Environmental Assessment
Monte Cristo Grade Road Bridge

Snohomish County, Washington
FEMA-1499-DR-WA (Public Assistance)
January 2009

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

FEMA

Environmental Assessment

Monte Cristo Grade Road Bridge

Prepared by Snohomish County Public Works
3000 Rockefeller Place
Everett, WA 98201

for

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

January 2009

Table of Contents

1. Purpose and Need for Action

1.1. Introduction 3
1.2. Purpose and Need for Action 6
1.3. Location and Background 6
1.3.1. Alternatives Analyzed in the 2005 Draft Environmental Assessment 6

2. Alternatives

2.1. Alternatives Analyzed in this EA 7
2.1.1. Alternative A – Action Alternative: Bridge Option 9
2.1.2. Alternative B – No Action Alternative 10

3. Affected Environment and Environmental Consequences.

3.1. Soils, Geomorphology, and Streambank Stability 19
3.1.1. Affected Environment 19
3.1.2. Alternative A – Bridge Option 22
3.1.3. Alternative B – No Action Alternative 23
3.2. Hydrology and Water Quality (and Executive Order 11988) 24
3.2.1. Affected Environment 24
3.2.2. Environmental Consequences 27
3.2.3. Alternative A – Bridge Option 27
3.2.4. Alternative B – No Action Alternative 29
3.3. Vegetation and Wetlands (and Executive Order 11990) 29
3.3.1. Affected Environment 29
3.3.2. Environmental Consequences 30
3.3.3. Alternative A – Bridge Option 30
3.3.4. Alternative B – No Action Alternative 31
3.4. Wildlife and Fish 31
3.4.1. Affected Environment 31
3.4.2. Environmental Consequences 35
3.4.3. Alternative A – Bridge Option 35
3.4.4. Alternative B – No Action Alternative 35
3.5. Threatened and Endangered Species (including Magnuson-Stevens Act and Essential Fish Habitat) 36
3.5.1. Affected Environment 36
3.5.2. Environmental Consequences 39
3.5.3. Alternative A – Bridge Option 39
3.5.4. Alternative B – No Action Alternative 40
3.6. Recreational Resources 40
3.6.1. Affected Environment 40
3.6.2. Environmental Consequences 41
3.6.3. Alternative A – Bridge Option 41
3.6.4. Alternative B – No Action Alternative 41
3.7. Visual Resources 41

3.7.1. Affected Environment 41
3.7.2. Environmental Consequences 42
3.7.3. Alternative A – Bridge Option 42
3.7.4. Alternative B – No Action Alternative 42
3.8. Environmental Justice 42
3.8.1. Affected Environment 42
3.8.2. Environmental Consequences 44
3.8.3. Alternative A – Bridge Option 44
3.8.4. Alternative B – No Action Alternative 44
3.9. Cultural Resources 44
3.9.1. Affected Environment 44
3.9.2. Environmental Consequences 45
3.9.3. Alternative A – Bridge Option 45
3.9.4. Alternative B – No Action Alternative 45
3.10. Transportation and Access 46
3.10.1. Affected Environment 46
3.10.2. Environmental Consequences 46
3.10.3. Alternative A – Bridge Option 46
3.10.4. Alternative B – No Action Alternative 47
3.11. Air Quality and Noise 47
3.11.1. Affected Environment 47
3.11.2. Environmental Consequences 47
3.11.3. Alternative A – Bridge Option 47
3.11.4. Alternative B – No Action Alternative 47
3.12. Socioeconomics 48
3.12.1. Affected Environment 48
3.12.2. Environmental Consequences 48
3.12.3. Alternative A – Bridge Option 48
3.12.4. Alternative B – No Action Alternative 48

4. Consultation and Coordination

4.1. Scoping 49
4.2. Tribal and Agency Coordination 50
4.3. Other Laws and Regulations 50

5. Wild and Scenic River (Recommended)

5.1.1. Wild and Scenic Rivers Act 50
5.1.2. Management Area 5: Recommended Wild and Scenic River 51
5.2. Affected Environment 52
5.3. Environmental Consequences Recommended Wild and Scenic River 52
5.3.1. Alternative A – Bridge Option 52
5.3.2. Alternative B – No Action 52

6. Cumulative Impacts

6.1.1. Affected Environment 53
6.1.2. Environmental Consequences 53
6.1.3. Alternative A – Bridge Option 53

6.1.4. Alternative B – No Action 53

7. BIBLIOGRAPHY

7.1. Literature Cited 54
7.2. Internet Sources 56

8. List of Preparers 59

9. Appendix A: Best Management Practices 61

10. Appendix B: Conservation Measures 63

11. Appendix C: Biological Assessment 65

12. Appendix D: Technical Memorandums 67

12.1. Fisheries Resource Report 67
12.2. Aquatics Conservation Strategy 67
12.3. Wildlife Resources Report and Biological Evaluation 67

13. Appendix E: Comment Letters and Responses 69

List of Figures

Figure 1: Project Location 4
Figure 2: Project Vicinity 5
Figure 3: 2003 Washout Site 8
Figure 4: Proposed Bridge Location 11
Figure 5: Bridge Site Plan and Profile 13
Figure 6: Original Bridge (circa 1970) 21
Figure 7: Existing Concrete Pier 25
Figure 8: General Timing of Salmonid Life Stages 34
Figure 9: Bridge Design 43

List of Tables

Table 3.2-1 Peak Flows Return Interval at Granite Falls. 24
Table 3.2-2 Mean Monthly Flows (cfs) at Granite Falls Gauge 26
Table 3.3-1 Plant Species Known to Occur in the Project Area 29
Table 3.4-1 Anadromous and Resident Fish of the Monte Cristo Grade Road Area 33
Table 3.5-1 Federally Listed Species that Occur in the Monte Cristo Grade Road Area 36
Table 3.5-2 Species of Salmonids and Possible Life Stages with Designated Essential Fish Habitat in the Action Area 38
Table 3.8-1 Race and Ethnicity Profile of Census Tract 536.02, Snohomish County, WA 44
Table 3.11-1 Estimated Cost of Each Alternative 48
Table 4.1-1 Staff that Attended the February 9, 2005 Monte Cristo Grade Road Site Visit 49
Table 4.1-2 Staff that Attended the March 1, 2005 Monte Cristo Grade Road Site Visit 49

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

Environmental Assessment

Monte Cristo Grade Road Bridge

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.

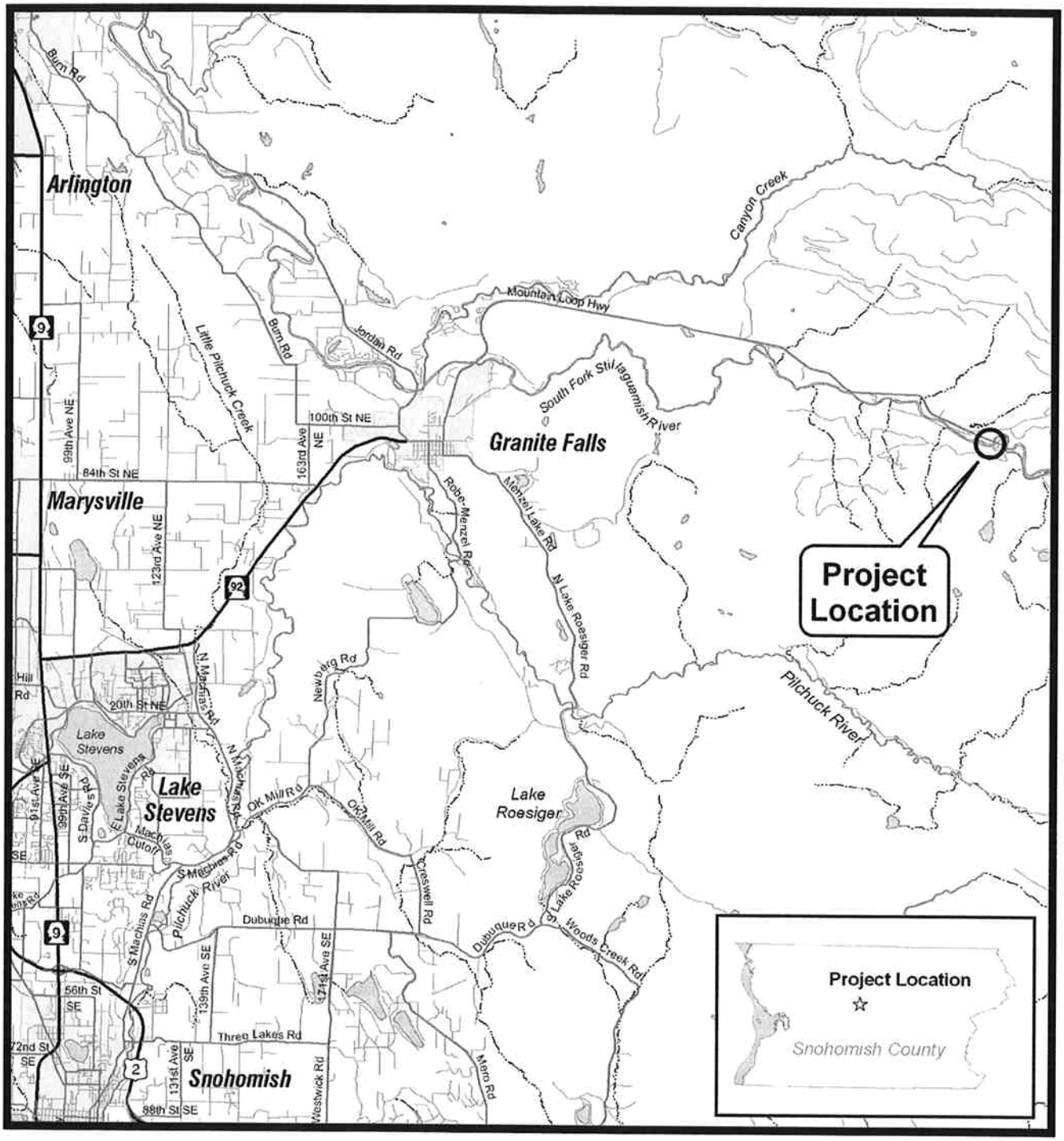
Because of the federal nexus with FEMA funding, an Environmental Assessment (EA), is being prepared by Snohomish County to comply with the National Environmental Policy Act (NEPA) pursuant to FEMA's regulations found in 44 Code of Federal Regulations (CFR) Part 10.

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.

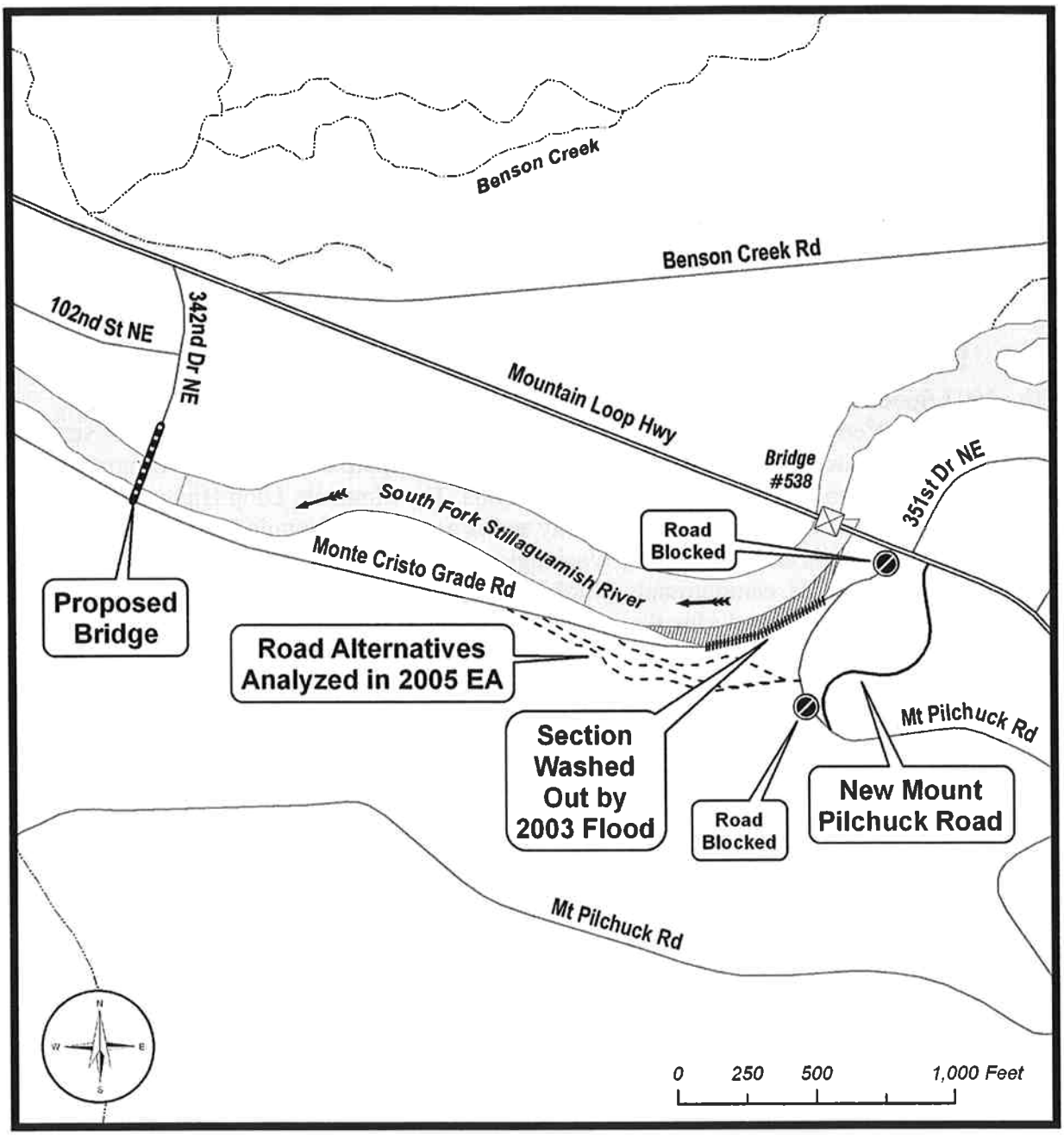


Key to Features:

Project Location — Roads

Snohomish County disclaims any warranty of merchantability or warranty of fitness of this map for any particular purpose, either express or implied. Any user of this map assumes all responsibility for use thereof, and further agrees to hold Snohomish County harmless from and against any damage, loss.

Figure 1: Project Location



Key to Features:

- Proposed Bridge
- County Bridges
- Mountain Loop Highway
- Roads
- Waterbodies
- Streams

Snohomish County

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.

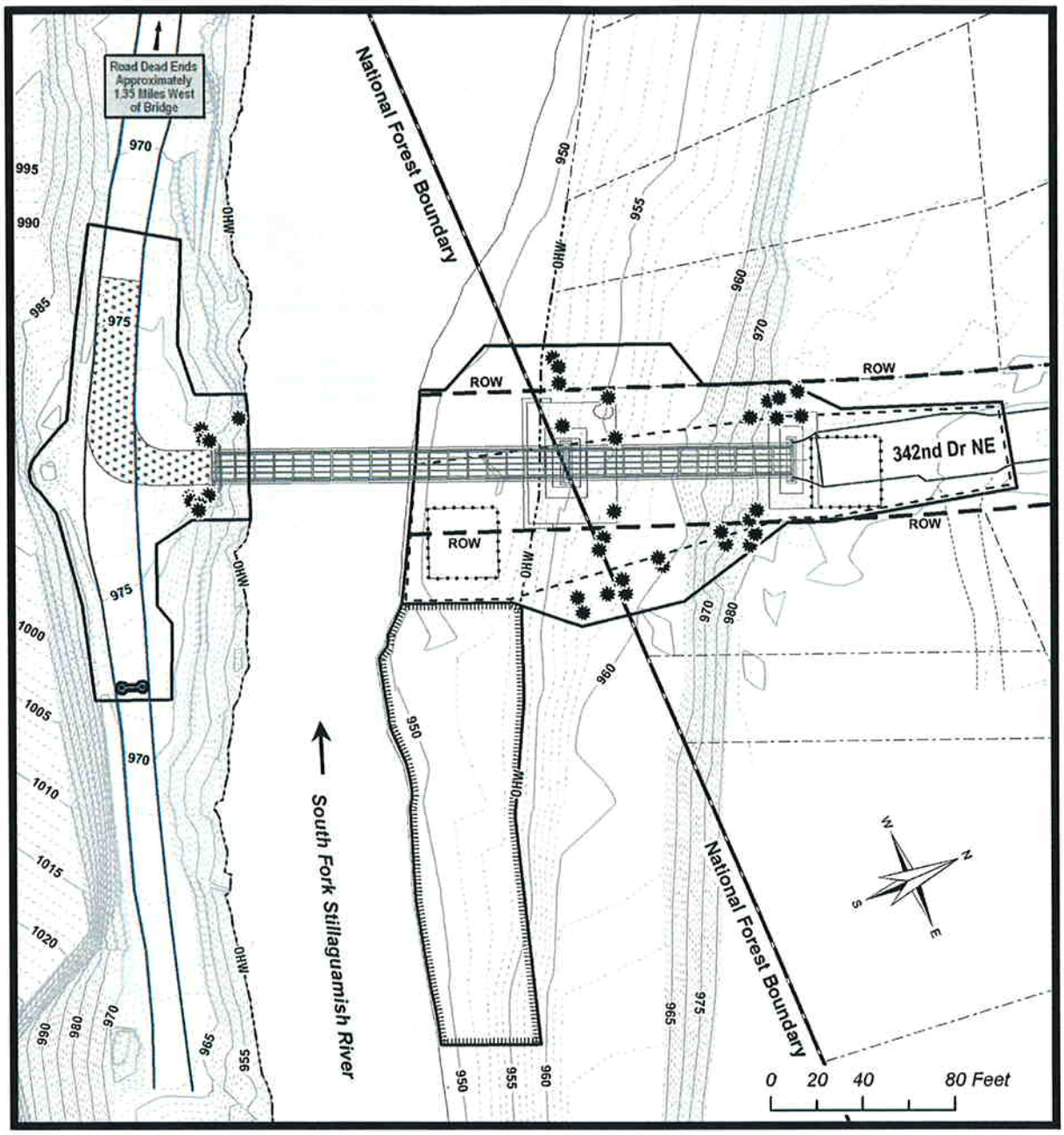
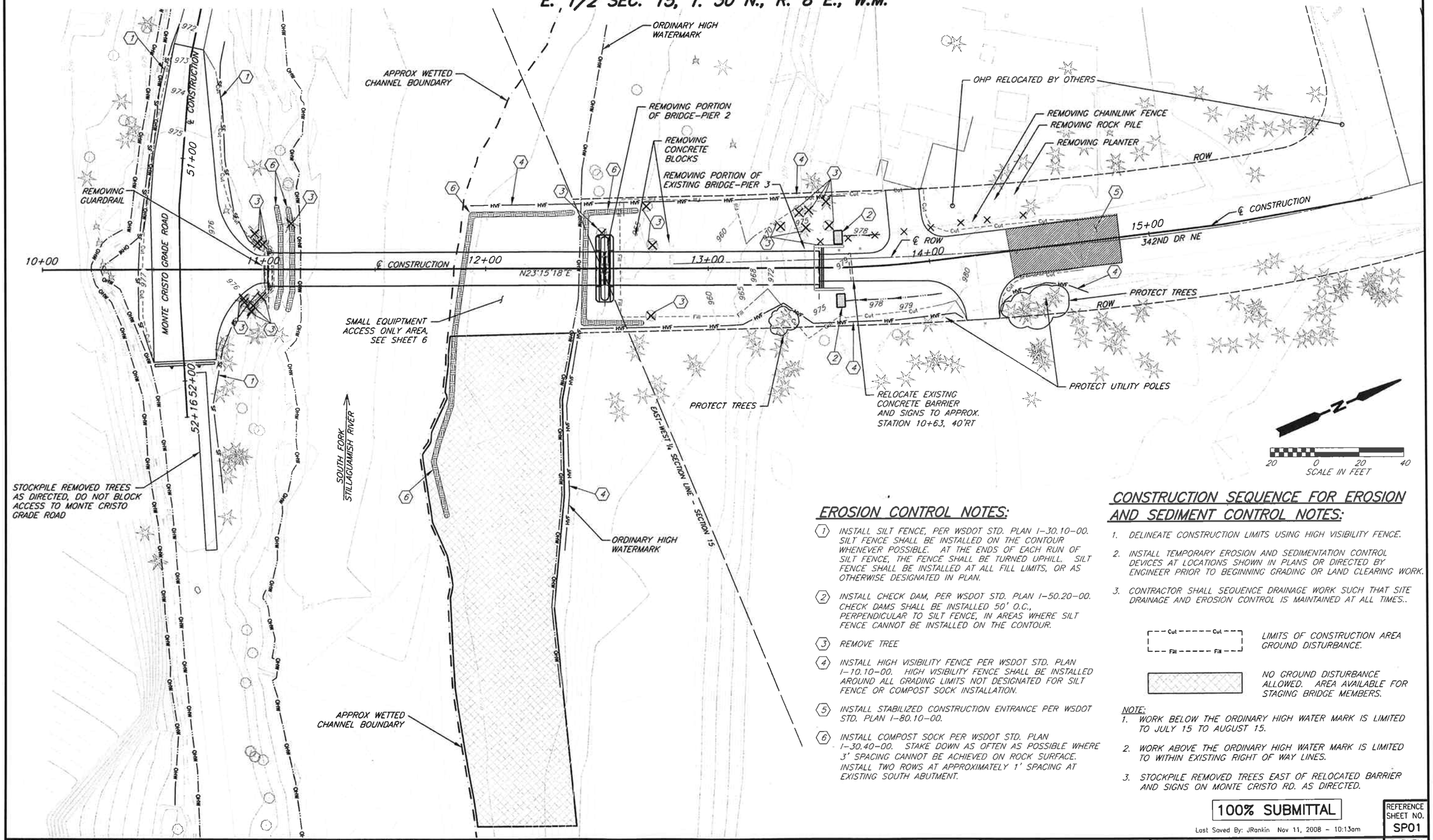


Figure 4: Proposed Bridge Location

E. 1/2 SEC. 15, T. 30 N., R. 8 E., W.M.



EROSION CONTROL NOTES:

1. INSTALL SILT FENCE, PER WSDOT STD. PLAN I-30.10-00. SILT FENCE SHALL BE INSTALLED ON THE CONTOUR WHENEVER POSSIBLE. AT THE ENDS OF EACH RUN OF SILT FENCE, THE FENCE SHALL BE TURNED UPHILL. SILT FENCE SHALL BE INSTALLED AT ALL FILL LIMITS, OR AS OTHERWISE DESIGNATED IN PLAN.
2. INSTALL CHECK DAM, PER WSDOT STD. PLAN I-50.20-00. CHECK DAMS SHALL BE INSTALLED 50' O.C., PERPENDICULAR TO SILT FENCE, IN AREAS WHERE SILT FENCE CANNOT BE INSTALLED ON THE CONTOUR.
3. REMOVE TREE
4. INSTALL HIGH VISIBILITY FENCE PER WSDOT STD. PLAN I-10.10-00. HIGH VISIBILITY FENCE SHALL BE INSTALLED AROUND ALL GRADING LIMITS NOT DESIGNATED FOR SILT FENCE OR COMPOST SOCK INSTALLATION.
5. INSTALL STABILIZED CONSTRUCTION ENTRANCE PER WSDOT STD. PLAN I-80.10-00.
6. INSTALL COMPOST SOCK PER WSDOT STD. PLAN I-30.40-00. STAKE DOWN AS OFTEN AS POSSIBLE WHERE 3' SPACING CANNOT BE ACHIEVED ON ROCK SURFACE. INSTALL TWO ROWS AT APPROXIMATELY 1' SPACING AT EXISTING SOUTH ABUTMENT.

CONSTRUCTION SEQUENCE FOR EROSION AND SEDIMENT CONTROL NOTES:

1. DELINEATE CONSTRUCTION LIMITS USING HIGH VISIBILITY FENCE.
2. INSTALL TEMPORARY EROSION AND SEDIMENTATION CONTROL DEVICES AT LOCATIONS SHOWN IN PLANS OR DIRECTED BY ENGINEER PRIOR TO BEGINNING GRADING OR LAND CLEARING WORK.
3. CONTRACTOR SHALL SEQUENCE DRAINAGE WORK SUCH THAT SITE DRAINAGE AND EROSION CONTROL IS MAINTAINED AT ALL TIMES..

Cut ------ Cut
Fill ------ Fill
LIMITS OF CONSTRUCTION AREA GROUND DISTURBANCE.

NO GROUND DISTURBANCE ALLOWED. AREA AVAILABLE FOR STAGING BRIDGE MEMBERS.

NOTE:
1. WORK BELOW THE ORDINARY HIGH WATER MARK IS LIMITED TO JULY 15 TO AUGUST 15.
2. WORK ABOVE THE ORDINARY HIGH WATER MARK IS LIMITED TO WITHIN EXISTING RIGHT OF WAY LINES.
3. STOCKPILE REMOVED TREES EAST OF RELOCATED BARRIER AND SIGNS ON MONTE CRISTO RD. AS DIRECTED.

100% SUBMITTAL

Last Saved By: JRankin Nov 11, 2008 - 10:13am

REFERENCE SHEET NO. SP01

PLAN CHECK	BY	DATE

DATE	NO.	REVISION	BY

REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.
10	WASH.		
DESIGNED BY:		DRAWN BY: TWN	
FIELD BOOK(S):		DRAWING # 07-4135-SP01.dwg	

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ROBERT P. DOHERTY STATE OF WASHINGTON 43425 REGISTERED PROFESSIONAL ENGINEER

APPROVED FOR CONSTRUCTION

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

DATE APPROVED:

SNOHOMISH COUNTY DEPARTMENT OF PUBLIC WORKS

PROJECT NO. RC1513

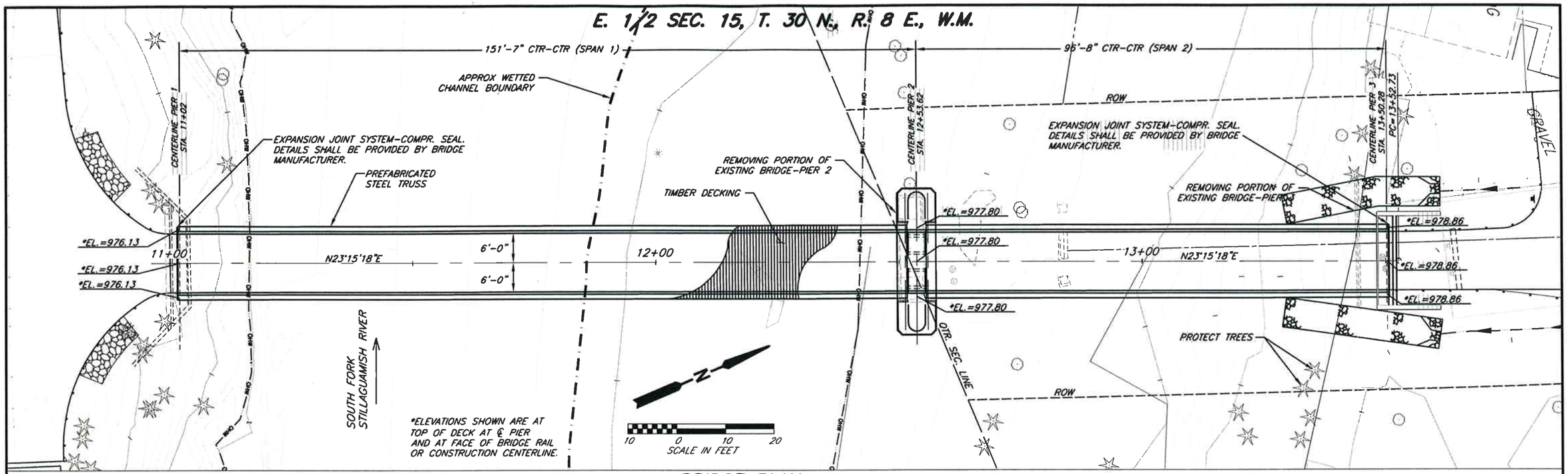
MONTE CRISTO GRADE RD.
BRIDGE #660
TESC & SITE PREPARATION PLAN

SURVEY NO. 3870

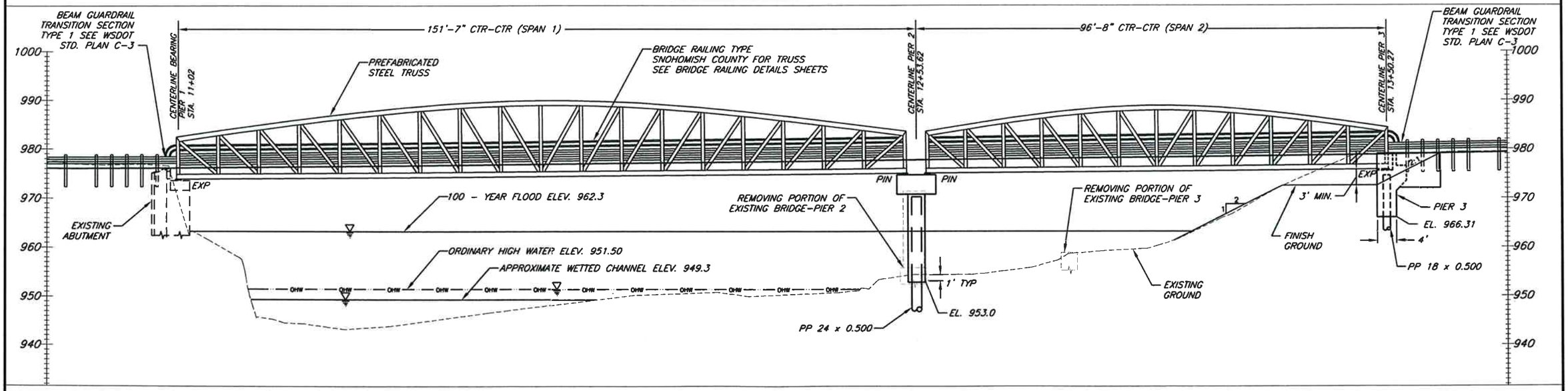
SHEET 4 OF 30 SHEETS

Plotted: Nov 21, 2008 - 2:28pm RTemplado P:\Snohomish County\035038\Design\Drawings\Civil\07-4135-SP01.dwg Layout Name: Layout1

E. 1/2 SEC. 15, T. 30 N., R. 8 E., W.M.



BRIDGE PLAN



BRIDGE ELEVATION

100% SUBMITTAL

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REFERENCE SHEET NO. BP01

PLAN CHECK	BY	DATE

DATE	NO.	REVISION	BY

REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.
10	WASH.		
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FIELD BOOK(S):		DRAWING # 07-4135-BPP02.dwg	

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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 #660
BRIDGE PLAN AND ELEVATION

SURVEY NO. 3870

SHEET 14 OF 30 SHEETS

LEGEND

EXISTING	PROPOSED	
		POWER/TELEPHONE POLE
		OUTFALL PROTECTION
		SIGN
		CONIFEROUS TREE
		DECIDUOUS TREE
		STUMP
		ASPHALT PAVEMENT
		GRAVEL ROAD
P		POWER LINE
		DITCH / STREAM
		CENTERLINE
		RIGHT-OF-WAY
		BUILDING/STRUCTURE
		PROPERTY LINES
		QTR SECTION LINE
		SAWCUT LINE
		PLASTIC YIELD LINE
	X	CURVE ID, NEW SIGN ID
	1/2	1/2 DELTA OF CURVE OR 1/2 POINT ALONG A LINE SEGMENT
	1/4	1/4 DELTA OF CURVE OR 1/4 POINT ALONG A LINE SEGMENT
	Cut Cut	LIMIT OF CUT (LIMITS OF CLEARING)
	Fill Fill	LIMIT OF FILL (LIMITS OF CLEARING)
	X	CONSTRUCTION NOTES
	X	TEMPORARY TRAFFIC CONTROL NOTES
		4' CHAINLINK FENCE
		GUARD RAIL
		EDGE PAVEMENT
		GRADING LIMITS
		BORINGS
320	320	CONTOUR LINE MAJOR
	321	CONTOUR LINE MINOR

EXISTING	PROPOSED	
		WORK AREA BOUNDARY
		TREE REMOVAL
		CHAINLINK FENCE REMOVAL
	SF SF	SILT FENCE
	HVF HVF	HIGH VISIBILITY FENCE
		COMPOST SOCK
		APPROX. WETTED CHANNEL BOUNDARY
	OHW OHW	ORDINARY HIGH WATER MARK
		CHECK DAM

GENERAL NOTE:

1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH SNOHOMISH COUNTY ENGINEERING DESIGN AND DEVELOPMENT STANDARDS (EDDS), WASHINGTON STATE DEPARTMENT OF TRANSPORATION/AMERICAN PUBLIC WORKS ASSOCIATION 2006 STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, AND THE SNOHOMISH COUNTY CODE, TITLE 30, UNIFIED DEVELOPMENT CODE.
2. LOCATIONS OF EXISTING UTILITIES AND IMPROVEMENTS SHOWN ARE APPROXIMATE ONLY AND IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE EXACT LOCATION(S) OF ALL UTILITIES AND IMPROVEMENTS TO AVOID DAMAGE OR DISTURBANCE.
3. FOR AID IN UTILITY LOCATION CALL 1-800-424-5555 PRIOR TO BEGINNING CONSTRUCTION.
4. SURVEY MONUMENTS SHALL BE INSTALLED IN ACCORDANCE WITH SNOHOMISH COUNTY ENGINEERING DESIGN AND DEVELOPMENT STANDARDS (EDDS), CHAPTER 4-03, DETAIL 4-130.

ABBREVIATIONS:

@ – AT
AP – ANGLE POINT
APPROX. –APPROXIMATE
ASPH – ASPHALT
BP – BEGIN PROFILE
BRG – BEARING
BVC – BEGINNING VERTICAL CURVE
CL – CENTERLINE
COMPR. – COMPRESSION
CONC – CONCRETE
CSTC – CRUSHED SURFACING TOP COURSE
CTR – CENTER
CY – CUBIC YARDS
DIA – DIAMETER
DR – DRIVE
E – EAST
EA – EACH
EF – EACH FACE
EL – ELEVATION
ELEV – ELEVATION
EP – EDGE OF PAVEMENT
EQ – EQUAL
EVC – END OF VERTICAL CURVE
EX – EXISTING
EXP – EXPANSION
FA – FORCE ACCOUNT
FF – FAR FACE
GB – GEOTECHNICAL BORING
GR – GRADE
HMA – HOT MIX ASPHALT
HORIZ. – HORIZONTAL
HVF – HIGH VISIBILITY FENCE
ID – IDENTIFICATION
K – LENGTH OF VERTICAL CURVE DIVIDED BY GRADE DIFFERENCE
L – LENGTH
LF – LINEAL FEET
LS – LUMP SUM
LT – LEFT
MIN – MINIMUM
N – NORTH
NE – NORTHEAST
NF – NEAR FACE
NTS – NOT TO SCALE
OHP – OVERHEAD POWER
OHW – ORDINARY HIGH WATER
P – POWER
PC – POINT OF CURVATURE
PED – PEDESTRIAN
PIN – PINNED
PP – PIPE PILE
PP – POWER POLE
PT – POINT OF TANGENCY
PVI – POINT OF VERTICAL INTERSECTION
R – RADIUS
R – RANGE
RD – ROAD
ROW – RIGHT OF WAY
RT – RIGHT
RW – RIGHT OF WAY
SEC – SECTION
SF – SILT FENCE
SP – SPACES OR SPACING
SPEC – SPECIFICATION
STA – STATION
STD. – STANDARD
SY – SQUARE YARD
T – TANGENT
T – TOWNSHIP
TYP – TYPICAL
UG – UNDERGROUND
UT – UTILITY
VC – VERTICAL CURVE
VERT. – VERTICAL
WM – WEST MERIDIAN

100% SUBMITTAL

Last Saved By: JRankin Nov 11, 2008 – 10:13am

REFERENCE SHEET NO. LA01

PLAN CHECK	BY	DATE

DATE	NO.	REVISION	BY

REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.
10	WASH.		
DESIGNED BY: TWN		DRAWN BY: CMB	
FIELD BOOK(S):		DRAWING # 07-4135-DT02.dwg	

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ROBERT P. DOBRETZ STATE OF WASHINGTON 43425 REGISTERED PROFESSIONAL ENGINEER

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 #660
LEGEND & GENERAL NOTES

SURVEY NO. 4135

SHEET 5 OF 30 SHEETS

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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.

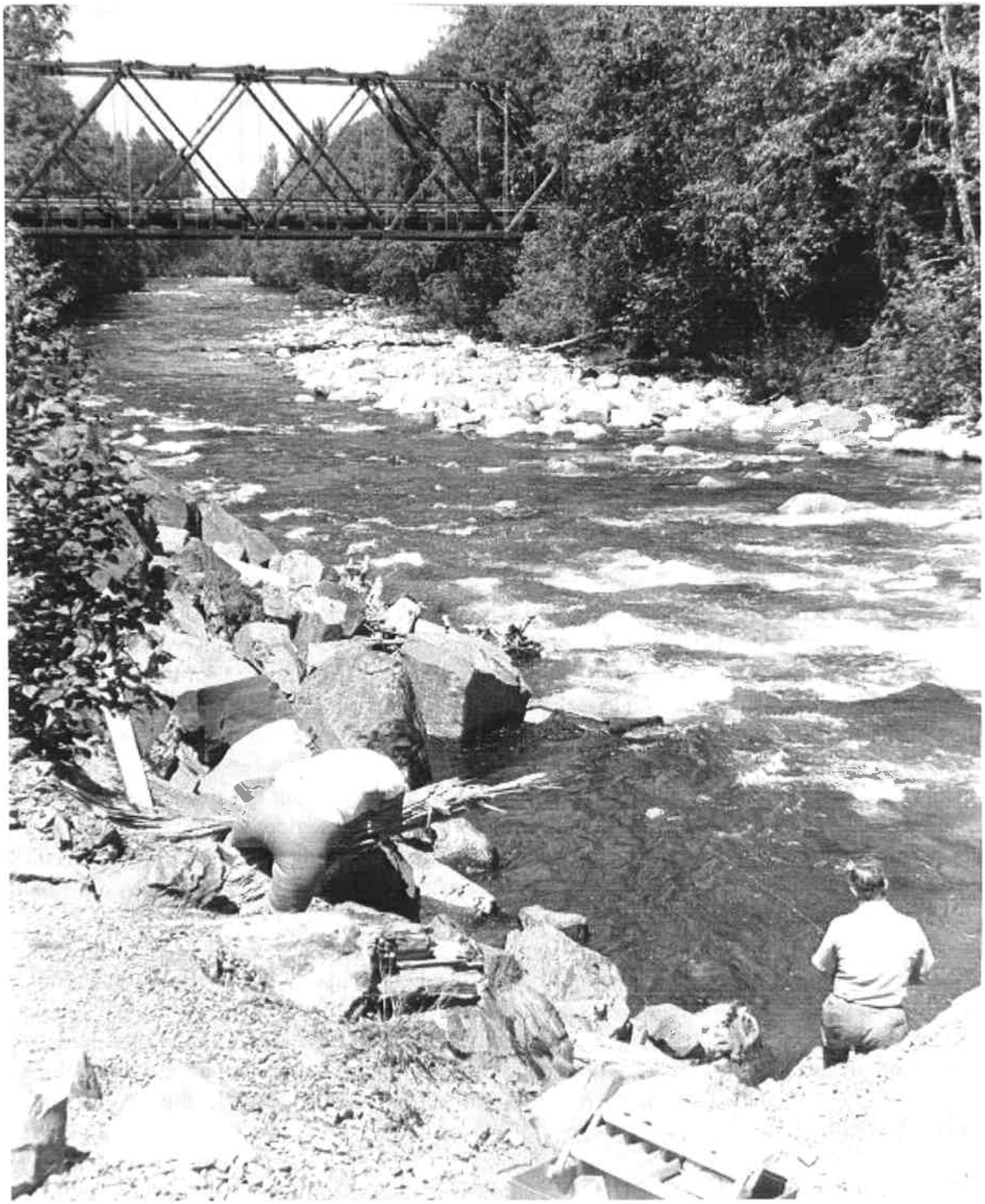


Figure 6: Original Bridge (circa 1970)

3.2. Environmental Consequences

3.2.1. 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.

3.2.2. 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.

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

3.3.1. 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.

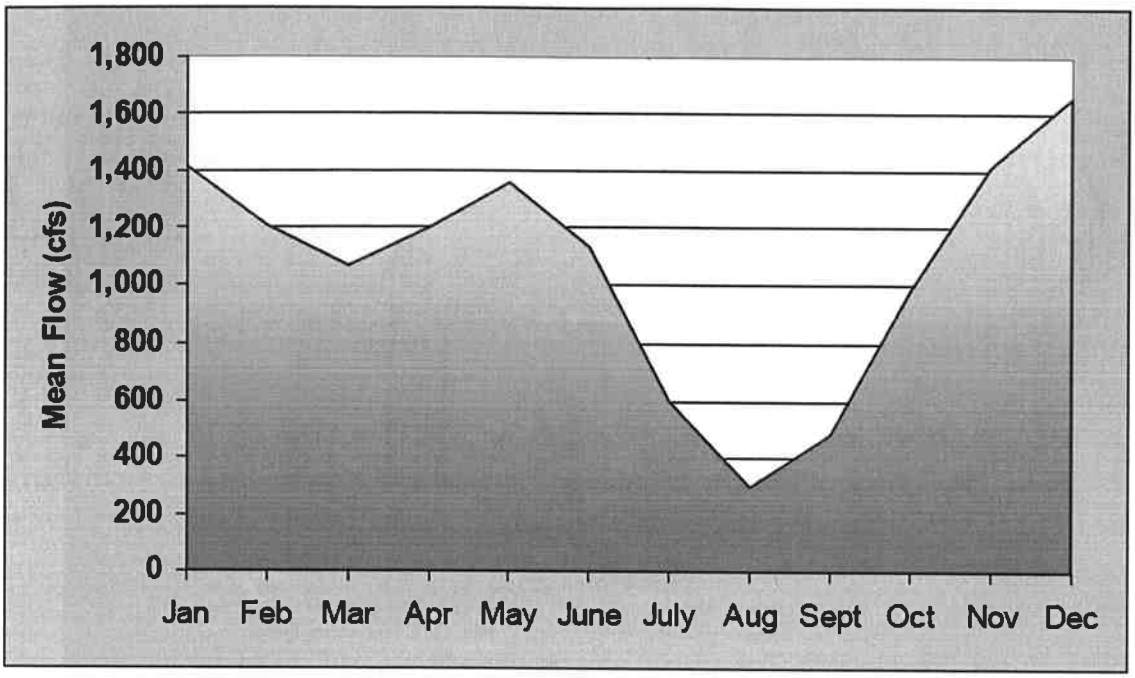
Recurrence Interval	Flow (cfs) at Granite Falls
2-year	16,400
5-year	21,700
10-year	25,000
25-year	28,600
50-year	31,900
100-year	34,800
500-year	41,200

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.

3.3.2. Environmental Consequences

3.3.3. 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.

3.3.4. 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.

3.4. Vegetation and Wetlands (and Executive Order 11990)

3.4.1. 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.

3.4.2. Environmental Consequences

3.4.3. 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.

3.4.4. 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.

3.5. Wildlife and Fish

3.5.1. Affected Environment

3.5.1.1. 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.

3.5.1.2. 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.

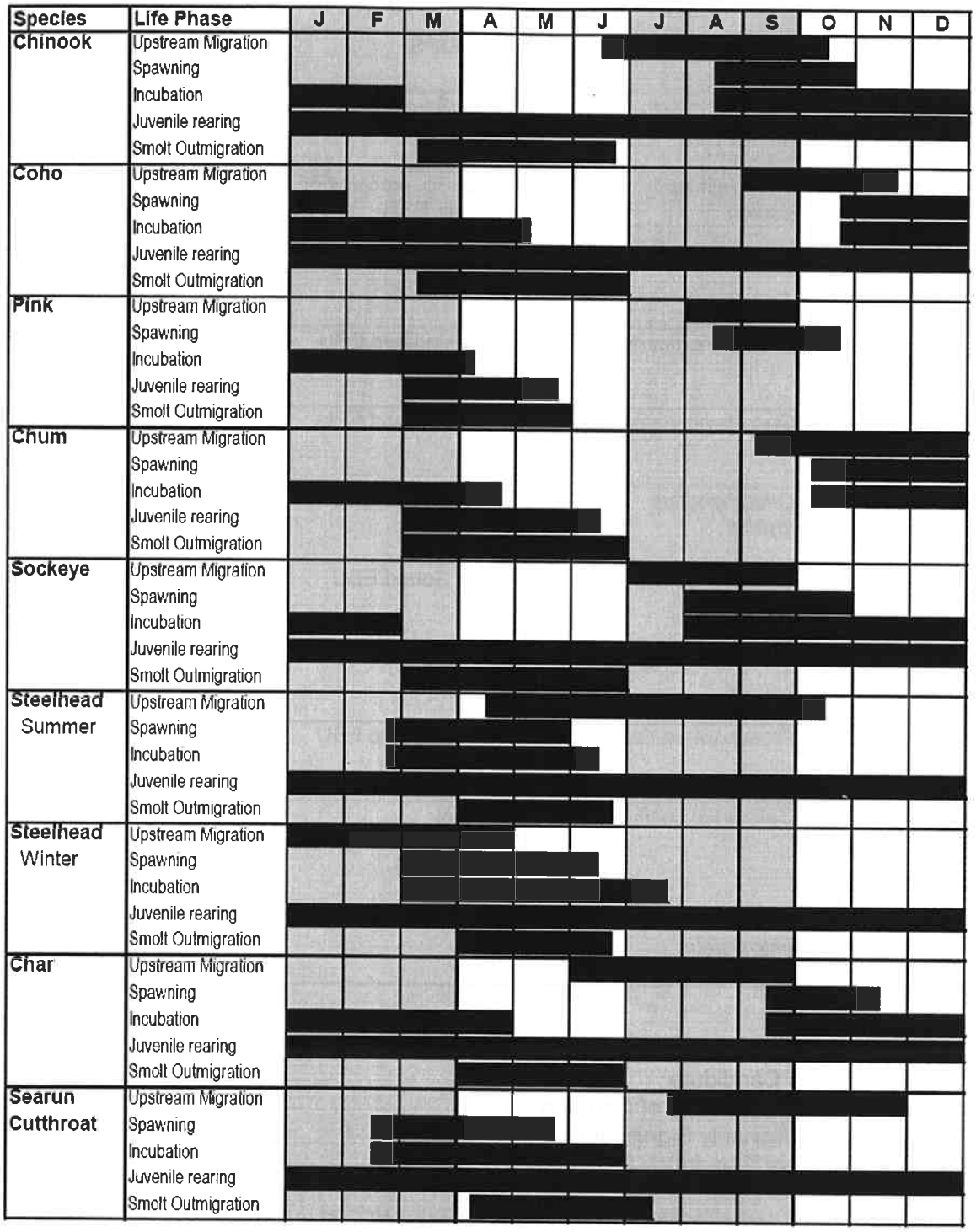
Table 3.4-1 Anadromous and Resident Fish of the Monte Cristo Grade Road Area

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

3.5.2. Environmental Consequences

3.5.3. 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.

3.5.4. 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.

3.6. 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 U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration/National Marine Fisheries Service (NMFS) as threatened, endangered, or as candidates for listing under the Endangered Species Act (ESA). No listed plant species are known to occur in the project area.

A separate Biological Assessment (BA) has been be prepared and submitted for review by USFWS and NMFS. Both Services have determined that "No Take" of Endangered Species is associated with this project. A letter of concurrence was received from USFWS dated November 13, 2008. A letter of concurrence was received from NMFS dated September 2, 2008. The concurrence letters are included in the BA, Appendix C.

3.6.1. Affected Environment

3.6.1.1. 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.

3.6.1.2. 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.

3.6.1.3. 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	

3.6.1.4. 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.

3.6.1.5. 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

3.6.1.6. 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.

3.6.1.7. 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.

3.6.2. 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.

3.6.3. 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.

3.6.4. 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.

3.7. Recreational Resources

3.7.1. 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.

3.7.2. Environmental Consequences

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

3.7.3. 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.

3.7.4. 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.

3.8. Visual Resources

3.8.1. 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.

3.8.2. Environmental Consequences

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

3.8.3. 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.

3.8.4. 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.

3.9. 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).

3.9.1. 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.)

3.9.2. Environmental Consequences

3.9.3. 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.

3.9.4. 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.

3.10. 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.

3.10.1. 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.

3.10.2. Environmental Consequences

3.10.3. 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.

3.10.4. 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.

3.11. Transportation and Access

3.11.1. 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.

3.11.2. Environmental Consequences

3.11.3. 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.

3.11.4. 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.

3.12. Air Quality and Noise

3.12.1. 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.

3.12.2. Environmental Consequences

3.12.3. 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.

3.12.4. 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.

3.13. Socioeconomics

3.13.1. 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.

3.13.2. Environmental Consequences

3.13.3. 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.

3.13.4. 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.

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 have had an opportunity to comment on the Draft EA. No further comments have been received. 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.

In addition, a separate Biological Assessment (BA) has been prepared and consultation was initiated with U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration/National Marine Fisheries Service (NMFS) as mandated by the ESA. The Services have determined that "No Take" of Endangered Species is associated with this project. The letters of concurrence from both agencies are attached to the BA in Appendix C.

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. WILD AND SCENIC RIVER (RECOMMENDED)

The South Fork Stillaguamish River, from the headwaters to Canyon Creek, has been recommended as a Wild and Scenic River in the U.S. Forest Plan. This recommendation is under review. However, because this river is a "Recommended" Wild and Scenic River, the project has been reviewed under the Wild and Scenic Rivers Act.

5.1.1. Wild and Scenic Rivers Act

The Wild and Scenic Rivers Act (Act) was signed into law as Public Law 90-542 on October 2, 1968. The Act established a National Wild and Scenic Rivers System (National System). To qualify, a river or river segment must be in a free-flowing condition and must be deemed to have one or more "outstandingly remarkable" scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values.

Section 5(d)(1)of the Act requires that *"In all planning for the use and development of water and related land resources, consideration shall be given by all Federal agencies involved to potential national wild, scenic and recreational river areas, and all river basin and project plan reports submitted to the Congress shall consider and discuss any such potentials."*

Rivers found eligible or suitable for the National System through federal agency planning processes are *not* protected by the Act from proposed hydroelectric facilities or other federally assisted water resources projects (Section 7(a)). However, the managing agency should, within its authorities, protect the values (scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values) that make the river eligible or suitable.

Section 10(a) of the Act is interpreted as a non-degradation and enhancement policy for all *designated* river areas, regardless of classification. Each component is to be managed to protect and enhance the free-flowing condition, water quality and values for which the river was designated, while providing for public recreation and resource uses which do not adversely impact or degrade those values. Therefore the managing agency should analyze and document:

a. The effects of the proposed activity on conditions of free-flow, including identification of any proposed measures to minimize those effects;
b. Any direct and adverse effects on the outstandingly remarkable and other significant resource values for which the river was designated or is being studied; and,
c. Any unreasonable diminishing of scenic, recreational, fish and wildlife values associated with project activities above or below the area.

To be consistent, the river management agency should analyze the effects of proposed projects with the intent of maintaining the highest standards for all *recommended* rivers. Relationship to Forest Plan

5.1.2. Management Area 5: Recommended Wild and Scenic River

The South Fork Stillaguamish River, from the headwaters to Canyon Creek, was recommended as a Scenic River in the Forest Plan (Management Area 5a). The goal would be to protect from degradation the outstandingly remarkable values and the wild, scenic, and recreation characteristics of recommended rivers and their environments pending a decision on inclusion into the National Wild and Scenic River System.

The Forest Plan, as amended, stipulates "(these) rivers shall be managed to protect those characteristics that contribute to the eligibility of these rivers at their highest potential classification" (Chapter 4, p.4-95 USDA FS 1990). The Forest Plan, as amended, identified the Outstandingly Remarkable Values for the South Fork Stillaguamish River to be Scenic, Recreation, Fisheries, and Wildlife Historical/Cultural and Ecological (Appendix E, p.E-134, USDA FS 1990).

The desired future condition for recommended recreation rivers is that evidence of a full range of management activities may exist. In addition, the river is readily accessible by roads or railroad and bridge crossings. High water quality is maintained.

5.2. Affected Environment

The Outstandingly Remarkable Values for the South Fork Stillaguamish River are: Scenic, Recreation, Fisheries, and Wildlife Historical/Cultural and Ecological.

5.3. Environmental Consequences Recommended Wild and Scenic River

This section discusses the No Action Alternative, and Action Alternative and the effects of implementation of those alternatives as they pertain to the Recommended Wild and Scenic River. As stated previously, rivers found eligible or suitable for the National System through federal agency planning processes are not protected by the Act from proposed projects. However, the managing agency should, within its authorities, protect the values (scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values) that make the river eligible or suitable.

The desired future condition for recommended scenic rivers is free flowing with no substantial evidence of human activity. A few small community buildings or structures may be present and visible from the river. Evidence of timber harvest is not noticeable from this river, and lands appear natural when viewed from riverbanks. The river is accessible by roads which may occasionally bridge the river area. Short stretches of conspicuous or longer stretches of inconspicuous and well screened roads or railroads paralleling the river area may be permitted.

5.3.1. Alternative A – Bridge Option

A new Monte Cristo Grade Road Bridge would be constructed 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 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 342"d Drive NE.

The new bridge would have an effect on free flow similar to that of the existing piers. There would be additional short-term impacts during construction which would be mitigated by standard best management practices. Refer to the Recreation, Fisheries, and Wildlife sections for affects on those values.

5.3.2. Alternative B – No Action

Under No Action Alternative the bridge would not be replaced and there would be no effects to the river.

6. 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.

6.1.1. 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.

6.1.2. Environmental Consequences

6.1.3. 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.

Wild and Scenic River: There would be no effect to the South Fork Stillaguamish River Recommended Wild and Scenic River since the project replaces existing piers with similar structures in the same location.

6.1.4. 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.

7. BIBLIOGRAPHY

7.1. 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.

7.2. 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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9. APPENDIX A: BEST MANAGEMENT PRACTICES

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 will 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 (provided by contractor).

- 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 150 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.

- Turbid water generated by excavation below the water table will be pumped from the excavation area and discharged to a vegetated area.

- 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 center pier.

- 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.

10. APPENDIX B: CONSERVATION MEASURES

The following Conservation Measures identified during the environmental process will be implemented during construction of this project in addition to the Best Management Practices.

Decking material

The decking material was originally planned to be constructed as a steel grate. The decking material has been changed to untreated wood. The wood decking will reduce the amount of noise generated.

Signage

Additional signage will be installed on the new bridge as approved by Snohomish County Traffic Operations.

Project timing

Work occurring on the gravel bar during the dry season will adhere to the in-water work window as specified by Washington Department of Fish and Wildlife (WDFW) in the Hydraulic Permit Approval, anticipated to be July 15 to August 15.

Tree removal

The construction sequencing has been modified during the design process to greatly reduce the number of trees to be removed. The original design showed a temporary construction road down to the beach as access for the crane. An alternate design has since been developed to use the existing, already-cleared right-of-way as the crane access instead of clearing vegetation for a new access road. This change minimizes the number of trees to be removed and disturbance to the gravel bar.

Riparian restoration

Following construction of the bridge, approximately 8,500 square feet of the existing Monte Cristo Grade Road on the south side of the river will be abandoned and decommissioned. Approximately 280 linear feet of the old road will be planted with native trees and shrubs. Over time, this replanted riparian area will provide habitat and cover for a variety of wildlife species. The plantings will be monitored and maintained by the County to ensure successful establishment of a native vegetation community.

11. APPENDIX C: BIOLOGICAL ASSESSMENT

Biological Assessment
Monte Cristo Grade Bridge
PW# 06-00976, RC1513

June 2008

Prepared for:
Federal Emergency Management Agency
by

Snohomish County Public Works
3000 Rockefeller Avenue
Everett, WA 98201

TABLE OF CONTENTS

EXECUTIVE SUMMARY V

1. INTRODUCTION 1-1

1.1 PURPOSE 1-3

1.2 CONSULTATION HISTORY 1-4

1.3 METHODS 1-4

1.3.1 Literature Review and Personal Communications 1-4

1.3.2 Geographic Information Systems Data 1-4

1.3.3 Field Investigations 1-4

1.3.4 Effect Determinations 1-4

1.3.5 Documentation 1-5

2. ACTION AREA AND SITE DESCRIPTION 2-1

2.1 ACTION AREA 2-1

2.2 GENERAL SITE CHARACTERISTICS 2-3

2.3 AQUATIC RESOURCES 2-3

2.4 TERRESTRIAL RESOURCES 2-6

3. PROPOSED ACTION 3-1

3.1 PROJECT PURPOSE 3-1

3.2 PROPOSED ACTION AND CONSTRUCTION DISTURBANCE 3-1

3.2.1 Bridge Construction 3-1

North Abutment 3-3

Gravel Bar Work Pad 3-3

Center Pier 3-3

South Pier 3-4

Bridge Span Placement and Site Restoration 3-4

3.2.2 Approach Roads 3-4

3.2.3 Impervious Area and Stormwater Treatment Facilities 3-4

3.2.4 Road Decommissioning 3-5

3.3 INDIRECT AND INTERRELATED ACTIVITIES 3-5

3.4 CONSERVATION MEASURES AND BEST MANAGEMENT PRACTICES 3-5

3.4.1 Conservation Measures 3-6

3.4.2 Best Management Practices 3-6

4. FISH SPECIES EVALUATIONS 4-1

4.1 CHINOOK SALMON 4-1

4.1.1 ESA and Stock Status 4-1

4.1.2 Chinook Salmon in the Action Area 4-2

4.1.3 Critical Habitat 4-2

TABLE OF CONTENTS (CONTINUED)

4.2 BULL TROUT 4-4
4.2.1 ESA and Stock Status 4-4
4.2.2 Bull Trout in the Action Area 4-4
4.2.3 Critical Habitat 4-4
4.3 STEELHEAD 4-6
4.3.1 ESA and Stock Status 4-6
4.3.2 Steelhead in the Action Area 4-6
4.3.3 Critical Habitat 4-6

5. WILDLIFE SPECIES EVALUATIONS 5-1
5.1 MARBLED MURRELET 5-1
5.1.1 ESA Status and Distribution 5-1
5.1.2 Marbled Murrelets in the Action Area 5-1
5.1.3 Critical Habitat 5-2

6. EFFECTS TO LISTED SPECIES AND CRITICAL HABITAT 6-1
6.1 RIPARIAN VEGETAION 6-1
6.2 WATER QUALITY 6-1
6.3 NOISE AND SOUND PRESSURE 6-3
6.4 CHANNEL CONDITIONS 6-4
6.5 EFFECT DETERMINATIONS 6-5
6.5.1 Effect Determinations for Chinook, steelhead, and bull trout 6-5
6.5.2 Effect Determination for Marbled Murrelet 6-6
6.5.3 Critical Habitat Determination for Chinook and bull trout 6-6
6.5.4 Critical Habitat Determination for Marbled Murrelet 6-7

7. REFERENCES 7-1

TABLE OF CONTENTS (CONTINUED)

APPENDICES

A Essential Fish Habitat Consultation

B Project Plans

C Pathway and Indicators Discussion

D Listed Species Life Histories

E Project Area Photos

ACRONYMS

BE	Biological Evaluation
BMPs	best management practices
BMU	bear management unit
cfs	cubic feet per second
DDT	dicholo-diphenyl-tricholoroethane
DPS	distinct population segment
DPSs	distinct population segments
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	evolutionarily significant unit
LWD	large woody debris
MBSNF	Mount Baker-Snoqualmie National Forest
MSA	Magnuson-Stevens Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OHWM	ordinary high water mark
PCE	primary constituent element
PHS	Priority Habitats and Species
RM	river mile
ROS	rain-on-snow event
TESC	temporary erosion and sediment control
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geologic Survey
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WRIA	Water Resources Inventory Area
WSDOT	Washington State Department of Transportation

EXECUTIVE SUMMARY

Snohomish County proposes to construct a single lane, steel truss bridge across the South Fork (SF) Stillaguamish River to restore vehicle access to approximately 20 properties. The County will receive funding from the Federal Emergency Management Agency (FEMA). A Clean Water Act Section 404 permit is required for proposed temporary fill within waters of the United States from the U.S. Army Corps of Engineers (USACE). The federal funding and Corps permit constitute federal actions under Section 7 of the Endangered Species Act (ESA). Since the project may affect threatened species, consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) is required.

Snohomish County has prepared this Biological Assessment (BA) on behalf of FEMA to determine the potential effects of the proposed Federal action on threatened and endangered species and their critical habitats.

The County is proposing to construct a bridge across the SF Stillaguamish to reconnect 342nd Dr NE to the Monte Cristo Grade Road at the site where a bridge was removed 30 years ago. The Monte Cristo Grade Road parallels the SF Stillaguamish and a portion was severely damaged by record flooding in October 2003, making it impassable. Replacing the road would cause extensive impacts to wetlands, streams and riparian buffers. To avoid those impacts, the County is proposing to build the bridge. 342nd Drive NE is approximately 550 feet long and connects to the south side of the Mountain Loop Highway at mile post 11.6, east of the Verlot Ranger station. This road currently ends at the SF Stillaguamish River, directly across from the Monte Cristo Grade Rd. The half mile of road between the original start of the Monte Cristo Grade Road and where the bridge will connect to the Monte Cristo Grade Rd will be decommissioned and used as mitigation.

The two abutments and the center pier still remain of the old bridge. The south abutment is located on bedrock above the Ordinary High Water Mark (OHWM) and is assumed to be used for the new bridge. The existing center pier is not structurally adequate to support the new bridge. The center pier will be replaced in approximately the same location, which is above the OHWM. The north abutment is located in the road and will be replaced with deeper piles. The bridge will cross the SF Stillaguamish River at river mile (RM) 47.

Potential effects of the project on federally listed species include: removal of riparian vegetation; work below the OHWM, but outside of the wetted channel; potential sedimentation; and construction related noise and vibrations.

Avoidance and minimization measures include: locating the bridge piers above the OHWM of the SF Stillaguamish River; scheduling work below the OHWM to occur during summer low flows between July15-August15 to avoid in-water work and minimize impacts to ESA-listed species; and employing standard sedimentation and erosion control measures. No in-water work will occur. All work below the OHWM will be above the wetted channel.

Conservation measures include restoring riparian vegetation, decommissioning part of the old road and enhancing it with riparian vegetation.

Analyses of potential impacts were made based on a review of plans for the proposed action, an on-site evaluation of existing habitat conditions, data on the current and historical distributions of each species, and personal communications with local agency biologists. Based on this review, determinations of effects were made for the proposed project, and are summarized in the Table 1.

Essential Fish Habitat (EFH) consultation with NMFS is required and effects to EFH are documented in Appendix A of this BA.

Table 1. Summary of Effects for Listed Endangered and Threatened Species, Critical Habitat and EFH

Common *Scientific*	ESA Status	Life Stages Considered	Effect Determination
Chinook salmon *Oncorhynchus tshawytscha*	Threatened	All freshwater phases	May affect, not likely to adversely affect
Chinook salmon critical habitat	N/A	N/A	May affect, not likely to adversely affect
Bull trout *Salvelinus confluentus*	Threatened	All freshwater phases	May affect, not likely to adversely affect
Bull trout critical habitat	N/A	N/A	May affect, not likely to adversely affect
Steelhead *O. mykiss*	Threatened	All freshwater phases	May affect, not likely to adversely affect
Marbled Murrelet *Brachyramphus marmoratus*	Threatened	Nesting	May affect, not likely to adversely affect
Marbled Murrelet Critical Habitat	N/A	N/A	May affect, not likely to adversely affect
Essential Fish Habitat	N/A	N/A	May adversely affect

1. INTRODUCTION

Severe flooding of the SF Stillaguamish River in October 2003 resulted in the destruction of the east end of the Monte Cristo Grade Road in central Snohomish County, cutting off access to approximately 20 properties. The river migrated approximately 60 feet to the east, eroding a high bank and approximately 200 linear feet of the Monte Cristo Grade Road.

In response to widespread flooding in October and November 2003, a federal disaster was declared for Snohomish County. The County requested federal financial assistance from the Federal Emergency Management Agency (FEMA) for the repair of damaged public facilities, including the Monte Cristo Grade Road. The purpose of this project is to restore vehicular access to the property owners along the Monte Cristo Grade Road. FEMA is funding construction of a bridge over the SF Stillaguamish River as an alternative to replacing the portion of Monte Cristo Grade Road that was damaged by the flood. Snohomish County has proposed the bridge alternative because rebuilding the Monte Cristo Grade Road would have far greater impacts to wetlands, riparian areas, and habitat for listed species.

The project will be constructed in summer 2009 and is located east of Verlot on 342nd Drive NE in Section 15, Township 30N, Range 8E (Figure 1) at river mile (RM) 47 of the SF Stillaguamish River.

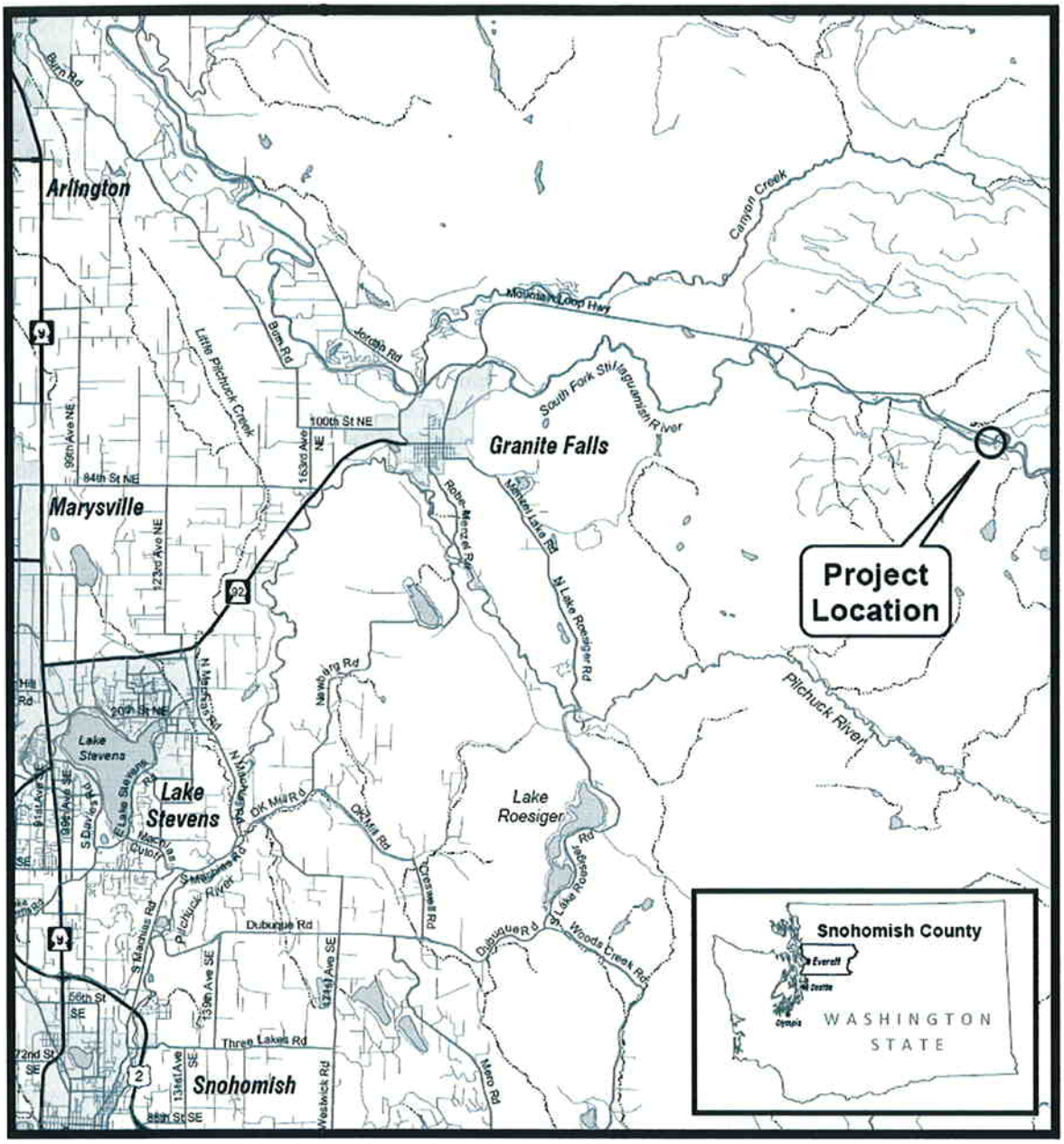


Figure 1. Project Location

1.1 PURPOSE

Section 7 of the Endangered Species Act (ESA) requires that federal agencies consult with the US Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) if their actions may affect listed species or critical habitat to ensure that they are not funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. This project involves two federal actions: FEMA funding of the repair and the Corps issuance of a Section 404 permit under the Clean Water Act. The County prepared this biological assessment (BA) for FEMA for consultation on the federal actions with the NMFS and USFWS. This BA addresses the direct and indirect effects of the funding and Section 404 permitting actions, as well as effects associated with any interdependent and interrelated activities on ESA-listed species, designated or proposed critical habitat. Because the project may adversely affect Essential Fish Habitat (EFH) designated per the Magnuson-Stevens Fishery Conservation and Management Act, consultation with NMFS regarding effects to EFH is also required. Effects to EFH will be similar to effects to critical habitat and the analysis of effects to EFH is included in Appendix A.

The County obtained listed species likely to occur in the project vicinity from the most recent USFWS and NMFS websites. From these sources, communications with local biologists, and evaluation of suitable habitat, we have determined that Chinook salmon, steelhead, bull trout and marbled murrelet may occur in the project vicinity (Table 1). Designated critical habitat for Chinook salmon, bull trout, and marbled murrelet also occurs in the project vicinity. No federally listed plant species were identified in the action area.

Suitable habitat for northern spotted owl is not present in the action area and the action area is not located within an established territory management circle (WDFW PHS 2006). The nearest spotted owl site center is over 2 miles outside of the action area.

Based on current land uses, level of human presence in the vicinity of the project, and lack of suitable habitat and critical habitat in the action area, the project will have **no effect** on northern spotted owl, Canada lynx, gray wolf, grizzly bear, or Southern Resident Killer Whale; these species will not be discussed further.

1.2 CONSULTATION HISTORY

FEMA issued an Environmental Assessment addressing rebuilding the road. The bridge is a new proposal and is considered a new project by FEMA.

Pre-consultation meetings and site visits were held with Suzy Lutey and Jim Muck (USFWS) and with Tom Sibley, Sean Gross, Brett Farman, and Dan Tonnes (NMFS) between early 2004 and 2008. Representatives of the Services consistently conveyed that rebuilding or realigning the damaged section of the Monte Cristo Grade Road would have impacts to listed species and strongly encouraged the County and FEMA to propose a lower impact alternative. Neither agency concurred with the effects call in the BA submitted June 9, 2005. This input was used to develop this proposal to build a bridge over the SF Stillaguamish to access the intact portion of the Monte Cristo Grade Road and associated properties, greatly reducing potential impacts to riparian habitat.

1.3 METHODS

1.3.1 Literature Review and Personal Communications

Existing literature and scientific data were reviewed to determine species distribution, habitat requirements, and other pertinent biological requirements. Federal, state and county biologists were also consulted to provide local information about listed species in the project vicinity. Literature and data sources are summarized in References (Chapter 7).

1.3.2 Geographic Information Systems Data

Using geographic information systems (GIS), natural resource related data was reviewed to thoroughly document all sensitive species and habitats associated with the proposed project. This included the Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species (PHS) and Salmonscape database, National Wetlands Inventory (NWI), Department of Natural Resources (DNR) soils and hydrography information, and Snohomish County's Chinook salmon and bull trout distribution GIS coverages.

1.3.3 Field Investigations

On-site investigations of the project site were conducted by County environmental staff to evaluate the environmental baseline, probability of species presence, and existing habitat conditions. Site investigations were conducted between 2003-2008 during all seasons of the year. General habitat suitability for each of the subject species was assessed. The extent of potential project impacts to potential species habitat was also evaluated in the field.

1.3.4 Effect Determinations

Direct and indirect effects of the action were analyzed using the information compiled from the literature review and site visits, review of engineered drawings, and consultation with project engineers and agency staff. Direct effects considered include physical impacts to the species as well as critical habitat (where designated) that could potentially result from construction activities. Indirect effects include effects that are caused by the proposed action and occur later in time. Indirect effects evaluated include potential

changes to habitat that could evolve following project construction and future disturbance related to project operation and maintenance.

Potential interrelated, interdependent activities and beneficial effects were also evaluated. Interrelated activities include activities that are part of the proposed action and depend on the proposed action for its justification. Interdependent activities include those activities that have no independent utility apart from the action under consultation.

Proposed conservation measures are intended to reduce or minimize project impacts, thus avoiding the take of listed species. Appropriate conservation measures have been developed through coordination between County biologists, the federal services, state and Tribal biologists, and project managers, and are considered when making the final effect determinations.

1.3.5 Documentation

The findings from the above tasks are documented in this BA. The presumed, historical and/or documented presence of these species and the level of known use within the project site are presented herein. General requirements and habits such as timing of spawning and vulnerability to the proposed construction activities are addressed for species that are threatened or endangered. Proposed conservation measures that will avoid, minimize, or mitigate the impacts of the proposed construction activities on listed species and their critical habitat are also presented. All of this information has been considered to make effect determinations for each species.

2. ACTION AREA AND SITE DESCRIPTION

2.1 ACTION AREA

The action area includes all areas to be affected directly or indirectly by the project. Potential direct and indirect effects include: 1) clearing of riparian vegetation; 2) water quality; 3) construction noise; and 4) altered channel conditions. The project will not increase the pre-disaster traffic capacity of Monte Cristo Grade Road and will not result in increased traffic. Although Best Management Practices (BMPs) will be used to minimize or eliminate in-stream effects of the project, there is some potential for sediment or debris to enter the river at the project site.

Sediment and erosion control, as well as spill control and containment BMPs, will minimize the potential for the project to degrade water quality. Due to the large volume of the receiving water body, any sediment introduced into the river should not be detectable beyond 300 feet downstream (using criteria of the 1998 Surface Water Quality Standards Agreement between the Washington State Department of Transportation and Ecology, which specifies a downstream point of compliance for turbidity standards based on flow rates during construction).

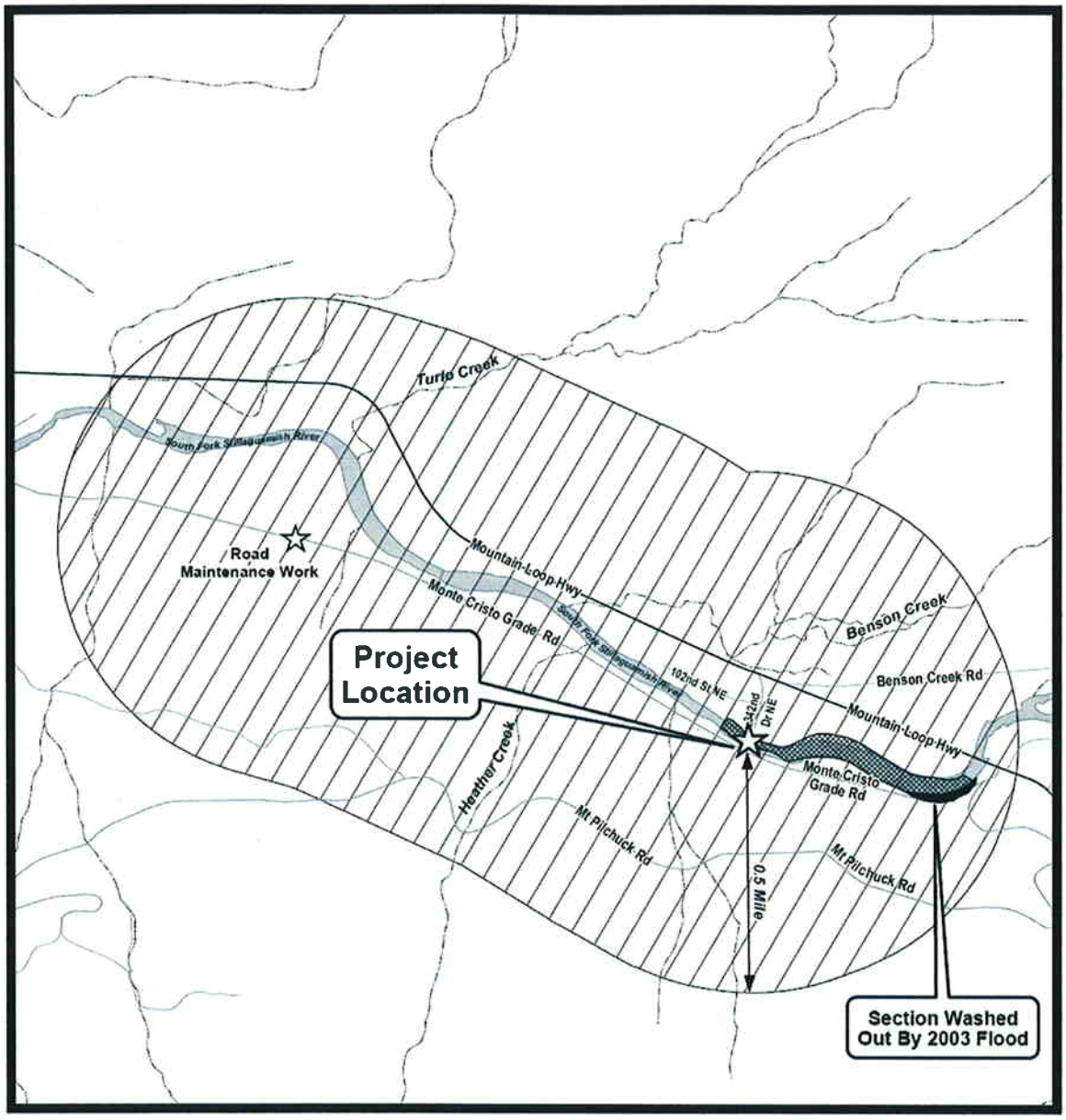
Due to proximity of the project to the Mt. Loop Highway and the river, construction noise (e.g. heavy equipment operation, gravel dumping, and trucks) will not generate noise in excess of ambient noise levels beyond 0.5 miles from the site.

Minor road maintenance of the Monte Cristo Grade Road downstream of the bridge site will be required after the bridge is constructed. This work will not be funded by FEMA and may not have any federal nexus; at this time, the County has not determined if the work will require a Section 404 permit. However, because the road maintenance cannot be completed until the bridge is constructed, the maintenance is considered an interdependent and interrelated activity and potential effects of the maintenance is accounted for in the delineation of the action area and subsequent analysis of effects.

Mitigation activities, including decommissioning of the Monte Cristo Grade Road segment upstream of the bridge site, will extend approximately 0.5 miles upstream on the south bank of the river. Mitigation will take place on the portion of road, between the road washout and the proposed bridge.

With these factors in mind, the action area for the project (Figure 2) includes: 1) the entire project limits; 2) the SF Stillaguamish River 300 feet downstream of the bridge site and adjacent to the mitigation sites upstream of the bridge; and, 3) 1 mile west along the Monte Cristo road and the adjacent terrestrial habitat within 0.5 miles of the project limits.

The actions area outlined above is a conservative estimate of the extent to which water quality impacts could result from the proposed project should best management practices (BMPs) fail, and in which noise disturbance from construction activities has the potential to affect wildlife species.



Key to Features:

- Project Location
- Streams
- Mountain Loop Hwy
- Local Roads
- Terrestrial Action Area
- Aquatic Action Area
- Waterbodies

0 500 1,000 Feet

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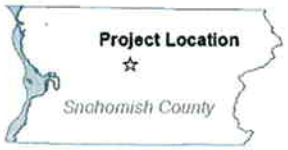


Snohomish County

Figure 2. Action Area

2.2 GENERAL SITE CHARACTERISTICS

The project is located near Verlot within Township 30, Range 8E, Section 15 in eastern Snohomish County (Figure 1). Topography in the project area is gentle along the Mountain Loop Highway. Second growth conifer forest is the dominant vegetation type surrounding the project area. Forested plant associations identified in the area include the western hemlock/swordfern (*Polystichum munitum*), foamflower (*Tiarella trifoliata*), and western hemlock/Alaska huckleberry (*Vaccinium alaskaense*) associations (Henderson et al. 1992).

The project is located off of the Mt. Loop Hwy on 342nd Drive NE, a short road which currently ends at the river, but crossed the SF Stillaguamish via a bridge, approximately 30 years ago. The concrete abutments and central pier of the historical bridge are still standing at the site. The north side of the bridge site is adjacent to a community of several residences. The south side of the bridge will connect to the Monte Cristo Grade Road and is surrounded by undeveloped Forest Service land. The road continues west adjacent to the river for approximately 2 miles. Approximately 20 parcels of private property including one cabin are located near the western terminus of the Monte Cristo Grade Road.

The north abutment of the historical bridge is located in the existing road of 342nd Dr NE. There are driveways on both sides of 342nd near the abutment. In the northwest quadrant of the bridge site, the front yard and carport of the adjacent home extends into the right-of way. In the northeast quadrant the adjacent yard is forested along the road.

The center pier of the historical bridge is located approximately 4 feet landward of the Ordinary High Water Mark (OHWM) of the SF Stillaguamish River (Appendix E photos). The 2003 flood was considered a 300-year event and much of the vegetation around the pier was removed by the flood waters. Water rose 10 feet above the OHWM (Van Wormer 2005). Trees were removed on all sides of the pier and sand was deposited along the east and north side of the pier. A large gravel bar is located waterward of the pier. The bar consists of small boulders, cobbles and sand.

The south abutment of the historical bridge is located on bedrock on the near vertical wall of the left river bank (Appendix E photos). The abutment is approximately 15 feet above the river. The terrain on the south side of the river is very steep with the Monte Cristo Grade Road bed benched into the hill side. The area landward (south) of the Monte Cristo Grade Road is forested.

2.3 AQUATIC RESOURCES

The SF Stillaguamish River flows from east to west through the action area. The Stillaguamish River is the fifth largest tributary to the Puget Sound and is one of its most important salmon-bearing streams. The Stillaguamish River has two primary tributaries, the North Fork (NF) Stillaguamish River and SF Stillaguamish River. The SF Stillaguamish River drains 255 square miles, 37 percent of the Stillaguamish River watershed (USFS 1995), and is divided into eight sub-basins.

The project lies in the middle of the Robe Valley sub-basin (24 mi^2), which is bounded at its downstream end by the mouth of Cranberry Creek and at the upstream end by the mouth of Twenty-two Creek. The Robe Valley sub-basin contains about 4 miles of river channel and 10 tributary streams, including Turlo Creek. About 60% of the Robe Valley sub-basin is in the national forest. There are approximately 15 miles of river and 309 miles of tributary streams that drain to the site (NMFS and USFWS 2005).

About 1/3 of the Robe Valley sub-basin is privately owned; over 90% has been logged in the past. Most of the tributaries are steep, with very little floodplain. Within this sub-basin, the river is confined between the Mountain Loop Highway and alternating bedrock outcrops, bluffs, and narrow bands of floodplain along the left (south) bank. Much of the left bank is composed of bedrock; much of the non-bedrock banks are covered with rock riprap to protect an abandoned railroad grade. Most of the riparian areas

along the river are composed of maturing second growth, much of it deciduous tree species. Tributary streams in the upper two sub-basins have good riparian canopy cover.

The streambed at the project site consists primarily of cobbles, gravel, sand, and silt. A large gravel bar is present along the right (north) bank. The gravel bar is largely exposed during typical and low flows, but is wet during freshets and flood events. The riverbed contains a tremendous amount of silt and fines from upstream landslides, bank sloughing, erosion, and logging practices.

Habitat condition in the SF Stillaguamish have been degraded by logging practices, resulting in higher stream temperatures, flooding, sedimentation and loss of large woody debris (WDFW 1998).

Chinook salmon use the habitat in the action area for rearing, holding for adults, and migration. Steelhead use the habitat in the action area for spawning, rearing, and migration. Bull trout use the habitat in the action area for foraging, migration, and overwintering of subadults and adults. Conditions in the action area likely contribute less to the conservation of bull trout, steelhead and Chinook than historically because upstream actions have altered water and sediment dynamics such that habitat conditions expressed at this time are not fully functional.

The *Checklist for Documenting Environmental Baseline and Effects of Proposed Actions(s) on Relevant Indicators* (NMFS 1996) is included as Table 2 and was used to assess current baseline parameters as well as to guide the determination of effect for the proposed action on Chinook salmon, bull trout, and steelhead. Descriptions of the individual parameters are presented in Appendix C. The evaluation is based on site visits, review of available information, and best professional judgment.

Table 2. Checklist for Documenting Environmental Baseline and Effects of Proposed Action(s) on Relevant Indicators

PATHWAYS: INDICATORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
	Properly[1] Functioning	At Risk[1]	Not Properly[1] Functioning	Restore[2]	Maintain[3]	Degrade[4]
Water Quality:						
Temperature		X			X	
Sediment/Turbidity			X		X	
Chemical Contaminants/Nutrients		X			X	
Habitat Access:						
Physical Barriers	X				X	
Habitat Elements:						
Substrate		X			X	
Large Woody Debris		X			X	
Pool Frequency		X			X	
Pool Quality		X			X	
Off-channel Habitat		X			X	
Refugia	X				X	
Channel Conditions and Dynamics:						
Width/Depth Ratio		X			X	
Streambank Condition	X				X	
Floodplain Connectivity		X			X	
Flow/Hydrology:						
Peak/Base Flows		X			X	
Drainage Network Increase		X			X	
Watershed Conditions:						
Road Density and Location		X			X	
Disturbance History		X			X	
Riparian Reserves		X			X	

Watershed Names: SF Stillaguamish River **Location:** T30N, R8E, Sec15

1 These three categories of function ("*properly functioning*," "at risk," and "*not properly functioning*") are defined for each indicator in the "Matrix of Pathways and Indicators."

2 For the purposes of this checklist, "restore" means to change the function of an "at risk" indicator to "*properly functioning*" (i.e., it does not apply to "*properly functioning*" indicators).

3 For the purposes of this checklist, "maintain" means that the function of an indicator does not change (i.e., it applies to all indicators regardless of functional level).

4 For the purposes of this checklist, "*degrade*" means to change the function of an indicator for the worse (i.e., it applies to all indicators regardless of functional level). In some cases, a "not properly functioning" indicator may be further worsened, and this should be noted.

2.4 TERRESTRIAL RESOURCES

Terrestrial habitats within the action area consist of upland and riparian forests. The forest overstory within the action area is composed primarily of mature, second growth western hemlock, Douglas-fir (*Pseudotsuga menziesii*), and red alder (*Alnus rubra*) with occasional western red cedar (*Thuja plicata*), Sitka spruce (*Picea sitchensis*), or big-leaf maple (*Acer macrophyllum*). Vine maple (*Acer circinatum*), huckleberries (*Vaccinium spp.*), and salmonberry (*Rubus spectabilis*) are common shrubs.

Suitable habitat for marbled murrelets to nest is defined as mature and old-growth forest with limbs greater than 4 inches in diameter and a height of 33 feet or greater from the ground to provide a platform for a nesting adult. It is important for the platform to have vertical and horizontal cover (branches that provide protection to the side and from above). Murrelets appear to select limbs and platforms that provide protection from predation (USFWS 2006).

The action area includes potential nesting habitat for marbled murrelets, and is designated marbled murrelet critical habitat. Primary constituent elements (PCEs) for marbled murrelet critical habitat that may be present within the action area include: 1) individual trees with potential nesting platforms; and 2) forested areas within 0.8 kilometers (0.5 miles) of individual trees with potential nesting platforms, and with a canopy height of at least one-half the site-potential tree height.

The Monte Cristo Grade road runs parallel to the south side (left bank) of the river. The road is bordered on the south by second growth forest. The forested area is exposed on one side due to the road cut and the adjacent river. The area has been logged in the past; however there are individual trees that have potential nesting platforms within the action area. These trees appear to be marginal habitat due to the lack of cover and the small diameters of the platform. These trees meet the 4 inch minimum criteria; however nesting success is thought to be rare at less than 7 inches (USFWS pers. comm., 2007).

3. PROPOSED ACTION

3.1 PROJECT PURPOSE

The purpose of the project is to construct a bridge to restore vehicular access to the property owners along the Monte Cristo Grade Rd. Access was cut off during the 2003 flood when approximately 200 linear feet of road and 40,000 cubic yards of high bank and bluff eroded into the river. Originally, the County planned to restore the road upslope of the washout. However, that proposal would have adversely affected several streams, a large wetland system, and riparian resources. The new road would have been in the channel migration zone and may have continued to erode. The alternative of constructing a bridge at the previously disturbed site of a historical bridge minimizes the impacts to the environment.

3.2 PROPOSED ACTION AND CONSTRUCTION DISTURBANCE

3.2.1 Bridge Construction

The new bridge will be constructed on the same alignment as the existing bridge abutments on 342nd Dr., in order to minimize short- and long-term effects to natural resources. The bridge will utilize the existing south abutment. The existing center pier and north abutment are insufficient to support the new bridge and will be removed and reconstructed in their same approximate footprint (see Figure 3 and plans in Appendix B). The bridge will be a two-span, single lane, prefabricated steel truss bridge with steel grate or untreated timber decking.

The bridge will provide over 10 feet of clearance to the ordinary high flow in the creek; it will also provide more than the 3-foot clearance requirement for the 100-year flow.

Construction is anticipated to commence in June 2009 and last until October 2009.

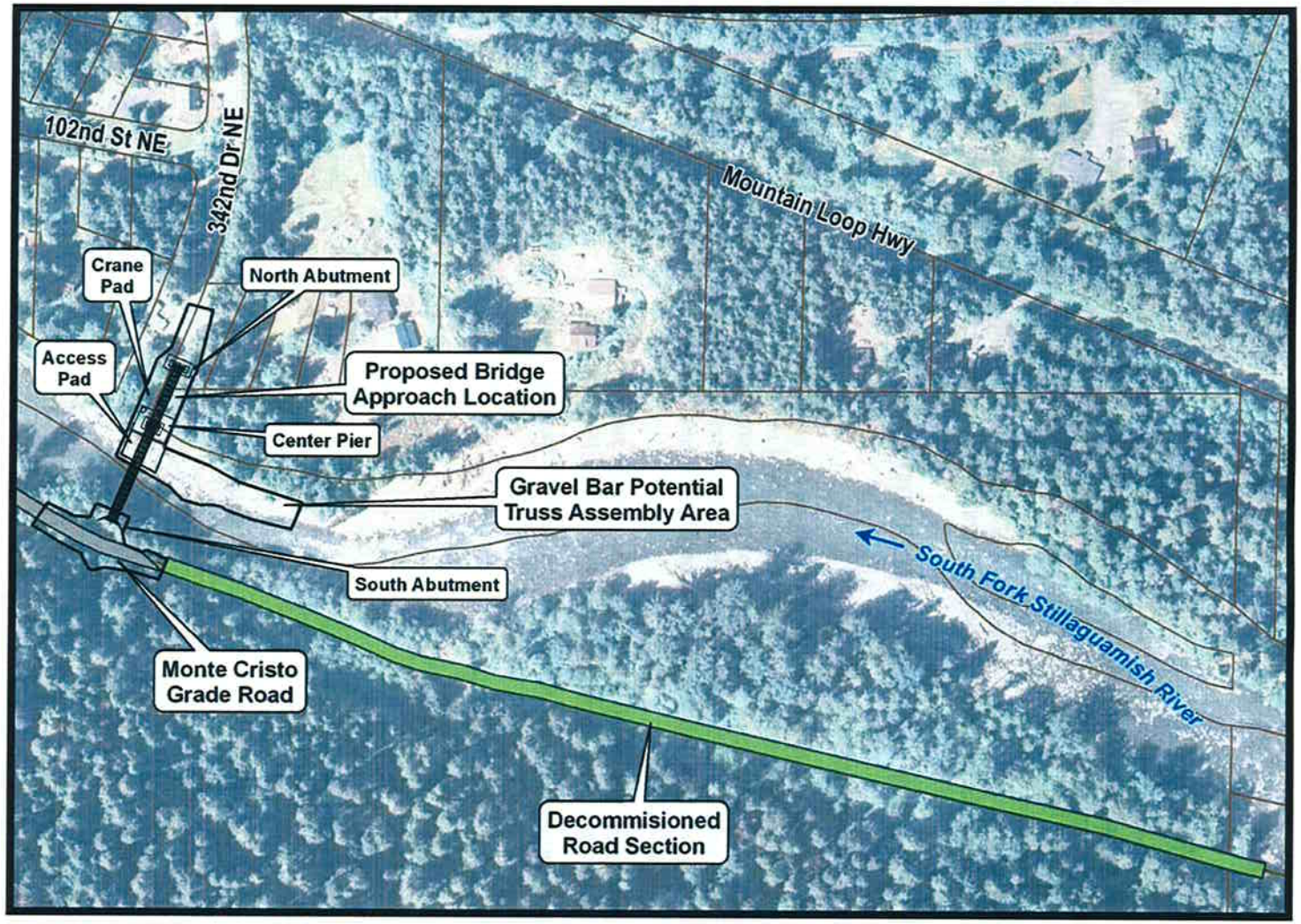


Figure 3. Site Aerial

0 150 300 Feet

No in-water work will take place. All work below the OHWM will be above the wetted channel. Staging may take place on the gravel bar in the dry. This work will adhere to the in-water work window, as specified by WDFW in the HPA (anticipated to be July 15 to August 15).

Equipment that will be used for the proposed project includes a crane, dump trucks, bulldozers, excavators, pile drivers, hoe rams, chainsaws, generators, compactors, and concrete saws. The contractor will be required to provide designated mobilization and refueling sites located at least 150 feet from the river and to prepare a spill response plan to minimize the likelihood and severity of potential fuel spills.

North Abutment

The existing north abutment does not meet modern engineering safety standards for supporting the bridge and thus will be replaced. The existing concrete abutment will be dug out of the existing approach road, broken up with heavy equipment, and hauled off-site before a new abutment is constructed.

A new abutment constructed of four driven steel piles will replace the existing abutment in the same location. The piles will be 18 inches in diameter and 80 feet long. This abutment is located in the existing road. No vegetation will be removed for this activity. Pile driving will occur within the murrelet breeding season approximately 150 yards away on the opposite side of the river from potential murrelet habitat. Pile driving will occur approximately 165 feet from the wetted channel.

Gravel Bar Work Pad

Grading will be required to create a work pad for a crane that will place the south span of the bridge. The work pad will be constructed on the exposed gravel bar, minimizing disturbance of riparian vegetation. To construct the work pad, large boulders on the gravel bar will be removed (by heavy machinery) and stockpiled, and a level work surface will be created on the bar by spreading rounded 'fish mix' gravel on the bar and placing timber mats on top of the fish mix. The work pad is anticipated to be no larger than 50'x 50' (2,500 square feet).

Approximately 15,000 square feet of the bar may be used for construction and staging. At the time of construction the bar will be above the elevation of the wetted channel but below the OHWM. No in-water work will occur. The portion of the bar above the wetted channel and outside of the work pad (12,500 square feet) may be used to assemble the trusses but no fill, grading, or removal of boulders will be required.

Center Pier

The existing center pier does not meet modern engineering safety standards for supporting the bridge and thus will be replaced. The existing concrete pier will be pushed over and broken up with heavy equipment and hauled off-site before a new, deeper, pier is constructed.

Seven 24-inch diameter steel piles will be driven above the OHWM to construct the center pier. The piles will be in a single row. The new abutment will be narrower, but longer than the existing abutment. The piles will have a concrete pile cap on top. The boulders will be excavated from the pile locations to approximately 1 foot and then the piles will be pre-drilled with an auger to avoid a messy excavation. The auger will pre-drill through the cobble layer (approx. 8 feet) to allow the piles to be placed without obstructions. Spoils from the auger will be contained and any water from dewatering will be pumped to baker tanks or dirt bags to remove fine sediments before being discharged in riparian areas.

Pile driving will occur within the murrelet breeding season approximately 116 yards away on the opposite side of the river from potential murrelet habitat. Pile driving will occur approximately 65 feet from the wetted channel.

South Pier

The crane will be used to transport materials over the river to the south side. The existing concrete abutment is founded on bedrock and will be expanded for the proposed bridge. It will be cleaned off with a power washer. The abutment is approximately 10 feet above and 10 feet landward of the OHWM. Measures will be taken to prevent debris from entering the river. The area around the abutment has revegetated and approximately 900 square feet of riparian vegetation will be cleared.

Approximately 6.5 cubic yards of concrete will be required for expansion of the abutment. Once the concrete forms are constructed around the existing abutment, the crane will transfer wet concrete over the river from the gravel bar (approximately 80 feet) to the south abutment. A tarp will be hung under the bucket and the outside of the bucket will be cleaned off prior to each load, to prevent any concrete from dropping into the river. It is anticipated that only a few loads will be required.

Concrete forms will be removed after and disposed after concrete has cured.

Bridge Span Placement and Site Restoration

The bridge spans will be placed by the crane and attached to the pier and abutments.

After the work is completed, the work pad on the gravel bar will be deconstructed. The timber mats will be removed and the native boulders will be redistributed on the bar. The gravel fish mix will be left on the bar to be redistributed by high flows and contribute to spawning gravel recruitment. Constructing the work pad with gravel fish mix will minimize the need to grade the gravel bar and disrupt the substrate.

Vegetated areas that were temporarily impacted by clearing and grading (Appendix B, Sheet 1) will be mulched and replanted with native vegetation. Plantings will be monitored and maintained by the County to ensure successful establishment of a native vegetation community. Vegetated areas that are permanently impacted by the project (i.e. paved over or shaded by the bridge) will be compensated for through mitigation on the decommissioned road segment (see 3.2.4 Road Decommissioning).

3.2.2 Approach Roads

The existing approach roads to the bridge will be utilized as the permanent approach roads. No clearing will be required. The south approach will be paved for approximately 50 feet.

The north approach to the bridge will be rebuilt and repaved once the center pier is constructed. The north approach will be narrower than the existing approach since the bridge will be 12' wide with a single lane. The finished approach road will consist of two 10' wide travel lanes.

3.2.3 Impervious Area and Stormwater Treatment Facilities

Existing asphalt will be removed in some areas, though new asphalt and gravel will be installed in other areas. It is anticipated that there will be a small net increase of approximately 500 sq. feet of impervious area at the approaches. Pavement will be removed from the width of the north approach but the pavement will extend toward the bridge beyond the existing pavement. Stormwater detention and water quality treatment are not required for this project, in accordance with Volume I of the Stormwater Management Manual for Western Washington (WSDOE 2005). The bridge deck will be an open grate or untreated timber which will not collect stormwater. The traffic volume on the bridge is expected to be very low (less than 20 average daily trips).

On the north side of the bridge, the existing road drainage consists of sheet flow off the road. The project will establish ditches that will outlet to rock pads at the top of the slope and then sheet flow through the vegetated slope. There is approximately 60 feet of gravel bar before the water reaches the SF Stillaguamish, which will provide some interception and infiltration.

On the south side of the bridge the existing road drainage goes to a ditch on the south side of the road or sheet flows off the road into the vegetation on the north side of the road. There will be no changes to the drainage on the south side.

3.2.4 Road Decommissioning

Approximately 2,000 linear feet of the Monte Cristo Grade Road between the bridge and the site of the 2003 flood damage will be decommissioned once the bridge is in place. The decommissioned portion will be used as mitigation for several County projects, including this project and additional future projects. The total amount of mitigation that could be created on the road is approximately 60,000 square feet. This project will utilize 10,000 square feet of that area to compensate for impacts per Snohomish County's Critical Areas Ordinance. The gravel and road base material be removed. Topsoil and mulch will be applied and the area will be planted with native trees and shrubs. Plantings will be monitored and maintained by the County to ensure successful establishment of a native vegetation community.

Additional mitigation will consist of restoring a non fish-bearing tributary that crosses the Monte Cristo Grade Road in a culvert. The culvert is perched approximately 10 above the OHWM of the SF Stillaguamish. This culvert will be removed and a natural stream reach will be reestablished by grading the streambanks of the tributary back to a 1:1 and using stream bed gravels and cobbles to create a natural channel configuration and bed. The natural stream channel will allow fish passage from the SF Stillaguamish into the tributary. This mitigation element will occur during the in-water work window in 2010 and will require a temporary stream bypass to reduce the potential for downstream sedimentation. Standard worksite isolation and sediment containment BMPs will be implemented.

3.3 INDIRECT AND INTERRELATED ACTIVITIES

Interrelated activities are actions that are part of a larger action and depend upon that action for their justification. Interdependent activities have no independent utility apart from the proposed action. Interrelated and interdependent activities that could result in direct or indirect effects are those that would not occur "but for" the proposed action. Since vehicle access was cut off 5 years ago, there has been no maintenance done on the Monte Cristo Grade Road, resulting in minor damage to the road. Road maintenance of the currently inaccessible segment of the Monte Cristo Grade Road is interrelated and interdependent to the federal actions of funding and permitting construction of the bridge because the road cannot be maintained until vehicular access is restored. Further, there would be no independent utility to maintaining the inaccessible road segment without the bridge, which will connect the road segment to the larger road network.

The Monte Cristo Grade Road has sustained minor flood damage approximately 1 mile west of the bridge. The road is approximately 1,000 feet from the SF Stillaguamish at this location. The water appears to be coming from a wetland on the south side of the road. At this time, it is unclear if the drainage failure was caused by a culvert being plugged or by sediment filling in a pre-existing roadside ditch. In order to make this road passable, a culvert will need to be placed or a ditch established to convey the drainage into existing ditches. Some portion of the work will occur at the margin of wetlands. Impacts to wetlands and vegetation will be avoided to the degree feasible and unavoidable impacts will be mitigated per Snohomish County's Critical Areas Ordinance and all other applicable regulations. County road crews will perform the work with County funds. Work will take place in 2009. It is unclear at this time if the road maintenance activity will require a Section 404 permit.

3.4 CONSERVATION MEASURES AND BEST MANAGEMENT PRACTICES

Conservation Measures that have been incorporated into the proposed project include avoidance and minimization measures, in addition to prescriptive compensatory mitigation requirements that comply

with Snohomish County Critical Areas Regulations (Snohomish County Code 30.62A). Best management practices include methods and techniques implemented during construction to reduce short- and long-term project impacts. These measures will be implemented for the purpose of avoiding and minimizing the likelihood of adverse effects to listed fish and wildlife species and their habitats.

3.4.1 Conservation Measures

Impacts to the river and riparian buffer will be avoided or minimized to the extent practicable. Specific conservation measures and mitigation for the project include:

- The project design minimizes the footprint of the bridge and approach road by constructing a single lane bridge.
- Riparian impacts will be mitigated by replacing affected functions and values at an equal or greater rate than provided for by existing conditions.
- No suitable habitat for marbled murrelet will be removed.
- Construction between April 1 and September 15 will take place no earlier than 2 hours after sunrise and end 2 hours before sunset.
- Minimize impacts to riparian vegetation to the minimum necessary for the bridge construction and crane access;
- Avoid in-water construction;
- Leave tree stumps as habitat snags;
- Disturbed riparian vegetation will be restored at greater than a 2:1 ratio;

The goal of the mitigation design is to compensate for functions lost through project impacts. Enhancement of riparian areas with native vegetation will occur at greater than a 2:1 ratio on an aerial basis. The County will enhance riparian buffers to provide functions that are distinctly greater than those functions affected by the project.

3.4.2 Best Management Practices

BMPs will be applied for all aspects of project implementation. Erosion and sediment control measures may include mulching, matting, and netting; filter fabric fencing; sediment traps and ponds. Long-term water quality impacts are not expected. Significant short-term effects to water quality are not expected if erosion control BMPs, stormwater treatment measures, and spill containment measures are properly implemented, monitored, and maintained during construction. A temporary erosion and sediment control (TESC) plan will be prepared and implemented to minimize and control pollution and erosion from stormwater. The use of BMPs should eliminate adverse effects to listed species.

General BMPs that will be implemented are as follows:

- No work will occur within the wetted channel of the SF Stillaguamish or other fish-bearing waters.
- All work will be performed in accordance with the conditions of the Hydraulic Project Approval (HPA) and other permits obtained for the project. This includes complying with the in-water work window specified in the HPA. Note that the in-water work window applies to activities below the OHWM of the SF Stillaguamish; the bridge construction will not require any work within the wetted channel.

- In-water work required for the decommissioning of the abandoned road segment and restoration of the tributary to the SF Stillaguamish will be performed within the in-water work window specified by WDFW and employ a stream bypass and other worksite isolation and sediment stabilization techniques.
- Clearly define construction limits with stakes prior to the beginning of ground disturbing activities. No disturbance would occur beyond these limits. Temporary construction fencing will be installed where determined to be necessary.
- Install silt fencing along the down-gradient edge of grading. (This BMP will not apply to removal of the boulders on the gravel bar because the BMP would cause more disturbance than removal of the boulders.)
- Staging areas will be located in areas that will prevent the potential of contamination of any wetland or water body. Servicing and refueling of vehicles will not occur within 150 feet of the river to reduce potential spills of petroleum and hydraulic fluids in sensitive areas. Additionally, drip pans will be fitted with absorbent pads and placed under all equipment being fueled.
- Spill control and emergency response plans will be implemented for fueling, concrete activity, and staging areas. The spill control/prevention plan will include the following items: notification procedures; specific cleanup and disposal instructions for different products; quick response containment and cleanup measures that will be available on site; and employee training for spill containment. These plans will satisfy all pertinent requirements set forth by federal, state, and local laws and regulations.
- No wet or curing concrete, including washwater from equipment, will enter the river or other natural water resources. A containment tarp will be used to isolate any runoff from activities involving wet or curing concrete activities.
- When heavy equipment is required, the project contractor will use equipment having the least impact necessary to accomplish the authorized work (e.g., low ground pressure, minimally sized, rubber tired).
- Prior to operating within the OHWM, all equipment will be cleaned of external oil, grease, dirt, or caked mud. Any washing of equipment will be conducted in a location that will not contribute untreated wastewater to a stream or wetland.
- BMPs will be regularly monitored and maintained during construction.
- Implement measures to minimize noise impacts during construction, including the following:
    - Limit construction to daylight work hours;
    - Turn off equipment when not in use;
    - Use only well-maintained and properly functioning equipment and vehicles.
- Implement stormwater runoff control BMPs, including the following:
    - Install temporary sediment control devices, such as such as sediment mats, filter bags, erosion blankets, sediment traps, staked sediment barriers, water bladder dams, and/or "dirt bags".
    - Use swales, trenches, or drains to divert stormwater runoff away from disturbed areas.
    - Monitoring of erosion and sediment control measures will take place weekly and during major storm events (during active construction periods only) if they should occur.

- All vehicles operated within 100 feet of any stream or water body will be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected will be repaired before the vehicle resumes operation. When not in use, all vehicles will be stored in the vehicle staging area as practicable. Other vehicles that may be stored in place, such as cranes, will be inspected daily for fluid leaks.
- An oil absorbing, floating containment boom shall be available on-site during all phases of work.

4. FISH SPECIES EVALUATIONS

This section outlines the distribution, listing and stock status, and critical habitat designations for listed fish species. Additionally, Table 3 outlines timing of use among these species in the SF Stillaguamish River. A discussion of applicable life histories is included as Appendix D.

Table 3. Timing of Use Among ESA listed Salmonids in SF Stillaguamish River (from Parametrix 2007)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Species/Life Stage												
Spawning												
Bull Trout												
Chinook Salmon												
Steelhead												
Incubation												
Bull Trout												
Chinook Salmon												
Steelhead												
Rearing												
Bull Trout												
Chinook Salmon												
Steelhead/Rainbow												

Shaded areas indicate life stage timing. Black shaded areas indicate peak of life stage timing.

4.1 CHINOOK SALMON

4.1.1 ESA and Stock Status

NMFS completed an ESA status review of Chinook salmon populations from Washington, Oregon, Idaho, and California and defined 15 evolutionarily significant units (ESUs) within the region. Naturally spawned spring, summer/fall, and fall Chinook salmon runs from the Puget Sound ESU were considered likely to become endangered in the foreseeable future (Myers et al. 1998). The abundance of Chinook salmon in the Puget Sound ESU has declined substantially from historic levels, and there is concern over the effects of hatchery supplementation on genetic fitness of stocks, as well as severely degraded spawning and rearing habitats throughout the area (Myers et al. 1998). In addition, harvest exploitation rates in excess of 90 percent were estimated to occur on some Puget Sound Chinook salmon stocks. Subsequent to this status review, NMFS issued a ruling in May 1999 listing the Puget Sound ESU as threatened (NMFS 1999b). Primary factors contributing to declines in Chinook salmon in the Puget Sound ESU include habitat blockages, hatchery introgression, urbanization, logging, hydropower development, harvests, and flood control (NMFS 1998).

WDF et al. (1993) originally listed two stocks of Chinook salmon in the Stillaguamish watershed; the North Fork summer Chinook stock and the South Fork fall Chinook stock; however, in 2002, run timing designations were dropped from most Puget Sound Chinook stock names because they had been

inconsistently applied. When this occurred, the Stillaguamish River stocks were renamed the North Fork and SF Stillaguamish River Chinook stocks.

The proposed project is located within the geographic range of the SF Stillaguamish population (PSTRT 2003). The most recent estimate of the 5-year geometric mean of natural spawners for SF Chinook salmon is 270, whereas the estimate of historical capacity is 20,000 (BRT 2005). The number of Chinook above Granite Falls is between 50 and 100 adult spawners. (The action area is located above the falls. The long-term trend for the population is 1.02, indicating likely minimal growth of the population from 1974-2002. Long-term median population growth rate estimates are approximately 1.0, indicating uncertainty as to whether the rate is slightly positive or slightly negative.

4.1.2 Chinook Salmon in the Action Area

Within the SF Stillaguamish basin, spawning occurs in the mainstem SF Stillaguamish River and in Canyon and Jim Creeks (StreamNet 2007, WSCC 2002, WDFW 2007). Other tributaries in the subbasin experience moderate to severe low flows during the usual Chinook migration and spawning period (Williams et al. 1975).

In the South Fork, the waterfall near the town of Granite Falls (RM34.5) was impassable to anadromous fish, including Chinook, until a fishway was constructed in the 1950s (WDFW 1998). The population is likely fewer than 100 adults in the SF Stillaguamish. Above the falls, the SF Stillaguamish gets very little Chinook use.

Although StreamNet (2007) does not report Chinook distribution in the SF Stillaguamish River upstream of Canyon Creek (RM33.7), Williams et al. (1975) reports moderate numbers of fall Chinook spawners in the SF Stillaguamish River between RM 44 near Robe and RM 62 near the town of Silverton.

Spawning has not been recorded in the action area (RM 47) recently. In the last two years there have been no redds recorded between Robe Canyon and Big Four, a reach that is surveyed 1-3 times each summer (WDFW 2008 pers. comm.). In years where redds were found in the reach, generally they were located at least 6 miles upstream of the action area.

It is expected that small numbers of Chinook adults may migrate upstream through the action area to upstream spawning areas in the latter half of construction in September and October. Due to their very low density in the upper SF Stillaguamish and data demonstrating that most spawning occurs farther upstream, it is very unlikely that Chinook will use the action area for spawning during or immediately following construction.

Chinook juveniles are unlikely to be encountered in the project area during construction. There are typically few spawners in the action area or further upstream. More importantly, the vast majority (about 97 percent) of Chinook salmon juveniles in the Stillaguamish River basin are reported to outmigrate from March through June as age 0 juveniles (Myers et al. 1998). Consequently, very few juveniles likely will be present during construction, which will occur from July to October.

4.1.3 Critical Habitat

On September 2, 2005, NMFS (2005) designated critical habitat for 19 salmon and steelhead ESUs in California and the Northwest. Critical habitat for Puget Sound Chinook salmon is located throughout the entirety of the Stillaguamish River and in the SF Stillaguamish River from its confluence with the NF Stillaguamish River upstream approximately 50 miles to the accessible headwaters (approximately RM 69), a reach that includes the action area (RM 47).

Specific primary constituent elements (PCEs) for Chinook salmon in freshwater areas, as defined by NMFS (2005), are:

- Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.
- Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions, and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
- Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

The action area lacks high water quality to support productive spawning due to the large amount of sediment in the SF Stillaguamish. Sediment intrusion is the primary limiting factor to SF Stillaguamish Chinook above Granite Falls. Rearing and migration conditions have been similarly degraded.

The PCEs in the action area have generally been degraded by upstream factors influencing watershed processes including logging, landslides, and the presence of the Mountain Loop Highway. The substrate, habitat complexity, large woody material, water temperatures and water quality and quantity have been impacted. Logging and forest roads are associated with many landslides and the resultant introduction of large quantities of fine sediment into the river. However, some major landslides in the basin are naturally occurring. The presence of the Mountain Loop Highway and associated development, including campgrounds, has impacted riparian vegetation, reducing shading and LWD recruitment. The presence of the highway and associated riprap bank protection also limits channel migration, thereby reducing channel length and increasing the gradient and bedload transport capacity of the river.

The quality of PCEs in the action area are further impacted by infrastructure located in the action area, though this has affected the PCEs to a much smaller degree than upstream factors. The most significant infrastructure within the action area influencing PCEs is the presence of the Monte Cristo Grade Road. The road roughly parallels the SF Stillaguamish, and is within 50 feet of the river in approximately the upstream half of the action area. The presence of the road reduces the potential for development of a fully functional, uninterrupted riparian vegetation community, somewhat reducing the potential for shading and LWD recruitment. However, given the topography, surrounding trees, and aspect of the site, the presence of the road has a very small effect on shading of the river. The presence of the road is also likely to result in a small increase in the transport of fine sediment from the riparian area to the river, though this is inconsequential relative to the huge quantities of fine sediment in the river due to natural and logging-influenced landslides in the watershed.

The Mountain Loop Highway bisects the northern part of the action area. However, the highway is unlikely to affect PCEs because it is several hundred feet or greater from the river throughout most of the action area. Although the Mountain Loop Highway and the Monte Cristo Grade Road both parallel the River throughout the action area, they do not currently limit channel migration and appear to have little likelihood of significantly limiting it in the future. Much of the Monte Cristo Grade Road is founded on bedrock and both roads are located well above the river.

The PCEs are also influenced by the presence of rural residences near the river at the upstream end of the action area, primarily on 342nd Drive NE and 102nd Street NE (Figure 1) and by the presence of two Forest Service campgrounds at the downstream end of the action area. Rural development has reduced riparian cover in localized areas and may be a source of low levels of water quality contamination from septic systems.

4.2 BULL TROUT

4.2.1 ESA and Stock Status

In 1998, USFWS completed a status review of bull trout, identifying five distinct population segments (DPSs) in the continental U.S. (USFWS 1998a). The Coastal-Puget Sound bull trout DPS is composed of 34 subpopulations (USFWS 1998b, 1999a). USFWS listed bull trout in the Coastal-Puget Sound DPS as threatened under the ESA on November 1, 1999 (USFWS 1999a).

The Coastal-Puget Sound DPS of bull trout, which includes the Stillaguamish subpopulation, is unique because it is thought to contain the only anadromous forms of bull trout within the continental U.S. (USFWS 1998a). The status of the migratory (fluvial, adfluvial, and anadromous) forms is of greatest concern throughout most of their range. The majority of the remaining populations in some areas may be largely composed of resident bull trout (Leary et al. 1991; Williams and Mullan 1992).

Stillaguamish River bull trout have been identified as a distinct stock based on their geographic distribution. Anadromous, fluvial and resident fish all exist in the watershed and, in many cases, overlap geographically. Because of this overlap and the lack of detailed information on fish movement within the basin, all bull trout in the Stillaguamish basin are currently considered to be a single stock. This determination may change as more information becomes available. Exact spawn timing is unknown, although bull trout typically are fall spawners.

In the South Fork, the waterfall near the town of Granite Falls was impassable to anadromous fish, including bull trout, until a fishway was constructed in the 1950s (WDFW 1998). However, anecdotal information from fish surveys in the 1920s and 1930s suggests a "char" population existed in the South Fork at that time. Since construction of the fishway, large adult bull trout/Dolly Varden are seen in the upper SF Stillaguamish River. The fishway allowed more anadromous fish to enter the watershed, increased competition, and likely pushed resident bull trout populations into the upper reaches of the watershed where competition was lower (USFS 1995).

4.2.2 Bull Trout in the Action Area

Bull trout are found throughout the Stillaguamish River basin (WDFW 1998; Snohomish County 2000; Snohomish County 2004; USFS 2006a; WDFW 2006). Spawning occurs in parts of the SF Stillaguamish Bull trout do not spawn in the action area or within the Robe Valley (WDFW 2008 pers. comm.). There is very small population of fluvial fish in the South fork, at critical levels (< 50 spawners a year) (WDFW 2008 pers. comm.). Although bull trout use the action area primarily for a migratory corridor, larger juveniles and subadults could use the action area for foraging and rearing.

Adult bull trout are likely to migrate through the action area during construction (July to October) to spawning grounds upstream. Rearing or subadult bull trout could be encountered in the project area during construction. However since the population is very small for the entire SF Stillaguamish, the likelihood of juvenile or subadult occurrence in this 0.5 mile stretch of river during construction is relatively small. A 0.25 mile-long reach of the SF Stillaguamish just downstream of the action area was completely de-fished in summer 2005 and no bull trout were encountered (Snohomish County, unpublished data).

4.2.3 Critical Habitat

Critical habitat for the Coastal-Puget Sound bull trout distinct population segment (DPS) was recently designated (USFWS 2005a). USFWS has designated bull trout critical habitat in the SF Stillaguamish River from its confluence with the NF Stillaguamish River (RM 18) upstream approximately 50 miles to the accessible headwaters (approximately RM 69), an area which includes the action area.

Specific PCEs for bull trout in freshwaters areas, as defined by USFWS (2005a), are:

1. Permanent water having low levels of contaminants such that normal reproduction, growth, and survival are not inhibited.
2. Water temperatures ranging from 2° to 15°C (36° to 59°F), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life history stage and form, geography, elevation, diurnal and seasonal variation, shade, such as that provided by riparian habitat, and local groundwater influence.
3. Complex stream channels with features such as woody debris, side channels, pools, and undercut banks to provide a variety of depths, velocities, and in-stream structures.
4. Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine substrate less than 0.63 cm (0.25 in) in diameter and minimal substrate embeddedness are characteristic of these conditions.
5. A natural hydrograph, including peak, high, low, and base flows within historic ranges or, if regulated, a hydrograph that demonstrates the ability to support bull trout populations.
6. Springs, seeps, groundwater sources, and subsurface water connectivity to contribute to water quality and quantity.
7. Migratory corridors with minimal physical, biological, or chemical barriers between spawning, rearing, overwintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows.
8. An abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.
9. Few or no predatory, interbreeding, or competitive nonnative species present.

The PCEs in the action area have generally been degraded by upstream factors influencing watershed processes including logging, landslides, and the presence of the Mountain Loop Highway. The substrate, habitat complexity, large woody material, water temperatures and water quality and quantity have been degraded. Logging and forest roads are associated with many landslides and the resultant introduction of large quantities of fine sediment into the river. However, some major landslides in the basin are naturally occurring. The presence of the Mountain Loop Highway and associated development, including campgrounds, has impacted riparian vegetation, reducing shading and LWD recruitment. The presence of the highway and associated riprap bank protection also limits channel migration, thereby reducing channel length and increasing the gradient and bedload transport capacity of the river.

The quality of PCEs in the action area are further impacted by infrastructure located in the action area, though this has affected the PCEs to a much smaller degree than upstream factors. The most significant infrastructure within the action area influencing PCEs is the presence of the Monte Cristo Grade Road. The road roughly parallels the SF Stillaguamish, and is within 50 feet of the river in approximately the upstream half of the action area. The presence of the road reduces the potential for development of a fully functional, uninterrupted riparian vegetation community, somewhat reducing the potential for shading and LWD recruitment. However, given the topography, surrounding trees, and aspect of the site, the presence of the road has a very small effect on shading of the river. The presence of the road is also likely to result in a small increase in the transport of fine sediment from the riparian area to the river, though this is inconsequential relative to the huge quantities of fine sediment in the river due to natural and logging-influenced landslides in the watershed.

The Mountain Loop Highway bisects the northern part of the action area. However, the highway is unlikely to affect PCEs because it is several hundred feet or greater from the river throughout most of the action area. Although the Mountain Loop Highway and the Monte Cristo Grade Road both parallel the River throughout the action area, they do not currently limit channel migration and appear to have little likelihood of significantly limiting it in the future. Much of the Monte Cristo Grade Road is founded on bedrock and both roads are located well above the river.

The PCEs are also influenced by the presence of rural residences near the river at the upstream end of the action area, primarily on 342nd Drive NE and 102nd Street NE (Figure 1). Rural development has reduced riparian cover in localized areas and may be a source of low levels of water quality contamination from septic systems.

4.3 STEELHEAD

4.3.1 ESA and Stock Status

On May 7, 2007, the National Marine Fisheries Service (NMFS) announced the listing of the Puget Sound distinct population segment (DPS) of steelhead as a threatened species under the Endangered Species Act. The listing was published in the Federal Register on May 11, 2007 and took effect on June 11, 2007.

Four steelhead populations have been identified in the Stillaguamish watershed, including one winter run and three summer runs (Snohomish County 2005). Both summer and winter steelhead are found in the South Fork Stillaguamish River.

Adult summer run steelhead generally spawn from mid-February to the end of May. The smolts outmigrate between April and July. Adult winter run steelhead generally spawn in the river from March to mid-June. Both summer- and winter-run juveniles rear in the river year-round.

4.3.2 Steelhead in the Action Area

Both summer and winter steelhead utilize the SF Stillaguamish River and many of its tributaries (StreamNet 2007; USFS 2006a; WDFW 2006). Steelhead did not historically access areas above the falls before the WDFW fish ladder was built in the 1950s. StreamNet (2007) reports spawning and rearing of summer steelhead and migration of winter steelhead in the action area. Construction will not occur during spawning and adults are not expected to migrate through the action area during construction.

Juvenile steelhead are expected to be rearing in the action area during construction. A 0.25 mile-long reach of the SF Stillaguamish just downstream of the action area was completely de-fished in summer 2005 and juvenile steelhead were encountered frequently (Snohomish County, unpublished data).

4.3.3 Critical Habitat

Critical habitat has not yet been designated or proposed for this species.

5. WILDLIFE SPECIES EVALUATIONS

This section outlines the distribution, ESA and stock status, and critical habitat for ESA listed wildlife species. A discussion of applicable life histories is included as Appendix F.

5.1 MARBLED MURRELET

5.1.1 ESA Status and Distribution

Marbled murrelets are marine birds that forage in nearshore environments from northern California through Alaska. They nest in mature coniferous forests west of the Cascade crest at low to moderate elevations (Smith et al. 1997). Marbled murrelets are resident year-round on coastal waters. USFWS listed marbled murrelets as threatened under the ESA in 1992 due to a decline in abundance and habitat degradation in the southern portion of their range. Exact numbers are unknown. Historical data are limited, but murrelets are currently rare and uncommon in areas where they were common or abundant in the early 1900s, especially along the southern coast of Washington, northern coast of Oregon, and coast of California south of Humboldt County (Sealy and Carter 1984; Marshall 1988; Carter and Erickson 1992; Nelson et al. 1992; Ralph 1994). An estimate for the number of individuals in Washington is 5,000 to 6,000 birds (Speich et al. 1992; Speich and Wahl 1995). The breeding population in Washington is estimated to be 1,900 to 3,500 pairs (Speich et al. 1992).

Marbled murrelet population decline has been attributed primarily to the loss and fragmentation of old-growth nesting habitat caused by logging and development (Ralph and Miller 1995). It is believed that forest fragmentation may be making nests near forest edges vulnerable to predation by other birds, such as jays, crows, ravens, and great-horned owls. In addition, this species is vulnerable to fishing nets and oil spills (Marshall 1988).

The USFWS conducted a 5-year review of marbled murrelet status in 2003 (USFWS 2004b). Based on available information in the Washington, Oregon, and California, the status review estimated there are currently 2,223,048 acres of suitable murrelet nesting habitat. The status review found that the marbled murrelet population is not stable through reproduction due to low fecundity levels across the 3-state area, as determined through nest success values (i.e., the number of fledglings per breeding pair of murrelets per year). In general, both radio telemetry and at-sea survey methods indicate that murrelet breeding success appears to decline from north to south. Predation has consistently been the most significant cause of nest failure. Murrelets appear to select platforms that provide protection from predation (USFW 2006). The factors affecting rates of predation on murrelet nests are not fully clear, yet key elements seem to be proximity to humans, abundance of avian predators, and proximity and type of forest edge to the nest. The status review did not find that a change in classification from threatened was warranted.

5.1.2 Marbled Murrelets in the Action Area

PHS data (WDFW 2006) indicates that the nearest marbled murrelet occupancy sites are over 0.3 mile outside the action area, although recent surveys have not detected marbled murrelet nesting in the project vicinity (USFS 2006b).

Patches of suitable habitat for marbled murrelet is present in the action area south of the Monte Cristo Grade Road. Suitable habitat was determined based on the presence of trees with platforms greater than or equal to 4 inches in diameter and greater than 33 feet above ground (USFWS 2006). The nearest suitable habitat tree is approximately 67 yards south of the south bridge abutment. Although the habitat in the action area is considered suitable per the criteria, it is marginal and inferior to older and more intact habitat available elsewhere in the SF Stillaguamish basin. The suitable habitat in the action area is expected to have high rates of avian (corvid) predation associated with human occupation and disturbed areas in the action area including the Mountain Loop Highway and local roads, residential development,

and young secondary forest. Further, observed nest platforms that are considered suitable are fairly small (i.e. less than 7 inches).

The early nesting season for murrelets is between April 1 and August 5 and the late season continues until although it is unlikely. Given the relatively small number of murrelets present in Washington relative to available suitable habitat, it is far more likely that murrelets will select higher quality nesting habitat (with larger nest platforms and fewer predators) in adjacent areas than exists in the action area. It is reasonably likely that murrelets nesting outside the action area will regularly migrate through the action area while flying to and from their nests.

5.1.3 Critical Habitat

The critical habitat designation includes 11 units in Washington State, including 1.2 million acres of federal land, 421,500 acres of state forest land, and 2,500 acres of private land. Not all suitable habitat is included in this designation, as only areas designated as most essential to murrelet survival in terms of quality, distribution, and ownership are included. The USFWS is currently proposing to revise the 1996 critical habitat designation for marbled murrelets.

Critical habitat for marbled murrelets is designated within the project action area. (USFW ECOS Critical Habitat Mapper website) The suitability of nesting habitat is marginal due to the small platform size and unprotected location of the trees. The trees that have potential platforms are along the edge of the forest with a steep slope on one side and the clearing for the road and river on the other side, leaving the trees fairly exposed to predation. The work will occur approximately 150 yards from suitable habitat during the nesting season.

6. EFFECTS TO LISTED SPECIES AND CRITICAL HABITAT

6.1 RIPARIAN VEGETAION

Approximately 4,500 square feet of riparian vegetation along the SF Stillaguamish River will be temporarily impacted by the temporary access road. All of the temporary impact is to scrub shrub or non-mature forest vegetation. Temporary impact includes clearing vegetation and/or grading and replanting with native woody species after construction. Approximately 900 square feet of non-mature forest will be permanently impacted by the south abutment and 1,300 square feet of scrub shrub riparian vegetation will be permanently impacted at the north abutment. No potential suitable nesting habitat for marbled murrelets will be removed.

In addition to the 4,500 square feet of temporarily impacted area that will be replanted, approximately 10,000 square feet of the decommissioned segment of the Monte Cristo Grade Road will be planted, restoring approximately 350 linear feet of riparian buffer adjacent to the river. The road base material will be removed, the area re-graded and replaced with soil and planted. The proposed mitigation, required per Snohomish County's Critical Areas Ordinance, includes replanting with native tree and shrub species to increase plant diversity and create a more complex vegetative structure.

The clearing impacts will not have a measurable effect on riparian functions such as LWD recruitment; temperature and stream shading due to the small area of clearing, surrounding topography, size of trees to be cleared, amount of adjacent mature forest, and north/south orientation of the clearing. Therefore, effects to listed species from clearing of this vegetation are expected to be insignificant.

Over the long term, the proposed action including mitigation will result in a net increase of 7,800 square feet of riparian vegetation in the action area. The shape and location of the mitigation area (in the footprint of the existing Monte Cristo Grade Road adjacent to the river) will contribute to a locally improved riparian buffer for fish species that will lead to minor increases in shading, allochthonous input, LWD recruitment, and sediment retention functions associated with riparian cover. Decommissioning of the road and establishment of mature vegetation may also slightly reduce the exposure of suitable murrelet nesting habitat to avian predators over the long-term.

6.2 WATER QUALITY

Fine Sediment

Fine sediment suspension has the potential to affect the behavior or feeding success of juvenile salmonids if it is of sufficient duration and intensity (Spence et. al 1996).

Work below the OHWM will be limited to the gravel bar that will be dry (out of the wetted channel) at the time of construction. Construction of the work pad will require the boulders from the bar to be set aside. Fish mix gravel and timber mats will be used to create a stable work surface. The mats will be removed after construction and the boulders will be redistributed on the bar with the fish mix gravel.

Grading for bridge construction has the potential to introduce fine sediment into the river during the construction season. However, sediment introduction will be insignificant because most heavy grading and excavation will occur near the central pier and north abutment, at least 60 feet from the wetted channel and standard erosion control BMPs will be employed to stabilize disturbed areas. Further, construction will occur in the dry season, when the likelihood of significant rain events is relatively low. The project will meet all water quality standards imposed by state and federal laws (e.g., Clean Water Act 404/401).

After construction ceases, there is potential for temporarily elevated turbidity in the first storm event of the season when the river rises enough to submerge the gravel bar. Disturbance of the gravel bar during construction, including removal and replacement of boulders, could cause minor localized disruption of natural bed armoring. The potential for this disturbance to result in a significant sediment plume is low. Additionally, the fish mix gravel that will be left on site will cover the disturbed area, further reducing the potential for fine sediment mobilization.

The location of the construction pad and access (below OHWM but outside of the wetted channel), the use of BMPs, e.g., erosion and sediment control measures, and prohibiting machinery from operating in the wetted channel all combine to make the probability of significant sedimentation discountable. The background levels of turbidity in the SF Stillaguamish are very high. Even if a minor sediment plume occurred, it would be relatively small in magnitude and duration, and listed fish would likely avoid the plume in preference of less turbid portions of the river.

The creation of riparian buffer as mitigation on the decommissioned road is not likely to effect water quality. BMP measures will be used to prevent sediment from enter the stream during restoration of the decommissioned road and the site will be mulched, further reducing the potential for sediment mobilization. The mitigation will provide a long-term improvement in water quality and quantity to the river by removing impervious surfaces adjacent to the river, and replacing them with a vegetated riparian buffer.

The removal of the tributary culvert in the mitigation site in 2010 could potentially introduce sediment into the river. However, the work site will be isolated from flow, the work will occur under low flow conditions, and BMPs will be in place to prevent sediment from entering the stream. Listed fish are not present in the tributary.

The interrelated and interdependent road maintenance work to fix the road at the west end could occur in wetlands. There is approximately 1000 feet of forested and scrub shrub vegetation between the road and the SF Stillaguamish. Erosion control measures will be used to prevent sediment from entering the wetland. If any sediment was introduced to the wetland, it would settle out in the wetland prior to reaching the SF Stillaguamish.

Stormwater

There is very low potential for the addition of 500 square feet of impervious surface to indirectly affect listed fish. No stormwater treatment currently exists at the project site. The project proposes to maintain the existing ditches on the south side and establish ditches on the north side that will disperse over the bank on to rock pads. The water will then sheet flow over vegetated areas and/or infiltration. The bridge deck will be untreated timber or open steel grate that will not collect or concentrate stormwater. Pollutants from vehicles traveling over the bridge will enter the river in very small quantities. Average traffic over the bridge is expected to be less than 20 vehicles. Because the bridge will not have a solid deck, pollutants from vehicles will not collect and concentrate. Any pollutants entering the river will dilute quickly. Indirect effects to water quality will be insignificant.

Wet Concrete

Concrete will be poured to construct piling caps on the north abutment and central pier and to expand the south abutment. Most concrete work will occur at the north abutment and central pier, over 60 feet from the wetted channel. Standard construction BMPs will be employed to ensure that uncured concrete and washwater are isolated from the river (see 3.4.2 for details).

Approximately 6.5 yards of wet concrete will be delivered to the south abutment by the crane stationed on the north side of the river. To reduce the potential for wet concrete to enter the river, the outside of the

bucket will be cleaned between loads and a tarp will be hung under the bucket as it is delivered over the river. A large bucket will be used such that only a few loads will be needed.

Given the distance of most concrete work to the wetted channel, the implementation of standard BMPs, and the implementation of additional BMPs for the delivery of concrete over the river, it is unlikely that any uncured concrete will enter the river. However, if a small amount of concrete is introduced to the river from the bucket or work on the south abutment, it will be diluted rapidly.

6.3 NOISE AND SOUND PRESSURE

Potential direct effects on listed fish could include disturbance to individuals due to pile driving above the OHWM. Pile driving will occur out of the water and cause minimal disturbance of a short-term duration. The north abutment will be driven approximately 150 feet from the water; a high bank and a gravel bar with boulders, cobbles, and sand separate the water from the abutment location. The piles of the center pier will be approximately 60 feet from the water and the gravel bar separates the water from pier. The stream channel is approximately 80-100 feet wide with a depth of less than 6 feet. Sound waves from the pile driving will have been largely attenuated and disrupted by the gravel bar. Further, the relatively shallow river further reduces the potential for harmful pressure waves to propagate through the water. Therefore the effect of pile driving on listed fish will be discountable.

Listed birds can be negatively affected by increases in noise disturbance, particularly while nesting or roosting (USFWS 2006). The project is located within critical habitat for marbled murrelets. All work will take place in the existing road right-of-way. The closest potential suitable habitat tree is located approximately 200 feet southwest of the south abutment.

Pile driving between April 1 and August 5 generally requires a distance of greater than 60 yards from suitable habitat in order avoid adverse affects to marbled murrelets (USFWS 2003), (Table 4). Pile driving will take place on the north side of the river at almost twice the prescribed distance from potential suitable habitat (approximately 116 yards). Project activities using heavy equipment and motorized tools require a distance of greater than 35 yards. Work on the south side of the river will not take place until the bridge is in place; this will likely occur after August 15th, which will be outside of the murrelet early breeding season. Any work on the south side will be approximately 67 yards from potential suitable habitat. Work occurring during the breeding season will be 116 yard away. The effects of noise will be discountable due to the low probability of murrelet nesting in the action area during construction (see 5.1.2). If murrelet nesting does occur within the action area during construction, effects from noise would be insignificant due to the combination of distance and timing.

Compared to pre-flood traffic volumes, there will be no substantial increase to traffic volumes resulting from the bridge replacement; therefore a long-term increase in disturbance to marbled murrelets is not expected.

Table 4. Effects Determinations by Type of Disturbance and Operating Period for Marbled Murrelets when Occupied Sites and/or Unsurveyed Suitable Habitat Occurs in the Vicinity of the Proposed Work.

Type of Disturbance	Operating Period for Project Activities and Associated Effects Determinations for Marbled Murrelet					
	No Effect		Not Likely to Adversely Affect		Likely to Adversely Affect	
	Date	Distance from Suitable Habitat	Date	Distance from Suitable Habitat	Date	Distance from Suitable Habitat
Blasts	9/16-3/30	any	4/1-8/5[a]	> 1 mile	4/1-8/5	< 1 mile
	8/6-9/15	> 1 mile[b]	8/6-9/15[c]	< 1 mile		
Impact pile drivers, jackhammers, or rock drills	9/16-3/30	any	4/1-8/5	> 60 yards	4/1-8/5	< 60 yards
	8/6-9/15	> 60 yards	8/6-9/15	< 60 yards		
Large-size helicopter (Sikorsky type) or large airplane	9/16-3/30	any	4/1-8/25	> 1 mile	4/1-8/5	< 1 mile
	8/6-9/15	> 1 mile	8/6-9/15	< 1 mile		
Helicopters (Bell Jet Ranger type) or single-engine airplane	9/16-3/30	any	4/1-8/5	> 120 yards	4/1-8/5	< 120 yards
	8/6-9/15	> 120 yards	8/6-9/15	< 120 yards		
Heavy equipment, motorized tools	9/16-3/30	any	4/1-8/5[a]	> 35 yards	4/1-8/5	< 35 yards
	8/6-9/15	> 35 yards	8/6-9/15[b]	< 35 yards		
Chainsaws falling trees and cutting downed wood	9/16-3/30	any	4/1-8/5	> 45 yards	4/1-8/5	< 45 yards
	8/6-9/15	> 45 yards	8/6-9/15	< 45 yards		
Prescribed burning	9/16-3/30	any	4/1-8/5	> 0.25 mile	4/1-8/5	< 0.25-mile
			8/6- 3/30	< 0.25 mile		

[a] April 1 to August 5 (early breeding season); [b] Site-, equipment-, and method-specific information can be used to shorten or lengthen the 1-mile distance for these activities; [c] August 6 to September 15 (late breeding season).
Source: *Programmatic biological opinion for selected forest-management activities, USFWS, 2003*

6.4 CHANNEL CONDITIONS

Construction of road crossings across rivers can change conditions at the site or reach scale by altering geomorphic processes including channel migration and the transport of coarse substrate and large woody debris. However, construction of the Monte Cristo bridge will not substantially or negatively alter geomorphic processes for several reasons. Construction of the bridge will rely on reconstructing and augmenting two existing abutments and the center pier within several feet of their existing footprints. Therefore, the post-construction condition will be very similar to the baseline. Further, the existing abutments do not significantly affect geomorphic processes. The river is naturally constrained by a bedrock outcrop on the south bank, and the south abutment is founded atop the outcrop. The north abutment is buried within 342nd Drive NE and is not exposed to flows. The center pier is just within the OHWM and is wetted only during high flows. Because the bedrock along the south bank is hydraulically smoother than the rough gravel/cobble bar on the right bank, the river is unlikely to migrate northward in

the foreseeable future. However, the two spans of the bridge are long enough to accommodate northward migration of the channel, should it occur.

The other activity with potential to affect geomorphic processes is the construction of the work pad on the bar below OHWM. Coarse bed substrate in a 50' x 50' area will be disturbed by construction. The largest boulders will be removed and stockpiled and fish mix spawning gravel will be imported and spread out to construct a level base for the timber mat work pad. After the bridge is constructed, the timber mats will be removed and the native boulders will be redistributed on the bar atop the fish mix spawning gravel. The gravel will be left in place to avoid extensive disruption of the bar that would be required to remove the gravel. The bed elevation in this area will be slightly higher than the pre-project profile. However, most of the gravel will be redistributed in the first bankfull event and may contribute to spawning sites downstream.

6.5 EFFECT DETERMINATIONS

The *Checklist for Documenting Environmental Baseline and Effects of Proposed Actions(s) on Relevant Indicators* is included in Section 2.4 and was used to guide the determination of effect for the proposed action on each fish species. An extensive field survey of the habitat parameters identified in the checklist was not performed in the action area. Rather, the checklist was completed using the best available scientific information for the area and through visual observation of the project vicinity and best professional judgment.

Based on field work by natural resource specialists, evaluation of the proposed design, review of pertinent literature, and interviews with fish and wildlife authorities, we conclude the following

6.5.1 Effect Determinations for Chinook, steelhead, and bull trout

Individuals of all listed fish species may be in the action area during construction, including rearing juvenile steelhead, migrating adult Chinook, and foraging and migrating subadult and adult bull trout. Based on the information and analysis presented in the biological assessment, the project **may affect, but is not likely to adversely affect** Chinook salmon, steelhead and bull trout.

- Minor riparian clearing will occur. Most cleared areas will be re-planted and an additional 10,000 square feet of riparian vegetation will be planted on the decommissioned road. Effects to all listed fish species will be **insignificant.** Over the long term, decommissioning and revegetation of a segment of the Monte Cristo Grade Road will likely reduce sediment input to the river.
- Minor increases in fine sediment suspension and pollutants associated with driving surfaces will be localized and dilute rapidly, resulting in **insignificant** effects to listed fish. Effects from introduction of wet concrete to the river are **discountable**; however, if a small amount of concrete is introduced into the river, it would dilute rapidly resulting in **insignificant** effects to all listed fish species.
- Pressure waves from pile driving will result in **insignificant** effects to listed fish. Pile driving will occur in the dry at least 65 feet from the wetted channel. Resultant pressure waves will be disrupted and attenuated in the mixed-substrate matrix of the intervening gravel bar to such an extent that they will not have the potential to harm fish in the river.
- Alteration of channel conditions will be minor and temporary. Fish mix spawning gravel will be left on-site and redistributed by the river, resulting in **insignificant**, and possibly beneficial, effects.

6.5.2 Effect Determination for Marbled Murrelet

It is unlikely that marbled murrelets will nest in the action area during construction (see Chapter 5.1.2). Based on the information and analysis presented in the biological assessment, the project **may affect, but is not likely to adversely affect** marbled murrelets.

- Minor riparian clearing will occur to locally widen the road at the existing bridge abutments and will not fragment cover or create new travel corridors into suitable habitat for avian predators. Therefore, clearing will have **insignificant** effects on marbled murrelet. Over the long-term, decommissioning and revegetation of a segment of the Monte Cristo Grade Road may have minor beneficial effects by reducing exposure of suitable habitat to avian predation. Alteration in geomorphic
- The effects of noise disturbance will be **discountable** due to the low probability of murrelet nesting in the action area during construction (see 5.1.2). However, if murrelet nesting does occur within the action area during construction, effects from noise would be **insignificant** due to the combination of distance and timing.

6.5.3 Critical Habitat Determination for Chinook and bull trout

Chinook Critical Habitat

The project **may affect, but is not likely to adversely affect** Chinook salmon critical habitat because:

- Minor changes in water quality, including a slight increase in impervious surface and a minor temporary increase in fine sediment, will have **insignificant** effects to the freshwater spawning PCE. Over the long term, decommissioning and revegetation of a segment of the Monte Cristo Grade Road will likely reduce sediment input to the river. Short-term changes in channel conditions from disturbance of the gravel bar will have **insignificant** effects to the freshwater spawning PCE. There will be a small change in cover due to minor riparian clearing, resulting in **insignificant** effects to the freshwater spawning PCE.
- Minor changes in water quality, including a slight increase in impervious surface and a minor temporary increase in fine sediment, will have **insignificant** effects to the freshwater rearing PCE. Over the long term, decommissioning and revegetation of a segment of the Monte Cristo Grade Road will likely reduce sediment input to the river. Short-term changes in channel conditions from disturbance of the gravel bar will have **insignificant** effects to the freshwater rearing PCE. There will be a small change in cover due to minor riparian clearing, resulting in **insignificant** effects to the freshwater rearing PCE.
- Minor changes in water quality, including a slight increase in impervious surface and a minor temporary increase in fine sediment, will have **insignificant** effects to the freshwater migration corridor PCE. Over the long term, decommissioning and revegetation of a segment of the Monte Cristo Grade Road will likely reduce sediment input to the river. Short-term changes in channel conditions from disturbance of the gravel bar will have **insignificant** effects to the freshwater migration corridor PCE. There will be a small change in cover due to minor riparian clearing, resulting in **insignificant** effects to the freshwater migration corridor PCE.

Bull trout

The project **may affect, but is not likely to adversely affect** bull trout critical habitat because:

- PCE #1 (Contaminants) - Contamination from uncured concrete is **discountable.** However, if a small amount of concrete is dripped into the river from the bucket transferring it to the south

abutment, the concrete would dilute quickly, resulting in **insignificant** effects to PCE #1. Effects to PCE #1 from spills of petroleum products associated with heavy equipment are **discountable.**

- PCE #4 (substrate) - The project will not degrade substrate conditions or potential spawning sites or result in increased embeddedness of gravels. Effects to PCE#4 will be **insignificant.**
- There will be no effect to other PCEs for bull trout critical habitat.

6.5.4 Critical Habitat Determination for Marbled Murrelet

The project **may affect, but is not likely to adversely affect** marbled murrelet critical habitat because:

- Clearing of riparian vegetation is **insignificant** because suitable nesting trees (trees with "old growth" characteristics or with potential nest platforms) will not be removed or increase exposure of suitable habitat to avian predation
- No primary constituent elements will be affected by the proposed project due to the small number of trees being removed and their location alongside an existing road.

7. REFERENCES

Barkdull, Brett. WDFW. May 27, 2008. RE: South Fork Stillaguamish Fish Usage. WDFW Fisheries Biologist. Personal e-mail.

Binford, L.C., B.G. Elliott, and S.W. Singer. 1975. Discovery of a nest and the downy young of the marbled murrelet. Wilson Bull. 87:303-319.

Bjornn. T.C. 1991. Bull trout (*Salvelinus confluentus*). Pages 230-235 in J. Stolz and J. Schnell, eds. Trout. Stackpole Books, Harrisburg, Pennsylvania.

Brown, L.G. 1992. On the zoogeography and life history of Washington's native char. Washington Department of Fish and Wildlife, Rept. #94-04, Fish. Mgmt. Div. 41 p.

BRT (West Coast Salmon Biological Review Team). 2005. Updated status of Federally listed ESUs of West Coast salmon and steelhead. U. S. Department of Commerce, National Marine Fisheries Service, Northwest Fisheries Science Center and Southwest FisheriesScience Center (June 2005).

Burgner, R. L., J. T. Light, L. Margolis, T. Okazaki, A. Tautz, and S. Ito. 1992. Distribution and origins of steelhead trout (*Oncorhynchus mykiss*) in offshore waters of the north Pacific Ocean. Int. North Pac. Fish. Comm. Bull. 51:1-92.

Burkett, E.A. 1995. Marbled murrelet food habits and prey ecology. *In*: Ralph, C.J, G.L. Hunt, M.G. Raphael, and J.F. Piatt. Tech. Eds. Ecology and conservation of the marbled murrelet. Gen. Tech. Rep. PSW-GTR-152. Pacific Southwest Research Station, USDA Forest Service, Albany, California.

Busby, P. J., Wainwright, T. C., Bryant, B. J., Lierheimer, L. J., Waples, R. S.,Waknitz, F. W., Lagomarsino, I. V. August, 1996. "Status Review of West Coast Steelhead from Washington, Idaho, Oregon, and California". *NOAA Technical Memorandum*. NMFS-NWFSC-27. P1-255 (255).

Carter, H.R., and R.A. Erickson. 1992. Status and conservation of the marbled murrelet in California, 1982-1987. Pp. 92-108 *in* Status and conservation of the marbled murrelet in North America (H.R. Carter and M.L. Morrison, eds.). Proc. West Found. Vertebr. Zool. 5.

Carter, H. and S. Sealy. 1986. Year-round use of coastal lakes by marbled murrelets. Condor 88:473-477.

Carter, H. and S. Sealy. 1987. Inland records of downy young and fledgling marbled murrelets in North America. The Murrelet 68:58-63.

DNR (Washington Department of Natural Resources). 2002. Statewide Transportation Layer. 24k-Scale GIS Data.

Ecology (Washington State Department of Ecology). 1993a. Stormwater Management Manual for Western Washington, Publication #93-74. Olympia, Washington.

Ecology (Washington State Department of Ecology). 2000. Final 1998 Section 303(d) List. Washington Department of Ecology water quality website. http://www.ecy.wa.gov/programs/wq/303d/1998_by_wrias.html

GeoEngineers. 2006. Draft Design Report: Waldheim Landslide Bank Habitat Enhancement – South Fork Stillaguamish River. Prepared for Snohomish County. Unpublished Data.

Goetz, F.A. 1994. Distribution and ecology of bull trout (*Salvelinus confluentus*) in the Cascade Mountains. Master's Thesis. Oregon State University, Corvallis, Oregon.

Groot, C. and L. Margolis. 1991. Pacific Salmon Life Histories. UBC Press, Vancouver, Canada. 564 p.

Haas, A.D, F.E. Leonetti, L.T. Parker, M.D. Purser and M.D. Rustay. 2003. Stillaguamish River Bank and Physical Habitat Conditions Survey – 2002 Summary Report. Snohomish County

Department of Public Works, Surface Water Management Division, Everett, WA.Hamer, T.E. 1990. Habitat relationships of marbled murrelets (*Brachyramphus marmoratus*) in western Washington. Washington Department of Wildlife.

Hayman, R. A., E. M. Beamer, and R. E. McClure. 1996. FY 1995 Skagit River Chinook restoration research. Skagit System Cooperative. Chinook Restoration Research Progress Report No. 1. Final Project Performance Report. NWIFC Contract # 3311 for FY 1995.

Healey, M.C. 1991. Life history of Chinook salmon (*Oncorhynchus tshawytscha*). Pages 311-393 in C. Groot and L. Margolis, editors. Pacific salmon life histories. UBC Press, University of British Columbia, Vancouver, British Columbia.

Henderson, J.A., R.D. Lesher, D.H. Peter, and D.C. Shaw. 1992. Field Guide to the Forested Plant Associations of the Mt. Baker-Snoqualmie National Forest. USDA Forest Service, Pacific Northwest Region. R6-ECOL-TP-028091.

Jackson, Chad. 2005. "RE: Chinook run timing." 7 December 2005. WDFW Fisheries Biologist. Personal e-mail.

Johnson, J.H., and P.A. Kucera. 1985. Summer-autumn habitat utilization of subyearling steelhead trout in tributaries of the Clearwater River, Idaho. Canadian Journal of Zoology 63:2283-2290.

King County DNR (King County Department of Natural Resources). 2000. Literature review and recommended sampling protocol for bull trout in King County. Seattle, Washington. June, 2000.

Kraemer, C. 1994. Some observations on the life history and behavior of the native char, Dolly Varden (*Salvelinus malma*) and bull trout (*Salvelinus confluentus*) of the North Puget Sound region. Draft report, Washington State Department of Fish and Wildlife, Mill Creek, Washington.

Leary, R.F., F.W. Allendorf, and S.H. Forbes. 1991. Conservation genetics of bull trout in the Columbia and Klamath River drainages. Wild Trout and Salmon Genetics Laboratory Report 91/2. Division of Biological Sciences, University of Montana, Missoula, Montana.

Marshall, D.B. 1988. Status of the marbled murrelet in North America: with special emphasis on populations in California, Oregon, and Washington. U.S. Fish and Wildl. Serv. Biol. Rep. 88.

MBSNF (Mount Baker-Snoqualmie National Forest). 1996a. Soil resource inventory - GIS data. U.S. Forest Service, Region 6, MBSNF Headquarters, Mount Lake Terrace, Washington. Available online at: <http://www.fs.fed.us/r6/mbs/maps/gis-si.shtml>. Accessed November 4, 2005.

MBSNF (Mount Baker-Snoqualmie National Forest). 1996b. J8 and S8 Soils - GIS data. U.S. Forest Service, Region 6, MBSNF Headquarters, Mount Lake Terrace, Washington. Available online at: <http://www.fs.fed.us/r6/mbs/maps/gis-js.shtml>. Accessed November 8, 2005.

Myers, J.M., R.G. Kope, G.J. Bryant, D. Teel, L.J. Lierheimer, T.C. Mainwright, W.S. Grant, F.K. Waknitz, K. Neely, S.T. Lindley, and R.S. Waples. 1998. Status review of Chinook salmon from Washington, Idaho, Oregon, and California. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-NWFSC-35. 443 pp.

Nelson, S.K., M.L.C. McAllister, M.A. Stern, D.H. Varoujean, and J.M. Scott. 1992. The marbled murrelet in Oregon, 1899-1987. Pp. 61-91 *in* Status and conservation of the marbled murrelet in North America (H.R. Cater and M.L. Morrison, eds.). Proc. West. Found. Vertebr. Zool. 5.

Nelson, S.K. 1997. Marbled Murrelet (Brachyramphus marmoratus). In: Birds of North America, No. 276 (A. Poole and G. Gill, eds.). Academy of Natural Sciences, Philadelphia, and American Ornithologists' Union, Washington, DC.

NMFS (National Marine Fisheries Service). 1996. Making Endangered Species Act determinations of effect for individual or grouped actions at the watershed scale. National Marine Fisheries Service, Environmental Technical Services Division, Habitat Conservation Branch. 28pp.

NMFS (National Marine Fisheries Service). 1998. Factors contributing to the decline of Chinook salmon: an addendum to the 1996 west coast steelhead factors for decline report. Protect Resources Division, Portland, Oregon.

NMFS (National Marine Fisheries Service). 1999a. Endangered and threatened species; threatened status for three Chinook salmon evolutionarily significant units (ESUs) in Washington and Oregon, and endangered status for one Chinook salmon ESU in Washington. Final Rule. March 24, 1999. Federal Register 64(56):14308-14328.

NMFS (National Marine Fisheries Service). 1999b. Essential Fish Habitat Consultation Guidance. Office of Habitat Conservation.

NMFS (National Marine Fisheries Service). 2000a. Designated critical habitat: critical habitat for 19 evolutionarily significant units of salmon and steelhead in Washington, Oregon, Idaho, and California. Final Rule. February 16, 2000. Federal Register 65(32):7764-7787.

NMFS (National Marine Fisheries Service). 2000b. Appendix A: Description and Identification of Essential Fish Habitat, Adverse Impacts and Recommended Conservation Measures for Salmon. Amendment 14 to the Pacific Coast Salmon Plan. Pacific Fishery Management Council. January 1999. Available at the PSMFC website at: http://www.pcouncil.org/.

NMFS (National Marine Fisheries Service) and USFWS. 2005. Endangered Species Act –Section 7 Formal Consultation Biological and Conference Opinion. Verlot Riverfront Tracts Banks Stabilization Project.

NOAA (National Oceanic and Atmospheric Administration) Fisheries. 2005. Endangered and threatened species; designation of critical habitat for 13 evolutionarily significant units of Pacific salmon (*Oncorhynchus spp.*) and steelhead (*O. mykiss*) in Washington, Oregon, and Idaho; Final Rule. September 2, 2005. Federal Register 70(170):52630–52858.

NOAA (National Oceanic and Atmospheric Administration) Fisheries. 2006. Listing Endangered and Threatened Species and Designating Critical Habitat: 12–Month Finding on Petition to List Puget Sound Steelhead as an Endangered or Threatened Species. March 29, 2006. Federal Register 71(60): 15666–15679.

NRC (National Research Council). 1996. Upstream—Salmon and Society in the Pacific Northwest. National Academy Press, Washington, D.C. 452 p.

Pacific Fishery Management Council (PFMC). 1999. Review of the 1998 ocean salmon fisheries. Pacific Fishery Management Council,Portland, Oregon. Available from Pacific Fishery ManagementCouncil, 2130 SW Fifth Ave., Suite 224, Portland, OR 97201, USA

Parametrix. 2005. Mountain Loop Highway Easement Transfer Botanical Survey Results Technical Memorandum. Prepared for Snohomish County Public Works. August 22, 2005

Parametrix 2007. Mountain Loop Highway Easement Transfer Critical Areas Study and Habitat Management Plan. Prepared for Snohomish County Public Works.

Pauley, G. 1991. Anadromous trout. Pages 96-104 in J. Stolz and J. Schnell, eds. Trout. Stackpole Books, Harrisburg, Pennsylvania.

PSTRT (Puget Sound Technical Recovery Team). 2003. Independent Populations of ChinookSalmon in Puget Sound. Final Draft. 59p.

Ralph, C.J. 1994. Evidence of changes in populations of marbled murrelets in the Pacific Northwest. Pp. 286-292 *in* A century of avifaunal change in western North America (J.R. Jehl, Jr. and N.K. Johnson, eds.). Stud. Avian Biol. No. 15.

Ralph, C.J., and S.L. Miller. 1995. Offshore population estimates of marbled murrelets in California. *In*: Ralph, C.J, G.L. Hunt, M.G. Raphael, and J.F. Piatt. Tech. Eds. Ecology and conservation of the marbled murrelet. Gen. Tech. Rep. PSW-GTR-152. Pacific Southwest Research Station, USDA Forest Service, Albany, California.

Reiser, D. W., and T. C. Bjorn. 1979. Habitat requirements of anadromous salmonids. Gen.Tech. Rep. PNW-96. USDA Forest Service. Pacific Northwest Forest and RangeExperiment Station, Portland, Ore. 54 p.

Rieman, B.E. and J.D. McIntyre. 1993. Demographic and habitat requirements for conservation of bull trout. General Technical Report. U.S. Forest Service Intermountain Research Station, Ogden, Utah. 38 pp.

Sealy, S.G. 1975. Feeding ecology of the ancient and marbled murrelets near Langara Island, British Columbia. Can. J. Zool. 53:418-433.

Sealy, S.G., and H.R. Carter. 1984. At-sea distribution and nesting habitat of the marbled murrelet in British Columbia: Problems in the conservation of a solitary nesting seabird. Pp. 737-781 *in* Status and conservation of the world's seabirds (J.P. Croxall, P.G.H. Evans, and R.W. Schreiber, eds.). ICBP Tech. Publ. no.2.

Smith M.R., W. Mattocks, Jr., and K.M. Cassidy. 1997. Breeding birds of Washington State. Volume 4 *in*: Washington State gap analysis – Final report. K.M. Cassidy, C.E. Grue, M.R. Smith, and K.M.

Dvornich (eds.). Seattle Audubon Society Publications in Zoology No. 1, Seattle, Washington. 538 pp.

Snohomish County. 2000. State of the waters, 2000 water quality of Snohomish County rivers, stream and lakes. Accessed on April 9, 2007 at: http://www.co.snohomish.wa.us/publicwk/swm/wq/publications/stateofwater/stateofwater.htm.

Snohomish County. 2004. Bull trout and Chinook distribution maps. Snohomish County Planning. Accessed on April 9, 2007 at: http://www.co.snohomish.wa.us/publicwk/swm/maps/

Snohomish County Department of Public Works (SCPW). June 2005. Stillaguamish watershed Chinook Salmon recovery plan. Surface Water Management Division. Everett, WA.

Speich, S.M., and T.R. Wahl. 1995. Marbled murrelet populations of Washington – Marine habitat preferences and variability of occurrence. Pp. 313-326 *in* Ecology and conservation of the marbled murrelet (C.J. Ralph, G.L. Hunt, Jr., M.G. Raphael, and J.F. Piatt, eds.). USDA For. Serv. Gen . Tech. Rep. PSW-152, Albany, California.

Speich, S.M, T.R. Wahl, and D.A. Manuwal. 1992. The numbers of marbled murrelets in Washington marine waters. Pp. 48-60 *in* Status and conservation of the marbled murrelet in North America (H.R. Carter and M.L. Morrison, eds.). Proc. West. Found. Vertebr. Zool. 5.

Spence, B. C., G. A. Lomnicky, R. M. Hughs, and R. P. Novitzki. 1996. An ecosystem approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research FWSs Corp., Corvallis, OR. (Available from the National Marine Fisheries USFWS, Portland, Oregon.).

Stillaguamish Lead Entity Strategies. 2004. Stillaguamish Implementation Review Committee.

Strachan, G., M. McAllister, and C.J. Ralph. 1995. Marbled murrelet at-sea and foraging behavior. *In*: Ralph, C.J, G.L. Hunt, M.G. Raphael, and J.F. Piatt, Tech. Eds. Ecology and conservation of the marbled murrelet. Gen. Tech. Rep. PSW-GTR-152. Pacific Southwest Research Station, USDA Forest Service, Albany, California.

Streamnet. 2007. Pacific Northwest Interactive Mapper. Available at: http://map.streamnet.org/snetmapper/viewer.htm

USDA (U.S. Department of Agriculture). 1996. The PLANTS database. Natural Resource Conservation Service, National Plant Data Center. Baton Rouge, Louisiana.

USFS (United States Forest Service). 1995. South Fork Upper Stillaguamish River Watershed Analysis. Mount Baker-Snoqualmie National Forest.

USFS (United States Forest Service). 2006a. GIS Fish Distribution Database. Mount Baker-Snoqualmie National Forest. Unpublished data

USFS (United States Forest Service). 2006b. Upper Waldheim Slide – Slope Stabilization and Easement. Initial Wildlife Specialist Report. Mount Baker-Snoqualmie National Forest. Unpublished data.

USFWS (United States Fish and Wildlife Service). 1998a. Endangered and threatened wildlife and plants; proposal to list the Coastal Puget Sound, Jarbridge River, and St. Mary-Belly River population

segment of bull trout as threatened species. Proposed rule June 10, 1998. Federal Register 63(111):31693-31710.

USFWS (United States Fish and Wildlife Service). 1998b. Candidate and listing priority assignment form for the coastal/Puget Sound population segment. February 12, 1998. 89 pp.

USFWS (United States Fish and Wildlife Service). 1999a. Endangered and threatened wildlife and plants; determination of threatened status for bull trout in the coterminous United States. Final rule November 1, 1999. Federal Register 64 (210): 58910-58933.

USFWS (United States Fish and Wildlife Service). 2002. Endangered and Threatened Species:Range Extension for Endangered Steelhead in Southern California. Final Rule. May 1, 2002. Federal Register 67 (21586).

USFWS (United States Fish and Wildlife Service). 2003. Biological Opinion and Letter of Concurrence for Effects to Bald Eagles, Marbled Murrelets, Northern Spotted Owls, Bull Troutfrom Olympic National Forest Program of Activities (FWS Reference Number 1-3-03-F-0833).

USFWS (United States Fish and Wildlife Service). 2004b. Marbled Murrelet Five Year Review. Portland, OR. Available at: http://ecos.fws.gov/docs/five_year_review/doc732.pdf

USFWS (United States Fish and Wildlife Service). 2005a. Endangered and threatened wildlife and plants; Designation of critical habitat for the bull trout; Final Rule. September 26, 2005. U.S. Fish and Wildlife Service. Federal Register 70(185):56212–56311.

USFWS (United States Fish and Wildlife Service). 2006. Endangered and Threatened wildlife and Plants; Designation of Critical Habitat for the Marbled Murrelet; Proposed Rule. September 12, 2006. U.S Fish and Wildlife Service. Federal Register 71(176):53838-53863.

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), Washington Department of Wildlife, and Western Washington Treaty Indian Tribes. 1993. 1992 Washington state salmon and steelhead stock inventory (SASSI): summary report. Washington Department of Fisheries, Olympia, Washington. 212 pp.

WDFW (Washington Department of Fish and Wildlife). 1998. 1998 Washington State salmonid stock inventory. Appendix: Bull trout and Dolly Varden. Washington Department of Fish and Wildlife, Olympia, Washington. 437 pp.

WDFW (Washington Department of Fish and Wildlife). 2002. Salmonid Stock Inventory. Olympia, Washington.

WDFW (Washington Department of Fish and Wildlife). 2006. Priority Habitats and Species Data. Olympia, Washington.

WDFW (Washington Department of Fish and Wildlife). 2007. Salmonscape fish database and mapping application. Available online at the WDFW website at: https://fortress.wa.gov/dfw/salmonscape/

Willamette National Forest. 1989. Biology of the bull trout Salvelinus confluentus. A literature review. Willamette National Forest. Eugene, Oregon. (Frequently cited as Goetz, Fred A. 1989.)

Williams, K.R. and J.M. Mullan. 1992. Implications of age, growth, distribution, and other vitae for rainbow/steelhead, cutthroat, brook, and bull trout in the Methow River, Washington. Appendix K in Mullan, J.W., K.R. Williams, G. Rhodus, T.W. Hillman, and J.D. McIntyre, 1992. Production and habitat of salmonids in mid-Columbia River tributary streams. U.S. Fish and Wildlife Service Monograph 1.

Williams, R.W., R. Laramie, and J.J. Ames. 1975. A catalog of Washington streams and salmon utilization, Volume 1, Puget Sound. Washington Department of Fisheries. Olympia, Washington.

Wilson, M. F. 1997. Variation in salmonid life histories: patterns and perspectives. U.S. Forest Service, PacificNorthwest Research Station Research Paper PNW-RP-498, Portland, Oregon, USA.

WSCC (Washington State Conservation Commission). 2002. Salmonid habitat limiting factory analysis. Stillaguamish River watershed (WRIA 5) Final Report.

Wydoski, R.S. and R.R. Whitney. 1979. Inland Fishes of Washington. University of Washington Press, Seattle, Washington.

APPENDIX A

Essential Fish Habitat Consultation

Essential Fish Habitat Consultation

ESSENTIAL FISH HABITAT

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 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 federal 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.

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). Chief Joseph Dam, Dworshak Dam, and the Hells Canyon Complex (Hells Canyon, Oxbow, and Brownlee dams) are among the listed man-made barriers that represent the upstream extent of the Pacific salmon fishery EFH. Salmon EFH excludes areas upstream of longstanding naturally impassable barriers (i.e., natural waterfalls in existence for several hundred years). In the estuarine and marine areas, proposed designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the

exclusive economic zone (EEZ), 370.4 kilometers (230.2 miles) offshore of Washington, Oregon, and California north of Point Conception (PFMC, 1999).

During the proposed project, coho, Chinook, and pink salmon may use EFH within the project area.

Table A-1. 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	

DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

Potential impacts of the Monte Cristo Bridge to ESA listed fish species are discussed in Chapter 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.

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 **may adversely effect** EFH. However, effects will be insignificant and will be avoided to the degree possible through implementation of BMPs and riparian mitigation.

APPENDIX B

Project Plans

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

CENTERLINE SOUTH ABUTMENT STA. 11+02

FEMA 100-YR. FLOOD LINE

PROPOSED PAVEMENT

MONTE CRISTO GRADE RD.

EXIST. GRAVEL RD.

SO. FORK STILLAGUAMISH RIVER

APPROX. WETTED CHANNEL BOUNDARY BY SNOHOMISH CO. 2/14/08 ELEV. 949.26

THRU OPEN GRATE STEEL DECK (TYP.)

1/4 SECT. LINE

C/L CENTER PIER STA. 12+53.62

RIGHT-OF-WAY N21°56'20"E

CENTERLINE NORTH ABUTMENT STA. 13+50.28

PC=13+52.73

PROPOSED PAVEMENT

342nd DR. NE

EXIST. PAVEMENT

11+00

12+00

13+00

12'-0"

N23°15'18"E

NEW ALIGNMENT

SPAN 1 151'-8"

SPAN 2 96'-8"

OHW

976 975 970 960 955 950 945

SCALE IN FEET 10 0 10 20

DATUM

NAVD 88

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 0.999891556, 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 (328,083.3333333333333333 FT.) & MULTIPLY BY THE CGF.

VERTICAL DATUM: NAVD 88

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

SOUTH ABUTMENT

CENTER PIER

NORTH ABUTMENT

FINISHED GRADE

EXISTING ABUTMENT TO BE MODIFIED

100-YR. FLOOD ELEV. 961.86 (NGVD 29 ELEV. 958.0)

ORDINARY HIGH WATER ELEV. 951.50

WETTED CHANNEL ELEV. 949.26

PIER CAP

PIER WALL

EXISTING CONCRETE PIER TO BE REMOVED

24"ø PIPE PILES

EL. 972.52

18"ø PIPE PILES

EXISTING GROUND

1000 990 980 970 960 950 940 930

10+75 11+00 11+50 12+00 12+50 13+00 13+50 13+75

SCALE: 1"= 10' H & V

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

Last Saved By: spwtr May 13, 2008 - 2:13pm

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

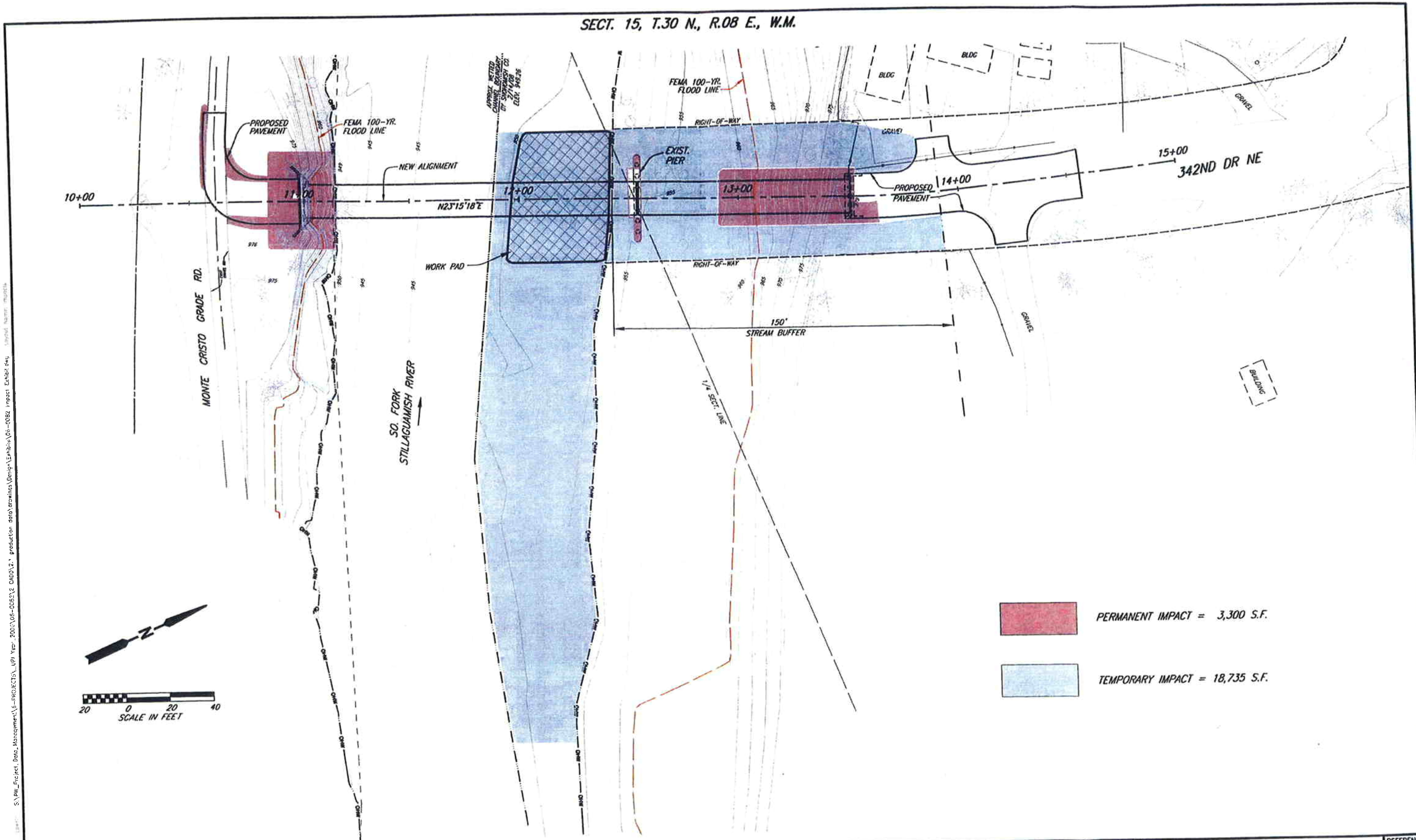
MONTE CRISTO GRADE RD.
BRIDGE REPLACEMENT
BRIDGE SITE PLAN AND PROFILE

REFERENCE SHEET NO.

SHEET

SHEETS

Plotted: May 13, 2008 - 2:13pm spwtr S:\FW_Project_Data_Management\06-PROJECTS_UPI Year_2006\06-0082\2 CAD\2.1 production dwg\drawings\Design\Exhibit\06-0082_Plan-Prof Exhibit.dwg Layout Name: Plan-Prof



Last Saved By: sperlr Jun 11, 2008 - 9:57am

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

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

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

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

IMPACTS EXHIBIT

REFERENCE SHEET NO.

SHEET 1 OF 1 SHEETS

APPENDIX C

Pathway and Indicators Discussion

Pathway and Indicators Discussion

TEMPERATURE

According to NMFS criteria, temperatures in the SF Stillaguamish River should not exceed 57°F (14°C) to be considered *properly functioning* or 57 to 60°F during spawning and 64°F (18°C) during the remainder of the year to be considered *at risk*. The portion of the SF Stillaguamish River in which the action area is located is 303(d)-listed for temperature, therefore its baseline condition is *at risk*.

The total quantity of impervious surfaces generated by the project will not increase significantly over baseline conditions, and all stormwater runoff will flow through vegetation prior to entering the river. Therefore, added impervious surfaces and associated stormwater runoff are unlikely to affect in-stream temperatures. The project requires the removal of 4,000 square feet of riparian buffer but shading will not be affected due to the adjacent dense forest and north, south orientation of the removed trees. Cleared areas will be mitigated at a greater than 2:1 ratio. The SF Stillaguamish River's riparian zone will not be significantly impacted by the project. For these reasons, significant impacts to stream temperature are not anticipated, and the project will *maintain* baseline conditions.

SEDIMENT/TURBIDITY

Logging and development in the sub-basin has increased fine sediment input to the Stillaguamish River. According to the DNR (2002), the Robe Valley sub-basin, with over 100 miles of logging roads, has the highest road density (3.98 mi/mi^2) of the three uppermost sub-basins of the South Fork and the third highest in the entire Stillaguamish watershed. At least 11% of these road miles cross areas of unstable geology with slopes greater than 30%. The upper two sub-basins contain 134 miles of logging road, of which 20% are potentially unstable.

In addition, a huge, chronic landslide has been very active since 1952 at Gold Basin, approximately three miles upstream from the project site. It erodes a large amount of silt, clay and gravel per year into the river. This is over 75% of the sediment that enters the entire South Fork (DNR 2002).

Based on NMFS criteria, baseline conditions for sediment are *at risk* due to the high number of documented landslides in the SF Stillaguamish River basin. Since the project will include the application of appropriate BMPs and sediment control measures, the project is anticipated to *maintain* baseline conditions.

CHEMICAL CONTAMINANTS/NUTRIENTS

The SF Stillaguamish River, from Canyon Creek (RM 33.7) upstream to its headwaters, is not 303(d) listed for any contaminant/nutrient parameters; however, a TMDL has been completed for fecal coliform (USFS 1995). This reach also had a TMDL completed for dissolved oxygen and currently is 303(d) listed for temperature (USFS 1995). Based on the matrix of pathways and indicators criteria, baseline conditions for chemical contaminants and nutrients are *at risk*. Because the project includes the application of appropriate BMPs, new impervious surfaces are insignificant, and all stormwater from new impervious surfaces will flow through or infiltrate into a vegetated swale, any water quality impacts to action area streams will be insignificant. For these reasons, the project is anticipated to *maintain* baseline conditions.

PHYSICAL BARRIERS

No man-made fish passage barriers exist in the SF Stillaguamish River. Based on the matrix of pathways and indicators criteria, the baseline conditions are *properly functioning*. The proposed project will not

affect fish passage and therefore will *maintain* baseline conditions at both the action area and watershed scales.

SUBSTRATE

No specific studies were found to document the quality of the spawning substrate in the upper three basins. Cobbles and gravel in most bars along the upper South Fork appear to be moderately to highly embedded with silt and other fine sediments. The Stillaguamish Lead Entity Strategy (2004) lists the Gold Basin and Robe Valley sub-basins as the highest priority for control of fine sediments. WDFW has found it generally impossible to obtain good spawning counts of South Fork chum salmon because the water is too turbid to see fish during the late fall and winter months in downstream areas (WDFW pers. Comm.). Chinook, pink and chum salmon prefer to spawn in the main river channel and larger tributaries. Populations of these species are very low in the upper three sub-basins, which may be due, in part, to the heavy silt loads from the Robe Valley and Gold Basin areas. Also, there are few large woody debris jams in the Robe Valley sub-basin. Without these structures, there is very little scouring action to maintain pool depth and adequate sorting of the gravel in the tail-out spawning area of the pools. Baseline substrate conditions are *at risk*. The proposed project includes the application of appropriate BMPs and sediment control measures and is not expected to increase sedimentation rates. Therefore, the proposed project will *maintain* current levels of substrate embeddedness.

LARGE WOODY DEBRIS

NMFS (1996) defines LWD as pieces of wood greater than 24 inches in diameter and 50 feet in length. A wood count of 80 pieces per mile is considered properly functioning. Historic removal of riparian vegetation has reduced the supply of wood to the river. Current counts average approximately 1 piece per mile (Haas et al. 2003). Therefore the process of LWD recruitment is considered *at risk*. The project will remove a small areas of trees in the riparian buffer, tree removal will be mitigated, and the scale of tree removal is insignificant at the action area and watershed scales. Consequently, the project is anticipated to *maintain* LWD functions.

POOL FREQUENCY

The SF Stillaguamish River's pool frequency is assumed to be *at risk*. Pool frequency depends mostly on the number of pieces of LWD, the number of stream meanders, channel gradient and sediment supply. The Robe Valley sub-basin receives a huge amount of sediment from the Gold Basin slide and nearby logging roads, so the tendency for pools to fill in is high. Without the necessary LWD, not many pools would be expected to form. Construction of the bridge does not involve in-water work and project effects are not expected to cause downstream pool filling. Therefore, the project is expected to *maintain* current pool functions within the action area.

POOL QUALITY

Pool quality is assumed to be *at risk*. As already noted, the lack of LWD in this reach and the tremendous amount of siltation from the Gold Basin slide contributes to the poor quality of pools. Construction of the bridge does not involve in-water work and project effects are not expected to cause downstream pool filling. Therefore, the project is expected to *maintain* current pool quality within the action area

OFF-CHANNEL HABITAT

Within the action area, and throughout much of the watershed, the SF Stillaguamish River has moderate to high gradient, confined channels that do not have accessible off-channel areas, e.g., backwaters and low energy off-channel areas. The USFS surmises that lack of backwater, low energy off-channel areas may be natural for some of the upper watershed sub-basins due to the steepness and confinement of the river valley (EBA 1999). However there are several tributaries within the action area that are perched or armored with rip-rap. There are no off-channel habitats, although there may be potential for off-channel habitat formation. Off-channel habitat in the action area is considered *at risk*. The proposed project will not create off-channel habitat and therefore will *maintain* existing conditions.

REFUGIA

Some amount of refugia habitat capable of supporting and maintaining all life stages of salmonids exists within the action area in the SF Stillaguamish River. The river is adequately buffered, and this habitat element is *properly functioning*. The proposed project will not impact in-stream habitat and therefore will *maintain* baseline conditions.

WIDTH/DEPTH RATIO

Although quantitative channel measurements were not taken during the site visit, the width to depth ratio appears to be *at risk* based on observations of landslides and channel incising in the SF Stillaguamish basin. The project will *maintain* current width-to-depth ratios as it will not alter stream channel morphology or increase sedimentation.

STREAMBANK CONDITION

Within the action area, parts of the SF Stillaguamish River's streambank is not stable. The Monte Cristo Grade Rd has been armored w/rip-rap in places and a large scale landslide is continuing within the upstream end of the action area. The bank in other areas is stable and composed of naturally stable bedrock or gravel bars. Overall, the streambank condition is *at risk*. The project will *maintain* existing conditions.

FLOODPLAIN CONNECTIVITY

The hydrologic linkage between off-channel areas and the SF Stillaguamish River is naturally low due to steep topography and high gradient channels that typically do not interact with floodplain areas. In these types of systems, overbank flow typically occurs only during extreme flood events. Although natural, this likely would be classified as *at risk* based on NMFS criteria. Project effects are anticipated to *maintain* floodplain connectivity baseline conditions.

CHANGES IN PEAK/BASE FLOWS

Clearing of mature forest vegetation over large areas of the watershed and construction of roads in upland forest areas has reduced natural infiltration, thereby increasing runoff rates and peak flows. Therefore, the baseline condition is *at risk*. The bridge includes a minimal increase in impervious surface, and all stormwater from the new bridge will be routed to dissipation pad and vegetated slope for treatment. Consequently, base and peak flows in action area streams are unlikely to change and therefore will *maintain* the current baseline conditions.

INCREASES IN DRAINAGE NETWORK

According to DNR (2002), the Robe Valley sub-basin, with over 100 miles of logging road, has the highest road density (3.98 mi/mi^2) of the three uppermost sub-basins of the South Fork and the third highest in the entire Stillaguamish watershed. The baseline condition is *at risk.* Decommissioning a segment of the Monte Cristo Grade Road will lead to a minor decrease in the drainage network. On a watershed scale, this decrease will not be significant; therefore, the project will *maintain* the current baseline condition.

ROAD DENSITY AND LOCATION

The Monte Cristo Grade Road is parallel to the SF Stillaguamish, which reduces the riparian buffer functions. The baseline conditions are *at risk.* The project will add 250 feet of road across the river. However, approximately 1,800 feet of the Monte Cristo Road will be decommissioned within the action area, therefore, the project will *maintain* baseline conditions at the watershed scale.

DISTURBANCE HISTORY

The predominant land use disturbance in the sub-basin is logging (present and historic). The geology in the area has resulted in highly unstable slopes which have caused several landslides within the major tributary drainages. The Robe Valley sub-basin has the highest percent (11%) of unstable roads in the SF Stillaguamish River. Due to the location of the action area and its watershed, disturbances exist in unstable or potentially unstable areas. Natural processes (sediment, LWD, and hydrology regimes) are mostly *at risk.* Therefore, based on the matrix of pathways and indicators criteria, the existing baseline conditions are *at risk.* The project includes minor clearing and paving, which will be far exceeded by the road area that will be decommissioned. Consequently, the project will *maintain* baseline conditions.

RIPARIAN RESERVES

The Monte Cristo Grade Road is parallel to the river and a relatively large percentage of the banks have been armored with rock and the riparian trees are not accessible by the river. In places, there are high banks where floodwaters cannot reach trees. The baseline condition is *at risk.* Minor tree removal will be mitigated and the scale of tree removal will not substantially affect the riparian reserves within the lower reach of the SF Stillaguamish. Including the decommissioning and planting of a segment of the Monte Cristo Grade Road, the project will result in long-term minor improvement to Riparian Reserves. Consequently, the project is anticipated to *maintain* this function at the watershed scale.

APPENDIX D

Listed Species Life Histories

Life Histories of Species Listed

CHINOOK SALMON PERTINENT LIFE HISTORY

In general, summer/fall Chinook salmon migrate into freshwater in August and September (Wydoski and Whitney 1979). Spawn timing begins in late September and peaks in October, similar to other Chinook salmon stocks in south Puget Sound (WDF et al. 1993). Adult Chinook would be migrating in the SF Stillaguamish River from late August through early October, but likely would not reach the action area until early September at the earliest.

After emergence, juvenile Chinook salmon rear in freshwater from a few days to 3 years (Wydoski and Whitney 1979); however, most juvenile Chinook salmon in Puget Sound streams migrate to the marine environment during their first year (Myers et al. 1998). Chinook that outmigrate in their first year are called "ocean type" due to their short freshwater residence and because they make extensive use of the nearshore marine environment for rearing. Ocean type Chinook salmon generally migrate downstream in the spring, just months after emerging from the gravel, or during the summer and autumn after a brief period of rearing in freshwater (Healey 1991; Myers et al. 1998).

Migrant juvenile Chinook salmon timing usually peaks in April and May and ends in June. Consequently, there is insignificant potential for outmigrating smolts to be present in the SF Stillaguamish River during project construction as the vast majority (if not all) outmigrating juveniles would have moved into the lower estuarine areas by July (Hayman et al. 1996). Additionally, 97% of Chinook salmon juveniles in the Stillaguamish River basin outmigrate as age 0 juveniles (Myers et al. 1998), therefore the vast majority of Chinook salmon in the basin will have outmigrated by the time the project begins, with only the "stream-type" juveniles (approximately 3% of the total SF Stillaguamish population) remaining to spend a year in freshwater.

Juvenile Chinook salmon that remain in freshwater after emergence may migrate to the ocean any time of year, though most Chinook salmon within a population tend to migrate at similar times and ages (Healey 1991). Migration commonly occurs during the night under the cover of darkness, although some fish may migrate during the day (Healey 1991). Chinook salmon fry tend to migrate along the banks and avoid the high velocity water near the center (thalweg) of the channel (Healey 1991).

BULL TROUT PERTINENT LIFE HISTORY

The amphidromous life-history form of bull trout is poorly studied (USFWS 1999a). Unlike strict anadromy, as exhibited by Pacific salmon, amphidromous individuals often return seasonally to freshwater as subadults, sometimes for several years, before returning to spawn (Wilson 1997). For bull trout, the amphidromous life history form is unique to the Coastal-Puget Sound population. For many years it was thought that amphidromous char[1] in Washington were Dolly Varden (*Salvelinus malma*), and that freshwater char were bull trout. There is conclusive evidence that amphidromous bull trout populate Puget Sound (Kraemer 1994), and anecdotal evidence suggests these native char were once much more abundant (USFWS 1999a). In Washington State, bull trout and Dolly Varden, two closely related char species, coexist and are managed as a single species. Separate inventories are not maintained by the

[1] The biological similarities of bull trout and Dolly Varden make them virtually indistinguishable in the field. As a result, they are often referred to collectively as "native char." In fact, WDFW has combined information on their status and distribution into a common inventory (WDFW 1998).

WDFW due to the considerable biological similarities in life history and habitat requirements that exist between the two species. Although historic reports of char may have specified either bull trout or Dolly Varden, methodologies for reliably distinguishing between the two have only recently been developed and have not yet been widely applied (WDFW 1998).

Bull trout are considered to be optionally amphidromous, (i.e., the survival of individuals is not dependent upon whether they can migrate to sea), in contrast to obligate anadromous species like pink (*Oncorhynchus gorbuscha*) and chum salmon (*O. keta*) (Pauley 1991). Nonetheless, the amphidromous life history form is important to the long-term persistence of bull trout and their meta-population structure. Amphidromous fish are generally larger and more fecund than their freshwater counterparts, and migratory forms play an important role in facilitating gene flow among sub-populations.

Bull trout, which spawn in late summer and early fall, are believed to be restricted in their spawning distribution by water temperature (Bjornn 1991). Locally, amphidromous forms typically return to freshwater in late summer and fall to spawn in upper tributaries and headwater areas. Puget Sound stocks typically initiate spawning in late October or early November as water temperature falls below 7 to 8° C. Spawning habitat almost invariably consists of very clean gravel, often in areas of groundwater upwelling or cold spring inflow (Goetz 1994). Egg incubation temperatures needed for survival have been shown to range from 2 to 4° C (Willamette National Forest 1989). Bull trout eggs require approximately 100 to 145 days to hatch, followed by an additional 65 to 90 days of yolk sac absorption during alevin incubation. Thus, in-gravel incubation spans more than 6 months. Hatching occurs in winter or late spring and fry emergence occurs from early April through May (Rieman and McIntyre 1993).

Generally, for their first 1 to 2 years, bull trout juveniles rear near their natal tributary and exhibit a preference for cool water temperatures (Bjornn 1991), although they appear less restricted by temperature than are spawners. Newly emerged bull trout fry are often found in shallow, backwater areas of streams that contain woody debris. Later, or in other habitats lacking woody debris for refugia, fry are bottom dwellers, and may occupy interstitial spaces in the streambed (Brown 1992).

Resident forms of bull trout spend their entire lives in small streams, while migratory forms live in tributary streams for several years before migrating to larger rivers (fluvial form) or lakes (adfluvial form). Migratory individuals typically move downstream in the summer and often congregate in large, low-velocity pools to feed (Bjornn 1991). Anadromous bull trout usually remain in freshwater 2 or 3 years before migrating to saltwater in spring (Wydoski and Whitney 1979).

Bull trout life histories are plastic (i.e., variable and changeable between generations), and juveniles may develop a life history strategy that differs from their parents. The shift between resident and migratory life forms may depend on environmental conditions. For example, resident forms may increase within a population when survival of migratory forms is low (Rieman and McIntyre 1993). Char are generally longer-lived than salmon, and bull trout up to 12 years old have been identified in Washington (Brown 1992).

STEELHEAD PERTINENT LIFE HISTORY

Steelhead are the anadromous form of freshwater resident rainbow or redband *O. mykiss* trout species. The present distribution of steelhead extends from Asia, to Alaska, and south to the U.S. Mexico border (Busby et al 1996; 67 FR 21586, May 1, 2002). Unlike many salmonid species, the *O. mykiss* exhibit extremely complex and plastic life-history characteristics, such that their offspring can exhibit different life-history forms from the parental generation. For example, offspring of resident fish may migrate to sea, and offspring of anadromous steelhead may remain in streams as resident fish (Burgner et al. 1992).

Those that are anadromous can spend up to 7 years in freshwater prior to smoltification (the physiological and behavioral changes required for the transition to salt water), and then spend up to 3 years in salt water before returning to freshwater to spawn. However, they typically return to their natal stream to spawn as 4- or 5-year-old fish. Unlike Pacific salmon, steelhead trout are iteroparous or capable of spawning more than once before they die. However, it is rare for steelhead to spawn more than twice before dying, and those that do are usually females (Busby et al. 1996).

Over their entire range, West Coast steelhead spawning migrations occur throughout the year, with seasonal peaks of migration activity varying by location. However, even in a given river basin there might be more than one seasonal migration peak, typically referred to as winter, spring, summer, or fall steelhead runs. Although there are generally four migration seasons, steelhead are typically divided into two basic reproductive ecotypes (summer and winter), based on the state of sexual maturity at the time they enter freshwater and the duration of spawning migration (Burgner et al. 1992). The summer or stream-maturing type enters fresh water in a sexually immature condition between May and October, and sexually matures in freshwater over several months. In contrast, the winter or ocean-maturing type enters fresh water in a sexually mature condition between November and April, and spawns shortly thereafter. In basins with ecotypes, the summer run generally spawns farther upstream than winter run fish. However, the winter run of steelhead is the predominant run in Puget Sound.

Depending on water temperature, fertilized steelhead eggs may incubate in redds for 1.5 to 4 months before hatching as "alevins". Following yolk sac absorption, young juveniles or "fry" emerge from the gravel and begin active feeding. As they grow, steelhead move to deeper parts of the stream, establish territories and diet changes from microscopic aquatic organisms to larger organisms such as isopods, amphipods and aquatic and terrestrial insects, primarily associated with the stream bottom (Wydoski and Whitney 1979). Riparian vegetation and submerged cover (logs, rocks and aquatic vegetation) are important, for providing cover, food, temperature stability, protection from predators. As a result, densities of juvenile steelhead are highest in areas containing in-stream cover (Reiser and Bjornn 1979; Johnson and Kucera 1985).

MARBLED MURRELET PERTINENT LIFE HISTORY

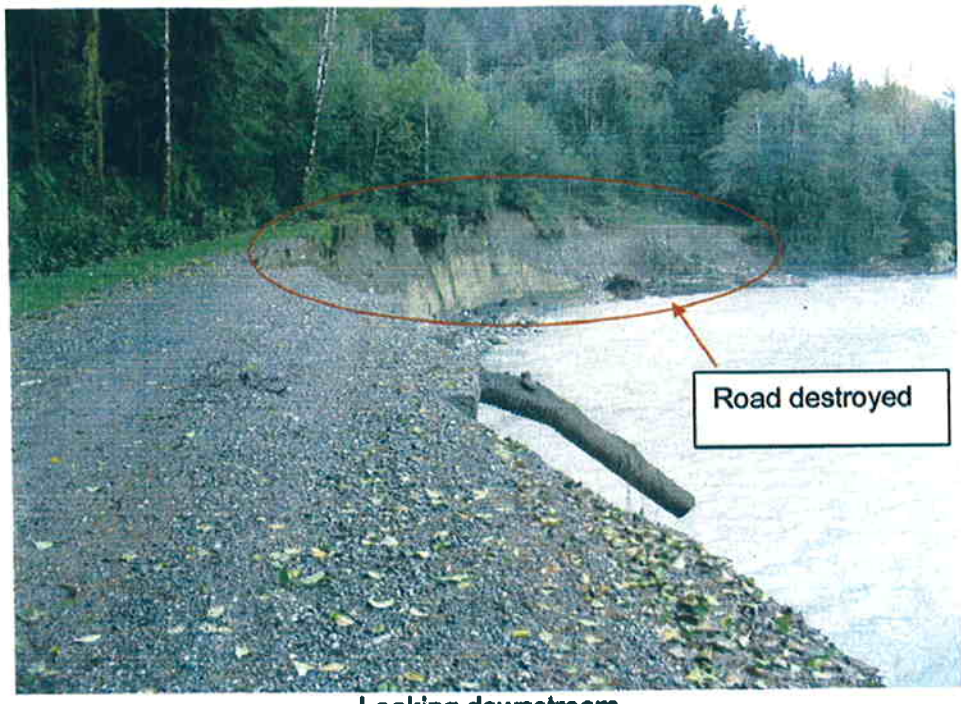
Marbled murrelets typically nest high in the canopy of old-growth forests or stands of large trees infected with mistletoe (mistletoe brooms of greater than 1 square foot of surface area are occasionally used by nesting murrelets; Ralph and Miller 1995). They do not nest in island colonies. Murrelets have been detected up to 68 km (43 miles) inland, but they are most abundant in old-growth/mature forest, particularly along the North Fork of the Stillaguamish River (Hamer 1990). Washington State surveys up to 1990 indicate that most murrelet nests have been located in conifers that were 150 or more years in age and located in mature or old-growth forests or residual old-growth trees greater than 35 inches diameter at breast height (Binford et al. 1975; Carter and Sealy 1986, 1987; Marshall 1988; Hamer 1990). The nesting period for murrelets extends from April 1 to September 15.

Marbled murrelets generally forage in nearshore and protected coastal waters throughout the year, including bays, inlets, fjords, lagoons, coves, and exposed outer coasts (Nelson 1997). Murrelets are generally found near the shore, usually within 5 km, and in-water that is less than 60 meters deep (Sealy 1975). In Washington State, most observed occurrences are on marine coasts (Strachan et al. 1995). Murrelets are opportunistic feeders that will consume the most available prey species, which may include Pacific sand lance (*Ammodytes hexapterus*), Pacific herring (*Clupea pallasi*), and surf-smelt (*Hypomesus pretiosus*) (Burkett 1995; Strachan et al. 1995). Movement pathways between marine foraging areas and inland areas are unknown, although murrelets are suspected to follow river valleys and other areas of least resistance.

APPENDIX E

Project Area Photos

Monte Cristo Grade Road –Damaged in 2003



Looking downstream

Looking upstream –road is washed out until the orange flags

North Abutment

From the north abutment looking south at the center pier and south abutment

Looking south at the approach

North Abutment

North abutment will be near the concrete barriers

Center pier

Existing center pier prior to 2006 flood

Exploratory digging at pier. Photo shows steep bank from the end of 342nd DR NE

Center pier

Gravel bar-location of crane pad and truss assembly area.

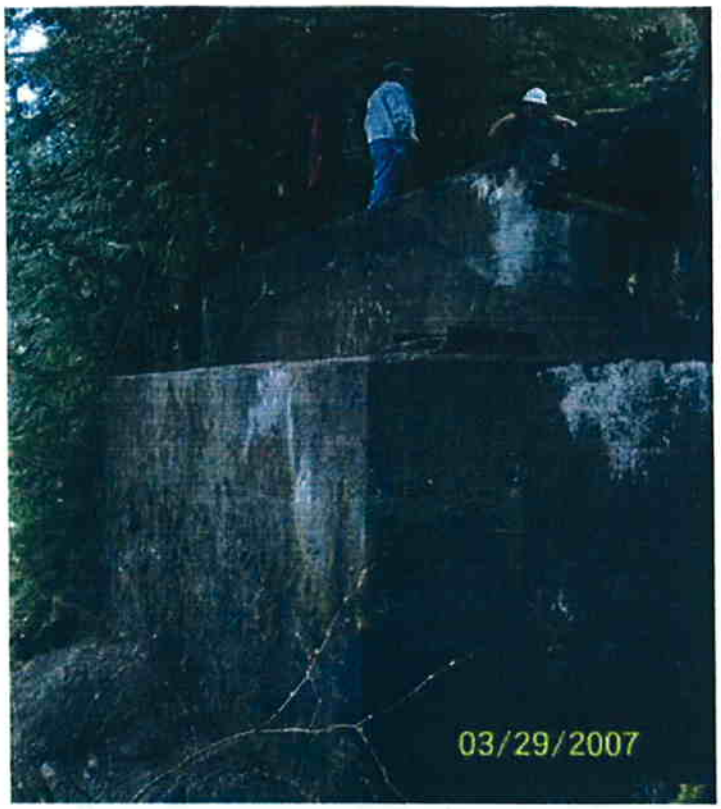
Center pier from north abutment

South Abutment

South abutment on top of bedrock

South abutment –to be used for the proposed bridge

South Abutment



South abutment

Monte Cristo Grade Road –looking west

South Abutment

Existing approach to the south abutment (abutment is directly behind the guardrail).

Concurrence Letters

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

NMFS Tracking No.:
2008/05415

September 2, 2008

Mark Eberlein
Federal Emergency Management Agency
Federal Regional Center
130 228th Street, Southwest
Bothell, WA 98021-8627

Re: Endangered Species Act Section 7 Informal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Monte Cristo Grade Bridge Construction (6th Field HUC 171100080206, South Fork Stillaguamish River, Action Agency No.: DR-1499-WA PW-205).

Dear Mr. Eberlein:

This correspondence is in response to your request for consultation under the Endangered Species Act (ESA). Additionally, this letter serves to meet the requirements for consultation under the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

Endangered Species Act

The Federal Emergency Management Agency (FEMA) submitted a Biological Evaluation (BE) to the National Marine Fisheries Service (NMFS) for the above referenced project on August 26, 2008. The FEMA requested NMFS' concurrence with the following determinations: (1) "may affect, not likely to adversely affect" Puget Sound Chinook (*Oncorhynchus tshawytscha*) salmon (PS Chinook), (2) "may affect, not likely to adversely affect" designated critical habitat for PS Chinook, and (3) "may affect, not likely to adversely affect" for Puget Sound steelhead (*O. mykiss*) (PS steelhead). PS Chinook salmon was listed as threatened under the ESA on March 24, 1999 (50 CFR 223 and 224). Critical habitat for PS Chinook was designated on September 2, 2005 (70 FR 52630). The PS steelhead Distinct Population Segment (DPS) was listed as threatened under the ESA on June 11, 2007 (72 FR 26722). This consultation with the FEMA is conducted under section 7(a)(2) of the ESA, and its implementing regulations, 50 CFR 402.

The FEMA proposes to provide funding to Snohomish County under the Stafford Act to construct a bridge to reconnect 342nd Dr. NE to Monte Cristo Grade Road. The bridge will restore vehicular access to the property owners along Monte Cristo Grade Road, an alternative preferred over replacing a portion of Monte Cristo Grade Road that was damaged by flooding in October and November of 2003. Replacing the road would have far greater impacts to wetlands, riparian areas, and habitat for listed species.

The project is located east of Verlot on 342nd Drive NE at river mile 47 of the South Fork Stillaguamish River. The action area is limited to the immediate vicinity of construction.

The new bridge will be constructed on the same alignment as the existing bridge abutments from where the bridge was removed 30 years ago. The south abutment is located on bedrock above the ordinary high water mark (OHWM), and will be expanded to support the new bridge. The area surrounding the abutment has revegetated, and approximately 900 square feet of riparian vegetation will be cleared. Approximately 6.5 cubic yards of concrete will be required for expansion of the abutment. Concrete forms will be removed after the concrete has cured. No uncured concrete will come in contact with river water.

The center pier is not structurally adequate to support the new bridge and will be replaced in approximately the same location, above the OHWM. After the center pier is deconstructed and removed from the site, seven 24-inch diameter piles will be driven in a single row approximately 70 feet deep, approximately 65-feet from the wetted channel. The center will be narrower, but longer than the existing pier. To minimize the excavation and prevent sediment from entering the water, boulders will be excavated to approximately 1-foot deep, and then an auger will pre-drill down to 8-feet. Spoils from the auger will be contained and any water from dewatering will be pumped to baker tanks or dirt bags to remove fine sediments before being discharged in riparian areas.

The north abutment doesn't meet engineering safety standards for supporting the bridge, and thus will be replaced. The existing concrete abutment will be dug out of the existing approach road, broken up with heavy equipment, and hauled off-site before a new abutment is constructed. The new abutment will be composed of four 18-inch diameter steel piles, 80-feet long. No vegetation will be removed for this activity. Pile driving will take place approximately 165-feet from the wetted channel.

To minimize disturbance to riparian vegetation, an exposed gravel bar will be used as a work pad. Large boulders will be removed and stockpiled, and a level work surface will be created by spreading round spawning gravel and placing timber mats on top of the gravel mix. The work pad will not be larger than 50-feet by 50-feet. No in-water work will occur. Equipment used for the project include a crane, dump trucks, bulldozers, excavators, pile drivers, hoe rams, chainsaws, generators, compactors, and concrete saws. A designated mobilization and refueling site will be located at least 150-feet from the river and a spill response plan will be developed to minimize the likelihood and severity of potential fuel spills.

After the work is completed, the work pad on the gravel bar will be deconstructed. The timber mats will be removed, and the native boulders will be redistributed on the bar. The spawning gravel mix will be left on the bar to be redistributed by high flows and contribute to gravel recruitment. Vegetated areas that were temporarily impacted by clearing and grading will be mulched and replanted with native vegetation. Plantings will be monitored and maintained by the County to ensure successful establishment of a native vegetation community. Part of the old road will be decommissioned and enhanced

with riparian vegetation. Vegetated areas that are permanently impacted will be compensated for through conservation measures on the decommissioned road segment.

Potential adverse effects include temporary and permanent impacts to riparian vegetation, a reduction in water quality, and a potential increase in impervious surface. Riparian vegetation provides disperse light, organic debris, and forage recruitment. Water quality may be reduced by increases in suspended sediment and noise near the wetted channel, which may result in physiological or behavioral changes. The increase in impervious surface increases the amount of stormwater runoff and volume of water entering the river, potentially altering hydrology.

Species Determination

Puget Sound Chinook Salmon
Puget Sound Steelhead

The NMFS analyzed the potential impacts of the project on PS Chinook and PS steelhead and determined that the impacts will be discountable and insignificant.

The effects will be discountable because PS Chinook and PS steelhead are not expected to be present during construction. Chinook spawning has not been recorded in the action area but may occur upstream, and the majority of Chinook juveniles outmigrate from March through June, so they are not anticipated to be in the area during construction from July to October. Steelhead spawning takes place between February through May for summer-run populations, and between March and June for winter-run populations, so during construction between July and October, adults are not expected to migrate through the action area.

If a few salmon do occur in the action area, the effects are expected to be insignificant. Any vegetation removed or disturbed will be mulched and replanted with native vegetation on site or used to enhance the area around the decommissioned road on a 2:1 ratio. Site specific erosion control measures along the down-gradient edge of grading will be installed to prevent sedimentation. All pile driving will take place in the dry at least 65-feet from the wetted channel, so noise will not rise to the level of harm. No wet or curing concrete will enter the river or any other natural water resources. A containment tarp will be used to isolate any runoff from activities involving wet or curing concrete. During construction, stormwater runoff control BMPs includes temporary sediment control devices and drains to divert stormwater away from disturbed areas. Any increase in impervious surface will be compensated for by the decommissioning of a large portion of the Monte Cristo Graded Road.

Because all potential adverse effects are discountable or insignificant, NMFS concurs with the FEMA determination of "may affect, not likely to adversely affect" for PS Chinook and PS steelhead.

Critical Habitat Determination

Puget Sound Chinook Salmon

Critical habitat consists of six Primary Constituent Elements (PCEs) for the PS Chinook Evolutionary Significant Unit, of which three have been determined to be at the action area.

- PCE 1 includes freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.
- PCE 2 includes freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juveniles growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
- PCE 3 includes freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

The NMFS analyzed the potential impacts of the project on PS Chinook critical habitat and determined that the impacts will be insignificant. Potential adverse affects include reduction in water quality, decrease in natural cover and forage material, and the construction of potential obstacles. Water quality may be reduced by the increase in suspended sediments released into the water, and by the increase in noise due to pile driving. Erosion control and sediment containment devices will prevent sediment from entering the water, or spreading beyond the immediate area. Pile driving will take place at least 65-feet from the wetted channel and will not rise to a level harmful to salmonids. Any vegetated areas disturbed by construction will be mulched and replanted with native vegetation at least a 2:1 ratio. Plants permanently removed for access to the bridge will be compensated for in the area where the road will be decommissioned. The support piers and abutments are all located above the OHWM, so they shouldn't pose any barriers to migration.

Because all potential adverse effects are discountable or insignificant, NMFS concurs with the FEMA effect determination of "may affect, not likely to adversely affect" for the critical habitat of PS Chinook.

This concludes informal consultation pursuant to the regulations implementing the ESA, 50 CFR 402.10. The FEMA must re-analyze this ESA consultation if new information reveals effects of the action that may affect listed species in a way not previously considered, the action is modified in a manner that causes an effect to the listed species or critical habitat that was not previously considered, or a new species is listed, or critical habitat designated, that may be affected by the identified action.

Magnuson-Stevens Fishery Conservation and Management Act

Federal agencies are required, under section 305(b)(2) of the MSA and its implementing regulations (50 CFR 600 Subpart K), to consult with NMFS regarding actions that are authorized, funded, or undertaken by that agency that may adversely affect Essential Fish Habitat (EFH). The MSA section 3 defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." If an action would adversely affect EFH, NMFS is required to provide the Federal action agency with EFH conservation recommendations (section 305(b)(4)(A)). This consultation is based, in part, on information provided by the Federal action agency and descriptions of EFH for Pacific salmon contained in Appendix A to amendment 14 to the Pacific Coast Salmon Plan (August 1999) developed by the Pacific Fishery Management Council and approved by the Secretary of Commerce (September 27, 2000).

The proposed action is described above and in the BE. The proposed action includes habitats, which have been designated as EFH for various life stages of Chinook salmon and coho (*O. kisutch*) salmon. As the bridge piers and abutments will be located above the OHWM, no long term effects are anticipated for this action.

The EFH Conservation Recommendations: Because the conservation measures that the FEMA included as part of the proposed action to address ESA/EFH concerns are adequate to avoid, minimize, or otherwise offset potential adverse effects to the EFH of the species during construction activities, conservation recommendations pursuant to MSA (section 305(b)(4)(A)) are not necessary. Since NMFS is not providing conservation recommendations at this time, no 30-day response from the FEMA is required (MSA section 305(b)(4)(B)).

This concludes consultation under the MSA. If the proposed action is modified in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations, the FEMA will need to reinitiate consultation in accordance with the implementing regulations for EFH at 50 CFR 600.920(l).

If you have questions regarding either the ESA or EFH consultation, please contact Brianna Blaud of the Washington State Habitat Office at (206) 526-4749, or by electronic mail at brianna.blaud@noaa.gov.

Sincerely,

D. Robert Lohn
Regional Administrator

cc: Jerry Creek, FEMA

United States Department of the Interior

FISH AND WILDLIFE SERVICE

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

NOV 1 3 2008

In Reply Refer To:
13410-2008-I-0581

Mark Eberlein, Regional Environmental Officer
U.S. Department of Homeland Security
Federal Emergency Management Agency (FEMA)
DR-1671-WA
130 228th Street SW
Bothell, Washington 98021-9796

Dear Mr. Eberlein:

Subject: FEMA DR-1499, PW# 205; Monte Cristo Grade Bridge

This correspondence is in response to your letter dated August 25, 2008, Biological Assessment, and Biological Assessment Amendment for constructing a new bridge due to damage to the Monte Cristo Grade Road along the South Fork Stillaguamish River in Snohomish County, Washington (Lat. 122.77144°, Long. 48.08642°). Storm damage occurring in October 2003 caused the river channel to move 60 ft to the east and eroded 200 ft of the road embankment. Pre-consultation meetings and site visits with U.S. Fish and Wildlife Service, National Marine Fisheries Service, FEMA, and Snohomish County representatives occurred between 2004 and 2008 and identified potential impacts to listed species and wetlands if the damaged road was rebuilt or realigned. This information was used to develop the proposal to build a new bridge over the South Fork Stillaguamish River to provide access to private and public properties.

The proposed new bridge over the South Fork Stillaguamish River would be a single-lane, steel truss bridge consisting of two spans. The new bridge would be located approximately 0.4 mile downstream of the eroded road embankment at the site where a previous bridge was removed 30 years ago. The proposed new bridge would include a south abutment, center pier, and a north

abutment. The existing 30-year-old north abutment would be removed and replaced with a new abutment constructed of four, 18-inch-diameter steel piles. The existing center pier would be removed and replaced with a single row of seven, 24-inch-diameter steel piles topped with a concrete pile cap. Piles at the north abutment would be installed with an impact hammer, and piles for the center pier would be installed by auger drilling. Pile driving will occur between 2 hours after dawn and 2 hours before dusk. All piles would be installed above the ordinary high water mark (OHWM) and not closer than 65 ft from the wetted channel. No in-water work would occur because all work below OHWM will be outside the wetted channel. The existing south abutment is constructed on bedrock and is approximately 10 ft above and 10 ft landward of the OHWM. Approximately 900 ft^2 of vegetation would be removed around the existing abutment to allow expansion to support the new bridge. Expansion of the abutment would require transferring approximately 6.5 cubic yards of wet concrete over the river using a crane. A tarp would be hung under the bucket to prevent concrete from dropping in the river. The existing approach roads would be paved and used as the road approaches for the new bridge. Erosion and sediment control Best Management Practices would be implemented to minimize impacts to listed species and their habitat.

A 50-foot-square work pad would be constructed on the gravel bar at the site by removing the large boulders, spreading 'fish mix' gravel to level the pad area, and placing timber mats on top of the fish mix. After construction is complete, the timber mats would be removed and the stockpiled boulders would be redistributed on the gravel bar. To minimize the need to grade the gravel bar, the 'fish mix' gravel would be left to be redistributed by high flows. Vegetated areas at the project site impacted by clearing and grading would be replanted with native vegetation. To mitigate for impacts from the proposed project, 2,000 ft of the Monte Cristo Grade Road (between the new bridge and the site of the 2003 flood damage) would be decommissioned and planted with native trees and shrubs. Also, a culvert under the decommissioned section of Monte Cristo Grade Road would be removed and the natural stream reach re-established to allow fish passage from the South Fork Stillaguamish River into the stream.

Your letter and Biological Assessment were received in our office on August 27, 2008, and the Biological Assessment Amendment was received on October 08, 2008. You requested our concurrence with the finding that the project "may affect, but is not likely to adversely affect" marbled murrelets (*Brachyramphus marmoratus*), northern spotted owl (*Strix occidentalis caurina*), bull trout (*Salvelinus confluentus*), and designated marbled murrelet and bull trout critical habitat. This request was submitted in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

Based on the information provided, we have concluded that effects to the federally listed marbled murrelet, northern spotted owl, bull trout, marbled murrelet critical habitat, and bull trout critical habitat associated with the proposed project would be insignificant or discountable. Therefore, we concur with your "may affect, not likely to adversely affect" determination for these species and their designated critical habitat. Specifically, our concurrence is based on the following rationale.

Marbled Murrelet

Installation of steel piles with an impact hammer and use of heavy equipment have the potential to produce sound levels and visual disturbances that may affect nesting marbled murrelets. Increased sound levels within suitable nesting habitat during the early breeding season (April 1 to August 5) can disrupt feeding of marbled murrelet chicks. No marbled murrelet nesting habitat would be removed by the proposed project. However, sound and visual disturbances are expected to have insignificant effects to marbled murrelets at distances greater than 60 and 35 yards from pile driving and heavy equipment, respectively (USFWS 2003). Because marbled murrelet chicks are fed predominately during the early morning and evening, pile installation will occur between 2 hours after dawn and 2 hours before dusk. With use of this timing restriction, marbled murrelet chicks are unlikely to miss a feeding and adults are less likely to miss feeding a chick. Additionally, if a chick does miss a feeding, it is anticipated that the chick has enough reserves to not be measurably affected until their next feeding.

Pile driving during the breeding season would occur on the north side of the river, approximately 116 yards from potentially suitable nesting marbled murrelet habitat. At this distance, and with use of the daily timing restriction, sound levels from pile driving and heavy equipment are expected to have insignificant effects to marbled murrelets (USFWS 2003). Construction of the south abutment would occur after August 15 (after the early breeding season), and only heavy equipment would be used. The south abutment is located approximately 66 yards from the nearest potentially suitable nest tree. Due to dense vegetation and the distance to the suitable nest tree, sound levels and visual disturbances from heavy equipment are expected to have insignificant effects to nesting marbled murrelets (USFWS 2003). Direct effects from increased sound levels and visual disturbances to marbled murrelets and their chicks are expected to be insignificant because of the daily timing restriction during the early breeding season, the time of year for work at the south abutment, and the distance of the proposed project from suitable nesting habitat.

Marbled Murrelet Critical Habitat

The proposed project occurs within designated marbled murrelet critical habitat and contains Primary Constituent Elements (PCEs). The final rule for marbled murrelet critical habitat (61 FR 26256 [May 24, 1996]) identifies two PCEs essential to provide and support suitable nesting habitat for successful reproduction: PCE #1) *individual trees with potential nesting platforms,* and PCE #2) *all forested areas, regardless of contiguity, within 0.5 mi of individual trees with potential nesting platforms and a canopy height of at least one-half the site-potential tree height.* Areas with one or both PCEs are, by definition, considered critical habitat. The proposed project has the potential to affect the PCEs of marbled murrelet critical habitat.

The proposed project will not remove trees with potential marbled murrelet nesting platforms. Because the bridge will be constructed at the site of the previous bridge (built 30 years ago), vegetation removal is minimal. Based on age, any trees to be removed will be less than approximately 8 inches in diameter. Also, decommissioning and planting a section of Monte Cristo Grade Road will help provide more forested area in the future. Therefore, effects of the proposed project to suitable nest trees and forested areas are expected to be insignificant.

Northern Spotted Owl

Installation of steel piles with an impact hammer and use of heavy equipment have the potential to produce sound levels and visual disturbances that may affect northern spotted owls. Increased sound levels near potential northern spotted owl habitat can disrupt normal behavior, especially during the early breeding season from March 1 to July 15 when young northern spotted owls have not yet hatched and could be harmed by adults flushing due to a disturbance. Because sound attenuates with increased distance from the source, sound and visual disturbances at distances greater than 60 yards from pile driving and 35 yards from heavy equipment are expected to have insignificant effects to northern spotted owls (USFWS 2003). Also, ambient sound levels at the project site are expected to be elevated due to the fast flow of the river and the proximity, 230 yards, to the Mountain Loop Highway. Northern spotted owls in the action area are expected to be habituated to ambient sound levels.

Mature forests with nesting, roosting, and foraging characteristics are present in the action area, south of the Monte Cristo Grade Road. Northern spotted owl territories have not been documented within 1 mile of the proposed action. Not enough mature forest is present to meet the needs for nesting near the action area, but the forest may be used for foraging and dispersal. No northern spotted owl habitat would be removed by the proposed project. Pile driving during the early breeding season would occur on the north side of the river, approximately 116 yards from potential northern spotted owl foraging and dispersal habitat. Construction of the south abutment would occur after August 15 (after the northern spotted owl early breeding season) and would only use heavy equipment. The nearest potential northern spotted owl foraging and dispersal habitat is 20 to 40 yards away. At these distances (116 yd for pile driving; 20 yd for heavy equipment) and through dense vegetation, sound levels would attenuate to levels that are expected to have insignificant effects to foraging and dispersing northern spotted owls (USFWS 2003). Potential disturbance from pile driving and heavy equipment to foraging or dispersing northern spotted owls is expected to be minimal and temporary. Because of ambient sound levels, distance of the proposed project from potential foraging and dispersal habitat, and available foraging and dispersal habitat in adjacent areas, direct effects from increased sound levels and visual disturbances to northern spotted owls are expected to be insignificant.

Bull Trout

No in-water work is planned because work below OHWM will be outside the wetted channel. However, any in-water work associated with the proposed project would occur during the recommended work window from July 1 to August 15 when bull trout are not expected to be present or exposed to potential impacts from project construction. Therefore, direct effects of the proposed project to bull trout are expected to be insignificant.

The proposed action will not impact a documented or potential forage fish spawning area and would occur during the recommended work window for the project area when bull trout prey species are not likely to be affected to any appreciable degree (i.e., some fish may be affected). Therefore, indirect effects to bull trout via reduced prey fish abundance are expected to be insignificant.

Bull Trout Critical Habitat

The proposed project occurs within designated bull trout critical habitat. The final rule for bull trout critical habitat (70 FR 56212 [September 26, 2005]) identifies eight Primary Constituent Elements (PCEs) essential for the conservation of the species. The project has the potential to affect the following PCEs of bull trout critical habitat:

PCE #1 - *Water temperatures that support bull trout use.*

Minimal change in overwater shading is expected because the proposed project will be constructed at the site of a previous bridge with minimal riparian habitat removal required. Also, the decommissioning and re-vegetation of a section of Monte Cristo Grade Road will provide more riparian habitat and more shade in the future. Therefore, effects of the proposed project to overwater shading and water temperatures are expected to be insignificant.

PCE #4 - *A natural hydrograph, including peak, high, low and base flows within historic ranges*

The design of the new bridge will provide at least 10 feet of clearance to the ordinary high flow and the center pier will be narrower (perpendicular to the river) than the existing pier. Therefore, effects of the proposed project to the natural hydrograph of the river are expected to be insignificant.

PCE #6 - *Migratory corridors with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows.*

Disturbance to sediments and increased turbidity at the project site will be minimal and short-term and are not expected to impact overall water quality. Because the proposed project will not form a barrier to migrating bull trout, effects of the proposed project to this PCE are expected to be insignificant.

PCE #7 - *An abundant food base including terrestrial organisms of riparian origin, aquatic macro-invertebrates, and forage fish.*

The proposed project is not expected to measurably affect riparian areas, aquatic macro-invertebrates, or forage fish in the action area. Disturbance to sediments and increases in turbidity due to construction are expected to be minimal and temporary. Therefore, effects to the food base from project activities are expected to be insignificant.

PCE #8 - *Permanent water of sufficient quantity and quality such that normal reproduction, growth, and survival are not inhibited.*

Turbidity associated with the proposed project will be minimal and temporary and is not expected to affect overall water quality. Therefore, effects to this PCE are expected to be insignificant.

This concludes informal consultation pursuant to the regulations implementing the Act (50 CFR 402.13). This project should be reanalyzed if new information reveals effects of the action that may affect listed species or critical habitat in a manner, or to an extent, not considered in this consultation. The project should also be reanalyzed if the action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this consultation, and/or a new species or critical habitat is listed that may be affected by this project that was not previously considered.

If you have any questions about this letter or our joint responsibilities under the Act, please contact Shirley Burgdorf at (360) 534-9340 or Carolyn Scafidi at (360) 753-4068.

Sincerely,

for Ken S. Berg, Manager
Western Washington Fish and Wildlife Office

cc:
WDFW, Region 4
WDOE, Bellevue, WA (R. Padgett)

LITERATURE CITED

USFWS (U.S. Fish and Wildlife Service). 2003. Biological Opinion and Letter of Concurrence for Effects to Bald Eagles, Marbled Murrelets, Northern Spotted Owls, and Bull Trout from Olympic National Forest Program of Activities (FWS reference number 1-3-03-F-0833).

12. APPENDIX D: TECHNICAL MEMORANDUMS

12.1. Fisheries Resource Report

12.2. Aquatics Conservation Strategy

12.3. Wildlife Resources Report and Biological Evaluation

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TECHNICAL MEMORANDUM

Date: **October 8, 2008**

To: **Sean Gross, Snohomish County Public Works**

From: **Pete Lawson**

Subject: **Monte Cristo Grade Road Bridge (#RC1520) Fisheries Resource Report - Work Authorization #20**

cc: **File**

Project Number: **553-1513-085, Phase 20**

Project Name: **Monte Cristo Grade Road Bridge Environmental Support**

Snohomish County Public Works (County) is proposing to construct a single-lane, steel-truss bridge across the South Fork Stillaguamish River (South Fork) to restore vehicle access to approximately 20 properties. The project limits include a small portion of United States Forest Service (USFS) land, and will require an easement from the USFS. The following technical memorandum summarizes the fisheries resources in the project area and analyzes the potential impacts associated with the project.

APPLICABLE LAWS, RULES, REGULATIONS, AND POLICIES

1. Mt. Baker-Snoqualmie National Forest Land and Resource Management Plan (Forest Plan, as amended).
2. Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl, including the Aquatic Conservation Strategy (ACS).
3. Washington State Hydraulic Code, including all provisions of the Hydraulic Project Approval for this project issued to Snohomish County by the Washington Department of Fish and Wildlife (WDFW).
4. Endangered Species Act of 1973, as amended (ESA) (16 U.S.C. 1531 et seq.) and its implementing regulations (50 Code of Regulations [CFR] Part 402). Section 7(a)(2) requires federal agencies to review actions authorized, funded, or carried out by them, to ensure such actions do not jeopardize the continued existence of federally listed species, or result in the destruction or adverse modification of designated critical habitat.
5. Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.), as amended by the Sustainable Fisheries Act of 1996, and its implementing regulations (50 CFR Part 600).

6. Forest Service Manual 2672.4 states: A biological evaluation must be completed for sensitive species for all programs and activities planned, funded, executed, or permitted by the U.S. Forest Service (Forest Service).
7. The National Forest Management Act of 1976 mandates the Use of Management Indicator Species (MIS) (Forest Service Manual 2621.1). Fish MIS are identified in the 1990 Forest Plan, p. 4-46.

RELEVANT MANAGEMENT OBJECTIVES/STANDARDS AND GUIDELINES

1990 Forest Plan, Threatened, Endangered, and Sensitive Species, Forest-wide Standards and Guidelines, p. 4-127

All proposed management actions which have the potential to affect habitat of endangered, threatened, or sensitive species will be evaluated to determine if any of those species are present. Habitat for sensitive plants and animals shall be managed to ensure that management activities do not contribute to these species becoming threatened or endangered.

1994 Forest Plan, Record of Decision Standards and Guidelines, p. C-32

Roads Management Standards and Guideline RF-1. Federal, state, and county agencies should cooperate to achieve consistency in road design, operation, and maintenance necessary to attain Aquatic Conservation Strategy objectives.

1994 Forest Plan, Record of Decision Standards and Guidelines, p. C-37

General Riparian Area Management Standards and Guideline RA-2. Fell trees in Riparian Reserves when they pose a safety risk. Keep felled trees on-site when needed to meet coarse woody debris objectives.

DEFINITIONS OF TECHNICAL TERMS

Anadromous—migrating from the sea to freshwater to spawn

Depressed Stock—a stock of fish whose production is below expected levels based on available habitat and natural variations in survival rates, but above the level where permanent damage to the stock is likely (Williams et al. 1975).

Critical Habitat (for threatened or endangered species; from the ESA, p. 2)—(i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the ESA, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of this Act, upon a determination by the Secretary that such areas are essential for the conservation of the species. (The USFWS and the NMFS formally designate what is "critical habitat" for their respective species. Critical habitat includes the stream channels with a lateral extent defined by the ordinary high-water line [33 CFR 319.11]).

Essential Fish Habitat (from http://www.nmfs.noaa.gov/sfa/sfaguide/102.htm)—those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.

Healthy Stock—a stock of fish experiencing production levels consistent with its available habitat and within the natural variations in survival for the stock (Williams et al. 1975).

Ordinary High Water Mark (OHWM) (33 CFR 328.3(e))—that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Redd—a spawning nest made by a fish, especially a salmon or trout

Sensitive Species (from http://www.fs.fed.us/r6/sfpnw/issssp/agency-policy)—those plant and animal species identified by the Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density and habitat capability that would reduce a species' existing distribution (Forest Service Manual 2670.5).

Spawn—to deposit eggs or sperm directly into the water, as fishes

Stock—the fish spawning in a particular lake or stream(s) at a particular season, which fish to a substantial degree do not interbreed with any group spawning in a different place, or in the same place at a different season (Williams et al. 1975).

MANAGEMENT REQUIREMENTS AND MITIGATION MEASURES

Management requirements and mitigation measures for the project are outlined below.

- In-water work conducted below the OHWM of the South Fork or its tributaries will occur during the approved WDFW in-water work window.
- There shall be no fill materials discharged below the OHWM and no wet or curing concrete will enter the river or other natural water resources.
- Erosion control best management practices (BMPs), such as silt fences, will be installed and maintained to reduce runoff and sedimentation.
- Clearing shall be restricted to areas needed for bridge and bridge approach construction activities and hazard tree management.
- Temporarily cleared areas shall be replanted with native vegetation and monitored to ensure adequate survival. Plantings will be maintained and replaced as necessary.

Analysis Methodology

Fish distribution was determined using the Mt. Baker-Snoqualmie National Forest (MBS) fish distribution database, WDFW reports and databases, the Washington State Conservation Commission limiting factors analysis report (WSCC 1999), and communications with local biologists.

Fisheries Affected Environment

The analysis area for fisheries effects is the South Fork, specifically the Robe Valley sub-basin (6th field HUC 17110080206), in Water Resources Inventory Area (WRIA) 5. The project site

is located east of Verlot on 342nd Drive NE in Section 15, Township 30N, Range 8E at about river mile (RM) 47 of the South Fork. The river flows from east to west through the project area. The streambed in the project area consists primarily of cobble, gravel, sand, and silt. High levels of silt and fines result from upstream landslides, bank sloughing, erosion, and logging practices. A large gravel bar occurs along the right (north) bank of the project site, which is largely exposed during typical low flows.

The Stillaguamish River basin is a Tier 1, Key Watershed and contributes directly to the conservation of resident and anadromous salmonids. Table 1 displays the fish species of interest and the special habitat designations addressed in this analysis.

Most native Puget Sound salmonid species occur in the project area. Coho salmon, steelhead, and cutthroat trout occur in the South Fork mainstem. Chinook salmon, bull trout, and pink salmon also occur in the mainstem, although typically in greater numbers downstream of Granite Falls (about 13 miles downstream). Chum and sockeye salmon occur primarily downstream of Granite Falls. For the small population of river sockeye salmon spawners known to inhabit the Stillaguamish River, it is currently unknown whether these fish are strays from other watersheds or a genetically distinct stock. However, preliminary information from other watersheds with river-spawning sockeye suggests that the populations have no genetic relationship to lake-spawning populations, such as the Baker Lake stock (Hendrick *in* WSCC 2002). The spawning that does occur in the South Fork is limited to the lower reaches (about RM 22), 25 miles downstream of the project area.

Occurrence of anadromous species in the project area is significantly influenced by fish passage conditions at Granite Falls. The falls was historically a natural migration barrier and likely restricted the upper watershed to resident forms of native salmonids (WDFW 1998). The WDFW constructed a fishway at the falls in the 1950s to allow upstream passage for anadromous species. However, sockeye and chum do not generally use the fishway and are therefore restricted to the lower river. Depending on flow conditions, passage through the fishway may also be difficult for other salmonids, such as Chinook and pink salmon.

Although it is expected that small numbers of adult Chinook salmon may migrate upstream through the project area, to upstream spawning areas late in the construction period (September and October), no recent spawning has been recorded near the action area. In the last 2 years there have been no redds recorded between Robe Canyon and Big Four, a reach that is surveyed 1 to 3 times each summer (Snohomish County 2008). In years where spawning has occurred in the area, the closest redds were about 2 miles upstream of the project site, and more typically at least 6 miles upstream.

Although some Chinook salmon could occur in the area during the overall construction period, no in-water work would occur during this period. Furthermore, the vast majority (about 97 percent) of Chinook salmon juveniles in the Stillaguamish River basin are reported to outmigrate from March through June as age-0 juveniles (Myers et al. 1998). Therefore, very few juveniles would likely be present during the construction period, which will occur from July to October.

Table 1. Fish Species of Interest and Special Habitat Designations in the South Fork Stillaguamish River Sub-watershed.

Species (Stock)	Status[1]	Utilization Associated with Project Analysis Area
Chinook salmon *Oncorhynchus tshawytscha* (Stillaguamish Fall)	NMFS—ESA listed Threatened (3/99); ESA designated critical habitat (9/05); Essential Fish Habitat Forest Service—MIS SaSI 2002—Depressed	South Fork Stillaguamish River
Bull trout *Salvelinus confluentus* (Stillaguamish)	USFWS—ESA listed Threatened (11/99); ESA designated critical habitat (9/05) Forest Service—MIS SaSI 1998—Unknown	South Fork Stillaguamish River
Steelhead *O. mykiss* (SF Stillaguamish Winter-run)	NMFS—ESA listed Threatened (5/07); ESA critical habitat not yet designated Forest Service—MIS (anadromous and resident rainbow) SaSI 2002—Depressed	Upper South Fork Stillaguamish River
Steelhead *O. mykiss* (SF Stillaguamish Summer-run)	NMFS—ESA listed Threatened (5/07); ESA critical habitat not yet designated Forest Service—MIS (anadromous and resident rainbow) SaSI 2002—Unknown	Upper South Fork Stillaguamish River
Coho salmon *O. kisutch* (Stillaguamish)	NMFS—ESA Candidate; Species of Concern (7/95); Essential Fish Habitat Forest Service—Sensitive; MIS SaSI 2003—Healthy	Upper South Fork Stillaguamish River; Marten Creek
Pink salmon *O. gorbuscha* (SF Stillaguamish)	NMFS—ESA, Not Warranted (10/95); Essential Fish Habitat Forest Service—MIS SaSI 2002—Healthy	Upper South Fork Stillaguamish River
Chum salmon *O. keta* (SF Stillaguamish)	NMFS—ESA, Not Warranted (3/98) Forest Service—MIS SaSI 2002—Healthy	South Fork Stillaguamish River to Granite Falls (13 miles downstream of project area)
Coastal cutthroat *O. clarki clarki* (Stillaguamish)	NMFS—ESA, Not Warranted (4/99) Forest Service—Sensitive, MIS (anadromous and resident) SaSI 2000—Healthy	South Fork Stillaguamish River
Sockeye salmon *O. nerka* (Baker River)	NMFS—ESA, Not Warranted (4/99) Forest Service—Sensitive, MIS SaSI 2002—Healthy	River spawning strays in the South Fork Stillaguamish River to RM 22 (25 miles downstream of project area). No known distribution of Baker Lake stock.

[1] NMFS—National Marine Fisheries Service; USDA Forest Service (Forest Service 1990 and 2004); USFWS—United States Fish and Wildlife Service; SASSI—Washington State Salmon & Steelhead Stock Inventory (WDF et al. 1993; WDFW and WWTT 1994); SaSI—Washington Salmonid Stock Inventory (WDFW 1998, 2000, 2002); MIS—Management Indicator Species (from USDA Forest Service 1990).

The project site is located within a generally confined reach, bounded by the Mountain Loop Highway on the right (north) river bank, and alternating bedrock outcrops, bluffs, and narrow bands of floodplain along the left bank. Much of the left bank consists of bedrock, with areas of rock riprap protecting an abandoned railroad grade.

Despite the bedrock and armored stream bank, some unstable slopes occur in the project vicinity. The Monte Cristo Grade Road is armored with riprap in places, although a large-scale landslide exists near the upstream end of the project site. The bank in other areas is stable and consists of naturally stable bedrock or gravel bars. The presence of Bridge #538 on the Mountain Loop Highway (commonly known as Blue Bridge) just upstream of the project site prevents the river from migrating as it would under natural conditions. This likely contributes to the chronic riverbank erosion at the site of the 2003 washout.

Most of the riparian areas along the river are composed of maturing second-growth deciduous species, although tributary streams in the area typically have good riparian canopy cover, including some areas of old-growth forest. There are few large woody debris jams in the Robe Valley sub-basin, resulting in limited scouring forces to maintain pool depths or adequate gravel sorting processes to maintain pool tail-out spawning areas.

The South Fork flows are often subject to extreme fluctuations. United States Geologic Survey (USGS) flow data over a 53-year period of record at Granite Falls (gage #12161000) indicated a maximum flow of 32,400 cubic feet per second (cfs) in February 1932 (USGS 2008). This flow approaches the estimated 100-year flood flow of 34,800 cfs. Mean monthly flows range from a low of 299 cfs in August to a high of 1,663 cfs in December.

Fisheries Environmental Consequences

The analysis area for direct and indirect effects to fisheries is the Robe Valley sub-basin, which includes a portion of the South Fork. The expected effects of the project are related to actions that could affect riparian cover, large wood recruitment, and sedimentation of spawning and rearing habitats. Healthy riparian areas provide many functions, including shade, as well as a source of large wood and other organic matter for the aquatic ecosystem. Large wood is important in creating and maintaining spawning and rearing habitats for fish, and providing cover from predators. Excessive sedimentation can bury redds and suffocate eggs, fill rearing pools, and irritate gills, which can kill or affect fish health.

Alternative A – Bridge Option

No in-water work would be required for the Bridge Option alternative, but work would occur over the South Fork and on its banks. Potential direct impacts to resident fish and aquatic organisms could include short-term sedimentation and increased turbidity in the river during construction, temporary and permanent impacts to riparian vegetation, impacts from altered hydrology or water quality from additional impervious surfaces, and water quality impacts from wet or curing concrete. No short-term or long-term direct impacts to aquatic habitat are anticipated under Alternative A, because no work in the wetted portions of the river will occur and all permanent structures (bridge abutments and bridge deck) would be placed outside of the OHWM of the river. If they occur, short-term impacts to fish species would be minor, and limited to small-scale, localized sedimentation. Long-term effects would be potential improvements in riparian habitat and a reduction of the overall sediment input potential.

Riparian Buffer Impacts

Approximately 900 square feet of non-mature forest vegetation will be permanently impacted by the south abutment and 1,300 square feet of scrub-shrub riparian vegetation will be permanently impacted at the north abutment. Less than 4,500 square feet of scrub shrub/non-mature forest riparian vegetation along the South Fork will also be temporarily impacted by a temporary access road. The removal of riparian vegetation has the potential to affect aquatic systems by reducing shade, overhead cover, and recruitment of woody debris and other organic matter. Immediate riparian impacts would occur under Alternative A and would be of low to moderate severity at the project scale level and minor at the reach scale. However, the project will replant all temporarily disturbed riparian areas with native tree and shrub species. In addition, approximately 8,500 square feet of the decommissioned segment of the Monte Cristo Grade Road will be planted, restoring approximately 350 linear feet of riparian buffer adjacent to the South Fork. This includes removal of road base material, re-grading, and replacement of soil prior to planting.

The short-term impact from the limited riparian clearing activities is not expected to measurably affect riparian functions such as large woody debris (LWD) recruitment or temperature and stream shading, because of the surrounding topography, relatively small size of trees cleared, amount of adjacent mature forest, and the north/south orientation of the clearing. Therefore, effects to fish species from vegetation clearing are expected to be insignificant. Furthermore, the proposed action and associated conservation measures will result in a net increase of about 7,800 square feet of riparian vegetation over the long term. The increased riparian buffer area is expected to improve fish habitat by providing minor increases in shading, terrestrial organic input, LWD recruitment, and sediment retention functions.

Sediment Impacts

Grading for bridge construction has the potential to introduce fine sediment into the river during construction, but this will be minimized or eliminated by limiting construction to the dry season, when the likelihood of significant rain events is relatively low. In addition, the project will meet all water quality standards imposed by state and federal laws (e.g., Clean Water Act 404/401). Sediment introduction will be substantially limited because most heavy grading and excavation will occur near the central pier and north abutment, at least 60 feet from the typical wetted channel, and standard erosion control BMPs will be employed to stabilize disturbed areas.

After construction ceases, potential sedimentation could occur during the first large fall/winter freshet, when the river rises to inundate the gravel bar used for equipment access. Disturbance of the gravel bar during construction, including removal and replacement of boulders, could cause minor localized disruption of natural bed armoring. However, such disturbances are expected to be limited and fish mix gravel will be spread over any disturbed bar area. Therefore, the potential for temporarily elevated turbidity is low during the first storm event of the season.

Likewise, establishing additional riparian buffer as a conservation measure on the decommissioned road is not likely to affect water quality in the South Fork or its tributary streams. BMP measures will be used to prevent sediment from entering the river during restoration of the decommissioned road and any exposed soil at the site will be mulched, further reducing the potential for sediment mobilization. The proposed riparian buffer will provide a long-term improvement in water quality and quantity to the river by removing impervious

surfaces adjacent to the river, and replacing them with a vegetated riparian buffer. The removal of the tributary culvert as a conservation measure in 2010 could also potentially introduce sediment into the river. However, the work site will be isolated from the flow; the work will occur under low flow conditions; and BMPs will be in place to prevent sediment from entering the river. In addition, no fish are known to occur in the tributary.

Water Quality Impacts

Although a small amount of new impervious surface area (500 square feet) would be added under Alternative A, there is a very low potential for negative impacts to fish from contaminants in the stormwater runoff from this surface. All stormwater runoff will be routed through new or existing ditches and dispersed over the river bank and rock pads before sheet flowing through vegetated areas to be filtered and partially infiltrated. Overall, the project will result in a net decrease in impervious surface area of about 8,000 square feet, due to the restoration of 8,500 square feet of existing roadway located immediately adjacent to the river. Furthermore, the average daily traffic on the road would be very low (less than 20 vehicles). Thus, no measurable increases in the concentration or loading of stormwater contaminants would be expected to enter the South Fork Stillaguamish River, and indirect effects to aquatic species would be nonexistent or insignificant.

Alternative A would require pouring concrete to construct piling caps on the north abutment and central pier and to expand the existing south abutment, which has the potential to enter the river. However, the majority of concrete work will occur at the north abutment and central pier, over 60 feet from the wetted channel, and BMPs will be employed to minimize or eliminate any of the 6.5 yards of wet concrete used for the south abutment from entering the river. This concrete will be delivered to the south abutment with a crane and concrete bucket. BMPs would include cleaning the bucket between loads and installing a tarp under the bucket prior to transporting any concrete across the river. Additionally, a large bucket will be used such that only a few loads will be needed. With the implementation of these BMPs, the potential for uncured concrete to enter the river is small. However, even if a small amount of concrete is introduced to the river from the bucket or work on the south abutment, it will be diluted rapidly and would not be at a concentration to cause harm to fish species.

Water Quantity Impacts

Undetained stormwater from additional impervious surface areas could affect the hydrology of adjacent streams, including alterations to the hydrologic cycle which can affect both low- and peak-flows within the stream. Altered stream hydrology can affect fish access (low flows), scour patterns, and other habitat-related factors.

Although a small amount of additional impervious surface area (500 square feet) would be added under Alternative A, the additional stormwater would be at least partially intercepted and filtered by the native vegetation present at the discharge point. In addition, the project will result in a net decrease in impervious surface area of about 8,000 square feet, due to the restoration of 8,500 square feet of existing roadway located immediately adjacent to the river. Based on the large size of the Robe Valley sub-basin and the net loss of imperious surface area in the project area, no measurable effects to the flow regime of the South Fork would occur and processes affecting fish resources (scour, deposition, water depth) would not be affected.

Summary of Alternative A Impacts

The fish species and special habitats of management interest in the Robe Valley sub-basin are shown in Table 1. Species that rear in the project area would have the most potential to be affected by Alternative A, although this potential is quite small. These include steelhead, cutthroat trout, bull trout, and coho salmon. Chinook and pink salmon may be present at the site in low numbers, but spend little time rearing in freshwater relative to other species and would therefore experience fewer effects. Species that only occur in downstream waters, including chum and sockeye salmon, would also experience negligible effects, because of further dilution of the minor on-site effects. Human disturbance to fish, including fishing pressure, are not expected to substantially change, because average daily traffic for the road is about 20 vehicles.

For federally listed fish and special habitats, the effect determinations are: *Not Likely to Adversely Affect* federally listed Chinook salmon, steelhead, and bull trout; *Not Likely to Adversely Affect* designated Chinook or bull trout critical habitats. The project *May Adversely Affect* Pacific Coast salmon essential fish habitat for Chinook, coho, or pink salmon, although these effects would be insignificant and short term, and avoided to the extent possible through implementation of BMPs and riparian buffer creation.

For the Forest Service Sensitive and MBS management indicator species of sockeye and chum salmon, project activities would have *No Impact*; the appropriate effect determination from project activities for coho, sockeye, and pink salmon and coastal cutthroat and rainbow trout is *Impact Individuals, Not Likely to Trend toward Listing.*

Alternative B – No Action

The No Action Alternative would avoid potential construction impacts at the project site and would not affect fish species. Human disturbance of fish 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. Local, long-term riparian function would be somewhat less than for Alternative A, because no decommissioning of a segment of the Monte Cristo Grade Road would occur.

The No Action Alternative does not require consultation under Section 7 of the ESA or under the Magnuson-Stevens Act. However, the effects of the No Action Alternative would be consistent with the following determinations typically used for interagency consultation. For federally listed fish and special habitats, the effect determinations would be: *No Effect* for federally listed Chinook salmon, steelhead, and bull trout, and designated Chinook salmon and bull trout critical habitat, and *No Effect* for Chinook, coho, or pink salmon essential fish habitat.

Project activities would have *No Impact* on the Forest Services' Sensitive and MBS management indicator species sockeye, chum, pink, and coho salmon; coastal cutthroat trout; and rainbow trout.

Fisheries Cumulative Effects

A cumulative effect is the effect on the environment that results from the incremental effect of the action, when added to the effects of other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes the other actions and regardless of land

ownership on which the other actions occur. An individual action when considered alone may not have a significant effect, but when its effects are considered in sum with the effects of other past, present, and reasonably foreseeable future actions, the effects may be significant. They can occur when small, incremental amounts of habitat are lost (or gained) over time through a variety of management activities across a landscape (40 CFR 1508.7).

The cumulative effects area consists of the South Fork, upstream of RM 47, and its tributaries. The downstream extent of the cumulative effects area is approximately 1 mile downstream from the project site. This extent represents a conservative estimate of the potential area of the downstream sediment effects and the restored public access to the Monte Cristo Grade Road. Identifying the downstream extent of effects related to fine sediment is imprecise; the 1 mile extent is based upon best professional judgment and experience of staff biologists. It is highly probable that measurable effects would not even extend as far as 1 mile downstream, and negligible beyond that point. The effect of the project will be a small-scale, short-term increase in localized fine sediment input into the river, and increased public access to the Monte Cristo Grade Road, as compared to the No Action Alternative.

Past Actions

The types of past projects that still have indirect lingering effects to fishery resources in the area include in-stream habitat restoration, bank stabilization, and transportation infrastructure projects (Table 2). Several past County projects are identified as having lingering effects that overlap in both time and space with the proposed project. The past projects include Phases 1 and 2 of the Mountain Loop Highway Bank Protection project and repairs at three sites along the Mountain Loop Highway from 2006 to 2008.

The 2006 repairs were necessitated by erosion of the highway prism during flooding in November 2006. In order to maintain access to Silverton and protect the highway, County crews placed riprap along several hundred feet of shoreline in locations where the river was directly adjacent to the highway and eroding the existing riprap armoring. These repair actions maintained the integrity of riprap revetments.

County crews constructed Phase 1 of the Mountain Loop Highway Bank Protection project, immediately adjacent to the proposed project, early in 2008. Phase 1 was constructed in response to rapid erosion of the right bank during winter flows and the recognition that the highway was likely to be damaged during late winter or spring freshets in 2008. In January 2008, the river eroded over 10 feet at one location, reaching to within 30 inches of the edge of the pavement. The Phase 1 project consisted of armoring about 150 feet of river bank with riprap. The project also incorporated several root wads into the bank protection.

These two previous bank protection activities were implemented under emergency conditions during a period of imminent threat to the road. Winter flows and the speed required to respond to the threat of erosion drastically reduced the range of options for repair. The intent of the Phase 2 (non-emergency) project was to avoid effects similar to those that have resulted from past road protection actions in the analysis area, particularly negative effects on cover and rearing areas for juvenile salmonids and limiting riparian processes for the foreseeable future. This was achieved by continuing 250 linear feet of bank protection upstream of the Phase 1 site,

Table 2. Selected Projects Considered For Fisheries Cumulative Effects

Past County Projects	Influence	Overlap with Proposed Project Activities in Time, Type, or Space		Comments Resulting Cumulative Effects
		Time/Type	Space	
Rivershore Lane bank stabilization and flood repair – 2005/2006	Improve in-stream habitat complexity, riparian habitat quality, and fine sediment levels. Decrease channel migration and increase turbidity during construction.	No/No	No	
Little Beaver culvert replacement- 2007	Increase/improve access to spawning and rearing habitats.	No/No	No	
Waldheim Slide upper slope stabilization- 2005	Reduce sedimentation.	No/No	No	Benefits of bank stabilization extend into the future as sediment is prevented from entering the river.
Mountain Loop emergency flood repairs- 2006	Degrade rearing habitat.	No/No	No/No	Repair riprap eroded from shoulder of Mountain Loop Highway during flood.
Perry Creek bridge flood damage repair- 2006	Degrade rearing habitat.	No/No	No	Repair bridge abutment damaged during flood.
Mountain Loop Bank Stabilization Project Phase 1 - 2007	Degrade rearing habit.	Yes/No	Yes	Project complete in early 2008 adjacent to Phase 2.
Big Four culvert replacement- 2009	Improve access to spawning and rearing habitat.	Yes/No	No	
Buck Creek Bridge replacement- 2013	Expected to improve rearing habitat and floodway capacity and locally degrade riparian habitat quality.	Yes/Yes	No	Magnitude of effects will depend on final design.
Marten Creek Bridge replacement- 2009	Improve rearing habitat and floodway capacity and locally degraded riparian habitat quality.	Yes/No	Yes	Improved habitat conditions.
Blue Bridge bank stabilization- 2009	Reduce channel widening and sediment input. Moderate increase in in-stream habitat complexity. Short-term increase in turbidity and possible harm to fish from worksite isolation and fish salvage activities.	Yes/Yes	Yes	Install wooden cribwall and rootwads to stabilize left bank of South Fork Stillaguamish upstream of Blue Bridge.

which incorporated soft bank protection elements (tree tops) within the harder bank protection measures (riprap). The tree tops provide rearing habitat and cover for fish, as well as providing nutrient input and habitat for aquatic macroinvertebrates.

The effects of the proposed action would be beneficial, resulting in a long-term improvement of riparian buffer along the South Fort, and mitigating the effects of past actions in the analysis area to some degree.

Present (Ongoing) and Future Actions

The agencies mentioned above continue to conduct these regular and planned activities in the upper South Fork watershed, although the precise locations and timing of some actions are not known. Known ongoing projects or those scheduled for future completion include repair of transportation infrastructure projects, restoration projects, trail development, and routine maintenance of roads, trails, and campgrounds (Table 3). None of the effects of the specifically identified projects are anticipated to overlap in both time and space with the proposed project, although some routine activities could overlap in time and/or space. However, the effects of the maintenance activities are typically temporary and immeasurable or beneficial to aquatic resources. Effects from these routine maintenance activities are immeasurable and therefore negligible, even if they do overlap in both space and time.

Summary

The contribution of the Monte Cristo Grade Bridge project alternatives would be negligible to the total cumulative effects to fish and fish habitats in the South Fork and its tributaries.

Forest Plan Consistency

All alternatives are consistent with the Forest Plan, as amended, Standards and Guidelines for fishery resources.

Table 3. Selected Present and Future Projects Considered For Fisheries Cumulative Effects

Present (Ongoing) and Future Forest Service Projects	Influence	Overlap		Comments Resulting Cumulative Effects
		Time/Type	Space	
Routine annual road maintenance	Decrease in chronic sedimentation and prevention of mass wasting	Yes/No	Yes	
Flood repairs of roads & bridges: Mallardy Creek Bridge (FS Road 4032), Coal Lake Road (FS Road 4060), Bear Lake Road & Black Creek Bridge (FS Road 4021)	Degrade rearing habitat and temporary increase in sedimentation	No/Yes	No	
Routine trail maintenance	Minor clearing of vegetation and reduction in sedimentation	Yes/No	Yes	
Campground maintenance	Clearing vegetation and possible disturbance of fish from recreational use	Yes/No	No	Includes clearing hazard trees
Trail construction at Perry Creek	Increase in sedimentation and disturbance from recreational use	Yes/No	No	
Trailhead parking lot enlargement at Dickerman Trailhead and Lake 22 Trailhead	Possible minor increase in sedimentation	Yes/No	No	
Decommissioning of the Perry Creek Road (FS Road 4063)	Reduction in sediment and improvement in riparian function	Yes/No	Yes	
Replacement of the Big Four Trail Bridge and trail repair	Temporary sedimentation	Yes/No	No	

REFERENCES

Myers, J.M., R.G. Kope, G.J. Bryant, D. Teel, L.J. Lierheimer, T.C. Wainwright, W.S. Grant, F.K. Waknitz, K. Neely, S.T. Lindley, and R.S. Waples. 1998. Status review of Chinook salmon from Washington, Idaho, Oregon, and California. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-NWFSC-35. 443 pp.

Snohomish County. 2008. Draft Biological Assessment - Monte Cristo Grade Bridge (PW# 06-00976, RC1513). August 2008. Everett, WA.

USDA Forest Service. 1990. Land and Resource Management Plan. Mt. Baker-Snoqualmie National Forest. USDA Forest Service, Pacific Northwest Region.

USDA Forest Service. 2004. Regional Forester's Sensitive Animal Species List, July 2004. Pacific Northwest Region, Portland, OR.

USGS (United States Geologic Survey). Historical flow data for Stillaguamish Watershed. Accessed online at: http://wa.water.usgs.gov/cgi/adr.cgi?12167000

WDF (Washington Department of Fisheries), Washington Department of Wildlife, and Western Washington Treaty Indian Tribes. 1993. 1992 Washington State Salmon and Steelhead Stock Inventory. Olympia, WA.

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

WDFW (Washington Department of Fish and Wildlife). 2000. Washington State Salmonid Stock Inventory, Coastal Cutthroat Trout Appendix. Olympia, WA.

WDFW (Washington Department of Fish and Wildlife). 2002 (draft). Washington State Salmon and Steelhead Stock Inventory. Olympia, WA.

WDFW (Washington Department of Fish and Wildlife) and WWTT (Western Washington Treaty Indian Tribes). 1994. 1992 Washington State Salmon and Steelhead Stock Inventory. Appendix One, Puget Sound Stocks. North Puget Sound Volume. Olympia, WA. 418pp.

WDFW (Washington State Conservation Commission). 2002. Salmonid habitat limiting factory analysis. Stillaguamish River watershed (WRIA 5) Final Report.

Williams, R.W., R.M. Laramie, and J.J. Ames. 1975. A Catalog of Washington Streams and Salmon Utilization. Puget Sound Region. Olympia, WA: Washington Department of Fisheries. Vol. 1.

WSCC (Washington State Conservation Commission). 1999. Salmon limiting factors final report: Water resource inventory area 5 – Stillaguamish Watershed. July 1999. Olympia, WA.

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TECHNICAL MEMORANDUM

Date: **October 8, 2008**

To: **Sean Gross, Snohomish County Public Works**

From: **Pete Lawson**

Subject: **Monte Cristo Grade Road Bridge (#RC1520) Aquatic Conservation Strategy (ACS) Review - Work Authorization #20**

cc: **File**

Project Number: **553-1513-085, Phase 20**

Project Name: **Monte Cristo Grade Road Bridge Environmental Support**

Snohomish County Public Works (County) is proposing to construct a single-lane, steel-truss bridge across the South Fork Stillaguamish River (South Fork) to restore vehicle access to approximately 20 properties. The following is an Aquatic Conservation Strategy (ACS) review, required by the Forest Plan, as amended (USDA Forest Service 1990), to assess the potential effects of the project on the ecological health of aquatic resources associated with construction of the Monte Cristo Bridge on the South Fork.

AQUATIC CONSERVATION STRATEGY REVIEW

The ACS was developed to maintain and enhance the ecological health of watersheds and aquatic ecosystems occurring on federal public lands. The four primary components of the ACS identified by the Forest Plan are intended to protect aquatic and riparian-dependent species and to maintain and restore the productivity and resiliency of aquatic and riparian ecosystems. These four components of the ACS are:

- Riparian Reserves
- Key Watersheds
- Watershed Analysis
- Watershed Restoration

Riparian Reserves

Riparian Reserves for the project area do not include cut areas around the streams and inner gorges and harvest prescriptions that acknowledge and maintain the functions of the Riparian Reserves.

Key Watershed

The project area is located within the South Fork, which is identified as a Tier 1 Key Watershed. Therefore, the Forest Plan would require a complete watershed analysis prior to timber harvest and reducing the amount of system and non-system roads through decommissioning. While the project does not include any timber harvest activities or any new permanent roads, about a half mile of existing Monte Cristo Grade Road would be decommissioned as part of the proposed project to enhance riparian buffer habitat along the South Fork.

Watershed Analysis

A watershed analysis was completed in 1996 (USDA Forest Service 1996) for the Lower South Fork/Canyon Creek watershed, in which the proposed project is located. In addition, a watershed analysis was completed in 1994 (USDA Forest Service 1994) for the Upper South Fork watershed, located 2 miles upstream of the project site.

Watershed Restoration

Restoration activities have occurred in several locations in the South Fork watershed area, which include road reconstruction and drainage upgrades, road decommissioning, noxious weed treatments, and in-stream treatments and off-channel aquatic habitat creation or enhancement. In addition to Forest Service-sponsored projects, the County has undertaken several restoration actions including fish passage improvement and restoration at the Shady Side dispersed recreation area, which restored a cleared area with riparian and conifer vegetation and blocked vehicle access to existing riparian and aquatic habitats.

In addition to the four primary components of the ACS, there are nine objectives that collectively ensure that the natural processes that the Riparian Reserves are intended to protect would continue to function appropriately. The requirements of the National Forest Management Act include a determination of consistency with these nine objectives as described in the Record of Decision for amendments to Forest Service and Bureau of Land Management planning documents within the range of the northern spotted owl (USDA and BLM 1994 page B-10). In addition, the *Pacific Coast Fed. of Fisherman's Assn. et al. v. Natl. Marine Fisheries Service, et al. and American Forest Resource Council, Civ.* No. 04-1299RSM(W.D. Wash)(*PCFFA IV*) decision ruled that project consistency reviews must evaluate the project at both the site scale and the watershed scale. The following is an assessment of the Monte Cristo Grade Road Bridge project against the nine ACS objectives.

Objective 1:

Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

The Monte Cristo Grade Bridge project would have a restorative effect, relative to Objective 1, by enhancing the South Fork riparian buffer to provide long-term improvement. Although some permanent riparian clearing of shrub and non-mature forest would occur (1,300 and 900 square feet of clearing, respectively) during project construction activities, about 8,500 feet of riparian buffer would be enhanced by abandoning and replanting a portion of the Monte Cristo Grade

Road with native shrubs and trees. Furthermore, all temporarily disturbed areas would be replanted with native trees and shrubs.

Because the bridge deck and piers will be placed outside of the South Fork ordinary high water mark (OHWM), natural river processes that provide in-stream cover, hydraulic refuge to aquatic species, and large woody debris (LWD)recruitment will not be affected by the proposed project.

Objective 2:

Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

The Monte Cristo Grade Bridge project would maintain and improve connectivity functions along the South Fork. The proposed action would maintain the integrity of the riparian buffer over the long term, although clearing of some vegetation would be necessary during construction. Because the existing bridge approaches are already in place, and because the bridge will be placed outside of the South Fork OHWM, the bridge itself would not affect aquatic refugia, and would have only a negligible effect on riparian connectivity. Similarly, the project is not expected to obstruct the movement of terrestrial species, dependent upon riparian corridors for their habitat needs or movement between habitat areas.

The long-term improvement in the riparian buffer would ultimately result in increased LWD recruitment, which could contribute to an increase of complex in-stream wood features that, in turn, would enhance the connectivity of productive rearing and foraging habitats for native fish and aquatic macroinvertebrates.

Objective 3:

Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

The Monte Cristo Grade Bridge project would maintain the physical integrity of the aquatic system because all work associated with the project would occur in the dry season and all structures associated with the bridge will be located outside of the OWHM. Also, the restoration of 8,500 square feet of existing roadway located immediately adjacent to the river will aid in restoring the overall integrity of the aquatic system.

The project would maintain the physical integrity of the streambed configuration and would not affect sediment transport or deposition processes within the South Fork. The project is designed to be consistent with the Stillaguamish Basin Chinook Salmon Recovery Plan by maintaining or improving long-term LWD recruitment potential.

Objective 4:

Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

The Monte Cristo Grade Bridge project would not adversely affect water quality in the South Fork. Although a small amount of impervious surface area (500 square feet) would be added under Alternative A, there is a very low potential for negative impacts to fish species from stormwater contaminants generated by this surface. All stormwater runoff will be routed through new or existing ditches, and dispersed over the river bank and rock pads, before sheet flowing through the vegetated buffer area. This process will filter and partially infiltrate the runoff. In addition to the small amount of additional impervious surface constructed under Alternative A, the average daily traffic on the road would be very low (less than 20 vehicles). Furthermore, the project will result in a net decrease in impervious surface area of about 8,000 square feet, due to the restoration of 8,500 square feet of existing roadway located immediately adjacent to the river. Thus, no measurable increases in the concentration or loading of stormwater contaminants would be expected to enter the South Fork Stillaguamish River, and indirect effects to aquatic species would be nonexistent or insignificant.

Although water quality would be maintained over the long term, construction and grading activities for the bridge and road decommissioning may cause minor, short-term increases in sedimentation and turbidity in the river. However, sediment will be minimized or eliminated because the majority of grading will occur at least 60 feet from the river; construction will be limited to the dry season; appropriate sediment and erosion control construction best management practices (BMPs) will be employed; and all water quality standards imposed by state and federal laws (e.g., Clean Water Act 404/401) will be met. Temporarily disturbed areas will be mulched and planted to reduce sediment mobilization after construction.

No substantial sedimentation from the gravel bar used for equipment access is expected during bridge construction or after the first high flows of fall/winter. Any disturbance of the bar will occur at low water and short term because fish mix gravel will be spread on site to cover the disturbed bar area, appropriate sediment and erosion control BMPs will be applied, and any boulders moved to deploy equipment will be re-dispersed subsequent to equipment removal.

Likewise, the proposed riparian buffer enhancement along Monte Cristo Grade Road would provide some potential improvement in long-term water quality in the river by removing some existing impervious surfaces adjacent to the river, and replacing them with a vegetated riparian buffer. Short-term effects from culvert removal along the road could occur, but the work site will be isolated from the river during low flow conditions, and BMPs will be in place to prevent sediment from entering the stream. Therefore, no measurable effects to water quality are expected.

Objective 5:

Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

The Monte Cristo Grade Bridge project would likely meet Objective 5 at the project and reach scale, and promote restoration at the watershed scale by improving the long-term sediment filtration process, and by converting a portion of the existing roadway into native riparian vegetated buffer habitat. Use of appropriate BMPs, management requirements, and mitigation measures would minimize and mitigate potential short-term increases in sediment mobility associated with any soil disturbance from construction activities. At both the reach and watershed scale, changes in the overall sedimentation rates attributable to the project would

likely be non-detectable given the high variability in natural rates of sediment input along the river.

Objective 6:

Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

The project would contribute to maintaining stream flows. Stormwater associated with the project at the bridge approaches is not expected to alter the hydrologic cycle, including low or peak river flows. The additional stormwater would be at least partially intercepted and filtered by the existing native vegetation at the discharge point and the area of additional impervious surface is small. In addition, 8,500 square feet of impervious surface will be removed along the Monte Cristo Road as project mitigation. Therefore, any changes would be negligible and immeasurable.

Likewise, minor clearing and grading would remove vegetation and increase soil compaction in the work area, causing a negligible increase in runoff from the site in the short term. This negligible increase in runoff from the relatively small site would have no measurable effect on the flow characteristics of the South Fork.

Objective 7:

Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

The project would maintain the current floodplain inundation and water table conditions at both the project and the watershed scales. Most of the work area is outside of the South Fork floodplain, and only a small increase would occur from installation of the center bridge pier to replace the existing pier. The majority of the work will occur outside of the OHWM, atop the high right and left banks of the river.

Objective 8:

Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

The project would contribute to the restoration of Objective 8 over the long term at both the project and watershed scales. The project will preserve as many riparian trees as possible and rehabilitate a left-bank portion of the riparian zone upstream of the bridge site, which currently serves as roadway. This would contribute to a long-term improvement of riparian vegetation that will provide shade, nutrient and sediment filtering, and a source of woody debris and other organic matter.

Objective 9:

Maintain and restore habitat to support well-distributed populations of native plants, invertebrates, and vertebrate riparian-dependent species.

The project would contribute to restoration of this objective by enhancing the integrity of the riparian area upstream of the bridge site. Maintaining a vegetated riparian zone directly adjacent to the river is necessary to support native plant, invertebrate, and vertebrate riparian-dependent species at the site scale. Preservation will contribute to supporting populations of native plant, invertebrate, and vertebrate riparian-dependent species at the watershed scale.

SUMMARY

Overall, the Monte Cristo Grade Bridge project would help preserve key ecological functions of the Riparian Reserves. The project, designed to allow access to the existing Monte Cristo Road, while not directly impacting the South Fork, is consistent with all nine ACS objectives at the site and watershed scales.

Because riparian planting of an existing road section will be conducted as a conservation measure, the project will preserve the physical integrity of the soils in the buffer, allowing the re-establishment of woody vegetation after construction. Long-term preservation of buffer soils and protection of riparian vegetation and soils will maintain connectivity of riparian habitats and watershed functions.

REFERENCES

USDA Forest Service 1990. Land and Resource Management Plan. Mt. Baker-Snoqualmie National Forest. U.S. Department of Agriculture, Forest Service, Pacific Northwest Region.

USDA Forest Service. 1994. South Fork Upper Stillaguamish Watershed analysis, Darrington Ranger District. Mt. Baker-Snoqualmie National Forest, WA.

USDA Forest Service. August 1996. Watershed Analysis South Fork Lower Stillaguamish River, Canyon Creek. Darrington Ranger District. Mt. Baker Snoqualmie National Forest, Pacific Northwest Region.

USDA Forest Service and BLM (Bureau of Land Management). 1994. Record of decision for amendments to Forest Service and Bureau of Land Management planning documents within the range of the Northern Spotted Owl. Portland, OR.

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TECHNICAL MEMORANDUM

Date: **October 8, 2008**

To: **Sean Gross, Snohomish County Public Works**

From: **Pete Lawson**

Subject: **Monte Cristo Grade Road Bridge Replacement**
Wildlife Resource Report and Biological Evaluation- Work Authorization #20

cc: **File**

Project Number: **553-1513-085, Phase 20**

Project Name: **Monte Cristo Grade Road Bridge Environmental Support**

INTRODUCTION

Record rainfall occurred in Western Washington during October 19 to 21, 2003, causing extensive damage throughout the region. Flooding and erosion in the South Fork Stillaguamish River (South Fork) watershed caused about 200 feet of the Monte Cristo Grade Road, just outside of Verlot, Washington, to wash out. Additional erosion also occurred during the 2006 and 2007 flood seasons. The Monte Cristo Grade Road is an unpaved gravel road that used to provide access to about 20 recreational properties and one residence. However, the road has been barricaded since 2003 and there is currently no vehicular access to these properties or to National Forest land along the road.

This biological evaluation examines the effects on wildlife of the Snohomish County (County) proposal to reconstruct a bridge across the South Fork and abandon about a half-mile of the Monte Cristo Grade Road. The bridge would connect the current dead end of 342nd Drive NE to the Monte Cristo Grade Road, on the same alignment as a previous bridge, to provide public access to properties along Monte Cristo Grade Road. The Forest Service proposes to issue a special use permit to the County to construct the project.

Existing Condition

The Monte Cristo Grade Road project occurs near an eroded bank of the South Fork. The area consists of scattered pockets of mixed deciduous and second-growth and old-growth mixed conifer forested habitat near the bridge location and upslope (south) areas, as well as along the road. There is abundant understory vegetation of primarily low-growing herbs and shrubs, including huckleberry, salmonberry, twinflower, horsetail, alder, and cottonwood. There are some large pockets of old-growth habitat with abundant and diverse riparian vegetation, as well

as several streams with side channels and adjacent ponds. These streams flow alongside the Monte Cristo Grade Road, and downslope (north) into the South Fork.

Methods

Analyses of potential impacts were made based on a review of plans for the proposed action, an on-site evaluation of existing habitat conditions, data on the current and historical distributions of each species from The Priority Habitat and Species (PHS) database maintained by Washington Department of Fish and Wildlife (WDFW 2008), and personal communications with local agency biologists (Brown, personal communication).

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES

A biological assessment was completed and approved in September 2008 by the County, which was the source of much of the information on threatened or endangered species, and their habitat, occurring in the area.

Spotted Owl

No surveys for spotted owls have been completed within the project area and no spotted owl territories have been documented within 1 mile of the bridge or along the road. Old growth forest with some of the characteristics of spotted owl nesting, roosting, and foraging habitat, is present along the south side of the South Fork Stillaguamish, both on National Forest and private land, in the general project vicinity. However, large blocks of habitat meeting United States Fish and Wildlife Service (USFWS) requirements for spotted owl home range territories are not available because the existing forest stands are surrounded on three sides by private land that is managed for timber production and the areas supporting mature forest are not large enough to meet the needs of nesting spotted owls.

Although mature forest in the project area may provide foraging or dispersal habitat for spotted owls, neither spotted owl nesting or roosting habitat is present within the immediate project area (100 yards of project site). In addition, the project site has high levels of ambient noise due to its location immediately adjacent to South Fork Stillaguamish River. Ambient noise levels at this location could interfere with hunting success or alert response, both of which depend primarily on the hearing ability of owls. For this reason it is possible that spotted owls are less likely to nest, roost, or forage at this location, compared to other locations farther away from the river.

Noise from most bridge construction activities will be limited to a small area and is expected to be within ambient noise levels of the river. However, pile driving noise may extend into the old-growth forest along the south side of the river, potentially disturbing any spotted owls that may be using the area for roosting, foraging, or dispersal. Any such disturbance would be short term and temporary; additional suitable habitat is available in adjacent areas. It is expected that resumption of the limited amount of road use will not alter any uses of the habitat in the area by spotted owls; therefore, continued use of the road will have no effect on spotted owls. The project is also outside of designated critical habitat for the northern spotted owl. Therefore, the project is *not likely to adversely affect* northern spotted owls, and will have *no effect* on critical habitat for spotted owls.

Marbled Murrelet

The PHS database maintained by WDFW documents two occurrences of marbled murrelet in the area. One is upslope and southeast of the bridge replacement site, approximately 0.3 mile from the construction area. This occurrence is far enough away such that construction noise from the bridge replacement work will not affect murrelet nesting at this location. The other occurrence is adjacent to the road and river, just over 0.25 mile from the bridge replacement site. This occurrence was from 1988 when the road was in use. It is expected that ambient noise levels from the river will mask noise expected from the bridge replacement location such that any occurrence of murrelets down the road are not likely to be affected by noise at the bridge site.

It is expected that the resumption of traffic along this road would not affect the use of suitable habitat by marbled murrelets. Right-of-way clearing will occur after the nesting season is completed (after August 15); so right-of-way clearing is unlikely to affect use of nesting habitat by marbled murrelets. Overall, no effect on marbled murrelets from continued use of the road and clearing of ROW vegetation is expected.

The project area is within designated marbled murrelet critical habitat, although no components of suitable habitat will be removed as part of the bridge replacement or right-of-way clearing. A few small firs are scheduled to be removed at the location of the new bridge, but would result in no change to suitable habitat; therefore, it is expected that this project is *not likely to have an adverse effect* on marbled murrelet critical habitat.

The effects of noise disturbance will be discountable due to the low probability of murrelet nesting in the action area during construction. However, if murrelet nesting does occur within the action area during construction, effects from noise would be insignificant due to the combination of distance and timing. The project is *not likely to adversely affect* marbled murrelets or their critical habitat.

Canada Lynx

The nearest potential habitat for lynx is located approximately 30 miles east of the project area along the Cascade Crest. Movement from occupied habitat to the project area is limited by lack of suitable foraging habitat. As a result, the project is expected to have *no effect* on Canada lynx.

Gray Wolf

Currently, only dispersing animals would be expected to occur in the project area because an adequate prey base to support resident wolves is not present. Because this area is already heavily influenced by human activity due to access to private parcels, developed and dispersed campgrounds along the South Fork, and residential uses, this project is not expected to affect dispersal patterns. As a result, the project is expected to have *no effect* on gray wolf.

Grizzly Bear

The project area is not within any Bear Management Unit that is known to have recent detection or sightings (within last 10 years). No habitat would be affected and there would be no change to vehicle access compared with past use. Because the project occurs on a low-use road, this project is not expected to affect grizzly bear movement patterns or habitat use. Therefore, the project is expected to have no effect on grizzly bear.

REGIONAL FORESTER'S SPECIAL-STATUS SPECIES

The following discussions address the potential impacts of the project on vertebrate and invertebrate species on the Regional Forester's list of special-status species potentially occurring in the project area. There is no potential habitat for common loon (large lakes); Larch Mountain, and Van Dyke's salamander (range is south of US 2); peregrine falcons (cliff habitat within 1 mile); wolverine (large undisturbed expanses of high elevation habitat) or great gray owls (open forest forage areas). Because of the lack of suitable habitat within the project area, this project will have no impact on these species.

On July 24, 2007, the Undersecretary of the Department of Agriculture signed a Record of Decision (ROD) (complete title: Record of Decision to Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Forest Service Land and Resource Management Plans Within the Range of the Northern Spotted Owl), which removed certain requirements from all of the National Forest land and resource management plans (LRMPs) within the range of the northern spotted owl. However, because the court in Northwest Ecosystem Alliance et al. v. Mark Rey et al., Civ. No. 04-844, Western District of Washington has not yet granted the government's motion to lift the modified October 11, 2006 injunction, this project is designed to be consistent with the 2001 Survey and Manage ROD, as modified by subsequent annual species reviews. Implementation of this project will have no adverse impacts on any of the terrestrial rare and uncommon mollusk species addressed in that ROD.

Bald Eagle

The USFWS removed the bald eagle from the federal list of endangered and threatened wildlife, effective August 8, 2007 (72 Federal Register [FR] 37346-37372). Bald eagles are protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act, and are on the Regional Forester's Sensitive Species List. Suitable nesting and roosting habitat for bald eagles occurs along the river in the project area, but no known records of bald eagle use are noted in the PHS database and there are no records of bald eagle nests or winter roost sites. This stretch of the river is not usually occupied in the winter months, likely due to lack of forage items. Even with a fish ladder at Granite Falls, the falls limits the extent of anadromous fish movement up the South Fork, reducing the amount of prey for eagles. The project will not remove any large potential nesting trees along the river and would occur after fledging of bald eagles is expected to be constructed (July 15 to August 15), and prior to any winter time use of eagles; therefore, the project is expected to have *no impact* on bald eagles.

Harlequin Duck

This species is found along large fast-flowing rivers and streams, and because this project occurs alongside the river, it is expected that harlequin ducks may nest or forage near the project site. However, activities associated with the bridge replacement will occur at the end of the breeding season when chicks can easily move away from any project activities that may disturb their foraging. No suitable habitat will be affected by this project and disturbance to any ducks while foraging is expected to be minimal. Therefore, the project is expected to have *no impact* on harlequin ducks.

Townsend's Big-Eared Bat

Potential foraging habitat for this species occurs in the project area. Roosting habitat in the form of mines, buildings, or caves is not known to occur in the area. The species has not been detected in the South Fork drainage. This project would not affect any roosting habitat and would not significantly alter vegetation. Because the project would occur during the day, there is no potential to alter foraging or roosting behavior. As a result, this project is expected to have *no impact* on Townsend's big-eared bats.

Johnson's hairstreak

This butterfly depends on lowland coniferous forests that contain dwarf mistletoes of the genus *Arceuthobium*. The nearest documented sighting was an adult butterfly found near Verlot in 1953. In addition, one larva was found in Snohomish in 1960, and one adult and one larva were found at Garland Mineral Springs near Index in 1961. Since 1960 there have been only 12 documented occurrences in Pierce, King, and Snohomish counties. No trees with dwarf mistletoe infestations would be affected by the proposed project; therefore, *no impact* to the Johnson's hairstreak is expected.

Puget Oregonian

This snail species is reported to use old forest habitat at elevations less than about 1,500 feet above sea level. This habitat type occurs adjacent to the project site, although the nearest occupied habitat for this species is 160 miles south of the project area. Numerous surveys in suitable habitat between the occupied location and the project area failed to detect the species. Because repeated surveys in apparently suitable habitat have failed to detect *Cryptomastix devia* within proximity of the project area, it is not expected to occur. In addition, no removal or disturbance of suitable habitat is expected as well. Therefore, the project is expected to have *no impact* on the Puget Oregonian.

Evening fieldslug

Occupied range for this species is from Hood River to the Klamath River basin, Oregon. After 10 years of surveying in suitable habitat, the species has not been detected in Washington, and therefore there is no reason to suspect the species to occur in the Mount Baker-Snoqualmie National Forest. Although there is suitable habitat in the overall project area, the proposed action does not affect suitable habitat. Because the species is not known or expected to occur and there would be no impacts to potential suitable habitat, the project is expected to have *no impact* on evening fieldslugs.

Warty jumping-slug

The nearest occupied site of this species is approximately 80 miles south of the project area. Numerous surveys in suitable habitat between the occupied location and the project area failed to detect the species. Although there is suitable habitat in the overall project area, the proposed action does not affect suitable habitat. Because this species is not known or expected to occur in the project area, and there would be no impacts to potential suitable habitat, the project is expected to have *no impact* on warty jumping-slugs.

Oregon megomphix

For Washington, records indicate this species has a low-elevation distribution from Olympia to the Columbia River, which does not include any National Forest lands. Numerous surveys in suitable habitat between the known locations and the project area failed to detect the species. This species appears to be found at elevations lower than those found in the project area. Therefore, this project is outside the range of potential suitable habitat. Because repeated surveys in apparently suitable habitat have failed to detect *Megomphix hemphilli* and this project is outside the range of this species, the project is expected to have *no impact* on Oregon megomphix.

Shiny tightcoil

This species is only known to occur east of the Cascade Mountains. A tentative identification of this species occurring on the Olympic Peninsula remains unconfirmed 10 years after its reporting. Because the species has not been confirmed to occur west of the Cascade Mountains, it is not expected to occur in the project area. The project is expected to have *no impact* on shiny tightcoils.

MANAGEMENT INDICATOR SPECIES

No impacts are expected to Management Indicator Species. The project would not affect mountain goat due to a lack of suitable habitat in the project area. There would be no change in habitat conditions for pine marten and therefore no impacts to the species. Although the project may occur in black-tailed deer winter range, construction activities would not occur during the winter and would avoid having any impact on wintering deer or forage for deer. Habitat for woodpeckers, including pileated woodpecker, would not be impacted by the removal of alder trees less than 6 to 20 inches in diameter. The removal of a limited number of second-growth trees is not expected to affect populations of woodpeckers in the area.

NEOTROPICAL MIGRATORY BIRDS

This project would not affect more than a few small-diameter alder and fir trees where neotropical birds may nest and forage. All project impacts will be limited to a small area and are expected to occur late in the nesting season, when all young are likely to have fledged. Therefore, the project is expected to have no impact on neotropical migratory birds.

CUMULATIVE EFFECTS

The project is in rural Snohomish County in an area dominated by federally owned forest land, 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. Several flood repair road projects are being planned in the basin on federal and county land, including culvert and bridge wash-out repairs on Forest Service land and a number of 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. The County recently updated its Critical Areas Ordinance, which provides restrictions for land development near sensitive natural resources and requirements for mitigation of impacts.

Construction of the bridge over the river could cause minor amounts of sediment to enter the river. However, the construction timing (dry season), limited area potentially disturbed, and the relatively short construction period indicate no long-term effects to wildlife species or habitat 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.

REFERENCES

Brown, Marianne. Personal email communication with Phyllis Reed, Wildlife Biologist/Environmental Coordinator of the Darrington Ranger District in the Mount Baker-Snoqualmie National Forest on September 9, 2008.

WDFW (Washington Department of Fish and Wildlife). 2008. Priority Habitats and Species Data. Olympia, Washington.

13. APPENDIX E: COMMENT LETTERS AND RESPONSES

Pilchuck Audubon Society
Champion for the Environment

1429 Avenue D, PMB 198
Snohomish, WA 98290
425-252-0926
web site: www.pilchuckaudubon.org

July 7, 2008

Mark Eberlein
FEMA Region X Environmental Officer
130th 228th Street SW
Bothell, WA 98021

Re: Bridge Construction to Provide Access to a Portion of the Monte Cristo Grade Road

Dear Mr. Eberlein:

Thank you for the opportunity to comment on the Draft EA for the Monte Cristo Grade Road Bridge. The mission of Pilchuck Audubon Society is to conserve and restore natural ecosystems, focusing on birds and other wildlife, for the benefit of the earth's biological diversity. It is with this statement in mind that we share our concerns below.

#1 Has any research been done to determine whether there are wildlife corridors in the path of the proposed bridge? We are concerned that the bridge could be a barrier for wildlife movement.

#2 The proposed open steel grate bridge design will increase the runoff of pollutants into the river. How will this be mitigated? What type of low impact stormwater treatment will be constructed for the new paved bridge approaches? It is imperative to protect the water quality of the river for wildlife, particularly ESA listed fish species.

#3 The EA states that work will be completed during "the dry season" (p. 24). But according to the table on p. 36, ESA listed fish will be spawning in the river during the dry months of August and September! These conflicting timetables may make it impossible to complete the construction.

#4 We have two concerns regarding the tree removal, as described on p. 29, section 3.4.3, which states, "The primary wildlife impact would occur from the removal of trees to construct the bridge." First, in terms of displacing potential bird nesting habitat, the EA notes "the bridge site is adjacent to large tracts of densely forested USFS which provides alternative habitat." The problem with this reasoning is that those adjacent habitats are already occupied. Any displaced nesting, migratory and resident birds have nowhere to go.

#5 Second, we are concerned about the tree removal proposed in Figure 4 (Proposed Bridge Location) on pg 11. This will likely result in what is known as an "edge effect" in the landscape, which can result in predation of eggs and young in the trees left standing. The proposed removal will tend to increase the edge effect, with subsequent adverse impacts to wildlife.

#6 Does the project conform to all Migratory Bird Treaty Act protections? Will trees be removed during nesting season? If so, this would obviously destroy nests as the trees are

removed. Contrary to the assertion on p.19 of the EA, this would indeed harm migratory birds.

#7 Furthermore, marbled murrelet nesting would be disturbed by the proposed action, and must be protected by appropriate work windows. If the trees to be removed are suitable marbled murrelet nest trees, their removal would be prohibited. The EA states (p. 41) that suitable marbled murrelet nesting habitat does exist within 200 feet of the proposed project area. Any birds using these trees would definitely be disturbed by the noise of construction. Bald eagles would also be disturbed by the noise.

#8 We are concerned about the possibility of fresh concrete spills into the river during construction, especially given the plan to hoist buckets of it across the river. The pressure washing of the old bridge abutments proposed could result in concrete dust polluting the river as well.

#9 We wish to correct the statement on p. 18 that "NEPA suggests [emphasis added] including analysis of a 'No Action Alternative'..." In fact, this analysis is required by NEPA, and must be rigorous and thorough. Furthermore, NEPA also requires that a full range of alternatives be examined. The EA evaluates only a single action alternative and the requisite 'No Action" alternative. At the least, an alternative to purchase the affected properties should also be evaluated.

#10 In light of the Midwest's recent floods and, in some cases, entire towns of displaced Americans, we consider the construction of a bridge for 24 recreational properties and 1 residence an unwise use of taxpayer money. Specifically, the proposed action would provide access for 15 property owners, with only one being a year-round resident; clearly the money intended for this project could be put to better use helping those not merely being inconvenienced.

#11 The EA points out (p. 17) that Snohomish County would be required to fund maintenance of the road once access is restored. The economic implications of this must be considered, including the high likelihood that this road will wash out again in the future.

#12 In summary, we urge you to consider at least one other action alternative: Purchasing properties accessed by the Monte Cristo Grade Rd. The economic impacts of this option must be examined, in light of the probable future washouts necessitating further maintenance costs. The final EA must also include a thorough evaluation of the project's effects on endangered species including marbled murrelets, northern spotted owls, and salmon. It must also describe how these effects would be effectively mitigated, if in fact they can be.

Sincerely,

Katherine Johnson and Kathryn Piland
Forest Committee

Please address correspondence to:
Kathryn Piland
21431 62nd St NE
Granite Falls, WA 98252

Response to comment letter from Pilchuck Audubon Society
Monte Cristo Grade Road Bridge Replacement

Number	Issue	Response
# 1	Has any research been done to determine whether there are wildlife corridors in the path of the bridge? Will the bridge be a barrier for wildlife?	Yes, a Technical Memorandum was prepared to evaluate the effects of the project on the wildlife resources. This memorandum is attached as Appendix C to the Environmental Assessment. Deer and other mammals likely move up and down the river banks while foraging or accessing water. Construction of the bridge will not change the contours or obstruct the existing bank. The replaced piers will be in the same location and approximately the same size as the existing piers. The existing piers are outside of the Ordinary High Water Mark (OHWM). The proposed bridge deck will be more than 21 feet above the beach and is not likely to impede use of the beach or bank by wildlife.
# 2	The proposed open steel grate bridge design will increase the runoff of pollutants into the river. How will this be mitigated? What type of low impact stormwater treatment will be constructed for the new paved bridge approaches? It is imperative to protect the water quality of the river wildlife, particularly ESA listed fish species.	The bridge design has been changed from a steel grate to wood decking. The wood decking will be untreated cedar. Runoff on the bridge would not be collected and concentrated. Because of the low traffic volume, the runoff would be minor and there not be a significant increase in pollutants. Stormwater is addressed in more detail in the Biological Assessment. Low impact stormwater treatment will be used on the north and south approaches to the bridge. The north approach drainage consists of sheet flow off the road. The project will establish ditches that will outlet to rock pads at the top of the slope and then sheet flow through the vegetated slope. On the south side of the river the existing road drainage goes to a ditch on the south side of the road or sheet flows off the road into the vegetation on the north side of the road. There will be no changes to the drainage pattern on the south side of the river There will be a net decrease of 8,000 square feet of impervious surface as part of the mitigation for this project. Approximately 8,500 square feet of the decommissioned portion of Monte Cristo Grade Road will be removed and planted with riparian vegetation. The riparian buffer created will result in greater surface water infiltration, buffer, and maintenance of base flow.
#3	The EA states that work will be completed during "the dry season" (p. 24). But according to the table on p.36, ESA listed fish will be spawning in the river during the dry months of August and September!	Although it is expected that small numbers of adult Chinook salmon may migrate upstream through the project area to upstream spawning areas late in the construction period (September and October), no recent spawning has been recorded near the action area. In the

	These conflicting timetables may make it impossible to complete the construction. There is not enough time to construct the bridge during the "dry season."	last 2 years there have been no redds recorded between Robe Canyon and Big Four, a reach that is surveyed 1 to 3 times each summer. In years where spawning has occurred in the area, the closest redds were about 2 miles upstream of the project site, and more typically at least 6 miles upstream. Although some Chinook salmon could occur in the area during the overall construction period, no in-water work would occur during this period. Furthermore, the vast majority (about 97 percent) of Chinook salmon juveniles in the Stillaguamish River basin are reported to out migrate from March through June as age-0 juveniles. Therefore, very few juveniles would likely be present during the construction period, which will occur from July to October. Work occurring on the gravel bar during the dry season will adhere to the in-water work window as specified by Washington Department of Fish and Wildlife (WDFW) in the Hydraulic Permit Approval (HPA) (anticipated to be July 15 to August 15).
#4	We have two concerns regarding the tree removal, as described on p. 29, section 3.4.3, which states, "The primary wildlife impact would occur from the removal of trees to construct the bridge." First, in terms of displacing potential bird nesting habitat, the EA notes "the bridge site is adjacent to large tracts of densely forested USFS which provides alternative habitat." The problem with this reasoning is that those adjacent habitats are already occupied. Any displaced nesting, migratory and resident birds have nowhere to go.	The bridge replacement has been designed to minimize the removal of trees. Construction sequencing has been modified during the design process to greatly reduce the number of trees to be removed. The design presented in the EA showed a temporary construction road down to the beach for the crane. An alternate design has since been developed to use the existing, already-cleared right-of-way as the crane access instead of clearing vegetation for a new access road. On the south side of the bridge the trees to be removed are primarily young alders and conifers that have self-seeded in the unused road right-of-way and in and around the old concrete abutments. There will be minor loss of habitat with the removal of these trees. Mitigation will be provided for these impacts (See answer #2 above).
#5	Second, we are concerned about the tree removal proposed in Figure 4 (Proposed Bridge Location) on pg 11. This will likely result in what is known as an "edge effect" in the landscape, which can result in predation of eggs and young in the trees left standing. The proposed removal will tend to increase the edge effect, with subsequent adverse impacts to wildlife.	Smaller trees will be taken along the already existing edge created by the road. Over the long term, the project will reduce edge effect compared to the baseline because of the size, shape, and location of the mitigation area compared to the proposed clearing area. The mitigation proposed will decommission 8,500 square feet of the Monte Cristo Grade Road. Approximately 280 linear feet of existing edge will be planted with native trees and shrubs. Over time this mitigation will provide cover for a variety of species. Plantings will be monitored and maintained by the County to ensure successful establishment of a native

		vegetation community.
#6	Does the project conform to all Migratory Bird Treaty Act protections? Will trees be removed during nesting season? If so, this would obviously destroy nests as the trees are removed. Contrary to the assertion on p.19 of the EA, this would indeed harm migratory birds.	A biological evaluation was conducted to examine the effects on wildlife of this project including Migratory Birds (see Appendix C: Technical Memorandum). Some small diameter alders and firs trees will be removed where neotropical birds may nest and forage. All project impacts will be limited to a small area and are expected to occur late in the nesting season, when the young are likely to have fledged. Therefore, the project is expected to have no impact on neotropical migratory birds. The construction sequencing has been modified to minimize the number of trees to be removed. Mitigation for removal of the trees includes replanting approximately 8,500 square feet of the Monte Cristo Grade Road.
#7	Furthermore, marbled murrelet nesting would be disturbed by the proposed action, and must be protected by appropriate work windows. If the trees to be removed are suitable marbled murrelet nest trees, their removal would be prohibited. The EA states (p. 41) that suitable marbled murrelet nesting habitat does exist within 200 feet of the proposed project area. Any birds using these trees would definitely be disturbed by the noise of construction. Bald eagles would also be disturbed by the noise.	None of the trees to be removed are suitable marbled murrelet nest trees. The nearest suitable habitat tree is approximately 200 feet south of the south bridge abutment. Construction will take place at a distance which noise will not disturb murrelets. When construction is scheduled to be closer, work will adhere to the work window. The early nesting season for murrelets is between April 1 and August 5. Given the relatively small number of murrelets present in Washington relative to available suitable habitat, it is far more likely that murrelets will select higher quality nesting habitat (with larger nest platforms and fewer predators) in adjacent areas than exists in the action area. It is reasonably likely that murrelets nesting outside the action area will regularly migrate through the action area while flying to and from their nests. Pile driving between April 1 and August 5 generally requires a distance of greater than 180 feet from suitable habitat in order avoid adverse affects to marbled murrelets (USFWS 2003), (Table 4). Pile driving will take place on the north side of the river at almost twice the prescribed distance from potential suitable habitat (approximately 350 feet). Project activities using heavy equipment and motorized tools require a distance of greater than 105 feet. Work on the south side of the river will not take place until the bridge is in place; this will likely occur after August 15th, which will be outside of the murrelet early breeding season. Any work on the south side will be approximately 200 feet from potential suitable habitat. Work occurring during the breeding season will be 350 feet away. The effects of noise will be discountable due to the low probability of murrelet nesting in the action

		area during construction (see 5.1.2). If murrelet nesting does occur within the action area during construction, effects from noise would be insignificant due to the combination of distance and timing. Compared to pre-flood traffic volumes, there will be no substantial increase to traffic volumes resulting from the bridge replacement; therefore a long-term increase in disturbance to marbled murrelets is not expected.
#8	We are concerned about the possibility of fresh concrete spills into the river during construction, especially given the plan to hoist buckets of it across the river. The pressure washing of the old bridge abutments proposed could result in concrete dust polluting the river as well.	Approximately 6.5 cubic yards of concrete will be required for expansion of the south abutment. Once the concrete forms are constructed around the existing abutment, the crane will transfer wet concrete over the river from the gravel bar (approximately 80 feet) to the south abutment. A tarp will be hung under the bucket and the outside of the bucket will be cleaned off prior to each load, to prevent any concrete from dropping into the river. It is anticipated that only a few loads will be required. Concrete forms will be removed after and disposed after concrete has cured. The south abutment has been scraped by hand to remove most of the dirt and moss. The concrete appears to be sound. The abutment is approximately 10 feet above and 10 feet landward of the OHWM. Measures will be taken to prevent debris from entering the river if additional cleaning is required.
#9	We wish to correct the statement on p. 18 that "NEPA suggests [emphasis added] including analysis of a 'No Action Alternative'..." In fact, this analysis is required by NEPA, and must be rigorous and thorough. Furthermore, NEPA also requires that a full range of alternatives be examined. The EA evaluates only a single action alternative and the requisite 'No Action" alternative. At the least, an alternative to purchase the affected properties should also be evaluated.	Thank you for the correction. The draft EA completed in 2005 examined three options plus a no-action alternative for restoring access to the road. Three additional options were also considered but eliminated prior to writing the draft EA. The bridge option is in addition to these earlier analyzed options. In 2007 all of the affected property owners were presented with the option of forming of a Road Improvement District or closing the road permanently. Sixty seven percent of the affected property owners have opted to form an RID to contribute a share of the replacement bridge costs based on the assessed value of their property and cost of the project.
#10	In light of the Midwest's recent floods and, in some cases, entire towns of displaced Americans, we consider the construction of a bridge for 24 recreational properties and 1 residence an unwise use of taxpayer money. Specifically, the proposed action would provide access for 15 property owners, with only one being a year-round resident;	Your comment is noted. Snohomish County has spent several years evaluating a number of different alternatives to reestablish access to this area. Due to the terrain and location of the river, the options are limited. The bridge is being proposed as the best option with the least environmental impacts and cost. All potential alternatives have been discussed with the County Council and County Executive, including the alternative

	clearly the money intended for this project could be put to better use helping those not merely being inconvenienced.	of closing the road, and it was agreed to re-establish access to this area.
#11	The EA points out (p. 17) that Snohomish County would be required to fund maintenance of the road once access is restored. The economic implications of this must be considered, including the high likelihood that this road will wash out again in the future.	Your comment is noted. The road will remain an unpaved County road which requires minimal annual maintenance. A hydraulic analysis of the river was conducted as part of the studies for this project. The bridge option was selected because this site has been relatively stable compared with the area upstream that washed out in 2003.

USDA United States Department of Agriculture | Forest Service | Mt. Baker-Snoqualmie National Forest Darrington Ranger District | 1405 Emens Street Darrington, WA 98241 (360) 436-1155

File Code: 1950, 2730
Date: July 24, 2008

Mary Auld
Snohomish County Public Works
3000 Rockefeller, M/S 607
Everett, WA 98201

Re: Draft Environmental Assessment for proposed Monte Cristo Grade Road Bridge

Dear Ms. Auld,

Thank you for the opportunity to comment on the draft Environmental Assessment (EA) for this proposed County project. Constructing a bridge to restore public access to the recreational lots in the Verlot vicinity on the south side of the South Fork Stillaguamish River appears to be the least impacting and more lasting solution than attempting to rebuild or relocate the washed-out section of the Monte Cristo Grade road.

#1 Judging from the map provided on page 11 of the EA, it appears that the middle section of the bridge would be constructed on and over National Forest System land outside of existing rights of way to Snohomish County for the Monte Cristo Grade Road and 342nd Drive NE. Unless Snohomish County has an easement to the area once occupied by the former 1970s bridge (referenced on page 15 of the EA), I am requesting that Snohomish County obtain an easement for the bridge section outside of the rights-of-way. The county should also enter into a Consent

#2 Agreement with the Forest Service for the sections of bridge that would occupy NFS land within existing rights-of-way, as it involves new construction. As a result, the EA should address project effects to resources pertinent to NFS land management as directed by the Mt. Baker-Snoqualmie National Forest Land and Resource management Plan, as Amended. Our staff and I have reviewed the EA and bridge plans, and our comments follow.

#3 The Biological Assessment (BA) that Snohomish County prepared to address project effects to federally-listed threatened and endangered species under Section 7 of the Endangered Species Act (ESA) should include a cumulative effects analysis of other past, present and proposed bridge and bank stabilization projects along the South Fork Stillaguamish River.

#4 The EA should address project effects on species of interest that include Forest Plan Management Indicator species and neotropical migratory birds, as well as Forest Service Regional Forester Sensitive species (fish, and wildlife) and Special Status Species. A complete list is posted on Region Six's website, (www.fs.fed.us/r6/sfpnw/issssp/agency-policy) but includes:

Sensitive fish: Puget Sound/Straight of Georgia coho salmon, native Puget Sound Lake and Sensitive wildlife: such as peregrine falcon, wolverine, and Johnson's hairsteak.

Management Indicator wildlife species (Forest Plan): such as pine marten, and woodpeckers (including pileated woodpecker).

Special Status Species: http://www.fs.fed.us/r6/sfpnw/issssp/agency-policy.

#5 The EA should include a discussion of Forest Plan management direction for the South Fork Stillaguamish Recommended Scenic River, and project effects on the River's free-flowing characteristics and "Outstandingly Remarkable Values" (see attached documentation provided by our Wild & Scenic River Specialist).

#6 To address aesthetic values and meet visual quality objectives along this river, we suggest that the County use a "weathering" steel for the trusses, as appears to be implied by the photograph on page 37 of the EA.

#7 Our botanist determined that a survey for Forest Service Sensitive and Other Rare and Uncommon plant species would not be required, as the north bank of the river is an active flood plain, the forested south bank has been occupied by the road, and there was once a bridge in that location before.

#8 In addition to needing an easement for portions of the proposed Verlot bridge, I am aware of two other locations where the County should establish legal occupancy (easements) for existing facilities on NFS land: for a portion of the Whitton Avenue bridge in Silverton, and a portion of a public road that leads into the Verlot Riverfront Tracts (VRT) subdivision from the Monte Cristo Grade Road. Eric Ozog provided Susan Fenner of County staff an encroachment survey, drawings and past correspondence regarding the Silverton bridge and VRT access road. As easements are needed for all three facilities, this presents an opportunity to combine the grant process into one effort, for efficiency and cost savings. Under our NEPA regulations, we have authority to Categorically Exclude from EA documentation the granting of these easements by using a NEPA Checklist, because the Silverton bridge and VRT access road are existing facilities, and we would concur with your EA for the Verlot bridge if it addresses Forest Service resource issues. Also, Our Forest surveyor and crew has surveyed the portion of the Silverton bridge and Verlot access road that occupies NFS land, and would be happy to provide that data for the County to prepare plats. The construction plans for the Verlot bridge which Susan Fenner provided would be adequate for that easement plat, if the National Forest boundary and existing rights-of-way lines for 342nd Drive NE and Monte Cristo Grade Road are shown.

A preliminary estimate of the cost to process the three easements would be in the range of $6,000 to $7,000, including resource staff time for the NEPA Checklist, public scoping, plat review, and preparation of the easement documents. If Snohomish County is agreeable to covering this cost, I will determine if we can schedule this project for our Fiscal Year 2009, and send you a proposed Cost Recovery Agreement and cost estimate to complete this work.

Sincerely,

/S/ PHYLLIS REED (ACTING FOR)

PETER R. FORBES
District Ranger

Cc's: Susan Fenner, Snohomish County
Deanna Clark-Willingham, Snohomish County
Attch.

Response to comment letter from U. S. Forest Service
Monte Cristo Grade Road Bridge Replacement

Number	Issue	Response
#1	Judging from the map provided on page 11 of the EA, it appears that the middle section of the bridge would be constructed on and over National Forest System land outside of existing rights of way to Snohomish County for the Monte Cristo Grade Road and 342nd Drive NE. Unless Snohomish County has an easement to the area once occupied by the former 1970s bridge (referenced on page 15 of the EA), I am requesting that Snohomish County obtain an easement for the bridge section outside of the rights-of-way.	The County will obtain the necessary easements from the Forest Service for this project.
#2	The county should also enter into a Consent Agreement with the Forest Service for the sections of bridge that would occupy NFS land within existing rights-of-way, as it involves new construction.	The County will enter into a Consent Agreement with the Forest Service for this project.
#3	The Biological Assessment (BA) that Snohomish County prepared to address project effects to federally-listed threatened and endangered species under Section 7 of the Endangered Species Act (ESA) should include a cumulative effects analysis of other past, present and proposed bridge and bank stabilization projects along the South Fork Stillaguamish River.	Cumulative Effects of the project were considered in Appendix C of the Biological Assessment (BA) and is available on request. Snohomish County is planning another project within the vicinity of the proposed Monte Cristo Grade Road Bridge. Bridge #538 (commonly called Blue Bridge) is approximately ¼ mile upstream on the Mountain Loop Highway and crosses over the South Fork Stillaguamish River. Snohomish County proposes to complete a bank stabilization project to protect Blue Bridge. This project is proposed for 2009 or 2010. The left bank of the Stillaguamish River, immediately upstream from the Blue Bridge is comprised of fine sand and silt that eroded during a 2006 flood. Continuing erosion threatens the piers and road approach on the eastern end of the bridge. Snohomish County proposes to construct a log crib wall combined with bioengineering and limited rock riprap to prevent additional loss of the riverbank.

		A Biological Assessment for the Blue Bridge project is being prepared and is expected to be issued Fall/Winter 2008-2009. This project is not expected to affect the proposed Monte Cristo Grade Road Bridge.
#4	The EA should address project effects on species of interest that include Forest Plan Management Indicator species and neotropical migratory birds, as well as Forest Service Regional Forester Sensitive species (fish, and wildlife) and Special Status Species.	Additional studies were conducted to analyze impacts to wildlife species included in the Mt. Baker-Snoqualmie National Forest Land and Resource Management Plan. A Biological Assessment was also completed to address species protected by the Endangered Species Act. See Appendix D.
#5	The EA should include a discussion of Forest Plan management direction for the South Fork Stillaguamish Recommended Scenic River, and project effects on the River's free-flowing characteristics and "Outstandingly Remarkable Values" (see attached documentation provided by our Wild & Scenic River Specialist).	Information concerning the South Fork Stillaguamish Recommended Scenic River has been incorporated into the final EA.
#6	To address aesthetic values and meet visual quality objectives along this river, we suggest that the County use a "weathering" steel for the trusses, as appears to be implied by the photograph on page 37 of the EA.	A weathering steel truss is planned for the bridge.
# 7	Our botanist determined that a survey for Forest Service Sensitive and Other Rare and Uncommon plant species would not be required, as the north bank of the river is an active flood plain, the forested south bank has been occupied by the road, and there was once a bridge in that location before.	Thank you for your determination.
#8	In addition to needing an easement for portions of the proposed Verlot bridge, I am aware of two other locations where the County should establish legal occupancy (easements) for existing facilities on NFS land.	Easements for these two other location will be prepared separately from the easements needed for the Monte Cristo Grade Road Bridge.

Sir, thank you for your comments; I will note them for the record and take them under consideration.

Mark

From: Mike McGivern [mailto:mariners.fan2@comcast.net]
Sent: Sunday, June 29, 2008 11:37 AM
To: Eberlein, Mark
Subject: Monte Cristo Grade Road Bridge

Dear Mark,

#1 We would like to formally make a recommendation to consider Alternative B – No Action Alternative as noted in section 2.1.2 of the Monte Cristo Grade Road Bridge Draft Environmental Assessment, FEMA -1499-DR-WA (Public Assistance) June 2008.

Our family owns a cabin on 102nd St NE, 5 properties west of the proposed bridge on 342nd Dr NE. We do not think the 1.5 to 2 million dollars use of taxpayer funds is justified to provide access to 1.35 miles of dead end gravel road access to 24 recreational properties and 1 residence.

Monte Cristo Grade Road is visible directly across the South Fork of the Stillaguamish River from our property. Most of the usage of the road, in our opinion, comes from people looking for camping spots, of which there are none, from partying teenagers in caravans, and from people driving around exploring. There is a considerable amount of traffic in the summer months, much more than you would expect for 24 recreational properties and 1 residence. Because this is a
#2 gravel road with no signage, it's not uncommon to have vehicles traveling at higher than safe rates of speed kicking up dust that migrates across the river to our property and others around us. The bridge will be within direct sight view of our cabin and property. There will be a considerable
#3 noise generated whenever the bridge is crossed by a vehicle because of the planned decking design of open steel grate. The noise generated by a vehicle crossing would be substantial, and in our opinion, degrade the serenity or our mountain retreat. The gravel road is another noise generator. We have thoroughly enjoyed having only the resident's truck as the sole vehicle on the road since the washout.

As you can tell, we are biased against the bridge because it directly affects the enjoyment of our mountain retreat for many reasons. We also fear a decrease in our property value because of the disturbance and visibility issues.

Thank you for consideration of our recommendation for Alternative B – No Action.

Mike and Cynthia McGivern
11001 NE 65th St
Kirkland Wa. 98033

CC: Maria Cantwell, Patty Murray

Response to comment letter from Mike and Cynthia McGirvin
Monte Cristo Grade Road Bridge Replacement

Number	Issue	Response
#1	We would like to formally make a recommendation to consider Alternative B – No Action Alternative as noted in section 2.1.2 of the Monte Cristo Grade Road Bridge Draft Environmental Assessment, FEMA -1499-DR-WA (Public Assistance) June 2008. Our family owns a cabin on 102nd St NE, 5 properties west of the proposed bridge on 342 nd Dr NE. We do not think the 1.5 to 2 million dollars use of taxpayer funds is justified to provide access to 1.35 miles of dead end gravel road access to 24 recreational properties and 1 residence.	Thank you for your letter and your comments. In 2007 all of the affected property owners were presented with the option of forming of a Road Improvement District (RID) or closing the road permanently. 67% of the affected property owners have opted to form an RID to contribute a share of the replacement bridge costs based on the assessed value of their property and cost of the project. Snohomish County and Federal Emergency Management Agency (FEMA) will share the remaining costs.
#2	Because this is a gravel road with no signage, it's not uncommon to have vehicles traveling at higher than safe rates of speed kicking up dust that migrates across the river to our property and others around us.	Signage will be installed when the bridge is complete.
#3	There will be a considerable noise generated whenever the bridge is crossed by a vehicle because of the planned decking design of open steel grate. The noise generated by a vehicle crossing would be substantial, and in our opinion, degrade the serenity or our mountain retreat.	The bridge design has been modified from the originally proposed open steel grate to a wood deck which may help to reduce the noise levels.