Draft Environmental Assessment

Monte Cristo Grade Road Bridge

Snohomish County, Washington
FEMA-1499-DR-WA (Public Assistance)
June 2008

U.S. Department of Homeland Security
FEMA Region X
130 - 228th Street SW
Bothell, WA 98021-9796

Draft Environmental Assessment

Monte Cristo Grade Road Bridge

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for

U.S. Department of Homeland Security
Federal Emergency Management Agency (FEMA)
130 - 228th Street SW
Bothell, WA 98021-9796

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ACRONYMS AND ABBREVIATIONS

BA	Biological Assessment
BMP	Best Management Practice
CFR	Code of Federal Regulations
cfs	cubic feet per second
Corps	U.S. Army Corps of Engineers
Cy	Cubic yards
dbh	Diameter at breast height
DPS	Distinct Population Segment
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
FR	Federal Register
Ft	feet
LWD	Large woody debris
MSE	mechanically stabilized earth
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
OHWM	Ordinary High Water Mark
PHS	Priority Habitats and Species
RM	River Mile
ROW	right-of-way
SCC	Snohomish County Code
SCPW	Snohomish County Public Works
SCS	Soil Conservation Service
SCSWM	Snohomish County Surface Water Management
SHPO	State Historic Preservation Office
SLE	Stillaguamish Lead Entity
STAG	Stillaguamish Technical Advisory Group
TMDL	Total Maximum Daily Load
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WAU	Watershed Assessment Unit
WDF	Washington Department of Fisheries
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WDOE	Washington Department of Ecology
WRIA	Water Resource Inventory Area
WSCC	Washington State Conservation Commission

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1. PURPOSE AND NEED FOR ACTION

1.1. Introduction

Record rainfall occurred in Western Washington during October 19 - 21, 2003 causing extensive damage throughout the region. Flooding and erosion in the South Fork Stillaguamish River watershed caused about 650 feet of the Monte Cristo Grade Road, just outside of Verlot, Washington to washout. The Monte Cristo Grade Road is an unpaved gravel road accessing twenty four recreational properties and one residence. The river now occupies a section of the old road footprint. Additional erosion occurred during the 2006 and 2007 flood seasons. The road has been barricaded since 2003 and there is currently no vehicular access to the recreational properties and Forest Service land along the road. (See Figure 1: Project Location).

Snohomish County requested funding from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) to repair the road. The event was a presidential declared disaster (#1499) and the County prepared Public Worksheet (PW) 205. The original PW was prepared March 2004. PW205 Scope of Work was revised October 2007.

Because of the federal nexus with FEMA funding, an Environmental Assessment (EA), is being prepared by Snohomish County to comply with the National Environmental Policy Act (NEPA) pursuant to FEMA's regulations found in 44 Code of Federal Regulations (CFR) Part 10.

A Draft EA, dated April 2005, was prepared by FEMA to analyze the construction of a new segment of road away from the river and around the washout. Three alternative road alignments were considered and analyzed. These alignments and potential environmental impacts of each are described in the *Draft Environmental Assessment*: *Reconstruction of the Monte Cristo Grade Road, 2005*. That EA was prepared but not distributed for public comment or review.

Following a review by FEMA and Snohomish County of the draft EA and Draft Biological Assessment (BA), another alternative was developed that would have less environmental impact. A bridge across the river was proposed to restore access to the Monte Cristo Grade Road. The bridge site is approximately 0.5 mile downriver from the washout site. There was a bridge in this location up until early 1970s when it was removed due to structural deficiencies.

A decision was made by Snohomish County Public Works in fall 2007 to pursue the bridge option. Further damage to the washout area had occurred from flooding in 2006 and additional wetlands and streams had also been identified along the steep slopes of the proposed road alignments. Impacting these critical areas would require extensive mitigation. The site of the washout is continuing to erode.

This Environmental Assessment examines the County's proposal to construct a bridge across the South Fork of the Stillaguamish River. It would connect the dead end of 342nd Drive NE to the Monte Cristo Grade Road on the same alignment as a previous bridge. Much of the background information contained in the April 2005 EA is applicable to this current EA.

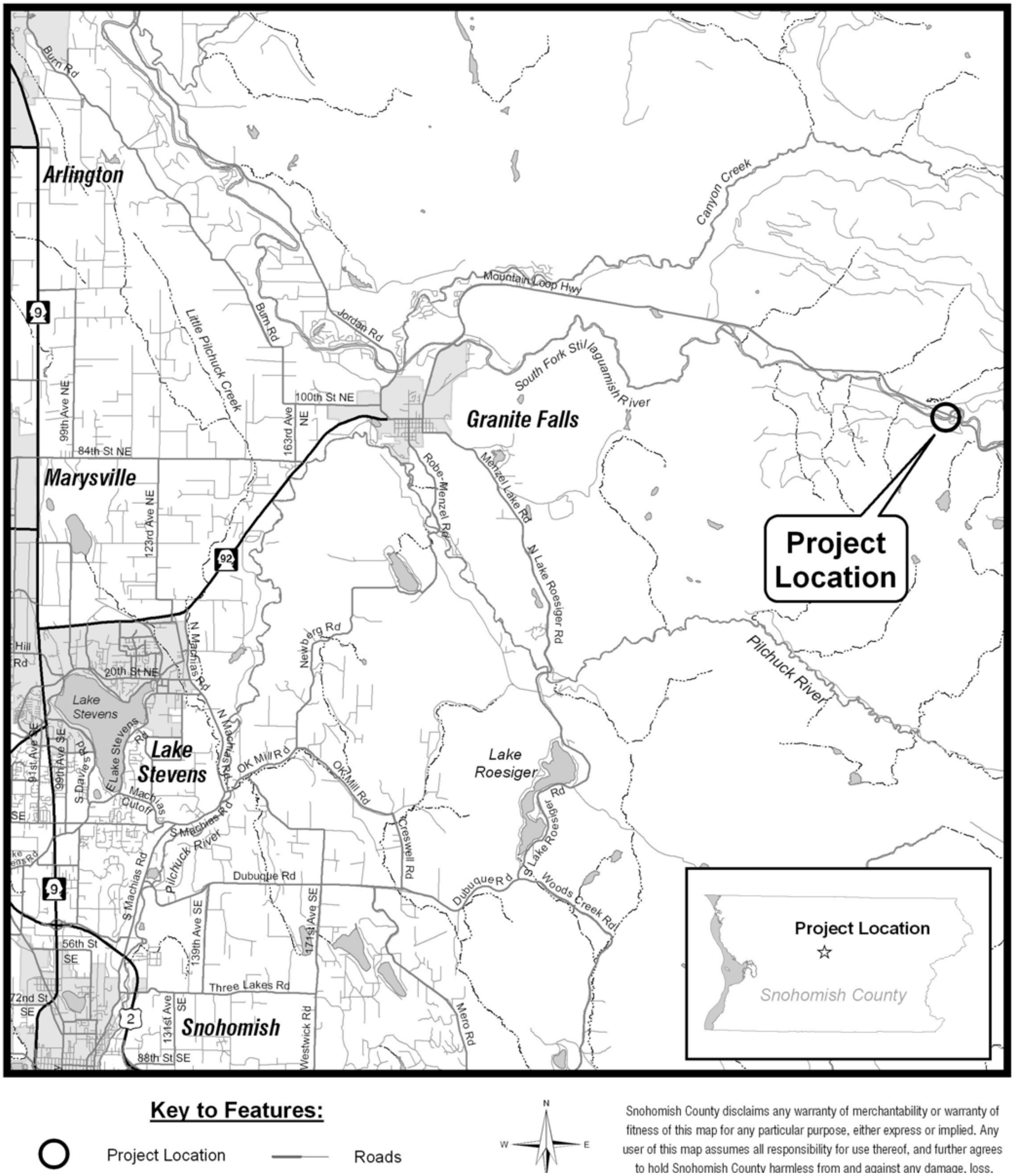


Figure 1: Project Location

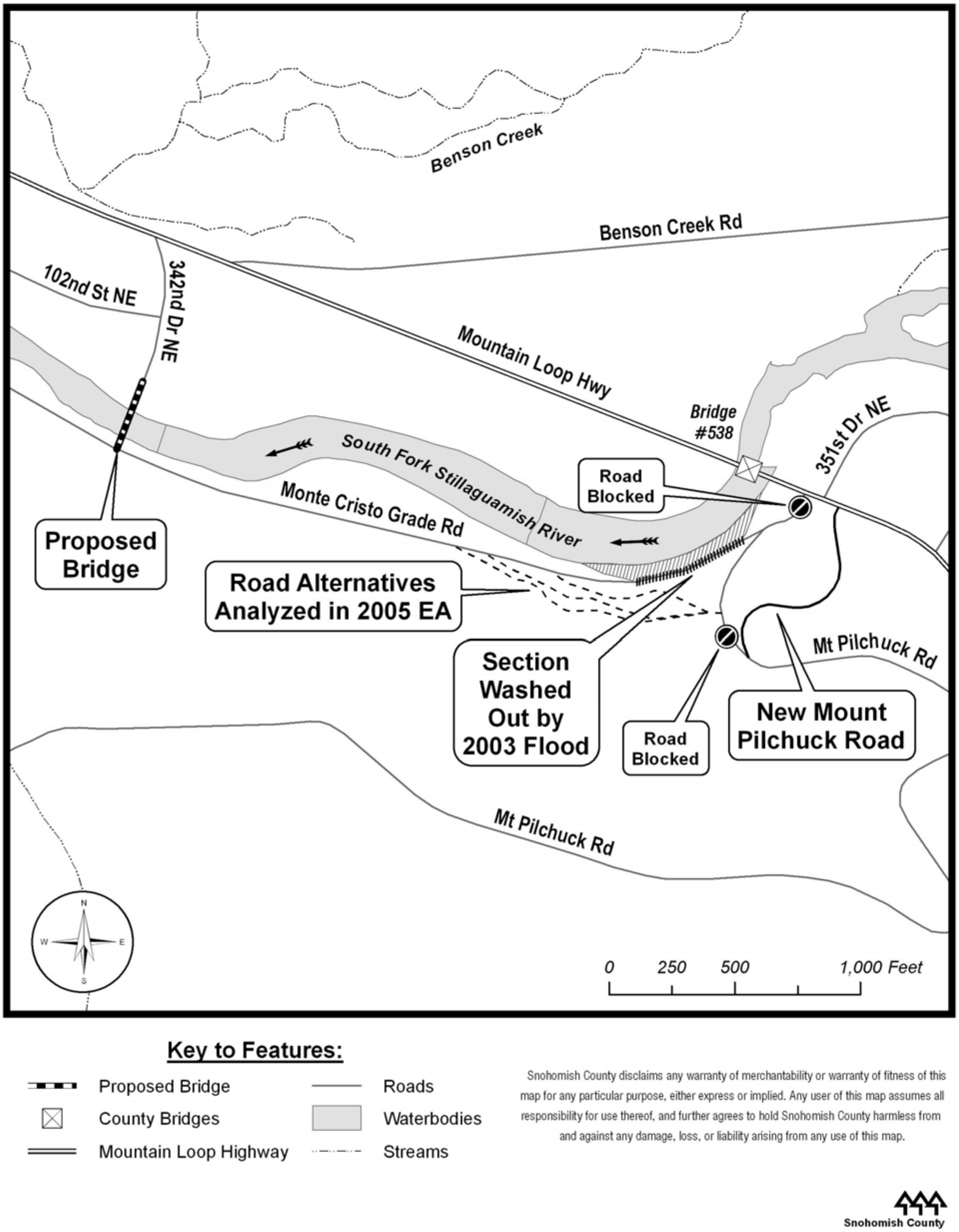


Figure 2: Project Vicinity

1.2. Purpose and Need for Action

The purpose of FEMA's Public Assistance Program is to assist local communities requesting funding to recover from damages caused by natural disasters. Snohomish County needs this proposed action to provide a safe, economical and continuous access to the 24 parcels and 15 property owners (including one permanent resident) along the road. The proposed bridge would restore the original function of the Monte Cristo Grade Road. Without the bridge, the property owners have no vehicular access to their properties. The purpose of the Action Alternative (Bridge Option) presented in this EA is to restore vehicular access to the road with the least environmental impact.

1.3. Location and Background

The 2003 floods washed out a section of the Monte Cristo Grade Road just outside the community of Verlot in Snohomish County, Washington, (Township 30N, Range 8E, Section 15, W.M.). Verlot is located on the Mountain Loop Highway, approximately 55 miles northeast of Seattle and 11 miles east of the town of Granite Falls. The Mountain Loop Highway is designated as a National Forest Scenic Byway and is a popular fifty mile loop road between the towns of Granite Falls and Darrington, Washington. This road provides access to an extensive network of hiking trails, campgrounds, climbing and picnicking areas. Segments of the road typically close due to snow during the winter months.

The section of road that washed out during the 2003 flood is at River Mile (RM) 47.2, along the left bank (facing downriver) of the South Fork Stillaguamish River. It is 0.1 mile from the intersection of the Mountain Loop Highway and Mount Pilchuck Road (USFS Road #42) just east of Snohomish County's Bridge #538 (commonly known as Blue Bridge). (See Figure 2: Project Vicinity).

During the 2003 flood, it was estimated that the flood flows reached approximately 10-12 feet above the low flow river levels at the washout site (Van Wormer 2005). The high flow undermined the mostly unconsolidated hillside where the road was located and removed 40 to 60 feet (horizontal distance) of the riverbank, which amounted to 30,000-40,000 cubic yards (cy) of sand, gravel, and cobble (Van Wormer 2005). The river bank has continued to erode and an additional section of the road was lost during a 2006 flood event.

Snohomish County has installed concrete barricades and signs on the Mount Pilchuck Road to prevent vehicular traffic access to the Monte Cristo Grade Road. Approximately two miles of the Monte Cristo Grade Road is isolated by the washout. At present, owners of the properties along the road must walk around the eroded area to reach their parcels. There is currently no vehicular access to these properties. The U.S. Forest Service (USFS) administers adjacent land in the project area as part of the Mount Baker-Snoqualmie National Forest. (See Figure 3: 2003 Washout Site).

1.3.1. Alternatives Analyzed in the 2005 Draft Environmental Assessment

The *Draft Environmental Assessment for the Reconstruction of the Monte Cristo Grade Road, April 2005*, examined three road alignments at the washout area and a No Action Alternative. The draft EA also discussed three options that were considered but not carried forward. One of these options was to reconstruct the road along its original alignment. However, it quickly became apparent that this was not a viable option as the South Fork Stillaguamish River now occupies much of the 650-foot washed out roadbed. The bluff would need extensive excavation and stabilization to rebuild the road. Another alternative considered but eliminated would have required the construction of a new road within several perennial streams, seeps and wetlands. This option would require extensive use of a Mechanized Stabilized Earth wall. A third option initially considered but rejected was the construction of a 3,500 foot long road from the Mount Pilchuck Road directly upslope of the washout. This option was eliminated due to the cost, long length and need for numerous switchbacks.

The alternatives carried forward and evaluated in the 2005 Environmental Assessment were:

- Alternative A: No Action Alternative;
- Alternative B: Northern alignment
- Alternative C: Middle alignment immediately upslope
- Alternative D: Southern alignment slightly farther upslope in some locations.

Environmental impacts are associated with all three action alternatives. The bank above the river is eroding and geologic evidence indicates that mass wasting of the bluff will continue, especially during high flows. A washout of a new road constructed on this bank could potentially occur due to this continued mass wasting and landslide activity. Landslides contribute high sediment loads to the watershed which can potentially impact fish habitat in the river. The new road alignments would also remove riparian habitat which provides shade, terrestrial insects and a source of large woody debris. Riparian buffer would need to be replaced with a Mechanized Stabilized Earth (MSE) wall to support the new section of road.

Following analysis of these three alignments, another alternative was proposed that would restore access to the Monte Cristo Grade Road but would have fewer environmental impacts. A bridge was proposed just down stream of the three proposed road alignments.

The bridge would be in the same location as a previous bridge constructed in the 1930s and removed in the 1970s. At that time the bridge was in need of repair and it was decided to remove the structure. The Mount Pilchuck Road connected with The Monte Cristo Grade Road and provided adequate access to the properties on the south side of the Stillaguamish River. The original concrete bridge abutments and center pier remain, but the deck and other structural elements were removed in the 1970s. Preliminary analysis indicated that constructing a bridge in this location would have fewer environmental impacts than creating a new road on the steep slopes around the washout site. The following is an analysis of the bridge alternative.

2. ALTERNATIVES

2.1. Alternatives Analyzed in this EA

Evaluation of the potential alternatives to restore vehicle access to the Monte Cristo Grade Road resulted in two alternatives carried forward for analysis in this EA:

- Alternative A – Bridge Option-Construct a bridge on previous bridge site at 342nd Drive NE and connect to the Monte Cristo Grade Road
- Alternative B – No Action Alternative

Site of Monte Cristo Grade Road washout, October 22, 2003 (looking downriver).

Washout site on December 3, 2007 during high flow (looking downriver from Blue Bridge).

Figure 3: 2003 Washout Site

2.1.1. Alternative A – Action Alternative: Bridge Option

Floods in 2003 washed out a portion of the unpaved Monte Cristo Grade Road near the Mountain Loop Highway leaving the remaining portion of the Monte Cristo Grade Road inaccessible. This project would re-establish access to Monte Cristo Grade Road by constructing a bridge across the South Fork of the Stillaguamish River, connecting 342nd Drive NE to the Monte Cristo Grade Road on the south side of the river. The Monte Cristo Grade Road dead ends at the Stillaguamish River, approximately 1.35 miles west of the bridge site.

The proposal is a one-lane vehicular bridge located where an earlier bridge stood. The original bridge and piers were constructed in the 1930s. The original steel truss superstructure was removed in the 1970s, leaving the center concrete pier on the north side of the river and concrete abutments on the north and south banks. The bridge was structurally deficient at that time and the Monte Cristo Grade Road was also accessible from the Mount Pilchuck Road.

A geotechnical evaluation of the remaining structures was conducted in 2006. According to this study, the existing center pier would need to be removed and replaced due to inadequate scour resistance and vertical load capacity. It is anticipated that the concrete abutment on the south side of the river would be left in place and modified to accommodate the new superstructure. If after more detailed analysis it is determined to be deficient, the abutment would be removed and replaced in the same location. A new abutment would also be constructed at the north end of the bridge at the end of 342nd Drive NE.

A prefabricated two-span, steel bow truss is planned for the superstructure. The first span between the north abutment and the center pier would be approximately 92 feet long and the second span over the main river channel would be approximately 152 feet long. Each span would be fabricated and installed as simple-spans. The horizontal alignment is straight with no skew at the new pier and abutment. The center pier and north abutment will be supported by pile foundations. The piles are planned to be vibrated in place. If it is not possible to vibrate the piles they would be driven into place.

The vertical alignment is straight with an upward slope from south to north of about 0.8%. The transverse slope on the bridge is flat. The bridge decking is planned to be open steel grate. The lane width would be 12 feet wide and the outside width would be approximately 14 feet wide.

Additional work includes grading and paving needed for the roadway approaches, grading to match existing driveways and modifying adjacent drainage ditches to provide water flow away from the new bridge abutments. Guardrail would be installed at the bridge approaches. It is anticipated that stormwater detention would not be required and that low impact development techniques would be used to treat the stormwater from the road approaches and possibly from the bridge. The new bridge and road approaches would be constructed within Snohomish County right-of-way. No additional right-of-way would be required. Temporary construction easements would be needed from adjacent properties for equipment access and staging areas.

The Monte Cristo Grade Road would remain unpaved following construction of the bridge. The road would be permanently barricaded in the area of the washout. (See Figure 4: Proposed Bridge Location).

Summary of Pier and Abutment Construction:

North abutment: The existing abutment would be removed. The new north abutment is proposed to be constructed of five vibrated or driven pipe piles with a pile cap. The piles are assumed to be 18 inches in diameter with an estimated length of 50 feet each.

Center pier: The existing center pier would be removed. The new center pier is proposed to be constructed of seven vibrated or driven steel pipe piles, covered with a concrete cap. The piles are assumed to be 24 inches in diameter. A reinforced concrete pier wall would extend from the pile cap to the bridge structure.

South abutment: The existing south abutment would be left in place, cleaned and reused to support the south end of the new truss. Some additional concrete may be needed to modify the abutment for the new bridge superstructure.

2.1.2. Alternative B – No Action Alternative

NEPA suggests including analysis of a "No Action Alternative," against which the effects of the action alternatives can be evaluated and compared. For the purpose of this EA, the No Action Alternative would keep the road in its current state of disrepair. No effort would be made to provide vehicle access to private residences or the private land farther downstream from the road wash-out.

Snohomish County would continue to maintain barriers at the eastern end of the road near the junction with the Pilchuck Road. FEMA funding, while available for a reconstruction of a damaged road, is not available for a land purchase program with unwilling sellers. Thus, Snohomish County would be responsible for the cost of any private property buy-out program that might be proposed to mitigate for the loss of personal use of the lands affected by the washout.

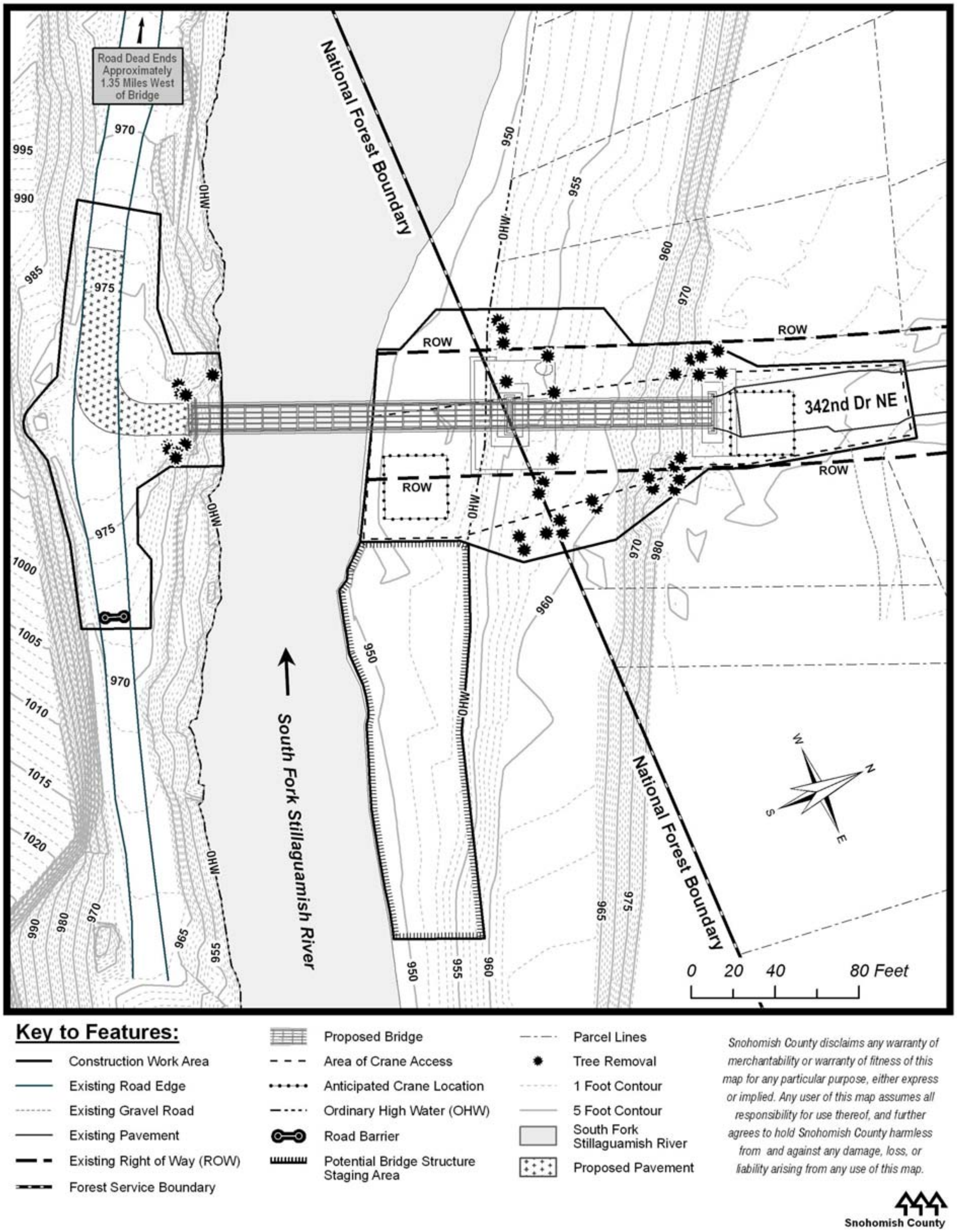
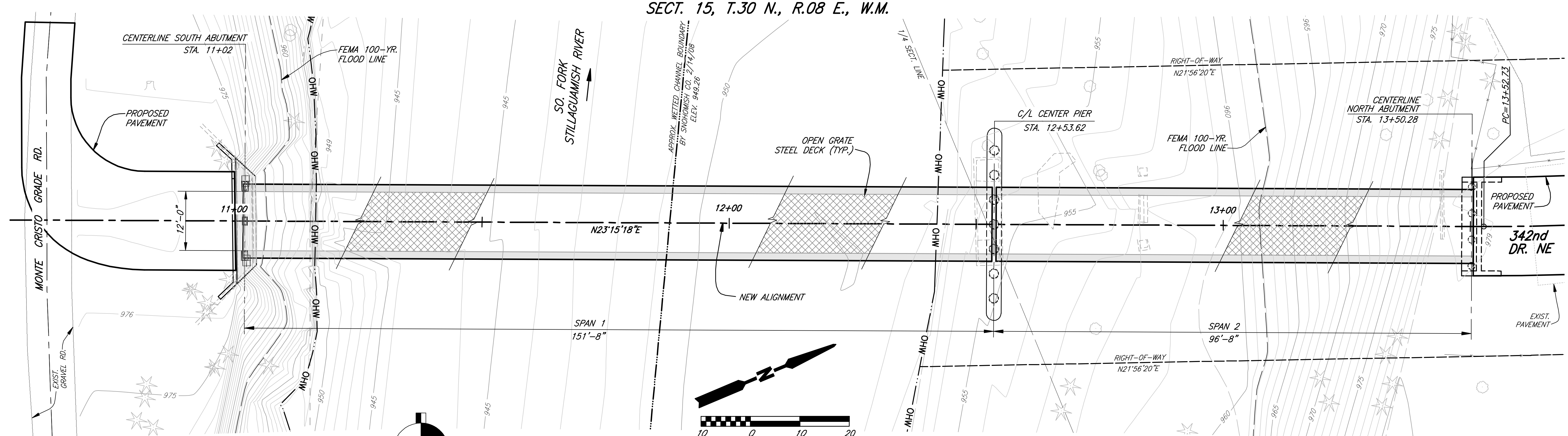
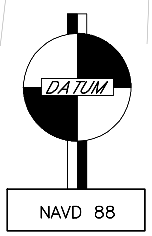


Figure 4: Proposed Bridge Location

SECT. 15, T.30 N., R.08 E., W.M.



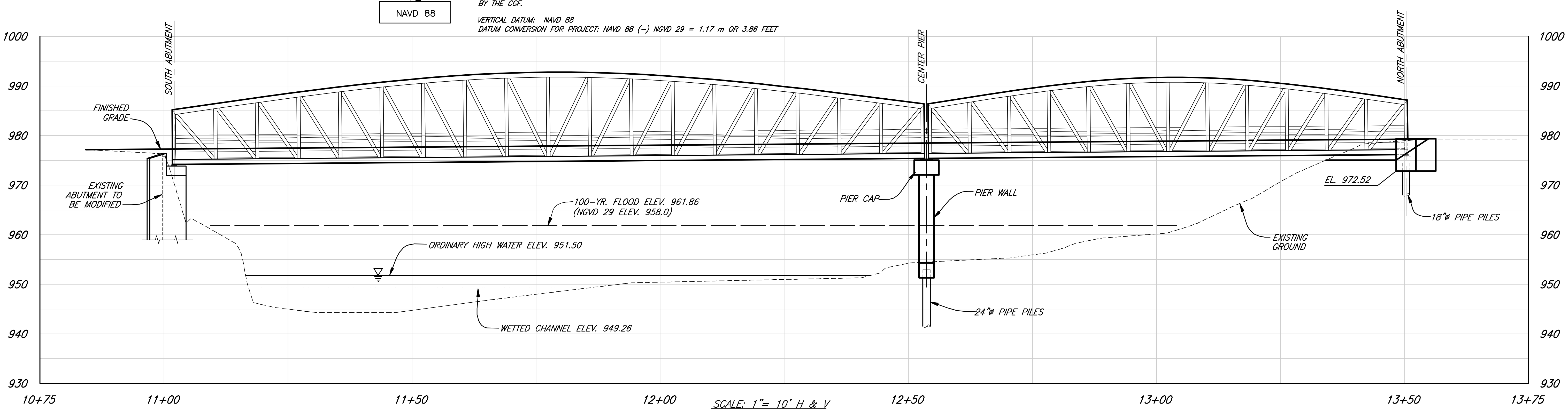


DATUM NOTE:

HORIZONTAL DATUM: N.A.D. 83/91 ADJUSTMENT, STATE PLANE COORDINATES (S.P.C.), WASHINGTON NORTH GRID. COMBINED GRID FACTOR (CGF) USED WAS 0.999881556, FROM THE SNOHOMISH COUNTY DATABASE. TO GET GROUND DISTANCES FROM SHOWN DISTANCES, MULTIPLY BY 1.000118458 .

TO CONVERT BACK TO S.P.C., SUBTRACT 100,000 METERS (328,083.333333333333333 FT.) & MULTIPLY BY THE CGF.

VERTICAL DATUM: NAVD 88
DATUM CONVERSION FOR PROJECT: NAVD 88 (–) NGVD 29 = 1.17 m OR 3.86 FEET



SCALE: 1"= 10' H & V

DATE	NO.	REVISION	BY	DES.	SURV.	R/W	CONST.

Last Saved By: spwrtr May 13, 2008 – 2:17pm

REGION NO.	STATE	FED. AID PROJ. NO.	SURVEY NO.
10	WASH.		3870

DESIGNED BY: L.WIRT
DRAWN BY: TWN, RTR
FIELD BOOK(S):
UPI # 06–0082

STRUCTURE DESIGN BY: WHPacific

APPROVED FOR CONSTRUCTION

OWEN B. CARTER, P.E.
SNOHOMISH COUNTY ENGINEER

DATE APPROVED:

SNOHOMISH COUNTY
DEPARTMENT OF
PUBLIC WORKS

PROJECT NO. RC1513

MONTE CRISTO GRADE RD.
BRIDGE REPLACEMENT
BRIDGE SITE
PLAN AND PROFILE

REFERENCE SHEET NO.

SHEET 1 OF 1 SHEETS

Plotted: May 15, 2008 – 11:49am spwrtr S:\PW_Project_Data_Management\6-PROJECTS_UPI Year_2006\06-0082\2 CADD\2.1 production data\drawings\Design\Exhibits\06-0082 Plan-Prof Exhibit.dwg Layout Name: Plan-Prof

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The following section discusses the existing conditions by resource and the potential effects of the proposed bridge. Cumulative impacts are discussed separately for all resources in Section 3.13. Measures to minimize project impact are also described.

3.1. Soils, Geomorphology, and Streambank Stability

3.1.1. Affected Environment

The project area is situated on the lower slopes of a predominantly north-facing slope of Pilchuck Mountain. The geologic unit in this area consists of Quaternary glacio-lacustrine silt that typically was deposited on either Vashon-age till, recessional outwash or bedrock. The area of the washout is composed of thick layers of fluvial and glacial outwash deposits on bedrock (Van Wormer 2005). The eroded riverbank reveals three layers of outwash: (1) an upper layer dominated by gravely sand and cobble, (2) a middle layer composed of fine sand, and (3) and lower gravely sand layer. This lower layer is being actively eroded by the river which, in turn, results in the upper layers giving way. A summary of geologic observations for the site was provided by Findley and Kammereck (2004), which characterized the road location as being on a glaciofluvial terrace approximately 30 ft above the river. The general geology is mapped as Pleistocene glacial deposits overlying Western Melánge Belt lithologies (Tabor 1988 as cited in Findley and Kammereck 2004). There are several small bedrock outcroppings suggesting a rather irregular bedrock surface. The steep slopes to the east of the eroded bluff are likely underlain with bedrock.

Snohomish County conducted a separate geophysical survey in January 2005 to evaluate the depth of bedrock in the area of the different road alignment options (Findley et al. 2005). The geophysical survey found that the bedrock surface generally dips to northeast with a slope angle of approximately 40 - 60 degrees (Findley et al. 2005). Findley et al. (2005) recommend that, in some locations along proposed road alignments, the exact depth to bedrock should be investigated further to determine appropriate construction techniques. Granular soils with some wet seeps dominate the eastern portion of the road alignments, while shallow bedrock occurs along the western portion. Additional geotechnical analysis was conducted by Golder Associates and a report submitted to Snohomish County in April 2008.

The combination of channel morphology and erodible surfaces suggests that the large volume of outwash deposits along the bluff at the road washout site is likely to continue to actively erode over the long-term (Findley and Kammereck 2004).

The presence of Bridge #538 on the Mountain Loop Highway (commonly known as Blue Bridge) just upstream of the project site, contributes to the river not being able to migrate as it would under natural conditions. This likely contributes to the river flows continually eroding the riverbank at the site of the 2003 washout. The clay, silt, and sand deposits of glacial and lake origin are the main source of the significant sediment production in the watershed (Perkins and Collins 1997, as cited in WSSC 1999). In the steeper sloped areas, these deposits are particularly prone to landslides. Seventy-five percent of the more than 1,000 landslides documented in the entire Stillaguamish watershed were associated with human disturbance, most commonly clear cuts or roads (Perkins and Collins 1997 as cited in Stillaguamish Lead Entity, 2004). Major sediment contributions on the South Fork Stillaguamish are at Gold Basin (SLE 2004), which is just upriver from the project. The Gold Basin landslide is listed as a priority site for sediment reduction projects by the SLE (2004).

The Snohomish County Soil Survey characterizes the soil in the vicinity of the bridge site as Skykomish gravelly loam, 0 to 30 percent slopes (U.S. Soil Conservation Service 1983). This soil is very deep, somewhat excessively drained soil and occurs on terraces, terrace escarpments, and outwash plains. The soil formed in glacial outwash and volcanic ash. The substratum to a depth of 60 inches or more is extremely gravelly loamy, coarse sand, and extremely gravelly coarse sand. Included in this unit are areas of Elwell and Olomount outcropings on mountainsides and ridgetops and Rober soils on terraces and terrace escarpments (U.S. Soil Conservation Service 1983). These soils are seasonally wet. Another soil in the vicinity is Nargar Variant sandy loam 3- 30 percent which is deep well drained soil on terrace escarpments and mountainsides.

The Geologic Map of the Sauk River (30- by 60 Minute Quadrangle, Washington) shows the bridge site lies within an area covered by Holocene-age (less than 10,000 years ago) river alluvium, deposited by the South Fork Stillaguamish River. The recent geologic history of the project site consists of the incision of the stream into the bedrock creating the original valley, subsequent infilling of the valley with Holocene-age alluvium (silts, sand, gravel and boulders) followed by river incision through the deposited alluvium resulting in well developed terraces. On of these terrace surfaces forms the area of the north bridge abutment.

Channel bed material consists of approximately eight feet of coarse gravels and cobble deposits atop a deep lens of medium sands. (Ambrose 2008). Explorations of the north abutment and center pier site encountered exclusively fluvial deposits. These deposits were dominated by fine to course sands but also contained some layers and lenses of silt. In additions the borings contained gravel and boulder deposits in the upper portions capping each hole.

The south abutment area consists of a cast in place concrete structure that appears to be founded on bedrock. Bedrock exposed several tens of feet upstream of the abutment consisted of fresh foliated, medium dark gray to dark gray, fine grained granulose, very strong phyllite. Bedding or foliation dips to the north-northeast at around 70 degrees.

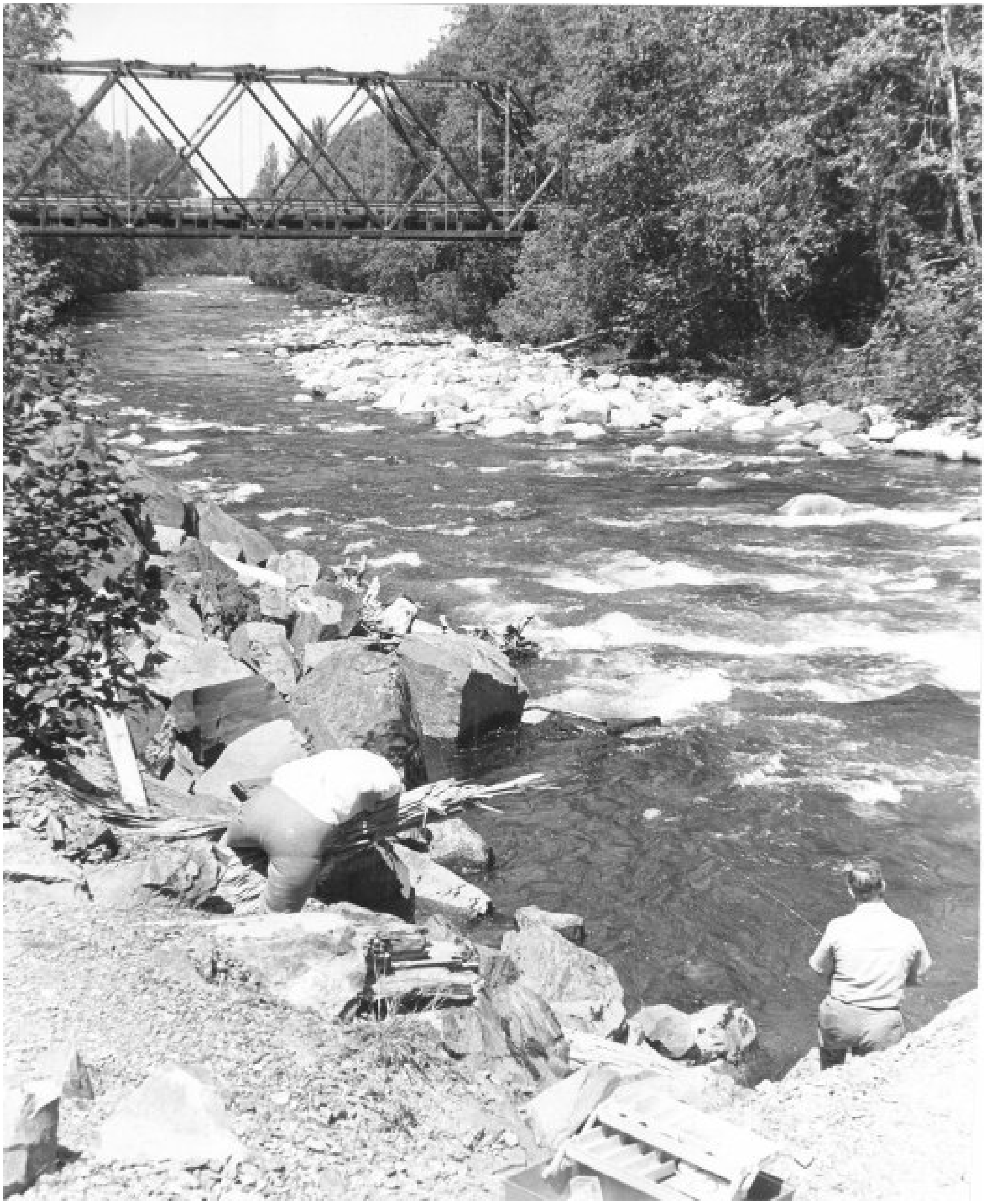


Figure 6: Original Bridge (circa 1970)

3.1.2. Environmental Consequences

3.1.3. Alternative A – Bridge Option

Under the Bridge Option a prefabricated two-span steel truss is planned. The existing pier would be removed and replaced with a new one in approximately the same location. Grading would be required to remove and replace the abutment at 342nd Drive NE and match existing road grades. Some grading would also be required on the south side of the river to match the existing grade at the old abutment which will be reused, if possible. Clearing and grading will occur within the County right-of-way. Construction easements may also be required from private landowners adjacent to the project site and U.S. Forest Service. Site preparation will include the removal of vegetation, unsuitable fill and topsoil from the construction area. In general, the fill appeared to be suitable for reuse as structural fill. (Golder 2008).

Impacts to North Side of the River

Construction would occur during the dry season. Ground impacts on the north side of the river include excavation for removal of the center pier and construction of a new pier. The proposed center pier would be at approximately the same location as the existing pier. The old pier is a cast-in-place structure with two columns supporting a concrete cap. (See Figure 7: Existing Concrete Pier). Impacts would also include excavation and removal of the existing north abutment where 342nd Drive NE dead ends. The abutment would be replaced with piles.

The new center pier will be supported by seven 24-inch diameter pipe piles driven to refusal. The north abutment would be supported by five 18-inch piles driven to refusal. Open-ended pipe piles are recommended due to their drivability in the granular soils encountered at the site. The depth of excavation for the center pier and north abutment piles is not determined at this time. Additional investigation is planned to determine the site design scour depth, the elevation and shape of the pile cap and pile depth.

A geologic site investigation encountered cobbles and boulders from the surface to depths between 7-8.5 feet in the area of the proposed pier. It is likely the depth of the obstructions will vary across the pile caps. Pre-drilling or excavation and backfilling with structural material may be needed prior to pile driving. If the pile cap is constructed below groundwater, a coffer dam and/or pumping may be required during construction. (Golder 2008).

Clearing and grading would also be needed at the dead end of 342nd Drive NE to match the existing road grade and for a temporary construction access road down to the beach. There is an existing, non-vegetated slope from the dead end of 342nd Drive NE down to the river level where the original bridge was located. This bank would be graded for equipment access down the north bank to the cobble beach. There is potential for soil erosion on this bank during clearing, grading and construction.

At the river level, approximately 310 cubic yards of temporary fill would be needed for the crane pads and construction access. The beach area is sandy, relatively flat with cobbles and boulders. The pad areas would be cleared and geo-textile laid down and covered with compacted gravels and quarry spalls to provide a base for the crane pads and construction access. Existing cobbles and boulders from the crane pad locations would be stockpiled. This material would be redistributed to restore the site following construction. The geo-textile and gravel used for the crane pads will be removed following construction.

Impacts to the soil are assumed to include: equipment movement, excavation for permanent and temporary bridge supports, access road construction and placement of a crane pad. A temporary support may be required for the bridge superstructure during construction. This temporary pier would be located just south of the existing pier and north of the wetted channel boundary. An area just east of the bridge site may be needed to temporarily stage the bridge sections during construction. This area is shown on Figure 4: Proposed Bridge Location and is approximately 12,340 square feet. Impacted areas would be returned to pre-existing conditions as closely as practicable and as required by all permits. Permanently impacted areas are approximately 400 square feet at the center pier, 100 square feet at the north abutment and 2,200 square feet for grading on 342nd Drive NE.

Liquefaction is assumed to occur in the sand deposits in the area of the bridge. Further investigation, including additional borings, is needed to determine depth of piles to minimize structural damage during an earthquake.

Impacts to South Side of River

Impacts to soils on the south side of the river consist primarily of grading to match the Monte Cristo Grade Road on either side of the existing abutment. The impacted area would be about 10,000 square feet. There would be no grading work below the OHWM on the south side of the river. All work would be on the existing road, rock bluff and existing concrete abutment above the river.

This old abutment is assumed to be a cast-in-place structure founded on exposed bedrock. The top of the abutment is nearly flush with the surrounding ground. The structure is approximately 14 feet in height from the road surface to the base. The abutment would be cleaned and reused. The abutment would be modified with additional concrete to support the bridge, if necessary.

The Monte Cristo Grade Road dead ends approximately 1.35 miles west of the bridge site. This gravel road has not been maintained by the Snohomish County Road Maintenance Division since the flood of 2003 washed out the vehicular access. Based on a recent inspection of the road (May 2008) sections of this road would need to be cleared to allow vehicle use. Fallen trees and branches would be removed and several blocked culverts would be replaced. Some regrading and placement of gravel would be needed. The river bank may be stabilized in several areas where scalloping and minor bank erosion has occurred. Maintenance of this road would be a separate Snohomish County project from the bridge replacement and would occur after vehicular access has been restored.

3.1.4. Alternative B – No Action Alternative

Under the No Action Alternative the soils and geology at the bridge site would remain in its current condition. The existing concrete bridge pier would not be removed and the southern abutment on top of bedrock would remain. No grading would be done at the bridge site.

3.2. Hydrology and Water Quality (and Executive Order 11988)

3.2.1. Affected Environment

The Stillaguamish River basin has a drainage area of approximately 685 square miles (WSSC 1999) and consists of two main streams; the North and South Fork Stillaguamish River. The confluence of these two forks is near the City of Arlington in northwest Snohomish County.

The South Fork Stillaguamish River begins in the Barlow Pass area at about 6,200 feet elevation and carries snow melt and rainfall from the high and steep slopes of the Cascade Mountains. It drains approximately 254 square miles and includes over 4,618 miles of streams and rivers (WDOE and SCPW 2003).

The Monte Cristo Grade Road Bridge project site is located near the upstream boundary of the Robe Valley Subbasin in Hydrologic Unit171100080202 (USGS website). This sub-basin encompasses over 15,000 acres of land. The 20 miles of the South Fork Stillaguamish River just upstream of the project site has a moderate gradient—33 ft vertical change/mile—while the river upstream of that is steep (100 ft/mile) (WDOE and SCPW 2003).

South Fork Stillaguamish flows are often subject to extremes in fluctuation. U.S. Geologic Survey (USGS) flow data over a 53-year period of record for the USGS gage at Granite Falls (gage #12161000) indicate that flows have fluctuated up to a maximum of 32,400 cubic feet per second (cfs) (February 1932) (USGS website). This flow approaches the estimated 100-year flood flow for this gage (Table 3.2-1). Mean monthly flows range from a low of 299 cfs in August to a high of 1,663 cfs in December. Major tributaries in this sub-basin include: Bear, Black, Boardman, Gordon, Hemple, and Wiley creeks (WSCC 1999). The Robe Valley receives approximately 103 inches of precipitation per year (WDOE and SCPW 2003).

Table 3.2-1 Peak Flows Return Interval at Granite Falls.

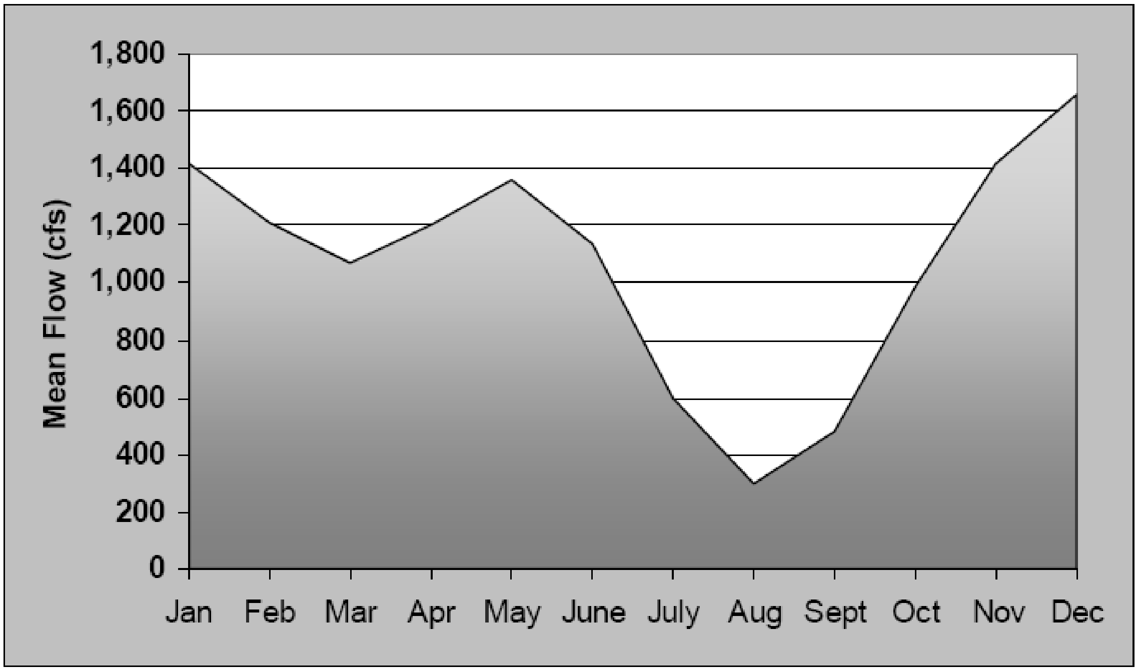
Recurrence Interval	Flow (cfs) at Granite Falls
2-year	16,400
5-year	21,700
10-year	25,000
25-year	28,600
50-year	31,900
100-year	34,800
500-year	41,200

Source: WDOE and SCPW (2003)

Existing concrete pier to be removed: Top photo is looking south. Bottom photo is looking north.

Figure 7: Existing Concrete Pier

Table 3.2-2 Mean Monthly Flows (cfs) at Granite Falls Gauge



The Robe Valley sub-basin is one of four in the entire Stillaguamish watershed that meet four criteria for being sensitive to forest practices affecting hydrology (SCSWM 2002). These criteria include having:

- A Unit Flood Discharge that is greater than 0.25 cfs/acre
- More than 35 percent of the area in the rain-on-snow zone
- Greater than 12 percent of the forestland in scrub-shrub stage
- Greater than 35 percent of forestland being non-federal

In terms of water quality, the South Fork Stillaguamish upriver of Canyon Creek (RM 33.7) is considered to be Class AA (extraordinary) as defined by the Water Quality Standards for Surface Waters of the State of Washington (Hicks, 2000 as cited in Pelletier and Bilhimer [2001]; Chapter 173-201A-030 WAC). Temperatures in Class AA waters are not to exceed 16°C due to human activities (Pelletier and Bilhimer 2001, Chapter 173-201A-030 WAC). The South Fork has a high sediment load (0.5 tons per mi^2 per day) but not nearly as high as the North Fork, which has 4.9 tons per mi^2 per day (Pelletier and Bilhimer 2001).

The Stillaguamish River comprises the Water Resource Inventory Area (WRIA) #5. WRIAs define watershed areas monitored by the Washington Department of Ecology (WDOE) for water quality impairments, contamination, and degradation. Portions of streams and rivers not meeting basic water quality requirements are included on a 303(d) list. No surface waters within the South Fork Stillaguamish basin are included on WDOE's 303(d) list, and only small portions of streams in the lower mainstem Stillaguamish are 303(d) listed.

This very limited number of 303(d) listings provides an indication of the general health and quality of water existing in the South Fork Stillaguamish River basin. However, the number of reported water quality violations in this watershed is increasing as evidenced by Washington State's growing number of 303(d) listings in the Stillaguamish drainage (WSSC 1999). WDOE will eventually implement a Total Maximum Daily Load (TMDL), defined as the sum of all pollutant loads to a water body, for each stream or lake on the 303(d) list. The South Fork Stillaguamish River is a candidate for 303(d) listing for fecal coliform, pH, dissolved oxygen, and temperature (WDOE 1998, as cited in WSSC 1999).

Lands within the Robe Valley sub-basin are dominated by unmanaged forests and areas managed for silviculture. Very few rural communities and developed areas with potential for point-source pollutant contributions occur within the South Fork Stillaguamish River sub-basin upstream of the town of Granite Falls. Thus, the South Fork Stillaguamish River has a very limited potential for water quality impairments. While South Fork Stillaguamish River contaminant risk may be minimal, sediment loading within the river can become extreme depending upon precipitation and land use alteration. South Fork Stillaguamish River sediment load becomes especially high during periods of fall/winter rains and when increased surface flow from snowmelt conveys loose surface substrate from surrounding lands.

Flow characteristics in the river near the washout site are likely affected by the presence of the Mountain Loop Highway Bridge 0.1 mile upstream (Bridge #538, Blue Bridge). The bridge abutments and the adjacent highway roadbed play a role in directing flows toward the south and not allowing the river channel to naturally migrate the west. At low flows, the thalweg (deepest part of the channel) is farther to the north, away from the washout site. But as flows increase the flow path becomes aimed directly at the landslide area (Van Wormer 2005). However, the reach of the channel through the project area appears to be much more stable than reaches upstream (Ambrose 2008). This section is considered a transport reach that tends to move large wood and sediment through rather than accumulate in large deposition areas. The geometry and alignment in this area is less subject to migration and wood accumulation than areas upstream. These are the mechanisms by which channels tend to migrate into their banks or avulse into historical channels.

3.2.2. Environmental Consequences

3.2.3. Alternative A – Bridge Option

Standard Best Management Practices would be used control erosion and sedimentation at the site during construction. These could include silt fences, check dams in swales, filter strips and baker tanks. There are no other stream or wetland crossings at the bridge site.

The proposed bridge would comply with Executive Order No. 11988, Floodplain Management. The center pier is above the OHWM but within the river's flood plain. The pier is designed to withstand flooding and would not alter the hydrology of the river. The footing of the pier would be below the scour depth of the river. The pier will be designed as a solid wall to minimize debris getting caught on the pier. The center pier would not affect the channel migration capacity of the river. The 100-year flood elevation is 958 feet according to FEMA Flood Insurance maps. The bottom of the bridge is approximately 13 feet above the 100-year flood elevation and the ordinary high water (OHW). (See Figure 5: Bridge Site Plan and Profile).

The bridge would be constructed during the dry season to reduce impacts to the river. However, depending on the river level during construction, a temporary water diversion could be necessary for construction of the center pier, temporary supports and crane pads. Work would be limited to the area above the wetted channel boundary (defined by County staff on February 14, 2008).

If dewatering is needed during construction of the center pier it could be performed with cofferdams constructed of sheet piling, precast concrete blocks or median barrier, sand bags and plastic sheeting. Once the cofferdam is in place, water would be pumped out.

It is anticipated that the south abutment would be retrofitted with cast in place concrete to meet current design standards. The abutment was scraped clean by hand (winter 2008) to remove moss, plants and soil and other accumulated debris. Final cleaning to ensure a proper bond of new concrete would require pressure washing with water. Silt fence, straw bale barrier and other appropriate best management practices (BMPs) would be used to control water runoff. Limits on time of continual washing can be in place as well to limit the buildup of water. The contractor would be required to meet all applicable water quality and Temporary Erosion and Sediment Control (TESC) requirements due to construction activities.

There is no vehicular access to the south side of the river due to the 2003 washout upstream. Equipment and materials to construct the bridge would be carried across a temporary work bridge and or lifted into place by a crane.

Concrete needed to restore the south abutment would be lifted across the river by a crane in a concrete bucket. It is anticipated that only a few cubic yards of concrete would be needed. Depending on the size of the bucket (generally available in 1/3 cubic yard to 4 cubic yard), only a couple passes over the river would be needed. Properly functioning buckets that do not leak would be specified and the bucket would be wiped clean prior to lifting over the river. If needed, plastic sheeting or other material would be draped below the bucket to ensure no drips from the gate. It may also be feasible to use a concrete pump truck to place concrete at the south abutment. The contractor would be required to have a written, approved plan for carrying concrete over the river and protecting it from spills, drips, etc. prior to bringing concrete on site for both the bucket and pump truck methods.

The roadway approaches would be graded to match the new bridge elevation. The north abutment would be designed to minimize grading on 342nd Drive NE and adjacent driveways. Culverts may be needed at the driveways to improve drainage and direct water away from the new bridge abutments. At the south abutment it is anticipated that the grade would rise by about one foot.

The amount of net impervious surface area is well below 5,000 square feet. Monte Cristo Grade Road will remain unpaved. Due to the seasonal use and limited number of residents the average daily traffic is expected to be very low on the Monte Cristo Grade Road. The estimated traffic volume is less than 20 vehicles per day. Steel grate decking would be used on the bridge. Stormwater detention and water quality treatment are not required in accordance with Volume I of Washington Department of Ecology Stormwater Management Manual for Western Washington.

3.2.4. Alternative B – No Action Alternative

Under the No Action Alternative, site hydrology and water quality at the bridge site would not be altered.

It is likely that the South Fork Stillaguamish River channel will continue to migrate to the south near the washout site, particularly during high flow events. This area would likely continue to erode and contribute sediment to the river.

3.3. Vegetation and Wetlands (and Executive Order 11990)

3.3.1. Affected Environment

Forests in the vicinity of the project site are dominated by western hemlock (*Tsuga heterophylla*), Douglas-fir (*Pseudotsuga menziesii*), and western red cedar (*Thuja plicata*). Deciduous species found in riparian and upland habitats are predominantly red alder (*Alnus rubra*), but a small number of black cottonwood (*Populus trichocarpus*) and big-leaf maple (*Acer macrophyllum*) also occur. Within the Robe Valley sub-basin, 21, 9, and 2 percent of federal, state, and private forest lands, respectively, are considered to be mature (WDOE and SCPW 2003). The vegetation communities near the site have been affected both by stand-replacing fires and logging in the Stillaguamish watershed (Peter 1999, SLE 2004). Poor railroad, road, and culvert design and maintenance have also led to substantial riparian habitat degradation. Nonetheless, the riparian habitat in the Robe Valley sub-basin is considered to be "recovering" (WSCC 1999).

At the bridge site, the vegetation is composed primarily of second-growth mixed coniferous and deciduous forests dominated by cedar, western hemlock and red alder. There are no federally listed plants occurring in the action area. Most of the area to be disturbed for bridge construction consists of existing road grade.

The understory consists of sword ferns, vine maple, salmonberry and thimbleberry. The uplands have been heavily influenced by logging and previous grading activities. The community of Verlot is located on the north side of the river. Vegetation on this side is a mixture of native and non-native plant species.

Narrow shrub-dominated riparian zones occur along streams in the area. The riparian species include salmonberry (*Rubus spectabilis*), vine maple (*Acer circinatum*), devil's club (*Oplopanax horridus*), and ninebark (*Physocarpus capitatus*). The seeps in the area support a mix of hydrophytic and mesophytic vegetation, including: salmonberry, devil's club, and vine maple (Table 3.3-1). Along the Monte Cristo Grade Road on the south side of the river the slopes are forested with large conifers including hemlock and red cedar up to 36 inches diameter at breast height (dbh).

Table 3.3-1 Plant Species Known to Occur in the Project Area

Species	Scientific name	Status	Vegetation Layer	Notes
Douglas-fir	*Pseudotsuga menziesii*	FACU	Overstory	Limited number.
Western Red Cedar	*Thuja plicata*	FAC	Overstory	Limited number

Western Hemlock	*Tsuga heterophylla*	FACU-	Overstory	Common upland species.
Big-leaf Maple	*Acer macrophyllum*	FACU	Overstory	Very limited in number.
Red Alder	*Alnus rubra*	FAC	Overstory	Pervasive in disturbed areas and along the unnamed stream
Black Cottonwood	*Populus balsamifera*	FAC	Overstory	Small number of saplings
Indian Plum	*Oemleria cerasiformis*	FACU	Shrub	Found throughout project site
Red Osier Dogwood	*Cornus stolonifera*	FACW	Shrub	Isolated individuals along river near debris chute.
Vine Maple	*Acer circinatum*	FACU	Shrub	Small number.
Salmonberry	*Rubus spectabilis*	FAC+	Shrub	Most common/dense shrub species in uplands, riparian zone, and wetland
Thimbleberry	*Rubus parviflorus*	FACU+	Shrub	Limited densities in shrub layer
Ocean Spray	*Holodiscus discolor*	FACU	Shrub	Small number along stream
Red Elderberry	*Sambucus racemosa*	FACU	Shrub	Limited in seeps and along stream.
Devil's Club	*Oplopanax horridus*	FAC	Shrub •	Limited densities in seeps.
Sword Fern	*Polystichum munitum*	FACU	Herb	Common component of upland forest community.
Deer Fern	*Blachnum spicant*	FAC+	Herb •	Common component of riparian zone.
Lady Fern	*Athyrium filix-femina*	FAC	Herb	Common component of riparian zone.
Bracken Fern	*Pteridium aquilinum*	FACU	Herb •	Fern of wet and disturbed areas.
Salal	*Gaultheria shallon*	FACU	Shrub •	Small number in upland zone.
Fringecup	*Tellima grandiflora*	FACU	Herb •	Most pervasive ground cover along road.
Piggy-back plant	*Tolmiea menziesii*	FAC	Herb	Common in riparian zone
Foamflower	*Tiarella trifoliata*	FAC	Herb	Common in riparian zone
Common Horsetail	*Equisetum arvense*	FAC	Herb	Found along disturbed roadside areas
Skunk Cabbage	*Lysichiton americanum*	OBL	Herb	Obligate wetland species found in site wetlands

Approximately 78 percent of the historic wetlands in the Stillaguamish River watershed have been impacted or lost (Gersib 1997). There are many riverine wetland sites that have been disconnected by historic flood control projects, although most of this has occurred well downstream of the project site where a large number of wetlands have been degraded by agricultural and urban land use.

3.3.2. Environmental Consequences

3.3.3. Alternative A – Bridge Option

Impacts to vegetation would occur during the clearing and grading needed to construct the new bridge. Some trees and other vegetation would be removed to accommodate the new bridge and the swing radius of the crane which would be used during construction. Approximately 32 trees, 8 inches in diameter or larger, may be removed. Additional smaller trees and shrubs may be removed in the work area to accommodate access, equipment movement and other construction activities. The trees to be removed are primarily alder and western red cedar. (Figure 4: Proposed Bridge Location). All brush and trees removed will be disposed of at an approved site. Some trees removed from the County right-of-way may be suitable for use in stream restoration projects. These trees would be stockpiled for reuse. Removal of the trees and brush will allow more light in the vicinity of the bridge site until the remaining trees grow larger. Mitigation for removal of the trees will include planting native tree species on the south side of the river within the riparian corridor.

This project complies with Executive Order No. 11990, Protection of Wetlands. There are no wetlands in the immediate vicinity of the proposed bridge and no wetlands will be impacted by the proposed bridge construction.

3.3.4. Alternative B – No Action Alternative

Under the No Action Alternative, vegetation would remain unaltered from current conditions. Continued erosion of the riverbank would reduce vegetated land over the long term at a slow rate. If no action is taken to construct the Monte Cristo Grade Road Bridge there would be no impacts or effects to native vegetation communities.

3.4. Wildlife and Fish

3.4.1. Affected Environment

3.4.1.1. Wildlife

The native riparian corridor and managed forests surrounding the project site provide habitat for a broad array of terrestrial wildlife species. Federally listed species under the Endangered Species Act (ESA) are discussed in Section 3.5. During the January site reconnaissance for the 2005 Environmental Assessment conducted by EDAW, biologists only detected chickadee (*Poecile atricapillus* and *P. rufescens*) and American crow (*Corvus brachyrhynchos*) at the washout site. However, the diversity of upland and riparian habitats and the proximity to the South Fork Stillaguamish River likely provide habitat for a variety of wildlife species common to forests of the Pacific Northwest including: various species of warblers, belted kingfisher (*Ceryle alcyon*), dark-eyed junco (*Junco hyemalis*), American robin (*Turdus migratorius*), brown creeper (*Certhia americana*), spotted towhee (*Pipilo maculatus*), red-tailed hawk (*Buteo jamaicensis*), black-tailed deer (*Odocoileus hemionus*), and small furbearers such as mink (*Mustela vision*) and weasel (*Mustela frenata*). The river is likely used by spotted sandpiper (*Actitis macularia*) and common merganser (*Mergus merganser*) that preferentially breed along the river and in riparian habitat and upland habitats.

The seeps and unnamed streams on the south side of the river appear to have habitat that is suitable for several amphibian species, such as coastal tailed frog (*Ascaphus truei*), Pacific giant salamander (*Dicamptodon tenebrosus*), and Pacific tree frog (*Hyla regilla*). Species such as western red-backed salamander (*Plethodon vehiculum*), rough-skinned newt (*Taricha granulosa*), red-legged frog (*Rana aurora*), and ensatina (*Ensatina eschscholtzii*) could occur in the riparian and upland habitats in the area. The tailed frog is a Washington State Monitor species and federal Species of Concern that has been documented in the lower section of Twenty-two Mile Creek approximately one mile southeast of the bridge site. The larger conifer and deciduous trees on the south side of the South Fork Stillaguamish River may be suitable for bald eagles, osprey, and other raptors for use as perches as they forage along the river.

3.4.1.2. Fish

The South Fork Stillaguamish River supports a wide diversity of resident and migratory fish species. Most notable is the extensive variety of resident and anadromous salmonid species (i.e., salmon and trout) that comprise a recreational sport fishery on the river. The Stillaguamish River is managed for wild coho (*Oncorhynchus kisutch*) and chinook (*O. tshawytscha*) stocks; however, hatcheries have supplemented wild runs of summer chinook, chum (*O. keta*), and coho on this river since 1939 (Corps 1997, as cited in WSSC 1999). Hatchery-raised chinook, coho, and pink (*O. gorbushcha*) salmon were introduced to the upper South Fork above Granite Falls after 1954 with the construction of the Granite Falls Fishway. Since 1994, fishing for bull trout/Dolly Varden (*Salvelinus confluentus*) in the Stillaguamish has been closed. Hatchery-origin chinook, chum, coho, and steelhead (*O. mykiss*) are released annually into the Stillaguamish basin.

In recent years, chinook salmon redds have been documented in the South Fork Stillaguamish River between RM 49.0 (less than 2 upstream of the project) and 64.5 (unpublished Washington Department of Fish and Wildlife [WDFW] data provided by C. Jackson). Approximately 51 miles (57 percent) of the 90 miles of stream in the Robe Valley subbasin are thought to support anadromous fish populations (WSSC 1999). Table 3.4-1 lists the common species that occur in the South Fork Stillaguamish River or its tributaries in the vicinity of the project site. The general life stage timing of salmonids is illustrated in Figure 8: General Timing of Salmonid Life Stages.

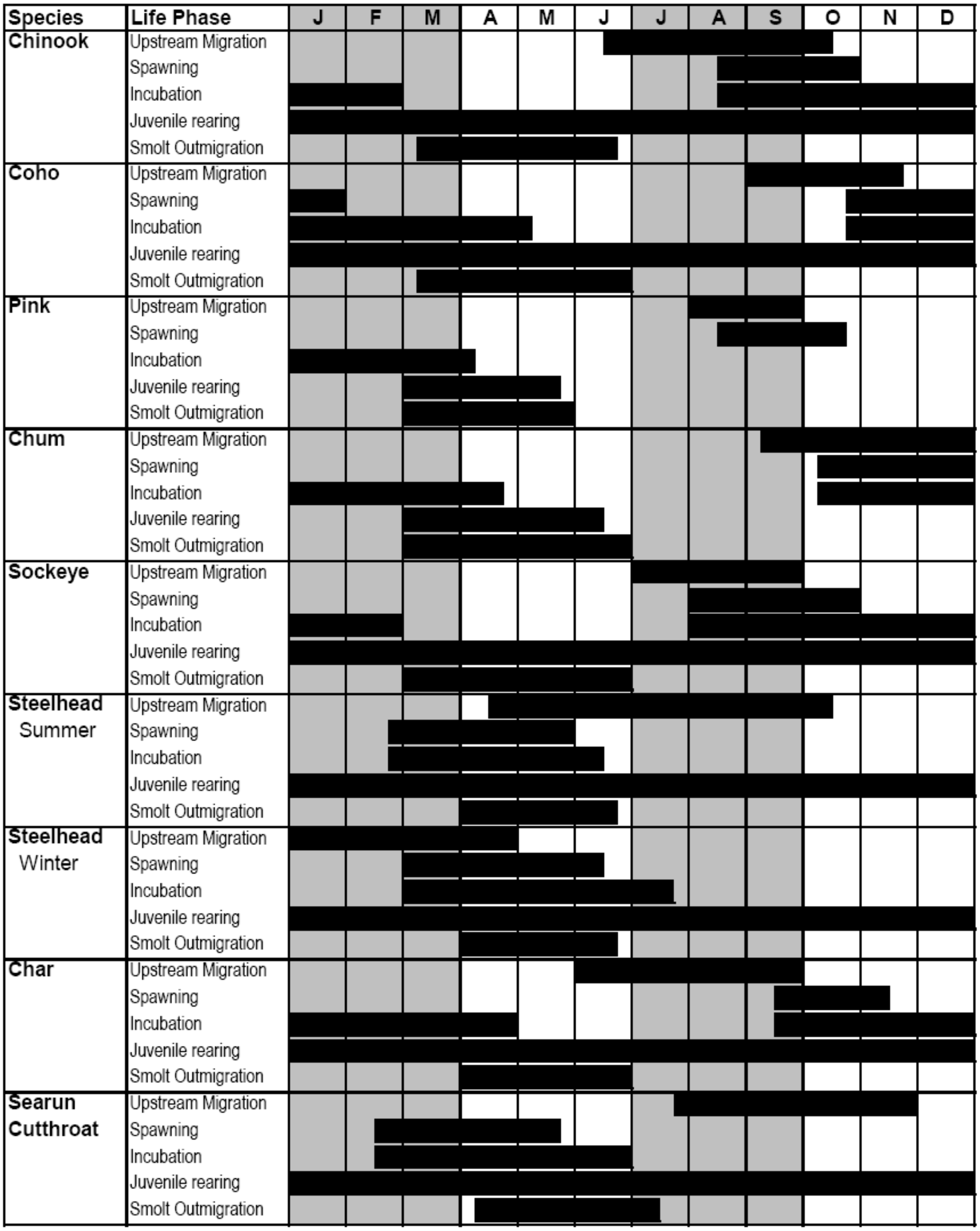
Table 3.4-1 Anadromous and Resident Fish of the Monte Cristo Grade Road Area

Species	Scientific Name	ESU/DPS	Federal Status	Project Area Use
Chinook Salmon	*Oncorhynchus tshawytscha*	Puget Sound ESU	FT, SC	Rearing and migration
Coho Salmon	*Oncorhynchus kisutch*	Puget Sound/Strait of Georgia ESU	FC	Rearing and migration
Chum Salmon	*Oncorhynchus Keta*	Puget Sound/Strait of Georgia ESU	--	Spawning and rearing; not spawn
Sockeye Salmon	*Oncorhynchus nerka*	No designated ESU	--	Rearing and migration
Pink Salmon	*Oncorhynchus gorbuscha*	No designated ESU	--	Rearing and migration
Steelhead	*Oncorhynchus mykiss*	Puget Sound ESU	FT	Migration, spawning, and rearing
Cutthroat Trout	*Oncorhynchus clarki clarki*	Puget Sound ESU	--	Resident-all life stages
Rainbow Trout	*Oncorhynchus mykiss*	No designated ESU	--	Resident-all life stages
Mountain whitefish	*Prosopium williamsoni*	No designated ESU	--	Resident-all life stages
Bull Trout	*Salvelinus confluentas*	Coastal Washington/Puget Sound DPS	FT, SC	Rearing and migration
Sucker	*Catostomus sp. cf, catostomus*	--	--	Resident all life stages

Status:

FT: Federal Threatened
SC: State Candidate
FCo: Federal Species of Concern
ESU: Evolutionarily Significant Unit
DPS: Distinct Population Segment

Sources: StreamNet website; NOAA Fisheries website; WDFW website.



General Timing of Life Stages of Salmonids in the Stillaguamish Watershed. (source: WSCC 1999

Figure 8: General Timing of Salmonid Life Stages

3.4.2. Environmental Consequences

3.4.3. Alternative A – Bridge Option

Temporary disturbance to wildlife could occur during construction due to noise and construction activity. Piles will be driven or vibrated into place for the center pier and the north abutment. Construction would affect a minimal amount of wildlife habitat on the north side of the river as this area is primarily the existing 342nd Drive NE and the residential community of Verlot. This area consists of homes and seasonal cabins. Much of the construction would occur in the existing road right-of-way and on the alignment of the previous bridge. Placing the piles is expected to take approximately 4-5 days. This work would occur approximately 70 feet landward from the wetted channel and above the OHWM. Some short term, temporary impacts to wildlife could occur during the placement of the piles due to noise and vibration.

On the south side of the river, much of the work would occur in the existing Monte Cristo Grade Road right-of-way and at the existing concrete abutment from the previous bridge. The south side of the river is more heavily vegetated and could potentially provide more wildlife habitat than the northern side. No pile driving would occur on the south side of the river. Work in this area includes minor grading and modifying the existing abutment with additional concrete.

No in-water work would be required for the Bridge Option but work would occur over the South Fork Stillaguamish River and on its banks. Direct impacts to resident fish and aquatic organisms during construction could include short-term sedimentation and increased turbidity in the river. The magnitude of stress to fish generally increases as turbidity level increases and particle size decreases (Bission and Bilby, 1982). Because fish can readily disperse, many species may relocate when sediment load is increased. This avoidance can expose fish to increased predation and energy expenditure.

The primary wildlife impact would occur from the removal of trees to construct the bridge. Approximately 32 trees 8 inches in diameter or greater would be removed to construct the bridge. The trees to be removed are primarily red alder and western red cedar. Some displacement of potential bird nesting habitat will occur with the removal of the trees. However, the bridge site is adjacent to large tracts of densely forested U.S. Forest Service land which provides alternate habitat.

The bridge site is within the Pacific Flyway for migratory birds. Removal of trees needed for the bridge construction will not significantly impact bird habitat or migration routes. No impacts are expected to migratory birds during or after the construction of the bridge.

3.4.4. Alternative B – No Action Alternative

The No Action Alternative would avoid potential construction impacts at the project site and would not affect fish and wildlife. Human disturbance of fish and wildlife would remain at existing low levels because of the lack of vehicle access to the Monte Cristo Grade Road. Pedestrian access to the bridge site would be possible from the Pilchuck Mountain Road but would remain low due to the narrow, rugged trail to access the area.

3.5. Threatened and Endangered Species (including Magnuson-Stevens Act and Essential Fish Habitat)

Threatened and endangered species include all plant and wildlife species designated by the USFWS and NOAA Fisheries as threatened, endangered, or as candidates for listing under the ESA. No listed plant species are known to occur in the project area. A separate Biological Assessment (BA) has been be prepared for review by NOAA Fisheries and USFWS. The following sections describe the listed or candidate fish and wildlife species that occur in the area.

3.5.1. Affected Environment

3.5.1.1. Fish

The fish species that occur in the South Fork Stillaguamish River in the vicinity of the project site include the Puget Sound Evolutionary Significant Unit (ESU) of chinook salmon (*Oncorhynchus tshawytscha*) (summer run), the Puget Sound/Strait of Georgia ESU of coho salmon (*O. kisutch*), and the Coastal Puget Sound DPS of bull trout (*Salvelinus confluentus*) (Table 3.5-1). The Puget Sound/Strait of Georgia ESU of chum salmon (*O. keta*) and the Puget Sound ESU of steelhead (*O. mykiss*) occur in the South Fork Stillaguamish River but have been determined not to warrant protection under ESA, although other distinct population segments of chum salmon and steelhead are protected under ESA. The South Fork Stillaguamish River in the project area is not included in the proposed Critical Habitat for chinook salmon but is proposed as Critical Habitat for bull trout.

Table 3.5-1 Federally Listed Species that Occur in the Monte Cristo Grade Road Area

Species	Scientific Name	ESU/DPS	Status	Project Area Use
Chinook Salmon	*Oncorhynchus tshawytscha*	Puget Sound ESU	Federal Threatened	Primarily restricted to 17 miles of South Fork
Coho salmon	*O. kisutch*	Puget Sound/Strait of Georgia ESU	Candidate	Rearing and migration in South Fork Stillaguamish near project
Bull trout	*Salvelinus confluentus*	Coastal Washington/Puget Sound	Threatened	Rearing and migration in South Fork Stillaguamish River
Steelhead	*O. mykiss*	Puget Sound DPS	Threatened	Rearing and migration in South Fork Stillaguamish

Status: FT=Federal Threatened; SC=State Candidate; FCo=Federal Species of Concern; ESU=Evolutionarily Significant Unit; DPS=Distinct Population Segment
Sources: Unpublished WDFW data; StreamNet website; NOAA Fisheries website; WDFW website

Anadromous fish access to the South Fork Stillaguamish River above Granite Falls, which was a natural anadromous fish barrier, is limited by poor attraction to the Granite Falls Fishway, poor entrance conditions at the fishway, sedimentation and flow problems and by a rock fall in Robe Canyon that may be a migration barrier (WDFW 2004b). In addition to fish passing through the

Granite Falls Fishway, there is a coho trapping and hauling program that transports small numbers of bull trout/Dolly Varden around Granite Falls and Robe Canyon.

3.5.1.2. Essential Fish Habitat (EFH)

Public Law 104-267, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to establish new requirements for Essential Fish Habitat (EFH) descriptions in Federal fishery management plans and to require Federal agencies to consult with National Marine Fisheries Service (NMFS) on activities that may adversely affect EFH. EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.

The Pacific Fisheries Management Council (PFMC) has recommended an EFH designation for the Pacific salmon fishery that would include those waters and substrate necessary to ensure the production needed to support a long-term sustainable fishery (i.e., properly functioning habitat conditions necessary for the long-term survival of the species through the full range of environmental variation) (PFMC 1999).

The Magnuson-Stevens Act requires consultation for all actions that may adversely affect EFH, and it does not distinguish between actions in EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities that may have an adverse effect on EFH. Cumulative impacts are incremental impacts, occurring within a watershed or marine ecosystem context that may result from individually minor but collectively significant actions. The assessment of cumulative impacts is intended in a generic sense to examine actions occurring within the watershed or marine ecosystem that adversely affect the ecological structure or function of EFH. The assessment should specifically consider the habitat variables that control or limit a managed species' use of a habitat. It should also consider the effects of all impacts that affect either the quantity or quality of EFH. The consultation requirements of section 305(b) of the Magnuson-Stevens Act (16 U.S.C. 1855(b)) provide that:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH.
- NMFS will provide conservation recommendations for any federal or state activity that may adversely affect EFH.
- Federal agencies will, within 30 days after receiving conservation recommendations from NMFS, provide a detailed response in writing to NMFS regarding the conservation recommendations. The response will include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NMFS, the federal agency will explain its reasons for not following the recommendations.

3.5.1.3. Identification of Essential Fish Habitat

Salmon fishery EFH includes all streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California, except above the impassable barriers identified by PFMC (PFMC 1999). Salmon EFH excludes areas upstream of longstanding naturally impassable barriers (i.e., natural waterfalls in existence for several hundred years). During the proposed project, coho, Chinook, and pink salmon may be within the project area.

Table 3.5-2 Species of Salmonids and Possible Life Stages with Designated Essential Fish Habitat in the Action Area

	Life Stage			
Species	Spawning/Egg	Juvenile Rearing	Migration (Adult/Juvenile)	Fresh/Salt Water Acclimatization
Coho Salmon	X	X	X	
Pink Salmon	X	X	X	
Chinook Salmon	X	X	X	

3.5.1.4. Direct, Indirect and Cumulative Effects

Potential impacts of the Monte Cristo Bridge to ESA listed fish species are discussed in Sections 6 of this BA. As discussed, strict adherence to BMPs will help protect the SF Stillaguamish River from water quality effects and other potential short-term impacts during project construction. Although, riparian mitigation, likely will improve in-stream habitat over the long-term, insignificant short-term impacts may occur to Pacific Coast salmon EFH. There should be no cumulative adverse effects to EFH.

3.5.1.5. EFH Determination

Based on the EFH requirements of Pacific Coast salmon species, BMPs, and conservation and mitigation measures proposed as part of the project, this project **will not adversely affect** EFH

3.5.1.6. Wildlife

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) was removed from protection in July 2007 under the federal Endangered Species Act. However, two other federal laws still provide protection for the bald eagle, the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

There are no known bald eagle nests within two miles of the project site (as of 2001), however, there were 32 bald eagle nest territories in Snohomish County—mostly in the western portion of the county (Stinson et al. 2001). During the winter months (November-March), bald eagles come from as far north as the Yukon and Alaska to forage on spawning salmon in western Washington rivers. It is unknown how many eagles actually use the immediate section of the South Fork Stillaguamish River, but it is likely that some eagles do use the area periodically. Regional eagle migration reaches its peak in late December and early January when the largest numbers of eagles are likely to occur in the vicinity of the project site. Bald eagles may make use of the larger trees along the South Fork Stillaguamish River near the project site for night roosts and perches. No communal roosts have been identified in the WDFW Priority Habitats and Species (PHS) database.

Marbled Murrelet and Spotted Owl

The marbled murrelet (*Brachyramphus marmoratus*), is the only listed wildlife species known to occur within two miles of the project. No spotted owls (*Strix occidentalis*) have been documented in the project area. The nearest suitable spotted owl habitat is on the slopes of Mt. Pilchuck. Only very small patches of larger trees occur near the proposed bridge location.

The marbled murrelet is a state and federal endangered species in Washington. This species nests in forests that have at least remnant old-growth characteristics that enable them to find nesting platforms on large horizontal limbs. Adult murrelets nesting in the Stillaguamish River watershed make daily flights between their nests and marine foraging areas in Puget Sound. The marbled murrelet has been documented within USFS forests within 0.8 mile of the project site (WDFW PHS data). The forests at the project site generally lack the structure (e.g., large trees with moss covered branches) necessary for nesting murrelets. However, a few trees approximately200 feet from the south abutment would be considered suitable habitat.

3.5.1.7. Plants

At the bridge site, the vegetation is composed primarily of second-growth mixed coniferous and deciduous forests dominated by cedar, western hemlock and red alder. There are no federally listed plants occurring in the action area. Most of the area to be disturbed for bridge construction consists of existing road grade.

3.5.2. Environmental Consequences

A detailed effect analysis for federally protected species for the preferred alternative would be provided in a separate Biological Assessment (BA). The following narrative summarizes information to be included in the BA.

3.5.3. Alternative A – Bridge Option

There is a potential for increased sediment in the river during construction, but this would be minimized by implementation of BMPs.

Although trees would be removed for construction of the bridge, construction would not directly affect any nesting habitat for bald eagles or marbled murrelets, nor would the bridge construction remove any bald eagle perch sites.

The project is 0.8 mile from a known marbled murrelet nesting site. Construction noise, which would be significantly higher than normal ambient levels, has the potential to disturb marbled murrelets. Construction noise would occur during the breeding season but the bridge site is outside the USFS recommended distance (>60 yards for heavy equipment) for not likely to adversely affect the species. No blasting would occur on this project. No suitable nesting habitat for marbled murrelets would be removed.

Assuming that construction takes place during the summer, there would be no effect on bald eagles as there are no bald eagle nests near the project.

The project is not likely to adversely affect listed fish species. There is no in-water water work proposed for the bridge. Some construction would take place over the water as the bridge is assembled and lifted into place. Construction during the dry period and the implementation of BMPs would ensure that there would be insignificant effects to fish in project area.

For this alternative, the determination is assumed to be May Affect, Not Likely to Adversely Affect for marbled murrelet, Chinook, steelhead, and bull trout and May Affect, Not Likely to Adversely Affect listed or proposed critical habitat.

3.5.4. Alternative B – No Action Alternative

There would be no effects to threatened or endangered species under the No Action Alternative. Without repair of the Monte Cristo Grade Road, human disturbance in the project area would remain at the current low levels. The continued erosion along the river may remove a small number of potentially suitable bald eagle perch sites. There is the potential for additional bank slides and wash-outs that act as minor sediment sources to the Stillaguamish River.

3.6. Recreational Resources

3.6.1. Affected Environment

The two-mile long Monte Cristo Grade Road provides access to twenty four undeveloped recreational properties and one residence along the southern bank of the South Fork Stillaguamish River. The road also accesses an undeveloped portion of the Mount Baker-Snoqualmie National Forest on the south flank of Mount Pilchuck. Currently there is no vehicular access to the Monte Cristo Grade Road due to the 2003 washout.

The Monte Cristo Grade Road does not provide public access to any developed recreation facilities, camping or constructed trails. The road does access three known waterfalls that draw recreational visitors (Snohomish County website). These waterfalls include:

- First Falls—a 30- to 40-foot cataract along an unnamed creek 0.3 mile west of the wash-out.
- Heather Creek Falls—a series of cascades accessible by hiking from a small pond located 0.6 mile west of First Falls.
- Triple Creek Falls—a 15- to 25-foot lower and 40-foot upper falls accessible by a 200-yard hike from the western end of the Monte Cristo Grade Road.

The primary recreational activities on the South Fork Stillaguamish River include fishing and whitewater boating. Fishing season upstream of the town of Granite Falls occurs between June 1 and November 30 (WDFW 2004a). Limited whitewater rafting occurs in the upper South Fork Stillaguamish River, with the season generally beginning in April and ending in July. Fishing could occur on Forest Service property from the Monte Cristo Grade road although there no developed boating or fishing access points in the project area.

Within the Verlot area, many visitors hike on the extensive network of USFS trails in the area. Closest to the project site is the Mt. Pilchuck Trail (USFS Trail #700). The trailhead for this popular route is located 6.9 miles from the Mountain Loop Highway along Forest Service Road #42. The Mount Pilchuck Trail receives heavy use during the summer and fall seasons (USFS website). A new segment of the Mount Pilchuck Road was constructed in 2007 due to flood damage on the Monte Cristo Grade Road at the washout site. The project relocated a section of the Mount Pilchuck Road approximately 160 feet east of its original location to bypass the damaged section of road. Approximately 780 feet of new road was completed.

The section of the Mountain Loop Highway between Barlow Pass and the town of Darrington reopened in 2007 after four years of closure by the Forest Service due to washouts, slides and other damage from floods and debris. This is a popular recreation road for picnicking, camping and climbing. This segment of the Mountain Loop Highway is only opened during the summer season.

3.6.2. Environmental Consequences

Each of the alternatives is described below in terms of its potential impacts to recreation resources.

3.6.3. Alternative A – Bridge Option

The Mountain Loop Highway is also designated as the Mountain Loop Scenic Byway and is a popular destination as a scenic drive. Drivers would likely to turn off the highway to see the bridge and explore the south side of the river.

If the bridge is constructed, the waterfalls, Forest Service land and private recreational properties on the south side of the Stillaguamish River would again be accessible by vehicle. However, because of the lack of public facilities or designated parking areas on the south side of the river the recreational use of this area is likely to be at a similar level as occurred prior to the road washout.

3.6.4. Alternative B – No Action Alternative

Under Alternative B, the washed-out segment of the Monte Cristo Grade Road would not be restored. There are currently no alternate trails or roads directly accessing the Monte Cristo Grade Road. Access to the road is only possible by hiking from the Pilchuck Mountain Road on steep terrain through heavily timbered Forest Service land around the washout site. A narrow trail along the washout site does access the Monte Cristo Grade Road; however, this trail is on private property.

3.7. Visual Resources

3.7.1. Affected Environment

The general visual character of the South Fork Stillaguamish River corridor, including the washed-out section of the Monte Cristo Grade Road, is mountainous with periodic vistas of forested hillsides, river valleys and the river itself.

On the north side of the river, the bridge site includes permanent residences and cabins along 342nd Drive NE and 102nd Street NE. The vegetation is a mix of native and non-native species with some large conifers. Looking south from the road end at 342nd Drive NE is the old concrete arched pier which once supported the earlier bridge. The pier and the concrete abutments are all that remain of the original bridge structure.

On the south side of the river the vegetation along the road is typical of the Puget Sound foothills. The deciduous-coniferous tree canopy is dominated by western hemlock, red cedar, and red alder, while the understory consists primarily of native shrub species. Large conifer trees are found on the USFS land to the south of the bridge site. The bluff where the Monte Cristo Road washed out is visible from the Mountain Loop Highway near Bridge #538 (commonly referred to as Blue Bridge), as well as from the residences along the riverfront on the opposite side of the river. The steep, vertical bluff is vegetated on top with alder and other deciduous trees and native understory.

3.7.2. Environmental Consequences

The following sections discuss the potential effects on visual resources from each alternative.

3.7.3. Alternative A – Bridge Option

Under the Bridge Option the existing concrete center pier would be removed and replaced with a similar structure. The new bridge is planned to be a prefabricated steel truss similar to the one pictured in Figure 9: Bridge Design. The bridge would be visible from the end of 342nd Drive NE. The bridge would also be visible from the river and the adjacent beach around the bridge site. The bridge may be visible from some of the cabins and homes off of 102nd Street NE just west of the bridge site. Due do the heavy vegetation and distance it is not likely the bridge would be visible from the Mountain Loop Highway.

3.7.4. Alternative B – No Action Alternative

Under Alternative B, the washed out segment of the Monte Cristo Grade Road would not be restored and there would be no effects to visual resources. The existing washout is comparable to other slides along the South Fork Stillaguamish River and is not visually inconsistent with natural features upstream and downstream of this section. Segments of the damaged road are likely to be eroded by future channel migration while other areas would naturally revegetate and would not detract from the visual character of the area in the long term.

Under the No Action alternative the existing concrete pier and original abutments would remain. The pier and the abutments are visible from 342nd Drive NE and from the river and beach.

3.8. Environmental Justice

In the past decade, the concept of Environmental Justice has emerged as an important component of federal regulatory programs, initiated by Executive Order (EO) No. 12898– Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations. This Executive Order directed each federal agency to “make achieving environmental justice by avoiding disproportionately high or adverse human health or environmental effects on minority and low-income populations” a part of its mission. EO 12898 emphasized that federally recognized Native tribes or bands are to be included in all efforts to achieve environmental justice (Section 6.606).

3.8.1. Affected Environment

The demographics of the affected area were examined to determine the presence of minority populations, low-income populations, or tribal peoples in the area potentially impacted by the proposed action. The race and ethnic profile of the local census tract from the 2000 census for the heavily rural census tract 536.02 (east of Granite Falls) is presented in Table 3.8-1. These percentages were based on a tract population of 4,564 persons. Snohomish County as a whole has a smaller percentage of Native Americans (1.4%), and a larger contingent of African Americans (1.7%) and Asians (5.8%). As part of the NEPA scoping process for the road alignment options, a site meeting was held with Tribal contacts, as detailed in Chapter 4, Consultation and Coordination.

This bridge shown above is similar in design to the one proposed for the Monte Cristo Grade Road Bridge. The photo shows a prefabricated steel truss bridge.

Figure 9: Bridge Design

Table 3.8-1 Race and Ethnicity Profile of Census Tract 536.02, Snohomish County, WA.

Race or Ethnicity	Percentage of Population*
White	94.8
Black or African American	0.5
American Indian or Alaskan Native	2.3
Asian	1.0
Native Hawaiian and Other Pacific Islander	0.4
Some other race	1.0

Source: 2000 Census website.
*Percentage adds to more than 100% because Hispanic and Latino is a category of ethnicity and includes more than one race category (black, white, etc.)

3.8.2. Environmental Consequences

3.8.3. Alternative A – Bridge Option

Constructing the bridge would restore access to the Monte Cristo Grade Road and would have no effects to low income or minority populations.

3.8.4. Alternative B – No Action Alternative

Under the No Action Alternative, conditions would remain the same at the site and there would be no disproportional impacts to low income or minority populations.

3.9. Cultural Resources

Cultural resources include resources of historical and/or archaeological significance. For purposes of this document; the term "historical resources" is used to refer to historic structures or districts and "archaeological resources" is used to refer to prehistoric or historical subsurface sites or objects.

3.9.1. Affected Environment

According to the files of the Washington Department of Archaeology and Historic Preservation (DAHP), which document the occurrence of National and State Historic Register resources, Historic Property Inventories, and Historic/Archaeological Sites and Districts, there are no documented historic or archaeological resources in the immediate vicinity of the project site (files retrieved electronically, December, 2007). The nearest site identified on the State Historic Register is the Hartford and Monte Cristo Railroad District; as described, the district is about three miles (at its closest point) from the project area. Correspondence between FEMA and the DAHP concluded that the remaining bridge pier at the proposed crossing site is not eligible for inclusion in the National Register of Historic Places. A letter was sent by FEMA to DAHP on December 19, 2007 requesting a review of the proposed bridge for Section 106 compliance. The DAHP responded on January 2, 2008 concurring with FEMA's recommendation and finding of No Historic Properties Effected.

The Stillaguamish River drainage is of cultural importance to the Stillaguamish and Tulalip Tribes, whose people have historically made use of its resources and used the river as a travel corridor. FEMA requested review of the project from the Stillaguamish Tribe and the Tulalip Tribes by letter dated May 3, 2005. No specific references of important features were supplied by Stillaguamish or Tulalip Tribal representatives during a site visit in 2004.

The Tribes were contacted again by FEMA regarding the proposed bridge option. No additional comments from the Stillaguamish or Tulalip Tribes were received in response to telephone and e-mail contacts in December, 2007.

3.9.2. Environmental Consequences

3.9.3. Alternative A – Bridge Option

Under this alternative a new bridge crossing of the river would be constructed to restore vehicular access to Monte Cristo Grade Road. The proposed bridge would be constructed on the same alignment that was disturbed for the original bridge in the 1930s. There would be some disturbance of the slope and cobble beach during construction.

The original bridge was constructed in 1930s and removed in the 1970s. According to a historic photograph the original bridge appears to be a Double Intersection Warren Through-Truss type of structure. The steel trusses were set on a concrete pier and abutments. The bridge connected Monte Cristo Grade Road to 342nd Drive NE and the Mountain Loop Highway. The Monte Cristo Grade Road was originally part of the railroad corridor for the now abandoned Northern Pacific Railroad line (Hartford to Monte Cristo).

The only evidence of the previous bridge is the concrete pier visible from 342nd Drive NE and a concrete abutment on each side of the river. There are barely visible remains of wooden piers on the beach which may have been part of temporary scaffolding used for construction of the bridge.

The Washington DAHP has concurred with FEMA's determination of "No Historic Properties Affected" for this Alternative. Correspondence between FEMA and the DAHP concluded that the destroyed bridge at the proposed crossing site is not eligible for inclusion in the National Register of Historic Places.

While there are no documented sites in the area, construction could uncover previously unknown artifacts. If this occurs, construction would be stopped in and around the area of discovery and a qualified archaeologist would examine the site and consult with the SHPO and the Tribes. If human remains are uncovered all construction would stop until all appropriate officials and agencies are contacted and consulted. A report would be prepared to document the occurrence and the final resolution of the consultation process. Given these provisions and the lack of documented resources in the area, there would be no effects to cultural resources from this alternative.

3.9.4. Alternative B – No Action Alternative

Under Alternative B, the access to Monte Cristo Grade Road would not be restored and no new river crossing would be constructed. It is possible that some artifacts may be in or near the existing road prism that could be affected by continued riverbank erosion. The extent of this possibility is unknown. There would be no effect to cultural resources outside of natural processes.

3.10. Transportation and Access

3.10.1. Affected Environment

The vicinity of the proposed project is served by a limited network of roads that include local highways and primitive gravel roads. The community of Verlot is approximately 170 residents (2000 census) with one small store, a campground and the Forest Service Ranger Station.

The Monte Cristo Grade Road is a gravel roadway that originally extended approximately two miles westward from its intersection with Pilchuck Road, about 0.1 mile east of Verlot, Washington, along the southern bank of the South Fork Stillaguamish River. The road provided access to one permanent residence and twenty four unimproved properties. The Monte Cristo Grade Road dead ends approximately 1.35 miles west of the bridge site.

After the wash-out occurred in 2003, the Monte Cristo Grade Road was closed to all vehicular traffic. Snohomish County has installed concrete barriers and signage near the intersection with Pilchuck Road. Private property owners must access their properties by walking around the washout. There is a narrow trail along the edge of the washout.

3.10.2. Environmental Consequences

3.10.3. Alternative A – Bridge Option

Under this option vehicular access would be restored to the remaining section of Monte Cristo Grade Road on the south side of the Stillaguamish River via 342nd Drive NE. Vehicular and pedestrian traffic on the new bridge is expected to be minor and similar to what occurred on the Monte Cristo Grade Road prior to the washout. This road serves 15 property owners on 24 undeveloped parcels and one resident. The estimated traffic volume is less than 20 vehicles per day and usage is primarily during the summer months. There is one permanent resident on the south side of the river that would use road as access. The remaining properties are not developed although some seasonal use of the bridge and road would be expected. There are no developed recreational or parking areas on the south side of the river.

Due to the low traffic volumes no improvements are expected at the intersection of the Mountain Loop Road and 342nd Drive NE. Following completion of the bridge, the Monte Cristo Grade Road would be maintained as a primitive, low volume gravel road.

During construction of the bridge, trucks and other vehicles would access the site via the Mountain Loop Highway and 342nd Drive NE. There are several permanent residents and cabins that access off of 342nd Drive NE, a low volume road. There is one road, 102nd Street NE that intersects 342nd Drive NE. This is also a low volume road that serves approximately twenty residents. These appear to be permanent residents and seasonal cabins.

The construction will occur in the road right-of-way where 342nd Drive NE dead ends. Access to one seasonal cabin at the road end and other residences on 342nd Drive NE will be maintained during construction. The bridge is expected to be completed in one construction season, approximately eight months. Contractors and construction crews are expected to commute daily from the town of Granite Falls, Everett and other nearby communities. No supplemental housing is anticipated to be needed. The temporary construction office will be located near the dead end of 342nd Drive NE.

3.10.4. Alternative B – No Action Alternative

Under Alternative B, access to the Monte Cristo Grade Road would not be restored. The private properties on Monte Cristo Grade Road would remain inaccessible to vehicular use.

3.11. Air Quality and Noise

3.11.1. Affected Environment

The project site is within the Mount Baker Snoqualmie National Forest. The closest incorporated town is Granite Fall, approximately 11 miles west bridge site. The area around the north side of the bridge site is the small rural residential community of Verlot. There are no large industries in this area. Air quality is considered high in this area of the county. Noise levels are typical of a rural residential setting. The primary noise generator is the Mountain Loop Highway which typically closes during the winter at Silverton, approximately 12 miles east of the bridge site.

3.11.2. Environmental Consequences

3.11.3. Alternative A – Bridge Option

Under this option vehicular access would be restored to the Monte Cristo Grade Road via 342nd Drive NE which is currently a dead end. There are several residential properties that take access from this road.

During construction there would be temporary increase in sound levels due to the use of heavy equipment and hauling of materials. The equipment used to construct the bridge includes a large crane, trucks, cement mixer and other vehicles. Piles would be constructed for the new bridge. The piles for the bridge would be vibrated or pounded in. The increase in sound levels would depend on the type of equipment being used and the amount of time it is in use. Noise impacts resulting from construction would be short term and temporary. The placement of the pilings is expected to take 4-5 days.

Sounds created from activity at temporary construction sites are exempt from the County's noise ordinance except between the hours of 10:00 p.m. and 7:00 a.m. The majority of construction activities related to the project would occur during daytime hours on weekdays which would minimize impacts. If nighttime construction is required, then the County would be required to comply with the nighttime noise limits as required in the noise ordinance.

Vehicular traffic would increase on 342nd Drive NE following construction of the bridge; however, the average daily traffic would remain low. The average daily traffic is expected to be less than 20 trips per day. There is only one developed property along the Monte Cristo Grade Road. The remaining properties are either undeveloped or Forest Service land. There are no developed recreational destinations that are accessed from the Monte Cristo Grade Road. Therefore, there would be no significant increase in air quality or noise levels with this alternative.

3.11.4. Alternative B – No Action Alternative

Under this option the washed-out segment of the Monte Cristo Grade Road would not be restored and vehicles would not have access to the road. The air quality and noise would remain in their present condition.

3.12. Socioeconomics

3.12.1. Affected Environment

The primary industry types in the Granite Falls and Verlot area are light manufacturing, education, health, and social services; construction; and agriculture, forestry, fishing and hunting, and mining (U.S. Census 2000). The Monte Cristo Grade Road provides access to a small number of private residential properties. One of the properties includes a residence.

3.12.2. Environmental Consequences

3.12.3. Alternative A – Bridge Option

The estimated cost of each alternative is provided in Table 3.11-1. Though FEMA cannot fund a property buy-out that requires condemnation, the assessed value of the affected properties is not provided under the No Action Alternative cost.

Table 3.11-1 Estimated Cost of Each Alternative

Alternative	Cost
Alternative A—Bridge Option	$ 1,516,170 (includes 20% contingency)
Alternative B—No Action Alternative	$0

Source: Van Wormer 2005.

The cost of building one of the originally proposed road alignments around the washout is substantial because of the difficult terrain and the physical and environmental constraints of the site. Extensive mitigation for impacts to streams and wetlands would be required. These costs would be borne by federal, state, and county tax-payers. There would be no direct costs applied to the affected landowners. Because the area is zoned for one structure per lot, there would be minimal further development along the rebuilt road.

The cost of building the bridge option is approximately $1,516,170 and much less damaging to the environment than the road alternatives originally proposed. The bridge option would be built in the same location as an earlier bridge with minimal new impacts as compared with the three road options proposed in the 2005.

The County does not anticipate the purchase of any right-of-way for this project. The bridge and the approach roads are within County right-of-way. The right-of-way on the north side of the river is 60 feet wide and 200 feet wide on the south side of the river. Temporary construction permits will be required from three property owners adjacent to the project area on 342nd Drive NE on the north side of the river. A temporary construction permit will also be required from U. S. Forest Service. Figure 4 shows approximate property boundaries.

3.12.4. Alternative B – No Action Alternative

The No Action Alternative could be implemented without buyout of the properties by simply closing the damaged road. There would be no project cost associated with this option, but there would be no vehicle access for landowners. While individual property owners would be inconvenienced from such action, there would be minimal socioeconomic impacts at the macro scale.

3.13. Cumulative Impacts

Cumulative impacts are those that result from the incremental impact of a proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other action (40 CFR 1508.7). Only those resources associated with cumulative effects are discussed below.

3.13.1. Affected Environment

The project is in rural Snohomish County in an area dominated by federally owned forest, with scattered private and state-owned land. Land-disturbing activities in the basin include forestry and associated road building, residential housing construction, and minor amounts of mining (WSCC 1999). A number of flood repair road projects are being planned in the basin on federal and county land including culvert and bridge wash-out repairs on USFS land and a number road shoulder repairs in the Stillaguamish River drainage. The landslides at Gold Basin are a high priority for stabilization to minimize sediment input to the river. Snohomish County recently updated its Critical Areas Ordinance, which provides restrictions for land development near sensitive natural resources and requirements for mitigation of impacts.

3.13.2. Environmental Consequences

3.13.3. Alternative A – Bridge Option

Under Alternative A, construction of the bridge over the river would cause minor amounts of sediment to enter the river from construction. No long term effects to the river are anticipated.

The bridge would re-establish vehicle access for landowners and could lead to future development of properties that are currently undeveloped. However, the area is zoned as one structure per lot so development would be minimal and would not significantly contribute to basin-wide cumulative effects from land clearing. The County does not expect changes in zoning that would greatly increase the development along this road. This is a dead end road and there are currently no utilities along the Monte Cristo Grade Road. If the properties are developed, the county expects it to be primarily for seasonal, recreational use.

3.13.4. Alternative B – No Action

For aquatic and terrestrial natural and physical resources, there would be no cumulative impacts associated with the No Action Alternative. Natural processes would continue to erode the right bank at the washout site, but this is the natural occurrence in a dynamic alluvial river system.

4. CONSULTATION AND COORDINATION

4.1. Scoping

On February 9, 2005, a site visit was held with FEMA and the representatives of the Stillaguamish and Tulalip Tribes to discuss the merits of the road alternatives and the issues of concern for the Tribes. FEMA requested review of the project from the Stillaguamish Tribe and the Tulalip Tribes by letter dated May 3, 2005.

Another meeting was held on site on March 1, 2005 with representatives of WDFW, USFWS, NOAA Fisheries, and the Washington State Emergency Management Division. Tables 4.1-1 and 4.1-2 list the attendees of those meetings.

Table 4.1-1 Staff that Attended the February 9, 2005 Monte Cristo Grade Road Site Visit

Tribal/Agency Affiliation	Staff
Tulalip Tribe	Dave Luzi
Stillaguamish Tribe	Pat Stevenson
FEMA	Bert Bowen
FEMA/EDAW	Jim Keany

Table 4.1-2 Staff that Attended the March 1, 2005 Monte Cristo Grade Road Site Visit

Agency Affiliation	Staff
USFWS	Suzy Lutey
NOAA Fisheries	Dan Tonnes
WDFW	Phil Jensen
Washington Military Department Emergency Management Division	Virginia Haas, Gary Urbas
FEMA/EDAW	Jim Keany

The primary issues raised by the Tribes and agencies included the following:

- Road alignment effects to aquatic systems and listed fish.
- Potential for new road to be affected by channel migration of stream.
- High cost of project for a low benefit providing access for one resident.
- Potential archaeological resource effects.
- Option of landowner buy-out to preclude need for road rebuilding.
- Effects of building close to river.
- Longevity of a new road built close to the river.

4.2. Tribal and Agency Coordination

FEMA has had continued coordination with Tribal entities and state and federal resource agencies throughout the NEPA process. The Tribes and agencies will have an opportunity to comment on the Draft EA. These comments will be evaluated and incorporated into the final document. In addition, a separate Draft BA has been prepared for review by USFWS and NOAA Fisheries as mandated by the ESA. Any recommendations that come out of that process will be incorporated into the Final BA and NEPA document.

Several meetings and additional phone calls were conducted with Tribal entities in regard to cultural resources. While the SHPO's office had no data on the project vicinity, they requested that results of the Tribal coordination be sent to their office. Upon completion of the NEPA process, this information will be sent to the SHPO's office.

The Tribes were contacted again by FEMA regarding the proposed bridge option by Charles Diters, Historic Preservation Specialist (FEMA Region 10). No additional comments from the Stillaguamish or Tulalip Tribes were received in response to telephone and e-mail contacts in December, 2007.

4.3. Other Laws and Regulations

State, federal, and local laws that apply to the project, under the action alternative, include the following:

- Section 313 of the Federal Clean Water Act – Stormwater Management and Erosion Sediment Control
- Section 404 of the Clean Water Act
- Section 10 of the Rivers and Harbors Act
- State Water Quality Standards for Construction Projects
- State Hydraulic Project Approval
- State/Snohomish County Shoreline Management Regulations
- Snohomish County Critical Areas Ordinance

5. BIBLIOGRAPHY

5.1. Literature Cited

Ambrose, J. 2008. Potential Bank Erosion and Maintenance Downstream of the proposed Monte Cristo Bridge, Verlot. Email communication to Lisa Wirt, P.E, Snohomish County Public Works from GeoEngineers, 600 Stewart Street, Suite 1700, Seattle, WA 98101, April 16, 2008.

Ambrose, J. 2008. Draft Hydraulics Report, Proposed Monte Cristo Bridge, South Fork Stillaguamish River, GeoEngineers, 600 Stewart Street, Suite 1700, Seattle, WA 98101, April 25, 2008.

Barton, B. 1977. Short-term effects of highway construction on the limnology of a small stream in southern Ontario. Freshwater Biol., 7: 99-108.

Beamer, E. M. and R. A. Henderson. 1998. Juvenile Salmonid Use of Natural and Hydromodified Stream Bank Habitat in the Mainstem Skagit River, Northwest Washington. Skagit System Cooperative, La Conner, WA.

Bisson, P.A. and R.E. Bilby. 1982. Avoidance of suspended sediment by juvenile coho salmon. North American Journal of Fisheries Management 2: 371-374.

Dillon, J., T. Littleton, and J. Laufle. 1998. Literature review of revetment and canalization impacts on Pacific Northwest aquatic resources with implications to Skagit River, Washington. U.S. Army Corps of Engineers, Seattle District, Seattle, Washington.

FEMA. Draft Environmental Assessment: Reconstruction of the Monte Cristo Grade Road, Snohomish County, WA FEMA-1499-DR-WA (Public Assistance) April 2005.

Findley, D.P. and A.Q. Kammereck. 2004. Memorandum of findings related to the Monte Cristo flood damage site, Snohomish County, prepared for W&H Pacific, September 29.

Findley, D.P., R.J. Fraser, R.E. Sylwester, and R.L. Plum. 2005. Summary of findings related from the geophysical survey for Monte Cristo site road replacement from Stillaguamish River flood damage, , prepared for W&H Pacific, January 14.

Fraley, J.J., and B.B. Shepard. 1989. Life history, ecology, and population status of migratory bull trout (*Salvelinus confluentus*) in the Flathead Lake and River system, Montana. Northwest Science 63:133-143.

Gersib, R. 1997. Restoring wetlands at a river basin scale, a guide for Washington Puget Sound operational draft. Washington State Department of Ecology, Publication No. 97-99, Olympia.

Golder Associates Inc. 2008. WHP/Monte Cristo Bridge Road Realignment Geotechnical Investigation, Snohomish Washington prepared for W & H Pacific, April 28.

Li, H. W. 1994. Cumulative Effects of Riparian Disturbances along High Desert Trout Streams of the John Day Basin, Oregon. Transactions of the American Fisheries Society 123:627-640.

McShane, C. , T. Hamer, H. Carter, G. Swartzman, V. Friesen, D. Ainley, R. Tressler, K. Nelson, A. Burger, L. Spear, T. Mohagen, R. Martin, L. Henkel, K. Prindle, C. Strong, and J. Keany. 2004. Evaluation report for the 5-year status review of the marbled murrelet in Washington, Oregon, and California. Unpublished report. EDAW, Inc. Seattle, Washington. Prepared for the U.S. Fish and Wildlife Service, Region 1. Portland, Oregon.

Miller, C. and D. Somers. 1989. TFW Stillaguamish River early action project. Tulalip Tribes Natural Resources Department, Marysville, WA.

Pelletier, G. and D. Bilhimer. 2001. Stillaguamish River temperature total maximum daily load. Quality assurance project plan. Washington Dept. Ecology. Publ. No. 01-03-066. 21pp.

Peter, D. 1999. Subregional Ecological Assessment (REAP) for Mt. Baker-Snoqualmie National Forest. Report from the Subregional Ecological Assessment Team. USDA, Forest Service, Mountlake Terrace, WA.

Pratt, K.L. 1992. A review of bull trout life history. Pages 5-9 in: P.J. Howell Buchannan *editors*, Proceedings of the Gearhart Mountain Bull Trout Chapter of the American Fisheries Society, Corvallis, Oregon.

Rieman, B.E. and J.D. McIntyre. 1996. Spatial and temporal variability in bull trout redd counts. North American Journal of Fisheries Management 16:132-141.

Rieman, B.E., D.C. Lee, and R.F. Thurow. 1997. Distribution, status and likely future trends of bull trout within the Columbia River and Klamath River basins. North American Journal of Fisheries Management 17:1111-1125.

SCSWM (Snohomish County Surface Water Management). 2002. The effects of selected forested practices on flooding in the Stillaguamish River Basin. Final Issue Paper #1. Prepared for Planning Advisory Committee for the Stillaguamish River Comprehensive Flood Management Plan.

SHPO (State Historic Preservation Office). 2004. Electronic geospatial National and State Historic Register, Historic Property Inventory, and Historic/Archaeological Sites and Districts data.

SLE (Stillaguamish Lead Entity). 2004. 2004 Stillaguamish Lead Entity Strategy. Prepared for Stillaguamish Implementation Review Committee & Washington State Salmon Recovery Funding Board.

STAG (Stillaguamish Technical Advisory Group). 2000. Technical Assessment and Recommendations for Chinook Recovery in the Stillaguamish Watershed.

Stinson, D.W., J.W. Watson, and K.R. McAllister. 2001. Washington State Status Report for the Bald Eagle. WDFW. Olympia, Washington. USDI (U.S. Department of the Interior). 2003. Estimates of distances at which incidental take of murrelets and spotted owls due to harassment are anticipated from sound-generating, forest-management activities in Olympia National Forest. Fish and Wildlife Service, Lacey, WA.

U.S. Soil Conservation Service. 1983. Snohomish County Soil Survey.

Van Wormer, M.S. 2005. Monte Cristo Grade Road 2003 Flood Damage Repair Conceptual Design. Prepared by W&H Pacific, Bothell, WA. For Snohomish County Public Works Department, Everett, Washington.

WDF (Washington Department of Fisheries). 1975. A Catalog of Washington Streams and Salmon Utilization. Vol. 1 Puget Sound.

WDFW (Washington Department of Fish and Wildlife). 1998. Washington state salmonid stock inventory: bull trout/Dolly Varden. Olympia.

WDFW. 2003. Design of road culverts for fish passage. Olympia, Washington.

WDFW. 2004a. Fishing in Washington: Sport Fishing Rules. 2004/2005 Pamphlet Edition. Washington Department of Fish and Wildlife. Olympia, WA.

WDFW. 2004b. Salmonid Stock Inventory. Updated Bull Trout and Dolly Varden. Appendix.

WDNR (Washington State Department of Natural Resource). 1997. Habitat Conservation Plan.

WDOE (Washington Department of Ecology). 1981. Stillaguamish River Basin Instream Resources Protection Program Including Proposed Administrative Rules. Draft. W.W.I.R.P.P Series – No. 10. 67pp.

WDOE and SCPW. 2003. Draft Public Review Stillaguamish River Comprehensive Flood m Hazard Management Plan. May 19, 2003.

WSCC (Washington State Conservation Commission). 1999. Salmon Habitat Limiting Factors Water Resource Inventory Area 5, the Stillaguamish Watershed.

5.2. Internet Sources

Snohomish County. 2004. Snohomish County Online Property Information on internet at: http://gis.co.snohomish.wa.us/maps/property/index.htm.

Snohomish County. 2004. Interactive Permit and Zoning Map on internet at: http://gis.co.snohomish.wa.us/maps/permits/index.htm.

StreamNet Fish Data Website. http://www.streamnet.org/pub-ed/ff/Species/index.html

USFS Pacific Northwest Fisheries Program Website.
http://www.fs.fed.us/r6/fishing/forests/fishresources/mtbsno_coldwater.html#dollybull

USGS. 2004. website URL = http://nwis.waterdata.usgs.gov/wa/nwis/monthly/
?site_no=12161000&agency_cd=USGS

U.S. Census 2000. Website URL =http://www.psrc.org/datapubs/census2000/sf1/index.htm.

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7. APPENDIX A: BEST MANAGEMENT PRACTICES

Proposed Mitigation Measures

Permits and Regulations

- The project will implement conditions included in any Hydraulic Project Approval (HPA) permit provided by WDFW.

- Mitigation required by Snohomish County's Critical Areas Ordinance would be developed in coordination with Snohomish County staff.

- No in-water work will be conducted in the mainstem South Fork Stillaguamish River.

Stormwater Control

- A site-specific Spill Prevention, Control, and Countermeasures (SPCC) Plan will be developed and implemented to ensure that all pollutants are controlled and contained.

- The project will implement stormwater control according to the State of Washington NPDES Stormwater Construction guidelines.

- In the event of unexpected rainfall, all concrete, paving, paint, paint remover, or other potentially harmful chemicals will be contained and prevented from leaving the construction area.

- Fueling and maintenance of equipment will occur more than 300 feet from surface water or wetlands, to the extent practical.

Sediment Control

- An Erosion and Sedimentation Control Plan (ESCP) will be prepared and implemented for all projects that require earth-moving, vegetation removal, or soil compaction. If the project includes excavation below the water table, the turbid water will be de-watered to the adjacent vegetated floodplain for infiltration and BMPs will be implemented to eliminate risk of runoff.

- Sediment containment will be completed using booms or portable rubber cofferdams. Turbid water generated by excavation below the water table will be pumped from the excavation area and discharged to the flat, vegetated floodplain.

- Exposed soil will be stabilized within 7 days of disturbance.

- Disturbed areas will be restored and revegetation implemented using plants native to the area.

- Temporary storage piles will not be placed in the 100-year floodplain from October 1 to May 1. Storage piles used in the project within 12 hours will not be considered as temporary storage.

- Project-caused unstable slopes will be stabilized as soon as possible.

Clearing and Disturbance

- Clearing and grading will be limited to the minimum necessary to complete the project. Boundaries of clearing will be clearly marked.

- Removed debris will be disposed of at an appropriate upland location.

- A temporary access road will be constructed from 342nd Drive NE to the beach level.

- Cobbles and rocks removed from the beach for crane pads and temporary construction access will be restored to the extent possible following construction

Implementation

- The Applicant is responsible for Conservation Measure success to ensure desired outcomes. The Applicant will be required to monitor and maintain Conservation Measures to control erosion and sediment, reduce spills and pollution, and provide habitat protection. Failure to properly implement Conservation Measures may result in loss of all financial assistance provided for that project.