

# Lewis River Hydroelectric Projects

*FERC Project Nos. 935, 2071, 2111, 2213*



Photo courtesy of Kendel Emmerson

## 2010 Annual Report

*Lewis River Aquatic Fund Projects*



April 2010

## Introduction

This 2010 Annual Report prepared by PacifiCorp Energy and the Public Utility District No. 1 of Cowlitz County, Washington (“Cowlitz PUD”) (collectively the “Utilities”) is provided to the Lewis River Settlement Agreement Parties to fulfill the reporting requirement in Article 7.5.3.2 (5) of the Settlement Agreement (SA). This report identifies the actions and selection of Aquatic Resource Projects (Resource Projects) to be funded from the Lewis River Aquatic Fund established under terms of the SA (Article 7.5, see **Appendix A**). Although the funding process was managed by the Utilities, the Aquatic Coordination Committee (ACC) provided final approval of funded projects. This report includes only Resource Projects selected from the 2009/2010 funding process, additional projects are expected to be selected and funded annually following the process established by the ACC.

This 2010 report is available to the Public on PacifiCorp Energy’s website at [http://www.pacificorp.com/content/dam/pacificorp/doc/Energy\\_Sources/Hydro/Hydro\\_Licensing/Lewis\\_River/annual\\_report\\_cover.pdf](http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Hydro/Hydro_Licensing/Lewis_River/annual_report_cover.pdf)

Copies of this report are available from PacifiCorp Energy upon request.

## Background

PacifiCorp Energy owns the Merwin, Yale, and Swift No. 1 hydroelectric projects on the Lewis River in southwest Washington. Cowlitz PUD owns the Swift No. 2 hydroelectric project, also located on the Lewis River. These projects are operated as a coordinated system by PacifiCorp Energy. On November 30, 2004, the Lewis River Settlement Agreement established the Lewis River Aquatics Fund (Fund). The purpose of the Fund is to support resource protection measures through funding aquatic related projects in the Lewis River basin.

As identified in the SA:

*“Resource Projects may include, without limitation, projects that enhance and improve wetlands, riparian, and riverine habitats; projects that enhance and improve riparian and aquatic species connectivity that may be affected by the continued operation of the hydroelectric projects; and projects that increase the probability for a successful reintroduction program upstream of Merwin Dam. Species that are targeted to benefit from Resource Projects include Chinook, steelhead, coho, bull trout, chum, and sea-run cutthroat.”*

Under the direction of the SA, the Utilities in Consultation with the ACC developed the “Aquatics Fund -- Strategic Plan and Administrative Procedures” (September 2005 – Revised January 2009). This strategic plan provides: (a) a guide to Resource Project development, solicitation, and review; and (b) provides administrative procedures to guide implementation of the Aquatics Fund.

The strategic plan is available to the Public on PacifiCorp Energy's website at:  
[http://www.pacificorp.com/content/dam/pacificorp/doc/Energy\\_Sources/Hydro/Hydro\\_Licensing/Lewis\\_River/Aquatics\\_Fund\\_Strategic\\_Plan\\_and\\_Administrative\\_Procedures\\_Sept\\_2005\\_Revised\\_January\\_2009.pdf](http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Hydro/Hydro_Licensing/Lewis_River/Aquatics_Fund_Strategic_Plan_and_Administrative_Procedures_Sept_2005_Revised_January_2009.pdf)

On September 4, 2009, PacifiCorp announced the availability of calendar year (CY) 2010 funds for aquatic related projects in the Lewis River Basin (Letter to interested parties from T. Olson, PacifiCorp, see **Appendix B**). The letter requested that individuals or parties interested in obtaining project funding submit a Pre-Proposal to PacifiCorp. Pre-Proposals were due by October 5, 2009.

In response to the announcement letter, six entities provided ten different project Pre-Proposals. They include:

<b>Applicant</b>	<b>Project Title</b>
Olympic Resource Management	9015/30 Rd. Fish Passage Upgrade
USDA Forest Service	Sheep Bridge Removal
USDA Forest Service	Pepper-Lewis Side Channel Instream Habitat Restoration
USDA Forest Service	2010 Nutrient Enhancement on Pine Creek
USDA Forest Service	Pine Creek Instream and Floodplain Structures for Bull Trout and Steelhead
Lower Columbia Fish Enhancement Group	NF Lewis RM 13.5 Off-Channel Habitat Enhancement
USFWS	Bull Trout Population Structure and Habitat Use in Tributaries to Swift Reservoir and the North Fork Lewis River
USFWS	Bull Trout Population Structure in the Lewis River Basin
Gifford Pinchot Task Force	Clear Creek Habitat Improvement Project
Cowlitz Indian Tribe	Eagle Island Habitat Enhancement

Following the Aquatics Fund – Strategic Plan and Administrative Procedures, PacifiCorp and Cowlitz PUD reviewed and evaluated the Pre-Proposals and, on November 6, 2009, provided the ACC with a list of projects recommended for further consideration (Memo to ACC from Shrier – PacifiCorp and Gritten-MacDonald – Cowlitz PUD, see **Appendix C**). In general the Utilities evaluation suggested that while additional information is needed before a commitment of funds should be given, the following projects be solicited to provide complete Proposals:

- USDA FS - Pepper-Lewis Side Channel Instream Habitat Restoration
- USDA FS - 2010 Nutrient Enhancement on Pine Creek

- USDA FS - Pine Creek Instream and Floodplain Structures for Bull Trout and Steelhead
- LCPEG - NF Lewis RM 13.5 Off-Channel Habitat Enhancement
- GPTF - Clear Creek Habitat Improvement Project (project withdrawn by the Gifford Pinchot Task Force on January 20, 2010)
- CIT - Eagle Island Habitat Enhancement

The 9015/30 Rd. Fish Passage Upgrade and the Sheep Bridge Removal projects were not selected for full proposals.

On December 10, 2009 the ACC concurred with the Utilities evaluation in addition to requesting full proposals for two additional projects:

<b>Applicant</b>	<b>Project Title</b>
*U.S. Fish & Wildlife Service	Bull Trout Habitat Use in Tributaries to Swift Reservoir and the NF Lewis River
*U.S. Fish & Wildlife Service	Bull Trout Population Structure in the Lewis River Basin

\* These two projects were combined in the final proposal to one project titled, "Bull Trout Population Structure Habitat Use in Tributaries to Swift Reservoir and the NF Lewis River"

Shortly thereafter PacifiCorp notified the project sponsors and requested full Proposals by January 29, 2010. Upon the due date, six proposals were submitted. The Clear Creek Habitat Improvement Project was withdrawn by the Gifford Pinchot Task Force on January 20, 2010.

Following receipt of the proposals the Utilities' Subject Matter Experts evaluated and scored the above proposals. Evaluations were conducted as outlined in the *Aquatic Fund – Strategic Plan and Administrative Procedures* document.

Consultation with the ACC began on February 11, 2010 with visual presentations of project proposals to include an opportunity for ACC questions and comments. On February 25, 2010, the ACC was provided a memo (Subject: Review of CY 2010 Aquatic Fund Final Proposals, see **Appendix D**) providing a description of the proposed Resource Projects, the Utilities evaluation of projects, and the Utilities basis for recommending or not recommending a project for funding. The Utilities requested review and ACC comment including its agreement or disagreement with the Utilities evaluation by March 26, 2010.

The ACC met on March 11, 2010 for an aquatic fund project discussion meeting followed by an Aquatic Project Proposal Decision Meeting on April 8, 2010. At this meeting consensus was reached on a final Resource Project list as follows:



**Projects Selected for Funding:**

<b>Applicant</b>	<b>Project Title</b>	<b>Approved Funding</b>	<b>Decision</b>
Cowlitz Indian Tribe	Eagle Island Habitat Enhancement	\$74,300	Yes (resource funds)
USDA Forest Service	Pepper-Lewis Side Channel Instream Habitat Restoration	\$41,300	Yes (resource funds)
USDA Forest Service	Pine Creek Instream and Floodplain Structures for Bull Trout and Steelhead	\$65,000	Yes ( ½ resource funds & ½ bull trout funds)

On April 13, 2010 the Utilities notified all ACC Participants of the selected 2009/2010 Aquatic Funding projects approved for full funding (email dated April 13, 2010 - ACC Funding Approvals Matrix , SA 7.5.3.2 - 2009/2010 Aquatic Fund Evaluation Matrix, see **Appendix E**)

**Projects Not Selected for Funding:**

<b>Applicant</b>	<b>Project Title</b>	<b>Funding Requested</b>	<b>Decision</b>
Lower Columbia Fish Enhancement Group	NF Lewis RM 13.5 Off-Channel Habitat Enhancement	\$212,720	No
USDA Forest Service	2010 Nutrient Enhancement on Pine Creek	\$30,776	No
U.S. Fish & Wildlife Service	Bull Trout Population Structure and Habitat Use in Tributaries to Swift Reservoir and the NF Lewis River	\$59,500	No

**Projects Selected for Funding**

The following is a summary description of the individual Resource Projects selected to be funded by the Aquatics Fund. All of such projects are expected to promote the recovery of anadromous fish post re-introduction upstream of the Lewis River dams, and the federally listed bull trout which spend a portion of their life history in the Lewis River hydroelectric project reservoirs. Included for each project is an overview of the original proposal, any ACC modifications to the project, and identification of Resource Project nexus to the hydroelectric projects. Final Resource Project Plans are provided as appendices to this document.

### 1) Eagle Island Habitat Enhancement

This Cowlitz Indian Tribe sponsored project includes the placement of medium to large jams and individual pieces of large woody debris through a 1,200 foot long side channel and restoration of riparian plant communities to restore vital spawning and rearing habitat along Eagle Island.

The main objective of this project is to provide more habitat for the six species of salmonid that use the North Fork Lewis River, thus helping to increase the abundance and distribution of those species along the entire Lewis River System. To accomplish that task a perennial side channel will be augmented with large woody debris to promote scour, pool formation, and habitat. Native plantings and invasive plant removal will help perpetuate the complexity of the system by providing wood and other organic inputs.

ACC representatives agreed to fund this project as proposed and granted funding of \$74,300.

The final Resource Project Plan is provided in **Appendix F** and would be completed in accordance with the schedule below pending acquiring additional funding through other resources:

Final Design and permitting	Late 2010/early 2011
Construction target date	Summer 2011
Monitoring	Continue until 2014
Herbicide treatments	Last treatment in 2014

### 2) Pepper-Lewis Side Channel Instream Habitat Restoration

This USDA Forest Service sponsored project includes the placement of approximately 161 pieces of large wood material to be used to create 14 structures at strategic locations in the side channel to maximize natural channel characteristics while providing structure stability.

Approximately 10 to 15 pieces of large woody material will be used at each structure location to form complex habitat. Structures will protrude 1/2 to 1/3 of the way into the channel to minimize water shear stress and create a meandering thalweg. Key pieces of wood at each location will be anchored into the streambanks using an excavator to dig trenches up to 30 feet long, and bury the wood. Other pieces of large woody material will be interwoven into these key pieces and riparian vegetation.

A secondary, minor component of this project would be to remove 10 pieces of creosote treated 10"x10" timbers 20' long from an existing logjam near the downstream edge of the side channel. The excavator would remove the timbers and they would be disposed of at a hazardous materials facility.

ACC representatives agreed to fund this project as proposed and granted funding of \$41,300.

The final Resource Project Plan is provided in **Appendix G** and would be completed in accordance with the schedule below:

NEPA Completion	Spring 2010
Monitoring	Summer 2010
Project Implementation	July 2011
As-built documents	December 2011
Pre & Post Project Data	December 2012

### 3) Pine Creek Instream and Floodplain Structures for bull Trout and Steelhead

Proposed by the USDA Forest Service, this project includes harvesting approximately 150-200 pieces of large wood material during thinning operations from a nearby timber sale unit, which would allow the use of long stems (60+ feet) some with attached rootwads. Woody material will be trucked to a staging area off Forest Road 2590 road, a helicopter will then fly wood into strategic locations along Pine Creek to optimize time and cost of helicopter use. A skidder and/or excavator will be used to transport material to specific project sites. This project would create and improve rearing opportunities for bull trout, and winter steelhead will also benefit from these activities.

Approximately 10 to 15 pieces of large woody material will be used at each structure location to form complex habitat. Structures will protrude  $\frac{1}{2}$  to  $\frac{1}{3}$  of the way into the channel to minimize water shear stress and create a meandering thalweg. Key pieces of wood at each location will be anchored into the streambanks using an excavator to dig trenches up to 30 feet long, and bury the wood. Other pieces of large woody material will be interwoven into these key pieces and riparian vegetation.

Due to high water velocities, introduced wood will have a large diameter and be of sufficient length to remain stable. In Pine Creek, pieces of wood will be at least 60 feet long to provide structure stability.

The final Resource Project Plan is provided in **Appendix H** and would be completed in accordance with the schedule below:

Finalize Project Design	Summer 2010
NEPA-Summer	Summer 2011
Monitoring	Summer 2011
Implementation	Summer 2011
As-built documents	December 2011
Pre & Post Project Data	December 2012

### **2009 Projects Withdrawn**

On April 15, 2009, the ACC approved funding of \$46,000 for the USDA Forest Service project – Pepper Creek Instream Habitat Restoration Project. The project was included in the Utilities CY2009 Annual Report. On June 11, 2009, the Forest Service withdrew this project. Funds were not distributed and became available for CY2010 or future projects.

## Conclusion

This report provides the final CY2010 Resource Project descriptions and plans for aquatic projects to be funded from the Lewis River Aquatics Fund. Distribution of funds to these projects will reduce the current Aquatic Fund by \$180,600. Of the projects selected by the ACC, the Pine Creek Instream and Floodplain Structures for Bull Trout and Steelhead project can be attributed to bull trout enhancement.

Per SA article 7.5.3.2 (5), any ACC member may initiate the Alternative Dispute Resolution Procedures to resolve disputes relating to Resource Projects 30 days after receiving this final report. If no disputes are identified, PacifiCorp and Cowlitz PUD will provide funds to the identified project owners to implement Resource Projects per SA article 7.8.





## APPENDIX A

## Appendix A

### Lewis River Settlement Agreement Article 7.5:

7.5 Aquatics Fund. PacifiCorp and Cowlitz PUD shall establish the Lewis River Aquatics Fund (“Aquatics Fund”) to support resource protection measures (“Resource Projects”). Resource Projects may include, without limitation, projects that enhance and improve wetlands, riparian, and riverine habitats; projects that enhance and improve riparian and aquatic species connectivity that may be affected by the continued operation of the Projects; and projects that increase the probability for a successful reintroduction program. The Aquatics Fund shall be a Tracking Account maintained by the Licensees with all accrued interest being credited to the Aquatics Fund. PacifiCorp shall provide \$5.2 million, in addition to those funds set forth in Section 7.1.1, to enhance, protect, and restore aquatic habitat in the Lewis River Basin as provided below. Cowlitz PUD shall provide or cause to be provided \$520,000 to enhance, protect, and restore aquatic habitat in the Lewis River Basin as provided below; provided that Cowlitz PUD’s funds may only be used for Resource Projects upstream of Swift No. 2, including without limitation the Bypass Reach. The Licensees shall provide such funds according to the schedules set forth below.

#### 7.5.1 PacifiCorp’s Contributions.

- a. PacifiCorp shall make funds available as follows: on each April 30 commencing in 2005, \$300,000 per year until 2009 (a total of \$1.5 million).
- b. For each of the Merwin, Yale, and Swift No. 1 Projects, PacifiCorp shall make one-third of the following funds available as follows after the Issuance of the New License for that Project: on each April 30 commencing in 2010, \$300,000 per year through 2014 (a total of \$1.5 million); on each April 30 commencing in 2015, \$100,000 per year through 2018 (a total of \$400,000); and on each April 30 commencing in 2019, \$200,000 per year through 2027 (a total of \$1.8 million); provided that, for any New License that has not been Issued by April 30, 2009, the funding obligation for that Project shall be contributed annually in the same amounts but commencing on April 30 following the first anniversary of Issuance of the New License for that Project.
- c. PacifiCorp shall contribute \$10,000 annually to the Aquatics Fund as set forth in Section 7.1.1.

7.5.2 Cowlitz PUD’s Contributions. Cowlitz PUD shall make or cause to be made funds available as follows: \$25,000 per year on each April 30 following the first anniversary of the Issuance of the New License for the Swift No. 2 Project through the April 30 following the 20<sup>th</sup> anniversary of the Issuance of the New License for the Swift No. 2 Project (a total of \$500,000); and a single amount of \$20,000 on the April 30 following the 21<sup>st</sup> anniversary of the Issuance of the New License for the Swift No. 2 Project.

7.5.3 Use of Funds. Decisions on how to spend the Aquatics Fund, including any accrued interest, shall be made as provided in Section 7.5.3.2 below; provided that (1) at least \$600,000 of such monies shall be designated for projects designed to benefit bull trout according to the following schedule: as of April 30, 2005, \$150,000; as of April 30, 2006, \$100,000; as of April 30, 2007, \$150,000; as of April 30, 2008, \$100,000; and on or before the April 30 following the fifth anniversary of the Issuance of all New Licenses, \$100,000; and such projects shall be consistent with bull trout recovery objectives as determined by USFWS; (2) fund expenditures for the maintenance of the Constructed Channel (Section 4.1.3) shall not exceed \$20,000 per year on average; (3) if studies indicate that inadequate “Reservoir Survival,” defined as the percentage of actively migrating juvenile anadromous fish of each of the species designated in Section 4.1.7 that survive in the reservoir (from reservoir entry points, including tributary mouths to collection points) and are available to be collected, is hindering attainment of the Overall Downstream Survival standard as set forth in Section 3, then at least \$400,000 of such monies shall be used for Resource Projects specifically designed to address reservoir mortality; and (4) \$10,000 annually shall be used for lower river projects as set forth in Section 7.1.1. Projects shall be designed to further the objectives and according to the priorities set forth below in Section 7.5.3.1.

7.5.3.1 Guidance for Resource Project Approval and Aquatics Fund Expenditures.

- a. Resource Projects must be consistent with applicable Federal, State, and local laws and, to the extent feasible, shall be consistent with policies and comprehensive plans in effect at the time the project is proposed. These may include, but are not limited to, Washington’s Wild Salmonid Policy, the Lower Columbia River Bull Trout Recovery Plan, and the Lower Columbia River Anadromous Fish Recovery Plan.
- b. The Aquatics Fund shall not be used to fund Resource Projects that any entity is otherwise required by law to perform (not including obligations under this Agreement or the New Licenses for use of the Aquatics Fund), unless by agreement of the ACC.
- c. The Licensees shall evaluate Resource Projects using the following objectives:
  - (1) benefit fish recovery throughout the North Fork Lewis River, with priority to federal ESA-listed species;
  - (2) support the reintroduction of anadromous fish throughout the Basin; and
  - (3) enhance fish habitat in the Lewis River Basin, with priority given to the North Fork Lewis River.

For the purposes of this Section 7.5, the North Fork Lewis River refers to the

portion of the Lewis River from its confluence with the Columbia River upstream to the headwaters, including tributaries except the East Fork of the Lewis River.

The Licensees shall also consider the following factors to reflect the feasibility of projects and give priority to Resource Projects that are more practical to implement:

- (i) Whether the activity may be planned and initiated within one year,
- (ii) Whether the activity will provide long-term benefits,
- (iii) Whether the activity will be cost-shared with other funding sources,
- (iv) Probability of success, and
- (v) Anticipated benefits relative to cost.

#### 7.5.3.2 Resource Project Proposal, Review, and Selection.

(1) By the first anniversary of the Effective Date, the Licensees shall develop, in Consultation with the ACC, (a) a strategic plan consistent with the guidance in Section 7.5.3.1 above to guide Resource Project development, solicitation, and review; and (b) administrative procedures to guide implementation of the Aquatics Fund. Both may be modified periodically with the approval of the ACC.

(2) Any person or entity, including the Licensees, may propose a Resource Project. In addition, the Licensees may solicit Resource Projects proposals from any person or entity.

(3) The Licensees shall review all Resource Project proposals, applying the guidance set forth in Section 7.5.3.1. The Licensees shall provide an annual report describing proposed Resource Project recommendations to the ACC. The date for submitting such report shall be determined in the strategic plan defined in subsection 7.5.3.2(1) above. The report will include a description of all proposed Resource Projects, an evaluation of each Resource Project, and the basis for recommending or not recommending a project for funding.

(4) The Licensees shall convene a meeting of the ACC on an annual basis, no sooner than 30 days and no later than 60 days after distribution of the report set forth in Section 7.5.3.2(2), for Consultation regarding Resource Projects described in the report.

(5) Licensees shall modify the report on proposed Resource



Projects, based on the above Consultation, and submit the final report to the ACC within 45 days after the above Consultation. Any ACC member may, within 30 days after receiving the final report, initiate the ADR Procedures to resolve disputes relating to Resource Projects. If the ADR Procedures are commenced, the Licensees shall defer submission of the final report on Resource Projects to the Commission, if necessary, until after the ADR Procedures are completed. If the ADR Procedures fail to resolve all disputes, the Licensees shall provide the comments of the ACC to the Commission. If no ACC member initiates the ADR Procedures, the Licensees shall submit the final report to the Commission, if necessary, within 45 days after submission of the final report to the ACC.

## APPENDIX B

## **Appendix B**

Memorandum dated September 4, 2009  
Letter to interested parties from T. Olson, PacifiCorp  
Availability of Funds for Aquatic Related Projects

September 4, 2009

**Subject: Availability of Funds for Aquatic Related Projects in the Lewis River Basin**

Dear Interested Party,

PacifiCorp owns the Merwin, Yale, and Swift No. 1 hydroelectric projects on the Lewis River in southwest Washington. Public Utility District No. 1 of Cowlitz County, Washington (Cowlitz PUD) owns the Swift No. 2 hydroelectric project, also located on the Lewis River. These projects are operated as a coordinated system. On November 30, 2004, the Lewis River Settlement Agreement established the Lewis River Aquatics Fund (Fund). On June 26, 2008, the Federal Energy Regulatory Commission acknowledged this fund as a stipulation of project operating licenses. The purpose of the Fund is to support resource protection measures via aquatic related projects (Resource Projects) in the Lewis River basin. The projects are evaluated for funding according to their:

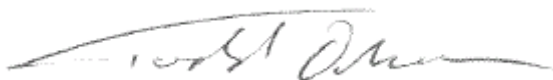
- (1) Benefit to fish recovery throughout the North Fork Lewis River, with priority to federal ESA-listed species;
- (2) Support of the reintroduction of anadromous fish throughout the Basin; and
- (3) Enhancement to fish habitat in the Lewis River Basin, with priority given to the North Fork Lewis River.

Species that are targeted to benefit from Resource Projects include Chinook, steelhead, coho, bull trout, chum, and sea-run cutthroat.

This letter is to provide you the opportunity to submit proposals for Resource Project funding. The total Fund amount available this year is limited to \$253,724.06 for Resource Projects and \$482,285.95 for Bull Trout Projects. The selection of Resource Projects will be conducted in two phases. To be considered, applicants must submit a completed Pre-Proposal Form (see attachment A for Form) **by close of business October 5, 2009**. Pre-Proposals will be evaluated with some projects appropriately selected for further consideration (see attachment B for evaluation criteria). If selected, applicants will be notified in early December, and be requested to submit a formal proposal by mid-January. The Utilities and representatives of the Lewis River Aquatic Coordination Committee will finalize the list of successful projects in early April 2010 and submit that list to the Federal Energy Regulatory Commission for approval shortly thereafter.

Please give attention to this excellent opportunity. If you should have any questions feel free to contact Mr. Frank Shrier, PacifiCorp, (503) 813-6622. We look forward to your response in early October.

Sincerely,



Todd Olson  
Implementation Program Manager



## APPENDIX C

## **Appendix C**

Memorandum dated November 6, 2009

Memo to ACC from Shrier – PacifiCorp and Gritten-MacDonald – Cowlitz PUD  
Review of CY 2010 Aquatic fund Pre-Proposals

November 6, 2009

To: Memo to Lewis River Aquatics Coordination Committee representatives

From: Frank Shrier – PacifiCorp Energy and Diana Gritten-MacDonald – Cowlitz PUD

**Subject: Review of CY 2010 Aquatic Fund Pre-Proposals**

On September 4, 2009 PacifiCorp Energy announced the availability of funds for aquatic related projects in the Lewis River Basin (letter to interested parties from T. Olson). The letter requested that individuals or parties interested in obtaining project funding submit a Pre-Proposal to PacifiCorp Energy. Pre-Proposals were due by October 5, 2009. At that time and in following the Aquatics Fund – Strategic Plan and Administrative Procedures, PacifiCorp Energy and Cowlitz PUD (Utilities) reviewed the Pre-Proposals and, with this memo are providing the ACC with a recommended project list for further consideration. Following ACC review and agreement with this project list, PacifiCorp Energy will request complete proposals from selected project proponents. The schedule for proposal request is early December with complete proposals due in late-January 2009.

In response to the announcement letter, six entities provided ten different project Pre-Proposals. They include:

Olympic Resource Management	9015/30 Rd Fish Passage Upgrade
USDA Forest Service	Sheep Bridge Removal
USDA Forest Service	Pepper-Lewis Side Channel Instream Habitat Restoration
USDA Forest Service	2010 Nutrient Enhancement on Pine Creek
USDA Forest Service	Pine Creek Instream and Floodplain Structures for Bull Trout and Steelhead
Lower Columbia Fish Enhancement Group	NF Lewis RM 13.5 Off-Channel Habitat Enhancement
US Fish & Wildlife Service	Bull Trout Habitat Use in Tributaries to Swift Reservoir and the NF Lewis River
US Fish & Wildlife Service	Bull Trout Population Structure in the Lewis River Basin
Gifford Pinchot Task Force	Clear Creek Habitat Improvement Project
Cowlitz Indian Tribe	Eagle Island Habitat Enhancement

PacifiCorp Energy and Cowlitz PUD subject matter experts have evaluated and scored the above proposals. Evaluations were conducted as outlined in the Aquatic Fund – Strategic Plan and Administrative Procedures document. For ACC review, the Utilities have attached to this memo an Evaluation matrix (Attachment 1). Costs for each project

are also included. Individual Pre-Proposals have been attached for reference (Attachments 2-11).

The Utilities evaluation suggests that while additional information is needed before a commitment of funds should be given, we propose that the following six projects be solicited to provide complete Proposals:

- USDA FS - Pepper-Lewis Side Channel Instream Habitat Restoration
- USDA FS - 2010 Nutrient Enhancement on Pine Creek
- USDA FS - Pine Creek Instream and Floodplain Structures for Bull Trout and Steelhead
- LCFEG - NF Lewis RM 13.5 Off-Channel Habitat Enhancement
- GPTF - Clear Creek Habitat Improvement Project
- CIT - Eagle Island Habitat Enhancement

The Utilities propose to not further consider the four projects: 9015/30 Rd Fish Passage Upgrade, Sheep Bridge Removal, and Bull Trout Habitat Use in Tributaries to Swift Reservoir and the NF Lewis River, and Bull Trout Population Structure in the Lewis River Basin.

For your information, PacifiCorp has included a financial reporting on the Aquatics Resource and Bull Trout (7.5) tracking accounts (Attachment 12) as of 10/31/09.

The Utilities are submitting this document and attachments for review in hopes of reaching concurrence on projects for further consideration. If, in your review of the Pre-proposals, you have comments or questions to ask the Project proponent, please provide us such and we will include in the formal Proposal request.

To meet the Funding Process Timeline as included in the Aquatics Fund – Strategic Plan and Administrative Procedures, **ACC representatives should provide comments and their project selection by Monday, December 7, 2009.** On December 10, 2009, project selection will be finalized during the ACC meeting. Soon after, the Utilities will request formal Proposals from identified project proponents.

Lewis River Aquatic Fund - Utilities' Evaluation of 2009/2010 Project Proposals																	
								Cost	Consistency with	Benefit to	Scientific	Success Potential	Cost	Total Score	Selected by		
No.	Applicant	Project Title	Project Schedule	Benefit	Bull Trout	Project Partners	Funding	Share?	Fund Objectives	Priority Fish	Validity		Effectiveness		Utilities for Full-Proposal	Comments	
1	Olympic Resource Management	9015/30 Rd Fish Passage Upgrade	Summer 2010	This project involves removal of two culverts and installation of two bridges to allow fish passage which affects 2.3 miles of fish habitat on tributaries to Pine Creek/Lewis River/Swift Reservoir.	No	None	\$ 235,000.00	No	Yes		9.33	13.33	3.33	1	26.99	N	Assume these improvements are required under RMAP. What is ORM's contributions to the project? They're required through forest practice laws to take care of problem culverts on their own. Proposal doesn't stipulate which tributary to Pine Creek, therefore do not know if the culverts are above natural anadromous fish barriers. Are there other options to building bridges? Only consider if culverts rather than bridges are installed. Streams do not justify that type of protection.
2	USDA Forest Service	Sheep Bridge Removal	2010/2011	Removal of remaining timbers to clean up river and remove hazardous material	Yes	Gifford Pinchot National Forest	\$ 7,500.00	Yes	Yes, but benefit is low.		8	8	3.33	2.66	21.99	N	Hazardous material should be responsibility of landowner. Project is upstream of habitat accessible to anadromous fish. If this bridge is owned by USFS and the project is contributing hazardous material then the USFS should cleanup.
3	USDA Forest Service	Pepper-Lewis Side Channel Instream Habitat Restoration	2010/2011	LWD placement to create a pool capable of rearing a combination of juvenile coho salmon and steelhead trout.	No	Potential: Fish First, Swift community Action Team, WDFW, Salmon Recovery Board funds and FS Whole Watershed Joint Venture Fund	\$ 58,000.00	Yes	Yes		13.33	12	3.33	2.83	31.49	Y	Concerns about LWD structures staying intact on mainstem. Need additional information on how LWD will be anchored. Low amount of habitat. Question the connectivity to the Lewis mainstem during late summer. Monitoring costs should be in-kind. Project will also benefit juvenile spring Chinook as well as immature bull trout.
4	USDA Forest Service	2010 Nutrient Enhancement on Pine Creek	2010	Adult carcasses from various hatchery reared and collected salmonids species will be distributed by hand in areas accessible to vehicles, inaccessible areas would be seeded by helicopter.	No	Gifford Pinchot National Forest, Clark Skamania Fly Fishers, Mt. St. Helens Institute and ORM	\$ 41,000.00	Yes	Yes		16	12	3	3	34	Y	Would like to see previous efforts reported including observed benefits of carcasses.
5	USDA Forest Service	Pine Creek Instream and Floodplain Structures for Bull Trout and Steelhead	2010	LWD placement instream in Pine Creek to stabilize stream banks to capture suitable sized spawning gravel for adult bull trout and steelhead.	Yes	Gifford Pinchot National Forest and Title II Funds	\$ 72,000.00	Yes	Yes		14.66	12	1.66	2.5	30.82	Y	No mention of coho in the write-up, they will benefit from this if project is successful as well. Redd superimposition concerns would not be between bull trout and STHD as they spawn in different habitat and STHD spawn 5 months later. Superimposition concerns would be between bull trout and coho as their spawn time directly overlaps and they dig redds in the same margin areas. Question the efficacy of placing LW into such a wide, unstable floodplain and stability of structures. Concerns over project success.
6	Lower Columbia Fish Enhancement Group	NF Lewis RM 13.5 Off-Channel Habitat Enhancement	2010/2011	Re-connection and enhancement of approx. 1,500 lineal feet of backwater/ off-channel habitat, riparian and wetland re-vegetation and reconnection of a perennial tributary to mainstem to restore fish passage.	No	LCFRB, Inter-fluve and Sam Kysar (landowner)	\$ 214,695.00	Yes	Yes		13.33	12	2.33	1.33	28.99	Y	Funds should not be used for noxious weed control. Cost seem high, not much in-kind support. Support flow through (future) option, but habitat currently has inlet and outlet and is currently being used.
7	USFWS	Bull Trout Habitat Use in Tributaries to Swift Reservoir and the NF Lewis River	2010/2012	Expand network of radio telemetry receivers in tributaries to Swift Reservoir and NF Lewis River.	Yes	WDFW, PacifiCorp, USFS and Cowlitz Indian Tribe	\$ 65,000.00	Yes	Maybe, project does not directly "enhance fish habitat".		10.66	12	4	0.83	27.49	N	Prohibitive costs and benefit is limited over existing knowledge or alternative methods. Data gathering. Only benefits bull trout - can't make the benefits connection to other listed species. Project does not provide tangible on-the-ground benefit. If the ACC did select for funding, ACC should consider not approving Bull Trout projects until this work is completed.
8	USFWS	Bull Trout Population Structure in the Lewis River Basin	2010/2011	Describe population structure of bull trout using genetic analysis to better prioritize recovery actions in the Lewis River.	Yes	WDFW, PacifiCorp, USFS and Cowlitz Indian Tribe	\$ 33,000.00	Yes	Maybe, project does not directly "enhance fish habitat".		10.66	14.66	4	2.33	31.65	N	One year of data will not likely give enough information. Not a habitat improvement. Could be important for future actions, however it only benefits bull trout - can't make the benefits connection to other listed species. Is this the same as the request that Abernathy Lab is making to USFWS grant?
9	Gifford Pinchot Task Force	Clear Creek Habitat Improvement Project	2010	Removal of 1.2 miles of spur road, including culvert removal, slope shaping and stabilization, scarification of the roadbed and revegetation.	No	GP Task Force and GP National Forest	\$ 73,725.00	Yes	Yes		10.66	9.33	2.5	2	24.49	Y	Need maps to verify road location in relation to Clear Creek. Benefits to fish is questionable. Clear Creek is too warm for bull trout. These roads should be managed, maintained, and/or removed by the owners.
10	Cowlitz Indian Tribe	Eagle Island Habitat Enhancement	2011/2013	Placement of medium to large jams and individual pieces of LWD through a 1,200 foot long side channel and restoration of riparian plant communities to restore vital spawning and rearing habitat along Eagle Island.	No	Cowlitz Indian Tribe, Interfluvve, Clark County WDFW and LCFRB	\$ 74,300.00	Yes	Yes		14.66	10.66	2.5	2.33	30.15	Y	Note the funds would be returned to ACC if full funding is not secured from Salmon Recovery Funds. This is essentially a wood placement project. High value towards Lewis River recovery goals. Habitat in this side channel is already in decent shape, cost seems somewhat excessive considering not much needs to be done. Write-up from project applicant even states that "overall channel complexity is relatively high" and that "the reach already contains relatively high -quality aquatic habitat". Also, applicant states that this will not affect boat traffic which is questionable.
						Totals	\$ 874,220.00										
	Fund Objectives:	1. Benefit fish recovery throughout the North Fork Lewis River, priority to federal ESA-listed species				Bull Trout Funds	\$ 177,500.00										
		2. Support the re-introduction of anadromous fish throughout the basin															
		3. Enhance fish habitat in the Lewis River Basin, with priority given to North Fork Lewis River															

## APPENDIX D

## **Appendix D**

Memorandum dated February 25, 2010

Memo to ACC from Shrier – PacifiCorp and Gritten-MacDonald – Cowlitz PUD  
Review of CY 2010 Aquatic fund Proposals



February 25, 2010

Memo to Lewis River Aquatics Coordination Committee representatives

From: Frank Shrier – PacifiCorp Energy and Diana Gritten-MacDonald – Cowlitz PUD

**Subject: SA 7.5.3.2 - Review of CY 2009 Aquatic Fund Proposals**

In September 2005 the Lewis River Aquatics Coordination Committee (ACC) established the Aquatics Fund – Strategic Plan and Administrative Procedures to meet obligations of the Lewis River Settlement Agreement. Since that time PacifiCorp Energy and the Public Utility District No. 1 of Cowlitz County (Cowlitz PUD) (collectively the Utilities) have been working under the Plan and with the ACC to identify and select aquatic resource projects for funding.

On December 21, 2009, the ACC selected eight aquatic project proposals for additional consideration. Shortly thereafter PacifiCorp Energy notified the project sponsors and requested full proposals by January 29, 2010. On January 20, 2010, the Gifford Pinchot Task Force withdrew the Clear Creek Habitat Improvement project. Upon the due date, seven full proposals were submitted. On February 11, 2010, PacifiCorp Energy provided copies of each final project proposal to the ACC. In addition, each applicant presented a PowerPoint at the ACC meeting on February 11, 2010, to present further project detail and address ACC questions and comments, if any. The proposed projects include:

<b>Applicant</b>	<b>Project Title</b>
Cowlitz Indian Tribe	Eagle Island Habitat Enhancement
Lower Columbia Fish Enhancement Group	NF Lewis RM 13.5 Off-Channel Habitat Enhancement
USDA Forest Service	Pepper-Lewis Side Channel Instream Habitat Restoration
USDA Forest Service	Pine Creek Instream and Floodplain Structures for Bull Trout and Steelhead
USDA Forest Service	2010 Nutrient Enhancement on Pine Creek
U.S. Fish & Wildlife Service	Bull Trout Population Structure and Habitat Use in Tributaries to Swift Reservoir and the NF Lewis River

The Utilities subject matter experts have evaluated and scored the above proposals. Evaluations were conducted as outlined in the Aquatic Fund – Strategic Plan and Administrative Procedures (PacifiCorp and Cowlitz PUD, September 2005 – Revised January 2009). For ACC review, the Utilities have attached an Evaluation Matrix to this memo, which identifies the average total score of the Utility reviewers for each Proposal

and comments/questions (Attachment 1). Costs for each project are also included. Individual Proposals have been previously provided to the ACC and are available upon request. They are also available for viewing on the Lewis River website at the following link:

[http://www.pacificorp.com/content/dam/pacificorp/doc/Energy\\_Sources/Hydro/Hydro\\_Licensing/Lewis\\_River/ACC\\_Final\\_Aquatic\\_Fund\\_Proj.pdf](http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Hydro/Hydro_Licensing/Lewis_River/ACC_Final_Aquatic_Fund_Proj.pdf)

By this memo the Utilities provide the ACC with a list of the projects and our recommendation for funding in order of evaluation ranking.

1. **Eagle Island Habitat Enhancement** – Funding request is for \$74,300. Utilities recommend: Funding
2. **NF Lewis RM 13.5 Off-Channel Habitat Enhancement** – Funding request is for \$212,720. Utilities recommend: Funding
3. **Pepper-Lewis Side Channel Instream Habitat Restoration** – Funding request is for \$41,300. Utilities recommend: Funding
4. **Pine Creek Instream and Floodplain Structures for Bull Trout and Steelhead** – Funding request is for \$65,000. Utilities recommend: Funding
5. **2010 Nutrient Enhancement on Pine Creek** – Funding request is for \$30,776. Utilities recommend: Funding, but would not stand in opposition if ACC collectively decided against funding.
6. **Bull Trout Population Structure Habitat Use in Tributaries to Swift Reservoir and the NF Lewis River** – Utilities recommend: Not funding but would not stand in opposition if ACC collectively decided to fund.

The next step in the process is for the ACC to review and provide input on selection of projects to be funded. An opportunity will be available to discuss the projects at the upcoming March 11, 2010, ACC meeting. The Utilities welcome review and your comments including your agreement or disagreement with the Utilities evaluation, and ask that you provide them to PacifiCorp **by March 26, 2010**. This timing is so that we may compile results and distribute the collective ACC's evaluation prior to the April 8, 2010, ACC meeting. At that meeting, the ACC should work to finalize its selection of to-be-funded projects. To continue to meet the Funding Process Timeline as included in the Plan, the ACC must reach agreement on projects no later than mid-April.

Thank you for your attention to this matter, we look forward to receiving your input.



## APPENDIX E

## **Appendix E**

Email dated April 13, 2010  
to the ACC from McCune – PacifiCorp  
CY 2009/2010 Lewis River Aquatic Fund Evaluation Matrix,  
Projects Approved for Funding

## McCune, Kimberly

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**From:** McCune, Kimberly  
**Sent:** Tuesday, April 13, 2010 9:29 AM  
**To:** '(michael\_hudson@fws.gov)'; 'Adam Haspiel (ahaspiel@fs.fed.us)'; 'Athena Sanchez (pebbles@yakama.com)'; 'Bernadette Graham Hudson (bghudson@lcfwb.gen.wa.us)'; 'Bighouse, Donna (DFW)'; 'Bill Bakke'; 'Bob Rose (brose@yakama.com)'; 'Brett Swift'; 'Bryan Nordlund'; 'Casey Barney'; 'Darlene Johnson'; 'David Hu'; 'Diana MacDonald'; 'Doyle, Jeremiah'; 'Eli Asher (easher@lcfwb.gen.wa.us)'; 'Eric Kinne'; 'Eychaner, Jim (RCO)'; 'George Lee'; 'James Dixon (dixonjfd@dfw.wa.gov)'; 'Jeff Breckel'; 'Jim Byrne (byrnejbb@dfw.wa.gov)'; 'Jim Malinowski'; 'Joel Rupley'; 'John Clapp'; 'John Weinheimer'; 'Kathryn Miller (kmiller@tu.org)'; 'Lesko, Erik'; 'LouEllyn Jones'; 'Mariah Stoll-Smith Reese (M.Reese@tds.net)'; 'Maynard, Chris (ECY)'; 'Melody Tereski'; 'Michael Thompson'; 'Michelle Day'; 'Nathan Reynolds'; 'Neil Turner (turnenet@dfw.wa.gov)'; 'Olson, Todd'; 'Pat Frazier (frazipaf@dfw.wa.gov)'; 'Paul Pearce (pearce@co.skamania.wa.us)'; 'Rhidian Morgan (rmmorgan@plasnewydd.org)'; 'Rich.Turner@noaa.gov (Rich.Turner@noaa.gov)'; 'Ruth Tracy'; 'Ryan Lopossa'; 'Shannon Wills'; 'Shrier, Frank'; 'Steve Branz [branzs@ci.woodland.wa.us]'; 'Steve Manlow (smanlow@lcfwb.gen.wa.us)'; 'Susan Rosebrough'; 'Taylor Aalvik (taalvik@cowlitz.org)'  
**Cc:** 'Gardner Johnston'; 'Tony Meyer'; 'Rudy Salakory'; 'Emily Platt'  
**Subject:** RE: 2009/2010 Lewis River Aquatic Fund Evaluation Matrix - Projects Approved for Funding  
**Attachments:** 04082010 LR - ACC Lewis River AQ Fund evaluation - 2009\_2010.xls

Attn: ACC Participants

Please find attached an updated aquatic fund evaluation matrix to reflect project comments and funding decisions from the ACC meeting on April 8, 2010.

PacifiCorp will submit the Aquatic Fund Annual Report to the FERC this month which will identify the 2009/2010 ACC actions and selection of Aquatic Resource Projects to be funded from the Lewis River Aquatic Fund established under terms of the SA (Article 7.5).

### Projects Selected for Funding:

Applicant	Project Title	Approved Funding	Decision
Cowlitz Indian Tribe	Eagle Island Habitat Enhancement	\$74,300	Yes (resource funds)
USDA Forest Service	Pepper-Lewis Side Channel Instream Habitat Restoration	\$41,300	Yes (resource funds)
USDA Forest Service	Pine Creek Instream and Floodplain Structures for Bull Trout and Steelhead	\$65,000	Yes ( ½ resource funds & ½ bull trout funds)

### Projects Not Selected for Funding:

Applicant	Project Title	Requested Funding	Decision
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Lower Columbia Fish Enhancement Group	NF Lewis RM 13.5 Off-Channel Habitat Enhancement	\$212,720	No
USDA Forest Service	2010 Nutrient Enhancement on Pine Creek	\$30,776	No
U.S. Fish & Wildlife Service	Bull Trout Population Structure and Habitat Use in Tributaries to Swift Reservoir and the NF Lewis River	\$59,500	No

Thank you.

Kimberly L. McCune - PacifiCorp Energy  
Hydro Resources Project Coordinator  
Phone: 503-813-6078  
Fax: 503-813-6633  
[kimberly.mccune@pacificorp.com](mailto:kimberly.mccune@pacificorp.com)

Lewis River Aquatic Fund ACC Evaluation Matrix 2009/2010  
April 8, 2010




## APPENDIX F

## **Appendix F**

### Eagle Island Habitat Enhancement

# **PROPOSAL FORM**

## ***Lewis River Aquatic Fund***

### **1. Project Title**

Eagle Island Habitat Enhancement: Site A

### **2. Project manager**

Rudy Salakory, Biologist  
Cowlitz Indian Tribe  
PO Box 2547  
Longview, WA 98632  
Phone: 360.508.6039  
Email: [rsalakory@cowlitz.org](mailto:rsalakory@cowlitz.org)

### **3. Identification of problem or opportunity to be addressed**

#### ***Problem:***

In the watershed of the North Fork and lower mainstem of the Lewis River, there is scarce riparian habitat, which is essential for:

- A. Lower Columbia River Chinook salmon, listed as a threatened species under the Endangered Species Act (ESA).
- B. Columbia River Chum salmon, listed as a threatened species under the ESA
- C. Lower Columbia River Steelhead, listed as a threatened species under the ESA
- D. Lower Columbia river Coho salmon, listed as a threatened species under the ESA

These species have endured many impacts that threaten their persistence in the watershed. The impacts arise from various sources, and include: alteration of natural flow regimes, degradation of riparian habitat function, loss of floodplain and off-channel habitat areas, inputs of point source and non-point source pollution and impacts of urbanization.

#### ***Opportunity:***

This project proposal develops the opportunity to benefit fish recovery throughout the North Fork Lewis River, with priority for federal ESA-listed species, by restoring critical riparian zone habitat. Enhancement of existing riparian forest will support larger populations of anadromous fish. This project will also increase the abundance of functional habitat, which is in short supply throughout the lower river.

Our proposal to the ACC is a new opportunity to leverage PacifiCorp mitigation funding in the Lewis River watershed at a 6:1 ratio. This ACC grant will be used as match to anchor a much larger Salmon Recovery Fund Board project that totals over \$420,000.00. If for any reason the full project is not funded through the SRFB, our ACC award will be

returned in full to PacifiCorp. If successful, this project will be the first of many projects centered on the Eagle Island reach over the next ten years.

#### **4. Background**

##### ***Site Description***

This site is located on the left bank (south) side of the south channel 250 meters downstream of the upstream end of Eagle Island and consists of a perennially-active side-channel that is approximately 1,200 feet long. The side-channel is a moderately sinuous gravel-bed channel. The gravel bar that separates the channel from the mainstem is well-vegetated and has a few mature riparian trees. There are several small islands in this side channel, and overall channel complexity is relatively high. There is currently some wood in the side-channel but scour pools are scarce and riparian cover is poor. The inlet begins in a shallow water reach just upstream of a riffle and the outlet is downstream of the riffle; the gradient is similar to the mainstem.

Modest channel complexity has been maintained throughout the 1,200 foot long side-channel. Deposition of gravel bars has created a multithread channel during low water conditions with small backwater eddies and side-channels. However, there are only several existing pieces of LWD to provide habitat cover and promote pool scour.

##### ***Fish Species and Use***

The lower North Fork Lewis Basin is used by 6 populations of salmon and steelhead, including fall and spring Chinook, winter and summer steelhead, coho, and chum. The fall Chinook run consists of an early-spawning “tule” run as well as a late-spawning “bright” run. Fall Chinook make extensive use of the lower mainstem for spawning. The highest concentrations of Chinook spawning occur within the 5 mile reach downstream of Merwin Dam; however, Chinook spawning also occurs within the Eagle Island reaches.

Since the early 1980s, WDFW has conducted juvenile seining targeting fall Chinook in the spring and early summer (typically late May to early July). The seining effort is conducted in order to capture juvenile fall Chinook for tagging and is not specifically designed to map spatial distribution or habitat preferences for juvenile rearing. Nevertheless, the data does provide some indication of occurrence of juvenile rearing in the project area. Data from 2004 to 2008 indicate approximately 200 to 4,000 juvenile fish are captured within the project area side-channel each spring. Based on species composition for the entire lower river, the vast majority of these fish are Chinook, with smaller amounts of coho, trout, and chum (very few expected in the project area).

##### ***Geomorphic Setting***

The project site is located in the broad alluvial lower Lewis River valley. The stream channel is unconfined at this location. The channel type is pool-riffle dominated by gravel and cobble substrate. Gradient is very flat at approximately 0.1%. The summer low flow wetted width of the south channel at this location is approximately 180 feet. There are few well-defined pools; past habitat surveys have indicated that most of the habitat in this reach is composed of glide habitat (PacifiCorp 2004).

The historical record (aerial photos dating back to 1938 and survey maps dating back to 1854) indicates a history of active channel dynamics in the project area. Channel changes are due to natural flood processes as well as human activities including gravel mining. Aerial photos since 1938 show flow in both the north and south Eagle Island channels, with summer flow slowly shifting more to the south channel over time.

At the reach scale, channel complexity, available habitat cover, and the health of native riparian forest communities have been reduced since historical conditions. Reach-scale fluvial evolution is progressing toward a simplified channel planform as former multithread channels are abandoned. Past gravel mining, and possibly the effects of the hydropower system on sediment transport, have contributed to incision that has resulted in abandonment of off-channel habitat and has appeared to reduce the frequency of channel adjustment.

### ***Vegetation Conditions***

Riparian vegetation conditions have been impacted by past clearing, the introduction of invasive species, and altered channel dynamics. The vegetation on the narrow island in the southern channel is stratified into two separate age classes. The eastern portions of the island are vegetated by young trees and a variety of non-native herbaceous species. Tree species within the eastern portion of the island are limited to Oregon ash, black cottonwood, and red alder. Tree density is very high in the eastern portion of the island with stem counts estimated at 500 per acre. The age class of the trees is in the 10-15 year range with average tree heights of 8-10 feet. There is very little shrub coverage in the eastern most portion of the island with species limited to Scouler's willow (*Salix scoulerana*), hooker willow (*Salix hookeriana*), Himalayan blackberry, Japanese knotweed (*Polygonum cuspidatum*) and spiraea. This is in contrast to the central and western portions of the island that have a dense shrub layer beneath a canopy of mature black cottonwood and Oregon ash trees. Herbaceous vegetation includes a wide variety of non-native species including colonial bentgrass, Canada thistle (*Cirsium arvense*), smooth hawkbeard, common vetch (*Vicia sativa*), common plantain (*Plantago major*), common tansy (*Tanacetum vulgare*), and curly dock (*Rumex crispus*).

### ***Large Woody Debris Conditions***

LWD in the mainstem Lewis River has been quantified as part of a number of studies, including the Stream Channel Morphology and Aquatic Habitat Study (BioAnalysts, et al. 2003, WTS-3 Report) and a habitat assessment conducted by the Lower Columbia Fish Recovery Board (LCFRB 2004a). The WTS-3 Study counted 72+ pieces (>15 cm diameter and >7.6 meters long) in the Eagle Island channels in 2000 and the LCFRB study (2004a) counted approximately 113 pieces (>10 cm diameter and >7.6 meters long).

Large woody debris (LWD) conditions in the lower river below Merwin Dam were evaluated as part of the Lewis River LWD Study (Interfluve et al. 2008). The study estimated the historical abundance of LWD pieces by reach using a regression model developed from old-growth streams throughout Washington State (Fox and Bolton 2007). These data suggest an historical LWD frequency of approximately 70 pieces per 100

meters, for a total of 2,709 pieces (>10 cm diameter and > 2 meters long) within the Eagle Island reaches. Thus, historical LWD numbers may have been on the order of 20 times larger than current numbers in the Eagle Island reaches.

As part of the LWD Study, a survey was conducted on August 10, 2007 to identify the quantity of “key pieces” of LWD in the mainstem. A key piece was defined as a piece that was judged to be self-stabilized within the bankfull channel. In the Eagle Island reaches (Lewis 4A and 4B) a total of 5 key pieces were identified; 4 were cottonwoods and one was of unknown species. One piece in reach 4B was serving as a key piece of a large jam that extended up onto the river right flood terrace (South channel, river mile 11.3). The presence of large key pieces is critical in a system the size of the Lewis, where most wood will only be retained in the channel as part of large jams that are initiated by very large (i.e. old-growth) key pieces.

In general, the LWD study concluded that LWD dynamics have been severely altered in the mainstem. The ability of the Lewis River to support significant quantities of LWD is impacted by: 1) the series of hydroelectric dams that interrupt wood transport, 2) past harvest of large trees that could provide a source for key pieces, 3) alteration of the natural flood regime that could serve to recruit wood from the stream corridor, and 4) channel alterations that reduce channel migration processes that could recruit LWD.

## **5. Project Objective(s)**

The main objective of this project is to provide more habitat for the 6 species of salmonid that use the North Fork Lewis River, thus helping to increase the abundance and distribution of those species along the entire Lewis River System. To accomplish that task a perennial side channel will be augmented with LWD to promote scour, pool formation, and habitat. Native plantings and invasive plant removal will help perpetuate the complexity of the system by providing wood and other organic inputs.

## **6. Tasks**

- Task 1: Landowner coordination and whole-project scheduling
- Task 2: Apply for necessary permits, (Right of entry, HPA, JARPA, ESA limit 8 SPIF)
- Task 3: RFQ and hiring of contractors for construction, invasive species removal and planting
- Task 4: Coordinate purchase and delivery of plant materials LWD materials
- Task 5: Project implementation: Site Access
- Task 6: Project implementation: Excavation and LWD placement
- Task 7: Project implementation: Invasive removal and plantings
- Task 8: Assess planting installation success/ prepare short report
- Task 9: Prepare as-built plans
- Task 10: Conduct monitoring to assess survivorship of plantings, construction efficacy
- Task 11: Prepare monitoring report

## **7. Methods**

Our restoration approach at Site A involves a combination of large woody debris placement to add complexity and cover. Riparian treatments are also included to treat areas disturbed during construction, to control invasive species, and to foster a native riparian vegetation community. Medium to large jams and individual pieces will be placed throughout the 1,200 foot long side-channel. At the head of the side channel, a large bar apex jam will be constructed that wraps the upstream end of the island and extends into the main channel; this will provide habitat benefit to the main channel and will be designed to encourage the maintenance of a split-flow condition during low flows. Two additional bar apex jams will be constructed within the side-channel to encourage split flow conditions to maximize complexity and edge habitat. Lateral scour pool jams will be constructed along channel margins of the side-channel to promote the development of lateral scour pools with wood cover. Habitat cover wood will be placed at numerous locations to provide shelter complexity for salmonid rearing. Placement of floodplain wood will provide roughness elements that are lacking due to the absence of a robust native riparian vegetation community. The types and function of large woody debris installations that are detailed in the 90% design plans (attached as Appendix “A”)

Vegetation enhancements near the eastern end of the site focus on control of Himalayan blackberry and the establishment of a native shrub/scrub layer. Planting of tree species will not be necessary in this area as there are high numbers of red alder, black cottonwood and Oregon ash seedlings already established in this area. Tree numbers are of a density sufficient to provide a canopy closure percentage of 75-100 percent upon maturation. The decision to not augment the existing tree diversity with conifers was based on the likelihood that conifers will experience high rates of mortality in gravelly and sandy soils on this portion of the island. Establishment of a dense shrub layer will improve wildlife habitat values, reduce scour during moderate flood events, and help prevent further establishment of invasive species. Species to be planted in this area have been specially selected due to the extremely sandy nature of the soil. Soil sample pits revealed very little organic matter in the soil, which will severely limit the ability of some native species to become established. Primary restoration species will consist of willow and red-osier dogwood. Himalayan blackberry can be effectively eliminated with herbicide applications in the fall followed up with spot treatments the following spring. Japanese knotweed is exceptionally difficult to completely eradicate although this very aggressive species can be effectively suppressed through the implementation of an herbicide treatment schedule. This schedule would include multiple injections of glyphosate using an herbicide lance throughout the growing season. Effective suppression of actively growing knotweed populations will require successive injections of herbicide over the course of two to three years.

## **8. Specific Work Products**

There will be three specific work products:

- Construction and placement of around 200 LWD structures and native plantings
- Construction completion report detailing final construction, lessons learned and photographs of the finished project
- A final report describing the entire process and the state of the project two years out (two years after implementation)

## **9. Project Duration**

Once this project is successfully funded by both the ACC and the SRFB, final design and permitting will begin in late 2010-early 2011 with a construction date target of late summer 2011. Initial narrative reports will be completed and distributed in late 2011. Multi-year monitoring and effectiveness monitoring will continue until 2014. Multi-year herbicide treatments may be necessary as well; the last treatments will be applied in 2014. A final report will be submitted in 2014.

## **10. Permits**

This project will need five permits. As a partner in development of this project, Clark County (the landowner) has indicated that right of entry and permission to implement the project in this proposal are already granted. ESA consultation requirements will be met under the limit 8 process through SRFB funded grants. This project meets the criteria for the Washington State Streamlined Joint Aquatics Resource Permit Application (JARPA) Process as well as the Nationwide Permit 27 (USACE) if required. Finally, a Hydraulic Project Approval (HPA) will be needed. An Aquatics Land Use Authorization will be needed from Washington State Department of Natural Resources for entry and work on this site.

## **11. Matching Funds**

No in-kind is expected for the ACC award component.. As previously noted, however, we intend to use this ACC award of \$74,300 to leverage an additional \$350,063 in funding from the SRFB, for a whole-project total of \$424,636; representing a 6:1 leveraging of funds.

## **12. Peer Review of Proposed Project**

This project has been completed in coordination with a Technical Oversight Group (TOG) made up of local technical stakeholders involved in aquatic habitat management in the Eagle Island area. Each step of this study has been conducted in coordination with the TOG and the TOG has provided reviews of each technical memo produced as part of this effort. TOG members include: Frank Shrier (PacifiCorp Energy), Eli Asher (Lower Columbia Fish Recovery Board), Donna Bighouse, Brian Calkins, and Ron Roler (WA Dept of Fish and Wildlife), Bill Dygert, Pat Lee (Clark County), and Rudy Salakory (Cowlitz Indian Tribe) as project proponent and project manager. In addition to stakeholder review, these plans were also reviewed by Michelle Cramer, Chief Environmental Engineer for WA Department of Fish and Wildlife.



### **13. Budget**

See Appendix “A” (page 9) for the full budget breakdown

### **14. Photo Documentation**

Photographic documentation of this project from before, during, and after construction will be an integral part of this project. Photographs will be part of the final report, as well as monitoring reports.

## **REFERENCES**

Bio-Analysts, EDAW, Historical Research Associates, Hardin-Davis, Mason Bruce & Girard, Meridian Environmental, Mobrand Biometrics, Montgomery Watson Harza, Northwest Hydraulic Consultants, Washington Department of Fish and Wildlife, and Watershed GeoDynamics. 2003. Final Licensee's 2001 technical study status reports for the Lewis River Hydroelectric Projects. FERC No. 935, 2071, 2111, 2213. Prepared for PacifiCorp, Portland, Oregon and Public Utility District No. 1 of Cowlitz County, Longview, Washington.

Interfluve, Cramer Fish Sciences, and Fox Environmental Services. 2008. Lewis River LWD Study. Prepared for PacifiCorp, Portland, OR.

LCFRB (Lower Columbia Fish Recovery Board). 2004a. Kalama, Washougal and Lewis River Habitat Assessments Chapter 3: The North Fork Lewis River Basin. Prepared by R2 Resource Consultants for the LCFRB.

LCFRB (Lower Columbia Fish Recovery Board). 2004b. Lower Columbia Salmon and Steelhead Recovery and Subbasin Plan. Prepared for Northwest Power and Conservation Council.

LCFRB (Lower Columbia Fish Recovery Board). 2009. LCFRB Habitat Strategy. Available on-line at <http://www.lcfrb.gen.wa.us/2008%20HWS.htm>.

Stillwater Sciences. 2006. Lewis River Spawning Gravel Evaluation. Prepared for PacifiCorp, Portland, Oregon and Public Utility District No. 1 of Cowlitz County, Longview, Washington.

Stillwater Sciences. 2009 Lewis River Spawning Gravel Evaluation, Final Report. Prepared for PacifiCorp, Portland, Oregon and Public Utility District No. 1 of Cowlitz County, Longview, Washington.

Wade, G. 2000. Salmon and steelhead habitat limiting factors: water resource inventory area 27. Washington Conservation Commission, Olympia

## Appendix A

### Working budget for the full project

<b>Section A: Personnel</b>	Hrs/Wk	Weeks	FTE	Annual Hours	Hourly Rate	Personnel Cost	Total Amount
CIT Executive Coordination	3	36	0.05	108	\$ 60.00	\$ 6,480	
Accountant	3	36	0.05	108	\$ 60.00	\$ 6,480	
NRD Project Manager (A&E)	8	32	0.12	256	\$ 25.00	\$ 6,400	
NRD Project Manager (Construction)	40	4	0.08	160	\$ 25.00	\$ 4,000	
sum of continuous staff FTE			0.3			<b>Personnel</b>	<b>\$ 23,360</b>
<b>Section B: Payroll Taxes &amp; Benefits</b>					%	Amount	
				32.54%	\$ 7,601		
					<b>Payroll Taxes &amp; Benefits</b>		<b>\$ 7,601</b>
<b>Section C: Travel</b>	Rate/Mile	Miles/Round trip		Trips/Week	weeks	Travel Cost	
Car Miles	0.500	80		1	40	\$ 1,600	
						<b>Travel Total</b>	<b>\$ 1,600</b>
<b>Section D: Supplies</b>			Unit	Qty	Unit cost	Cost	
Large Woody Debris			EACH	200	\$ 600	\$120,000	
Straw Mulch			ACRE	1.5	\$1,500	\$ 2,250	
Boulders			EACH	352	\$100	\$ 35,200	
						<b>Supplies</b>	<b>\$ 157,450</b>
<b>Section E: Contractual Costs</b>			Qty	Unit	Unit cost	Cost	
Permit Acquisition			1	EACH	\$20,000	\$ 20,000	
Additional Design			1	EACH	\$15,000	\$ 15,000	
Plantings (Cuttings)			EACH	1800	\$ 3.25	\$ 5,850	
Plantings (Bare Root)			EACH	1220	\$ 5.25	\$ 6,405	
Seed Installation			ACRE	0.8	\$ 775	\$ 620	
Large Woody Debris Placement			EACH	200	\$ 500	\$ 100,000	
Construction Oversight			1	EACH	\$10,500	\$ 10,500	
Invasive Species Control			1.5	ACRE	\$ 500	\$ 750	
						<b>Contractual Costs</b>	<b>\$ 163,625</b>
<b>Section F: Construction Costs</b>			Qty	Unit	Unit cost	Cost	
Mobilization			1	EACH	\$ 30,000	\$ 30,000	
Stone Construction Entrance			1	LS	\$ 5,000	\$ 5,000	
Erosion Control			1	LS	\$ 30,000	\$ 30,000	
Coffer Dams			300	LF	\$ 35	\$ 10,500	
						<b>Construction Costs</b>	<b>\$ 75,500</b>
						<b>Total Budget</b>	<b>\$ 424,636</b>

## **Appendix B**

### ***Function of LWD to be placed***

<b>Habitat cover wood</b>
Habitat cover wood consists of individual placements or small accumulations (1-10 pieces) within the active channel that are designed to provide holding and rearing cover. These structures provide velocity refuge during high flow, provide cover from predators, and provide a substrate for macro-invertebrate colonization.
<b>Lateral scour pool jams</b>
Lateral scour pool log jams are positioned to induce pool scour. They are typically placed along the outside of meander bends although they may be placed at other locations along the channel boundary as appropriate. These jams provide the functions of cover wood and also maintain pools, sort gravels, and capture additional wood.
<b>Bar apex jams</b>
Bar apex jams are positioned with the intent of creating or maintaining a split flow condition around the jam. These jams consist of key members oriented parallel to the flow with raked members positioned perpendicular to the flow along the upstream portion of the jam. Bar apex jams create scour just upstream of the jam and deposition just downstream. They are designed to capture additional fluvial wood from upstream. These jams provide habitat cover and velocity refuge but are mainly designed to enhance channel complexity.
<b>Floodplain wood</b>
Floodplain wood consists of individual pieces or small accumulations of wood placed on the floodplain surface to increase floodplain roughness where natural floodplain roughness elements (e.g. vegetation or logs) are insufficient. These placements reduce avulsion risk and erosion associated with unstable channels until a point at which natural vegetation and natural wood recruitment are able to provide natural stability.

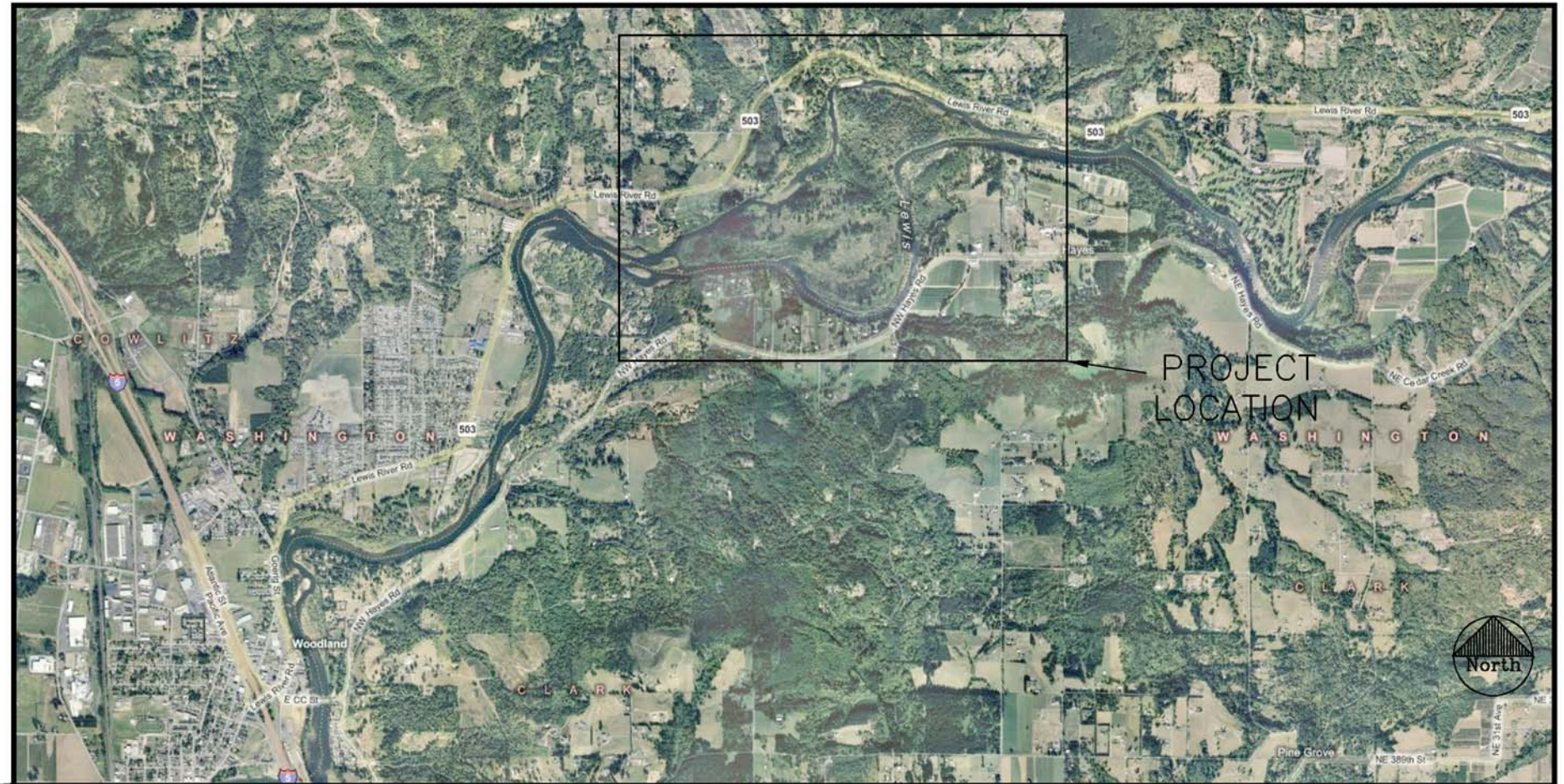
**Table 1. Types of woody debris installations described in the 90% design drawings.**

## **Appendix C**

### ***Proposed Project Plans***

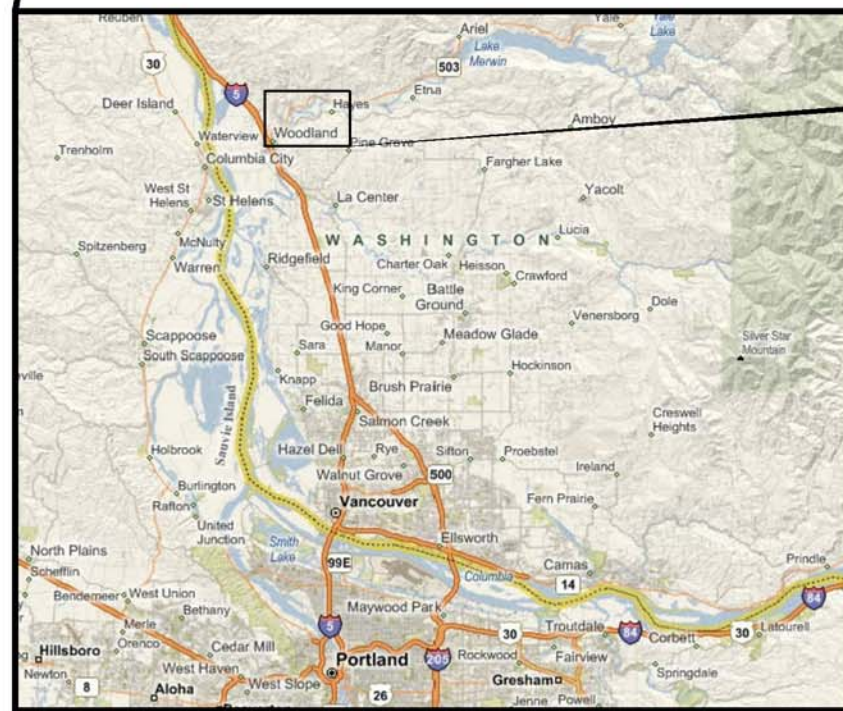
**Project plans begin on the following page**





SITE MAP

Preliminary Not  
For Construction



VICINITY MAP

ABBREVIATIONS

LWD	LARGE WOODY DEBRIS
ESC	EROSION SEDIMENT AND CONTROL
FES	FABRIC ENCAPSULATED SOIL
FT	FEET
STA	STATION
ELEV	ELEVATION
IN	INCH
APPROX	APPROXIMATE
YR	YEAR
'	FEET
"	INCH
°	DEGREES
%	PERCENT
INV	INVERT
DIA	DIAMETER
HDPE	HIGH DENSITY POLYETHYLENE
OHW	ORDINARY HIGH WATER

SHEET INDEX

1	COVER, SHEET INDEX AND VICINITY MAP
2	GENERAL NOTES
3	SITE PLAN AND ACCESS
4	EROSION AND SEDIMENT CONTROL PLAN
5	PLAN VIEW HABITAT RESTORATION
6	CROSS-SECTIONS
7	TYPICAL DETAILS
8	TYPICAL DETAILS
9	TYPICAL DETAILS
10	TYPICAL DETAILS
11	EROSION CONTROL NOTES AND DETAILS
12	REVEGETATION PLAN

90% DESIGN

NO.	BY	DATE	REVISION DESCRIPTION

RP	BN	BN,GJ
DRAWN	DESIGNED	CHECKED
BN	11/20/09	
APPROVED	DATE	PROJECT

Lewis River – Eagle Island  
Habitat Restoration – Site A  
Woodland, Washington



1020 Wasco Street, Suite 1  
Hood River, OR 97031  
541.386.9003  
www.interfluve.com

Cover, Sheet Index and  
Vicinity Map

SHEET  
1 of 12



EXISTING DATA

GENERAL TOPOGRAPHIC INFORMATION IS PROVIDED FROM LIDAR FROM CLARK COUNTY AND SPECIFIC PROJECT AREA SURVEY PERFORMED BY INTER-FLUVE, INC.

SOILS

LEWIS RIVER GRAVEL BAR.

UTILITIES

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR HAVING UTILITIES LOCATED PRIOR TO CONSTRUCTION ACTIVITIES.

THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE AFFECTED UTILITY SERVICE TO REPORT ANY DAMAGED OR DESTROYED UTILITIES. THE CONTRACTOR SHALL PROVIDE EQUIPMENT OR LABOR TO AID THE AFFECTED UTILITY SERVICE IN REPAIRING DAMAGED OR DESTROYED UTILITIES AT NO COST TO THE OWNER.

CONSTRUCTION ACCESS

THE CONTRACTOR SHALL ENTER THE SITE FROM NW 15TH AVE. NEAR ITS INTERSECTION WITH NW HAYES ROAD.

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR OBTAINING ANY REQUIRED TRAFFIC CONTROL OR ACCESS PERMITS.

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING ANY REQUIRED TRAFFIC CONTROL INCLUDING, BUT NOT LIMITED TO, SIGNAGE AND FLAGGERS.

ALL SAPLING AND TREES TO BE TRANSPLANTED OR REMOVED SHALL BE APPROVED BY THE OWNER’S REPRESENTATIVE AND CLEARLY MARKED.

ALL EQUIPMENT, MATERIALS AND PERSONNEL SHALL REMAIN WITHIN THE LIMITS OF DISTURBANCE.

THE CONTRACTOR SHALL KEEP THE WORK AREAS IN A NEAT AND SIGHTLY CONDITION FREE OF DEBRIS AND LITTER FOR THE DURATION OF THE PROJECT.

COFFERDAM

WORK AREA(S) SHALL BE ISOLATED BY COFFERDAMS INSTALLED UPSTREAM AND DOWNSTREAM OF ENHANCEMENT AREA. COFFERDAM MAY BE CONSTRUCTED WITH SAND FILLED BULK BAGS AND LINED WITH VISQUEEN ADJACENT TO ACTIVE FLOW IN THE CHANNEL.

DEWATERING OF WORK AREA(S) SHALL OCCUR CONCURRENT WITH FISH RESCUE. THE OWNER WILL BE RESPONSIBLE FOR CONDUCTING AND COORDINATING THE FISH RESCUE. THE CONTRACTOR SHALL COORDINATE DEWATERING WITH FISH RESCUE ACTIVITIES.

PUMPING SHALL BE PERFORMED TO KEEP WORK AREA DEWATERED. PUMPED DISCHARGE SHALL RELEASE SEDIMENT-LADEN WATER IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OR INCREASE TURBIDITY OF SURFACE WATERS. (SEE CONTROL DEWATERING).

FISH RESCUE

COFFER DAM SHALL BE INSTALLED TO ISOLATE WORK.

INITIAL DEWATERING SHALL OCCUR SLOWLY BY INCREMENTALLY REDUCING COFFER DAMMED AREAS OVER A PERIOD OF 30 MINUTES TO ALLOW TIME FOR FISH TO FIND RESIDUAL POOLS WITHOUT RISK OF SUDDEN STRANDING.

RESIDUAL POOLS WITHIN THE DEWATERED CONSTRUCTION SITE SHALL BE PUMPED DRY USING SCREENED PUMP INTAKES. TRAPPED FISH SHALL BE RESCUED.

FISH BARRIERS AND PUMP INTAKES SHALL ADHERE TO NMFS SCREENING CRITERIA. NATIONAL MARINE FISHERIES SERVICE JUVENILE FISH SCREEN CRITERIA (REVISED FEBRUARY 16, 1995) AND ADDENDUM: JUVENILE FISH SCREEN CRITERIA FOR PUMP INTAKES (MAY 9, 1996)

ALL FISH RESCUE EFFORTS SHALL BE SUPERVISED BY A QUALIFIED FISHERIES/AQUATIC BIOLOGIST EXPERIENCED WITH THE COLLECTION AND HANDLING OF SALMONID FISHES FROM CONSTRUCTION SITES.

ALL FISH TRAPPED IN RESIDUAL POOLS WITHIN THE PROJECT AREA WILL BE CAREFULLY COLLECTED BY SEINE AND/OR DIP NETS AND PLACED IN CLEAN TRANSFER CONTAINERS WITH ADEQUATE VOLUME OF WATER AND HELD WITHIN NO LONGER THAN 10 MINUTES.

CAPTURED FISHES SHALL BE IMMEDIATELY RELEASED TO DOWNSTREAM OR UPSTREAM OF THE CONSTRUCTION SITE, DEPENDING ON SPECIES AND LIFESTAGE.

TREE SALVAGE

ANY REMOVED VEGETATION GREATER THAN 6 INCHES DIAMETER AND 15 FEET LONG SHOULD BE INCORPORATED INTO LOG JAM STRUCTURES. CONTRACTOR IS RESPONSIBLE FOR REMOVING SMALLER CLEARING AND GRUBBING DEBRIS FROM THE SITE AT THE END OF THE PROJECT UNLESS DIRECTED BY THE OWNER’S REPRESENTATIVE.

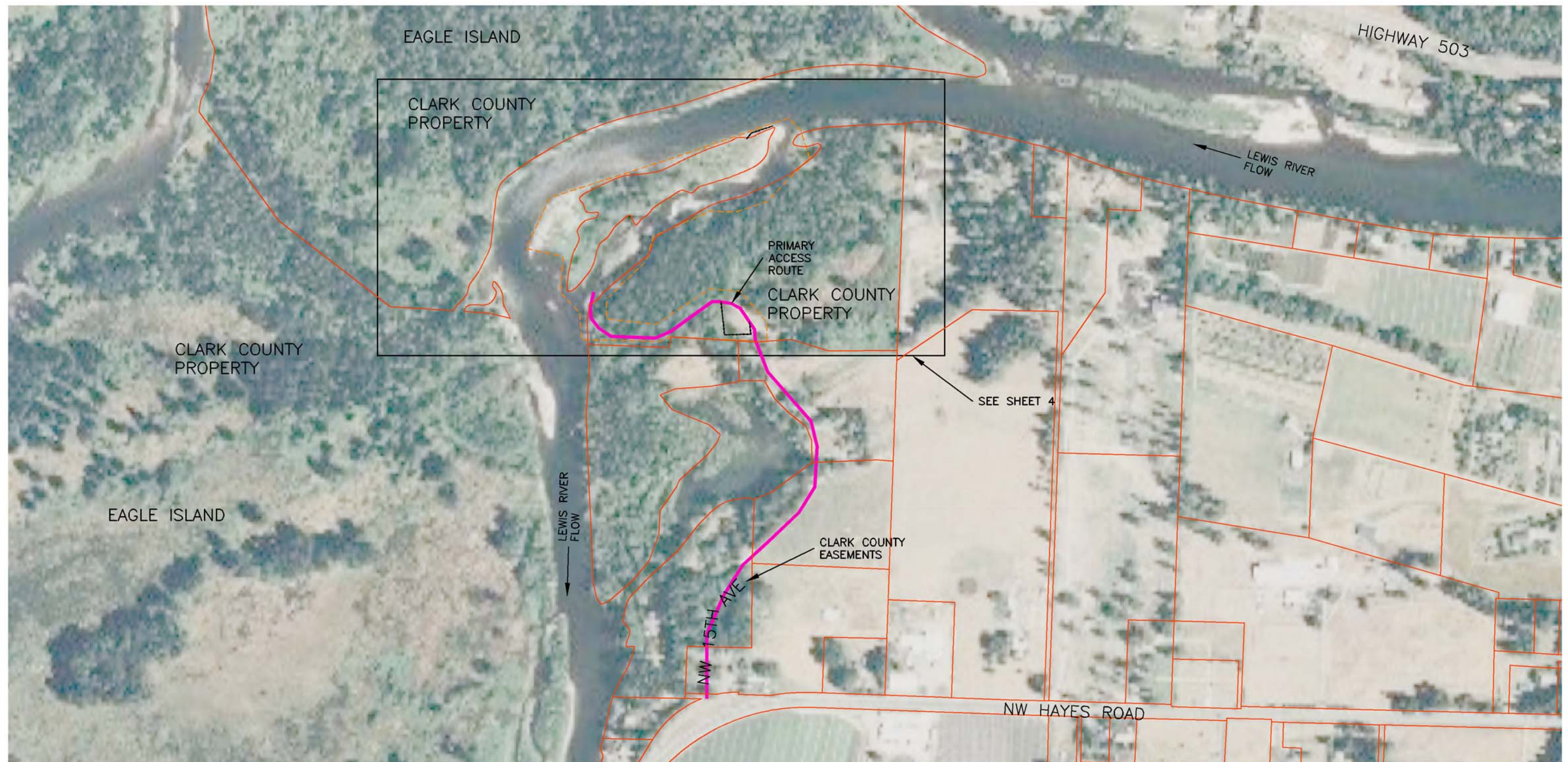
LIVE TREES

ALL TREES NOT MARKED FOR REMOVAL SHALL BE LEFT STANDING UNDISTURBED. LOGGING ACTIVITY SHALL NOT DEBARK OR DAMAGE LIVE TREES.

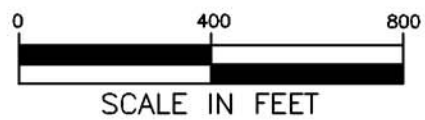
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SITE PLAN



LEGEND

- ACCESS ROUTE
- PROPERTY LINES
- LIMITS OF DISTURBANCE

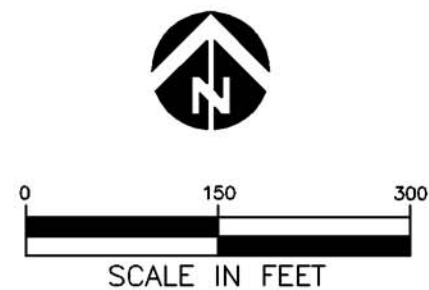
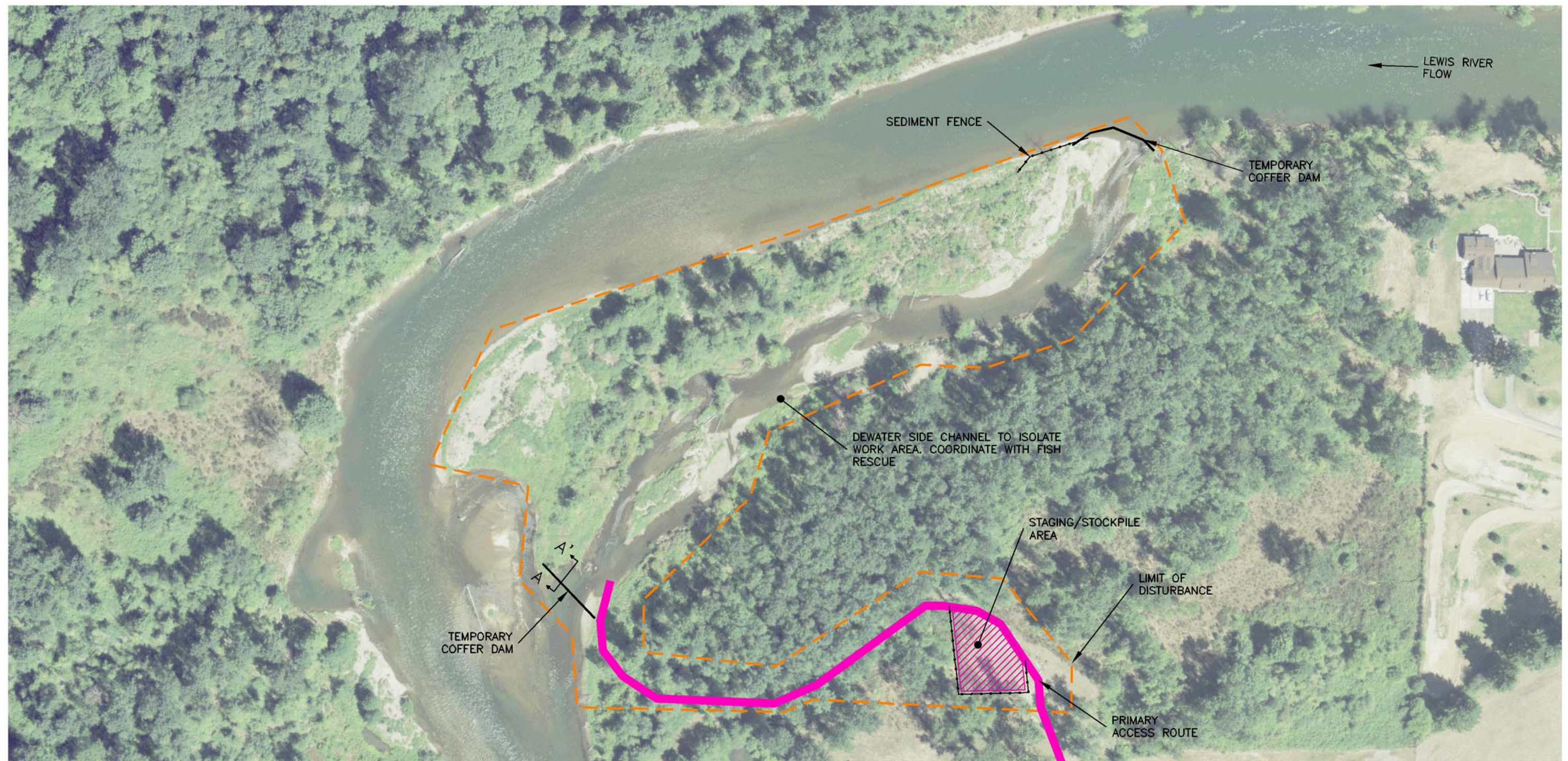
Preliminary Not  
For Construction

				Lewis River – Eagle Island Habitat Restoration – Site A Woodland, Washington			Site Plan and Access		SHEET
				RP DRAWN	BN DESIGNED	BN,GJ CHECKED			3 of 12
				BN APPROVED	11/20/09 DATE				
NO.	BY	DATE	REVISION DESCRIPTION						



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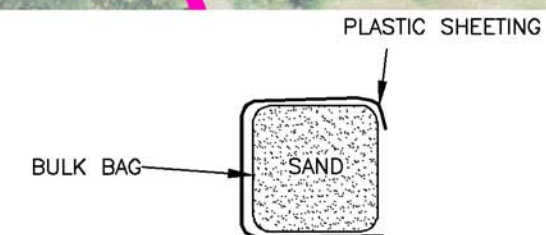


### LEGEND

- TEMPORARY COFFER DAM
- ACCESS ROUTE
- STAGING/STOCKPILE
- LIMITS OF DISTURBANCE
- SEDIMENT FENCE

### PLAN VIEW

Preliminary Not  
For Construction



### SECTION A-A'

NO SCALE

- NOTES:
1. PLACE COFFER DAMS PRIOR TO PERFORMING IN-WATER WORK.
  3. REMOVE COFFER DAMS AFTER IN-WATER WORK IS COMPLETE.

NO.	BY	DATE	REVISION DESCRIPTION

RP	BN	BN,GJ
DRAWN	DESIGNED	CHECKED
BN	11/20/09	
APPROVED	DATE	PROJECT

Lewis River – Eagle Island  
Habitat Restoration – Site A  
Woodland, Washington

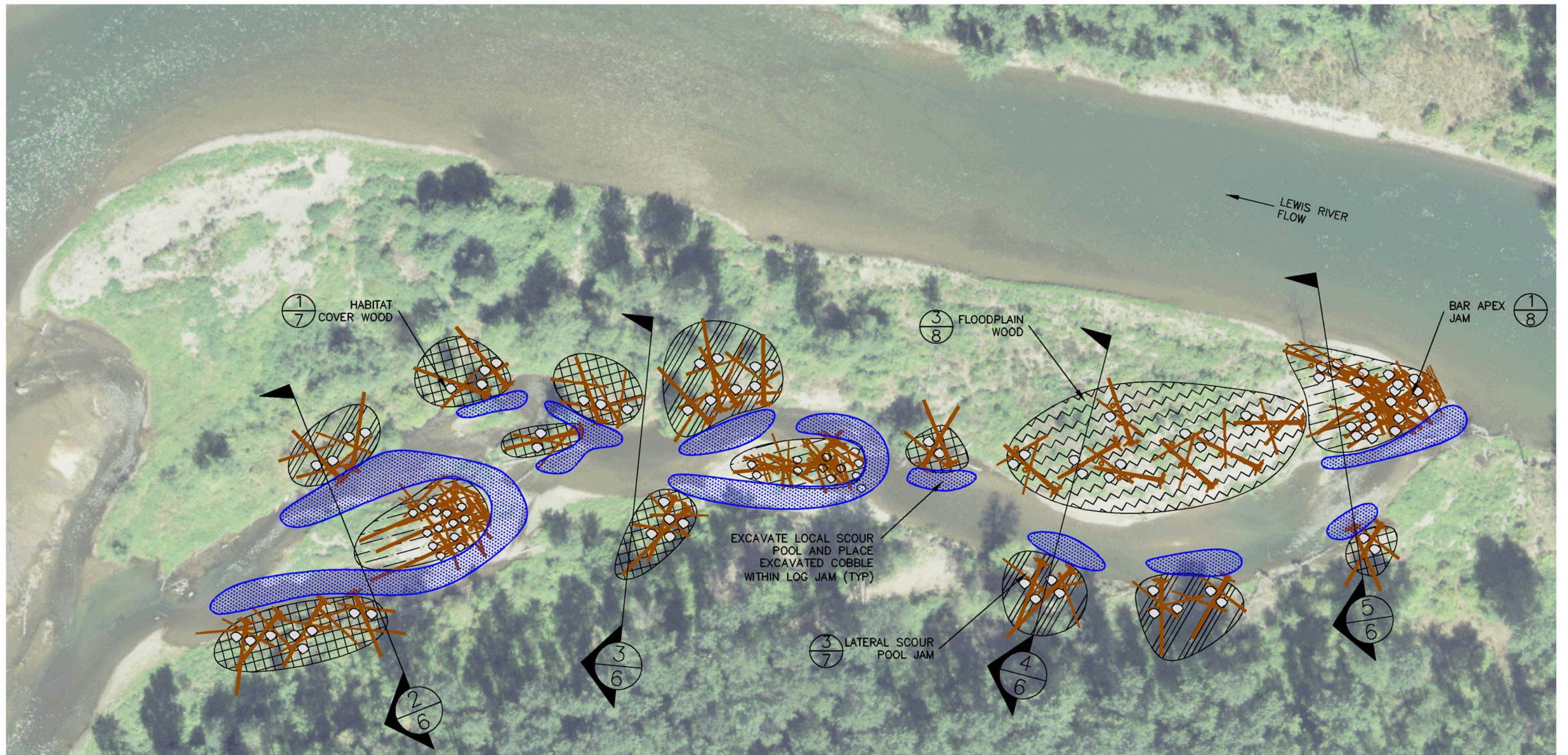


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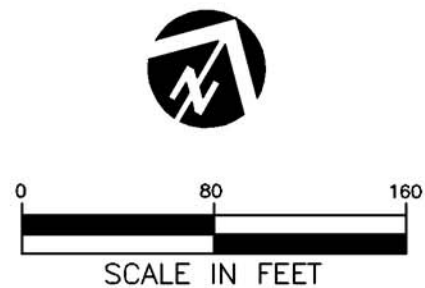
Erosion and Sediment  
Control Plan

SHEET  
4 of 12





PLAN VIEW



LEGEND

- |                       |  |                        |  |
|-----------------------|--|------------------------|--|
| EXISTING CONTOURS     |  | HABITAT WOOD COVER     |  |
| WOOD                  |  | LATERAL SCOUR POOL JAM |  |
| BOULDER BALLAST       |  | FLOODPLAIN WOOD        |  |
| LOCALIZED SCOUR POOLS |  | BAR APEX JAM           |  |

NOTE:  
SPECIFIC ORIENTATION OF LOGS AND  
BALLAST MATERIALS MAY VARY FROM  
PLAN VIEW DRAWING DEPENDING ON  
SIZE AND SHAPE OF MATERIAL  
ACQUIRED AND SITE CONDITIONS AT  
TIME OF CONSTRUCTION.

Preliminary Not  
For Construction

NO.	BY	DATE	REVISION DESCRIPTION

RP	BN	BN,GJ
DRAWN	DESIGNED	CHECKED
BN	11/20/09	
APPROVED	DATE	PROJECT

Lewis River – Eagle Island  
Habitat Restoration – Site A  
Woodland, Washington

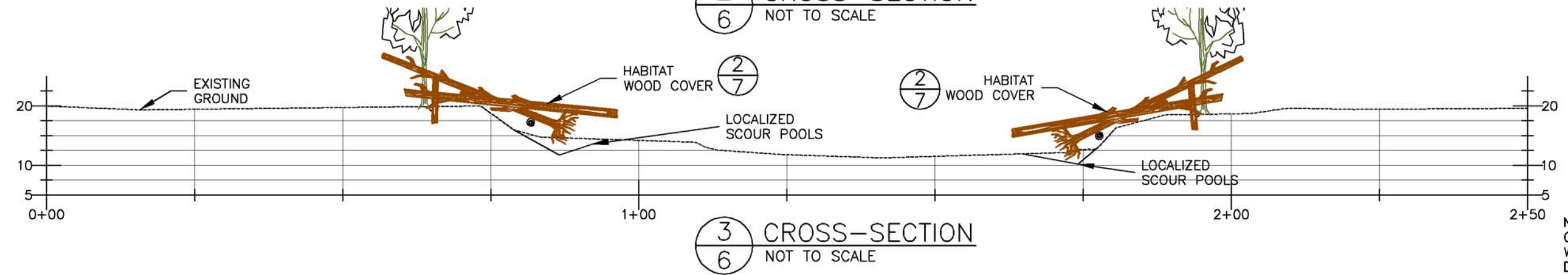
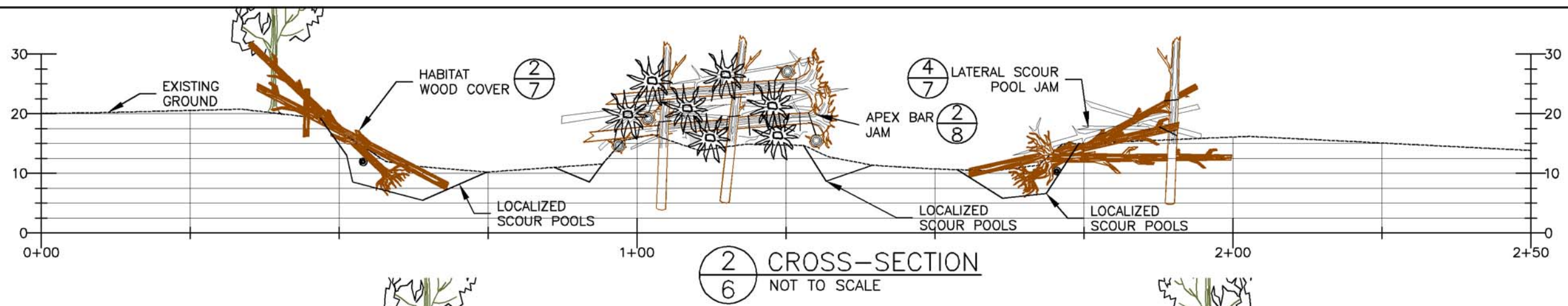


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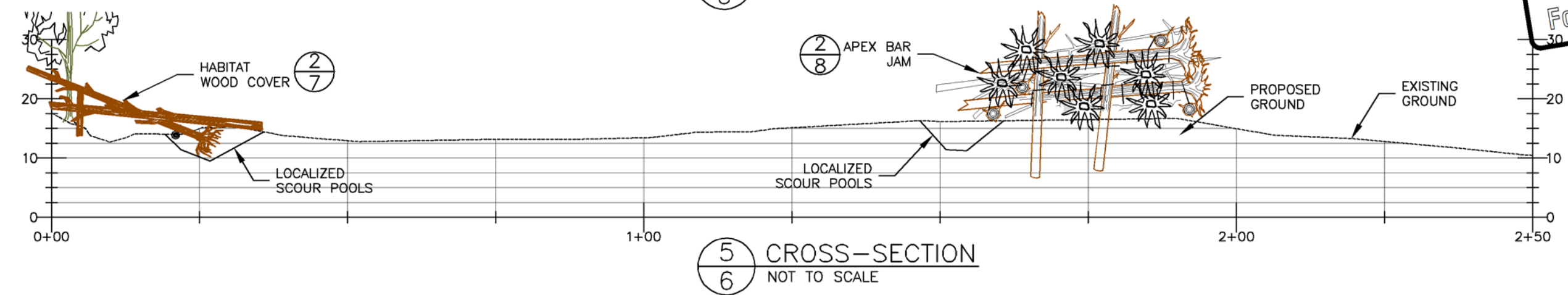
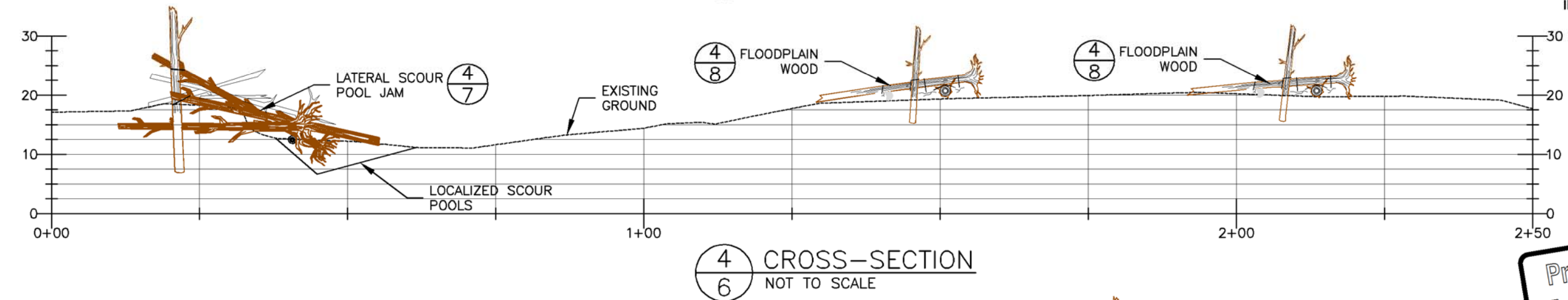
Plan View  
Habitat Restoration

SHEET  
5 of 12





NOTE:  
CROSS-SECTION INFORMATION  
WAS COMPILED USING SURVEY  
DATA CONDUCTED OCT, 2009 BY  
INTER-FLUVE, INC.



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For Construction

NO.	BY	DATE	REVISION DESCRIPTION

RP	BN	BN,GJ
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BN	11/20/09	
APPROVED	DATE	PROJECT

Lewis River – Eagle Island  
Habitat Restoration – Site A  
Woodland, Washington



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Cross-Sections

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6 of 12





BRACING TO EXISTING TREES OR INSTALLED VERTICAL LOGS WILL OCCUR AT LOCATIONS IDENTIFIED IN THE FIELD TO PROVIDE HORIZONTAL STABILITY. FILLER LOGS AND TREE TOPS WILL BE INSTALLED AT "RACKING" LOCATIONS TO EMULATE NATURAL DEBRIS ACCUMULATIONS AND TO OPTIMIZE FISH HABITAT. THESE PIECES ARE TO BE CONSIDERED MOBILE AND TRANSIENT, AND MAY BECOME LOOSE, DISPLACED, REPLACED, OR ACCUMULATED ONTO DURING FLOODING.

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Lewis River – Eagle Island  
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Woodland, Washington



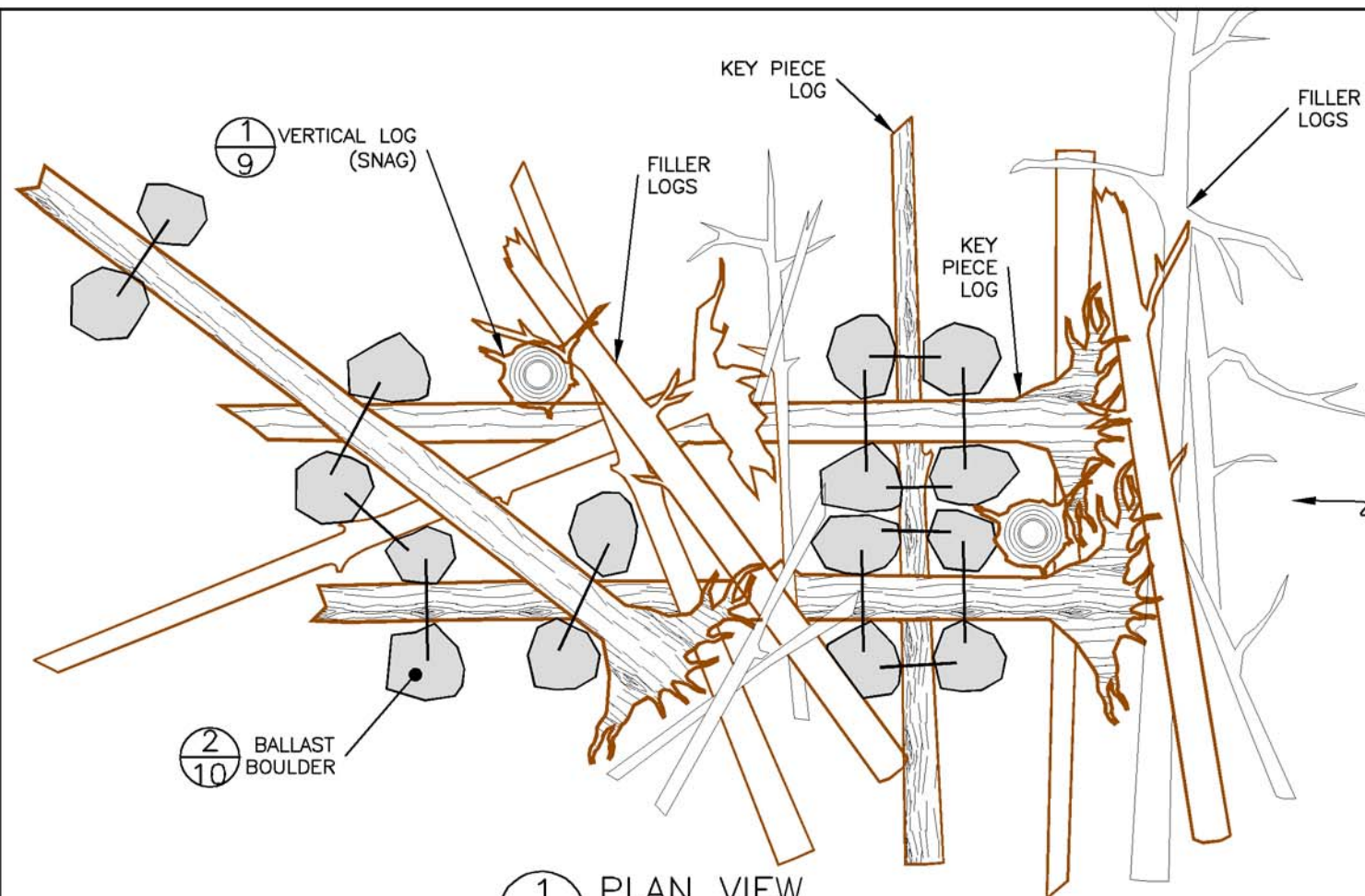
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### Typical Details

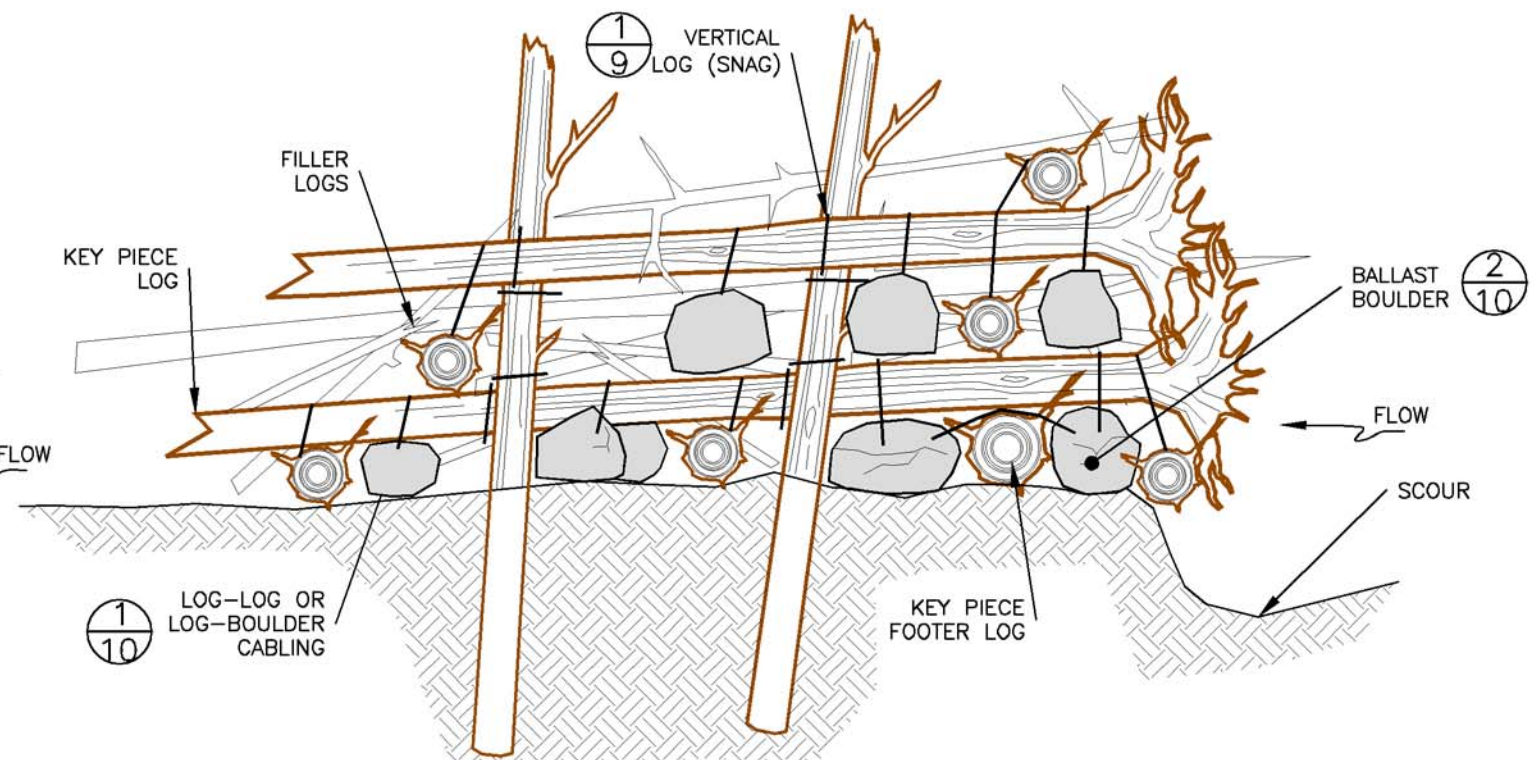
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7 OF 12





1 PLAN VIEW  
8 TYPICAL BAR APEX LOG JAM  
NOT TO SCALE

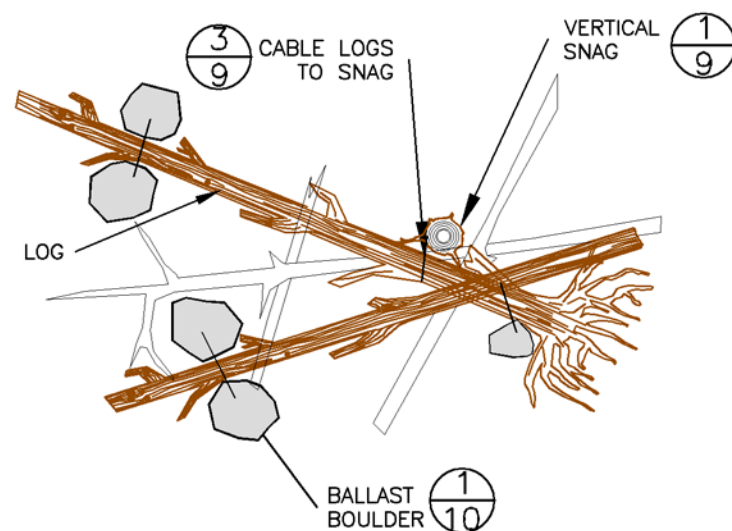


2 SECTION VIEW  
8 TYPICAL BAR APEX LOG JAM  
NOT TO SCALE

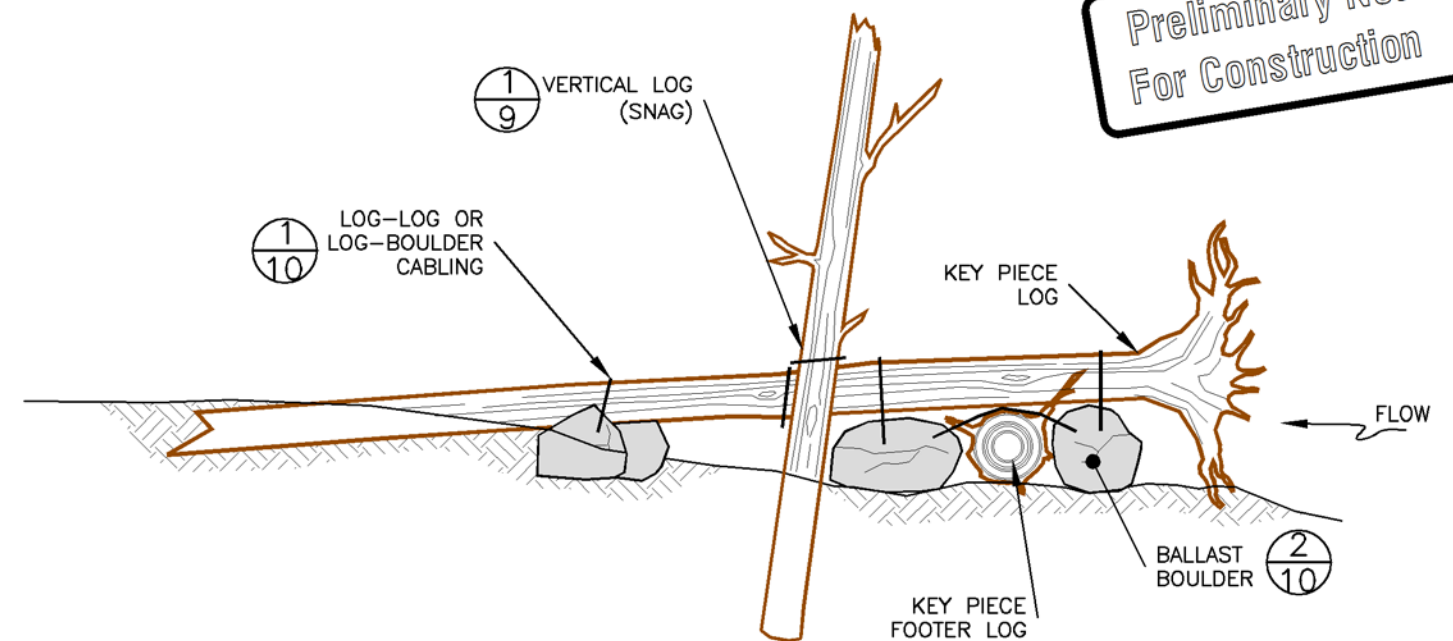
## NOTES

SPECIFIC ORIENTATION OF LOGS AND BALLAST MATERIALS MAY VARY FROM TYPICAL DRAWINGS DEPENDING ON SIZE AND SHAPE OF MATERIAL DELIVERED OR SALVAGED.

BRACING TO EXISTING TREES OR INSTALLED VERTICAL LOGS WILL OCCUR AT LOCATIONS IDENTIFIED IN THE FIELD TO PROVIDE HORIZONTAL STABILITY. FILLER LOGS AND TREE TOPS WILL BE INSTALLED AT "RACKING" LOCATIONS TO EMULATE NATURAL DEBRIS ACCUMULATIONS AND TO OPTIMIZE FISH HABITAT. THESE PIECES ARE TO BE CONSIDERED MOBILE AND TRANSIENT, AND MAY BECOME LOOSE, DISPLACED, REPLACED, OR ACCUMULATED ONTO DURING FLOODING.



3 PLAN VIEW  
8 TYPICAL FLOODPLAIN WOOD  
NOT TO SCALE



4 SECTION VIEW  
8 TYPICAL FLOODPLAIN WOOD  
NOT TO SCALE

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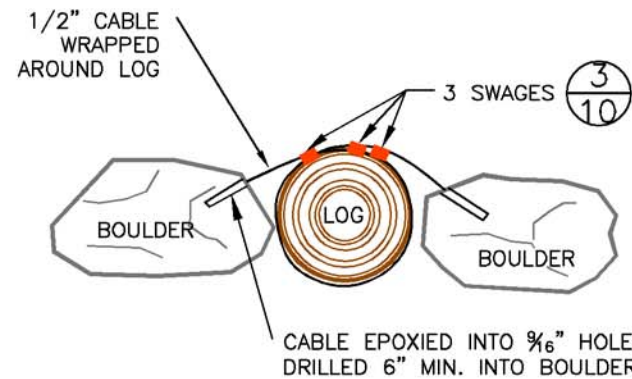
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8 of 12







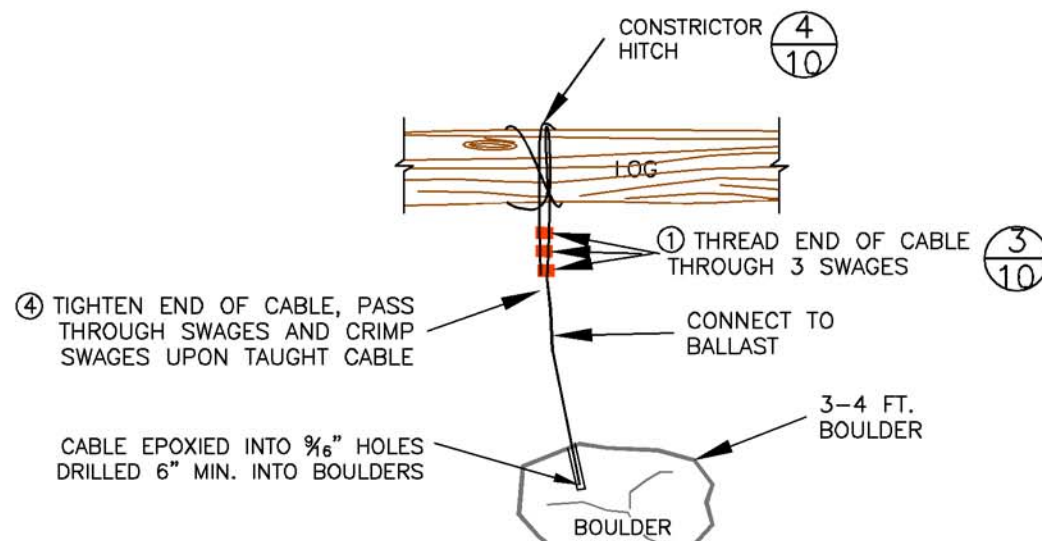
1 LWD INSTALLATION DETAILS

Log Wood Buoyancy Force in Pounds Assumes Wood Specific Gravity = 0.5	
DBH X Log Length (feet)	Safety Factor 1.5
1 x 30	1104
2 x 30	4416
3 x 30	9935
1 x 40	1472
2 x 40	5887
Additional Root Wad Buoyancy Force in Pounds. Estimate Based on 35% Void Space Adjust as needed based on void space in each root wad.	
2 X 2 Foot Diameter RW	64
3 X 3 Foot Diameter RW	215
4 X 4 Foot Diameter RW	510
5 X 5 Foot Diameter RW	997
6 X 6 Foot Diameter RW	1722

NOTE:  
THE NUMBER OF ANCHOR ROCKS PER ANCHORED LOG STRUCTURE SHALL BE AS SHOWN ON THE TABLES PROVIDED ON THIS SHEET USING APPROPRIATE NUMBER OF BOULDERS AND THE SIZE OF LOGS.

Submerged Boulder Ballast in Pounds. Assumes Rock Specific Gravity of 2.65 and lift @ 6fps	
Boulder Diameter	Ballast
3 Foot	1289
2 - Boulder Configuration	2579
4 - Boulder Configuration	3868
3.5 Foot	2085
2 - Boulder Configuration	4171
4 - Boulder Configuration	6256
4 Foot	3156
2 - Boulder Configuration	6311
4 - Boulder Configuration	9467

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2 CONSTRUCTOR HITCH CABLE WRAP

## BOULDER BALLAST AND WOOD CABLING:

### BOULDER BALLAST NOTES

**DESCRIPTION**  
THIS WORK CONSISTS OF INSTALLING LOGS WITH ROOT WADS INTO ANCHORED LOG STRUCTURES AS SHOWN ON THE PLANS AND AS DIRECTED BY THE OWNERS REPRESENTATIVE.

**MATERIALS**  
ANCHORS FOR THIS WORK WILL CONSIST OF CABLED BOULDERS. BOULDERS SHALL BE NON-FRACTURED BASALT WITH A MINIMUM SPECIFIC GRAVITY OF 2.65.

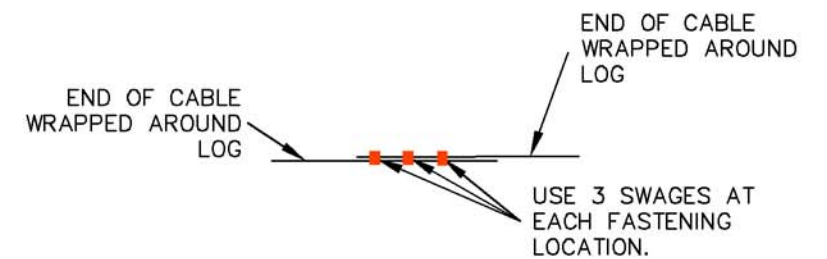
CABLE SHALL BE GALVANIZED, STEEL CORE, AND SHALL HAVE A MINIMUM DIAMETER OF 1/2 INCH.

SWAGES SHALL BE ZINC PLATED COPPER AND SHALL MEET THE PERFORMANCE REQUIREMENTS OF MILITARY STANDARD MS-51844, REV. C, SLEEVES, SWAGING-WIRE ROPE. MINIMUM OF 3 SWAGES PER CONNECTION.

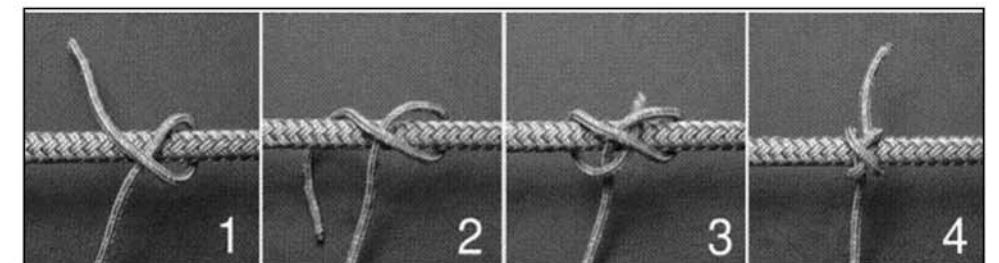
EPOXY FOR ANCHORING SHALL BE HILTI HIT RE 500 ADHESIVE OR APPROVED EQUAL.

#### CONSTRUCTION

FINAL POSITIONING OF THE ANCHORED LOG STRUCTURES SHALL BE IN THE APPROXIMATE LOCATION AS SHOWN ON THE PLANS AND AS APPROVED IN THE FIELD BY THE OWNERS REPRESENTATIVE.



3 SWAGES CABLE SPLICE DETAIL



4 CONSTRUCTOR HITCH CABLE KNOT DETAIL

#### GENERAL NOTES , CONT'D

FINAL POSITIONING OF THE ANCHORED LOG STRUCTURES SHALL BE IN THE APPROXIMATE LOCATION AS SHOWN ON THE PLANS AND AS APPROVED IN THE FIELD BY THE OWNERS REPRESENTATIVE.

BALLAST BOULDERS SHALL BE SECURED AS SHOWN ON THE PLANS.

DRILL HOLES IN SOLID ROCK AND AVOID ANY CRACKS OR FRACTURES. HOLES SHALL BE 9/16 INCH IN DIAMETER. HOLES MUST BE DRILLED 6 INCHES, MINIMUM, INTO ROCK. HOLES MUST BE CLEANED OF LOOSE ROCK FRAGMENTS AND POWDER WITH A BRUSH AND WATER. HOLES MUST BE CLEAN OF ALL DUST, DEBRIS, OIL, AND SOAP RESIDUES. THE HOLES MUST FLUSH CLEAR TO INSURE NO MATERIAL EXISTS BETWEEN THE CABLE, EPOXY, AND ROCK SURFACE. INSTALL EPOXY PER MANUFACTURER'S RECOMMENDATIONS.

CABLE SHALL BE WRAPPED ONCE AROUND LOG BEFORE ENDS ARE INSERTED INTO THE DRILLED HOLES FILLED WITH EPOXY. WIPE CABLE WITH CLEAN ACETONE SOAKED RAG TO REMOVE OILS AND GREASES PRIOR TO INSERTION INTO EPOXY FILLED HOLE. FILL DRILL HOLES ENOUGH TO ENSURE COMPLETE COVERAGE WITH EPOXY. INSERT CABLE INTO HOLE SO THAT END OF CABLE HITS THE BOTTOM OF THE HOLE. EXCESS EPOXY SHOULD COME OUT OF THE TOP OF THE HOLE AS CABLE IS SEATED IN DRILL HOLE.

MINIMUM 3 SWAGES PER CONNECTION. SWAGES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION, SPACING AND SWAGE TOOL DIAMETER FOR THE SIZE AND LOAD RATING OF THE CABLE BEING USED. SWAGING TOOL SHALL BE CHECKED FOR PROPER COMPRESSION, ACCORDING TO MANUFACTURER'S RECOMMENDATIONS, USING A GAUGE PROVIDED BY THE MANUFACTURER OF THE SWAGE FITTINGS BEING INSTALLED.

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10 of 12



THE CONTRACTOR IS ADVISED THAT THE PROJECT AREA DRAINS TO A SALMON BEARING STREAM AND/OR STATE WATERS AND THAT THE CONTRACTOR IS RESPONSIBLE TO PROTECT THE RECEIVING WATERS FROM DELETERIOUS EFFECTS OF CONSTRUCTION.

THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE EROSION CONTROL MEASURES SHOWN OR DESCRIBED IN THE CONTRACT DOCUMENTS AND ANY ADDITIONAL MEASURES THAT MAY BE REQUIRED BY THE CONTRACTORS MEANS AND METHODS OF CONSTRUCTION AS NEEDED TO CONTROL EROSION AND SEDIMENT AT THE CONSTRUCTION SITE AND TO PREVENT VIOLATION OF SURFACE WATER QUALITY, GROUND WATER QUALITY, OR SEDIMENT MANAGEMENT STANDARDS. EROSION CONTROL MEASURES SHALL BE MAINTAINED THROUGHOUT THE COURSE OF CONSTRUCTION AND UNTIL ALL DISTURBED EARTH IS STABILIZED IN FINISH GRADES.

EROSION CONTROL

CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING ALL NECESSARY EROSION CONTROL FACILITIES TO COMPLY WITH APPLICABLE EROSION CONTROL REGULATIONS.

AN APPROVED EROSION AND SEDIMENT CONTROL (ESC) PLAN IS PROVIDED IN THESE DRAWINGS. THE BID AND CONSTRUCTION CONTRACT ARE BASED UPON IT. THE CONTRACTOR SHALL BE SOLEY RESPONSIBLE FOR PROVIDING EROSION CONTROL MEASURES TO COMPLY WITH APPLICABLE REGULATIONS AND PERMITS.

THE FOLLOWING RECOMMENDATIONS FOR AN ESC PLAN WILL PROVIDE A GUIDELINE FOR THE CONTRACTOR TO DEVELOP AND IMPLEMENT AN ESC PLAN.

A. THE IMPLEMENTATION OF THESE RECOMMENDATIONS FOR AN ESC PLAN AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED, AND VEGETATION IS ESTABLISHED.

B. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

C. ESC FACILITIES AS APPROXIMATELY SHOWN ON THIS PLAN ARE TO BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, OR VIOLATE APPLICABLE WATER STANDARDS.

D. THE ESC FACILITIES SHOWN ON THE ESC PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.

E. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.

F. FROM OCTOBER 1 – APRIL 30, NO SUBSTANTIALLY UNWORKED SOILS SHALL REMAIN EXPOSED FOR MORE THAN TWO DAYS AT A TIME. FROM MAY 1 – SEPT 30 NO SUBSTANTIALLY UNWORKED SOILS SHALL REMAIN EXPOSED FOR MORE THAN SEVEN DAYS AT A TIME.

SEDIMENT FENCES

1. THE SILT FENCE SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, SILT FENCE SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 12 INCH OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST, OR OVERLAP 2’X2” POSTS AND ATTACH AS APPROVED BY THE OWNER’S REPRESENTATIVE.

2. THE SILT FENCE IS TO BE INSTALLED AT LOCATIONS SHOWN ON THE PLAN ALONG THE DOWNHILL PERIMETER OF DISTURBED AREAS. THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 4 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 12 INCHES.

3. THE SILT FENCE SHALL HAVE A MINIMUM VERTICAL BURIAL OF 6 INCHES. ALL EXCAVATED MATERIAL FROM FILTER FABRIC FENCE INSTALLATION SHALL BE BACKFILLED AND COMPACTED, ALONG THE ENTIRE DISTURBED AREA.

4. STANDARD OR HEAVY DUTY SILT FENCE SHALL HAVE MANUFACTURED STITCHED LOOPS FOR 2’ x 2’ POST INSTALLATION.

5. SILT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY PROTECTED AND STABILIZED.

6. SILT FENCES SHALL BE INSPECTED BY THE CONTRACTOR IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

7. ON PROJECT COMPLETION THE CONTRACTOR SHALL REMOVE ALL SILT FENCES AND TEMPORARY EROSION CONTROL MEASURES FROM THE PROJECT SITE.

INSPECTION AND MAINTENANCE

ALL BEST MANAGEMENT PRACTICES (BMPs) SHALL BE INSPECTED, MAINTAINED, AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. ALL ON-SITE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF RAIN PER 24 HOUR PERIOD.

SEDIMENT MUST BE REMOVED FROM SILT FENCES BEFORE IT REACHES APPROXIMATELY ONE THIRD THE HEIGHT OF THE FENCE, ESPECIALLY IF HEAVY RAINS ARE EXPECTED.

STABILIZE SOILS AND PROTECT SLOPES

FROM MAY 1 THROUGH SEPTEMBER 30, ALL EXPOSED SOILS SHALL BE PROTECTED FROM EROSION BY MULCHING, PLASTIC SHEETING, HYDROSEED COVERING, OR OTHER APPROVED MEASURES WITHIN ONE WEEK OF GRADING. FROM OCTOBER 1 THROUGH APRIL 30, ALL EXPOSED SOILS MUST BE PROTECTED WITHIN 2 DAYS OF GRADING. SOILS SHALL BE STABILIZED BEFORE A WORK SHUTDOWN, HOLIDAY OR WEEKEND IF NEEDED BASED ON THE WEATHER FORECAST. SOIL STOCKPILES MUST BE STABILIZED AND PROTECTED WITH SEDIMENT TRAPPING MEASURES. HYDROSEED AS SOON AS PRACTICAL ALL DISTURBED AREAS NOT INDICATED IN THE CONTRACT DOCUMENTS FOR OTHER PERMANENT STABILIZATION MEASURES. DESIGN, CONSTRUCT, AND PHASE CUT AND FILL SLOPES IN A MANNER THAT WILL MINIMIZE EROSION. REDUCE SLOPE VELOCITIES ON DISTURBED SLOPES BY PROVIDING TEMPORARY BARRIERS. STORMWATER FROM OFF SITE SHOULD BE HANDLED SEPARATELY FROM STORMWATER GENERATED ON SITE.

AFTER FINAL SITE STABILIZATION

ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BMPs ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED FROM THE SITE OR INCORPORATED INTO FINISHED GRADING. DISTURBED SOIL AREAS RESULTING FROM REMOVAL SHALL BE PERMANENTLY STABILIZED.

CONSTRUCTION ACCESS

PUBLIC RIGHTS-OF-WAY SHALL BE KEPT IN A CLEAN AND SERVICEABLE CONDITION AT ALL TIMES. IN THE EVENT MATERIALS ARE INADVERTENTLY DEPOSITED ON ROADWAYS THE MATERIAL SHALL BE PROMPTLY REMOVED. MATERIALS ARE TO BE SWEEPED AND REMOVED PRIOR TO ANY STREET FLUSHING.

SILT FENCE SHALL BE PLACED ALONG ACCESS ROUTES, STOCKPILE AREA, AND DOWNSTREAM OF OUTLET COFFER DAM.

CONTROL POLLUTANTS

CONTRACTOR MUST PREPARE A SPILL PREVENTION CONTROL AND COUNTER MEASURE (SPCC) PLAN AND IMPLEMENT REQUIRED MEASURES TO CONTROL POLLUTANTS. SEE THE SPECIAL PROVISIONS.

ALL POLLUTANT DISCHARGES OTHER THAN SEDIMENT THAT OCCUR ON SITE DURING CONSTRUCTION SHALL BE HANDLED AND DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORMWATER, GROUNDWATER, OR SOILS TO REMAIN ON SITE.

THE USE OF LIME, FLY ASH, OR OTHER SOIL AMENDMENTS THAT COULD ALTER THE PH OF DISCHARGE WATERS IS PROHIBITED.

SEDIMENT CONTROLS

THE DUFF LAYER, NATIVE TOP SOIL, AND NATURAL VEGETATION SHALL BE RETAINED IN AN UNDISTURBED STATE TO THE MAXIMUM EXTENT PRACTICABLE. THE CONTRACTOR SHALL MARK ALL AREAS WHICH ARE NOT TO BE DISTURBED, INCLUDING SETBACKS, SENSITIVE/CRITICAL AREAS AND THEIR BUFFERS. TREES AND DRAINAGE COURSES NOT TO BE DISTURBED SHALL BE MARKED AND FLAGGED BEFORE CONSTRUCTION ACTIVITIES ARE INITIATED. THESE AREAS SHALL BE PROTECTED BY THE CONTRACTOR WITH BARRIER FENCING AS SHOWN ON THE DRAWING AND AS DIRECTED BY THE ENGINEER WHEN CONSTRUCTION ACTIVITIES ARE INITIATED.

THE CONTRACTOR MAY ELECT TO CONSTRUCT TEMPORARY SEDIMENTATION PONDS, TANKS, OR OTHER FACILITIES AS NECESSARY TO CONTROL RUNOFF AND/OR TO FILTER DEWATERING DISCHARGE.

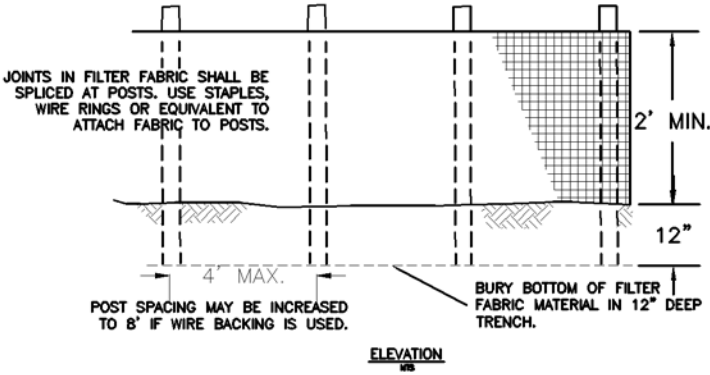
CONTROL DEWATERING

HIGHLY TURBID OR CONTAMINATED DEWATERING WATER FROM CONSTRUCTION EQUIPMENT OPERATION SHALL BE PREVENTED FROM DELIVERING SEDIMENT TO THE RIVER. DISPOSAL OPTIONS FOR DEWATERING DISCHARGE INCLUDE:

- 1. SEDIMENT-LADEN WATER MAY BE PUMPED TO AN UPLAND AREA AND ALLOWED TO SHEET FLOW OVER UNDISTURBED GROUND THROUGH EXISTING VEGETATION TO INFILTRATE INTO THE GROUND.
- 2. USE OF AN APPROPRIATELY SIZED AND MAINTAINED SEDIMENTATION BAG (DIRTBAG) OR OTHER SEDIMENTATION FACILITY WITH OUTFALL TO A DITCH OR SWALE FOR SMALL VOLUMES OF LOCALIZED DEWATERING.


NOTES:

- 1. FENCE SHALL NOT BE INSTALLED ON SLOPES STEEPER THAN 2:1.
- 2. JOINTS IN FILTER FABRIC SHALL BE OVERLAPPED 12 INCHES AT POST.
- 3. USE STAPLES, WIRE RINGS, OR EQUIVALENT TO ATTACH FABRIC.
- 4. REMOVE SEDIMENT WHEN IT REACHES 1/3 FENCE HEIGHT.



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1  
11 SILT FENCE  
DETAIL

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					BN	11/20/09					
					APPROVED	DATE	PROJECT				
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## APPENDIX G

## **Appendix G**

### **Pepper-Lewis Side Channel Instream Habitat Restoration**

## **1. Project Title**

### **Pepper-Lewis Side-Channel Instream Habitat Restoration**

## **2. Project Manager**

### **Adam Haspiel**

Mt. St. Helens National Volcanic Monument  
42218 NE Yale Bridge Road  
Amboy, WA 98604  
360-449-7833  
360-449-7801 (fax)  
[ahaspiel@fs.fed.us](mailto:ahaspiel@fs.fed.us)

## **3. Identification of problem or opportunity to be addressed**

An opportunity to enhance approximately 0.25 miles of limited side channel habitat in the Upper Lewis River with large woody material (LWM) exists.

This side channel is associated with Pepper Creek, a tributary to the North Fork Lewis River, which keeps cool water flowing throughout it when the mainstem Lewis River water levels drop during summer months.

Rearing habitat for coho has been identified to be limited in the Upper Lewis System.

Approximately 161 piece of LWM are being proposed under this project to be used to create 14 structures at strategic locations in the side channel to maximize natural channel characteristics while providing structure stability. Woody Material would come from a nearby timber sale unit which would provide long pieces of wood with attached rootwads.

A secondary, minor component of this project would be to remove 10 pieces of creosote treated 10"x10" timbers 20' long from an existing logjam near the downstream edge of the side channel. The excavator would remove the timbers and they would be disposed of at a hazardous materials facility.

## **4. Background**

Aquatic technicians conducting stream surveys in Pepper Creek during the summer of 2008 identified juvenile coho salmon and rainbow trout in this side channel. During the summer of 2009 District fish biologist Adam Haspiel also identified coho salmon and rainbow trout using this side channel. Most of this side channel is devoid of LWM.

Reconnaissance surveys conducted for this project occurred during June, July, August September, October and November of 2009. The side channel surface flow connects with the Lewis River. Water flows into the side channel from the river until early July when seasonal water levels drop. Pepper Creek also flows into the side channel and this keeps all but the upper 200 feet of the channel well supplied with cold water, the upper 200 feet is subsurface during this time of year. The side channel flows year round into the Lewis River providing easy access into and out of the side channel. The side channel

varies between five and 30 feet in width, and is well protected by a stable island with large 36 inch plus diameter cottonwood trees and 24 inch plus conifer trees. During the November survey two coho redds were observed in the side channel. In November 1956 Chambers (WDFW) found three coho redds in this side channel. This island and side channel have been a stable feature of the Lewis River for over 50 years.

The Lower Columbia Salmon Recovery Plan 2009 Six Year Habitat Work Schedule identifies this as a Tier 1 reach. For coho salmon it has an Overall Preservation rank of 2 of 100, and Overall Restoration rank of 31 of 103, this means it is highly valued and should respond very well to restoration efforts. EDT analyses concludes habitat diversity and side channel habitat is one of the highest concerns in this reach and should respond well to restoration activities. Concerns include high habitat diversity, moderate hatchery fish competition, food availability, and sediment concerns.

The ACC Synthesis Matrix rated this section of the river as having medium restoration potential and as a Primary coho population area.

## **5. Project Objective(s)**

### **GOAL:**

*Enhance the quality of fish habitat in the Lewis River by:*

- ◆ Improving habitat complexity and diversity in the side channel using LWM
- ◆ Providing refugia during winter flows for juvenile salmonids.
- ◆ Providing increased spawning opportunities for adult salmonids.

This project addresses the following Aquatic Fund priorities.

### **Priority 1:** *Benefit fish recovery throughout the North Fork Lewis River, with priority to federal ESA-listed species.*

The main focus of this project is for coho salmon, however steelhead trout and possibly Chinook salmon will also benefit from this project

Lower Columbia ESU coho salmon are listed as a threatened species under the ESA

Lower Columbia ESU steelhead trout are listed as a threatened species under the ESA

Lower Columbia ESU Chinook Salmon are listed as a threatened species under the ESA

### **Priority 2:** *Support the reintroduction of anadromous fish throughout the basin.*

Juvenile anadromous salmonids will have a quality rearing and refugia area when this project is complete, thus ensuring survival and promotion of the various species during reintroduction efforts.

### **Priority 3:** *Enhance fish habitat in the Lewis River Basin-, with priority given to the North Fork Lewis River.*

Coho salmon and rainbow trout have already been observed in limited numbers in this side channel, additions of LWM will enhance the side channel, providing increased use of side channel habitat. Production in this area should increase substantially upon completion of this project.

## **6. Tasks:**

### **Task 1: NEPA and required permits.**

- 1) Complete NEPA documentation. Field work for this NEPA document was completed during the summer and fall of 2009. Specialists reports are completed, and our Level 1 consultation team (USFS, USFWS and NOAA) has reviewed and concurred with this project as required under the regional restoration Biological Opinions To meet ESA sec. 7 compliance. The final document should be crafted and signed by March 2010.
- 2) Instream restoration activities are covered within the WDFW-MOU.

### **Task 2: Project Design.**

- 1) Finalize project design and project preparation details. Preliminary designs have been planned during reconnaissance visits in 2009. We will use a laser level to run a longitudinal profile and collect cross-sectional information as we finalize designs.
- 2) Secure materials. We will layout a timber sale unit for thinning operations and prepare for harvest operations. Additional material may be acquired from PacifiCorp Swift Reservoir Cleaning operations.
- 3) Finalize disposal options for creosote timbers.

### **Task 3: Project Implementation**

- 1) Develop contract. A standard RFQ contract will be developed specifying the scope of the project and project requirements. We will use an equipment rental contract to perform the actual work which will allows us the flexibility to make changes to the project as implementation is occurring.
- 2) Administer contract. A Fish Biologist or Fisheries Technician will administer the contract to ensure contract compliance and project specifications are met.

### **Task 4: Monitoring**

- 1) Perform baseline monitoring. This monitoring will occur prior to project implementation and include a longitudinal profile, cross-sections, pebble counts, photo-documentation and snorkel surveys. MSHI will provide two interns (ACC funds), ten volunteer youth from the youth stream team (ACC funds), and a supervisor (MSHI IK) to perform monitoring work. They will perform all aspects of the monitoring with supervision and training from the Forest Service.
- 2) Perform after project monitoring. This monitoring will occur following project implementation and will continue on an annual basis for several years following project completion. MSHI will provide two interns and ten volunteers (ACC) for this portion of the work supervised by the Forest Service (MSHI IK).
- 3) Monitoring Report. A monitoring report will be written each year following project implementation. MSHI will provide raw data in excel format, the Forest Service will provide analysis of data and report.

## **7. Methods:**

The Mount. St. Helens Fisheries department will oversee all phases of this project including project design, implementation and monitoring.

Approximately 161 piece of large wood material would be harvested during thinning operations from a nearby timber sale unit which would allow us to use long stems (60+ feet) with attached rootwads. Woody material will be trucked down a spur road through private land to a staging area at the confluence of the Muddy River and Lewis River. From there, the wood will be moved to the project site via a skidder and excavator. This project would create and improve rearing opportunities for coho salmon. Wood for this project would primarily come from USFS lands, however if an opportunity exists to acquire large wood from Swift Reservoir cleaning operations, we may pursue that avenue as well.

Approximately 10 to 15 pieces of LWM will be used at each structure location to form complex habitat. Structures will protrude 1/2 to 1/3 of the way into the channel to minimize water shear stress and create a meandering thalweg. Key pieces of wood at each location will be anchored into the streambanks using an excavator to dig trenches up to 30 feet long, and bury the wood. Other pieces of LWM will be interwoven into these key pieces and riparian vegetation.

A secondary part of this project would be to remove 10 pieces of creosote treated 10"x10" timbers 20' long from an existing logjam near the downstream edge of the side channel. The excavator would remove the timbers and they would be disposed of at a hazardous materials facility.

## **8. Specific Work Products**

Deliverable 1: Completed project.

Deliverable 2: A report describing the project. Report to include project narrative, financial information, staff time to implement the project, and photographs of completed projects.

Deliverable 3: Monitoring Report.

## **9. Project Duration**

Monitoring for this project would begin during the summer of 2010, Project implementation would occur July 15<sup>th</sup> 2011 and is expected to take two weeks to complete. As built documents will be completed by December 31<sup>st</sup>, 2011. An initial report documenting fish response to the structures will be completed by December 31<sup>st</sup>, 2012. The first monitoring report with pre and post project data will be available December 31, 2012. If funding or LWM supply becomes an issue, project dates would be delayed by one year from above.

A project closeout meeting would occur at an ACC meeting following project completion.

## 10. Permits

**NEPA-** The Forest Service is almost done with the NEPA for this project. Expected NEPA completion date is March 2010.

The Gifford Pinchot National Forest has a Memorandum of Agreement with the Washington State Department of Ecology (DOE). The agreement recognizes the Forest Service will ensure that 1) all waters on National Forest lands meet or exceed water quality laws and regulations (Sections 301, 302, 303, 306 and 307) of the Clean Water Act and 2) activities on those lands are consistent with the level of protection of the Washington Administrative Code relevant to state and federal water quality requirements. This agreement is neither a fiscal nor a funds obligation document.

The Gifford Pinchot National Forest has a Memorandum of Understanding (MOU) with the Washington State Department of Fish and Wildlife Regarding Hydraulic Projects conducted by USDA Forest Service Northwest Region (2005). Compliance with the instream restoration provisions within this MOU replaces the need for an individual hydraulic project approval (HPA). This fish habitat enhancement project will be conducted within the provisions set forth in this MOU.

The Clean Water Act (as amended by the Water Quality Act of 1987, Public Law 100-4) authorizes the states to regulate the “fill and removal” activities of Federal agencies. In Washington, the Forest Service has authorization for its fill and removal projects through the MOU with WDFW when the projects comply with the provisions of the MOU.

Land ownership in this section of the Lewis River is comprised of federal and private lands. The project is wholly on Forest Lands, however the access route is through private lands. We have received permission from the landowners to use the private spur road to access this project area.

## 11. Matching Funds and In-kind Contributions

Partner	Contribution	Funds
Forest Service	Project development, Contracting, Permitting, Monitoring	\$27,000 In-kind
Materials from USFS	Trees	\$16,100 In-kind
Mt. St. Helens Institute	Monitoring	\$2,000 In-kind
Swift Community Action Team (SCAT)	Machine Time	\$800
Fish First	Machine Transport	\$800
Equipment Rental Services	Machine Time	\$800

## 12. Professional Review of Proposed Project

This project proposal was reviewed by Gifford Pinchot National Forest (GPNF) Hydrology program manager, Ruth Tracy and GPNF Fisheries program manager Dave Hu.

### 13. Budget

	NEPA	Final designs	Project Mgmt	Construction	Monitoring/Labor /Reporting/Coord.
<b>Personnel Costs</b>					
FS - Zone Team or Contract	\$8,000 (IK)				
FS –Fish Bio and Hydrologist		\$4,000 (IK) \$1,000 (ACC)			
FS - Fish Bio and Hydrologist			\$5,000 (IK) \$3,000 (ACC)		\$1,000 (ACC)
FS - Contract administrator -				\$3,000 (IK) \$4,000 (ACC)	
FS - Contract Specialist				\$2,000 (IK)	
DNR Specialist					
Mt. St. Helens Institute					\$2,000 (IK)
Mt. St. Helens Institute Community Education					\$3,000 (ACC)
<b>Materials</b>					
Forest Service 161 Pieces of LWM				\$16,100 (IK)	
<b>Contract Payables</b>					
				\$13,300 (ACC) \$2,400 Fish First, SCAT, ERS)	
Excavator and Skidder Contract				\$11,000 (ACC)	
Logging and hauling of trees				\$4,000 (ACC)	
Hazardous Materials Removal				\$ 1,000(ACC)	
Materials and Supplies					
<b>Administrative Overhead</b>	\$3,500(IK)	\$1,500 (IK)			
<b>Total ACC Funds</b>	<b>\$41,300</b>	<b>\$1,000</b>	<b>\$4,000</b>	<b>\$32,300</b>	<b>\$4,000</b>
<i>Total FS Funds</i>	<i>\$43,100</i>	<i>\$11,500</i>	<i>\$5,500</i>	<i>\$21,100</i>	
<i>Total Partner Funds</i>	<i>\$4,400</i>			<i>\$2,400</i>	<i>\$2,000</i>
<b>Project Total</b>	<b>\$88,800</b>				
FS personnel estimated as \$300/day.					



## Pepper Lewis expanded budget 2010

Item	Personnel	Estimated Days/units*	Cost Per Unit	Total*
NEPA Environmental Assessment required by Federal Law	Fish Biologist Wildlife Biologist Hydrologist Botanist Archeologist Soil Scientist Recreation Forester NEPA Coordinator	5 2 5 5 5 1 0.5 0.5 3	\$300 per day per person	\$8,000 (IK)
Final Designs	Fish Biologist Hydrologist Fish Technician	5 3 9	\$300 per day per person	\$4,000 (IK) \$1,000 (ACC)
Project Management	Fish Biologist Fish Technician Mileage	12 11 2000 miles	\$300 per day per person \$0.50	\$4,000 (IK) \$3,000 (ACC) \$1,000 (IK)
Adminstration Overhead (Forest Contract Prep)	Contract Specialist	16.6	\$300 per day per	\$5,000 (IK)
Construction	Contract Administration/Prep Transportation	28 1,000 miles	\$300 per day per person \$0.50	\$4,500 (IK) \$4,000 (ACC) \$500 (IK)
Materials & Supplies	Field Equipment, Notebooks, Misc Supplies			\$1,000 (ACC)
Trees		161		\$16,100 (IK)
Monitoring <i>MSHI</i> <i>USFS</i>	Supervisor Assistant Fish Biologist  Volunteers  Transportation	17   25  1,000	\$300 per day per person  \$20 \$0.50	\$1,500 (IK) \$3,500 (ACC)  \$500 (IK) \$500 (ACC)
<b>Total</b>				<b>\$58,100</b>

\*Values are rounded up or down as need to display whole number and days

## Pepper-Lewis Equipment Budget 2010

Item	Cost per unit	Number of units	ACC cost	Total Cost
Excavator Operator/Fuel/Supplies, misc	\$100/hour	50	\$5,000	\$5,000
Excavator Machine	\$ Donated (\$1600)	40		\$1,600
Excavator Move in/out	\$ Donated (\$800)	1		\$800
Skidder	\$150/Hour	50	\$7,500	\$7,500
Skidder Move in/out	\$800	1	\$800	\$8,00
Logging and Hauling cost: Estimate from Logging Contractor*	\$10,350	1	\$11,000	\$11,000
Hazardous materials transport and disposal			\$4,000	\$4,000
<b>Total</b>	<b>Donated \$2,400</b>		<b>\$28,300</b>	<b>\$30,700</b>

\*From Logging Contractor  
Ball Park Estimate Received on January 6, 2010

### **Questions and Comments submitted by ACC members**

#### *Pepper-Lewis Side Channel Instream Habitat Restoration*

*We would like additional information describing this reach and off-channel connectivity. Was a similar project approved for funding in 2008/2009?*

A project for Pepper Creek itself was submitted and approved during the 2008/2009 funding cycle. It was withdrawn after windstorm events that winter blew many trees into Pepper Creek, providing much needed LWD. This project is in a side channel of the Lewis River and Pepper Creeks confluence with the Lewis River is in this side channel. This side channel reach is approximately ¼ mile long and has minimal amounts of LWM. It connects to the mainstem at the top end of the channel and is well protected by a highly stable island that separates the side channel from the mainstem. Water flows into the side channel from the mainstem during most months except the dry summer season. Pepper Creek flows into this side channel and keeps the water cool and flowing during summer months. The side channel exits into the mainstem and stays connected to it because of water inputs from Pepper Creek.

*We are interested in the sponsor's plans for stabilizing wood in this side channel, since it will be subject to high mainstem flows. The partnership plan should be more clearly developed, as should an entire project budget.*

We plan to use an excavator to anchor the wood up to 30 feet into the stream banks. Wood complexes will only span 1/2 to 1/3 of the channel to reduce shear stress on LWD and keep a meander in the channel. The channel is well protected from the mainstem by a very stable island over 50 years old composed of 36 inch plus cottonwoods and 24 inch plus fir trees. There is a

narrow opening on the top end of the side channel that limits the amount of water into the side channel from the mainstem. We have many committed partners such as Fish First, Swift Community Action Team, and Equipment Rental Services ( they have donated equipment time and will move equipment in and out), and have been working with Mt. St. Helens Institute as they develop their youth stream monitoring team.

*We also agree that the monitoring portion of the budget should be moved to an in-kind contribution by the USFS.* Monitoring is only a small portion of the funding request. Monitoring is essential to any watershed restoration project. The Forest Service provides monitoring expertise and direction, and partners with the Mt. St. Helens Youth Stream Team to provide members of the urban community a chance to experience the outdoors while performing worthwhile work. Most of the funds for monitoring are given to the Mt. St. Helens Institute for the Youth Stream Team. **We would like to discuss with the ACC group why funds for monitoring this project are a concern, and not a concern for other projects proposed.**

*Concerns about LWD structures staying intact on mainstem. Need additional information on how LWD will be anchored. Question the connectivity to the Lewis mainstem during late summer. Monitoring costs should be in-kind.* Please see answers to above comments. There are no structures in the mainstem Lewis River proposed, only in the side channel.

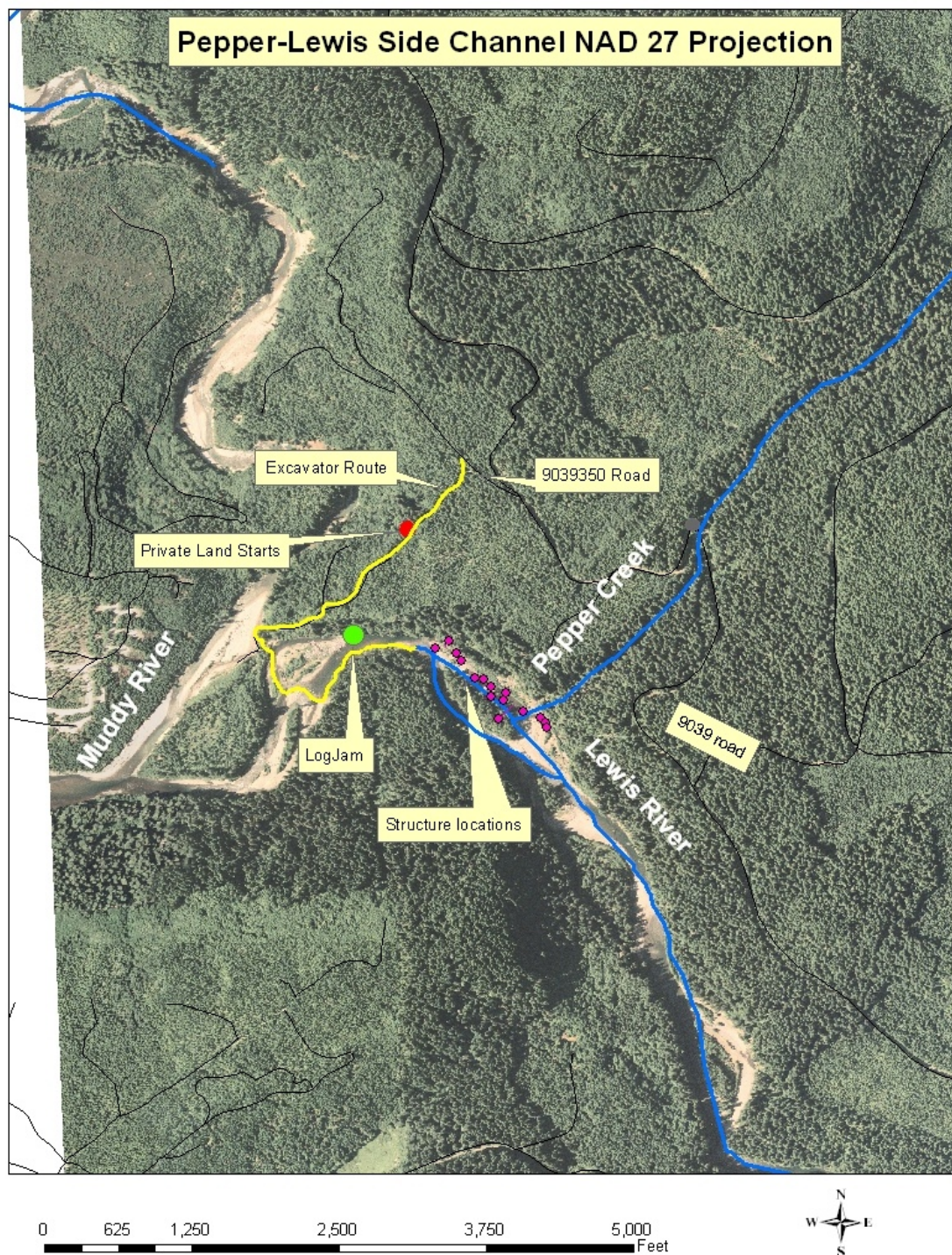


Figure 1. Map of Project area.



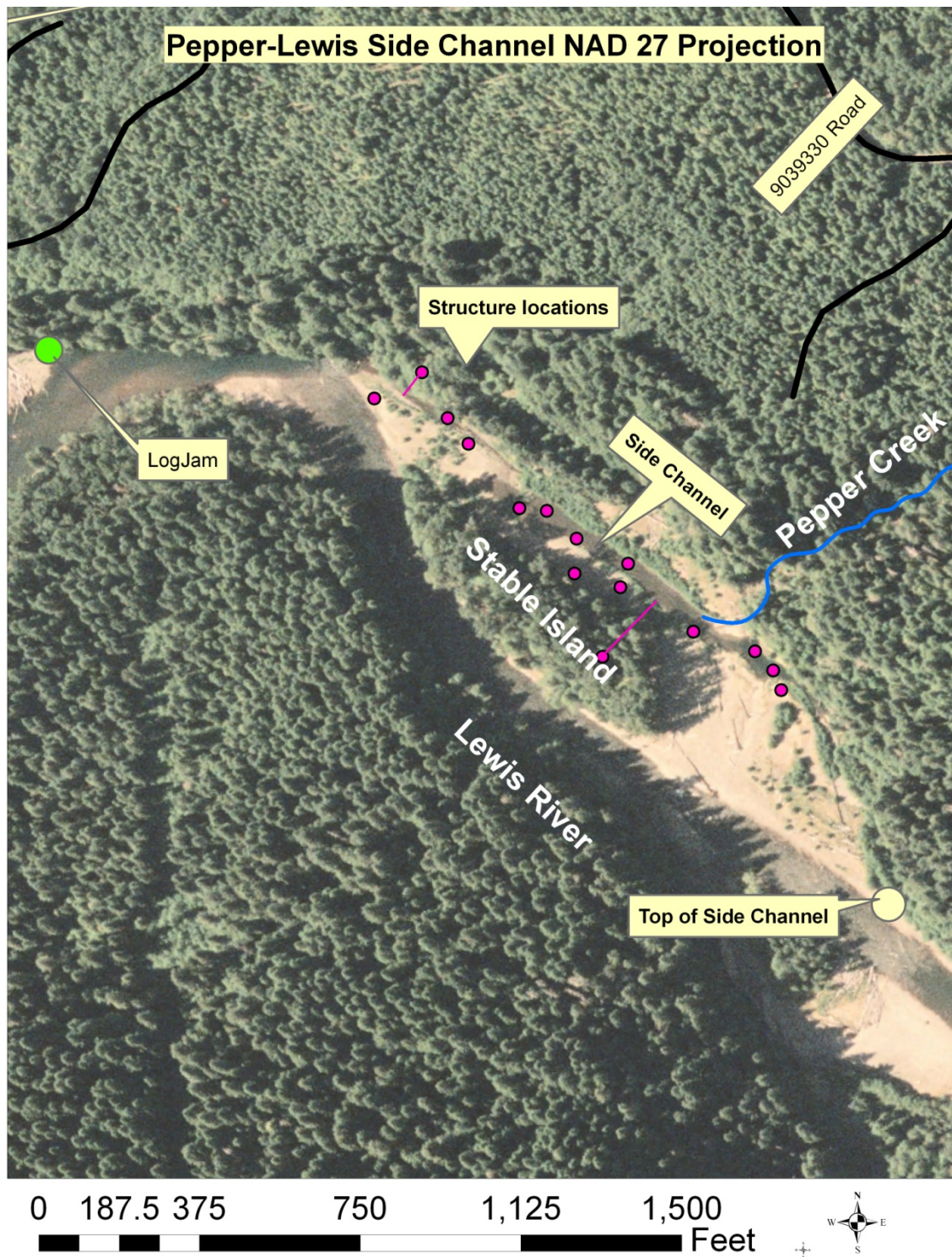
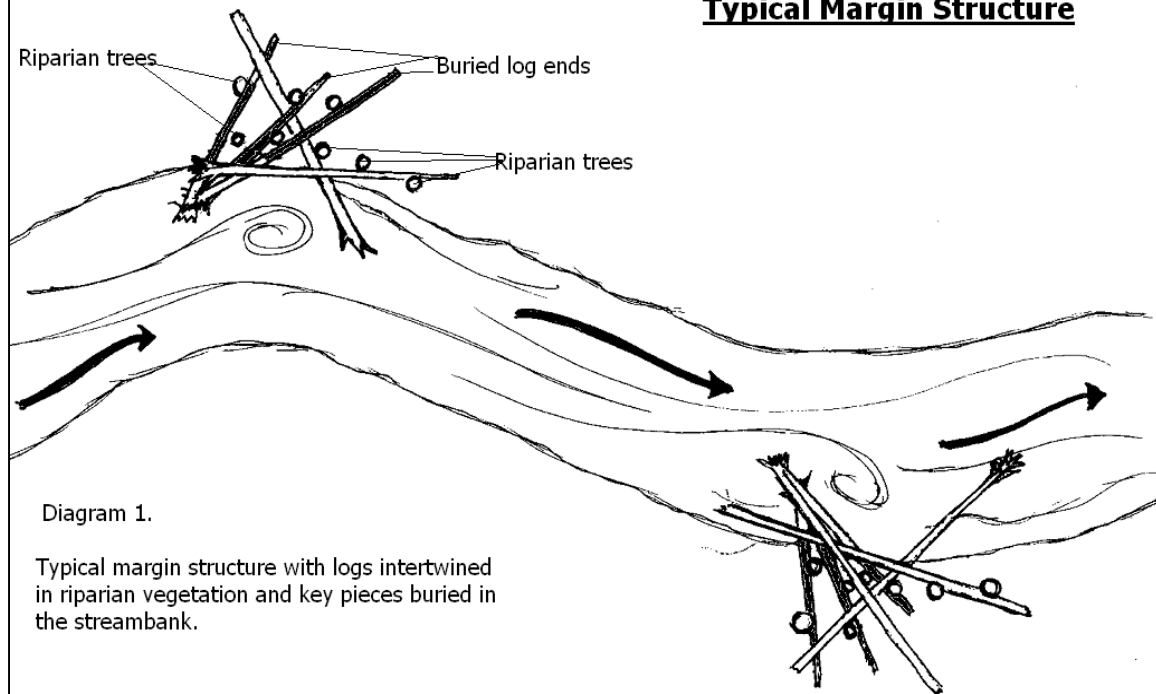


Figure 2. Map of Project

## Typical Margin Structure



## APPENDIX H

## **Appendix H**

### **Pine Creek Instream and Floodplain Structures for Bull Trout and Steelhead**



## **1. Project Title**

### **Pine Creek Instream and Floodplain Structures for Bull Trout and Steelhead.**

## **2. Project Manager**

**Adam Haspiel**

Mt. St. Helens National Volcanic Monument  
42218 NE Yale Bridge Road  
Amboy, WA 98604  
360-449-7833  
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## **3. Identification of problem or opportunity to be addressed**

The Pine Creek system was affected by the eruption of Mount St. Helens in 1980 when a lahar scoured the length of it, eventually delivering sediment into Swift Reservoir. As a result of the lahar and subsequent floods of 1996, and 2006 much of the instream wood was buried or transported, leaving Pine Creek devoid of functional instream Large Woody Material (LWM).

A variety of log structures will be placed instream in Pine Creek using helicopters and/or heavy equipment to stabilize streambanks, capture suitable sized spawning gravel for adult bull trout and steelhead. Additionally, the structures will create slow water pockets to enhance juvenile rearing habitat and create resting areas for spawning adult bull trout and steelhead. Floodplain structures will allow point bars to build up and riparian vegetation to become well established and withstand flood waters. The project will be implemented from RM 0.9 to RM 1.9 on FS lands in section 14 (see attached map). Approximately 150-200 pieces of wood will be placed in 15 complex structures.

## **4. Background**

The overall objective for bull trout restoration in the Upper Lewis watershed focuses on Pine Creek, Cougar Creek, Muddy River and Rush Creek. Currently Pine Creek has the highest use by adult bull trout (Personal communication Jim Byrne, WDFW 2007). Spawning gravel is limited (but more abundant than Rush Creek) in Pine Creek and the actual success rate of spawning adults is uncertain (Personal Comm. Jim Byrne WDFW 2010). Currently spawning superimposition probably occurs due to low amounts of available spawning gravel. Therefore, it is desirable to increase the amount of spawning gravel available to bull trout to ensure species recovery.

Reintroduction of salmonids: Steelhead trout will most likely use Pine Creek once reintroduction occurs, and they will be competing with bull trout for spawning gravel. Steelhead will likely superimpose redds on bull trout redds because bull trout spawn earlier than steelhead.

A US Forest Service stream survey conducted in 2005 found LWM to vary from 2.2 to 12.3 pieces per mile throughout the entire survey. This is well below the 80 pieces per mile identified as Properly Functioning Condition (PFC) for west side streams by PacFish. More wood is found in the lower reaches than in the upper reaches. The pool/riffle ratio averaged 5/95. Spawning gravel was found to be in sparse pockets throughout the reach. Streambanks were found to have some erosion and instability.

Reconnaissance surveys in Pine Creek conducted in September 2009 by US Forest Service fish biologist Adam Haspiel and technician Bryce Michaelis, found similar circumstances.

2009 WDFW snorkel and spawning surveys found 14 redds in P8, 0 redds between Upper Forest Service Boundary and P7, 5 redds between P7 and P8, and 7 redds between P8 and P10. All redds were found on the margins of the stream where the water velocity is slower.

The above information leads us to believe that placing LWM in Pine Creek would allow creation of pools and useable areas of spawning gravel to form in stream margins, bull trout preferred spawning habitat in Pine Creek. Placing LWM in flood plains will allow the formation of point bars to occur, eventually leading to recruitment and deposition of suitable spawning substrate as well as establishment of riparian vegetation and creating stable banks.

The Lower Columbia Salmon Recovery Plan 2009 Six Year Habitat Work Schedule identified this as a Tier 2 reach for salmon recovery. Bull Trout populations were not considered in this rating. This reach is rated as high potential for Winter Steelhead, and as a contributing population. This reach also rated High for response to instream structure work. Habitat diversity is one of the highest concerns in this reach.

The ACC Synthesis Matrix rated this section of Pine Creek as having medium restoration potential for steelhead.

The Gifford Pinchot National Forest Restoration Plan identified this section of Pine Creek as a candidate site for instream work.

This project compliments proposed timber stand thinning in headwater streams of P8 and Pine Creek. Stands of previously harvested and heavily stocked trees have resulted in trees spaced too close together to provide optimum growth. Upland stands will be commercially thinned to promote more vigorous growth of selected dominant trees. The objective of thinning these stands is to attain a healthier stand of larger trees than would occur without the thinning. Outer riparian areas of a few intermittent streams will be thinned for the same objective of accelerating the attainment of larger trees with additional long term benefit of larger wood recruitment to the riparian forest floor and to the intermittent stream. Another component of the thinning sale would be to replace failing culverts on existing roads to reduce risk of sediment inputs into P8 and Upper Pine Creek.

## **5. Project Objective(s)**

The main objective of this project is to increase instream structural diversity, stabilize streambanks, amass spawning gravel, and create pools in Pine Creek. The addition of LWM to sections of Pine Creek would slow water velocities, allowing gravels moving through the system to deposit, increasing the quantity of suitable spawning substrate available for bull trout and soon to be reintroduced steelhead trout. LWM will also create velocity refuge and holding areas for migrating and spawning adults, and rearing habitat for juvenile salmonids. A resulting increase in spawning gravel in Pine Creek may also contribute to reducing redd superimposition in the project reach.

Forest Service managed land includes the lower and upper sections of the Pine Creek Subwatershed. Private Timber companies own the middle sections of the subwatershed. As such, this project would occur on Forest Service managed lands.

This project addresses the following ACC priorities:

**Priority 1:** Benefit fish recovery throughout the North Fork Lewis River, with priority to federal ESA-listed species.

Bull trout and steelhead trout are listed as a threatened species under the ESA. This project will contribute to the recovery of these species by increasing the amount and quality of spawning substrate available.

**Priority 2:** Support the reintroduction of anadromous fish throughout the basin.

By creating resting pools and spawning gravel in this stream, this project will increase steelhead trout spawning and rearing opportunities in the cold, fast water of Pine Creek.

**Priority 3:** Enhance fish habitat in the Lewis River Basin-, with priority given to the North Fork Lewis River.

This project is composed of large woody material placed instream designed specifically to enhance and restore fish habitat. This project will contribute to increasing instream habitat diversity and quantity of suitable spawning substrate and in turn it is expected that this project will contribute to increasing fish production in this area.

## **6. Tasks:**

### **Task 1: NEPA and required permits.**

- 1) Complete NEPA documentation. Field work for this NEPA document is anticipated to occur and be completed during the summer and fall of 2010. Specialists reports will be completed, and our Level 1 consultation team (USFS, USFWS and NOAA) will review and complete ESA Sec 7 consultation under a regional restoration Biological Opinions during the winter of 2010-2011. The final document should be crafted and signed by March 2011.
- 2) These instream and floodplain restoration activities are covered within the provisions of the WDFW and USFS Memorandum of Understanding .

### **Task 2: Project Design.**

- 1) Finalize project design and project preparation details. Preliminary designs have been planned during reconnaissance visits in 2010. We will use a laser level to run a longitudinal profile and collect cross-sectional information as we finalize designs.
- 2) Secure materials. We will layout a timber sale unit for thinning operations and prepare for harvest operations. Additional material may be acquired from PacifiCorp's Swift Reservoir Cleaning operations.

### **Task 3: Project Implementation**

- 1) Develop contract. A standard RFQ contract will be developed specifying the scope of the project and project requirements. We will use an equipment rental

contract to perform the actual work which will allow us the flexibility to make changes to the project as implementation is occurring.

- 2) Administer contract. A Fish Biologist and Fisheries Technician will administer the contract to ensure contract compliance and project specifications are met.

#### **Task 4: Monitoring**

- 1) Perform baseline monitoring. This monitoring will occur prior to project implementation and include a longitudinal profile, cross-sections, pebble counts, photo-documentation and snorkel surveys. MSHI will provide two interns (ACC funds), five volunteer youth from the youth stream team (ACC funds), and a supervisor (MSHI IK) to perform monitoring work. They will perform all aspects of the monitoring with supervision and training from the Forest Service.
- 2) Perform after project monitoring. This monitoring will occur following project implementation and will continue on an annual basis for several years following project completion. MSHI will provide two interns for this portion of the work supervised by the Forest Service (MSHI IK).
- 3) Monitoring Report. A monitoring report will be written each year following project implementation. MSHI will provide raw data in excel format, the Forest Service will provide analysis of data and report.

#### **7. Methods:**

The Mt. St. Helens Fisheries department will oversee all phases of this project including project design, implementation and monitoring.

Approximately 150-200 piece of large wood material would be harvested during thinning operations from a nearby timber sale unit which would allow us to use long stems (60+ feet) some with attached rootwads. Woody material will be trucked to a staging area off Forest Road (FR) 2590 road, a helicopter will fly wood into strategic locations along Pine Creek to optimize time and cost of helicopter. From there it will be moved to specific project sites via a skidder and/or excavator. This project would create and improve rearing opportunities for bull trout, winter steelhead will also benefit from these activities. - Wood for this project would come mainly from USFS lands, and some may be obtained from Swift Reservoir cleaning operations.

Approximately 10 to 15 pieces of LWM will be used at each structure location to form complex habitat. Structures will protrude 1/2 to 1/3 of the way into the channel to minimize water shear stress and create a meandering thalweg. Key pieces of wood at each location will be anchored into the streambanks using an excavator to dig trenches up to 30 feet long, and bury the wood. Other pieces of LWM will be interwoven into these key pieces and riparian vegetation.

Due to high water velocities, introduced wood will have a large diameter and be of sufficient length to remain stable. In Pine Creek, pieces of wood will be at least 60 feet long to provide structure stability. Long log length is a critical factor in stability: logs longer than the active channel width are not likely to move very far downstream (Grevgory, S.V. 1993). The wetted width in this section of Pine Creek averages 36 feet.

## **8. Specific Work Products**

Deliverable 1: Completed project.

Deliverable 2: A report describing the project. Report to include project narrative, financial information, -staff time to implement the project, and photographs of completed projects.

Deliverable 3: Monitoring Report.

## **9. Project Duration**

Monitoring for this project would begin during the summer of 2011, project implementation would occur July 15<sup>th</sup> 2011 and is expected to take two weeks to complete. As built documents will be completed by December 31<sup>st</sup>, 2011. An initial report documenting fish response to the structures will be completed by December 31<sup>st</sup>, 2012. The first monitoring report with pre and post project data will be available December 31<sup>st</sup> 2012. If funding or LWM supply becomes an issue, project dates would be delayed by one year from above.

A project closeout meeting would occur at an ACC meeting following project completion.

## **10. Permits**

**NEPA-** This project would require NEPA. The Forest Service will complete NEPA for this project in time to meet implementation dates of July 2011.

The Gifford Pinchot National Forest has a Memorandum of Agreement with the Washington State Department of Ecology (DOE). The agreement recognizes the Forest Service will ensure that 1) all waters on National Forest lands meet or exceed water quality laws and regulations (Sections 301, 302, 303, 306 and 307) of the Clean Water Act and 2) activities on those lands are consistent with the level of protection of the Washington Administrative Code relevant to state and federal water quality requirements. This agreement is neither a fiscal nor a funds obligation document.

The Gifford Pinchot National Forest has a Memorandum of Understanding (MOU) with the Washington State Department of Fish and Wildlife Regarding Hydraulic Projects conducted by USDA Forest Service Northwest Region (2005). Compliance with the MOU provisions for instream restoration replaces the need for an individual hydraulic project approval (HPA. This fish habitat enhancement project will be conducted within the provisions set forth in this MOU.

The Clean Water Act (as amended by the Water Quality Act of 1987, Public Law 100-4) authorizes the states to regulate the “fill and removal” activities of Federal agencies. In Washington, the Forest Service has authorization for its fill and removal projects through the MOU with WDFW when the projects comply with the provisions of the MOU.

The project is in compliance with all pertinent sections.

## 11. Matching Funds and In-kind Contributions.

Partner	Contribution	Funds
Forest Service	Project development, Contracting, Permitting, Monitoring	\$21,000 In-kind
Materials from USFS	Trees	\$20,000 In-kind
Mt. St. Helens Institute	Monitoring	\$1,000 In-kind

## 12. Professional Review of Proposed Project

This project proposal was reviewed by Gifford Pinchot National Forest (GPNF) Hydrology program manager, Ruth Tracy, and the GPNF Fisheries program manager, Dave Hu.

## 13. Budget

	NEPA	Final designs	Project Mgmt	Construction	Monitoring/Labor /Reporting/Coord.
<b>Personnel Costs</b>					
FS - Zone Team or Contract	\$8,000 (ACC) \$2,000 (IK)				
FS –Fish Bio and Hydrologist		\$4,000 (IK) \$1,000 (ACC)			
FS - Fish Bio and Hydrologist			\$5,000(IK) \$3,000 (ACC)		\$2,000 (ACC)
FS - Contract administrator -				\$3,000 (IK) \$6,000 (ACC)	
FS - Contract Specialist				\$2,000 (IK)	
DNR Specialist					
Mt St. Helens Institute					\$1,000 (IK)
Mt. St. Helens Institute Community Education					\$1,000 (ACC)
<b>Materials</b>					
Forest Service 200 Pieces of LWM				\$20,000 (IK)	
Title II funds					
<b>Contract Payables</b>					
Excavator and Skidder Contract				\$12,000 (ACC)	
Logging and hauling of trees				\$11,000 (ACC)	
Helicopter				\$20,000 (ACC)	
Materials and Supplies			\$ 1,000 (ACC)		
<b>Administrative Overhead</b>	\$3,500(IK)	\$1,500 (IK)			
<b>Total ACC Funds \$65,000</b>	<b>\$8,000</b>	<b>\$1,000</b>	<b>\$4,000</b>	<b>\$49,000</b>	<b>\$3,000</b>
<i>Total FS Funds \$41,000</i>	<i>\$5,500</i>	<i>\$5,500</i>	<i>\$5,000</i>	<i>\$25,000</i>	
<i>Total Partner Funds \$1,000</i>					<i>\$1,000</i>
<b>Project Total \$107,000</b>					
FS personnel estimated as \$300/day.					

## Pine Creek Expanded Budget 2010

Item	Personnel	Estimated Days/units*	Cost Per Unit	Total*
NEPA Environmental Assessment required by Federal Law	Fish Biologist Wildlife Biologist Hydrologist Botanist Archeologist Soil Scientist Recreation Forester NEPA Coordinator	6 2 6 6 6 1 1 2 3	\$300 per day per person	\$8,000 (ACC) \$2,000 (IK)
Final Designs	Fish Biologist Hydrologist Fish Technician	5 3 9	\$300 per day per person	\$4,000 (IK) \$1,000 (ACC)
Project Management	Fish Biologist Fish Technician Mileage	12 11 2000 miles	\$300 per day per person \$0.50	\$4,000 (IK) \$3,000 (ACC) \$1,000 (IK)
Administration Overhead (Forest Contract Prep)	Contract Specialist	17	\$300 per day per	\$5,000 (IK)
Construction	Contract Administration/Prep Transportation	35 days 1,000 miles	\$300 per day per person \$0.50	\$4,500 (IK) \$6,000 (ACC) \$500 (IK)
Materials & Supplies	Field Equipment, Notebooks, Misc Supplies			\$1,000 (ACC)
Trees		200		\$20,000 (IK)
Monitoring	Supervisor Assistant Volunteers	13 10	\$300 per day per person \$20	\$1,000 (IK) \$3,000 (ACC)
<b>Total</b>				<b>\$64,000</b>

\*Values are rounded up or down as need to display whole number and days

## Pine Creek Equipment Budget 2010

Item	Cost per unit	Number of units	Total Cost
Excavator and Skidder Contract	\$150/hour	70	\$10,500
Excavator / Skidder Move in/out	\$1,500 Lump Sum	1	\$1,500
Logging and Hauling cost: Estimate from Logging Contractor*	\$11,000	1	\$11,000
Helicopter	\$5,000/hour	2 hours	\$10,000
Helicopter Move in/out	\$10,000 Lump Sum	1	\$10,000
<b>Total</b>			<b>\$43,000</b>

\*From Logging Contractor  
 Ball Park Estimate Received on January 6, 2010



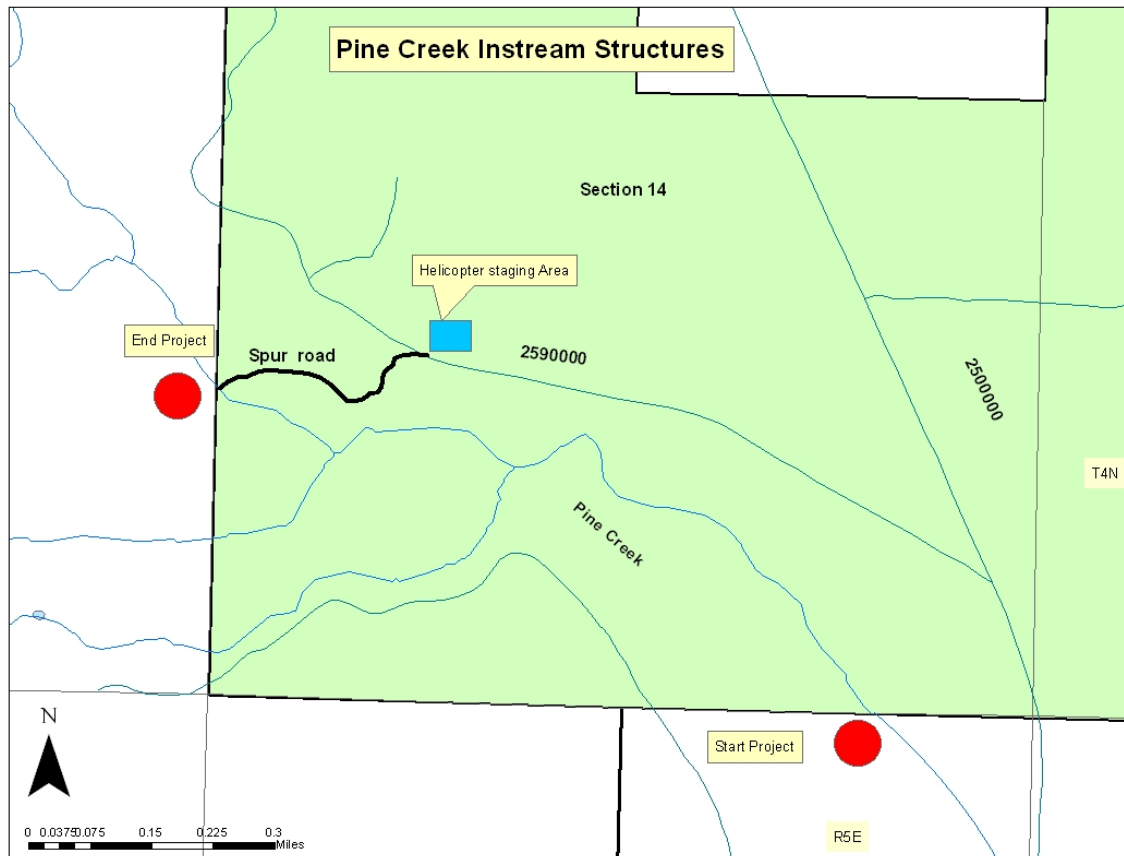


Figure 1. Map of project area

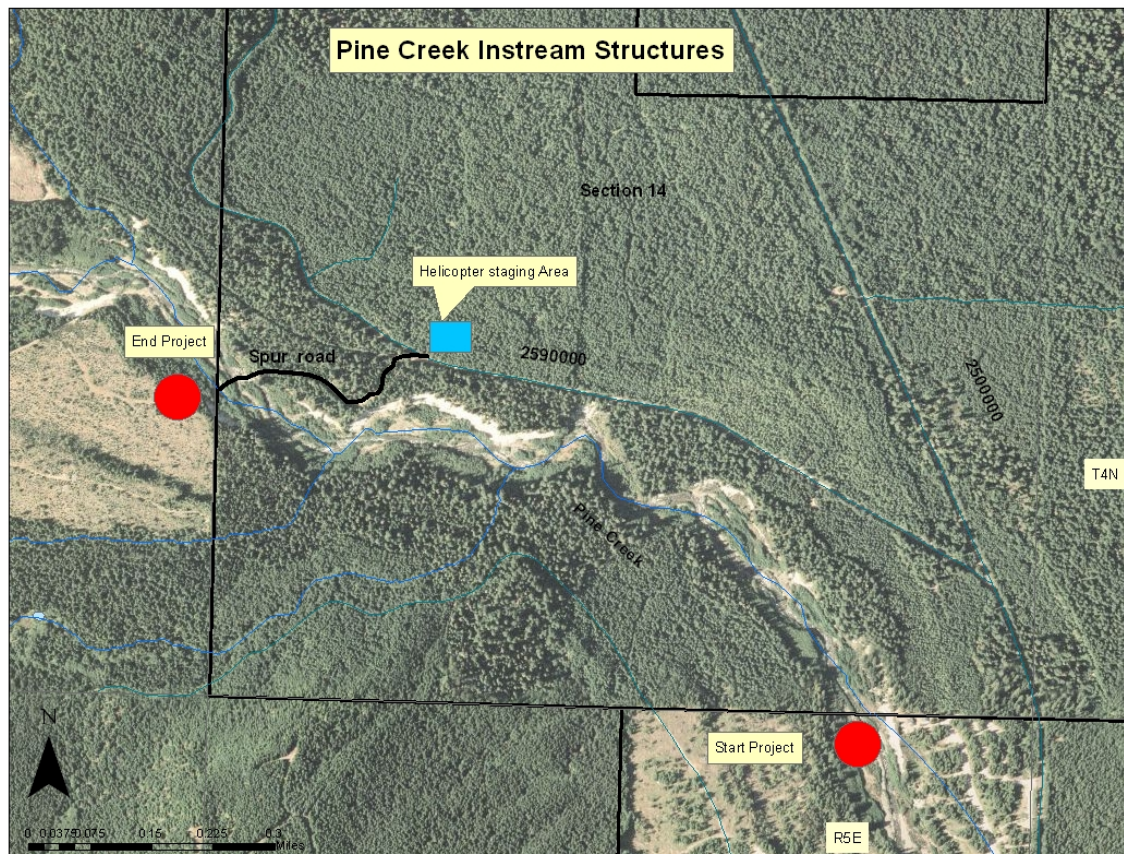
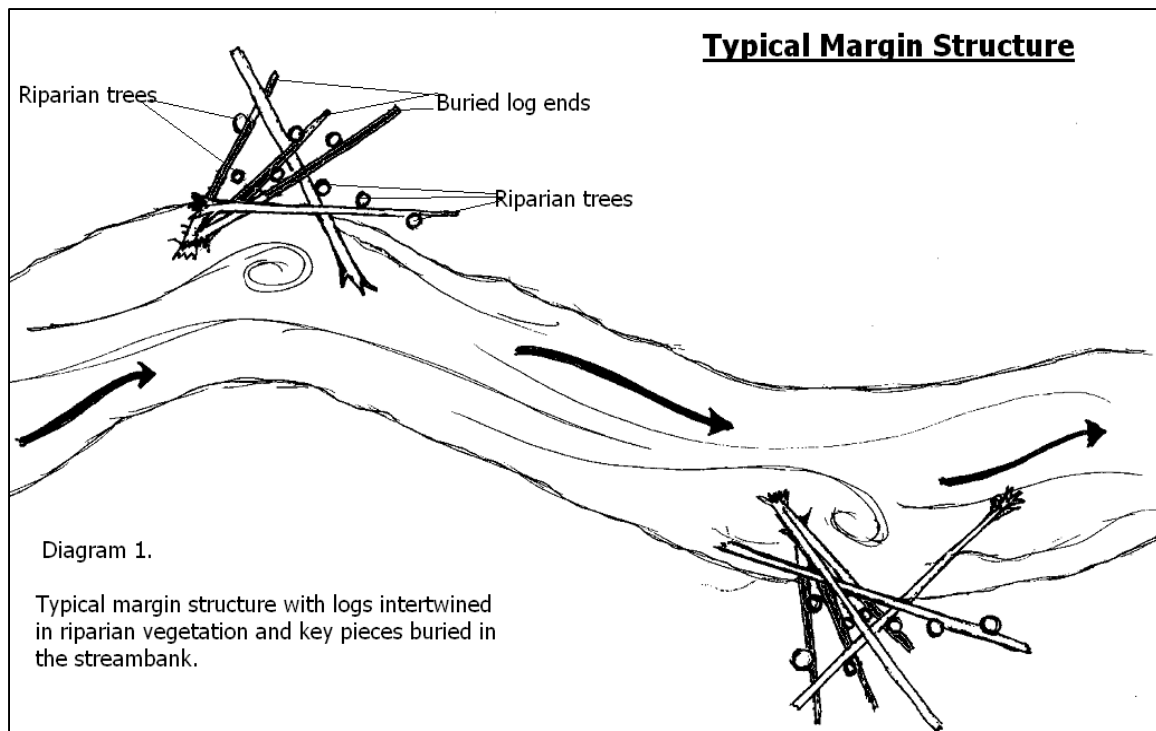


Figure 2. Aerial Photograph with project reach identified.





**Photo of Pine Creek from road 2590**



### **Questions and Comments submitted by ACC members**

#### **2010 Nutrient Enhancement on Pine Creek and Pine Creek Instream**

*Is there potential to partner with local landowners in the middle section of the basin? We would like more information on anchoring LWD in place. Why was a similar proposal not completed and funds returned in 2007?* The original proposal in 2007 was on private timber land in the middle section of the basin. Liability issues between the helicopter company and the timber company prevented the project from going forward. Funds were returned to the ACC after several attempts over a two year period to resolve this issue failed. We plan to use whole trees or long logs flown in by helicopter and placed with an excavator. To save money trees will be stockpiled at locations in the creek and placed with an excavator. Key pieces will be anchored into 30+ feet into the streambank to provide structure stability. Other pieces will be placed on the floodplain and intertwined into the existing riparian vegetation.

*The pre-proposal suggests that logs would have to be 75-100 feet long to be stable in this stream. How was that figure determined, and do those lengths require rootwads for stability? Would this material be available and transportable?* Studies have demonstrated that using long wood provides the most stability in unanchored stream restoration projects. This project combines anchoring of key pieces of structures (burying) with placement of other pieces intertwined in riparian vegetation. Not all pieces will need to be 75-100 feet in length because we will bury key pieces into the streambank. Some wood that is intertwined with riparian vegetation will be 75 to 100 feet in length, most pieces will be at least 60 feet long. The 2005 stream survey document a wetted width of 36 feet in the lower reach of Pine Creek. We plan to use whole trees or long logs flown in by helicopter and placed with an excavator. Some trees will have rootwads and some will not, rootwads will help provide structure stability.

*Methodology for securing the structures needs to be elaborated upon. It seems unlikely the structures will be able to be secured. The budget shows 'Materials-Trees' as having a value of \$30,000. It is assumed this amount is considered in-kind by the Forest Service (though not clearly indicated in the budget). Who determined the value of the trees? Are the trees being assessed at current market value? Are the trees going to be harvested or are they from a previously existing stockpile of dead trees?*

Some trees will lay on benches intertwined with riparian vegetation, Some trees will be keyed into the streambanks. An excavator will dig long trenches (up to 30') into the streambank in strategic locations to anchor key pieces that will provide the backbone for support for the structure. The trees will be harvested by thinning timber sale units to promote stand growth. Tree value was determined by a Forest Service Silviculturist. A 16 inch tree has about 300 board feet in it. Current mill prices for these species are approximately \$300 per 1000 board feet. So a tree has a value of approximately \$100 each, If we use 200 trees then the value is \$20,000.

*Is there some way we can have a more limited construction project in order to answer some questions about doing this kind of work in Pine Creek. Can these types of structures collect sediment in such a high energy stream throughout the winter? What constitutes success for a LWD project in Pine Creek and how might you test that? We might be able to do a "pilot project" as discussed during the original proposal on private land. The problem with doing this is mainly cost effectiveness. It costs the same amount of money to mobilize equipment for a small project as it does for a large project. Structures will not be placed any further than 1/2 to 1/3 of the way into a stream, this will relieve pressure on the structure and allow stream gravels to build up. One of the main problems in Pine Creek is lack of structure, this leads to a high energy stream. Structures will slow water down and reduce stream energy. Success for a LWD project in Pine Creek would be a stable structure that collects spawning gravel and creates pool habitat. Monitoring of structures will provide a "test" of structure success.*

## **References**

Gregory, S.V., 1993, The basis for integrated watershed and stream restoration *In* Shively, D., ed., Watershed and Stream Restoration Workshop, Annual Meeting of the American Fisheries Society, August 26, 1993, Portland, OR: Portland, Oregon, American Fisheries Society, p. 1-13.