FINAL- Environmental Assessment for: Stillaguamish River Cook Slough Weir Repair Silvana, Washington.

Prepared by:

U.S. Army Corps of Engineers
Seattle District
Seattle, Washington

April 2010

-page left intentionally blank-

Executive Summary

This document is an environmental assessment (EA) prepared by the Seattle District, U.S. Army Corps of Engineers (USACE) for repair of an existing Stillaguamish River weir known as the Cook Slough weir. It is intended to satisfy public involvement and disclosure requirements under the National Environmental Policy Act of 1969. The document describes the project and its likely effects on terrestrial resources, aquatic resources, federally listed species under the Endangered Species Act and effects on the human environment arising from repair activities of the weir. This document will serve as the basis for the preparation of a Finding of No Significant Impact or an Environmental Impact Statement.

The existing Cook Slough weir is located at river mile 16 on the Stillaguamish River. The weir was constructed in 1936-37 to provide gradient control to keep adequate summer flows in both the Stillaguamish main stem and Cook Slough. The weir also reduces backwater during flood events and provides some fish passage.

The downstream sheet pile installed during an earlier repair has failed in the vicinity of the low flow fish notch and in the same area the Wakefield piling cutoff wall has also failed. There are numerous large voids, and there is a large scour hole downstream of the weir. Failure of the weir would stress the bank protection system on Cook Slough. A complete failure of the weir would change the flow split between Cook Slough and the main channel. Significant aggradation could be expected on the main channel. The reduction in discharge would greatly reduce the ability of the main channel to remain clear of sediment and would also greatly limit fish migration and habitat in the main stem.

Summary of Impacts

Environmental impacts from the proposed project include both acute and chronic changes to the baseline condition. Acute impacts are episodic and principally associated with construction activities during the repair. They may include increased turbidity and temporary riparian vegetation losses due to staging and associated construction operations. During construction there is also a potential for stress or injury to fish associated with altered flow patterns or encounters with temporary rock structures. Despite appropriate containment and control measures, there is always a possibility of leaks or spills of chemicals including fuels, lubricants, adhesives, and other chemicals. During construction it is possible that the fishway efficiency may be temporarily altered due to changing flow characteristics, nearby noise or other construction related activities.

Chronic impacts are generally positive and include a reduced potential for stranding of juveniles due to flow manipulation caused by the weir repairs. The repaired weir and redesigned fishway will allow better attraction flows to the left bank and better reliability of meeting minimum instream flows.

TABLE OF CONTENTS

1. Introduction ***1***
1.1. Project Authority 1
1.2. Purpose and Need 1
1.3. Project Location 2
1.4. Background 4

2. Alternatives Evaluation. ***4***
2.1. Alternatives Evaluation 4
2.2. No Action Alternative 4
2.3. Localized Repair Alternative 5
2.4. Comprehensive Repair Alternative 5

3. Detailed Description of the Preferred Alternative ***6***
3.1. Comprehensive Weir Repair 6
3.1.1. Cofferdam construction 6
3.1.2. Fishway 7
3.1.3. Riprap scour protection 8
3.1.4. Access Road. 8

4. Affected Environment ***9***
4.1. Climate and Geology. 9
4.2. Water Quality 9
4.2.1. Water Temperature 10
4.2.2. Turbidity and suspended sediments 10
4.2.3. Chemistry 10
4.3. Hydraulics and Hydrology 10
4.4. Vegetation 11
4.5. Wetlands 11
4.6. Aquatic Resources 11
4.7. Terrestrial Resources 12
4.8. Cultural Resources 13
4.9. Federally Endangered and Threatened Species 13
4.10. Noise and Air Quality 14
4.11. Demographics and Socioeconomics 14

5. Environmental Effects of the Proposed Project ***14***
5.1. Climate and Geology 14
5.1.1. Sediments 15
5.2. Water Quality 15
5.2.1. General 15
5.2.2. Temperature. 15

5.2.3. Turbidity and Suspended Sediments 15
5.2.4. Chemistry.....16
5.2.5. Land Use and Potential Pollution Sources.....16
5.3. Hydraulics And Hydrology 17
5.4. Vegetation 17
5.5. Wetlands.....17
5.6. Aquatic Resources 17
5.6.1. Fish Resources.....17
5.7. Terrestrial Resources 18
5.8. Federally Threatened And Endangered Species.....18
5.8.1. Chinook Salmon.....18
5.8.2. Bull Trout.....19
5.8.3. Steelhead.....20
5.8.4. Marbled Murrelet.....21
5.9. Archaeological And Historical Cultural Resources.....22
5.10. Noise and Air Quality.....22

6. Environmental Effects of the No Action Alternative.....23

7. Cumulative Effects.....24
7.1. Corps Stillaguamish River Bank Protection Project. 24

8. Treaty Rights.....25

9. Environmental Compliance.....25
9.1. National Environmental Policy Act.....25
9.2. Endangered Species Act.....25
9.3. Clean Water Act Compliance.....26
9.4. Fish and Wildlife Coordination Act.....26
9.5. Essential Fish Habitat.....26
9.6. National Historic Preservation Act 26
9.7. Clean Air Act.....27
9.8. Environmental Justice 27
9.9. Coastal Zone Management Act 27

10. Conclusions 28

11. References.....29

LIST OF FIGURES

Figure 1-1. Vicinity Map.
Figure 1-2. View of weir showing sheet pile failure.
Figure 1-3. Cook Slough weir showing the new fishway design, and scour protection riprap blanket placement.

APPENDICES

APPENDIX A. SUBSTANTIVE COMPLIANCE FOR SECTION 404 OF THE CLEAN WATER ACT AND THE RIVERS AND HARBORS ACT

APPENDIX B. REQUIRED STATE AND FEDERAL AGENCY RESPONSES

APPENDIX C. PROJECT CORRESPONDENCE

page left intentionally blank

1. Introduction

This document is an environmental assessment (EA) prepared by the Seattle District, U.S. Army Corps of Engineers (Corps) for repair of an existing weir located on the Stillaguamish River at river mile (RM) 16 currently known as the Cook Slough weir (CSW). The repair does not alter the existing weir design except to provide enhanced fish passage by redesigning the boulder fishway to function properly at low flows. The EA is intended to provide for public disclosure of project components and impacts to the environment required by the National Environmental Policy Act of 1969 for all Federal Actions.

1.1. Project Authority

The Stillaguamish River Flood Control Project was originally authorized by the Flood Control Act of 22 June 1936. Cook Slough weir was one of the flood control projects authorized under this act. The Flood Control Act of 28 June 1938 provides for Federal maintenance of the project.

1.2. Purpose and Need

The Cook Slough weir repair project consists of needed repairs to the existing structure in order to avoid total structure failure. The project also includes the construction of a boulder channel fishway to provide better fish passage during low flow events.

The purpose of the Cook Slough weir is to provide gradient control in order to keep adequate summer flows in both the Stillaguamish main stem and Cook Slough (sometimes referred to as Koch Slough). The weir also reduces backwater during flood events and provides some fish passage. A fishway was incorporated into the weir in 1988, on the left (south) bank of the river. The existing fishway is a simple baffle system that does not have adequate attraction flows and may contribute to fish stranding at low flow events (NMFS personal communication). The downstream sheet pile installed during an earlier repair has failed in the vicinity of the low flow fish notch and in the same area the Wakefield piling cutoff wall has also failed (Figure 1-1). There are numerous large voids with some extending upstream almost to the second row of timber piling and there is a large scour hole downstream of the weir. This scour hole tends to hold fish, and may act to distract fish away from the current fishway. This can lead to stranding and mortality, especially during low flow and high temperature events.

Failure of the weir would stress the bank protection system on Cook Slough. A complete failure of the weir would change the flow split between Cook Slough and the main channel. Significant aggradation could be expected on the main channel. The reduction in discharge would greatly reduce the ability of the main channel to remain clear of sediment and would also greatly limit fish migration and habitat in the main stem.

Figure 1-1. View of weir showing sheet pile failure.

1.3. Project Location

The Cook Slough weir is located near the city of Silvana, Washington on the Stillaguamish River at the upstream end of Cook Slough, in T31N, R5E, Sec. 6 SW ¼ (Figure 1-2). The project is located at RM 16 on the Stillaguamish River, in unincorporated Snohomish County. Adjacent lands include privately owned farms and tribal lands.

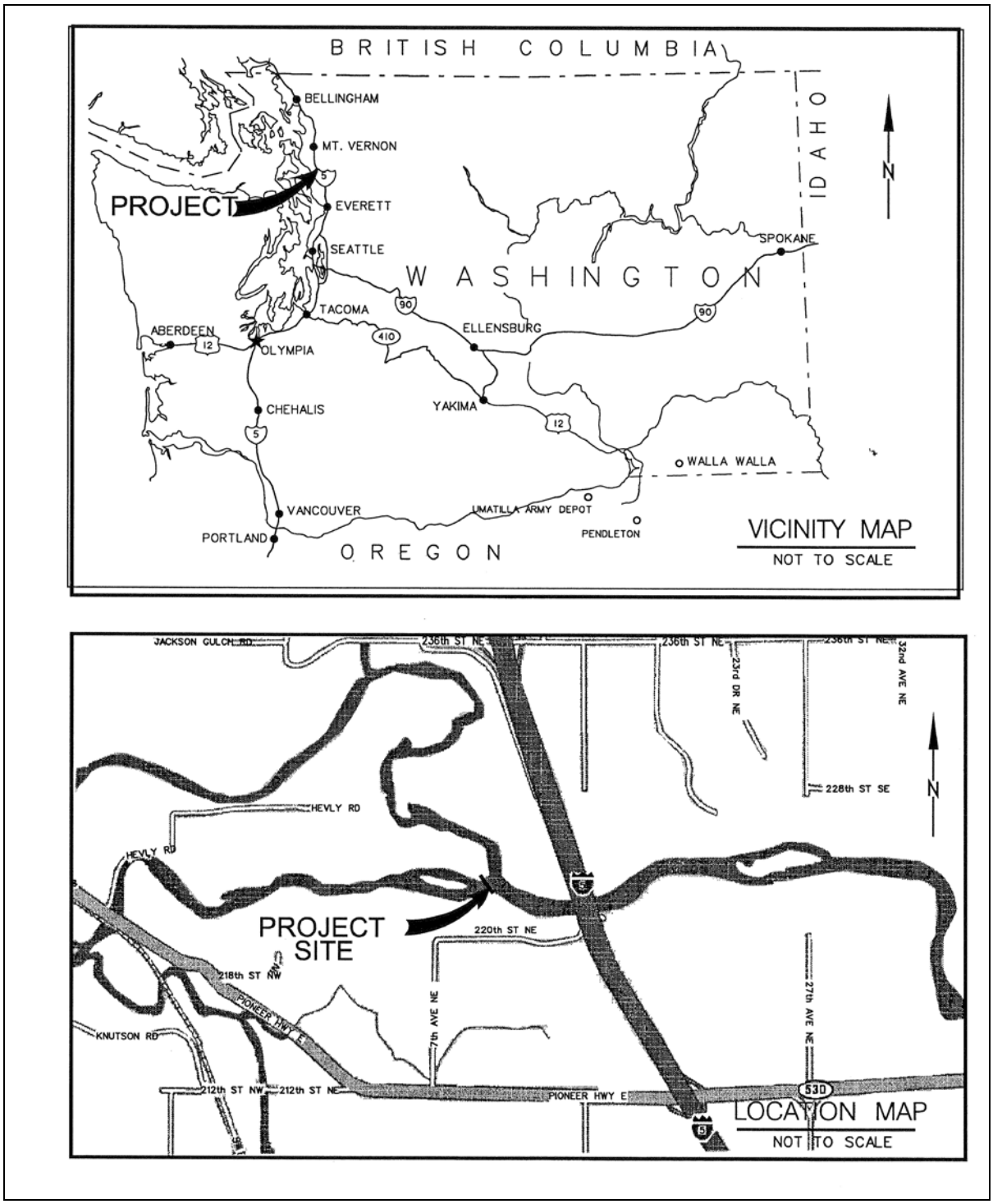

Figure 1-2. Project vicinity Map.

1.4. Background

The construction of the Cook Slough weir was completed in 1937 to provide flood control for the town of Stanwood, Washington. A repair to the facility was performed in 1984 and a fish passage system was constructed in 1988 and 1989. The original construction consisted of a reinforced concrete weir with ogee crest supported by timber piling and Wakefield piling timber cutoff wall between steel sheet pile cell abutments. The repair performed in 1984 corrected some structural deficiencies and installed a notch in the weir for fish passage at low flows. Part of the ogee concrete was removed and replaced, steel sheet piling was installed along the upstream and downstream faces of the weir, an 'L' shaped angle connected the top of the piling to the concrete slab, and some voids under the slab were filled with grout. In 1988 a fish passage baffle system (fishway) was constructed at the south abutment with some enhancements to it performed in 1989.

The Stillaguamish River Basin is the fifth largest tributary to Puget Sound encompassing an area of approximately 684 square miles with more than 975 miles of rivers and tributaries (USACE, 2000). Two large forks, the North and South Forks, converge into a main stem near Arlington, WA and eventually branch into the main channel and sloughs before the river empties into Puget Sound. Near Arlington, the river meanders westward 23 miles through a fertile flood plain, where most of the basin's agricultural land is located. Near Silvana, the channel divides into Cook Slough and the main stem river channel. The river divides again approximately eight miles from the mouth, into Hat Slough where the primary flow is concentrated in the river channel. The river channel below Hat Slough is extensively shoaled and carries little or no flow during the dry season. Since the 1860's, several private and public entities have constructed small flood control levees and dredged channels for purposes of both flood control, gravel mining, and for converting wetlands to agriculture lands. The watershed includes land governed by Snohomish County and Skagit County, the cities of Arlington, Stanwood, and Granite Falls, and the Stillaguamish and Tulalip Tribes.

2. Alternatives Evaluation.

2.1. Alternatives Evaluation

The following section describes the alternatives considered for the project including the no action alternative. Rationale is presented for eliminating an alternative or considering it in greater detail.

2.2. No Action Alternative

The No action alternative includes no direct action to repair any portion of the existing Cook Slough weir by the Corps. This alternative does nothing to prevent continued deterioration of the weir or solve any problems associated with failure of the weir. The current maintenance efforts consisting primarily of removal of backed up debris would continue. The fishway would remain in its current configuration.

Conclusions:
The no action alternative essentially allows the weir to further deteriorate, eventually to complete structural failure. Failure of the grade control weir would stress the bank protection system on the Cook Slough. This alternative would not improve the fishway or adequately address the scour hole. This could lead to further fish strandings and temperature induced mortalities. A complete failure of the weir would change the flow split between Cook Slough and the main channel. Significant aggradation could be expected on the main channel. The reduction in discharge would greatly reduce the ability of the main channel to remain clear of sediment and would also greatly limit fish migration and habitat in the main stem.

2.3. Localized Repair Alternative

This alternative would only provide needed repairs to the existing structure to restore the weir to pre-damage conditions. Structural repairs needed in order to keep the weir functioning as in the past would be accomplished (sheet pile replacement, and the filling of voids). The repairs recommended in this alternative would correct the current structural deficiencies which are jeopardizing the structural integrity of the weir, but are a relatively short term repair solution. The estimated life of repairs for this localized repair alternative is 10 to 15 years. This alternative would not change the current fishway in anyway or fill the scour hole below the weir.

Conclusions:
This alternative would meet at least a portion of the purpose and need of the project by keeping the weir functioning as originally designed/authorized. This would however, miss an opportunity to improve the fish passage situation at the weir, and would not incorporate any benefits to the native salmon populations of the Stillaguamish River. For these primary reasons, the Localized Repair Alternative was rejected and dropped from further analysis

2.4. Comprehensive Repair Alternative

This alternative would perform all structural repairs to the weir as well as improve the existing fishway in order to enhance fish passage.

Conclusions:
This alternative would meet the purpose and need of the project by keeping the weir functioning as originally designed/authorized, as well as use the opportunity to greatly improve fish passage at the site. The Cook Slough weir has been deteriorating over time and is continuing to deteriorate. Repair options range from short term to longer term fixes, but repair of the weir is necessary to prevent ultimate failure of the weir. The consequences of complete failure are significant and costly, and would be complicated to fix. Based on the analysis of the current weir condition, the recommended alternative is the Comprehensive Repair Alternative. A comprehensive repair of the weir will cost more than the repairs recommended in the Localized Repair Alternative, but will provide a longer weir repair lifespan (50 years) and prevent significant changes to the geomorphology of the area (avoids the aggradation of the mainstem). This alternative

was identified early in the planning process and addresses structural needs of the weir as well as fish passage. This represents the best sustainable mix of federal interests that are consistent with federal fish passage responsibilities. For this reason, this alternative is considered the preferred alternative and the impacts of this alternative will be presented throughout the remainder of this document. A detailed description of this alternative is provided in Section 3.

3. Detailed Description of the Preferred Alternative

3.1. Comprehensive Weir Repair

The proposed project includes a structural repair of the weir to fix its current damaged/deteriorated condition. Construction is currently planned for the Summer of 2010, and will run from approximately 15 July to 31 October 2010. The starting date is dependent on the flow and river stage, as the repair work will require low flow conditions.

The project proposes to replace approximately 200 linear feet of steel sheet piling, and repair all deteriorated concrete areas. The existing scour hole on the downstream side of the weir will be filled with rock riprap in order to provide adequate scour protection. The existing fishway structure will be modified to enhance fish passage, and the existing low flow notch will be permanently removed. Temporary access roads will be constructed. Stabilization of the sand/gravel bar will be necessary to support heavy equipment. The project also requires the temporary construction of a cofferdam upstream of the weir to partially dewater the weir structure for equipment access and to effect repairs. All stabilization materials will be removed and disturbed areas will be restored at project completion.

The construction sequence will be essentially as follows: construct upstream berm to isolate the fishway, divert flow over the weir, re-work fishway, remove fishway berm, construct berm to isolate the weir face and scour hole, divert flow through the fishway, remove damaged sheet pile, drive new sheet pile, fill voids, redo sill, remove dewatering berm, restore site.

3.1.1. Cofferdam construction

A cofferdam berm will be used to partially dewater the construction site. Water will first be diverted over the weir to effect the boulder channel fishway construction and then through the fishway to effect weir structural repairs. This two phase approach to dewatering will ensure that a minimum flow will be maintained downstream of the weir in Cook Slough throughout the project duration. Dewatering will hydraulically isolate the fishway, weir and scour hole repair areas from the river during construction activities and effectively control all discharges and downstream turbidity. Construction of the cofferdam is planned for July during a period of naturally high turbidity, low flows and within established in-water work windows (currently July 15 – August 31) as much as possible.

3.1.2. Fishway

Improvements to the left bank fishway will be designed to eliminate fish stranding and to provide enhanced passage during low flow events (Figure 1-3). The existing fishway, essentially a baffle structure, was added to the weir in 1988, and was a minimally engineered, quick solution to low flow fish strandings. The new design provides a graduated boulder channel (~4% slope), with multiple plunge pools to bring fish up to the current baffle system and allow passage. Additionally the permanent elimination of the low flow notch will increase attractant flow through the fishway structure, especially during low flow events. The boulder channel fishway re-work portion of this project will be accomplished early in the project in order to avoid threatened or endangered fish migrations and/or spawning periods as much as possible. The fish passage structure may be required to be at least partially dewatered during this portion of the repair. However, minimum flows into Cook Slough will be maintained. The work may continue outside of the fish window, but all work would be completed by 31 October in order to avoid the late season high flows. In all cases, appropriate measures will be taken to control downstream turbidity caused by the project.

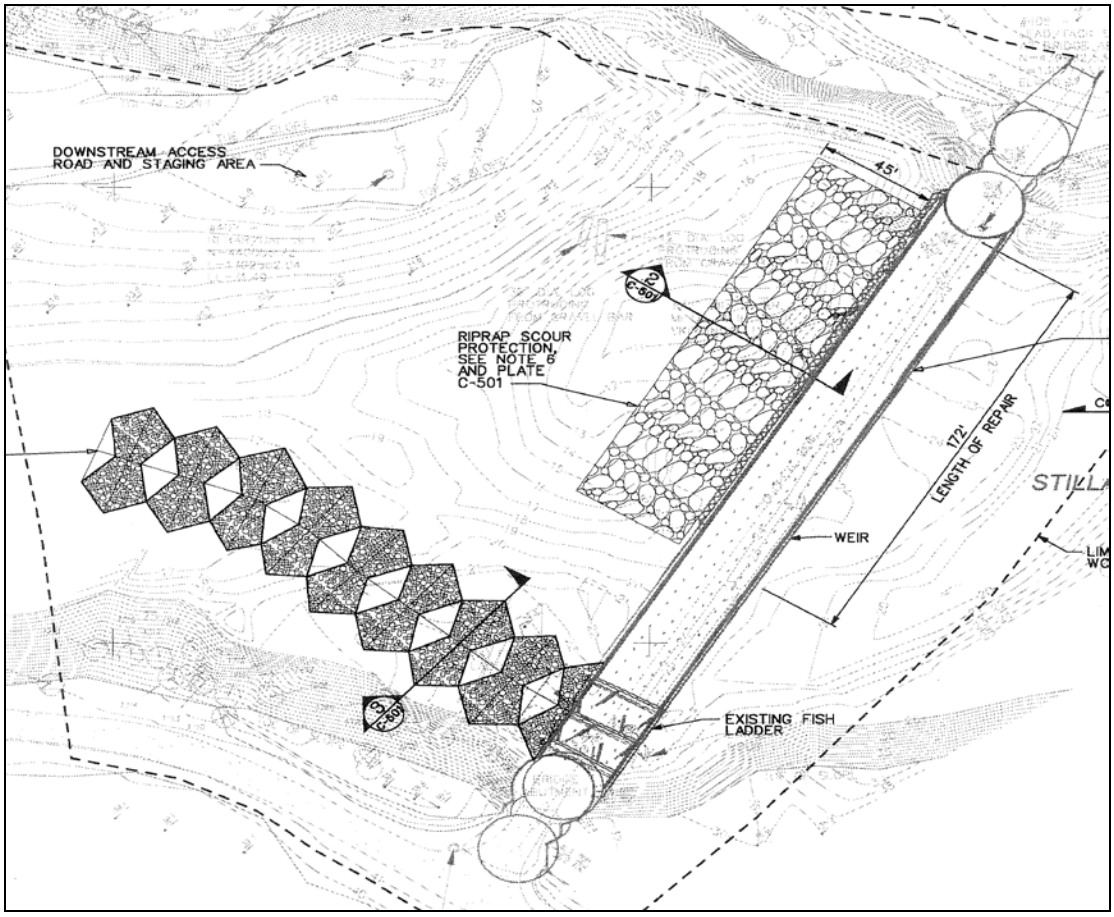

Figure 1-3. Cook Slough weir showing the new fishway design, and scour protection riprap blanket placement.

3.1.3. Riprap scour protection
The downstream scour hole will be filled with approximately 1,400 square feet of class II riprap (16 inch diameter rock) tapered from approximately 3 -8 feet in depth. The riprap blanket will be sloped up toward the downstream sheet pile side of the weir wall to provide extra structural stability. Filling in the scour hole will eliminate the distracting effect of the deep plunge pool and should reduce fish strandings by focusing fish on the re-worked fishway. This work would be accomplished behind the cofferdam and in the dry.

3.1.4. Access Road.
An existing right bank gravel road will be used for primary site access. Heavy equipment access to the weir face and fishway areas will be via existing right bank gravel bar and inside of the cofferdam berm. Some additional stabilization will be provided at the gravel bar and access road. Left bank access, if needed, would be via existing gravel road. These areas will be restored to pre-project conditions upon project completion as much as possible.

The Corps utilizes the below best management practices (BMPs) when applicable, as well as recommendations received from US Fish and Wildlife Service, National Marine Fisheries Service, and the State of Washington Department of Ecology to minimize project impacts:

General
- Equipment that will be used near the water will be cleaned prior to construction
- Work will be conducted during a period of low flow
- Refueling will occur at least 500 feet away from the river bank
- Construction equipment will be regularly checked for drips or leaks
- At least one fuel spill kit with absorbent pads will be onsite at all times

Sediment Control
- The Construction Supervisor is responsible for implementing whatever turbidity control measures are needed to ensure the turbidity mixing zone does not exceed the standards contained in *Water Quality Standards for Surface Waters of the State of Washington* (173-201A WAC)
- Turbidity will be periodically monitored
- Equipment that will be used near the water will be cleaned prior to construction
- Continuous visual inspections will be made by the Construction Supervisor to ensure compliance
- If the mixing zone exceeds the 173-201A WAC standards, the Construction Supervisor will modify construction methodologies in order to meet the standards
- If the 173-201A WAC standards cannot be maintained, the Construction Supervisor will halt the construction activities causing the discharge until an alternative plan can be developed in conjunction with the Corps and/or agencies
- The use of silt fencing or other sediment control devices will be implemented as required by the design. As site conditions change (i.e. rain) implementation of other devices may be necessary.

4. Affected Environment

4.1. Climate and Geology.

The Stillaguamish Basin's climate is typically maritime, with cool wet winters and mild summers. Average rainfall ranges from 30 inches in the western lowlands to over 140 inches in the forested eastern region. Approximately 75% of the basin's precipitation falls between October and March. At elevations greater than 3000 feet, much of this precipitation falls as snow. Major winter and spring flooding can occur when abrupt warming results in rain-on-snow events. Spring snowmelt runoff generally peaks in May. The lowest stream flows occur during dry summer months, typically July through September.

The Stillaguamish Basin, like other river basins arising in the Cascade Range along Puget Sound, has been shaped by a number of geologic processes and events. The two major geologic processes along the Pacific Northwest Coast are the movement of tectonic plates, which is manifested by seismic activity and volcanism, and glaciation. The Cascade Mountain Range is the result of several periods of tectonic uplift and volcanic eruptions. High volcanic peaks such as Mount Rainier, Mount St. Helens, and Mount Baker continue to build in modern times (Kruckeberg 1991). Throughout much of the Quaternary Period, the basin underwent continental glaciation. The ice was typically several thousand feet thick and caused tremendous scouring and compaction of the volcanic material. Each advance of the ice left behind lateral moraines of unconsolidated materials and compacted till from underneath the ice. The Stillaguamish Basin is composed of various lithologies that include Jurassic Period metamorphic rock in the western portion, and Tertiary Period sedimentary and volcanic rock in the east. The most recent period of Washington's glaciation, the Vashon Stage, occurred approximately 15,000 years ago. During this period, a mile-thick cordilleran ice sheet extended just south of the present-day city of Olympia. It completely retreated approximately 13,000 years ago, and left behind the deposits of gravels and compacted till material seen today in most soils and surface formations (Kruckeberg 1991). Ice dams formed glacial lakes in many of the river valleys and left behind lacustrine silts and clay in the lower elevation valleys. Other surficial deposits include talus (rockfall) and alluvial and/or debris fans at mouths of tributary valleys. These glacial-lacustrine clays and silts have been the main source of the significant sediment production of the basin.

4.2. Water Quality

Section 303(d) of the 1972 Clean Water Act (CWA) requires the U.S. Environmental Protection Agency, or a designated authority, to identify the polluted water bodies of the United States and to develop plans to clean them up. In Washington State, the Department of Ecology has this responsibility. Water bodies that do not meet federal or EPA-approved state water quality standards are initially put on the "303(d) list" of impaired waters.

4.2.1. Water Temperature

Both the project area and nearby Pilchuck Creek have been placed on the 303(d) list because of exceedances of the temperature standard. Water temperatures have been recorded greater than 17.5^{o} C during the hot summer months, which exceeds the Washington State criteria (173-201A WAC). Significant reductions of large vegetation in riparian areas in conjunction with lower flows in warmer months are likely causes of the increased temperatures.

4.2.2. Turbidity and suspended sediments

The Stillaguamish has a naturally heavy sediment load because of the inherent instability of the glacial lacustrine sediments. Sediment is one of the two most prevalent non-point source pollutants in the watershed, with the main contributors being forest practices, agricultural practices, and development and urban runoff. Landslides associated with forestry are a source of especially large amounts of sediment. The vast majority of these slides are the direct result of logging roads and clearcuts in the upper basins. Peak flows, which have increased in frequency and intensity in the last 20 years, exacerbate sediment problems.

4.2.3. Chemistry

The Washington State Department of Ecology has listed the Stillaguamish River basin under Section 303(d) of the federal Clean Water Act as not meeting water quality standards for fecal coliform bacteria, dissolved oxygen, pH, arsenic, ammonia, lead, copper, and nickel. Water samples collected in Port Susan and at many places throughout the Stillaguamish River watershed have concentrations of fecal coliform bacteria that exceed state water quality standards. This means that shellfish cannot be harvested commercially from Port Susan, and some reaches of the river may not be clean enough for swimming. Another indicator of degraded water quality is the amount of dissolved oxygen in the water. At several locations in the watershed, during times of warm weather and late summer low flows there is not enough dissolved oxygen for healthy stream life. Non-point source pollution is the primary source of contamination for the lower basin, and results from agricultural practices, urbanization, road building, and timber harvesting.

4.3. Hydraulics and Hydrology

Runoff patterns have been fundamentally altered in many portions of the basin by agricultural activities, urbanization, road building, near-eradication of beaver populations, and timber harvesting. All of these activities tend to change water infiltration and storage within the watershed such that high flows become flashier, and low flow conditions are exacerbated. Widespread logging, particularly in the headwaters, appears to have contributed to more severe effects of rain-on-snow events that have repercussions throughout the channel systems and floodplains of the basin. Flood events that once scoured the river and inundated the adjacent flood plain no longer occur. The lower main stem contains considerable areas reserved for agricultural purposes, with some urbanization, causing moderate drainage network extension and increased peak flows. The Cook Slough weir is a gradient control weir designed to keep adequate summer flows in both the Stillaguamish main stem and Cook Slough.

4.4. Vegetation

The project area's natural vegetation is characterized by an overstory of red alder (*Alnus rubra*), vine and bigleaf maples (*Acer spp*.), black cottonwood (*Populus trichocarpa*), western red cedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), and Douglas fir (*Pseudotsuga spp*.). Many shrubs are present including Himalayan blackberry (*Rubus armeniacus*), wild rose (*Rosa acicularis*), snowberry (*Symphoricarpos albus*), huckleberry (*Vaccinium spp*), Oregon grape (*Mahonia aquifolium*), and willow (*Salix spp*). The understory includes salal (*Gaultheria ssp.),* devil's club (*Oplopanax horridus*) and various mosses, ferns and grasses. The natural riparian vegetation has been greatly altered and generally reduced to a discontinuous, narrow band between the river and farmland. At the project location, the vegetation is frequently brushed and consists mainly of mixed non-native grasses, Himalayan blackberries, and small cottonwoods, alders, or willows.

4.5. Wetlands

Habitat in the lower Stillaguamish River Basin historically consisted of extensive salt water and brackish marsh, freshwater wetlands, and riparian habitats. In intertidal areas, bullrush (*Scirpus maritimus*), Lyngby's sedge (*Carex lyngbyei*) and seaside arrowgrass (*Triglochin maritimum*) dominated (Bortleson 1980). Just beyond the extent of tidal inundation, the valley floor was largely comprised of groves of Sitka spruce and Western red cedar. Many of the basin's emergent and forested wetlands have been converted into agricultural lands or urbanized. This occurred through the placement of fill, the building dikes and levees, and the construction of drains, ditches and other methods to remove or depress surface and ground water. A reconnaissance survey of the project area found wetland conditions absent from the upstream and downstream area of the weir.

4.6. Aquatic Resources

The Stillaguamish watershed supports five species of Pacific salmon: chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), pink (*O. gorbuscha*), chum (*O. keta*), and a small population of sockeye (*O. nerka*). Two species of anadromous trout, steelhead (*O. mykiss*) and searun cutthroat (*O. clarki clarki*), two species of native char, bull trout (*Salvelinus confluentus*) and Dolly Varden (*S. malma*), and several noncommercial resident species are also present in the Basin. Three of these species are listed under the Endangered Species Act. Chinook, steelhead, and bull trout are listed as threatened. Historically the Stillaguamish basin acted as a series of interconnected habitats that supplied all of the life history needs of these fish. The once large estuary, with its blind sloughs and off channel habitats, provided excellent rearing areas. The extensive well buffered, cool, stream system in the upper watershed contained all the channel attributes that salmon and other cold water species require. The numbers of salmon and trout formerly associated with the Stillaguamish is not well chronicled. There are only anecdotal references and the fact that several Native Americans resided in close proximity to their traditional harvest areas and there were many such villages that used fish traps along the lower part of the river (Lane 1973). One report estimated that historic coho production alone accounted for 1.5 to 2.5 million smolts per year (Pess et al. 1999). The Stillaguamish supports both wild and hatchery stocks. Various State and

Tribal hatcheries have supplemented the wild runs of summer chinook, chum, and coho since 1939.

Two species of native char are present in the Stillaguamish Basin, bull trout and Dolly Varden. Although sometimes anadromous, it is likely that the majority of Stillaguamish char are resident. Some hybridization between Dolly Varden and bull trout is likely due to habitat overlap within the basin. Spawning occurs primarily in the headwaters of the North and South Forks. Resident non-native char, such as the brook trout (*Salvelinus fontinalis*), are present in many upper-watershed lakes. Native resident trout spawn and rear in almost all basin stream and lake waters. Rainbow and cutthroat trout occur throughout the main stem, and the North and South Forks. Some stocking of cutthroat and rainbow trout has occurred throughout the basin. Other resident fishes found in the Stillaguamish Basin include large-scale sucker (*Catostomus macrocheilus*); torrent, coast range, shorthead, and prickly sculpins (*Cottus* spp); pacific, river and western brook lamprey (*Lampetra* spp.); peamouth (*Mylocheilus caurinus*); three-spine stickleback (*Gasterosteus aculeatus*); mountain whitefish (*Prosopium williamsoni*); speckled dace (*Rhinichthys osculus*); and redside shiner (*Richardsoni balteatus*). Exotic species within the basin likely include the largemouth and smallmouth bass (*Micropterus* spp.), yellow perch (*Perca flavescens*), and brown bullhead (*Ictalurus nebulosus*).

4.7. Terrestrial Resources

This section is adapted from the Final Environmental Assessment for the Stillaguamish River Ecosystem Restoration Puget Sound and Adjacent Waters Authority, Snohomish County, Washington, November 2000 (USACE 2000). Historically, the extensive stands of mature forest in the Stillaguamish Basin supported many species of wildlife, including those predators with large home range requirements, such as the grizzly bear (*Ursus chelan*), black bear (*Euarctos americanus*), gray wolf (*Canis lupus*), and cougar (*Felis concolor*). Other mammals found throughout the basin included Roosevelt elk (*Cervus elaphus*), black-tailed deer (*Odocoileus hemionus columbianus*), beaver (*Castor canadensis*), California wolverine (*Gulo gulo*), Townsend's bat (*Corynorhinus townsendii*) and small mammals such as Townsend chipmunk (*Eutamias townsendi*), martin (*Martes americana*), chickaree (*Tamiasciurus douglasi*), redback voles (*Clethrionomys gapperi*) and deer mice (*Peromyscus maniculatus*). Beaver were important in creating complex systems of pools and wetlands in the smaller tributaries and back channels. Avifauna historically associated with the Basin's forest stands included bald eagles (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), marbled murrelets (*Brachyramphus marmoratus*), and other species of passerine birds and raptors. The marshlands and eelgrass beds of the Stillaguamish estuary supported a great variety of shorebirds and waterfowl. The estuary is on the Pacific flyway and provided important resting and feeding habitat for migratory birds such as black brant (*Branta nigricans*) and harlequin duck (*Histrionicus istrionicus*). It also provided overwintering habitat for northern migrant species such as snow geese (*Chen hyperborea*) and tundra swan (*Cygnus columbianus*). In addition, the mild winters allowed for large resident populations of some species to stay in and around the estuary all year. Resident species included the great blue heron (*Ardea herodias*), pintail duck (*Anas acuta*) and gadwall (*Anas strepera*). Common furbearers, usually associated with the riparian areas, were

mink (*Mustela vison*), muskrat (*Ondatra zibethica*), weasels (*Mustela* spp.), raccoon (*Procyon lotor*), and snowshoe hare (*Lepus americanus*). Several amphibians lived in the basin, including Cascade frogs (*Rana cascadae*) and red-legged frogs (*R. aurora*). Several wildlife species are no longer present within the Stillaguamish Basin, or their populations are low. However, species that are more commonly in edge habitats are now more abundant. Species that have been eliminated are the gray wolf, grizzly bear, and sea otter. Species whose populations have been diminished include the marbled murrelet, martin, California wolverine, Townsend's bat and beaver. Many of these species require a large home range and are typically associated with large patches of mature forests. In general, much of the species diversity associated with the historic conditions in the basin remain; what has changed over time is the abundance and distribution of these species.

4.8. Cultural Resources

This section has been adapted from USACE (2000). Use of the Stillaguamish River Basin by humans is believed to have occurred soon after the retreat of the Pleistocene glaciers around 12,000 years ago. The earliest regional evidence of human occupation consists of a small number of fluted Clovis or Clovis-like projectile points characteristic of the period between 12,000-11,000 years ago, and Olcott sites, thought to represent a period of occupation prior to development of marine-oriented Northwest cultures. After about 5,000 years ago, larger populations organized in more complex ways exploited a wide range of locally available resources, including shellfish, salmon, small mammals, berries, roots, and bulbs. Shell middens are numerous on saltwater shorelines; the apparent lack of earlier shell midden sites is due to inundation of earlier shoreline sites by rising sea levels, which did not attain near-modern levels until c. 5,000 years ago. Ground stone, bone, antler, and shell tools, associated with fishing, marine mammal hunting, and plant processing, became increasingly more common and diversified. Emphasis on salmon exploitation grew over time as large-scale fishing, processing, and storage technologies were developed. Evidence of a well-developed massive woodworking technology, cedar plank houses, and semi-permanent villages appears in the archaeological record by c. 3,500 years ago. Materials imported from east of the mountains to the project area for lithic tool manufacture evidence increased contact and trade with groups in eastern Washington. Resource specialization, increased population, improved food storage methods, and establishments of larger villages were all signs of a more sedentary lifestyle after approximately 2,500 years ago. Full scale development of marine-oriented cultures on the coast and inland hunting, gathering, and riverine fishing traditions as represented in the ethnographic record is apparent after c. 2,500 years ago. A wide variety of ground and chipped stone and bone artifacts made of both local and imported materials occur, representing complex and diversified technologies for fishing and sea mammal hunting, processing, and storage. Large-scale woodworking and cedar plank houses occupied by a large semi-sedentary population are also well represented. Wood artifacts, including fishhooks, wedges, cordage, and basketry, have been recovered from sites exhibiting good preservation environments.

4.9. Federally Endangered and Threatened Species

There are several species present in the project area that have some degree of federal protection under the Endangered Species Act (ESA) of 1973. A separate biological

assessment designed to describe and assess affects to these species has been developed and is being evaluated under the Section 7 consultation process by both the US Fish and Wildlife Service and National Marine Fisheries Service. A summary of ESA impacts and determinations is provided in section 5.8.

4.10. Noise and Air Quality

The project area is located in a rural community outside any major urban centers. Residential and industrial noise from transient sources is primarily from Interstate Highway 5 traffic as well as the use of local farm equipment and intermittent residential noise from a few nearby homes.

The Puget Sound region has been an attainment area for carbon monoxide since October 11, 1996. As of May 14, 2001, the Puget Sound Region was classified as attainment area for particulate matter (PM_{10}) pollution. Thus, the project area is within attainment areas for all criteria pollutants. The reductions in PM_{10} pollution that led to attainment status are a result largely of changes enacted by the legislature in the 1991 Clean Air Washington Act. Those changes tightened up emission standards for wood stoves and fireplaces, prohibited outdoor burning in urban areas, and authorized an inspection program for diesel trucks and buses, which was implemented by the Department of Ecology. In addition, a partnership between the Clean Air Agency and the Northwest Hearth Products Association encouraged people to trade out their old wood stoves and fireplaces for cleaner burning, EPA-certified models of natural gas, propane, and pellet stoves.

4.11. Demographics and Socioeconomics

As of the census of 2000, there were 606,024 people, 224,852 households, and 157,846 families residing in Snohomish County. The population density was 290 people per square mile (112/km²). The racial makeup of the county was 85.63% White, 1.67% Black or African American, 1.36% Native American, 5.78% Asian, 0.28% Pacific Islander, 1.92% from other races. There were 224,852 households out of which 37.30% had children under the age of 18 living with them, 56% were married couples living together, 9.8% had a female householder with no husband present, and 29.8% were non-families. The average household size was 2.65 and the average family size was 3.13. The median age was 35 years. The median income for a household in the county was $53,060, and the median income for a family was $60,726. The per capita income for the county was $23,417. About 4.9% of families and 6.9% of the population were below the poverty line.

5. Environmental Effects of the Proposed Project

5.1. Climate and Geology

Construction activities associated with the proposed project will result in both native soils and fill material being disturbed and compacted by heavy machinery. Soil disturbances are required for access road construction, scour protection, and cofferdam construction in support of the weir repair. Non-native rock and fill used for the cofferdams will be

removed when construction is complete, and all disturbed lands will be restored and non-native rock removed or reused elsewhere. Geology and soils will not be appreciably altered.

5.1.1. Sediments

Construction techniques designed to manage fine material releases from construction activities will be in place, as will methods to control erosion and non-point pollution. Still, in-water work may result in short-term fine material releases as a result of riverbed disturbances.

In-water placement of armor rock and associated fill for cofferdam construction will present an opportunity for non-native materials to enter the stream corridor. Use of armor rock is required to protect the proposed project. High flows represent a significant threat to the project under construction and if not protected will cause delays in completion and extend the period of construction. River flows working on the cofferdam may dislodge armor rock that may not be recovered after construction. The rock will be sized to minimize this loss and maximize safety of personnel and equipment. When the cofferdams are no longer needed, armor rock and any non-native fill materials will be removed from the riverbed to the extent practicable but some rock may be unrecoverable. Lost material is expected to disperse downstream and become isolated components of the rivers' coarse substrate and not represent a reduction in ecological function. Long-term sediment conditions at the project site will remain unchanged.

5.2. Water Quality

5.2.1. General

Water quality and flow in the Stillaguamish River will not be appreciably altered by construction of the proposed project. The project area represents a small area in comparison to the remainder of the watershed reducing any potential for significant water quality or flow stability degradations. The river will continue to transport fine sediment throughout its length. Natural water quality characteristics of the Stillaguamish River (turbidity) will further moderate the potential for adverse short-term construction impacts.

5.2.2. Temperature.

Summer water temperatures of the Stillaguamish River are considered elevated over background and can exceed 17.5°C at the project area. The proposed action will not have any measurable effect in either degrading or improving the river temperature regime. A slight improvement may be seen in the area immediately downstream of the weir after removal of the scour pool. Minimum flows will be maintained downstream in Cook Slough throughout the duration of the project.

5.2.3. Turbidity and Suspended Sediments

There will be some construction impacts on water quality at several stages during the construction process. Pulses of short-term turbidity are possible following release of stored sediments as part of cofferdam construction. In extreme cases, releases of this sort

can lower dissolved oxygen concentrations for short durations particularly in areas of slow poorly mixed waters. The nature of the material releases is not expected to represent a measurable degradation of dissolved oxygen or other important water quality parameters. Short-term releases of clean materials should not result in higher temperatures, increased biological oxygen demand (BOD) or releases of contaminants such that dissolved oxygen will be notably degraded. This is particularly true in the turbulent Stillaguamish River, which remains well mixed and oxygenated despite high turbidity levels.

Because of the naturally high turbidity levels found in the Stillaguamish River within the construction windows, it may be difficult to isolate project related turbidity from natural sources. Water quality objectives will be monitored in the project area and downstream during construction to confirm that water quality impacts are minimal. A monitoring plan is included in the project.

5.2.4. Chemistry

Existing chemical characteristics of concern on the Stillaguamish River will not be influenced by the construction or operation of the proposed project. Elevated pH levels in the Stillaguamish River are related to increased periphyton production associated with degraded flow conditions. Construction of the proposed project will not alter the volume of water through the Stillaguamish River or affect flow related impacts to water quality.

Fecal coliform is considered a non-point pollution concern caused by urban growth, and agriculture neither of which will be influenced by the proposed project. There are no known contaminated materials in the project construction area. No contaminated materials will be imported as part of construction.

The proposed project will require placement of concrete as part of the weir repair. The area of concrete placement will be behind the cofferdam and hydraulically isolated from the river making any entrance to the river nearly impossible. The largest concern over uncured concrete entering the freshwater system is that of pH. If uncured concrete is poured in sufficient volumes into an aquatic system, it can cause a lowering of pH and a subsequent increase in the uptake availability to some heavy metals. This process is most notable in slow water systems where the accumulation of curing effects can cause harm to fish and aquatic benthos. This effect is also related to surface area making large unconfined placements most likely to cause concern. Since no unconfined in-water concrete placements are anticipated it is unlikely that the proposed project will cause notable changes in pH to the degree that water quality standards would be violated or physiological harm would occur to aquatic organisms.

5.2.5. Land Use and Potential Pollution Sources

The proposed project will not alter land use or pollution sources except for the temporary water quality issues discussed in previous paragraphs. There are no known sources of existing hazardous or toxic waste sources in the project area.

5.3. Hydraulics And Hydrology

The hydraulic impacts of the proposed project were compared against those of the existing condition. The weir repair does not alter the function of the existing weir in any way with the exception of the re-worked fishway and the elimination of the low flow notch.

5.4. Vegetation

The upland portion of the project area is actively farmed agricultural lands. The vegetation at the site is frequently brushed and consists largely of mixed non-native grasses and Himalayan blackberries, and small cottonwoods and alders or willow. The existing access roads will be used to the maximum extent possible. Some vegetation will have to be removed to facilitate heavy equipment access to the weir site. Riparian and upland vegetation will be avoided wherever possible. Native vegetative plantings are anticipated in areas disturbed by construction activities.

5.5. Wetlands

There are no wetlands present in the project area or immediate vicinity. No wetlands will be impacted by the weir repair project.

5.6. Aquatic Resources

5.6.1. Fish Resources

Environmental baseline and project effects have been analyzed by evaluating pre and post construction conditions against aquatic functional assessments prescribed by NMFS (1996) and USFWS (1999).

Short-Term Construction Impacts

Summary- Preparation of the construction site holds the potential for short-term impacts to fish particularly through an increase in delivery of fine sediment. This impact would be generated by a number of activities but particularly by construction of temporary access roads as well as by operating equipment around and in the riverbed. These releases will be minimized by onsite sediment control measures as prescribed by existing shoreline guidelines and state regulations however some material may still enter the river. Another short-term impact will be the construction of a cofferdam to facilitate concrete repairs.

Mechanisms for Impact- Increased fine sediment delivery resulting in elevated total dissolved solids (TDS) within a river or lake can cause respiratory difficulties for adult and juvenile salmonids at extremely high volumes or for sustained periods. TDS are distinct from turbidity in that TDS represent actual particulate matter within the water body rather than a change in transparency or color. If sustained, elevated fine sediment delivery can also cause siltation within the bed of a river where salmon redds are located and dependent upon adequate upwelling of flow through gravels though grain sizes implicated in redd loss are larger than those typically considered TDS.

Project Conclusions- Heavy loads of total dissolved solids occur naturally in the Stillaguamish River although they vary with time of year along with turbidity. During

winter when salmon returns are low, TDS and turbidity drop making construction related releases more evident unless high flows cause TDS to elevate. During summer low flow, TDS is also low due to reduced inflows. Releases during these times could coincide with fish returns between spring and early fall (March to October). Adherence to existing erosion control measures and careful attention to cofferdam construction will minimize releases associated with the project. Onsite monitoring of construction releases and for maintenance of sediment control features will be necessary to ensure excessive releases with the potential to affect aquatic resources do not occur. A turbidity monitoring plan as required by Washington Department of Ecology will be implemented. Long term project effects include dependable fish passage during both high and low flows, and the elimination of fish strandings in the current scour hole at the weir face.

5.7. Terrestrial Resources

Effects to wildlife, if any, will likely be temporary in nature and occur primarily during construction through noise and visual disturbance. Wildlife may temporarily be displaced during construction, but given their mobility and the available surrounding habitat, the overall effect will be minimal. In addition, the increase in fish passage success will provide more adult fish upstream benefiting numerous species. The level of human disturbance at the project location will remain similar to the baseline condition. Overall effects, both adverse and favorable, will be insignificant.

5.8. Federally Threatened And Endangered Species

5.8.1. Chinook Salmon

Chinook salmon are one of six salmon species belonging to the genus *Oncorhynchus*. They can reach 36 inches in length and weigh up to 22 lbs. All Chinook salmon require cold, freshwater streams that contain gravel beds suitable for reproduction. Spawning occurs from November to January, with the eggs hatching the following spring. After emerging, Chinook fry seek shallow, nearshore habitat with low water velocities, and eventually move to progressively deeper, faster water as they grow. Fry will remain in streams for up to a year feeding on aquatic insects, zooplankton and small fish before they move seaward the following spring. Most Chinook return to spawn after spending 2-4 years maturing in the open ocean. They typically return to their native streams to spawn. Chinook salmon utilize freshwater, nearshore, and offshore environments during their lifecycles. Migrating adults on their way to spawn, follow shoreline environments and may congregate around the mouth of spawning streams prior to entry. Juvenile Chinook rear exclusively in the estuarine and pelagic areas of Puget Sound. Initially, juveniles tend to follow shorelines associated with structure, then as they get larger, they move into deeper water habitats. Most Chinook complete their out-migration to the Pacific Ocean in a very short time however, some may remain in Puget Sound for a year or more. Factors for Chinook decline include degradation and loss of habitat, artificial propagation, disease and predation, and harvest (NMFS 2008). Two distinct stocks of Chinook salmon, summer and fall, occur within a single population in the Stillaguamish River near the project site. The summer and fall stocks enter the Stillaguamish River beginning in mid-July with spawning from mid-August through October. Juvenile fall Chinook rear for approximately 3 months before migrating to the ocean. Juvenile

summer Chinook may rear up to a year before migrating to the ocean. Out-migration for both stocks occurs between mid-March and June. Status of these populations were classified as "depressed" in the 1993 Salmon and Steelhead Stock Inventory (SASSI) effort (Stillaguamish Technical Advisory Group, 2000).

The proposed action provides needed repairs to an existing structure. The project also uses this action as an opportunity to improve the fishway, greatly enhancing fish passage at the site. The short term adverse effects due to construction are somewhat offset by hydraulically isolating the repair area, and construction timing, as well as, the enhanced migration provided by the improved fishway design.

The CSW has been repaired and modified several times during the 1980's and 1990's in an effort to improve fish passage and maintain structural integrity. In 1988, the Corps created a low-flow notch in the center of the weir and constructed a fishway at the left bank side of the structure. Modifications to enhance the performance of the existing fishway were made in the mid-1990's. Baffles were added and a plunge pool was created, however fish strandings at low flows are still a potential problem. The reworked fishway provided by this project will provide dependable, up-stream fish passage, especially during low flows. The pool and chute fishway would act as a pool and weir fishway at low flow, when flow plunges and dissipates in each pool. At high flow, the fishway performs as a hybrid between a pool and a weir, as well as a roughened chute structure, creating a stream flow condition down the center of the fishway. The fishway is designed to create a significant amount of attraction flow, and to function over a wide range of flows. The removal of the existing low flow notch, and filling of the scour hole will also direct a greater attractant flow through the fishway, especially during low flows.

Project short term construction impacts include sudden movements, vibrations and noises from heavy equipment operation, and driving of sheet piles, as well as increased local turbidity. The weir repair construction will be accomplished behind a berm cofferdam and the area will be hydraulically isolated from the river. The fishway re-work will be accomplished in the wet as much as possible, but may require partial de-watering to control downstream turbidity. Sediment levels will likely rise in the action area as a result of the construction of the access road and coffer dam berm. Concrete repairs to the weir and in stream excavation and placement of riprap in the downstream scour hole will be done behind the coffer dam and in the dry. This area will be hydraulically isolated from the river, greatly minimizing any downstream turbidity. Sediment and environmental monitoring will be conducted throughout the construction period. Primarily due to the possible handling of fish during dewatering the proposed action *is likely to adversely affect* Chinook salmon. The project *may affect, but is not likely to adversely affect* designated critical habitat for the Puget Sound Chinook salmon ESU in the action area.

5.8.2. Bull Trout

Bull trout are native char in the family Salmonidae. In 1978, they were differentiated from Dolly Varden as a separate species (Cavender, 1978) with further support from investigations by Haas and McPhail (1991). Bull trout reach sexual maturity between

four and seven years of age and are known to live as long as twelve years. Spawning usually takes place in the fall during September and October and occurs primarily at night. Bull trout characteristically occupy high quality habitat, often in less disturbed portions of a drainage in cold water and near headwaters. Necessary key habitat features include channel stability, clean spawning substrate, abundant and complex cover, cold temperatures, and lack of barriers which inhibit movement and habitat connectivity (Reiman and McIntyre, 1993).

Bull trout exhibit four types of life history strategies. Three strategies revolve around freshwater including the adfluvial form, which migrate between lakes and streams; the fluvial form, which migrate within river systems; and the resident form, which are non-migratory. The fourth strategy, anadromy, occurs when the fish spawn in freshwater after spending a portion of their life in the ocean (Goetz 1989).

The Coastal/Puget Sound bull trout population was listed under the Endangered Species Act as a federally threatened species in October 1999. Their populations have declined through much of their range with some local populations extinction, and many other stocks being isolated and potentially at risk (Rieman and McIntyre 1993). Throughout its range, the bull trout has been threatened by the combined effects of habitat degradation, fragmentation, dewatering, road construction, mining, agriculture, the blockage of migratory corridors, poor water quality, entrainment, and exotic species introductions. Exploitation, poaching and incidental mortality of bull trout during other targeted fisheries are additional threats (NMFS 2008). Bull trout are known to exist in the Stillaguamish River including the vicinity of the CSW, although the habitat is less than ideal in the immediate vicinity. Four local populations have been identified in the Stillaguamish core area: 1) Upper Deer Creek, 2) North Fork Stillaguamish River, 3) South Fork Stillaguamish, and 4) Canyon Creek NMFS 2008). The bull trout population in the Stillaguamish River basin is estimated at fewer than 1,000 adults (NMFS 2008). Although no known systematic surveys have been completed, most bull trout are thought to reside in Canyon Creek or the upper South Fork, they have also been found in Boulder, Squire and Deer Creek (WDFW 1998). However, bull trout may be present in the project area. Conservation measures will be applied to this project and will likely reduce the magnitude of potentially adverse affects. For reasons discussed above for Chinook salmon, the proposed action *is likely to adversely affect* bull trout. The project *may affect, but is not likely to adversely affect* designated critical habitat for the Puget Sound bull trout.

5.8.3. Steelhead

Steelhead are one of six salmon species in the genus Oncorhynchus and exhibit perhaps the most complex suite of life history traits of any species of Pacific salmonids. They can reach up to 45 inches in length and weigh up to 40 pounds, although the average is 5 to 12 pounds and 18.5 to 25.5 inches. Biologically, steelhead can be divided into two basic reproductive ecotypes; the stream-maturing type or summer steelhead that enters fresh water in a sexually immature condition and requires several months to mature and spawn, and the ocean-maturing type or winter steelhead that enters fresh water with well-developed gonads and spawns shortly thereafter. In the Pacific Northwest, steelhead that

enter fresh water between May and October are considered summer steelhead, and steelhead that enter fresh water between November and April are considered winter steelhead. The most widespread run type of steelhead is the winter steelhead. Non-anadromous forms of the species are usually called rainbow trout. In contrast to other salmon, spawning steelhead feed on salmon eggs, insects and plants. Spawning occurs from January through June, with the eggs hatching in about 50 days. Steelhead young remain in streams from one to three years feeding on aquatic insects, zooplankton, small fish, and crab larvae before moving out to sea. After one to four years in the ocean, most returning steelhead spawn in the same area from which they hatched. Some steelhead, primarily females, do not die after spawning (iteroparity) and may spawn again. Steelhead utilize freshwater, nearshore and offshore environments during their lifecycles. They spawn in the same environment as Chinook salmon. Adequate stream cover is important to fry survival, as is high dissolved oxygen levels. Mortality is especially high during freshwater life stages and is often a result of poor forest and agricultural management practices that lead to siltation. Siltation in turn, may degrade spawning beds or smother eggs. The time spent in estuarine habitat is critical to the development of the species and their ability to survive in the offshore environment. Factors for decline of steelhead include degradation and loss of habitat, artificial propagation, disease and predation, and harvest. The presence of man-made obstacles that block access to important spawning areas is also a factor of decline (NMFS 2008). Steelhead populations identified in the Stillaguamish watershed include Canyon Creek Summer, South Fork Stillaguamish Summer, Deer Creek Summer, and Stillaguamish Winter. Spawning steelhead are expected to occur in the project area between the months of May and October for the summer run, and November through June for the winter run, while juvenile steelhead usually out-migrate from April to June.

Steelhead are present in the project area. Conservation measures will be applied to this project and likely reduce the magnitude of potentially adverse effects. None of the factors of decline noted by NMFS (2008) for the Stillaguamish River are affected by the project. Additionally, the redesigned fishway will enhance fish passage and migration, especially during the critical low flow events. For the reasons discussed above for Chinook salmon, the proposed action *is likely to adversely affect* steelhead in the action area. Critical habitat has not been designated for steelhead.

5.8.4. Marbled Murrelet

The project site is about 10 straight-line miles from Puget Sound. The project area is actively farmed agricultural lands and lacks any coniferous trees of adequate size to support nesting. Because the marbled murrelet almost exclusively feeds in ocean waters and nest in old growth forests (Strachan, et al. 1995), potential effects from the repair activities at the project area will have no effect on their feeding or nesting behavior. Also, because of the project's proximity to Interstate 5 and other heavily traveled roads, noise from construction operations is not expected to adversely impact the birds by diverting them away from their ocean feeding areas or any interim resting areas. In addition, marbled murrelets, based on their movement patterns of early morning and late evening (Sealy and Carter 1984), are not likely to be present in the project area during

normal construction operations. The project will have *no effect* on the marbled murrelet or its designated critical habitat.

5.9. Archaeological And Historical Cultural Resources

Construction of the Cook Slough weir was completed on 25 March 1937 as part of a Washington State Works Progress Administration (WPA) ongoing project (OP 65-93-897/ WP 627). The Corps has determined that the proposed project is an undertaking of the type that could affect historic properties and must comply with the requirements of Section 106, as amended through 2004, of the National Historic Preservation Act of 1966, as amended through 2000 (NHPA) (16 USC 470). Section 106 requires that Federal agencies identify and assess the effects of Federal undertakings on historic properties and to consult with others to find acceptable ways to resolve adverse effects. Properties protected under Section 106 are those that are listed or are eligible for listing in the National Register of Historic Places (NRHP). Eligible properties must generally be at least 50 years old, possess integrity of physical characteristics, and meet at least one of four criteria for significance. Regulations implementing Section 106 (36 CFR Part 800) encourage maximum coordination with the environmental review process required by the National Environmental Policy Act (NEPA) and with other statutes. The Washington State Archaeological Sites and Resources Act (RCW 27.53) may also apply.

To comply with Section 106 of the NHPA, a Corps archaeologist and an architectural historian conducted a cultural resources reconnaissance survey of the proposed project's Area of Potential Effects (APE). Cultural resources studies conducted for the project included: an examination of the archaeological and historic site records at the Office of Archaeology and Historic Preservation (OAHP), a search of the OAHP electronic historic sites inventory database, other background and archival research, a pedestrian survey of the project area, and an evaluation of the significance of the weir. No properties listed in the National Register and no sites or structures listed in the state inventory were found to have been previously recorded within the APE. The Corps sent letters to the Stillaguamish Tribe, and the Tulalip Tribe soliciting any knowledge or concerns or religious significance for the APE (Appendix C). A Corps Archeologist will provide on site monitoring during ground disturbance activities.

5.10. Noise and Air Quality

Noise and air quality impacts in the immediate area of the construction may occur but will be minor and temporary. Noise and air quality disturbances from the construction, primarily from construction equipment, and driving of sheet piles will not occur at levels considered a significant impact to fish and wildlife resources. The construction noise and air quality disturbances will not cause direct mortality, latent mortality or other physiological damage. Truck traffic in and around the site will be kept to major roads as much as possible.

None of the action (construction) alternatives are expected to result in significant air quality degradation. During construction, there would be temporary and localized reduction in air quality due to emissions from heavy machinery. Construction vehicles and heavy equipment would generate gasoline and diesel exhaust fumes, carbon dioxide

(CO2), carbon monoxide, nitrogen and sulfur oxides, hydrocarbons, unburned carbon particles and dust on roadways.

Table 1 details total estimated project emissions for specific pollutants as derived from an average of maximum hourly emission rates for each engine size (not types of equipment) as found in the Sacramento Metropolitan Air Quality Management District (2008) roadway construction emissions spreadsheet model. Calculations assumed a worse case scenario of full time operation (10 hrs per day, 6 days per week) of ten 50-horsepower engines, ten 500-horsepower engines, and five 1000-horsepower engines over the 4-month project. In reality, operations may not be continual for all engines.

TABLE 1. ESTIMATED AIR EMISSIONS FOR COOK SLOUGH WEIR REPAIR.

horsepower	pieces	tons CO	tons ROG	tons CO_2	tons NO_x	tons SO_x	tons PM
50	10	1.6	0.7	65.1	0.7	0.01	0.01
500	10	1.8	1.1	623.3	6.3	0.01	0.2
1000	5	7.7	1.9	626.1	8.2	0.01	0.3
total emissions		11.1	3.7	1314.5	15.2	0.03	0.51

CO: carbon monoxide
ROG: reactive organic gases (= VOC: volatile organic compounds), an ozone precursor
CO_2: carbon dioxide
NO_x: nitrogen oxides, an ozone precursor
SO_x: sulfur oxides
PM: particulate matter

In addition, about 15 tons of CO_2 are expected to be generated from construction workers' personal vehicles using gasoline (based on 19.4 pounds CO_2 generated per gallon burned [USEPA 2008], and assuming 10 vehicles getting 20 miles per gallon and making six 40-mile round trips to the site each week for 4 months).

The Corps expects that air quality would meet standards set forth by the Washington Department of Ecology and would not be permanently affected by the project. Worse case scenario estimates indicate that no alternative would exceed the Environmental Protection Agency's (EPA) *de minimis* threshold levels (100 tons/year for carbon monoxide, 100 tons/year for NO_x, and 50 tons/year for ROG/VOCs) (40 CFR 93.153). This project should not affect the implementation of Washington's Clean Air Act implementation plan.

6. Environmental Effects of the No Action Alternative

The no action alternative essentially allows the weir to further deteriorate to complete structural failure. Failure of the grade control weir would stress the bank protection system on the Cook Slough. A complete failure of the weir would change the flow split between Cook Slough and the main channel. Significant aggradation could be expected on the main channel. The reduction in discharge would greatly reduce the ability of the main channel to remain clear of sediment and would also greatly limit fish migration and habitat in the main stem. This alternative would not improve fish passage or adequately

address the scour hole. This could lead to further fish strandings and temperature induced mortalities.

The no action alternative represents the continuation of baseline conditions and the perpetuation of all existing beneficial and adverse effects associated with the weir and its routine maintenance. For most parameters of environmental effect such as, climate and geology, sediment, water quality, land use and potential pollution sources, vegetation, wetlands, terrestrial resources, cultural resources, air and noise; the no action alternative represents no significant perpetuation of adverse or beneficial environmental effects. However, this alternative would eliminate any short term adverse construction impacts associated with the proposed project.

7. Cumulative Effects

The NEPA defines cumulative effects as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions in the project vicinity, regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR §1508.7).

7.1. Corps Stillaguamish River Bank Protection Project.

The Stillaguamish River Bank Protection Project consists of operation and maintenance of 26 bank protection sites on the Stillaguamish River located near the cities of Arlington and Silvana. Sites are located both up and down river from the Cook Slough weir. Previous work conducted on these sites included the placement of riprap to prevent bank erosion and to rebuild toe slopes, the occasional placement of rock barbs or groins to deflect water from the bank's base, and finally the brushing and mowing of vegetation in an effort to maintain emergency access, allow for visual observations and to maintain site integrity. Large woody debris (LWD) is utilized in conjunction with riprap when available.

Operation and maintenance typically occurs on an "as needed" basis with each site receiving maintenance approximately every 2-3 years dependent upon flood conditions and site integrity. Approximately one-third (8) of the 26 sites will be vegetatively managed during any given year. Historically, all vegetation was removed from the sites including trees and shrubs, and then mowed to make visual observations easier, maintain site integrity and to provide access for emergency operations. These operations were deemed necessary and prudent and have since been refined to allow some variance of vegetation to remain on site to increase riparian habitat where it historically did not exist. In-water work of this project adheres to the prescribed construction window in order to avoid threatened or endangered fish migrations and/or spawning periods. In an extremely rare instance, emergency operations may be required in the event of flooding and/or bank failure, where work performed outside the fish window may be unavoidable. In all cases, appropriate measures will be taken to incorporate timing restrictions pertinent to listed species when conducting in-water work.

8. Treaty Rights

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

- The work will not interfere with access to usual and accustomed fishing grounds or with fishing activities or shellfish harvesting;
- The work will not cause the degradation of fish runs and habitat; and
- The work will not impair the Treaty tribes' ability to meet moderate living needs.

9. Environmental Compliance

9.1. National Environmental Policy Act

Section 1500.1(c) and 1508.9(1) of the National Environmental Policy Act of 1969 (as amended) requires federal agencies to “provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact” on actions authorized, funded, or carried out by the federal government to insure such actions adequately address “environmental consequences, and take actions that protect, restore, and enhance the environment." This assessment evaluates environmental consequences from the proposed Cook Slough weir repair on the Stillaguamish River, Washington. A 30 day public notice and comment period was conducted from 11 June to 10 July 2009. One comment was received as documented in Appendix C.

9.2. Endangered Species Act

In accordance with Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed or proposed threatened or endangered species. The potential effects of the project and conservation measures taken to reduce those effects are summarized in 5.10 and are addressed in greater detail in the Biological Assessment (BA) for the project. The BA concluded that due to construction related impacts, involving fish exclusion efforts and possible handling of listed species during site dewatering, and due to the possibility of in water work outside of the construction

timing window, the project is likely to adversely affect Puget Sound (PS) Chinook salmon, PS bull trout, and PS steelhead. The proposed project may affect, but is not likely to adversely affect salmonid critical habitat. The project is expected to have no effect on the marbled murrelet or its critical habitat. The Services agreed with the Corps and further concluded that the proposed action is not likely to jeopardize PS bull trout, and that the proposed action, when added to the baseline condition, and when cumulative effects are considered, will maintain or improve population viability for populations of PS Chinook, and PS steelhead (Appendix B).

9.3. Clean Water Act Compliance

The Clean Water Act (CWA) requires federal agencies to protect waters of the United States. Section 404 of the CWA prohibits the disposal of dredged or fill material into waters of the U.S. unless it can be demonstrated there are no less environmentally damaging practicable alternatives. The Act requires federal agencies to comply with state water quality standards. The Corps will address its responsibilities under the Clean Water Act prior to the start of project construction. A 404(b)(1) evaluation has been prepared and is included as Appendix A. The Corps of Engineers has obtained a CWA Section 401 WQC from the Washington Department of Ecology (Appendix B).

9.4. Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA, 16 USC 661) requires that wildlife conservation receive equal consideration and be coordinated with other features of water resource development projects. This goal is accomplished through Corps funding of USFWS habitat surveys evaluating the likely impacts of proposed actions, which provide recommendations for avoiding or minimizing such impacts. The Corps has initiated discussions with the Services on the proposed project and will continue to work with them during project planning and construction.

9.5. Essential Fish Habitat

In accordance with the Essential Fish Habitat (EFH) requirements of the Magnuson-Stevens Fishery Conservation and Management Act, the Corps has determined that the proposed work would impact approximately 425 linear feet of Cook Slough on the Stillaguamish River, areas which are classified as EFH utilized by Pacific salmon. We have determined that the proposed action would not adversely affect EFH for federally managed fisheries in Washington waters. NMFS concluded that the action results in short-term effects on water quality, rearing, and migration habitat, and has identified the following conservation recommendation to avoid, mitigate or offset the impact of the proposed action on EFH: "The COE should modify and enhance its riparian plantings along the fish way with native trees and shrubs to provide shading and other habitat enhancing functions." The Corps will implement this recommendation.

9.6. National Historic Preservation Act

Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA; 16 USC 470), requires that Federal agencies identify, evaluate and assess the effects of undertakings on sites, buildings, structures, or objects listed in or eligible for listing in the National Register of Historic Places (NRHP). Eligible properties must generally be at

least 50 years old, possess integrity of physical characteristics, and meet at least one of four criteria for significance. Regulations implementing Section 106 (36 CFR Part 800) encourage maximum coordination with the environmental review process required by NEPA and with other statutes. Recently-amended Washington State laws also apply on non-Federal lands, including the Archaeological Sites and Resources Act (RCW 27.53), Indian Graves and Records Act (27.44 RCW) and the Abandoned and Historic Cemeteries and Historic Graves Act (68.60 RCW). The Washington Department of Archaeology and Historic Preservation concurred with the Corps determination of No Historic Properties Affected on April 30, 2009 (Appendix B). A Corps Archeologist will provide on site monitoring during ground disturbance activities.

If, during construction activities, the contractor observes items that might have historical or archeological value, such observations shall be reported immediately to the Contracting Officer, or, if present, the Corps' construction supervisor so that the appropriate authorities may be notified and a determination can be made as to their significance and what, if any, special disposition of the finds should be made. The contractor shall cease all activities that may result in the destruction of these resources and shall prevent his employees from trespassing on, removing, or otherwise damaging such resources.

9.7. Clean Air Act

The Clean Air Act required 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 requires Federal actions to conform to the appropriate SIP. An action that conforms with a SIP is defined as an action that would 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 project area is not located in a non-attainment area, and any adverse impacts to air quality associated with the project would be temporary and localized, so the project should not cause or contribute to any new violation of any standard in the project area.

9.8. Environmental Justice

Executive Order 12898 directs federal agencies to identify and address disproportionately high and adverse human health or environmental effects of agency programs and activities on minority and low-income populations. Essentially the project is a repair of an existing structure. The project has the potential to produce employment opportunities in the area. No tribal resources would be harmed. No adverse effects to minority or low-income populations would result from the implementation of the proposed project.

9.9. Coastal Zone Management Act

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

The Corps conducted a review of the Snohomish County Shoreline Master Program. In accordance with State guidelines, the project area has been designated as "*Rural*," by Snohomish County. The SMA is the State of Washington's application of the CZMA. Based on a thorough review, the Corps has determined that the proposed project is consistent to the maximum extent practicable with enforceable policies of both counties shoreline management programs. The Washington Department of Ecology has concurred with the Corps CZMA consistency statement (Appendix B).

10. Conclusions

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

11. References

Bortleson, G.C., M.J. Chrzastowski, and A.K. Helgerson. 1980. Historical Changes of Shoreline and Wetland at Eleven Major Deltas in the Puget Sound Region, Washington. Hydrologic Investigations Atlas, U.S. Geological Survey. Suzzallo Library, University of Washington, Seattle, WA.

Carter, H.R. 1984. At-Sea Biology of the Marbled Murrelet (Brachyramphus marmoratus) in Barkley Sound, British Columbia. Master's Thesis, Department of Zoology, University of Manitoba, Winnipeg, Canada.

Cavender, T. M. 1978. Taxonomy and distribution of the bull trout, *Salvelinus confluentus* (Suckey), from the American Northwest. California Fish and Game 64: 139-174.

Goetz, F. 1989. Biology of bull trout, Salvelinus confluentus, a literature review. U.S. Forest Service, Willamette National Forest. Eugene, OR.

Haas, G.R., J.D. McPhail. 1991. Systematics and distributions of Dolly Varden (*Salvelinus malma*) and bull trout (*Salvelinus confluentus*) in North America. Canadian Journal of Fisheries and Aquatic Sciences 48:2191-2211.

Kruckeberg, A.R. 1991. The Natural History of Puget Sound Country. University of Washington Press. 468 p.

Lane, B. 1973. Identity, Treaty Status, and Fisheries of the Snohomish Tribe of Indians. Report prepared for the U.S. Department of Interiorand the Snohomish Tribe of Indians. OAHP Reference Library.

Miller, C. and D. Somers 1989. TFW Stillaguamish River Early Action Project. Tulalip Tribes Natural Resources Department, Marysville, WA.

NMFS, 1996. Making Endangered Species Act determinations of effect for individual or grouped actions at the watershed scale. Environmental and Technical Services Division. Habitat Conservation Branch.

NMFS (National Marine Fisheries Service). 2008. Endangered Species Act-Section 7 Consultation Biological Opinion and Magnusson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation. Emergency Flood Control and Bank Protection Project Middle North Fork Stillaguamish River, Sixth Field HUC 171100080106 Snohomish County, Washington dated June 30, 2008.

Pess, G.R., B.D. Collins, M.M. Pollock, T.J. Beechie, A. Hass and S.Grisby. 1999. Historic and Current Factors that Limit Coho Salmon (Oncorhynchus kisutch) Production in the Stillaguamish River Basin, Washington State: Implications for Salmonid Habitat Protection and Restoration. A Report prepared for Snohomish County Department of Public Works and the Stillaguamish Tribe of Indians. 51pp.

Rieman, B.E. and J.D. McIntyre. 1993. *Demographic and habitat requirements for conservation of bull trout*. USDA Forest Service, Intermountain Research Station. General Technical Report INT-302.

Sacramento Metropolitan Air Quality Management District. 2008. CEQA tools. Online at http://www.airquality.org/ceqa/index.shtml. Accessed 30 Dec 2008.

Sealy, S.G., and H.R. Carter. 1984. At sea distribution and nesting habitat of the marbled murrelet in British Columbia: problems in the conservation of a solitarily nesting seabird. Pages 737–756 in J.P. Croxall, P.G. Evans, and R.W. Schreiber (eds.), Status and conservation of the world's seabirds. (ICBP Technical Seabirds Publication 2.)

Strachan, G., M. McAllister, and C.H. Ralph. 1995. Marbled murrelet at-sea and foraging behavior. In, C.J. Ralph, G.L. Hunt, Jr., M.G. Raphael, and J.F. Piatt (eds.), Ecology and conservation of the marbled murrelet. (General Technical Report PSW-GTR-152). U.S. Forest Service, Pacific Southwest Research Station. Albany, CA.

Stillaguamish Technical Advisory Group. 2000. Technical Assessment and Recommendations for Chinook Salmon Recovery in the Stillaguamish Watershed. Stillaguamish Technical Advisory Group. September, 2000.

USACE. 2000. Environmental Assessment: Stillaguamish River Ecosystem Restoration Puget Sound and Adjacent Waters Authority Snohomish County, Washington. November 2000.

USACE. 2001. Biological Assessment for Chinook and Coho Salmon, Bull Trout and Bald Eagle. Stillaguamish River Old Channel. Section 1135 Environmental Restoration Project.

USFWS/NMFS. 1998. Endangered Species Consultation Handbook. U.S. Fish and Wildlife Service, and National Marine Fisheries Service.

U.S. Fish and Wildlife Service (USFWS). 1999. A framework to assist in making Endangered Species Act determinations of effect for individual or grouped actions at the bull trout subpopulation watershed scale. Revised 6/11/99.

U.S. Fish and Wildlife Service (USFWS). 2000. Impacts of Riprapping to Ecosystem Functioning, Lower Sacramento, California. USFWS, Sacramento Office.

Washington Department of Fish and Wildlife (WDFW). 1998. Washington State Salmonid Stock Inventory; Bull Trout/Dolly Varden. Washington Department of Fish and Wildlife. Olympia, WA.

Washington Department of Fish and Wildlife and Western Washington Treaty Indian Tribes. 1994. 1992 Washington State Salmon and Steelhead Stock Inventory; Appendix One, North Puget Sound. Washington Department of Fish and Wildlife. Olympia, WA.

Washington Department of Fish and Wildlife. 2001. Priority Habitat and Species Database. Washington Department of Fish and Wildlife. Olympia, WA.

APPENDIX A

Substantive Compliance for Section 404 of the Clean Water Act and the Rivers and Harbors Act

Repair of Stillaguamish River Cook Slough Weir
Snohomish County, Washington
Substantive Compliance for
Section 404 of the Clean Water Act
and the
Rivers and Harbors Act

The purpose of this document is to record the Corps' evaluation and findings regarding this project pursuant to Section 404 of the Clean Water Act (CWA) and the Rivers and Harbors Act (RHA).

This document covers the repair of existing barrier weir located on the Stillaguamish River outside the town of Silvana. The proposed project lies within Snohomish County, Washington.

This document addresses the substantive compliance issues of the Clean Water Act 404(b)(1) Guidelines [40 CFR §230.12(a)] and the Regulatory Programs of the Corps of Engineers [33 CFR §320.4(a)].

12. BACKGROUND

12.1. Project Location

The Cook Slough weir is located at Township 31 North, Range 5 East, Section 6, SW ¼. The project is at river mile (RM) 16 on the Stillaguamish River. The Stillaguamish River Basin is the fifth largest tributary to Puget Sound encompassing an area of approximately 684 square miles with more than 975 miles of rivers and tributaries. Two large forks, the North and South Forks, converge into a mainstem near Arlington, WA and eventually branch into the main channel and sloughs before the river empties into Puget Sound. The Cook Slough weir was constructed in 1936-37 to provide gradient control to keep adequate summer flows in both the Stillaguamish main stem and Cook Slough.

12.2. Project Authority

The Stillaguamish River Flood Control Project was originally authorized by the Flood Control Act of 22 June 1936. Cook Slough weir was one of the flood control projects authorized under this act. The Flood Control Act of 28 June 1938 provides for Federal maintenance of the project.

12.3. Need and Purpose

The proposed action consists of needed repairs to the existing weir structure in order to avoid total structure failure. In addition, the action will redesign and construct an enhanced fish ladder structure to provide passage, especially during low flow events. The weir reduces backwater during flood events and provides some fish passage. A fish way was incorporated into the weir in 1988, on the left (South) bank of the river. The

existing fish way is a simple baffle system that does not have adequate attraction flows and may contribute to fish stranding at low flow events

The downstream sheet pile installed during an earlier repair has failed in the vicinity of the low flow fish notch and in the same area the Wakefield piling cutoff wall has also failed. There are numerous large voids with some extending upstream almost to the second row of timber piling and there is a large scour hole downstream of the weir. This scour hole tends to hold fish, and acts to distract fish away from the current fish way. This may lead to stranding and mortality, especially during low flow and high temperature events. Failure of the weir would stress the bank protection system on Cook Slough. A complete failure of the weir would change the flow split between Cook Slough and the main channel. Significant aggradation could be expected on the main channel. The reduction in discharge would greatly reduce the ability of the main channel to remain clear of sediment and would also greatly limit fish migration and habitat in the main stem.

The federal objective is to identify the least-cost environmentally acceptable solution/ alternative to provide gradient control and ensure long-term safe and efficient upstream fish passage. Work was initiated on the alternatives evaluation in March 2008.

13. Availability of Less Environmentally Damaging Practicable Alternatives to Meet the Project Purpose.

13.1. Alternative 1- No Action

The No action alternative includes no direct action to repair any portion of the existing Cook Slough weir by the USACE. This alternative does nothing to prevent continued deterioration of the weir or solve any problems associated with failure of the weir. The current maintenance efforts consisting primarily of removal of backed up debris would continue. The fish ladder would remain in its current configuration.

13.2. Alternative 2- Localized Repair Alternative

This alternative would only provide repairs to the existing structure to restore the weir to pre-damage conditions. All structural repairs needed in order to keep the weir functioning as in the past would be accomplished. The repairs recommended in this alternative would correct the current structural deficiencies which are jeopardizing the structural integrity of the weir, but are a relatively short term repair solution. The estimated life of repairs for this localized repair alternative is 10 to 15 years. This alternative would not change the current fish ladder in any way.

13.3. Alternative 3 - Comprehensive Repair Alternative

The proposed project includes a structural repair of the weir to fix its current damaged/deteriorated condition. Along with the repair the following are other aspects of the project necessary to complete construction:

- Partial demolition of existing weir structure,

- Construction of temporary access roads, both upstream and downstream of the weir,
- Construction of a temporary coffer dam and partial dewatering of the site during construction,
- Construction of fish ladder to improve migration and passage,
- Filling of scour hole and riprap scour protection immediately downstream of the weir sheet pile, and
- Stabilization and restoration of all disturbed areas after project completion.

The project proposes to replace approximately 300 linear feet of steel sheet piling, and repair all deteriorated concrete. The existing Scour hole on the downstream side of the weir will be filled with rock riprap in order to provide adequate scour protection. The existing fish ladder structure will be modified to enhance fish migration, and the existing low flow notch will be permanently removed. Temporary access roads will be constructed. Stabilization of the sand/gravel bar will be necessary to support heavy equipment. All stabilization materials will be removed at project completion. The project also requires the temporary construction of a cofferdam upstream of the weir to partially dewater the weir structure for equipment access and to affect repairs.

Findings. The Corps rejected Alternatives 1, and 2 because they would either not meet the authorized project objectives, were not cost effective, or they were not considered less environmentally damaging alternatives than the proposed action. For more information refer to Section 2.0 of the draft Environmental Assessment.

14. Significant Degradation, Either Individually or Cumulatively, To the Aquatic Environment

14.1. Impacts on Ecosystem Function.

The most widespread effect of the proposed action will likely be the increase in ambient noise levels associated with sheet pile driving. Riparian and upland habitats on and adjacent to the project area will be disturbed by construction. The Corps has assessed potential impacts from the construction and determined that they will be highly localized in nature, short in duration, and minor in scope (see Environmental Assessment). Short-term impacts from construction activities include minor temporal impacts to riparian vegetation, and temporary disruption of fish migration. Short-term impacts also include temporary contact by juvenile salmon with elevated turbidity levels and contact with rock and other hard structures. These short-term impacts will be reduced to the extent practicable or avoided through implementation of timing restrictions and BMP's (Erosion/sediment control plan to be developed by Contractor and approved prior to construction). Due to these measures, impacts to these important resources will not be significant either individually or cumulatively.

14.2. Impacts on Recreational, Aesthetic and Economic Values.

The project area is not actively used for recreation. Construction activities will not disrupt recreational activities at the site.

There are no known aesthetic or economic values that will be disrupted during construction. The site is remotely located with little of the site being visible to surrounding residents or activities. The immediate surrounding area is actively farmed agricultural lands which will not be disturbed. Economic values of residents in the immediate area will not be degraded with the construction of the proposed project.

Findings. The Corps has determined that there would be no significant adverse impacts to aquatic ecosystem functions and values or recreational, aesthetic, and economic values.

15. Appropriate and Practicable Measures To Minimize Potential Harm to the Aquatic Ecosystem

15.1. Impact Avoidance Measures.

Construction areas, material stockpiles, vehicle turnarounds and other disturbances will be sited to avoid sensitive areas. Work will be kept to existing disturbed areas on the left and right bank to the maximum extent practicable.

15.2. Impact Minimization Measures.

The proposed project is likely to require several construction seasons before completion. As such, work around the project site will be on-going for approximately 24 months. Where practicable, construction sequencing and planning will be used to minimize impacts associated with noise and disruptions to fish trap operations. Appropriate erosion control measures will be installed to minimize impacts to adjacent wetlands and riparian areas.

15.3. Compensatory Mitigation Measures.

Native vegetative plantings are anticipated in areas disturbed by construction. Environmental monitoring will be conducted to confirm both benefits and impacts of the project.

Findings. The Corps has determined that all appropriate and practicable measures have been taken to avoid and minimize potential harm. Unavoidable impacts caused by construction will be mitigated in close coordination with resource agencies.

16. Other Factors in the Public Interest.

16.1. Fish and Wildlife.

The Corps has coordinated with State and Federal agencies to assure careful consideration of fish and wildlife resources. The Corps will continue to coordinate with State Fish and Wildlife agencies and has prepared a Biological Evaluation in accordance with the Endangered Species Act. The Corps will assure full compliance with the Endangered Species Act prior to project implementation.

16.2. Water Quality.

A Public Notice (CENWS-PL-04-09) will be prepared to serve as an application for a Section 401 Water Quality Certification from the Washington Department of Ecology (Ecology). Ecology is expected to issue a Water Quality Certification for the proposed work. The Corps will abide by the conditions of the State issued Water Quality Certification to ensure compliance with State water quality standards. Possible sources of water quality degradation to be addressed in the 401 Water Quality Certification include releases of turbid water and operation of mechanical equipment in and around the waters edge.

16.3. Tribal Treaty Rights.

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

(1) The work did not interfere with access to usual and accustomed fishing grounds or with fishing activities or shellfish harvesting;
(2) The work did not cause the degradation of fish runs and habitat; and
(3) The work did not impair the Treaty tribes' ability to meet moderate living needs

16.4. Activities Effecting Coastal Zones.

Pursuant to Section 173-27-040 of the Washington Administrative Code, the Corps determined that this proposal is consistent to the maximum extent practicable with the State of Washington Shoreline Management Program. A consistency statement has been completed and submitted to the Department of Ecology for review and concurrence.

16.5. Environmental Benefits.

The proposed project would have several long-term environmental benefits. The proposed project represents an opportunity to reduce maintenance requirements that adversely affect local wildlife and fish resources. The proposed project will greatly

enhance fish passage and migration at the site, minimizing fish strandings, and temperature related mortality.

16.6. Navigation.

No adverse effects to navigation will occur as a result of the proposed project. The Stillaguamish River does not support commercial or recreational navigation at the project location.

Findings. The Corps has determined that this project is within the public interest.

17. 404(b)(1) Evaluation [40CFR§230]- Potential Impacts on Physical and Chemical Characteristics (Subpart C)

17.1. Substrate [230.20].

The proposed project will include a need for temporary cofferdams. Cofferdams allow for safe repair of the weir. The cofferdams will be constructed of large non-native angular rock, filter fabrics and smaller fill. These materials will remain in the river for periods possibly exceeding 90 days. When no longer needed, the cofferdams will be removed though some rock may escape detection due to low water visibility or bedload movement. All efforts will be made to retrieve non-native materials at the time of construction. The proposed project contains features to allow for natural passage of bedload materials when in full operation.

17.2. Suspended Particulate/Turbidity [230.21].

Any increases in turbidity resulting from the proposed action would be a result of construction activities and cofferdam construction. Construction material will be selected to minimize excessive amounts of fines. Any sediment plumes attributable to the resultant material would be temporary, localized, and equivalent to those created by natural sediment transport processes. Water quality monitoring during construction will be implemented to ensure adequate water quality protections.

17.3. Water Quality [230.22].

No significant water quality effects are anticipated (see 5.2 above).

17.4. Current Patterns and Water Circulation [230.23].

No adverse impacts to Current patterns and water circulation are anticipated. The repaired weir will function in a manner consistent with the current weir nd is not expected to appreciably alter flow or circulation patterns around the area.

17.5. Normal Water Fluctuations [230.24].

No adverse affects anticipated.

17.6. Salinity Gradients [230.25].

No adverse affects anticipated.

18. 404(b)(1) Evaluation [40 CFR §230]- Potential Impacts on Biological Characteristics of the Aquatic Ecosystem (Subpart D)

18.1. Threatened and Endangered Species [230.30].

Pursuant with Section 7 of the Endangered Species Act, the Corps prepared a Biological Assessment (BA) to assess potential impacts of the proposed work on species protected under the Act. This document concluded that the proposed project was not likely to adversely affect bull trout (*Salvelinus confluentus*), steelhead (*Oncorhynchus mykiss),* and chinook salmon (*Oncorhynchus tshawytscha*). The BA concluded that the project would have no effect on the marbled murrelet (*Brachyramphus marmoratus*). The BE and supporting cover letters will be sent to the National Marine Fisheries Service (NMFS) and US Fish and Wildlife Service for concurrence.

18.2. Aquatic Food Web [230.31].

No adverse affects are anticipated.

18.3. Wildlife [230.32].

Noise associated with project construction and disturbances to the surrounding uplands and riparian zone may have an effect on bird and terrestrial mammals in the project vicinity. The impacts of any sound disturbance would likely result in temporary displacement of animals rather than injury. Construction activities and disturbances on the land may disrupt local movements of mammals and other wildlife. Impacts of this project will be temporary and are further explained within a Biological Assessment submitted to the US Fish and Wildlife Service and National Marine Fisheries Service.

19. 404(b)(1) Evaluation [40 CFR §230]- Potential Impacts to Special Aquatic Sites (Subpart E)

19.1. Sanctuaries and Refuges [230.40].

The proposed project will not impact any designated sanctuary or refuge area.

19.2. Wetlands [230.41].

The river banks are highly modified due to past stabilization activates and flood control. No wetlands were found in the immediate construction area on the left bank.

19.3. Mudflats [230.42].

The proposed project will not alter or discharge material in or near mudflat areas. The project will not alter the inundation patterns of mudflats.

19.4. Vegetated Shallows [230.43].
No adverse affects are anticipated

19.5. Coral Reefs [230.44].
No adverse affects are anticipated.

19.6. Riffle and Pool Complexes [230.45].
No adverse affects are anticipated.

20. 404(b)(1) Evaluation [40 CFR §230]- Potential Effects on Human Use Characteristics (Subpart F)

20.1. Municipal and Private Water Supplies [230.50].
No adverse affects are anticipated.

20.2. Recreational and Commercial Fisheries [230.51].
The project is not expected to affect recreational or commercial fisheries.

20.3. Water Related Recreation [230.52].
No water related recreation takes place at the project location.

20.4. Aesthetics [230.53].
No adverse affects are anticipated. Any disturbed areas will be replanted.

20.5. Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves [230.54].
There are no Federal preserves in or near the vicinity of the project area.

21. 404(b)(1) Evaluation [40 CFR §230]- Evaluation and Testing (Subpart G)

21.1. General Evaluation of Dredged or Fill Material [230.60].
The fill material will be composed of clean coarse rock, and other naturally occurring inert material obtained from upland borrow sources for which all state and local permits have been obtained.

21.2. Chemical, Biological, and Physical Evaluation and Testing [230.61].
The extraction site is sufficiently removed from sources of pollution to provide reasonable assurance that the proposed discharge material is not a carrier of contaminants. Therefore, the required determinations pertaining to the presence and effects of contaminants can be made without testing.

22. 404(b)(1) Evaluation [40 CFR §230]- Action to Minimize Adverse Effects (Subpart H)

22.1. Actions Concerning the Location of the Discharge [230.70].

The effects of the discharge will be minimized by limiting discharge volume to the maximum practicable extent. The majority of discharge will be temporary. Rock cofferdams will be sized to ensure safety of personnel and equipment. The location and timing of the proposed discharge has been planned to minimize impacts to aquatic and terrestrial organisms.

22.2. Actions Concerning the Material to be Discharged [230.71].

Treatment substances and chemical flocculates will not be added to materials before disposal. Concrete work will be conducted in the dry when possible, cast and cured on land when feasible or poured in forms when necessary.

22.3. Actions Controlling the Material after Discharge [230.72].

Materials used during construction will be concrete and large rock. Rock will be sized to ensure movement of material is negligible. Rock associated with cofferdams will be removed. There is no mechanism to actively manage fines at the diversion structure.

22.4. Actions Affecting the Method of Dispersion [230.73].

Dispersion of material will be minimized through appropriate size selection of rock and material. No portion of the proposed project is expected to disperse from its original location although some non-native rock may shift through time. Dispersion of fines will be minimized through the placement of cofferdams and working within the dry whenever feasible. Water pumped from within the cofferdams will be managed.

22.5. Actions Related to Technology [270.74].

Appropriate machinery and methods of transport of the material for removal and discharge will be employed. To minimize disturbance of areas outside of the project footprint, cofferdams will be constructed and internal drainage filtered in accordance to the erosion control plan. All machinery will be properly maintained and operated.

22.6. Actions Affecting Plant and Animal Populations [270.75].

Construction features will be located to minimize impacts to plant and animal populations. Specific impacts of the proposed project can be found in the Draft environmental assessment.

22.7. Actions Affecting Human Use [230.76].

The discharge will not result in damage to aesthetically pleasing features of the aquatic landscape. The discharge will not increase incompatible human activity in remote fish and wildlife areas. The area is not directly used for recreation. Human use is generally limited to fishing and farming.

22.8. Other Actions [230.77].
Not applicable.

23. Public Interest Review.
The Corps finds these actions to be in compliance with the 404(b)(1) guidelines and not contrary to the public interest.

23.1. Effects on Wetlands.
No wetlands will be altered by the proposed project.

23.2. Fish and Wildlife.
U.S. Fish and Wildlife Service and the National Marine Fisheries Service have initiated Section 7 ESA consultation to ensure that direct and indirect loss and damage to fish and wildlife resources attributable to the proposed project will be minimized. The project will be coordinated through Washington Department of Fish and Wildlife, affected tribes and other regulatory agencies to ensure consideration of local concerns.

23.3. Water Quality.
The Corps will abide by conditions of a Section 401 Water Quality Certification upon issuance by the Washington Department of Ecology to ensure compliance with Washington water quality standards.

23.4. Historic, Cultural, Scenic, and Recreational Values.
No wild and scenic rivers, National Landmarks, National Rivers, National Wilderness Areas, National Seashores, National Recreation Areas, National Lakeshores, National Parks, National Monuments, or estuarine and marine sanctuaries are in or near the project and none will be adversely impacted by the proposed project.

23.5. Effects on Limits of the Territorial Sea.
Not applicable

23.6. Consideration of Property Ownership.
Project is located on private property. Existing easements are in place for access and maintenance operations.

23.7. Activities Affecting Coastal Zones.
The proposed work complies with the policies, general conditions, and general activities specified in the Snohomish County Shoreline Management Master Plans and Washington Administrative Code to the maximum extent practicable.

23.8. Activities in Marine Sanctuaries.
Not applicable.

23.9. Other Federal, State, or Local Requirements.

a. National Environmental Policy Act. An environmental assessment (EA) and FONSI have been developed to satisfy the documentation requirements of NEPA.

b. Endangered Species Act. 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. A Biological Assessment (BA) has been prepared and will be submitted to USFWS and NMFS. The NMFS and USFWS are expected to respond to the determinations made in the BA for effects to threatened and endangered species.

c. Clean Water Act. The Corps must demonstrate compliance with the substantive requirements of the Clean Water Act. This document records the Corps' evaluation and findings regarding this project pursuant to Section 404 of the Act. Public Notice shall serve as the application for a Section 401 Water Quality Certification from the Washington Department of Ecology. Ecology is expected to issue a Water Quality Certification for the project prior to construction. The Corps will abide by the conditions of the State issued Water Quality Certification to ensure compliance with State water quality standards.

d. Coastal Zone Management Act. The Coastal Zone Management Act of 1972, as amended, requires Federal agencies to carry out their activities in a manner which is consistent to the maximum extent practicable with the enforceable policies of the approved Washington Coastal Zone Management Program. The proposed action will replace an aging and injurious structure with a new structure. The replacement structure and its construction will closely follow the footprint of the original project, and will not cause substantial adverse effects to aquatic resources or the environment. Pursuant to Section 173-27-040 of the Washington Administrative Code, the Corps determined that this proposal is consistent to the maximum extent practicable with the State of Washington Shoreline Management Program. The consistency statement will be submitted to the Department of Ecology following public review of the proposed project.

e. Rivers and Harbors Act. This document records the Corps' evaluation and findings regarding this project pursuant to the Rivers and Harbors Act. No adverse effect to navigation is anticipated.

f. National Historic Preservation Act. Construction of the Cook Slough weir was completed on 25 March 1937 as part of a Washington State Works Progress Administration (WPA) ongoing project (OP 65-93-897/ WP 627). The Corps has determined that the proposed project is an undertaking of the type that could affect historic properties and must comply with the requirements of Section 106, as amended through 2004, of the National Historic Preservation Act of 1966, as amended through 2000 (NHPA) (16 USC 470). Section 106 requires that Federal agencies identify and assess the effects of Federal undertakings on historic properties and to consult with others to find acceptable ways to resolve adverse effects. Properties protected under Section 106

are those that are listed or are eligible for listing in the National Register of Historic Places (NRHP). Eligible properties must generally be at least 50 years old, possess integrity of physical characteristics, and meet at least one of four criteria for significance. Regulations implementing Section 106 (36 CFR Part 800) encourage maximum coordination with the environmental review process required by the National Environmental Policy Act (NEPA) and with other statutes. The Washington State Archaeological Sites and Resources Act (RCW 27.53) may also apply.

The Corps' proposed Area of Potential Effects (APE) was reviewed by the Washington State Office of Archaeology and Historic Preservation (OAHP) for concurrence.

To comply with Section 106 of the NHPA, a Corps archaeologist and an architectural historian conducted a cultural resources reconnaissance survey of the proposed project's APE. Cultural resources studies conducted for the project included: an examination of the archaeological and historic site records at the OAHP, a search of the OAHP electronic historic sites inventory database, other background and archival research, a pedestrian survey of the project area, and an evaluation of the significance of the weir. No properties listed in the National Register and no sites or structures listed in the state inventory were found to have been previously recorded within the APE. The Corps sent letters to the Stillaguamish Tribe, and the Tulalip Tribe soliciting any knowledge or concerns or religious significance for the APE.

g. Fish and Wildlife Coordination Act. The Fish and Wildlife Coordination Act (FWCA, 16 USC 470) requires that wildlife conservation receive equal consideration and be coordinated with other features of water resource development projects. This goal is accomplished through Corps funding of USFWS habitat surveys evaluating the likely impacts of proposed actions, which provide recommendations for avoiding or minimizing such impacts. The Corps has initiated discussions with USFWS/NMFS on the proposed project and will continue to work with USFWS/NMFS prior to completion and submittal of final project documents. This will be done to ensure FWCA recommendations are given appropriate consideration prior to final design.

23.10. Floodplain Management.

No adverse effects to floodplain management, vegetative communities, wetlands or aquatic habitat will occur as a result of the proposed work.

23.11. Water Supply and Conservation.

No adverse effects to water supply or conservation will occur as a result of the proposed work.

23.12. Energy Conservation and Development.

No adverse effects to energy conservation or development will occur as a result of the proposed work.

23.13. Navigation.

No adverse effects to navigation will occur as a result of the proposed work.

23.14. Environmental Benefits.

The proposed project would eliminate the continued degradation of the existing weir structure. The proposed project includes features to enhance fish passage and migration as well as long term flow stability to the river.

23.15. Economics.

During the feasibility study, the Federal Government determined that repair of the existing weir structure was economically justified.

23.16. Mitigation.

Potential impacts of the construction work on salmonids will be minimized through implementation of timing restrictions and best management practices. Monitoring and contingency plans will be in place for any unavoidable adult fish impacts.

24. Conclusions.

Based on the analyses presented in project NEPA documents, as well as the following 404(b)(1) Evaluation and General Policies for the Evaluation of Permit Applications analysis, the Corps finds that this project complies with the substantive elements of Section 404 of the Clean Water Act and the Rivers and Harbors Act.

APPENDIX B

Required State and Federal Agency Responses

1. State Historic Preservation Office: National Historic Preservation Act Section 106 Consultation, dated April 30, 2009.

2. Washington State Department of Ecology: Water Quality Certification, dated January 15, 2010, with amendment dated May 14, 2010.

3. Washington State Department of Ecology: Coastal Consistency Determination, dated January 15, 2010.

4. National Marine Fisheries Service: Endangered Species Act Section 7 formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation, dated April 12, 2010.

5. U.S. Fish and Wildlife Service: Endangered Species Act Section 7 Biological Opinion dated April 23, 2010.

STATE OF WASHINGTON

DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION

1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501
Mailing address: PO Box 48343 • Olympia, Washington 98504-8343
(360) 586-3065 • Fax Number (360) 586-3067 • Website: www.dahp.wa.gov

April 30, 2009

Kat? letter I just signed?

Ms. Deborah J. Johnston
Environmental Resources Section
Seattle District, Corps of Engineers
PO Box 3755
Seattle, Washington 98124-3755

Re: Koch Slough Weir Rehabilitation Project
Log No.: 042909-12-COE-S

Dear Ms. Johnston:

Thank you for contacting our department. We have reviewed the materials you provided for the proposed Koch Slough Weir Rehabilitation Project in Snohomish County, Washington.

We concur with your determination of No Historic Properties Affected. We concur with your proposed stipulations for professional archaeological monitoring. Please provide the monitoring report when available that demonstrates your stipulations were followed.

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

These comments are based on the information available at the time of this review and on the behalf of the State Historic Preservation Officer in conformance with Section 106 of the National Historic Preservation Act, as amended, and it's implementing regulations 36CFR800. Should additional information become available, our assessment may be revised. Thank you for the opportunity to comment on this undertaking and a copy of these comments should be included in subsequent environmental documents.

Sincerely,

Robert G. Whitlam, Ph.D.
State Archaeologist
(360) 586-3080
email: rob.whitlam@dahp.wa.gov

DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION
Protect the Past, Shape the Future

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

[illegible]

May 14, 2010

Kevin McCoag
US Army Corps of Engineers, Seattle District
PO Box 3755
Seattle, WA 98124

RE: Requested Amendment to Administrative Order #7303 for U.S. Army Corps of Engineers Reference # P1-09-18, Repair Stillaguamish River Cook Slough weir Project, Snohomish County, Washington

Dear Mr. McCoag:

Enclosed is an amendment to the Water Quality Certification issued on January 15, 2010, for the above project.

The purpose of this amendment is to respond to your March 17, 2010 and corrected April 27, 2010 requests to change Condition 1.2 to reflect an extension of the in-water work window in order that the entire project can be completed in one season this year.

If you have any questions, please contact Rebekah Padgett at (425) 649-7129. The enclosed Amendment may be appealed by following the procedures described in the Amendment.

Sincerely,

Geoff Tallent, Section Manager
Northwest Regional Office
Shorelands and Environmental Assistance Program

GT:rep:eja

By Certified Mail: 7007 0220 0004 6659 1948

cc: Ginger Gelser, Washington Department of Fish and Wildlife
Howard Knight, Snohomish County Planning Department

e-cc: Loree' Randall – HQ
Patricia Lambert – NWRO
Ramesh Iyer – NWRO
ecyrefedcomments@ecy.wa.gov

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

January 15, 2010

Kevin McKeag
US Army Corps of Engineers, Seattle District
PO Box 3755
Seattle, WA 98124

RE: Water Quality Certification Order #7303 for U.S. Army Corps of Engineers Reference #PL-09-18, Repair Stillaguamish River Cook Slough Weir Project, Snohomish County, Washington

Dear Mr. McKeag:

On December 9, 2009, US Army Corps of Engineers, Seattle District submitted a request to the Department of Ecology (Ecology) for a Section 401 Water Quality Certification (401 Certification) under the federal Clean Water Act for the proposed Repair Stillaguamish River Cook Slough Weir project.

On behalf of the State of Washington, Ecology certifies that the work described in the JARPA and the public notice complies with applicable provisions of Sections 301, 302, 303, 306 and 307 of the Clean Water Act, as amended, and applicable state laws. This certification is subject to the conditions contained in the enclosed Order.

If you have any questions, please contact Rebekah Padgett at (425) 649-7129. The enclosed Order may be appealed by following the procedures described in the Order.

Sincerely,

Erik Stockdale, Unit Supervisor
Northwest Regional Office
Shorelands and Environmental Assistance Program

ESimpreja
Enclosure

By Certified Mail # 7007 0220 0004 6659 1764

cc: Ginger Holser, Washington Department of Fish and Wildlife
Howard Knight, Snohomish County Planning Department
e-cc: Loree' Randall – HQ
Patricia Lambert – NWRO
Raman Iyer – NWRO
ecyrefedocmits@ecy.wa.gov

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

January 15, 2010

Kevin McKeag
US Army Corps of Engineers, Seattle District
PO Box 3755
Seattle, WA 98124

Dear Mr. McKeag:

RE: **Coastal Zone Consistency for U.S. Army Corps of Engineers Reference #PL-09-18 Repair Stillaguamish River Cook Slough Weir Project, Snohomish County, Washington**

On December 9, 2009, US Army Corps of Engineers, Seattle District (Corps) submitted a Certification of Consistency with the Washington State Coastal Zone Management Program (CZMP). Pursuant to Section 307(c)(3) of the Coastal Zone Management Act of 1972 as amended, Ecology concurs with the Corps' determination that the proposed work is consistent with Washington's CZMP.

You have the right to appeal this decision to the Pollution Control Hearings Board. To appeal this you must:

- File your appeal with the Pollution Control Hearings Board within 30 days of the "date of receipt" of this document. Filing means actual receipt by the Board during regular office hours.
- Serve your appeal on the Department of Ecology within 30 days of the "date of receipt" of this document. Service may be accomplished by any of the procedures identified in WAC 371-08-305(10). "Date of receipt" is defined at RCW 43.21B.001(2).

Be sure to do the following:

- Include a copy of this document that you are appealing with your Notice of Appeal.
- Serve and file your appeal in paper form; electronic copies are not accepted.

1. To file your appeal with the Pollution Control Hearings Board

Mail appeal to:		Deliver your appeal in person to:
The Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903	OR	The Pollution Control Hearings Board 4224 – 6th Ave SE Rowe Six, Bldg 2 Lacey, WA 98503

2. To serve your appeal on the Department of Ecology

Mail appeal to:

The Department of Ecology
Appeals Coordinator
P.O. Box 47608
Olympia, WA 98504-7608

OR

Deliver your appeal in person to:

The Department of Ecology
Appeals Coordinator
300 Desmond Dr SE
Lacey, WA 98503

3. And send a copy of your appeal to:

Department of Ecology
Northwest Regional Office
Attn: Rebekah Padgett
3190 160th Avenue SE
Bellevue, WA 98008

For additional information visit the Environmental Hearings Office Website:
http://www.eho.wa.gov

To find laws and agency rules visit the Washington State Legislature Website:
http://www1.leg.wa.gov/CodeReviser

Your appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320. These procedures are consistent with Ch. 43.21B RCW.

If you have any questions regarding Ecology's consistency determination please contact Rebekah Padgett at (425) 649-7129.

Sincerely,

Erik Stockdale, Unit Supervisor
Northwest Regional Office
Shorelands and Environmental Assistance Program

ES:rrp:cja

By certified Mail # 7007 0220 0004 6659 1771

cc: Ginger Holser, Washington Department of Fish and Wildlife
Howard Knight, Snohomish County Planning Department

e-cc: Loree' Randall – HQ
Patricia Lambert – NWRO
Raman Iyer – NWRO
ecyrefedpermits@ecy.wa.gov

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
510 Desmond Dr. SE, Suite 102
Lacey, Washington 98503

APR 23 2010

In Reply Refer To:
13410-2010-F-0139

Deborah Johnston
Seattle District, Corps of Engineers
ATTN: Regulatory Branch (McKeag)
P. O. Box 3755
Seattle, Washington 98124-3755

Dear Ms. Johnston:

This document transmits the U.S. Fish and Wildlife Service's Biological Opinion (Opinion), incidental take statement, conservation recommendations, and reinitiation notice based on our review of the Cook Slough weir repair project.

The enclosed document evaluates the effects of the proposed action on the threatened bull trout (*Salvelinus confluentus*), bull trout critical habitat, and the threatened marbled murrelet (*Brachyramphus marmoratus*) in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

This Opinion is based on information provided in the December 14, 2009, Biological Assessment, telephone conversations, emails, and other sources of information. A complete record of this consultation is on file at this office.

In your Biological Assessment for the proposed action, you made the effect determinations of "may affect, likely to adversely affect" for bull trout and "may affect, not likely to adversely affect" to bull trout critical habitat and "no effect" for the marbled murrelet. The U.S. Fish and Wildlife Service does not provide written concurrence on "no effect" determinations. The determination for effects to marbled murrelets rests with the action agency.

TAKE PRIDE IN AMERICA

The enclosed Opinion concludes that the proposed action "may affect, likely to adversely affect" bull trout, and "may effect, not likely to adversely affect" bull trout critical habitat. Our rationale for our concurrence is addressed under the "Consultation History" section of the Opinion. The Opinion also concludes that the proposed action "is not likely to jeopardize" bull trout, and is "not likely to destroy or adversely modify" designated bull trout critical habitat.

If you have any questions about the enclosed Biological Opinion, or your responsibilities under the Endangered Species Act, please contact Ron Malecki (360) 753-4371 or Martha Jensen (360) 753-9000, of this office.

Sincerely,

Ken S. Berg, Manager
Washington Fish and Wildlife Office

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, Washington 98115

Refer to NMFS No:
2009/06691

April 12, 2010

Evan Lewis, Acting Chief
Corps of Engineers, Seattle District
Environmental Resources Section
Post Office Box 3755
Seattle, Washington 98124-3755

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Repair of the Stillaguamish River Cook Slough Weir in Snohomish County, Washington (6th Field HUC: 171100080305, Hat Slough)

Dear Mr. Lewis:

The enclosed document contains a Biological Opinion prepared by the National Marine Fisheries Service pursuant to section 7(a)(2) of the Endangered Species Act on the effects of your proposed project to Repair the Stillaguamish River Cook Slough Weir near Silvana, Washington. In this Biological Opinion, the National Marine Fisheries Service concludes that the action, as proposed, is not likely to jeopardize the continued existence of Puget Sound Chinook salmon or result in the destruction or adverse modification of designated critical habitat for Puget Sound Chinook salmon.

As required by section 7 of the Endangered Species Act, the National Marine Fisheries Service provided an incidental take statement with the Biological Opinion. The incidental take statement describes reasonable and prudent measures the National Marine Fisheries Service considers necessary or appropriate to minimize incidental take associated with this action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements, that the Federal agency and any person who performs the action must comply with to carry out the reasonable and prudent measures. Incidental take from actions that meet these terms and conditions will be exempt from the Endangered Species Act take prohibition.

This document also includes the results of our analysis of the action's likely effects on Essential Fish Habitat pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and includes one conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects on Essential Fish Habitat. The conservation recommendation is not identical to Endangered Species Act Terms and Conditions. Section 305(b)(4)(B) of the MSA requires Federal agencies to provide a detailed written response to the National Marine Fisheries Service within 30 days after receiving these recommendations.

If the response to the recommendation is inconsistent with the Essential Fish Habitat conservation recommendations, the U.S. Army Corps of Engineers must explain why the recommendations will not be followed, including the justification for any disagreements over the effects of the action and the recommendations. In response to increased oversight of overall Essential Fish Habitat program effectiveness by the Office of Management and Budget, the National Marine Fisheries Service established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each Essential Fish Habitat consultation and how many are adopted by the action agency. Therefore, in your statutory reply to the Essential Fish Habitat portion of this consultation, we ask that you clearly identify the number of conservation recommendations accepted.

If you have questions regarding this consultation, please contact Joel Moribe at the Washington State Habitat Office at (206) 526-4359 or via email at joel.moribe@noaa.gov.

Sincerely,

Barry A. Thom
Acting Regional Administrator

APPENDIX C

Project Correspondence

Stillaguamish Tribe of Indians

PO Box 277
3310 Smokey Point Drive
Arlington WA 98223

RECEIVED
29 APR 09
KLS

April 24, 2009

Katherine M. Kelly
Department of the Army
P.O. Box 3755
Seattle, WA 98124-2255

RE: 2009 Koch Slough Weir Rehabilitation Project

Dear Madam,

After reviewing the notice of application with our cultural committee this letter is forwarded to you stating that the Tribe would like extreme caution to be observed for the above referenced project. If anything of cultural significance is found, please stop work and contact us. If human remains are encountered, stop work, secure the area, and contact the Department of Archaeology and Historic Preservation, the County, the Tribe, and the Medical Examiner immediately. Please use caution due to the wetlands and any streams that may contain habitat for salmon, if applicable to this permit.

The Tribe is continuously doing research on its cultural heritage and if anything in the future should apply, we will notify your agency. We have this application on file and in our database at the tribe.

Thank you for your consideration in contacting us regarding this matter.

Sincerely,

Victoria Yeager

Victoria Yeager
Stillaguamish Tribe of Indians
Cultural Resources

Phone 360-652-7362 Fax 360-659-3113

Corps response to comment from Stillaguamish Tribe of Indians:

A Corps Archeologist will provide on site monitoring during ground disturbance activities. If, during construction activities, the contractor observes items that might have historical or archeological value, such observations shall be reported immediately to the Contracting Officer, or, if present, the Corps' construction supervisor so that the appropriate authorities may be notified and a determination can be made as to their significance and what, if any, special disposition of the finds should be made. The contractor shall cease all activities that may result in the destruction of these resources and shall prevent his employees from trespassing on, removing, or otherwise damaging such resources.