

## 1. Project Title

### Muddy River Tributary near Hoo Hoo Bridge

## 2. Project Manager

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

***Problem:***

The Muddy River proper and some associated tributaries were highly impacted by the volcanic eruption and subsequent lahar events of the 1980 eruption of Mt. St. Helens. Impacts include loss of riparian vegetation, high mobile sedimentation loads, loss of functional large woody material, channel instability, and increased summer water temperatures. It is therefore critical to restore or enhance functioning side channels and tributaries to ensure success of reintroduced salmon and steelhead in the Muddy River Watershed. This habitat is essential for species listed under the Endangered Species Act (ESA) that use this watershed within the Lewis River Basin, including coho and Chinook salmon, steelhead trout, and bull trout. These species have endured many impacts that threaten their survival in the watershed. Effects in addition to the Mount St. Helens eruption and associated lahar event include sediment inputs, shade reduction, large wood removal and passage barriers from past land management activities such as logging, roads, and development of hydro-resources, which until recently has blocked all access into the upper watershed for anadromous species since the 1930's. To ensure reintroduction efforts of salmon and steelhead into the upper basin are successful the Forest Service has worked with PacifiCorp on a variety of projects including acclimation ponds for juvenile spring Chinook salmon, road decommissioning, replacement of migration blocking culverts with bridges, and various streambank and instream fish habitat restoration projects.

***Opportunity:***

This project proposal develops the opportunity to ensure fish reintroduction efforts into the upper North Fork Lewis River including the Muddy River Watershed are successful. It prioritizes opportunities for ESA listed fish species by restoring instream fish habitat in a tributary of the Muddy River to its full potential. Enhancement and restoration of instream habitat will increase the overall abundance of functional habitat in the upper basin. This proposal builds on the success of several other projects in this tributary including a PacifiCorp funded project to remove a migration barrier culvert with a bridge, and an Ecotrust funded project to restore fish habitat in the lower portion of this tributary. The upper portion has great potential because the riparian vegetation is more intact than the lower section, and the stream was not as affected by 1980 volcanic events.

The Forest Service proposes to enhance ½ mile of a Muddy River tributary associated with Hoo Hoo Bridge, with instream structures composed of large woody material with rootwads. The Tributary has cooler summer water temperatures than many of the streams entering the Muddy River and has a dense riparian canopy of Alder and second growth conifers to keep the groundwater influenced flow well shaded and cool. It currently lacks large woody material, but it has the potential to provide excellent rearing and refugia habitats. Enhancing the stream with large woody material should bring it to its full potential and create desirable habitat for fish (Everest et al. 1985; Everest et al. 1986)

A tracked excavator will place 15 structures constructed from approximately 200 pieces of large wood, into the stream. The large wood will come from a timber sale unit currently being developed near the 8322700 road. Structures will be keyed into the stream bank by trench-excavating and backfilling over 2/3 of each log length. A tracked excavator will access the area via an abandoned road, and will assemble the instream structures.

#### **4. Background**

Reconnaissance surveys conducted for this project occurred during August and September 2012. Juvenile coho salmon were first documented in this tributary by fisheries technician Bryce Michaels during the 2008 survey of the migration barrier culvert. They were located in the pool formed by the culvert which has since been replaced. Restoration projects associated with this tributary include removal of a migration barrier culvert with a bridge in 2009 (Partial ACC Funds), Instream Restoration of the lower reach of this tributary in 2012 (Ecotrust Funds), Noxious weed removal projects for Scotch Broom over the last 10 years (ACC, Rocky Mtn. Elk, Skamania County, Title II and USFS funds.)

A stream survey of the tributary was completed September 12-15, 2005. At that time rainbow and cutthroat trout were observed in the stream. The lower portion of the stream below the new bridge is within the Muddy River 100 year floodplain and was affected by the 1980 lahar, the reach upstream of the bridge was not directly affected by the lahar event, however past timber management activities occurred in this watershed and an old road located about 250-400 feet away parallels the creek for some distance. Large woody material was observed at about eight pieces per mile. Pools deeper than three feet were found to be approximately 2.2 per mile. Spot water temperatures recorded during the survey ranged from 9°-11°C.

The Lower Columbia Salmon Recovery Plan 2009 Six Year Habitat Work Schedule does not specifically identify this tributary, however the project tributary flows into the reach identified as Muddy River 2 which is rated as Tier 3. The Lower Columbia Fish Recovery Boards Salmon Recovery Plan specifically cites side channel habitat and stream channel habitat structure as high priority restoration needs. It is rated in the top five stream reaches for restoration work. The top three critical life stages identified in the plan are egg incubation and 0-age active rearing, and, 0-age inactive rearing (overwintering). The ACC Synthesis Matrix rated this section of the river as having Medium/High restoration potential and as a Primary coho population area with a low rating for coho reach potential. Concerns in Muddy River 2 include temperature, high sediment, channel stability, marginal riparian area and low instream LWD.

The Gifford Pinchot National Forest Stream Restoration Plan identifies these as priority projects in the Muddy River. The Muddy River Action Plan places high priority on these projects to help salmonid reintroduction efforts.

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

### **GOAL:**

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

- ◆ Improving habitat complexity and diversity in this cool water tributary to the Muddy River using Large Woody Material
- ◆ 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.*

Coho salmon and steelhead trout are listed as a threatened species under the ESA. This project will directly benefit recovery of listed species by providing quality tributary habitat for rearing of juvenile salmonids. Spawning habitat will also be restored in the tributary for adult salmonids.

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

Creating quality rearing habitat in tributaries will support reintroduction of anadromous fish in the Muddy River Watershed, which flows into the North Fork Lewis River.. The ACC Synthesis Matrix rated this section of the river as having medium/high restoration potential and as a Primary coho population area.

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

This project is located in the Muddy River Watershed which flows into the North Fork Lewis River. It is well documented that coho salmon juveniles prefer slow water habitats with large wood components.

## **6. Tasks:**

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

- 1) NEPA was completed for this project area in 2010. NEPA for the timber stand is currently being performed and will be completed with a final document expected by early summer 2013.
- 2) Instream restoration activities are covered within the WDFW-MOU, and the Regional Permit with the Army Corps of Engineers.

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

- 1) Finalize project design and project preparation details. Preliminary designs were completed during reconnaissance visits in 2012. A laser level will be used to obtain a longitudinal profile and collect cross-sectional information as we finalize designs.

- 2) Secure materials. We are developing a 20 acre timber sale to use for fish habitat restoration activities over the next five years in the vicinity of the 8322700 road. We will layout an area within this stand to thin and prepare for harvest operations.

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

- 1) Develop equipment and logging 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 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. Mount St. Helens Institute (MSHI) will provide two interns and volunteers including urban youth 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. Monitoring will begin one year prior to implementation, occur following project implementation and will continue on an annual basis for several years following project completion. MSHI will provide two interns and volunteers for this portion of the work supervised by the Forest Service.
- 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 15 structures will be created using 200 pieces of LWM that would be harvested during thinning operations from a nearby timber sale unit which would allow long stems (40+ feet) with attached rootwads to be obtained. Woody material will be trucked via Forest Road 8322700 and 8322, and stockpiled in a meadow beyond the north side of Hoo Hoo Bridge. From there, the wood will be transported to each structure site using a logging skidder. Once at the site the logs will be moved and placed by an excavator. Wood for this project will come from a timber sale unit adjacent to the 8322700 road.

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 to bury the wood. Other pieces of LWM will be interwoven into these key pieces and riparian vegetation.

## **8. Specific Work Products**

Deliverable 1: Completed project. Fifteen structures will be created using 200 pieces of LWD.

Deliverable 2: Construction Completion Report describing the project. Report to include project narrative, lessons learned and photographs of completed projects.

Deliverable 3: Monitoring Report.

Deliverable 4: Final Report describing the entire process and the status of the project two years after implementation.

## **9. Project Duration**

Monitoring for this project would begin during the summer of 2013. Project implementation would occur July 15<sup>th</sup> 2014 and is expected to take two weeks to complete. 'As built' documents will be completed by December 31<sup>st</sup>, 2014. An initial report documenting fish response to the structures will be completed by December 31<sup>st</sup>, 2015. The first monitoring report with pre and post project data will be available December 31, 2015. 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**

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.

The US Forest Service has a state wide Regional General Permit (RGP) with the Army Corps of Engineers to perform aquatic restoration activities in waterways. Permit CENWS-OD-RG-RGP-8 authorizes the USFS to perform 13 restoration activities including Large Wood, Boulder and Gravel Placement on National Forest Lands.

Land ownership in this section of the Lewis River is comprised of public lands. The project is wholly on public lands.

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

Partner	Contribution	Funds
Forest Service	Project development, Contracting, Permitting, Monitoring	\$14,000 In-kind
Materials from USFS	Trees with rootwads	\$30,000 In-kind
Mt. St. Helens Institute	Monitoring	\$2,000 In-kind

### 12. Professional Review of Proposed Project

This project proposal was reviewed by Gifford Pinchot National Forest (GPNF) Soil and Water Program Manager, Ruth Tracy.

### 13. Budget

	NEPA	Final designs	Project Mgmt	Construction	Monitoring/Labor /Reporting/Coord.
<b>Personnel Costs</b>					
FS - Zone Team or Contract					
FS –Fish Bio and Hydrologist		\$4,000 (IK) \$1,000 (ACC)			
FS - Fish Bio and Bio Technician			\$5,000 (IK) \$3,000 (ACC)		\$1,000 (ACC)
FS - Contract administrator -				\$3,000 (IK) \$4,000 (ACC)	
FS - Contract Specialist				\$2,000 (IK)	
Mt St. Helens Institute					\$2,000 (IK)
Mt. St. Helens Institute Community Education					\$2,000 (ACC)
<b>Materials</b>					
Forest Service 200 Pieces of LWM with rootwads				\$30,000 (IK)	
<b>Contract Payables</b>					
Excavator Contract				\$12,000 (ACC)	
Logging and hauling of trees				\$15,000 (ACC)	
Materials and Supplies			\$1,000 (ACC)		
<b>Total ACC Funds</b>	<b>\$39,000</b>	<b>\$1,000</b>	<b>\$4,000</b>	<b>\$31,000</b>	<b>\$3,000</b>
<i>Total FS Funds</i>	<i>\$44,000</i>	<i>\$4,000</i>	<i>\$5,000</i>	<i>\$35,000</i>	
<i>Total Partner Funds</i>	<i>\$2,000</i>				<i>\$2,000</i>
<b>Project Total</b>	<b>\$85,000</b>				
FS personnel estimated as \$400/day.					

## Muddy River Hoo Hoo Tributary expanded budget 2013

<b>Item</b>	<b>Personnel</b>	<b>Estimated Days/units*</b>	<b>Cost Per Unit</b>	<b>Total*</b>
Final Designs	Fish Biologist Hydrologist Fish Technician	5 2 5.5	\$400 per day per person	\$4,000 (IK) \$1,000 (ACC)
Project Management	Fish Biologist Fish Technician Mileage	10 7.5 2000 miles	\$400 per day per person \$0.50	\$4,000 (IK) \$3,000 (ACC) \$1,000 (IK)
Construction	Contract Administration/Prep  Transportation  Logging contract Equipment contract	21  1,000 miles	\$400 per day per person \$0.50	\$4,500 (IK) \$4,000 (ACC) \$500 (IK) \$15,000(ACC) \$12,000 (ACC)
Materials & Supplies	Field Equipment, Notebooks, Misc Supplies			\$1,000 (ACC)
Trees with rootwads		200		\$30,000 (IK)
Monitoring <i>MSHI</i>  <i>USFS</i>	Supervisor Assistant Fish Biologist  Volunteers  Transportation	10   25  1,000	\$300 per day per person   \$20  \$0.50	\$1,500 (IK) \$2,500 (ACC)  \$500 (IK) \$500 (ACC)
<b>Total</b>				<b>\$85,000</b>

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

## Muddy River Hoo Hoo Tributary Equipment Budget 2013

Item	Cost per unit	Number of units	ACC cost	Total Cost
Excavator Operator/Fuel/Supplies, misc	\$125 hour	84	\$10,500	\$10,500
Excavator Move in/out	\$1,500	1	\$1,500	\$1,500
Logging and Hauling cost: Based on Previous Contract	\$15,000	1	\$15,000	\$15,000
<b>Total</b>			<b>\$67,000</b>	<b>\$27,000</b>

### **Questions from ACC members**

All projects: Proposals should demonstrate that the project is scientifically supported, has a clear nexus to the Lewis River hydroelectric projects, and clearly supports the Aquatic Fund objectives. Please prepare the document with the assumption that the reader is not familiar with the Lewis River basin, its issues, or its resources.

### **Muddy River Tributary near Hoo Hoo Bridge**

*WDFW: Would like additional information on the success or failure of the stage one work that occurred in 2011. Need diagram of where structures will be placed. Need explanation on how structures will be anchored. The previous work that occurred in this tributary occurred in 2012. Structures all looked successful after implementation however a more thorough evaluation will occur this summer after structures have gone through a winter. Based on previous experience with these types of structures in smaller tributaries such as these, the 2012 project should remain intact and successfully enhance fish habitat. Structures will be anchored into the streambanks by digging a trench with an excavator, burying key pieces of material, and then backfilling the trench. At least 2/3rds of the log will be buried in the streambanks because trenches will be between 30 and 40 feet in length depending upon the length of the log used.*

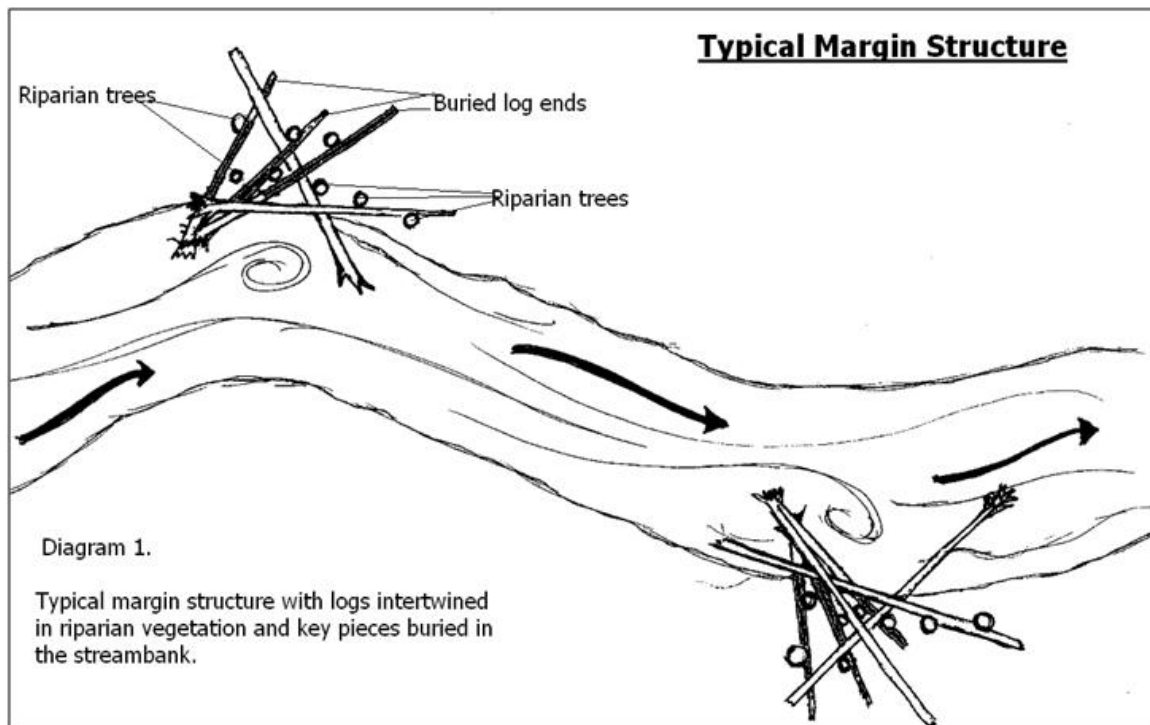
*LCFRB: It appears from the pre-proposal that habitat may be functioning as is; therefore, there needs to be a full description of the current habitat conditions and the improvements in these conditions that will result from implementation of this project. A more complete description of existing stream in the project reach as well as watershed conditions is needed. The final proposal should explain the rationale for the number of structures and provide a diagram showing approximate structure locations and elaborating on the type, location and scale of expected habitat outcomes. Based on the 2005 stream survey there were only 2.2 pools per mile that had depths greater than three feet, a criteria used by the Forest Service and many other groups to categorize a full functional pool. During the survey large woody material was document at 8 pieces per mile, regional standards for this type of stream are 80 pieces per mile, so currently this stream has only 10 percent of the amount recognized for a fully functional stream. The Muddy River mainstem and some associated tributaries were highly impacted by the*

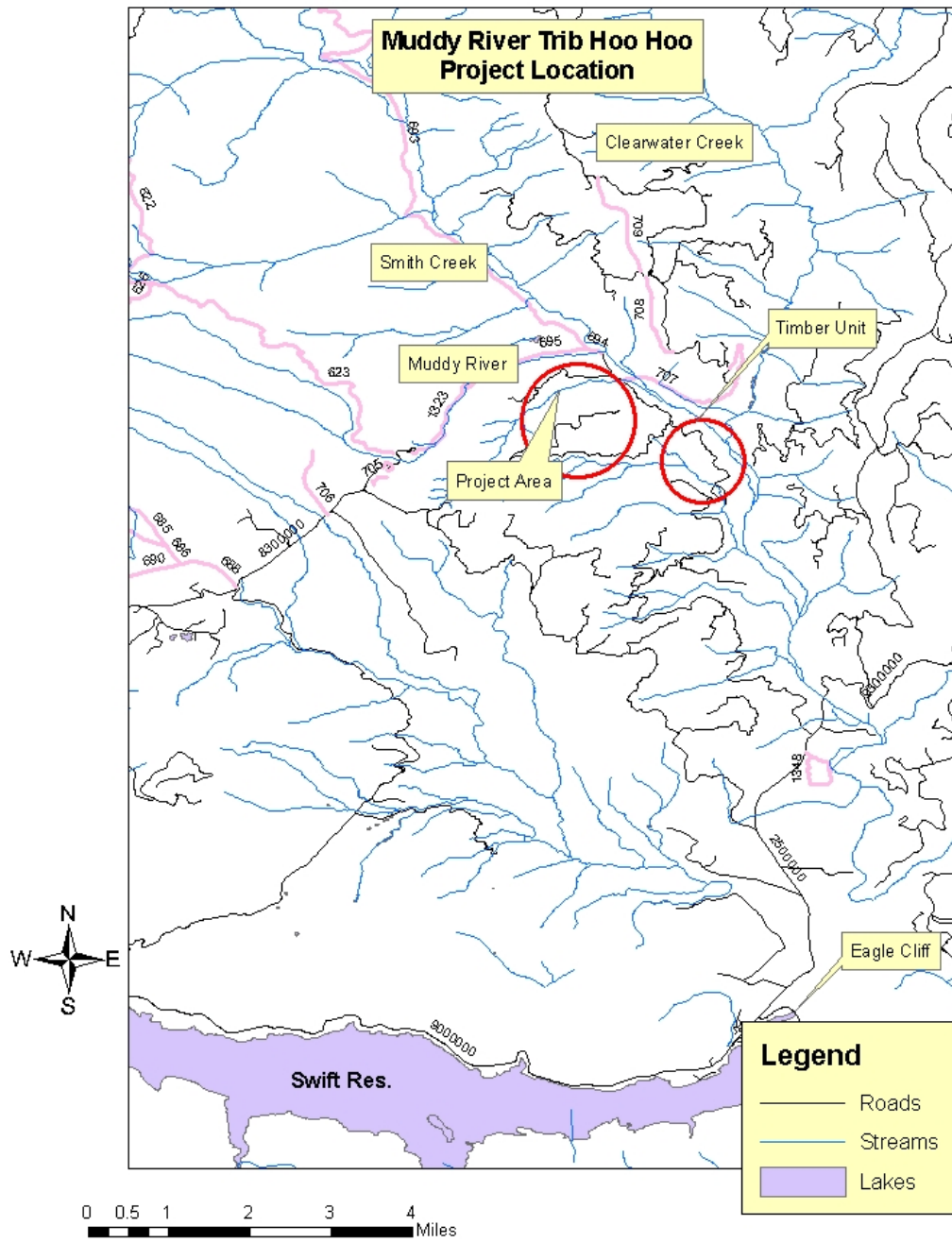


volcanic eruption and subsequent lahar events of the 1980 eruption of Mt. St. Helens. Effects include loss of riparian vegetation, high mobile sedimentation loads, and loss of functional large woody material.

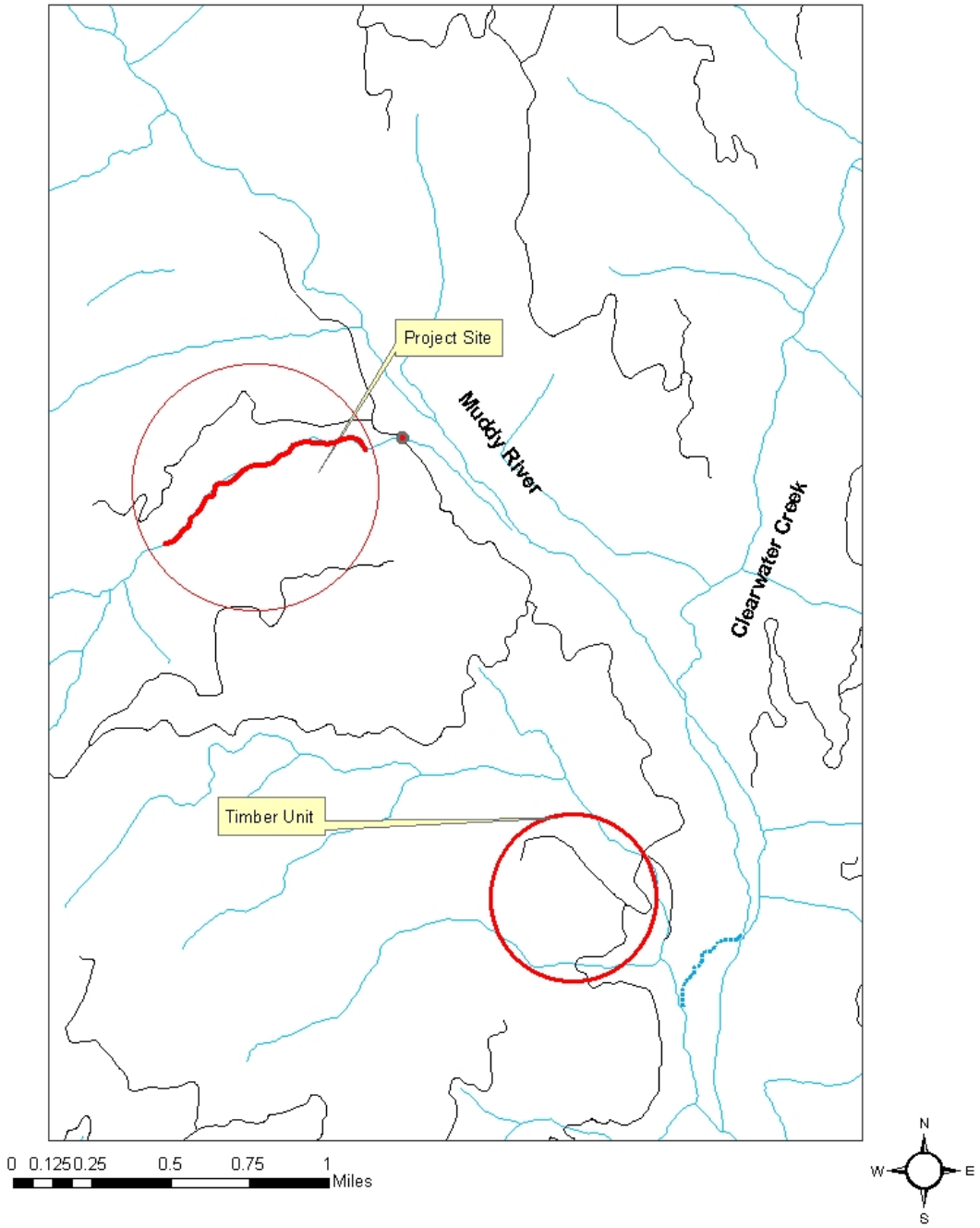
*USFS: Please expand on project need and current fish usage; Please show map of proposed structure locations (e.g. zoomed aerial map with asterisks or symbols where log placement); Like the invasive plant treatment elements and consider as an appropriate riparian treatment; Recommend describing how fits into and contributes to Forest restoration plans. Current fish use includes rainbow trout and limited coho salmon observations. Based on discussions in the ACC group invasive weed treatments will be limited to areas directly affected by implementation of the project.*

*PacifiCorp: Is there any known spawning or rearing in this section?*

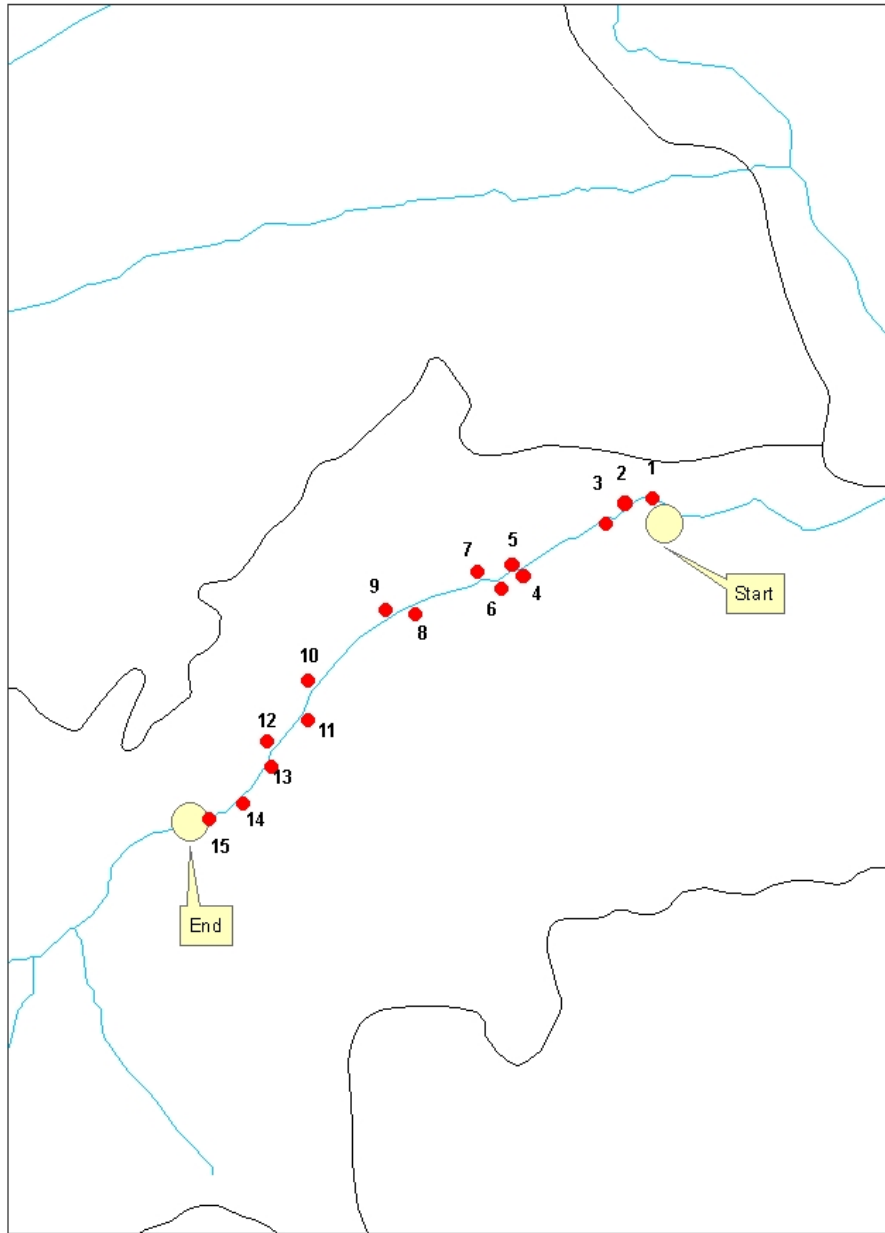




2013 Muddy River Trib. Hoo Hoo Proposal



**2013 Muddy River Trib. Hoo Hoo Proposal  
Proposed Structure Locations**



0 225 450 900 1,350 1,800 Feet

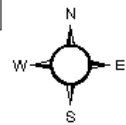


Table of structure design criteria and expected outcomes

Structure Number	Hiding Cover	Overwintering Refugia	Summer Rearing	Pool Formation	Gravel Sorting	Bank Stability
1	x	x	x	x		x
2	x	x	x	x		x
3	x	x	x	x		x
4	x	x	x	x	x	
5	x	x	x	x	x	
6	x	x	x	x	x	
7	x	x	x	x	x	
8	x	x	x	x	x	
9	x	x	x	x	x	
10	x	x	x	x	x	
11	x	x	x	x	x	
12	x	x	x	x	x	
13	x	x	x	x	x	x
14	x	x	x	x		x
15	x	x	x	x		x



**1. Photos of past restoration downstream of project proposal**



**2. Section of stream below project proposal area**

## References

Everest, Fred, James Sedell, John Wolfe, 1985. "Fisheries Enhancement in the Fish Creek Basin", Project No. 1984-01100, 234 electronic pages, (BPA report DOE/BP-16726-1)

Everest, Fred H. Gordon H. Reeves, James R. Sedell, Pacific Northwest Forest and Range Experiment Station 1986. Abundance, Behavior, and Habitat Utilization by Coho Salmon and Steelhead in Fish Creek, Oregon as Influenced by Habitat Enhancement 1985 Annual Report.