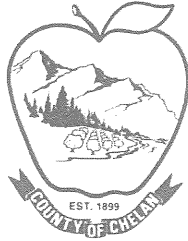


# North Road Improvement Project Final Detailed Mitigation Report



Chelan County, WA  
County Road Project Number 636



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# **1 Introduction**

## **1.1 Project Summary**

The Chelan County Public Works Department (CCPW) is proposing to construct a roadway improvement project that is located along North Road, approximately 0.50 miles northeast from the City of Leavenworth, Washington, between the intersections with the Chumstick Highway and Fox Road. This project is located Section 1, T24N, R17E and Section 6, T24N, R18E W.M. The location of the project site is shown on Figures 1 through 3, found at the end of this report. Appendix D contains photos of the project area.

The project will widen the existing 24-foot North Road to 26 feet and improve pavement structure, width, horizontal and vertical alignment, railroad trestle clearance, one culvert, drainage, and clear areas. The overall goal of the project is to improve fish passage and safety on this rural two-lane road, not to increase vehicle capacity.

The design of North Road has been through numerous revisions in order to reduce impacts to critical areas along the 0.56 mile project corridor. Design features which attempted to minimize impacts to wetlands were implemented, such as, over-steepened slopes, limiting sensitive area impacts to temporary, retaining walls, guardrails, realignment into upland areas, and smaller roadway widths.

## **1.2 Culvert Replacement**

Chumstick Creek is adjacent to North Road at mile post (MP) 0.05, between the Chumstick Highway and Motteler Road, and is one of two water bodies within the project area. This creek is classified as a Type F (fish bearing) water body. North Road crosses over Chumstick Creek on approximately 35 to 40 feet of fill and flows through a 10-foot diameter by 180-foot long corrugated metal culvert.

Chumstick Creek culvert below North Road is a full barrier to spring Chinook salmon and a partial passage barrier to steelhead. In addition to roadway improvement work, the existing culvert and much of the fill material above it will be removed and replaced with a new bridge carrying North Road over Chumstick Creek. The proposed bridge will be a single span concrete girder bridge and will accommodate two lanes of traffic with provisions for a future sidewalk, for a total width of 32 feet and span length of about 150 feet (see Appendix C for details).

Excavation of the existing roadway fill above the culvert will likely be performed in two stages. In the first stage, excavation will be done from North Road to create a bench located about 10 to 15 feet below the road. Next, a temporary access road will be constructed on the west side of the ravine, south of North Road, adjacent to County Shop Road. The second stage of excavation will consist of diversion of the creek around the

project area and removal of the remainder of the roadway fill and culvert. The culvert will need to be cut into pieces and lifted out of the dry creek bed. After which, creek enhancement activities will be conducted. Section 3.3 discusses further on what these activities will entail.

## 2 Sensitive Area Impacts

### 2.1 Sensitive Area Impacts

Unavoidable wetland and buffer impacts are the result of placing fill in sensitive areas to accommodate road construction, creating an overall safer route for the community to travel. Resulting from this project, 1,037 ft<sup>2</sup> (0.02 acres) of lower functioning Category III wetlands will be permanently impacted, in addition to 1,937 ft<sup>2</sup> (0.04 acres) of wetland buffer impacts (see Appendix B). Table 1A outlines the permanent wetland and buffer impacts.

**Table 1A: Summary of *Permanent* Wetland and Buffer Impacts**

Wetland	Wetland Impact (ft <sup>2</sup> )	Buffer Impact (ft <sup>2</sup> )
Chumstick Creek Wetland (Wetland A)	0	0
Stevens Creek Wetland (Wetland B)	232 (0.005 acres)	1,937 (0.04 acres)
North Road Ditch Wetland (Wetland C and D)	805 (0.02 acres)	0
Totals	1,037 (0.025 acres)	1,937 (0.04 acres)

In an effort to minimize permanent wetland impacts resulting from the roadway improvement project, temporary wetland and buffer impacts will occur. Temporary removal of vegetation is needed in order to remove the Chumstick Creek culvert, construct a bridge over the top of the creek, and to improve the Steven Canyon Creek culvert. Resulting from this project 1,102 ft<sup>2</sup> (0.03 acres) of temporary wetland impacts and 25,694 (0.58 acres) of temporary buffer impacts will occur (see Appendix B). Within the temporary impact area, all disturbed vegetation will be replanted. Table 1B below summarizes these temporary impacts.

**Table 1B: Summary of *Temporary* Wetland and Buffer Impacts**

Wetland	Wetland Impact (ft <sup>2</sup> )	Temporary Buffer Impact (ft <sup>2</sup> )
Chumstick Creek Riparian Buffer	0	23,737 (0.54 acres)
Chumstick Creek Wetland (Wetland A)	324 (0.01 acres)	0
Stevens Creek Wetland (West of Wetland B)	778 (0.02 acres)	1,957 (0.04 acres)
North Road Ditch Wetland (Wetland C and D)	0	0
Totals	1,102 (0.03 acres)	25,694 (0.58 acres)

## 2.2 Supporting Documentation

In November 2008, David Evans and Associates, Inc wetland biologist completed the *Wetland and Stream Report for the North Road Improvements* (Henrichsen) and Grette Associates, LLC completed the Icicle Station, Leavenworth, WA – *Wetland Delineation and Classification Report*. Both can be found in Appendix A and discuss:

- Background and existing information on the project area;
- Field investigation/delineation results (wetland and stream);
- Existing wetland function and values;
- Regulatory requirements; and
- Figures and Photographs

If additional wetland information is needed and can not be found in this report, refer to the above referenced reports.

## 2.3 Wetland Mitigation

For mitigating wetland and buffer impacts, CCPW will perform out-of-kind resource tradeoff compensatory mitigation by re-establishing lost and degraded habitat and ecosystems within and adjacent to Chumstick Creek. In particular, as part of the North Road Improvement Project CCPW will remove the 10-foot by 180-foot Chumstick Creek culvert under North Road and replace it with a 150-foot long bridge. The removal of the culvert will create additional floodplain (see Section 2.3.1 for additional information) and provide a critical link for restoring year-round passage to spring Chinook salmon (listed as endangered) and steelhead trout (reclassified as threatened).

According to the *Wetland Mitigation in Washington State Part 1: Agency Policies and Guidance* (Ecology *et al.* 2006), Section 6.3.2.3 out-of-kind resource tradeoff may be allowed when, in part:

- Wetland impacts occur to a highly degraded wetland, which provides low levels of wetland function.
- It can be demonstrated that the greatest environmental benefits in a basin can be achieved by restoring, rehabilitating, or preserving non-wetland resources.
- Options for meaningful wetland compensation are limited or non-existent.
- When the non-wetland habitats contribute to the restoration of habitats for sensitive or endangered species.

In addition to removing the partial fish barrier culvert, CCPW proposes to mitigate 0.02 acres of wetland impacts by re-establishing the riparian corridor with plantings totaling 0.08 acres. This 0.08 acres will include the willow shrub and riparian forest vegetative communities. Table 2 below outlines the mitigation totals.

**Table 2: Wetland Mitigation Totals**

Wetland Category	Wetland Impact (ft <sup>2</sup> )	Mitigation Ratio	Mitigated Area (ft <sup>2</sup> )
Category III	1,037 (0.02 acres)	3:1	3,300 (0.08 acres)

The Chumstick Creek plan/mitigation sheets can be found in Appendix C.

### 2.3.1 Floodplain Re-Establishment

CCPW proposes to enhance Chumstick Creek channel by matching the up- and downstream channel grade following the removal of the culvert and replacing it with a bridge. Newly formed side slopes will blend with existing side slopes immediately up- and downstream of the removed culvert. The scour hole that currently exists at the culvert outlet will be retained and a grade control structure will be constructed at the upstream side of the scour hole to reduce the potential for a head cut to move upstream in the new channel. The grade control structure will be constructed of 3- to 4-foot diameter, rounded boulders. A predetermined streambed material mix will be placed along the entire low flow channel bed.

Within the 226-foot Chumstick Creek channel, considered the project area, only 920 ft<sup>2</sup> of floodplain exists. The 180-foot culvert located under North Road (which is considered part of the roadway infrastructure) utilizes 3,600 ft<sup>2</sup> of creek floodplain. The proposed North Road Improvement Project will remove the culvert and restore the floodplain in the project area. Because of this, the net gain of floodplain in the project area will be 3,826 ft<sup>2</sup>. Below is a detailed calculation on the floodplain within the project area.

#### Existing Floodplain

$$\begin{aligned}
 &20\text{-ft channel width} * 226\text{-ft channel length} = 4,520 \text{ ft}^2 \\
 &20\text{-ft channel width} * 180\text{-ft culvert length} = 3,600 \text{ ft}^2 \\
 &4,520 \text{ ft}^2 \text{ existing floodplain} - 3,600 \text{ ft}^2 \text{ of existing culvert} = \\
 &\quad \boxed{920 \text{ ft}^2 \text{ existing floodplain in the project area}}
 \end{aligned}$$

#### Proposed Floodplain

$$\begin{aligned}
 &21\text{-ft channel width} * 226\text{-ft channel length} = \\
 &\quad \boxed{4,746 \text{ ft}^2 \text{ proposed floodplain}}
 \end{aligned}$$

#### Net Gain in Floodplain Area

$$\begin{aligned}
 &4,746 \text{ ft}^2 \text{ of proposed floodplain} - 920 \text{ ft}^2 \text{ of existing floodplain} = \\
 &\quad \boxed{3,826 \text{ ft}^2 \text{ net gain in floodplain in the project area}}
 \end{aligned}$$

## 2.4 Riparian Buffer and Wetland Buffer Mitigation

Riparian and wetland buffers within the project area are relatively nonexistent with sparse vegetation present because of development such as infrastructure for the BNSF railroad,



private driveways, agriculture land, and North Road itself. The North Road Improvement Project will permanently impact 0.04 acres of wetland buffer. Per Chelan County and the Department of Ecology, at a minimum CCPW is required to mitigate using a 1:1 ratio. However, as part of the Chumstick Creek culvert removal, re-establishment/enhancement of 0.29 acres of upland forest buffer will be part of the project. The planting and re-establishment of the upland forest buffer will utilize a 6:1 mitigation ratio (see Table 3). A maintenance easement will be located off each wingwall of the new bridge over Chumstick Creek, in anticipation of future maintenance/bridge work. This area is not included in the upland forest buffer calculation. See Figure 4 for details.

**Table 3: Buffer Mitigation Totals**

Wetland Category	Buffer Impact (ft <sup>2</sup> )	Mitigation Ratio	Mitigated Area (ft <sup>2</sup> )
Category III	1,937 (0.04 acres)	6:1	12,525 (0.29 acres)

## 2.5 Temporary Impacts

The North Road Improvement Project will have a total of 0.61 acres of temporary wetland and buffer impacts associated with it. These impacts are necessary in order to complete the project, as proposed. The majority of the temporary impacts will occur when 0.55 acres of Chumstick Creek wetland and buffer vegetation will be impacted in order to remove the culvert, install new bridge structures, and conduct enhancement activities to the creek (streambed material, grade control structure, channel realignment, etc.).

The remaining, 0.06 acres of temporary impacts will occur at Stevens Canyon Creek. Here, the culvert under North Road will be removed and replaced with a larger one. This will allow for a greater culvert capacity in order to minimize roadway flooding in this area. However, because of the additional culvert capacity, the already disturbed creek channel will need to be reshaped. Construction sequencing will include; removing the top 12-inches of wetland soil and stockpile separately, install the new culvert, the stockpiled soil will be placed back over the wetland, and finally the disturbed Steven Canyon Creek area will be revegetated/restored with native species. All of the 0.06 acres of temporarily impacted area will be self-mitigating by replanting with adjacent like or similar native species.

## 3 Mitigation Site

### 3.1 Site Selection

The existing 10-foot diameter by 180-foot long culvert for Chumstick Creek is a partial fish passage barrier culvert and will be replaced with a bridge and natural stream channel to provide year-round passage to all fish species at all life stages. The goal of this action is to increase the spatial structure, abundance and productivity of Upper Columbia spring Chinook salmon (listed as endangered) and steelhead (reclassified as threatened) in the Wenatchee subbasin. Chumstick Creek is a major spawning area for steelhead and minor

spawning area for spring Chinook. This proposal directly addresses the Upper Columbia Revised Biological Strategy's Tier 1 habitat action recommendation to restore fish passage by providing unobstructed passage under North Road. By removing fish passage barriers on Chumstick Creek, a migration corridor will be re-established for Chinook, steelhead, and re-introduced coho. In addition, for a different project, Chelan County has obtained funding from Bonneville Power Administration to replace approximately twelve private culverts upstream of this project. Replacement of these barriers would open approximately 7 miles of spawning and rearing habitat on Chumstick Creek.

### **3.2 Watershed Description**

The proposed project is located within the Icicle/Chumstick Watershed and the Derby Canyon Sub-watershed. Rural development and the Chumstick Highway have channelized Chumstick Creek. Historic disturbances also include logging and culvert placement. Agricultural and urban development, in addition to railroad and road construction, have contributed to general disturbance of riparian habitat, resulting in loss of riparian vegetation, channel confinement, and surface erosion. According to a USFWS stream survey; nine of the 28 culverts on Chumstick Creek may be fish passage obstructions, including the North Road culvert.

### **3.3 Resource Tradeoff Mitigation – Floodplain Re-Establishment**

#### *Design*

The proposed creek enhancement design consists of a low flow channel and floodplain terrace. The bottom width of the channel is proposed to be 8 feet, sloped 4H:1V from centerline to 1H:1V side slopes up to a 5-foot wide bench on both sides of the channel resulting in a total channel width of 21 feet. The side slope rising up to the bridge abutments range from 2H:1V (west embankment) to 1.5H:1V (east embankment).

The low flow channel bench will consist of double fabric encapsulated soil lifts (FESL) on each side of the restored channel. Due to anticipated high channel velocities, the use of a turf reinforcement matting (TRM) will be used above the FESL, up to an elevation of the 100-year water surface elevation. Temporary erosion control fabric (coir or jute matting) placed above the 100-year water surface elevation is proposed as a measure to protect disturbed channel side slopes until vegetation establishes. Brushlayering techniques to provide added bank stabilization are incorporated in both the FESL and TRM slope protection methods and irrigation installed within brushlayers will increase survival rates of plantings during hot summer months.

A grade control structure is proposed, in order to keep an existing scour pool within the Chumstick Creek channel. Streambed material will be placed along the entire low flow channel bottom width of 8 feet and will extend laterally 2 feet on each side. The streambed material gradation was determined using guidelines presented in the 2003 WDFW, *Design of Road Culverts and Fish Passage*. Streambed materials will consist of loose to medium dense, angular, silty sand with gravel, cobbles, and boulders.

Within the limits of disturbance where the new slopes are graded, vegetation (upland forest, riparian forest, and willow shrub, see Table 4) and biotechnical reinforcement (fabric encapsulated soil lifts, coir matting, and a permanent turf reinforcement mat) will be included. Vegetation and biotechnical reinforcement of the slopes will occur within the limits of disturbance. All disturbed slopes will be vegetated along with installation of temporary erosion control measures to minimize development of rills and surface erosion of the newly constructed slopes.

The Chumstick Creek culvert removal and subsequent channel/re-establishment design has been a cooperative effort between WDFW and CCPW. WDFW has approved all aspects of the design effort that CCPW has proposed.

### *Benefits*

Floodplains provide immeasurable recreational, economic, and scientific opportunities for humans and diverse habitats for birds, fish, mammals, reptiles, and other wildlife. They play an integral part in the function of our river systems because of the connection to surface waters and wetlands. The alteration or development of the floodplains eliminates or degrades these vital values and resources.

If floodplains are relatively undisturbed or have been restored to a nearly natural state, they provide a wide range of benefits. Some of which include:

- Reduce flood velocities and peaks
- Flood storage and conveyance
- Accommodate stream meander
- Filter nutrients and impurities
- Moderate water temperature changes
- Maintain high biological productivity of floodplain and wetland vegetation
- Provide breeding and feeding grounds
- Protect rare and endangered species habitat (ie. in the North Road area steelhead trout and Chinook salmon)
- Support high rate of plant growth
- Maintain biodiversity
- Integrity of ecosystem

### **3.4 Proposed Vegetation**

Vegetation has been selected for the floodplain enhancement site for numerous reasons, including but not limited to, replicating impacted species from the culvert removal portion of the roadway improvement project, the ability to adapt to site conditions, capability to increase floodplain functions, and how readily available each specie is locally.

The existing roadway/culvert embankment is vegetated with ponderosa pine, wild rose, snowberry, red-osier dogwood, willow species, and a variety of other upland brush and grass species. Table 4 details the proposed planting plan and seed mix and separated out by willow shrub, riparian forest, and upland forest. The same three plant community zones are designated for the seed mix. The detailed planting and creek restoration plan can be found in Appendix C.

**Table 4: Planting Plan**

Plant Schedule				
Plant Community		Scientific Name	Common Name	Quantity
Willow Shrub	Tree	<i>Salix lasiandra</i>	Pacific Willow	20
	Shrub	<i>Salix bebbiana</i>	Bebb's willow	66
		<i>Salix exigua</i>	Coyote willow	65
		<i>Alnus incana</i>	Gary alder	157
		<i>Cornus sericea</i>	Red-osier dogwood	131
Riparian Forest	Tree	<i>Populus balsamifera</i>	Black cottonwood	15
		<i>Alnus rubra</i>	Red alder	31
	Shrub	<i>Acer glabrum</i>	Douglas maple	31
		<i>Crataegus douglasii</i>	Black hawthorn	31
Upland Forest	Tree	<i>Pinus ponderosa</i>	Ponderosa pine	45
	Shrub	<i>Symphoricarpos albus</i>	Common snowberry	354
		<i>Amelanchier alnifolia</i>	Serviceberry	354

Seed Mix		
Plant Community	Scientific Name	Common Name
Willow Shrub	<i>Glyceria striata</i>	Fowl mannagrass
Riparian Forest	<i>Calamagrostis canadensis</i>	Blue joint
	<i>Deschampsia caespitosa</i>	Tuft hairgrass
Upland Forest	<i>Calamagrostis rubescens</i>	Pinegrass
	<i>Hesperostipa comata</i>	Needle and thread grass
	<i>Lomatium triternatum</i>	Nine-leaf lomatium
	<i>Elymus glaucus</i>	Western ryegrass
	<i>Lupinus sericeus</i>	Silky lupine

## 4 Mitigation Goals, Objectives, and Performance Criteria

Goals describe the intent of mitigation effort and planned accomplishment or end product. An objective is a key element of the overall goal needed to achieve the end product. Goals and objectives must be appropriate, achievable and sustainable. Each objective has performance measures and success standards, these performance criteria set the targets that determine if the objective is met. Performance measures and success standards must be meaningful, measureable, and achievable.

### 4.1 Mitigation Goals

#### *Primary Mitigation Goals*

CCPW proposes to restore the characteristics of Chumstick Creek within the project area by re-establishing the natural and historic functions, with the primary goal to promote year-round fish passage of threatened steelhead and endangered Chinook salmon. This will be accomplished by removing the partial fish barrier culvert and replacing it with a bridge; creating 3,826 ft<sup>2</sup> of additional floodplain and adding 0.08 acres of a willow shrub and riparian forest plant communities. In addition, appropriate streambed material will be imported and creating a grade control structure to prevent a loss of an important scour pool.

Resulting from the roadway improvement project, the mitigation area will serve to replace loss functions from the impacted wetlands and the Stevens Creek riparian buffer, totaling 0.02 and 0.04 acres, respectively. Re-established functions include, but are not limited to;

- Reducing flood velocities and peaks,
- Flood storage and conveyance,
- Filter nutrients,
- Maintain high biological productivity,
- Provide breeding and feeding grounds, and
- Maintain biodiversity.
- Fish and wildlife habitat,
- Food chain support; and
- Improved temperature moderation to Chumstick Creek.

A secondary goal of the project is revegetating the riparian buffer. Riparian habitat will be temporarily cleared in order to remove the Chumstick Creek culvert and regraded so the existing side slopes (riparian buffer) will match the grade up- and downstream. Because of this temporary disturbance, 0.41 acres of upland forest community will be replanted. Of the 0.41 acres of upland forest, 0.29 acres will be utilized as buffer mitigation.

### *Mitigation Site Protection*

The boundary CCPW's Chumstick Creek mitigation area, which includes 0.08 acres of re-established riparian corridor and 0.29 acres of upland forest buffer, will be placed in the in the County's right-of-way plan sheets. This area will be designated as an "environmentally sensitive area, wetland mitigation site" and will note that any future development is prohibited within this boundary.

## **4.2 Objectives, Performance Measures, and Success Standards**

Chelan County, or an appointed representative, will monitor the mitigation area for (ten) 10 years after installation. If all the success standards are achieved in less than ten (10) years monitoring, Chelan County may terminate monitoring with approval of the review agencies. Formal monitoring, which generally involves quantitative methods (mortality counting and percent cover), will be completed and documented one, three, five, seven, and ten years after construction. Chelan County, or an appointed representative, will also complete qualitative assessments of the mitigation area on years two, four, six, eight, and nine for adaptive management purposes only. The monitoring area will include the 0.08 acres of willow shrub and riparian forest habitat, with an additional 0.29 acres of upland forest buffer habitat to accommodate permit requirements. The monitoring will determine if the performance measures or success standards have been met. If they have not been met, adaptive management will be implemented. The purpose of the mitigation plan is to achieve the prescribed success standards unless Chelan County, in consultation with the regulatory agencies, establishes replacement standards based on circumstances and conditions observed at the mitigation site. Monitoring reports will be submitted to the Army Corps of Engineers, and if needed Washington State Department of Ecology for review.

Chelan County anticipates the mitigation goals will be accomplished with the construction and installation of the mitigation design as shown on the planting plan in Appendix C. Contingency actions (see Section 4.4), however, may be needed to correct unforeseen problems.

Any same-species replacements made after permit issuance can be mentioned in the next monitoring report, any substantive changes must be coordinated with the Army Corps of Engineers and if needed, Ecology. Failure to meet the proposed standard will be included with each monitoring year report in order to approve contingency changes to the mitigation.

### ***Objective 1 – Establish a Native Plant Community***

The mitigation site will include willow shrub, riparian forest, and upland forest plant communities. All three communities should be established within 10 years of planting the area. Within the 10 years, aerial coverage of both the willow shrub and riparian forest should be no less than 50%, 70% in the emergent (grass) area, and 50% in the upland forest.

## Performance Measures

### All Years:

- No more than 30% coverage of non-native, invasive species in the willow shrub, riparian forest, and upland forest areas by the following: reed canarygrass (*Phalaris arundinacea*), non-native blackberries (*Rubus sp.*), knapweed (*Centaurea sp.*), or any other non-native, invasive species.

### Year 1:

- The vegetation will achieve 90% survival of planted species at the end of the first year plant establishment period. If all dead species plantings are replaced, the performance measures will be met.

### Year 3:

- Native woody shrub species (planted or volunteer) will maintain an average density of at least 4 plants per 100 square feet in the willow shrub, riparian forest, and upland forest plant communities. Native colonizing vegetation will be included in these coverage calculations.
- Native emergent vegetation will achieve 40% coverage.

### Year 5:

- Native woody shrub species (planted or volunteer) will achieve 35% aerial coverage in the willow shrub and riparian forest plant communities. Native woody colonizing vegetation will be included in these coverage calculations.
- Native woody species will achieve 30% coverage in the upland forest buffer community.
- Native emergent vegetation will achieve 50% coverage.

*Note: If all of the Year 10 performance standards are met in this year, the applicant can present the data to the Army Corps of Engineers that the mitigation site has achieved all requirements for wetland mitigation. If the site is accepted by the Army Corps of Engineers and determined complete and successful, additional monitoring will not be required.*

### Year 7:

- Native woody shrub species (planted or volunteer) will achieve 40% aerial coverage in the willow shrub and riparian forest wetland. Native colonizing vegetation will be included in these coverage calculations.
- Native woody species will achieve 40% coverage in the upland forest buffer community.
- Native emergent vegetation will achieve 60% coverage.

*Note: If all of the Year 10 performance standards are met in this year, the applicant can present the data to the Army Corps of Engineers that the mitigation site has achieved all requirements for wetland mitigation. If the site is accepted by the Army Corps of Engineers and determined complete and successful, additional monitoring will not be required.*

Year 10:

- Native woody shrub species (planted or volunteer) will achieve greater than 50% coverage in the willow shrub and riparian forest wetland. Native colonizing vegetation will be included in these coverage calculations.
- Native woody species will achieve greater than 50% coverage in the upland forest buffer community.
- Native emergent vegetation will achieve 70% coverage.

#### **4.3 Maintenance Plan**

The goal of the wetland mitigation area is to create a functional self-sustaining system that should require very little maintenance. Once the vegetation is established, minimum disturbance will occur. Maintenance will be performed by Chelan County personnel or a contracted company and would be confined to repairing vandalism, erosion damage, minor re-vegetation (if necessary), trash collection, and weed control. For the first few years, maintenance personnel may be onsite monthly during the growing season (May-October) to provide necessary weed control and check overall health of vegetation growth.

#### **4.4 Contingency Plan**

If the mitigation plan is not meeting its performance measures and success standards, implementation of the contingency plan may be necessary. Failure to meet the proposed vegetation standard of success will result in some or all of the following contingency actions:

- Plant additional vegetation – Additional planting may be required to meet plant cover standards. Plant species will be evaluated in relation to site conditions to determine if plant species substitutions will be required.
- Weed control – Control of competitive weed/invasive species may be required if plant survival or cover standards are not met. Methods of weed control could include hand or mechanical weeding, mulching, or herbicide application.
- Herbivore control – If vegetation cover or survival standards are not met because of animal browsing, the wildlife responsible will be identified and appropriate damage control methods employed. Possible control methods include fencing, use of repellents, and temporary barriers.
- Contingency revisions require coordination with the Army Corps of Engineers. Failure to meet the proposed standard must be included with each monitoring year report in order to approve contingency changes to the mitigation.



## **5 Implementation Schedule**

The wetland mitigation area will be constructed concurrently with the North Road Improvement project. Planting will occur in the late fall 2009, when site conditions allow. Monitoring will begin the spring of 2010, during the “green-up” period.

## **6 Conclusions**

CCPW is proposing to construct a roadway improvement project that is located along North Road, 0.50 mile northeast of Leavenworth, Washington. Unavoidable wetland and buffer impacts are the result of placing fill in wetlands to accommodate road widening; creating an overall safer route for the community to travel. CCPW is proposing to mitigate for those impacts through removing a fish barrier culvert and re-establishing 0.37 acres of the Chumstick Creek riparian and buffer habitat within the Icicle/Chumstick Watershed and the Derby Canyon Sub-watershed.

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