste be managed in accordance with RCRA requirements if they existed. The project is 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 failure, 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 does 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 is to rehabilitate a damaged levee. No wetlands will be 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 will not interfere with access to usual and accustomed fishing grounds or with fishing activities or shellfish harvesting;
- (2) The work will not cause the degradation of fish runs and habitat; and
- (3) The work will 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.	Not 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 is not a major Federal action substantially affecting the quality of the human environment, and therefore does not require preparation of an environmental impact statement.

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]

13. 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) 396-1310
Fax: (360) 738-2468

December 15, 2004

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 November 24th, 2004, multiple levees were damaged along the Nooksack River and its tributaries. They include the following:

- The "Williams Levee" - an approximately 100-foot section of this levee located on the left bank of the Nooksack River near Everson was damaged.
- The "Sande-Williams Levee" - an approximately 200-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 the right bank of Bertrand Creek near Ferndale failed.
- The "Hannegan Levee" - an approximately 500-foot section of this levee located on the left bank of the Nooksack River near Lynden was damaged.
- The "Bylsma Levee" - an approximately 500-foot section of this levee located on the left bank of the Nooksack River near Lynden was damaged.
- The "Vanderpol Levee" - the upstream segment of this levee located on the left bank of the Nooksack River near Lynden was damaged.
- The "Twin-View Levee" - a portion of this levee located on the left bank of the Nooksack River near Everson 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,

A handwritten signature in black ink, appearing to read "James E. Lee".

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

Appendix B

ESA Consultation Document

NOOKSACK RIVER BYLSMA LEVEE
Rehabilitation of Flood Control Works
Whatcom County, Washington
ESA Consultation Document
July 2005

1.0 Introduction

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

This ESA Consultation Document evaluates the environmental effects of the proposed repair and reconstruction of Bylsma levee located on the Nooksack River near Lynden, Whatcom County Washington. The location is further described as Section 30, Township 40 North, Range 03 East W.M. The levee is on the left bank at River Mile (RM)16.20 to RM 17.40 and the project area is 400 linear feet (LF) which includes 200 LF on the levee face and 400 LF on the backslope. The levee protects agricultural property and potentially protects public infrastructure. Public infrastructure effects were not further evaluated in the economic analysis since agricultural impacts justified the federal interest. The levee was damaged during the 24 to 26 November 2004 flood event. There is approximately 100 LF of severe erosion damage on the riverward slope of levee and 400 LF of damage to the levee backslope. Erosion from the flood event resulted in armor rock being lost from the levee toe and riverward slope. This damage has resulted in slumping of the levee face. Overtopping during the flood event resulted in scour damage on the backslope for approximately 400LF. The County and Diking district constructed temporary measures during the flood using sandbags and field material. The Corps has determined that the levee is in need of emergency repair. The proposed project consists of rebuilding the riverward slope back to pre-flood condition (2H: 1V), reshaping the back slope, and armoring the riverward slope and toe. A fish bench will be constructed at the new toe to provide rearing habitat for salmon, two rows of willow-lifts will be installed on 6-inch centers at the fish bench and Ordinary High Water mark (OHWM), and additional pre-rooted willows will be placed in a dense and random pattern on the levee face. Trees unavoidably removed for construction will be placed on the finished levee face with root wads submerged. Turbidity monitoring will be performed to ensure in-water work activities do not exceed state water quality standards.

If no action is taken to contain the floodwaters, there is a high potential that during the upcoming flood season (October), the river would overflow the levee again, posing a major threat to the agricultural property and associated public infrastructure.

The proposed project consists of reshaping and armoring 200 linear feet (LF) of the riverward slope and reshaping 400 LF of the damaged backslope. The damaged area of the riverward slope is approximately 100 LF. However, a transition area not to exceed 50 LF at each end is needed

to ensure a complete protected structure. The riverward slope will be reestablished to 2:1, and then a three-foot thick blanket of class IV riprap will be placed for armor rock and a 5' high by 10' wide weighted toe will be placed using class V riprap. Improvements to the existing access road and levee ramp will be required to reduce erosion and provide stable vehicular access. The access road and ramp are approximately 1000 LF.

A fish bench will be constructed at the new toe for juvenile salmon rearing habitat. The idea for the benches came from research conducted by Roger Peters, USFWS. The benches consist of additional excavation of the high accumulated sediment bench to provide a more gradual slope at approximately the Ordinary High Water Mark (OHWM) for juvenile salmonid refuge, keying on average water surface elevations for the April-May timeframe when the majority of juvenile salmonids are outmigrating. The bench location was approved by team hydraulic and geotechnical engineers using the criteria that levee integrity would not be compromised and hydraulic conveyance would not be reduced. Gravel will be placed on the surface of the bench once the 6:1 slope is established. In addition to the fish bench, two rows of willow-lifts will be installed on 6-inch centers at the fish bench and OHWM, and additional pre-rooted willows will be placed in a dense and random pattern on the levee face. Trees unavoidably removed for construction will be placed on the finished levee face with root wads submerged.

The proposed work is not expected to substantially affect the quality of the human environment because the damaged section of shoreline will be returned to the pre-flood condition. Construction will employ best management practices (Table 1) to minimize potential adverse effects to aquatic and terrestrial resources.

Table 1. BMPs to be used during construction.

1. Equipment that will be used in or near the water will be cleaned prior to construction.
2. Work is planned to be conducted during a period of low flow.
3. Temporary sediment traps will be used to minimize turbidity where possible.
4. Biodegradable hydraulic fluids will be used for machinery at the site.
5. Refueling will occur on the backside of the levee.
6. Construction equipment will be regularly checked for drips or leaks.
7. At least one fuel spill kit with absorbent pads will be onsite at all times.
8. Drive trains of equipment will not operate in the water.
9. At least one biologist will be onsite during in-water/near water construction.

2.0 Effects of the Proposed Action and Effects Determinations

2.1 Chinook Salmon

A review of the 2002 update to the Salmonid Stock Inventory (WDFW), 2002; at <http://wdfw.wa.gov/fish/sasi>) documents Chinook salmon spawning habitat upstream of the project site in the South Fork Nooksack River, North Fork Nooksack River, and at the intersection of the Middle Fork and Mainstem Nooksack River.

Designation of the Nooksack River as critical habitat for the Chinook salmon is still currently under discussion (NOAA, 2004). The primary constituent elements determined essential to the conservation of Puget Sound Chinook salmon are: (1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval

development; (2) Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks; (3) Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival; (4) Estuarine areas free of obstruction and excessive predation with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation; (5) Nearshore marine areas free of obstruction and excessive predation with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and (6) Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

The Corps has determined the proposed project **may affect, but is not likely to adversely affect Chinook salmon and may affect, but is not likely to adversely modify proposed critical habitat for Chinook salmon**. Should critical habitat be designated, this determination would be revised to **may affect, but is not likely to adversely affect designated critical habitat for Chinook salmon**.

This determination is supported by specific avoidance and minimization measures incorporated into the design to avoid or minimize potential "take" during construction. The project footprint has been designed to incorporate a fish bench into the toe feature, minimize the linear distance of repair (thus minimize tree removal), and aggressively plant the levee face with native willows.

Placement of toe rock will result in temporary increase in turbidity and placement of rock on the riverward slope could result in turbidity if unusually high river levels occur. The project is scheduled during the in-water construction period (June 15-August 31) to avoid periods of greatest Chinook vulnerability and highest expected use. In addition, tree removal has been minimized to the greatest extent possible and only occurs in the 50LF transition areas. A fish bench, two willow-lifts, additional random willow plantings, and unsecured trees will be placed on the levee face with root wads submerged to minimize potential effects to Chinook salmon.

2.2 Bull Trout

Bull trout in the Nooksack River system were identified by the 1998 Washington State Salmonid Stock Inventory as spawning well upstream of the project location. The geographically closest stock is the Lower Nooksack stock, which occurs in the Middle Fork of the river upstream of its intersection with the mainstem river. No bull trout stocks have been documented utilizing the project area for anything other than a migration corridor. Although bull trout have not been documented using the project area it is possible that they could be utilizing the area for rearing.

On June 25, 2004, approximately 187 miles of streams within the Nooksack River system were also proposed as a critical habitat for the Coastal Puget Sound bull trout [FR, 2004]. The

primary constituent elements determined essential to the conservation of bull trout are: (1) water temperatures ranging from 36 to 59°F, with adequate thermal refugia available for temperatures at the upper end of this range (2) Complex stream channels with features such as LWD, side channels, pools, and undercut banks to provide a variety of depths, velocities, and instream structures; (3) Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young of the year and juvenile survival; (4) A natural hydrograph; (5) Springs, seeps, groundwater sources and subsurface water connectivity to contribute to water quality and quantity; (6) Migratory corridors with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows; (7) An abundant food base; (8) few or no nonnative predatory interbreeding, or competitive species present; and (9) permanent water of sufficient quantity and quality such that normal reproduction, growth and survival are not inhibited.

The Corps has determined that the proposed project **may affect, but is not likely to adversely affect** bull trout and **may affect, but is not likely to modify proposed critical habitat** for bull trout. Should critical habitat be officially designated, the critical habitat determination would be **may affect, but is not likely to adversely affect designated critical habitat for bull trout**.

Aside from the physical habitat conditions, this determination is also supported by the low likelihood that bull trout would be present in the action area during construction due to the high water temperatures that often occur in the Nooksack River in late July and August. For example, 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). Bull trout life history information in lower Puget Sound rivers has been reported by the Seattle District Corps of Engineers and can be found on our webpage. Of primary importance is that bull trout are not typically found at water temperatures greater than 18.0 Celsius. The temperatures that will likely be encountered in late July and August in 2005 will likely be at or near 18.0 Celsius.

2.3 Bald Eagle

Since construction activities will not occur during the nesting season, it will not affect nesting habitat or behaviors, prey, and only minor disruptions to foraging activities are expected during construction, the proposed project **may affect, but is not likely to adversely affect** 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 would not occur during marbled murrelet nesting season and would not have a detrimental effect on the species. The proposed project has **No Affect** on the marbled murrelet.

2.4 Essential Fish Habitat

The project area has been designated as Essential Fish Habitat (EFH) for various life stages of four 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 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 proposed action will not reduce the quality and/or quantity of EFH for Pacific salmon. A fish bench for juvenile salmonid refuge will be constructed at the new toe, two rows of willow-lifts will be installed on 6-inch centers at the fish bench and Ordinary High Water mark (OHWM), and additional pre-rooted willows will be placed in a dense and random pattern on the levee face. Trees unavoidably removed for construction will be placed on the finished levee face with root wads submerged. Turbidity monitoring will be performed to ensure in-water work activities do not exceed state water quality standards.

2.5 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 separate Section 7 consultation at the time of their development.

There are no significant cumulative effects that can be identified from 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. The levees would continue to be maintained at their current level.

The Corps is also proposing four other levee rehabilitation projects on the Nooksack River which are being addressed as individual Section 7 actions. The total length of shoreline that is being returned to the pre-flood condition is approximately 1.0 mile in a 33.0 mile stretch of the Nooksack River. Approximately 23,000 tons of class III riprap will be added to the banks of the river to replace the riprap that was eroded during the flood event. Projects that require in-water work may affect water quality. To minimize the effects to water quality all projects requiring in-water work will be monitored for turbidity. Construction will temporarily halt if the water quality standards are exceeded. Riparian vegetation will need to be removed to repair the levees, however, all projects include the planting of native vegetation, which will minimize the impacts to vegetation. Effects to fish and wildlife, if any, will be temporary and occur primarily during construction. The addition of the willow plantings may increase some fish habitat values.

Cumulative impacts from local, short-term disturbances caused by the construction project (noise, emissions, traffic disruptions, etc.) will be minor and insignificant.

Appendix C

Proposed Project Map & Drawings

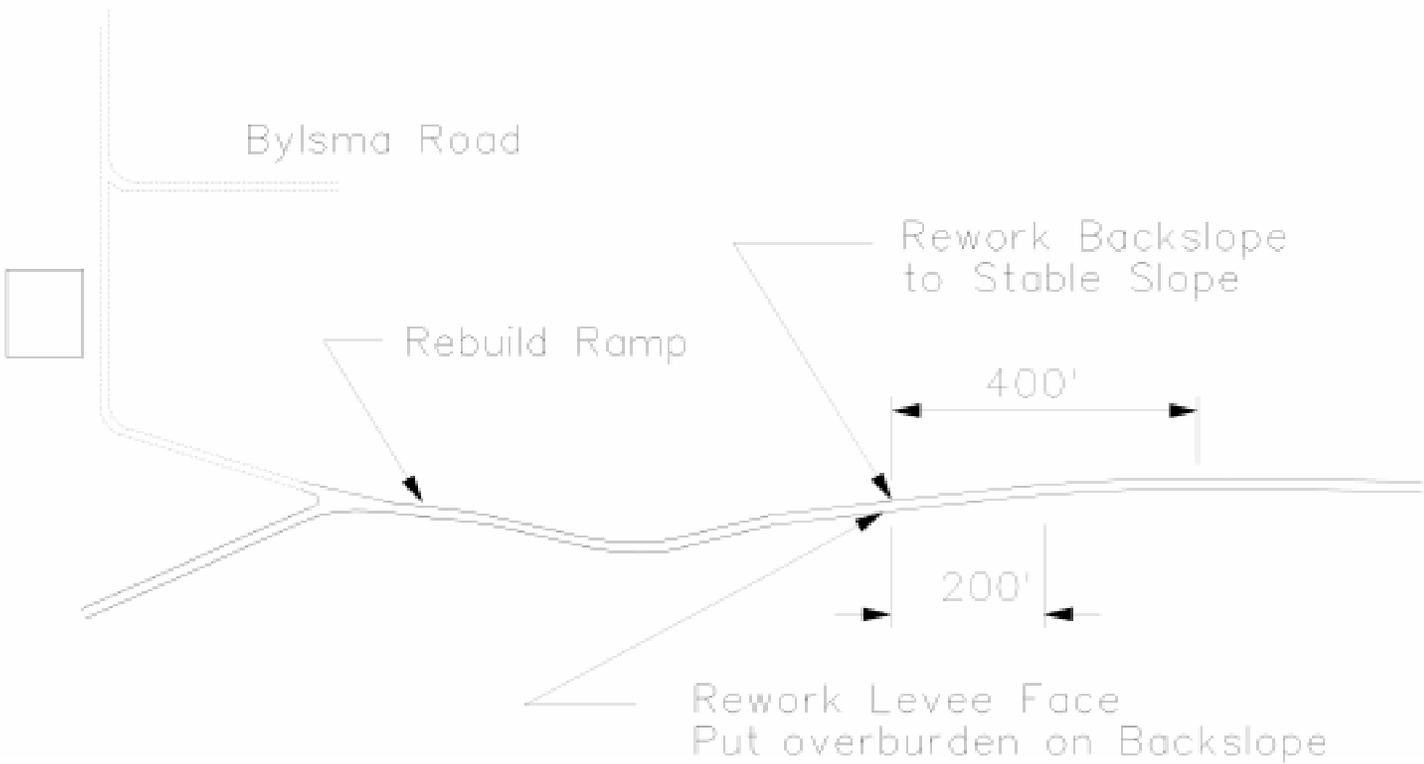
Bylsma Levee NSK-06-05

Whatcom County,
Washington
T40N R03E W.M.



Project Footprint

- Proposed Repair Area
- Staging Area (288' x 100')
- Access Route

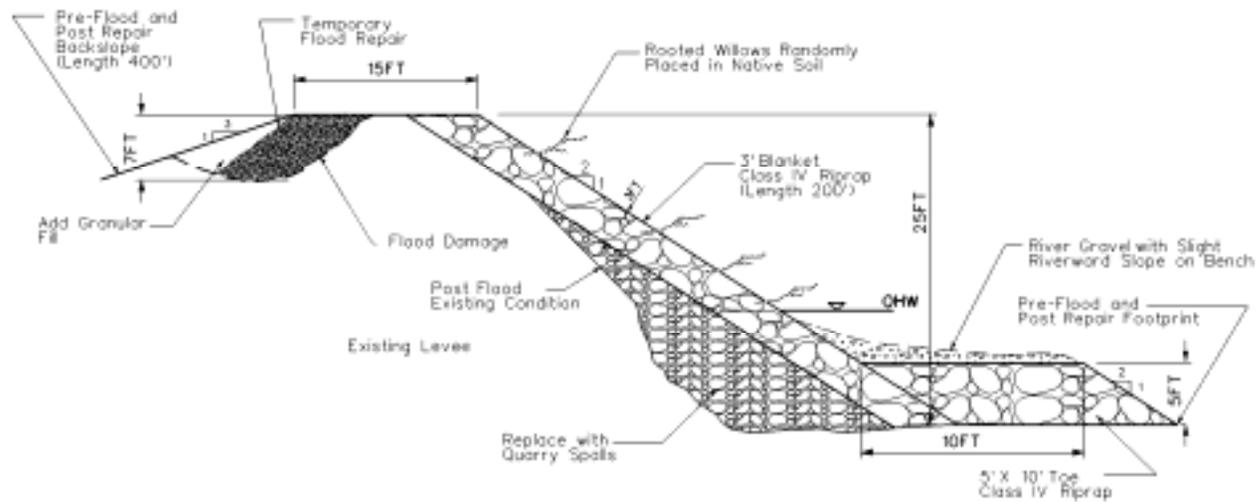


Project: Bylsma Levee	Drawn: Desjardins	Date: Feb 05
Subject: Typical Cross Section	Checked: Kaiser	Sheet: 1 of 2

Notes:

Final Willow, elevations to be determined in field.

Large red alders removed from slope for repair will be placed on levee face with rootwad in water



BYLSMA LEVEE
Typical Cross Section

Project	Bylsma Levee	Drawn	Desjardin	Scale	1" = 2'
Sheet	Typical Cross Section	Date	Kaiser	Drawn	Feb 05

Appendix D

Site Photos



Photo 1: Damaged Section Looking Downstream



Photo 2: Damaged Section Looking Upstream

Appendix E

Draft FONSI

REHABILITATION OF FLOOD CONTROL WORKS BYLSMA LEVEE
WHATCOM COUNTY, WASHINGTON

DRAFT FINDING OF NO SIGNIFICANT IMPACT

1. Background. The Seattle District, U.S. Army Corps of Engineers (Corps) is proposing to repair and reconstruct Bylsma levee, located on the Nooksack River near Lynden, Washington in July and August 2005. The levee is on the left bank at River Mile (RM) 16.20 to RM 17.40 and the project area is 400 linear feet (LF). The levee protects agricultural property and associated public infrastructure. The U.S. Army Corps of Engineers, Seattle District, is proposing the following project under the authority of Public Law 84-99 (33 USCA 701n).

The Nooksack River streamgauge near Ferndale (nearest streamgauge to site) recorded a 12-year recurrence interval flood event on 26 November 2004. During this flood event the levee sustained significant damage by erosion for approximately 100 LF and damage to the backslope from overtopping for approximately 400 LF. The County and Diking District constructed temporary measures during the flood using sandbags and field material.

On 15 December 2004, Whatcom County Public Works Department requested assistance under the PL84-99 Program in implementing a repair project at this location (Appendix A). The Corps has determined that the levee is in need of permanent repair and is proposing to repair approximately a 200-foot section of the levee.

2. Purpose and Need. The purpose of this project is to provide protection to the agricultural lands and potentially public infrastructure from flood damage. This section of the levee sustained significant damage by erosion during the November 2004 flood event and was temporarily repaired. The levee is in need of permanent repair.

There is a high potential that during the upcoming flood season the river would overflow the levee again, posing a major threat to agricultural lands and potentially public infrastructure, if no action is taken to contain the floodwaters.

3. Action. The proposed project consists of reshaping and armoring 200 linear feet (LF) of the riverward slope and reshaping 400 LF of the damaged backslope. The damaged area of the riverward slope is approximately 100 LF. However, a transition area not to exceed 50 LF at each end is needed to ensure a complete protected structure. The riverward slope will be reestablished to 2:1, and then a three-foot thick blanket of class IV riprap will be placed for armor rock and a 5' high by 10' wide weighted toe will be placed using class V riprap. Improvements to the existing access road and levee ramp will be required to reduce erosion and provide stable vehicular access. The access road and ramp are approximately 1000 LF.

A fish bench will be constructed at the new toe for juvenile salmon rearing habitat. The idea for the benches came from research conducted by Roger Peters, U.S. Fish and Wildlife Service (USFWS). The benches consist of additional excavation of the high accumulated sediment bench to provide a more gradual slope at approximately the OHWM for juvenile salmonid refuge, keying on average water surface elevations for the April-May timeframe when the

majority of juvenile salmonids are outmigrating. The bench location was approved by team hydraulic and geotechnical engineers using the criteria that levee integrity would not be compromised and hydraulic conveyance would not be reduced. Gravel will be placed on the surface of the bench once the 6:1 slope is established. In addition to the fish bench, two rows of willow-lifts will be installed on 6-inch centers at the fish bench and Ordinary High Water mark (OHWM), and additional pre-rooted willows will be placed in a dense and random pattern on the levee face. Trees unavoidably removed for construction will be placed on the finished levee face with root wads submerged. Water quality monitoring will be performed for in-water work to ensure turbidity does not exceed state water quality standards. The project will be constructed between July 15- August 31.

Access to the site will not require the construction of a new road as an existing 1,000 LF farm road is already present. However, the farm road and access ramp will need to have approximately 8-10 inches of gravel placed upon it to reduce erosion and provide stable vehicular access. Earthen material may also need to be placed on the access ramp for additional support.

4. Summary of Impacts. The primary impacts of this action will be the temporary and localized increase in noise in the construction area and temporary turbidity caused by in-water work. Long term impacts to the riparian functions from removal of red alder trees will be off-set by aggressively planting the levee face with native shrubs. Construction will employ best management practices to minimize potential adverse effects to aquatic and terrestrial resources.

The attached draft environmental assessment provides an evaluation of the proposed 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 are anticipated as a result of the project.

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

Date

Debra M. Lewis
Colonel, Corps of Engineers
District Engineer

BENNETT/PM-PL-ER

ZIMINSKE/PM-PL-ER

KOMOROSKE/OD-EM

THOMASON/PM-PL

NELSON/OC

BEVENS/PM/

LEFLER/DDE

LEWIS/DE/s/

PM-PL-ER FILE

