

Environmental Assessment

NISQUALLY RIVER LEVEE REPAIR REHABILITATION OF FLOOD CONTROL WORKS PIERCE COUNTY, WASHINGTON



Draft of July 16, 2004



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

**Nisqually River Levee
Rehabilitation of Flood Control Works
Pierce County, Washington**

**July 2004
Draft Environmental Assessment**

Responsible Agencies: The responsible agency is the U.S. Army Corps of Engineers, Seattle District (Corps). Pierce County Environmental Services is the non-federal sponsor.

Summary: In accordance with the National Environmental Policy Act (NEPA), this environmental assessment (EA) document evaluates the potential environmental impacts of emergency repair of the Nisqually River levee, located on the right bank between river mile (RM) 67.6 and 68.6, near the town of Ashford, in Pierce County Washington. The levee protects residential areas and public infrastructure (roads). The U.S. Army Corps of Engineers, Seattle District (Corps), is proposing the following project under the authority of Public Law 84-99 (33 USCA 701n), based on the written request of Pierce County Environmental Services. The proposed project consists of pulling the riverward slope back to 1.5H: 1V, reshaping and armoring the riverward slope with Class V riprap, repairing the launchable toe, and incorporating native willows into the repair.

The Nisqually River levee was damaged during December 2003 rains and consequent high river flows. Coupled with this event, prior large events including the 1996 flood of record likely eroded the riprap toe blanket causing the levee to be vulnerable to smaller events. The naturally dynamic and braided river channel has eroded the toe of the levee for approximately 800 linear feet, with approximately 400 linear feet of this damage significant enough to cause vertical walls nearly six feet high along the levee face.

The Corps has determined that the levee is in need of emergency repair and is proposing to repair an approximately 800-foot section of the levee. Without emergency repair of the damaged riverward slope and toe, failure of the levee could occur under water depths associated with as little as a 10-year flood event. Failure of the levee threatens the life and property of an estimated 51 permanent and summer residences located behind the levee along Highway 706.

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

THE OFFICIAL COMMENT PERIOD ON THIS ENVIRONMENTAL ASSESSMENT ENDS ON AUGUST 17, 2004. This document is available online at:

<http://www.nws.usace.army.mil/ers/envirdocs.html>

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1. INTRODUCTION

This Environmental Assessment (EA) evaluates the environmental effects of the proposed repair of the Nisqually River Levee located on the right bank of the Nisqually River near Ashford, in Pierce County Washington. The area behind the levee is within the historic floodplain of the Nisqually River, and contains multiple single-family residences and summer cabins and associated roads. The levee has been repaired in the past under PL 84-99, most recently in 1977 when the riverward-armoring blanket and the toe rock were repaired.

The Nisqually River levee was damaged during December 2003 rains and subsequent high river flows. Coupled with this event, prior large events including the 1996 flood of record likely eroded the riprap toe blanket causing the levee to be vulnerable to smaller events. The naturally dynamic and braided river channel has eroded the toe of the levee for approximately 800 linear feet, with approximately 400 linear feet of this damage significant enough to cause vertical walls nearly six feet high along the levee face.

The Corps has determined that the levee is in need of emergency repair. The proposed project consists of pulling the riverward slope back to 1.5H: 1V, reshaping and armoring the riverward slope with Class V riprap, repairing the launchable toe, and incorporating native willows into the repair. Without emergency repair of the damaged riverward slope and toe of the levee, failure of the levee could occur under water depths associated with as little as a 10-year flood event. Failure of the levee threatens the life and property of an estimated 51 permanent and summer residences located behind the levee along Highway 706.

The proposed work is not expected to significantly affect the quality of the human environment because the damaged section of shoreline will be returned to its pre-flood, armored condition within the same footprint occupied by the original levee. Construction will employ best management practices to minimize potential adverse effects to aquatic and terrestrial resources including reuse of existing riprap rock, water quality monitoring, and replacement of riparian vegetation.

1.1 Location and Setting

The levee is located west of the southwestern corner of the Mount Rainier National Park boundary at approximately River Mile 67.6 to 68.6, near the town of Ashford within Pierce County Washington (Figure 1). The levee is specifically located within Township 15 North, Range 7 East, the southern half of Section 33, Western Meridian. The area is within the historic floodplain of the Nisqually River, and contains multiple single-family residences and summer cabins and associated roads (Photo 1). Highway 706, the only road leading into the southwestern portion of Mount Rainier National Park is located north of the levee and these residences (Figure 1).

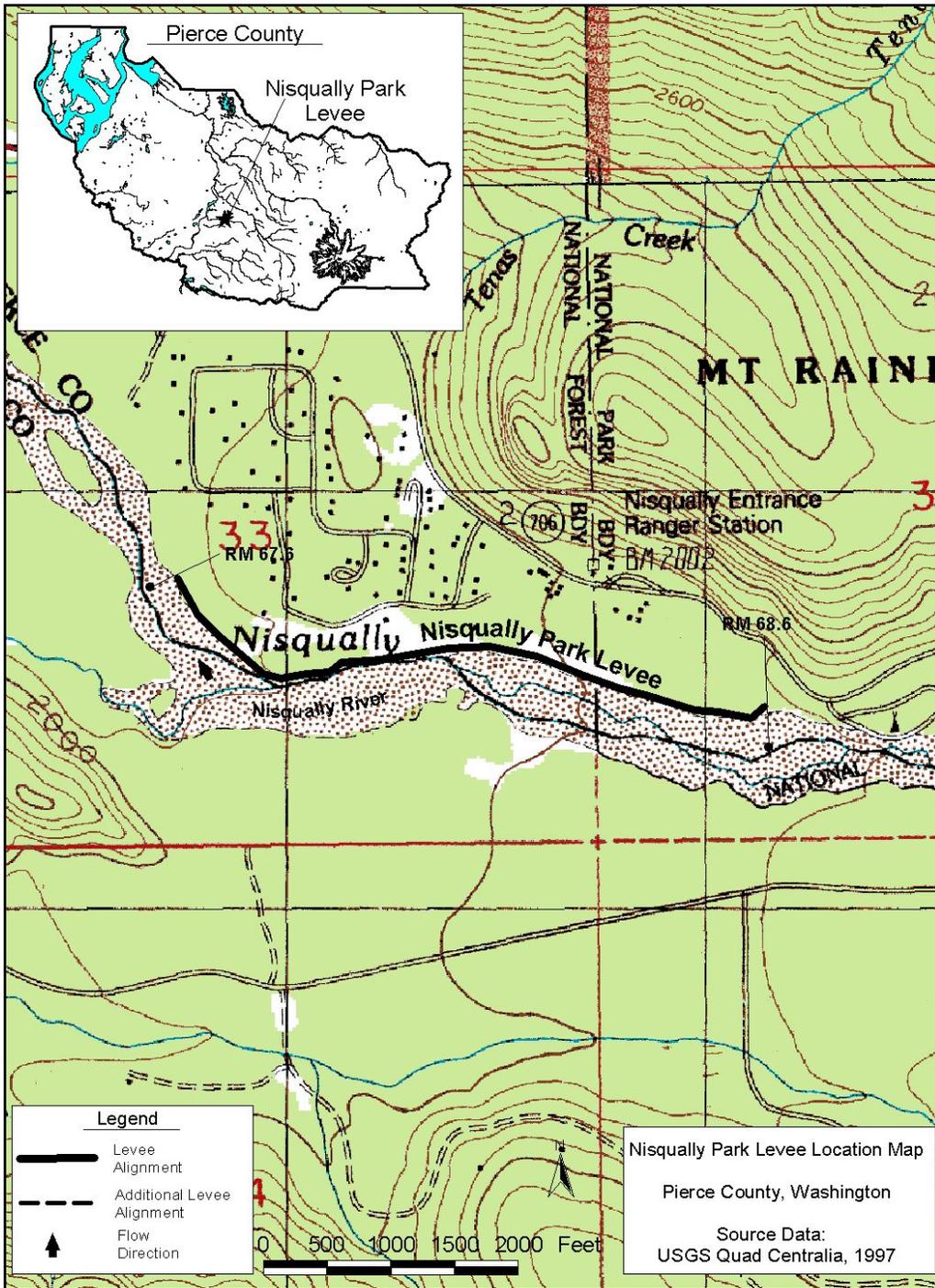


Figure 1. Location of Nisqually River levee



Photo 1: Example of home located behind and protected by the levee (photo taken from access road on top of the levee. March 2004.

1.2 Background

Local interests originally constructed the approximately 5,300 foot long levee to protect residential properties, structures, and roads, although the exact date of construction is unknown. The levee is owned and maintained by Pierce County Environmental Services (the County); Corps involvement has been limited to levee rehabilitation, most recently in 1977. The National Weather Service zero damage flood stage is 10.0 feet (stream flow of approximately 10,000 cfs). The zero flood damage level has been exceeded six times since the last repair in 1977, including the flood of record that occurred on February 8, 1996. That flood correlated with a 100-year flood event and was estimated to have resulted in a stream flow of 21,200 cfs and a river stage of 12.18 feet.

The Nisqually River levee was damaged during December 2003 rains and resulting high river flows. Coupled with this event, prior large events including the 1996 flood of record likely eroded the riprap toe blanket causing the levee to be vulnerable to more frequent smaller events. The Corps inspected the levee on December 27, 2003 and found the levee in varying states of repair. The County had recently end-dumped large riprap at three locations that appeared to be holding up well. However, scouring along the toe in some locations and large holes in the riverward bank armoring had caused significant scouring of the toe of the levee and nearly vertical eroding slopes which are being undercut by the river channel. The river has eroded the toe of the levee for approximately 800 linear feet, with approximately 400 linear feet of this damage significant enough to cause vertical walls nearly six feet high along the levee face. Pierce County Environmental Services requested that the Corps repair the levee under the Corps PL 84-99 program on February 13, 2004 (Appendix A).

1.3 Project Purpose and Need

The purpose of this project is to repair the approximately 800-foot long portion of Nisqually River Levee to preclude failure of the levee and the imminent flooding danger and resulting damage to the local residents and infrastructure protected by the levee, including a pumping station that provides potable water to the area residents. Because of the scour that is occurring, relatively small stream velocities are capable of eroding the exposed bank of small gravels and cobbles. The levee could fail in a flood stage that merely covers the damaged area, rather than a flood event that produces significant velocities. A 10-year flood event would have the water depth necessary to cause the levee to fail. Two or more feet of inundation would completely damage the pumping station.

Consequently, the Corps has determined that the approximately 800-foot long section of the levee is at risk for failure unless emergency repairs to the riverward slope, armored blanket, and toe are made. The Corps has determined that the levee is in need of permanent repair during the summer of 2004 before the onset of seasonal fall and winter rains which could pose a major threat to community, if no action is taken to repair the levee.

Figures 2 and 3 illustrate the extent and depths of water that would likely be experienced in the area protected by the levee due to such a failure of the levee. Photos 2 and 3 illustrate the eroded riverward face of the levee and the loss of the toe rock.

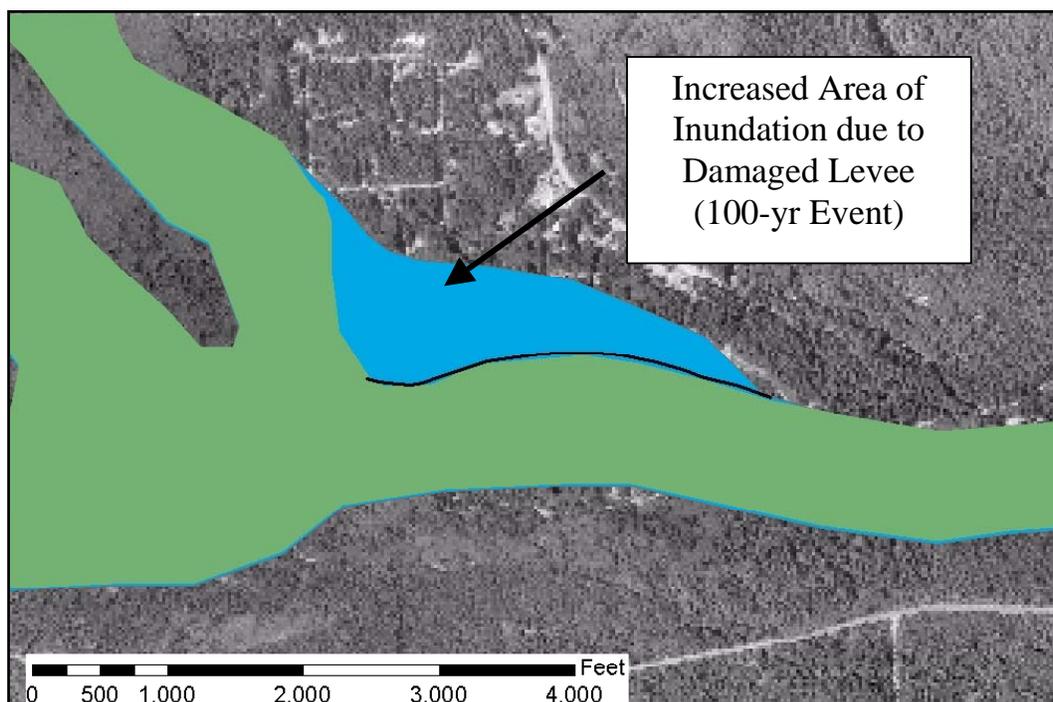


Figure 2. Extent of flooding if Nisqually River levee fails.

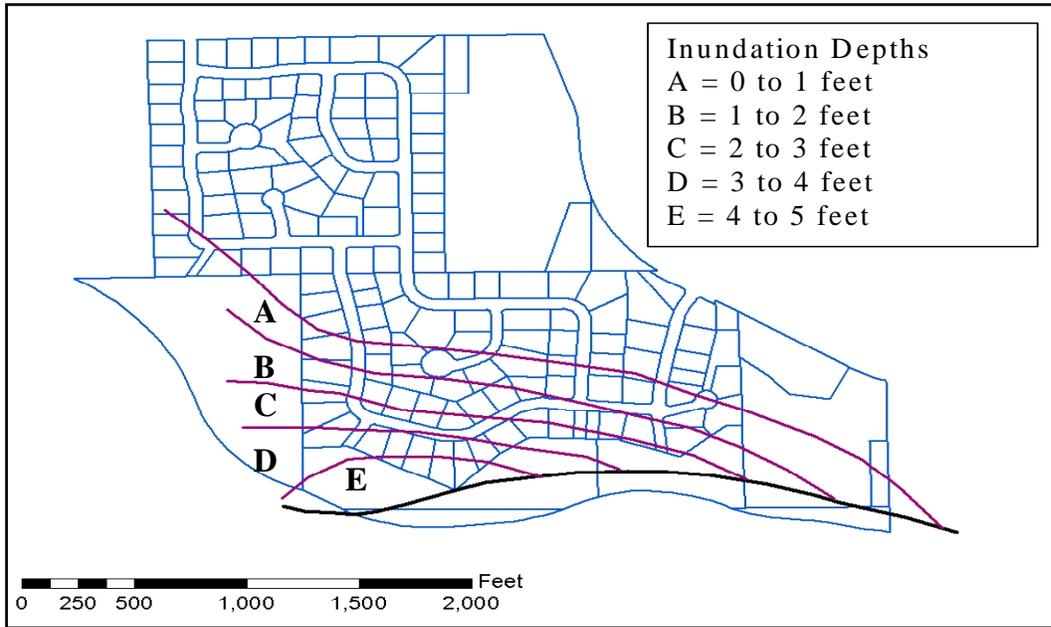


Figure 3. Anticipated depths of flooding if Nisqually River levee fails.



Photo 2. Damaged portion of levee, facing downstream, illustrating loss of face rock and exposure of cobbles. March 2004.



Photo 3. Eroded face and toe of levee, facing downstream, showing loss of face rocks, softening of face slope, and exposure of cobbles at toe of levee. March 2004.

1.4 Authority

The repair of the Nisqually River Levee is authorized by Public Law 84-99 (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.

2. ALTERNATIVES CONSIDERED

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

- the No Federal Action Alternative,
- the Non-Structural Alternative,
- the Setback Alternative, and
- the Repair the Scour Alternative (the Recommended Alternative)

In order for any alternative to be acceptable, it must meet the following 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

2.1 No Federal Action Alternative

The No-Action alternative would provide no federal action and leave the levee in its currently damaged condition. There would be no further action to repair the damage to the face and toe of the levee by the Corps. This alternative was not considered acceptable because of the high potential of additional flood damages to properties and infrastructure protected by the levee and because of the potential for the loss of life if the levee failed.

2.2 Non-Structural Alternative

The Non-Structural alternative would buy-out the existing residential properties and provide for any necessary relocations. The Corps estimated that it would cost approximately \$7 million to buy out and relocate the 51 properties likely to be damaged by failure of the levee. This alternative was not considered acceptable because the costs were deemed too high compared to the costs for other alternatives.

2.3 Setback Alternative

The Setback Alternative would realign the levee behind the existing levee footprint. This alternative would involve the purchase and relocation of many of the properties behind the levee (approximately \$7 million), in addition to the cost of constructing a new levee further away from the active river channel and connecting it at both ends to the existing undamaged sections of the levee. Thus, the costs of the setback alternative would likely be greater than the costs of the non-structural alternative. This alternative would also have environmental effects associated with construction of the new levee, including the clearing of riparian vegetation and the potential loss of wetland areas along the backside of the current levee alignment. This alternative was not considered acceptable because the costs were deemed too high compared to the costs for other alternatives.

2.4 Repair the Scour Alternative (Preferred Alternative)

The Repair the Scour Alternative would repair the damage to the toe and face and return the levee to its pre-flood damage condition. This alternative would consist of pulling the riverward slope of the levee back to 1.5H: 1V, reshaping and armoring the riverward slope with Class V riprap, repairing the launchable toe, and incorporating native willows into the repair. The Corps

estimates that this alternative would cost approximately \$203,000 to implement. The loss of riparian vegetation would be minimized and no wetland areas would be impacted by this alternative. In water work to place the toe rocks would be restricted to a fish window to minimize adverse effects on water quality and fisheries resources. This alternative would also incorporate reuse of existing riprap rock, water quality monitoring, and replacement of riparian vegetation to minimize effects on the aquatic and terrestrial resources in the area.

This alternative was recommended as the proposed action (preferred alternative) because it was the least environmentally damaging, lowest cost alternative that would provide flood protection similar to the rest of the levee segment.

3. DESCRIPTION OF THE PROPOSED ACTION

3.1 Proposed Action

To repair the levee to its pre-flood condition, the toe rocks, launchable toe rocks, and armoring rock on the face of the levee (the blanket) must be replaced and the riverward slope returned to 1.5H:1V (Figure 4). Due to the large velocities (16 to 18 fps for a 100-yr event) of the high gradient stream, Class V riprap is required. Class V riprap was used in the 1977 rehabilitation of the levee. The remaining large pieces of riprap will be used as available to repair the damaged area and restore the toe.

According to Corps regulations regarding levee repair (ER 500-1-1 and ER 1130-2-530), trees and vegetation that create floodway obstructions, decrease conveyance, or cause levee instabilities need to be removed. As such, the existing young red alder (*Alnus rubra*) and Douglas-fir (*Pseudotsuga menziesii*) trees, as well as the invasive Scot's broom (*Cytisus scoparius*) and Himalayan blackberry (*Rubus discolor*) that are scattered along the top and face of the levee will be removed. Then the face of the levee will be reshaped and a one-foot thick layer of quarry spalls will be placed along the face of the levee and then covered with 42 inches of Class V riprap as the armoring rock (Figure 4). The armor rock will catch at the river bottom at the launchable toe.

The launchable toe consists of a volume of rock that is designed to fall into a developing scour hole (should one occur) to prevent the loss of the riprap blanket. The launchable toe requires 50 cubic feet of material per linear foot, while the new blanket or riprap requires 140 cubic feet of material per linear foot. The toe will be five feet deep with two feet buried in the existing streambed only in areas outside of the low-flow channel (i.e. where the river flow is away from the toe of the levee). The 1977 rehabilitation of the levee also utilized a five-foot deep toe.

Equipment likely to be used in this repair includes a small bulldozer and a track-mounted excavator. No end dumping over the bank will occur. There will be no excavation within the river channel and no use of any rounded river rocks in the repair. All in-water work will be conducted during the fish window of July 15 to September 15. Due to low stream-flow conditions anticipated at the time of in-water work, no diversion of the stream away from the toe of the levee will likely be necessary.

3.2 Environmental Enhancement Features

Project construction will include environmental enhancement features in the form of native willow slips to offset temporary construction impacts to existing riparian vegetation growing along the levee. The young red alder and Douglas fir trees as well as the invasive Himalayan blackberry and Scot's broom shrubs will be replaced with native willows. Native willow slips will be locally harvested by the project sponsor (Pierce County) and supplied to the project during construction. Target native species will include Pacific willow (*Salix lucida*), Sitka willow (*Salix sitchensis*), and/or Scouler's willow (*Salix scouleriana*) as locally available and appropriate to the site. Approximately 100 willow slips (approximately 5-6 feet in total length)

will be installed approximately 8-10 feet apart into gaps between the riprap along the ordinary high water mark.

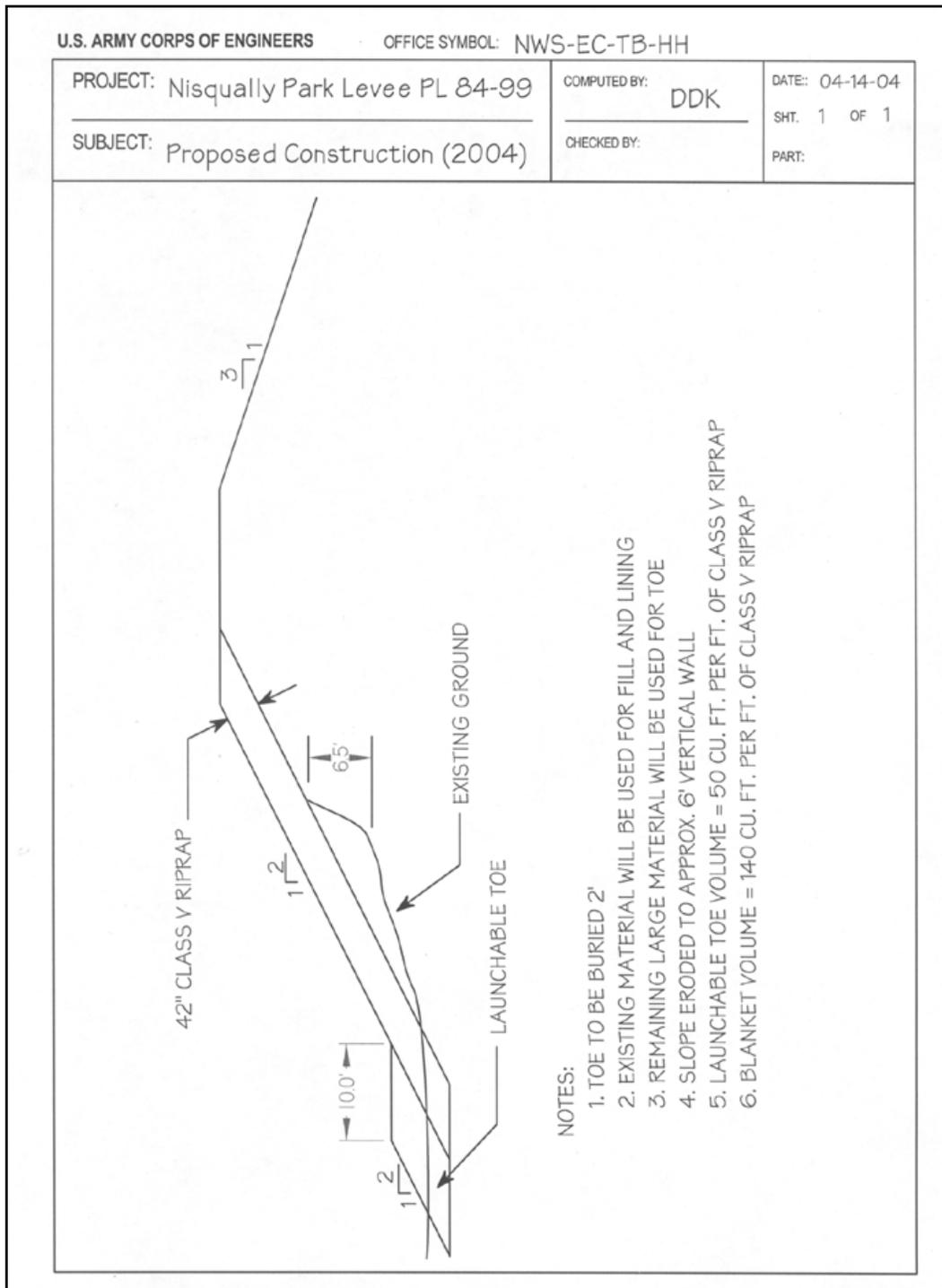


Figure 4. Proposed repair of Nisqually River levee to achieve pre-damage conditions.

4. EXISTING ENVIRONMENT

4.1 Physical Characteristics

4.1.1 Project Area

The project area extends along the right bank of the river between river miles 67.6 to 68.6 and includes the approximately 800-foot segment of the levee in need of emergency repair. The project area extends from the project site on the right bank of the Nisqually River, downstream approximately 500 feet for aquatic species from the downstream end of the section in need of repair and includes a one-mile radius from the project area for terrestrial species. Staging for the repair work will be accomplished on the levee; the site will be accessed via the existing access road on top of the levee.

4.1.2 Nisqually River Basin

The topography in the immediate project area is a broad expanse of relatively flat river floodplain along the southern, left bank of the river and a more narrow band of floodplain along the northern, right bank of the river. Highway 706 runs along the toe of slope north of the project area (Figure 1). Throughout the project area, the Nisqually River is a broad, dynamic reach with a braided channel and an approximately 1 percent slope.

The entire Nisqually River basin encompasses some 760.9 square miles, of which the upper basin (above the La Grande dam) encompasses approximately 289.2 square miles (Nisqually Watershed Planning Group, 2002).

The Nisqually River levee is located within the upper river basin. The upper river basin is geologically dominated by andesite (lava) flows, volcaniclastic rocks, and undifferentiated glacial drift. The levee is located in an area characterized by volcanic deposits, glacial outwash deposits, and undifferentiated glacial drift materials (Nisqually Watershed Planning Group, 2002).

The upper river basin supplies approximately 60 percent of the total flow of the Nisqually River. Average annual precipitation in the vicinity of the levee is approximately 75 to 83 inches, as recorded between 1961 and 1990 (Nisqually Watershed Planning Group, 2002). Stream flow measurements have been recorded approximately 10 miles downstream of the levee at a U.S. Geological Service stream gauge near the town of National. Based on data recorded at this gauge, average annual stream flow between 1943 and 2001 has been approximately 772 cubic feet per second (ft³/sec). Monthly stream flow varies through the year with May and June recording the highest average monthly stream flows (1,037 and 1,058 ft³/sec, respectively) due to annual snowmelt upstream on Mount Rainier. September and October are the driest months, with average monthly stream flows of approximately 432 and 466 ft³/sec, respectively. Peak stream flows have varied between 1,910 ft³/sec recorded on September 4, 1977 and the flood of record on February 8, 1996, which was a 21,200-ft³/sec event with 12.18 feet of water recorded at the stage gauge.

4.2 Water Quality

Water quality in the Nisqually River from Alder Dam (River Mile 44.2) to the headwaters is classified as Class AA (extraordinary) (WAC 173-201A-130 and -030). Water quality is considered extraordinary in Class AA waters in terms of temperature, dissolved oxygen, fecal coliform concentrations, turbidity, pH, and deleterious materials concentrations. There are no known areas of sediment or water contamination in the vicinity of the levee or within the project area. Water quality measurements were recorded at the USGS gauge near the town of National only on July 21, 1981; no comprehensive picture of water quality conditions specific to the vicinity of the proposed levee repair is available.

4.3 Vegetation

The levee is located in a rural residential area just outside the southwestern corner of Mount Rainier National Park. As such is dominated by forested areas interspersed with home sites, small-businesses catering to tourists, and small farms.

The top and sides of the levee are sparsely vegetated with red alder (*Alnus rubra*) saplings and small trees varying in widths from six to eight inches diameter at breast height (dbh). The edges of the access road on top of the levee support invasive Scot's broom (*Cytisus scoparius*) and Himalayan blackberry (*Rubus discolor*) shrubs.

The backside of the levee supports stands of red alder trees varying in width from six to 12 inches dbh with an understory of scattered sword fern (*Polystichum munitum*) at the downstream end. Small stands of mixed coniferous forest are interspersed between the homes located behind the levee. These forest stands are dominated by Douglas fir (*Pseudotsuga menziesii*), western red cedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), sword fern, and Cascade Oregon-grape (*Mahonia nervosa*). The stands of mixed forests become denser as the number of homes decrease in proximity to the National Park boundary at the upstream end of the levee.

The left bank of the river and its associated floodplain are dominated by black cottonwood (*Populus balsamifera*), Douglas fir, western red cedar, and red alder trees with a dense understory of salmonberry (*Rubus spectabilis*) shrubs (as viewed through binoculars from the right bank of the river).

4.4 Fish and Wildlife

4.4.1 Anadromous Salmonids and Forage Fish

The Nisqually River supports nine species of salmon and trout (Cook-Tabor 1999, Nisqually Watershed Planning Group, 2002). Pacific salmon species recorded within the Nisqually River are: summer/fall chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), winter chum (*O. keta*), odd-year pink (*O. gorbuscha*), and land-locked, hatchery-released sockeye (*O. nerka*). Trout species recorded within the Nisqually River include Dolly Varden (*Salvelinus malma*), bull trout (*S. confluentus*), steelhead (*O. mykiss*), and cutthroat trout (*O. clarki*). However, the Alder and La Grande dams limit anadromous species to the mainstem and tributaries below the dams. Consequently, there are no anadromous species within the reach of the river adjacent to the Nisqually levee. Please refer to Section 4.5 below for further discussion of the occurrence of

resident bull trout as federally threatened species that may occur within the vicinity of the proposed levee repair.

Nisqually River fall chinook is considered a mixed population of both native and hatchery origin. Chinook escapement for the Nisqually River from 1970 to 1997 averaged 779 fish, and ranged from 85 to 2,332 fish during that period (Nisqually Watershed Planning Group, 2002). Nisqually River chinook are included within the Puget Sound Evolutionary Significant Unit (ESU), which has been listed as, threatened under the Endangered Species Act. However, as the Alder and LaGrande dams block upstream anadromy downstream of the proposed levee repair, chinook do not occur within the vicinity of the proposed project.

Nisqually River coho is considered a mixed population of both native and hatchery origin. Coho escapement for the Nisqually River from 1972 to 1997 averaged 3,220 fish, and ranged from 600 to 13,000 fish during that period (Nisqually Watershed Planning Group, 2002). Nisqually River chum is considered a native stock and is isolated from other Puget Sound stocks through geographic isolation and run timing. Chum escapement for the Nisqually River from 1970 to 1995 ranged from 10,000 to over 60,000 fish during that period (Nisqually Watershed Planning Group, 2002). Nisqually River pink salmon is considered a native stock that returns in odd numbered years only. Pink salmon escapement for the Nisqually River over the last 30 years has been highly variable, ranging from 500 to 12,300 fish (Nisqually Watershed Planning Group, 2002). Due to declining numbers, this stock is considered depressed by WDFW and the Nisqually Tribe. Nisqually River winter steelhead is considered a native stock and has been showing steadily declining numbers since the early 1990's and continues to decline; no escapement data is available prior to 1980 (Nisqually Watershed Planning Group, 2002).

Sockeye salmon have been observed spawning in the mainstem Nisqually River and in its tributary the Mashel River. The juveniles rear in lakes. Kokanee (landlocked, non-anadromous sockeye) have been introduced into Alder Lake with hatchery releases recorded in 1994, 1996, and 1997. This population reproduces naturally in the Little Nisqually River and in East Creek (Nisqually Watershed Planning Group, 2002). Both resident and anadromous forms of cutthroat trout are found in most fish bearing waters of the Nisqually River basin. Coastal cutthroat are relatively abundant in diverse habitats and multiple age classes are present; they are therefore assumed to be a healthy stock (Nisqually Watershed Planning Group, 2002).

Forage fish include Pacific herring (*Clupea harengus pallasii*), surf smelt (*Hypomesus pretiosus*), and sand lance (*Ammodytes hexapterus*) prey on epibenthic invertebrates and crustaceans and are themselves important prey items for larger juvenile salmon and bull trout. Sand lance is particularly important for juvenile chinook and bull trout. All three species have been captured within the Nisqually Reach and within the Nisqually River estuary in surveys conducted in 1979 and 1980, but do not occur in the freshwaters of the upper river in the vicinity of the levee (Nisqually Watershed Planning Group, 2002).

4.4.2 Wildlife

Based on the appearance of fairly undisturbed forest and riparian conditions, complex forest structure with good stratification of vegetation layers and the presence of downed wood and snags, the immediate vicinity of the levee likely supports a wide variety of wildlife species. A search of the WDFW PHS database revealed a number of federal or state priority species that have been recorded in the surrounding area.

The area surrounding the levee would be considered high quality habitat for large mammals such as black-tailed deer (*Odocoileus hemionus columbianus*), elk (*Cervus elaphus*), black bear (*Ursus americanus*), coyote (*Canis latrans*) and cougar (*Felix concolor*); smaller mammals such as beaver (*Castor canadensis*), mink (*Mustela vison*), river otter (*Lutra canadensis*), bobcat (*Lynx rufus*), Douglas squirrel (*Tamiasciurus douglasii*), and porcupine (*Erethizon dorsatum*) also likely inhabit the riparian area. Due to the presence of tree, shrub, and herbaceous vegetation layers and the presence of downed wood and snags, it is also likely that pileated woodpeckers (*Dryocopus pileatus*), downy (*Picoides pubescens*), and hairy woodpeckers (*Picoides villosus*), barred owls (*Strix varia*), great-horned owls (*Bubo virginianus*), bats, neotropical migratory songbirds, and raptors such as goshawk (*Accipiter gentiles*), and red tailed hawk (*Buteo jamaicensis*) inhabit the riparian areas along the river.

The riparian area also likely supports birds such as great-blue herons (*Ardea herodias*) and belted kingfishers (*Ceryle alcyon*) that feed on fish and amphibians in the floodplain of the river. Resident amphibians likely to inhabit the shoreline area include red-legged frogs (*Rana aurora*), Pacific chorus frogs (*Hyla regilla*), long-toed salamander (*Ambystoma macrodactylum*), and rough skinned newt (*Taricha granulose*). Tailed frogs (*Ascaphus truei*) have been recorded within the extremely cold, upper reaches of the Nisqually River, more than five miles upstream of the levee (WDFW PHS database search March 15, 2004). Resident reptiles include the garter snake (*Thamnophis sirtalis*) and possibly Northern alligator lizard (*Gerrhonotus coeruleus*). More interior old-growth forested habitats also support marbled murrelet (*Brachyramphus marmoratus*) and northern spotted owl (*Strix occidentalis occidentalis*) nesting.

Wolverines (*Gulo gulo*), gray wolves (*Canis lupus*), fishers (*Martes pennanti*), and Larch Mountain salamanders (*Plethodon larselli*) have also been recorded in the forests along the upper Nisqually River (WDFW PHS database search March 15, 2004). Please refer to Section 4.5 below for further discussion of the occurrence of gray wolves, bald eagles, marbled murrelets, and northern spotted owls as federally threatened species under the Endangered Species Act.

4.5 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. A Biological Assessment (BA) of potential impacts to endangered and threatened species within the project area is prepared to meet these requirements. Information regarding the occurrence and distribution of threatened and endangered species was determined via the WDFW Priority Habitats and Species database search conducted on March 15, 2004 and through coordination with WDFW regional habitat biologists.

There are six threatened species listed by the U.S. Fish and Wildlife Service (USFWS) under the ESA as potentially occurring within the vicinity of the proposed levee repair: bull trout (*Salvelinus confluentus*), bald eagles (*Haliaeetus leucocephalus*), marbled murrelet (*Brachyramphus marmoratus*), northern spotted owl (*Strix occidentalis occidentalis*), grizzly bear (*Ursus arctos*), and gray wolf (*Canis lupus*). Despite three years of surveys in Mount Rainier National Park, there has been no Canada lynx (*Lynx canadensis*) documented within the

area (Martha Jensen, USFWS, personal communication, June 7, 2004). Therefore, Canada lynx were not addressed in the BA. Due to the presence of Alder and LaGrande dams downstream of the levee, there are no anadromous salmonids upstream of the dams. Thus, NOAA Fisheries did not identify Puget Sound chinook salmon (*Oncorhynchus tshawytscha*) within this portion of the Nisqually River or request coordination under ESA for any listed species under their jurisdiction.

In June 2004, the Corps entered into an informal consultation with the U.S. Fish and Wildlife Service (USFWS) via preparation of a BA regarding the proposed emergency repair of the Nisqually River levee. The BA for this project (Corps 2004) addressed the known occurrences and the potential impacts of the proposed project on these species under the jurisdiction of USFWS. A summary of the occurrence of listed species in the vicinity of the Nisqually River levee is presented below. USFWS concurred with the effect determination of “may affect, but not likely to adversely affect” for species under the jurisdiction of USFWS, via a letter dated **xx August 2004** (Appendix B).

4.5.1 Puget Sound/Coastal Bull Trout

Due to Alder and La Grande dams, there are no anadromous salmonids within the project reach of the Nisqually River; thus there are no anadromous Puget Sound/Coastal bull trout (or Puget Sound chinook) in this portion of the river. The current status of Nisqually bull trout is unknown, as are the timing and locations of spawning (Nisqually Watershed Planning Group, 2002). While the lake habitats of Alder Lake and the river habitat upstream of Alder Lake, particularly within Mount Rainier National Park, is considered available and excellent for bull trout, it is unknown if these habitats are utilized by bull trout (Nisqually Watershed Planning Group, 2002).

There has been one record of a bull trout recorded off the river delta of the Nisqually River in 1978 (Fred Goetz, Corps of Engineers, personal communication, March 19, 2004). Resident bull trout have not been recorded in the Nisqually River, and given the abundant prey population (kokanee salmon) stocked into Alder Lake and present in tributaries above the dams (Jeanette Dorner, Nisqually Tribe, personal communication, March 18, 2004), angler records of bull trout would be expected in that area if resident bull trout exist in the river above the dams (Fred Goetz, personal communication, Corps of Engineers, March 19, 2004). Thus, although the presence of resident bull trout in the river reach along the levee is possible, it is unlikely.

4.5.2 Bald Eagle

Bald eagles are commonly seen flying, perching, and foraging along the river, but there are no bald eagle nests along the levee or along the river within the project area. The nearest bald eagle nests are approximately 14 miles downstream of the levee to the west along Alder Lake (PHS database results confirmed with Julie Stofel and Kelly McAlister, WDFW, personal communications, March 15 and March 23, 2004 respectively).

4.5.3 Marbled Murrelet

There are no marbled murrelet nests recorded along the Nisqually River or near the levee. The project site lacks old-growth forests and does not contain suitable marbled murrelet foraging habitat. Marbled murrelets nest in the old growth coniferous forests within and around Mt. Rainier National Park, and the surrounding preserved areas of the Mount Baker Snoqualmie National Forest and the Wenatchee National Forest. The nearest recorded marbled murrelet

sightings are approximately 11 miles southwest of the river (recorded in 2001) and approximately 12 miles north of the levee (recorded in 1997).

4.5.4 Northern Spotted Owl

There are no northern spotted owl nests recorded along the Nisqually River or near the levee. The project site lacks old-growth forests and does not contain suitable spotted owl foraging habitat. Spotted owls nest in the old growth coniferous forests within and around Mt. Rainier National Park. The nearest spotted owl nests are approximately 1.6 to 3 miles northeast of the levee in the Goat Creek, Lake Allen, and Tum Tum Peak areas.

4.5.5 Grizzly Bear and Gray Wolf

While grizzly bears and gray wolves have been recorded within the watersheds of the Nisqually, Cowlitz, Puyallup, and Carbon rivers surrounding Mt. Rainier, none of these records have been within 5 miles of the levee and no records of either animal have been recorded within the last decade. The nearest gray wolf was a sighting of a single adult recorded in 1992 approximately 10 miles upstream of the levee near the headwaters of the Nisqually River. The nearest grizzly bear was a sighting of an adult and an individual of unknown age recorded in 1993 approximately 5 miles north of the levee, but within the Puyallup River drainage near its headwaters.

4.6 Cultural Resources and Native American Concerns

Based on a survey of the levee conducted by the Corps' archeologist, there are no known cultural resources in the project area. A database and literature search revealed that there are no documented archaeological sites in the project area. A cultural resources survey was conducted on March 18, 2004 in the repair area and a cultural resource report has been prepared as part of the Section 106 of the National Historic Preservation Act compliance process. The Corps received a letter from the State Historic Preservation Officer dated xx August 2004, concurring with the Corps finding of No Historic Properties Affected.

4.7 Land Use

The project area is located just outside the southwestern corner of Mount Rainier National Park, which is federally owned land. The levee protects approximately 51 residential properties that are either seasonally occupied as summer cabins or support permanent residences. The residents have cleared their home sites to varying extents. Some lots have retained a portion of the native forest, others are almost completely landscaped. Land use outside the immediate vicinity of the levee is primarily rural residential and agricultural. Scattered small businesses supporting the tourist trade into the National Park are also present in the immediate surrounding area.

4.8 Recreational Use

Recreational uses of the Nisqually River in the vicinity of the project site are seasonal and moderate. Most recreational use takes place within the National Park. Recreational opportunities within the area include, but are not limited to, such passive recreational pursuits as sightseeing, wildlife observation, mountain/rock climbing, camping, photography, hiking, fishing and boating. Recreational opportunities along the levee itself are limited to wildlife observation, photography, and hiking.

4.9 Air Quality and Noise

Heavy industry, railways, or large volumes of vehicular traffic do not impact air quality within the vicinity of the Nisqually River levee. Air quality is temporarily affected by smoke produced in residential heating and agricultural practices. The Puget Sound region has been an attainment area for carbon monoxide since October 11, 1996; all other areas of King, Kitsap, Pierce and Snohomish counties within the jurisdiction of the Puget Sound Clean Air Agency are unclassified. Thus, the project area along the upper Nisqually River is within an unclassified area for ozone and particulate matter.

Noise levels are similarly not elevated in the vicinity of the proposed levee repair. Existing noise and disturbance levels are typically fairly low within the majority of the project area and likely limited to traffic along Highway 706 and local vehicular traffic.

4.10 Transportation and Infrastructure

Traffic within the vicinity of the levee is limited to local traffic throughout the residential area protected by the levee, local traffic through and between the towns of Ashford, National, and Elbe, traffic into and out of Mount Rainier National Park on Highway 706. Due to its gradient and flows, vessel traffic on the Nisqually River is limited to small fishing boats and hand-launched vessels such as canoes and kayaks.

The levee protects the local roads and driveways, as well as other public infrastructure such as electrical and telephone lines. Homes in the vicinity of the levee appear to function on septic systems rather than on public sewer system.

4.11 Aesthetics

Due to its largely undeveloped character, visual and aesthetic resources along the majority of the upper Nisqually River are present and valued by residents and visitors. Scenery and visual attractions in the immediate vicinity of the levee are limited to the river corridor and its adjacent riparian areas along this reach of the river. The landscape elements of landform, vegetation, water, color, and related factors have been impaired by the levee and its access road, but improve upstream along the river where the levee terminates and the National Park begins.

4.12 Economics

Nisqually Park Levee provides protection to a community of single-family residents and vacation residences, there are approximately 150 single-family residences protected by this section of levee. In addition, there is a pumping station that provides potable water to the area residents. Two or more feet of inundation are expected to completely damage the pumping station.

The Nisqually Park community is situated along the Nisqually River. About a third of the structures are threatened by a 100-year inundation event. The remaining structures are on higher ground and not expected to be impacted. A levee breach at the damage site would cause substantial damage to approximately 50 single-family houses. The residential houses have an average structure value of approximately \$100,000 per house. They range in value from \$95,000 to \$175,000.

The Project Information Report prepared for the proposed levee repair contains a more detailed analysis of expected average annual damages to residential structures and contents in the event the levee were to fail (PIR, Corps 2004). Other damage categories such as utilities, roads and streets, cleanup, emergency costs, as well as additional damages due to high flow velocities expected may be substantial, however they were not quantified in the analysis because of lack of data.

5. ENVIRONMENTAL EFFECTS OF THE PREFERRED ALTERNATIVE

5.1 Physical Characteristics

No Action Alternative

Under the No Action Alternative, the physical characteristics of the upper Nisqually River in the vicinity of the levee would slowly change through time as the remaining cobbles and gravels are steadily eroded from the levee face and the toe and face rock continue to be lost to the river channel. It is likely that the levee would fail during a flood event in which the river stage rose to cover the damaged portions of the levee. This scenario could occur under as low as a 10-year flood event (Figures 2 and 3). Failure of the levee would not only cause substantial flooding and erosion damage to the residential structures and infrastructure protected by the levee, but would also broaden the active floodplain of the river in this area and could cause the river channel to shift location during a major flood event.

Preferred Alternative: Repair the Scour

Under the Preferred Alternative, the face and toe of the levee would be reshaped and repaired within the placement of a new rock blanket composed of Class V riprap. No change to the channel configuration or average monthly, annual, or flood flows of the river would be expected. The physical characteristics of the upper Nisqually River are not expected to change as the levee would be repaired using the same materials and within the same footprint as the existing levee. The repair would prevent the levee from continuing to erode and would thereby prevent levee failure and migration of the river channel in a flood event.

Therefore, temporary impacts to the physical characteristics of the project area as a result of repair of the levee are expected to be insignificant and discountable and are not expected to significantly degrade the physical characteristics of the project area.

5.2 Water Quality

No Action Alternative

Under the No Action Alternative, water quality within the upper Nisqually River in the vicinity of the levee would gradually degrade as the remaining cobbles and gravels are steadily eroded from the levee face and the toe and face rock continue to be lost to the river channel. Failure of the levee during a flood event would degrade water quality through increased turbidity. Turbidity would be caused by the loss of the remaining face and toe rock, as well as by loss of the interior materials of the levee. Water quality would also be degraded by the mobilization of household goods, chemicals, and waste materials if floodwaters inundated the residential properties that were protected by the levee.

Preferred Alternative: Repair the Scour

There will be short-term water quality impacts from the construction of repairs to the levee. Equipment likely to be used in this repair includes a small bulldozer and a track-mounted excavator. 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.

There will be a temporary increase in turbidity due to the placement of the launchable toe in the river and the placement of armor rock along the face of the levee. No end dumping of rock or use of rounded river rock will occur in order to repair the levee. There will be no excavation within the river channel. All work will be conducted during the fish window of July 15 to September 15. Due to low stream-flow conditions anticipated at the time of in-water work, no diversion of the stream away from the toe of the levee will likely be necessary.

According to the Code of Federal Regulations, Title 33, Section 323.4 (a) (2), levee repair is an activity that does not require a Section 404 permit; therefore, a 401 Water Quality Certification from the Washington Department of Ecology is also not required (see Section 9.0). However, the Corps will monitor water quality during construction within and at the outer edge of a 300-foot mixing zone downstream of the construction. If turbidity exceeds water quality standards (greater than 5 NTU over background if background is <50 NTU, or greater than 10% over background if background is >50 NTU), construction will be stopped and will recommence when turbidity returns to acceptable levels.

Therefore, temporary impacts to water quality during repair of the levee are expected to be insignificant and discountable and are not expected to significantly degrade the existing water quality condition within the project area.

5.3 Vegetation

No Action Alternative

Under the No Action Alternative, the existing vegetation along the levee would ultimately be eroded and washed into the river channel during the continual erosion of the levee face. Levee failure during a flood event, would result in the complete loss of all trees and vegetation currently growing on the levee and likely the loss of many of the more shallowly rooted trees in the areas protected behind the levee.

Preferred Alternative: Repair the Scour

The Corps anticipates removing then six to eight inch dbh red alder trees from the top of the riverward side of the levee; the Corps would also remove the understory of Scot's broom and herbaceous species from the riverward face and top of the levee along the approximately 800-foot section in need of repair. No wetlands would be impacted by repair of the levee. The existing trees and potential wetland areas along the backside of the levee will not be disturbed during or as a result of the repair of the levee. The repaired levee and disturbed areas along the face of the levee will be hydro-seeded after construction. The riverward slope of the levee will incorporate willow cuttings into the repair rock blanket.

Therefore, any changes to the distribution, character, or abundance of wetland or riparian vegetation as a result of repairing the levee are expected to be insignificant and discountable and are not expected to result in long-term degradation of vegetation communities within the project area.

5.4 Fish and Wildlife

No Action Alternative

Under the No Action Alternative, the existing habitats for fish and wildlife adjacent to and along the levee would gradually degrade as the existing vegetation along the levee would ultimately be eroded and washed into the river channel during the continual erosion of the levee face. Levee failure during a flood event would result in the complete loss of all trees and vegetation currently growing on the levee and likely the loss of many of the more shallowly rooted trees in the areas protected behind the levee.

However, expansion of the river's floodplain into areas now protected by the levee could ultimately result in increased habitat for riparian associated wildlife through the creation of additional early successional habitats, wetlands, and the formation of snags and downed wood as existing trees die or are uprooted by floodwaters. Temporary increases in turbidity and decreases in water quality during a flood and levee failure event could negatively impact fish populations in the vicinity of the levee, but these impacts would gradually decrease as the area stabilized following the flood.

Preferred Alternative: Repair the Scour

There will be short-term impacts to resident fish and wildlife from repair of the levee. The primary impacts will be to water quality, with a temporary increase in turbidity expected during construction of the launchable toe and placement of the armor rock. Because all in-water work will be accomplished during the established fish window (July 15 – September 15), the potential disruption to fish and aquatic wildlife will be minimized. Construction noise and the operation of the machinery may temporarily disturb any wildlife in the area, but local species are expected to return to their normal activities and habitats after construction is completed (within approximately 2-3 weeks) and during periods without construction activity (i.e. at night). Construction activities will be accomplished so as to avoid any impacts to wetland areas that may be located along the backside of the levee. There are no wetlands located on or along the face of the levee. The addition of the willow plantings along the face of the levee may ultimately increase some fish habitat values along the toe of the levee.

Therefore, any impacts to fish and wildlife as a result of repairing the levee are expected to be insignificant and discountable and are not expected to result in long-term degradation of fish and wildlife populations within the project area.

5.5 Threatened and Endangered Species

No Action Alternative

Under the No Action Alternative, the existing habitats for threatened and endangered species, including Puget Sound/Strait of Georgia bull trout, bald eagles, marbled murrelets, northern

spotted owls, gray wolves, and grizzly bears adjacent to and along the levee would continue to gradually degrade as the existing vegetation along the levee would ultimately be eroded and washed into the river channel during the continual erosion of the levee face. Levee failure during a flood event would result in the complete loss of all trees and vegetation currently growing on the levee and likely the loss of many of the more shallowly rooted trees in the areas protected behind the levee. Levee failure would reduce the habitat value of the river channel to bull trout, but these effects would likely be temporary and abate once the flooding had subsided. Foraging opportunities for bald eagles would likely be unaffected by failure of the levee, although perching opportunities in trees on or adjacent to the levee could be reduced by levee failure. Northern spotted owls, marbled murrelets, grizzly bears, and gray wolves are unlikely to be affected by the continued erosion and ultimate failure of the levee.

Preferred Alternative: Repair the Scour

The Corps has determined that by repairing the levee within the fish window of July 15 to September 15 and using the appropriate best management practices, any temporary impacts to water quality, vegetation, or prey populations, or increases in noise and disturbance during construction which might affect endangered or threatened species are expected to be insignificant and discountable.

Repair of the levee within the fish window of July 15 to September 15 and the use of appropriate best management practices will reduce any temporary impacts to water quality that might affect resident bull trout. While the noise and activity associated with repairing the levee may temporarily disturb foraging and perching eagles along the levee, these effects are expected to be insignificant and discountable. Because marbled murrelets forage for fish within the waters of Puget Sound during nesting season, repair work on the levee is not expected to disrupt their foraging. The repair of the levee is similarly not expected to effect prey populations on which the murrelets depend and will not affect their designated critical habitat (old growth forests).

Similarly, because spotted owls forage for northern flying squirrels and rodents predominately at night and within dense coniferous forests and adjacent habitats, repair work on the levee is not expected to disrupt their foraging. The repair of the levee is not expected to affect prey populations on which the owls depend and will not affect their designated critical habitat (old growth forests). The distance between the levee repair work and both marbled murrelet and spotted owl nesting territories spatially separates these birds from any disturbance to their nesting or reproductive success.

The repair of the levee is not expected to effect prey populations on which grizzly bears or gray wolves depend nor denning areas in which they reproduce due to the lack of suitable habitat along the levee and in the immediate area surrounding the levee. While a gray wolf could move through the area of levee in search of food or territory, it is unlikely they would do so during construction work to repair the levee. It is highly unlikely that a grizzly bear would be transiting through the area due to its proximity to human homes and State Route 706.

Effects to bull trout, bald eagles, northern spotted owls, marbled murrelets, grizzly bears, or gray wolves would be temporary, limited to the immediate vicinity of the repair work, and not expected to significantly disrupt the normal behavior patterns of these animals or their designated critical habitats (in the case of northern spotted owls and marbled murrelets).

Long-term degradation of bull trout, bald eagle, marbled murrelet, northern spotted owl, grizzly bear, and gray wolf habitat is also not expected. Cumulative effects would be minimized by avoiding disruptions of the local prey base through appropriate timing of work windows. Minimal effects are expected because the construction window is timed to avoid periods of juvenile salmonids use.

As such, the Corps has determined that this project “*may affect, but is not likely to adversely affect*” these species. This determination is based upon the low likelihood that these species would be present in the project area during construction activities, the lack of nesting or other critical habitats along the levee, the timing of the construction activities, and the implementation of best management practices to reduce turbidity, disruption to aquatic organisms, and vegetation disturbance during construction. This determination has been coordinated with USFWS, which issued a concurrence with this determination on xx August 2004 (Appendix B).

5.6 Cultural Resources and Native American Concerns

No Action Alternative

Under the No Action Alternative, there would be no repair of the face or toe of the levee. The levee would continue to erode and would ultimately fail in a flood event. There would be no impact due to the continued erosion or ultimate failure of the levee due to the lack of identified cultural resources in the vicinity of the levee. The erosion of the levee, its ultimate failure, and consequent flooding could potentially uncover and affect unrecorded historic properties in the project area.

Preferred Alternative: Repair the Scour

No impacts to cultural resources are anticipated from implementation of the proposed repair work due to a lack of cultural resources within the immediate vicinity of the levee. Recently conducted archeological surveys by Corps archeologists have been coordinated with the local Native American Tribes and the State Historic Preservation Officer. However, if any cultural resources are encountered during construction activities, all work will cease and the State Historic Preservation Officer and local Native American Tribes will be notified.

Therefore, the proposed repairs to the levee are not expected to result in long-term degradation of cultural resources within the project area. Coordination with the Nisqually Tribe will ensure no conflict between the construction activities and the usual and accustomed fishing activities of the Tribe.

5.7 Land Use

No Action Alternative

Under the No Action Alternative, there would be no repair of the face or toe of the levee. The levee would continue to erode and would ultimately fail in a flood event. The erosion of the levee, its ultimate failure, and consequent flooding could potentially alter local land use, as currently protected areas behind the levee would no longer be suitable for sale as residential properties. These areas would either have to be protected by a new levee or would revert back to undeveloped floodplain habitats.

Preferred Alternative: Repair the Scour

Under the Preferred Alternative, the levee face and toe would be repaired and would then be unlikely to fail under subsequent flood events. This would protect the existing land use patterns behind the levee. Repair of the levee would maintain the current level of flood protection, and so is unlikely to encourage future development of the area. Repair of the levee would not impact the primarily rural residential and agricultural land use outside the immediate vicinity of the levee.

Therefore, any changes to local land use as a result of the repair of the levee are expected to be insignificant and discountable and are not expected to result in long-term land use change or to have adverse effects on land use within the project area.

5.8 Recreational Use

No Action Alternative

Under the No Action Alternative, there would be no repair of the face or toe of the levee. The levee would continue to erode and would ultimately fail in a flood event. The erosion of the levee, its ultimate failure, and consequent flooding could potentially alter local recreational use of the area. The areas currently protected behind the levee would likely revert to undeveloped floodplain habitats that may ultimately attract recreational pursuits such as bird and wildlife watching, hiking, and photography.

Preferred Alternative: Repair the Scour

Under the Preferred Alternative, the levee face and toe would be repaired and would then be unlikely to fail under subsequent flood events. This would protect the existing recreational use of the levee and its surrounding area. Repair of the levee would not impact recreational use of the lands outside the immediate vicinity of the levee, including Mount Rainier National Park.

Therefore, any changes to recreational use of the area as a result of the repair of the levee are expected to be insignificant and discountable and are not expected to result in long-term degradation or adverse effects on recreational opportunities within the project area.

5.9 Air Quality and Noise

No Action Alternative

Under the No Action Alternative, there would be no repair of the face or toe of the levee. The levee would continue to erode and would ultimately fail in a flood event. The erosion of the levee, its ultimate failure, and consequent flooding would not significantly alter local air quality or ambient noise levels. The areas currently protected behind the levee would likely revert to undeveloped floodplain habitats; without human habitation, these areas would not generate noise or negatively impact air quality.

Preferred Alternative: Repair the Scour

During construction, there would be temporary and localized reduction in air quality due to emissions from heavy machinery operating to grade and armor the riverward face of the levee.

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.

Ambient noise levels would increase while construction equipment was operating; intermittent increases in noise would occur during the arrival and unloading of the trucks delivering the Class V riprap to the site. However, these effects would be temporary and localized, and occur only during daylight working hours. Noise disruption factors were considered for their effect on threatened and endangered species in the Biological Assessment (Appendix B).

Due to their temporary and localized nature, any changes to air quality or noise levels within the project area as a result of repair activities are expected to be insignificant and discountable. The Preferred Alternative is not expected to result in long-term degradation of air quality or noise levels within the project area.

5.10 Transportation and Infrastructure

No Action Alternative

Under the No Action Alternative, there would be no repair of the face or toe of the levee. The levee would continue to erode and would ultimately fail in a flood event. The erosion of the levee, its ultimate failure, and consequent flooding could alter local transportation and infrastructure. 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 commercial and residential infrastructure (including electricity, telephone, and septic systems), as well as the loss of tax revenues for local municipalities.

Preferred Alternative: Repair the Scour

During construction, there would be temporary and localized increases in traffic on local roads and along Highway 706 to deliver the Class V riprap to the sight and along the levee access road during the repairs. Construction vehicles associated with the project would increase truck traffic merging, turning and traveling together with local traffic. Infrastructure would continue to be protected behind the levee once the repair is completed.

Due to their temporary and localized nature, any changes to transportation patterns within the project area as a result of the repair activities are expected to be insignificant and discountable. The Preferred Alternative is not expected to result in long-term degradation of transportation capabilities within the project area.

5.11 Aesthetics

No Action Alternative

Under the No Action Alternative, there would be no repair of the face or toe of the levee. The levee would continue to erode and would ultimately fail in a flood event. The erosion of the levee, its ultimate failure, and consequent flooding could alter the local aesthetics of the area surrounding the levee. Failure to repair the levee could negatively impact local aesthetics through increased flood damage to homes, agricultural operations, roads, and other commercial

and residential infrastructure (including electricity, telephone, and septic systems) and the loss of existing vegetation from areas behind the levee. If the area behind the levee remained undeveloped, aesthetics would be expected to improve as a natural vegetation community became established.

Preferred Alternative: Repair the Scour

During construction, there would be temporary and localized decreases in the general aesthetics of the immediate vicinity of the levee as levels of truck traffic, noise, and truck emissions increase during the repair. There would be a temporary disruption to local bird and wildlife watching as a result of the repair activities, but the disruption would cease once construction activities were concluded. The view of the levee from local roads and homes would not be changed by the repaired levee.

Due to their temporary and localized nature, any changes to aesthetic opportunities within the project area as a result of repair activities are expected to be insignificant and discountable. The Preferred Alternative is not expected to result in long-term degradation of aesthetic opportunities within the project area.

6. UNAVOIDABLE ADVERSE EFFECTS

Unavoidable adverse effects associated with this project include:

- (1) a temporary and localized increase in noise, which may disrupt fish, wildlife, and recreational users in the vicinity of the levee repair,
- (2) a temporary and localized disruption of local traffic by construction vehicles

Given the temporary, localized, and discountable nature of these effects, the Corps has determined that these effects are not significant.

7. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The irreversible and irretrievable commitment of resources is the use of materials, resources, or land during implementation of an alternative that makes these resources unavailable for other uses, given known technology and reasonable economics.

Industrial resources required during implementation of the selected alternative include fossil fuels, construction-related materials, as well as labor and capital. The repair work would require use of existing machinery.

8. CUMULATIVE EFFECTS

Cumulative impacts result from the “individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7). NEPA requires the evaluation of cumulative impacts of the proposed repair of the levee in light of past, current, and reasonably foreseeable future actions along the upper Nisqually River. Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the project area considered in this evaluation. Future federal actions would require additional NEPA evaluation at the time of their development.

The actions with the largest potential for cumulative impacts in this area are continuation of residential construction on properties protected by the levee, coupled with the consequent loss of native vegetation and wildlife habitats as development continues. There are no known plans to raise the levee to provide an increased level of flood protection or to extend the levee past its current extent. The project maintains the existing level of flood protection. In the event of winter storms that damage other sections of the levee, the County would likely flood fight to prevent damage to adjacent properties.

While the original construction of the levee did remove a portion of the floodplain from the active influence of the river, repair of the levee does not further damage the floodplain, the river, or their biological functions. The harm to the biological function of the river and its floodplain is not increased by repair of the levee, but rather is maintained at its current level.

The cumulative effects of repairing the levee on federally listed species as a measure of the capability of the river system to support imperiled species are expected to be minimal. Minimal effects on bull trout, bald eagles, northern spotted owls, marbled murrelets, grizzly bears, and

gray wolves are expected because the repair work would occur within the fish window and so would largely avoid effects on juvenile salmonids. Cumulative effects would also be minimized by avoiding disruptions of the local prey base through appropriate timing of work windows.

9. ENVIRONMENTAL COMPLIANCE

9.1 Coordination

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

- NOAA Fisheries Service (NOAA Fisheries)
- U.S. Fish and Wildlife Service (USFWS)
- Washington Department of Fish and Wildlife (WDFW)
- The Nisqually Tribe
- Washington State Office of Archaeology and Historic Preservation
- Pierce County Environmental Services

The Muckleshoot Tribe, the Puyallup Tribe, and the Squaxin Island Tribe were also contacted regarding any overlap between the project area and their usual and accustomed fishing rights, but these tribes identified no such overlap.

9.2 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 Environmental Assessment document is to solicit public comment and fulfill the Corps of Engineers documentation requirements under the National Environmental Policy Act.

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

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed or proposed threatened or endangered species. NOAA Fisheries Service and USFWS were notified of the project location and action. Due to the presence of Alder and LaGrande dams downstream of the levee, there are no anadromous salmonids upstream of the dams. Thus, NOAA Fisheries Service did not identify Puget Sound chinook salmon within this portion of the Nisqually River or request coordination under ESA for any listed species under their jurisdiction. Prior to construction, ESA documentation was prepared for the project through a Biological Assessment. The Corps determined that the Preferred Alternative *may effect, but is not likely to adversely effect* potentially occurring threatened or endangered species. The ESA document and concurrence letter from USFWS is contained in Appendix B.

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

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

9.5 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 upper Nisqually River is above the tidally influenced portion of the river and is not on the Seattle District list of navigable waterways (http://www.nws.usace.army.mil/publicmenu/DOCUMENTS/Navigable_waters.pdf).

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

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

Washington's Shoreline Management Permit and Enforcement Procedures are codified in section 173-27 of the Washington Administrative Code. Developments exempt from substantial development permit requirements include: *"Normal maintenance and repair of existing structures or developments, including damage by accident, fire or elements...Normal repair means to restore a development to a state comparable to its original condition, including but not limited to its size, shape, configuration, location and external appearance, within a reasonable period after decay or partial destruction, except where repair causes substantial adverse effects to shoreline resources or environment..."* [WAC 173-27-040(b)].

The proposed action 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 extend beyond the footprint of the original project, and will not cause substantial adverse effects to shore resources or the environment. Pursuant to WAC 173-27-040(b), the Corps believes this proposal is therefore exempt from substantial development permit requirements, making it consistent to the maximum extent practicable with the State of Washington Shoreline Management Program.

The Corps sent a letter to the Washington Department of Ecology (Ecology) on July 19, 2004, informing Ecology of this determination. Pursuant to 15 CFR 930.41, *Federal Consistency with Approved Coastal Management Programs*, a Federal agency may presume State agency agreement with a consistency determination if a State agency fails to provide a response within 60 days from receipt of the Federal agency notification.

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

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

There are no known cultural resources in the project area. The disturbed nature of the levee and bank material significantly reduces the chance of finding cultural resources. A cultural resources survey was conducted in the repair area and a cultural resource report has been prepared as part of the Section 106 of the National Historic Preservation Act compliance process. A letter was received from the State Historic Preservation Officer concurring with the Corps finding of No Historic Properties Affected, dated xx August 2004.

9.8 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 will not exceed EPA's *de minimis* threshold levels (100 tons/year for carbon monoxide and 50 tons/year for ozone).

9.9 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 be protected 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 Nisqually River is not one of the three designated Washington Rivers.

The Nisqually River is listed in the Nationwide Rivers Inventory (NRI) as one of more than 3,400 free-flowing river segments in the United States that are believed to possess one or more "outstandingly remarkable" natural or cultural values judged to be of more than local or regional significance. This inventory is found at (<http://www.ncrc.nps.gov/programs/rtca/nri/STATES/wa2.html>). The Nisqually River from Mount Rainier to Alder Lake is listed in the NRI as a "Classic example of Alaska-type glacier fed stream". Its 'outstandingly remarkable values' include scenery and geology. The proposed repair of the levee will not alter these values, as the location, size, and materials of the levee will not change from that already in place.

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

The proposed project would be conducted in such a manner that migratory birds would not be harmed or harassed. The proposed work would be outside the nesting season for most birds. Riparian vegetation suitable for nesting would be avoided, where possible. Any shrub removal would be limited to after July 1 to reduce impacts to nesting birds. Where nesting vegetation is removed, adequate riparian vegetation for nesting sites exists upstream and downstream from the project site. Replanting of willows would mitigate for riparian vegetation that is removed.

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

While the proposed project is a Federal water resources development project, private funds were originally used to construct the levee. Since the project is not a Civil Works activity, the Corps' Seattle District policy is that emergency PL84-99 projects do not require formal Fish and Wildlife Coordination Act coordination via a Fish and Wildlife Coordination Act report. Given the relatively small size and scope of the project, fish and wildlife coordination issues that could have resulted in a "No Action" determination by USFWS are not expected. However, fish and wildlife coordination was accomplished through the informal consultation with USFWS under Section 7(a)(2) of the Endangered Species Act and through site meetings and coordination with the Washington Department of Fish and Wildlife (WDFW) on the Hydraulic Project Approval (HPA) obtained by the local sponsor from WDFW. The project is in compliance with the procedural requirements of this act to 'assure equal consideration of wildlife in water resources development programs'.

9.12 Federal Water Project Recreation Act, as Amended (16 USCA 4612 et seq.)

The Federal Water Project Recreation Act (P.L. 89-72), as amended, requires that full consideration be given to opportunities for fish and wildlife enhancement in investigating and planning Federal water resources projects. The proposed project is consistent with this act; willows have been incorporated into the repair design to provide enhancement of riparian and fisheries habitat along the toe of the levee.

9.13 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 has been observed during project site visits. If abandoned or buried hazardous waste or pesticides were discovered during construction, it would be managed in accordance with RCRA or CERCLA requirements, as applicable. Contractor hazardous materials and waste would be managed in accordance with RCRA requirements. The project is in compliance with this act.

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

Executive Order 11988 requires federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy of the floodplain, and to avoid direct and indirect support of floodplain development where there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to

reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains.”

Section 8 of E.O. 11988 notes that the order does not apply to assistance provided for emergency work essential to save lives or protect public property, health, and safety. The project has not constructed a change that would affect occupancy of the floodplain. By repairing the levee breach, the project would be 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.

9.15 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.

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

Executive Order 11990 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. No wetlands would be impacted by repair of the levee. The existing trees and potential wetland areas along the backside of the levee will not be disturbed during or as a result of the repair of the levee.

Table 9.1. 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 through preparation of Environmental Assessment
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; project is not within a non-attainment area
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.	Coordination accomplished through ESA consultation
Endangered Species Act	Requires federal agencies to protect listed species and consult with US Fish & Wildlife or NMFS regarding the proposed action.	Consistent through preparation of BA document and concurrence from USFWS
National Historic Preservation Act	Requires federal agencies to identify and protect historic properties.	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
Wild and Scenic Rivers Act	Requires "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
Migratory Bird Treaty Act and Migratory Bird Conservation Act	Requires not harming or harassing migratory birds.	Consistent
Federal Water Project Recreation Act	Requires full consideration be given to opportunities for fish and wildlife enhancement in investigating and planning Federal water resources projects	Consistent

Resource Conservation and Recovery Act (RCRA)	Requires managing hazardous materials and waste in accordance with RCRA requirements.	Consistent
Executive Order 12898 Environmental Justice	Requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects on minority and low-income populations.	Consistent
Executive Order 11988, Floodplain Management	Requires federal agencies to consider how their activities may encourage future development in floodplains.	Consistent
Executive Order 11990, Protection of Wetlands	Requires federal agencies to protect wetland habitats.	Consistent
Washington Hydraulic Code	Requires proponents of developments, etc. to protect state waters, wetlands and fish life.	Not Applicable to Federal projects; Pierce County is obtaining HPA

10. CONCLUSION

Due to the timing of construction (July 15-September 15) 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 added to the site may increase some fish habitat values. Overall effects, both adverse and favorable, are insignificant.

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

11. REFERENCES

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12. PREPARERS

The following Corps personnel prepared and/or reviewed this EA:

- Victoria Luiting, Biologist, Environmental Resource Section (NWS), Author
- Aimee Kinney, Biologist, Environmental Resource Section (NWS), Internal Technical Review
- Christopher Pollock, Planning Branch, (NWS), Project Manager

13. APPENDICES

Appendix A

Requests for Corps Assistance



Pierce County

Public Works and Utilities

Environmental Services

9850 64th Street West
University Place, Washington 98467-1078
www.piercecountywa.org/environmental

February 13, 2004
WP52374

Mr. Douglas Weber
Project Manager
Emergency Management Branch
US Army Corps of Engineers, Seattle District
PO BOX C-3755
Seattle, WA 98124-2255

SUBJECT: Nisqually River Levee Repair

Dear Mr. Weber:

Please accept this letter as Pierce County's formal request for river levee repair under the Corps PL 84-99 Program. Specifically, a segment of the Nisqually River Levee (located west of the Mt. Rainier National Park Service boundary) is in need of major repair due to a recent washout earlier in the flood season. It is estimated that 250 Lin-Ft of levee needs rebuilding including the face and toe.

Pierce County Water Programs understands that the levee segment is in the Corps PL-84-99 Program and was recently visited as part of the Corps annual updates to the program.

Please advise of any needed additional information you may need for further review. If you have any questions, please contact Randy Brake, Water Programs Engineer, at (253) 798-4651. Thank you in this regards.

Sincerely,

Tim Ramsaur, P.E.
Water Programs Manager

cc: Anthony C. Fantello, Water Programs Maintenance and River Systems Manager
Harold P. Smelt, P.E., Water Programs Capital Improvement Program Manager
Randy Brake, Water Programs Engineer
File

Administrative Services
(253) 798-4050
Fax (253) 798-4637

Sewer Utility
(253) 798-4050
Fax (253) 798-4695
pcsewer@co.pierce.wa.us



Solid Waste
(253) 798-2179
Fax (253) 798-4674
pcsolidwaste@co.pierce.wa.us

Water Programs
(253) 798-2725
Fax (253) 798-7709
pcwater@co.pierce.wa.us

Appendix B

USFWS Concurrence Letter for Informal ESA Consultation

Appendix C

Draft FONSI

REHABILITATION OF FLOOD CONTROL WORKS NISQUALLY RIVER LEVEE
PIERCE COUNTY, WASHINGTON

DRAFT FINDING OF NO SIGNIFICANT IMPACT

1. Background. The Seattle District, U.S. Army Corps of Engineers (Corps) is proposing to repair the Nisqually River levee in early September 2004. This levee is located west of the southwestern corner of the Mount Rainier National Park boundary at approximately River Mile 67.6 to 68.6, on the right bank of the Nisqually River near the town of Ashford within Pierce County Washington. The area behind the levee is within the historic floodplain of the Nisqually River, and contains multiple single-family residences and summer cabins, as well as associated roads and 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 levee has been repaired in the past under PL 84-99, most recently in 1977 when the riverward-armoring blanket and the toe rock were repaired.

The Nisqually River levee was damaged during December 2003 rains and subsequent high river flows. Coupled with this event, prior large events including the 1996 flood of record likely eroded the riprap toe blanket causing the levee to be vulnerable to smaller events. The naturally dynamic and braided river channel has eroded the toe of the levee for approximately 800 linear feet, with approximately 400 linear feet of this damage significant enough to cause vertical walls nearly six feet high along the levee face. The Corps has determined that the levee is in need of emergency repair. Without emergency repair of the damaged riverward slope and toe of the levee, failure of the levee could occur under water depths associated with as little as a 10-year flood event. Failure of the levee threatens the life and property of an estimated 51 permanent and summer residences located behind the levee along Highway 706.

2. Purpose and Need. The purpose of this project is to repair the approximately 800-foot long portion of Nisqually River Levee to preclude failure of the levee and the imminent flooding danger and resulting damage to the local residents and infrastructure protected by the levee. Because of the scour that is occurring, relatively small stream velocities are capable of eroding the exposed bank of small gravels and cobbles. The levee could fail in a flood stage that merely covers the damaged area, rather than a flood event that produces significant velocities. A 10-year flood event would have the water depth necessary to cause the levee to fail.

Consequently, the Corps has determined that the approximately 800-foot long section of the levee is at risk for failure unless emergency repairs to the riverward slope, armored blanket, and toe are made. The Corps has determined that the levee is in need of permanent repair during the summer of 2004 before the onset of seasonal fall and winter rains which could pose a major threat to community, if no action is taken to repair the levee.

3. Action. To repair the levee to its pre-flood condition, the toe rocks, launchable toe rocks, and armoring rock on the face of the levee (the blanket) must be replaced and the riverward slope

CENWS-PM-PL-ER

SUBJECT: Rehabilitation of Flood Control Works Nisqually River Levee, Pierce County, Washington

returned to 1.5H to 1V. Due to the large velocities (16 to 18 fps for a 100-yr event) of the high gradient stream, Class V riprap is required. Class V riprap was used in the 1977 rehabilitation of the levee. The remaining large pieces of riprap will be used as available to repair the damaged area and restore the toe. The face of the levee will be reshaped and a one-foot thick layer of quarry spalls will be placed along the face of the levee and then covered with 42 inches of Class V riprap as the armor rock.

The armor rock will catch at the river bottom at the launchable toe that is designed to fall into a developing scour hole (should one occur) to prevent the loss of the riprap blanket. The toe will be five feet deep with two feet buried in the existing streambed only in areas outside of the low-flow channel (i.e. where the river flow is away from the toe of the levee). The 1977 rehabilitation of the levee also utilized a five-foot deep toe. No end dumping over the bank will occur. There will be no excavation within the river channel and no use of any rounded river rocks in the repair. All work will be conducted during the fish window of July 15 to September 15. Due to low stream-flow conditions anticipated at the time of in-water work, no diversion of the stream away from the toe of the levee will likely be necessary. Project construction will include environmental enhancement features in the form of native willow slips to offset temporary construction impacts to existing riparian vegetation growing along the levee.

4. Summary of Impacts. The primary impacts of this action will be the temporary and localized increase in noise in the construction area and the removal of scattered small trees and invasive shrubs from the top and riverward face of the levee. To minimize the project impacts to vegetation, the project area will be replanted with willow plantings.

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, aesthetics, 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

LUITING/PM-PL-ER

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