## **FINAL REPORT** Whites Gulch Migration Barrier Removal Project





United States Department of the Interior - Bureau of Reclamation **Klamath River Restoration Program** Grant Agreement No. R10AP20673

(Initial Grant No. 07FG200119)

### Project Partners

Siskiyou County Department of Public Works California Department of Fish and Game, Fisheries Restoration Grant Program

Prepared By

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### Summary

The Whites Gulch Migration Barrier Removal Project improved access to 3.5 miles of habitat for juvenile and adult Chinook salmon, steelhead trout, and threatened Southern Oregon Northern California Coast (SONCC) Coho salmon. The perched 10-foot tall, 14-foot wide, 90-foot long multi-plate arch culvert was replaced with a 60-foot long, 24-foot wide single span, pre-cast concrete bridge supported by reinforced concrete wall abutments in summer 2009. The bridge provides for natural stream channel conditions and adjustments through the crossing, increased capacity to convey the estimated 100-year flows for the watershed (2,511 cfs) and full access to upstream cold-water refugia, rearing and spawning habitat for the species listed above. This project complemented two upstream dam removal projects that were completed in 2008 by the Salmon River Restoration Council, California Department of Fish and Game (CDFG) and the NOAA Open Rivers grant program.

The project is located in NW ¼, NE ¼ Section 35, T40N, R11W, MDBM, approximately five miles east of the community of Sawyer's Bar (Attachment 1-Project Location Map). The crossing is located on Whites Gulch Road Siskiyou County Road No. 2E002) at milepost 0.43, past the bridge over the North Fork Salmon River. The project was conducted with the full support of the Forest Service (upstream and downstream land manager) and adjacent private landowners who allowed for equipment storage and spoils disposal on their respective properties. Siskiyou County Department of Public Works (DPW) engineering staff completed the design. The required permitting was completed by Siskiyou County DPW and 5C Program staff, with assistance from State and Federal agencies, including CDFG, the Bureau of Reclamation and the Forest Service. The Siskiyou County DPW bridge and road crew staff completed construction. 5C staff and consultants provided guidance during the design, permitting and construction phases, and monitored the pre, during and post-project conditions including flows, channel adjustments, and revegetation success.

This report includes three attachments (Project location map, Project photolog, and Project As-Built Diagrams). In addition, Appendix A includes the reporting metrics required by the Grant Agreement.

### Project Background, Purpose and Need

The purpose of this project was to restore access to 3.5 miles of upstream spawning, rearing and refugia habitat for adult and juvenile Coho and Chinook salmon and steelhead trout by replacing the existing culvert on Whites Gulch Road with a bridge. The replacement was needed because the existing culvert was a complete barrier to all age classes of Coho and Chinook salmon and steelhead.

Whites Gulch is a tributary to the North Fork Salmon River, a major tributary to the Salmon and Klamath Rivers in Northwestern California. Whites Gulch Road is a Siskiyou County maintained road within lands administered by the United States Forest Service, Klamath National Forest (KNF), Scott and Salmon River Ranger District. The project allowed access to critical cold water refugia and spawning habitat for juvenile and adult Coho salmon, spring and fall Chinook salmon and steelhead trout, consistent with the KNF's goals and objectives under FEMAT

(1993), the ROD for the Northwest Forest Plan (1994), and the KNF Land and Resource Management Plan (LMP, 1995). Since the project improved passage conditions for sensitive aquatic species, it is consistent with actions to promote recovery of listed and candidate species and Species of Special Concern. The Project also addressed habitat restoration goals described in the February 2004 *Recovery Strategy for California Coho Salmon* (report to the California Fish and Game Commission).

The North Fork of the Salmon River is a major tributary to the Klamath River, located in the Sawyer's Bar Hydrologic Subarea (HSA) of the Salmon River HA or Hydrologic Area (Klamath River Hydrologic Unit). Approximately 99% of the 480,864-acre Salmon River watershed is located primarily within Klamath National Forest (KNF) management and 1% is within the Shasta-Trinity & Six Rivers National Forests. 42.67% of the watershed area is held in protected status (designated as wilderness and/or Wild & Scenic River) with 56.04% being managed for public multi-use lands (federal & state). 1.3% of the watershed area is private (Klamath National Forest LMP, 1995). Per the KNF LMP, the outstandingly remarkable values that the North Fork Salmon Watershed should be managed for include fisheries, scenic value, vegetation and water quality. The North Fork Salmon River Coho population is listed in the 2004 Recovery Strategy for California Coho Salmon as a "key population to maintain or improve". The Salmon River is also a Key Watershed under the Klamath River Watershed Assessment and historically, Coho habitat was estimated to include 105 miles in the Salmon River and its tributaries (CDWR 1965) with more recent estimates that Coho only have access to about 85 miles (CH2M HILL, 1985). Problems facing Coho salmon in the Salmon River watershed include depleted large woody debris, barriers to fish passage, high sediment loads, and unstable spawning gravels. The 2004 Recovery Strategy lists problems facing Coho salmon in the Sawyers Bar HSA as: sediment input from roads, marginal summer water temperature resulting from the broad unvegetated flood plain and riparian areas, and waste discharge from mine tailings (Recovery Strategy Section 6.12). Watershed & implementation task recommendations for the Salmon River HA listed in the 2004 Recovery Strategy include, but are not limited to SA-HA-01 & SA-HA-05 (Section 9.40). Both list reducing sediment and providing Coho salmon passage at all life history stages where roads affect access to habitat. Measures to achieve this goal include: implementing Forest Roads Analysis, private, and county road assessment recommendations and correcting identified passage barriers on all roads.

Siskiyou County is part of the Five Counties Salmonid Conservation Program (5C), a water quality improvement and fisheries conservation strategy within the SONCC Coho salmon Evolutionary significant Unit (ESU) including the counties of Del Norte, Humboldt, Mendocino, Siskiyou and Trinity. The 5C was developed in response to the 1997 listing of the SONCC Coho ESU as threatened under the federal Endangered Species Act. Its fish passage improvement element continues to provide an essential step toward the delisting of the SONCC Coho ESU as both a Federal and State listed species. The 5C's Migration Barrier Removal element consists of barrier inventory data, prioritized ranking of sites, design/construction, funding procurement, and pre/during and post-project monitoring. From 1998-2004, an inventory of all County maintained stream crossings within anadromous

stream reaches was conducted in all five counties, resulting in 245 crossings identified as complete or partial barriers to fish passage. The crossings were prioritized using site-specific information weighed heavily towards the biological considerations of anadromous salmonids. Each barrier was assigned a score based on five parameters: Anadromous species diversity within the stream reach at each crossing location; The extent of the barrier; Habitat quality and quantity upstream; Risk of culvert failure; and, Current condition of the crossing. Each barrier was ranked for inter-county tracking and a Program Ranking Matrix was developed to insure that the highest priority projects throughout the Program Area were addressed. To date, 56 of the 245 projects have been constructed, restoring approximately 131 miles of spawning and rearing habitat for Coho and Chinook salmon, steelhead and Coastal cutthroat trout.

The confluence with the North Fork Salmon River is approximately 1,300 feet downstream of the county culvert and Summer steelhead and spring Chinook have been observed utilizing this section of the channel (SRRC, 1980-2006; CDFG, 1967/1970). Critical habitat was designated for the federally threatened SONCC ESU up to the County culvert crossing. Only SONCC Coho salmon are listed as threatened in the Klamath River HU. The project area lies within the Upper Klamath and Trinity River Chinook (UKTR) ESU for fall and spring runs and the Klamath Mountains Province steelhead DPS (Distinct Population Segment), neither are federal or state listed species, but are Forest Service sensitive species.

The Whites Gulch culvert was inventoried during the Siskiyou County Barrier Inventory, conducted between August 2000 and March 2002 by Ross Taylor & Associates (5C consulting biologist). This crossing was identified as one of the highest priorities to treat in the County and 5C Program area. It was initially ranked as the second highest priority due to: the severity of the barrier for all species and life stages; the good habitat quality and significant length of upstream habitat gain; and the potential for steelhead and Coho salmon. At the time of the initial inventory, it was not known that spring Chinook also use the lower reaches of Whites Gulch below the county barrier.

During the inventory, FishXing analysis predicted the existing culvert (10-foot tall x 16.5-foot wide x 90-foot long metal pipe arch set at 3% grade, perched on bedrock) to be a complete barrier to adult salmonids and all age classes of juveniles. The barrier status was primarily due to the excessive slope and lack-of-depth through the culvert as well as the perched outlet. The quantity of upstream habitat made available with this project is approximately 3.5 miles of excellent-quality spawning, rearing and refugia habitat with a dense riparian zone of conifers and hardwoods, numerous pools and ample areas of spawning-sized gravels. The stream also hosts cool-water temperatures during late-summer flows.

This site was also assessed during the Siskiyou County DIRT (Direct Inventory of Roads and Treatments) inventory in October 2007. This inventory is part of the 5C sediment reduction program, which includes an inventory of County road sediment sources to streams. The calculated stream crossing volume estimated to deliver, should the culvert had failed, was 826 cubic yards.

## Location

The project is located approximately five miles east of the community of Sawyer's Bar in Siskiyou County, California on County Road # 2E002 (Whites Gulch Road) at Milepost 0.426. The legal description is: T40N, R11W, NW ¼, NE ¼, Section 35 MDBM (see Attachment 1). The average elevation of the project area is 2,400 feet. Whites Gulch is a fourth order (7th field) watershed in the North Fork Salmon River watershed. The project is located within a Late Successional Reserve (LSR) land allocation as defined in the KNF's LMP. County Road right-of-way is granted through an existing special use permit with the KNF and due to the proposed realignment of the existing roadway during the project; an encroachment beyond the County's current permitted right-of-way was approved by the KNF and incorporated into an amended special use permit.

### Engineering and Design

The crossing was assessed with FishXing during the 5C barrier inventory (as described above) and Siskiyou County DPW engineering staff conducted the long profile and cross section surveys in early fall 2006. During the design phase (2005 to 2008), CDFG, NNMFS, DPW engineering, 5C and consulting engineers discussed several options for improving passage at the crossing. The design phase of this project began in late 2005/early 2006 when SRRC (Salmon River Restoration Council) proposed removal of two upstream dams on Whites Gulch. The two dams were located ~0.3 and 1 mile upstream of the County barrier and were removed by SRRC in cooperation with CDFG and NOAA Fisheries in October 2008. Since the county crossing was the highest priority barrier in the County and it is the first barrier in the stream system, existing 5C Program engineering funds from CDFG were allocated to project design in early 2006. This funding was utilized to complete the geotechnical investigation, topographical surveying and formulation of the conceptual design. Site visits to discuss the dam removal projects and the county barrier project design were held in August and November 2006. The main objective of the November 2006 site visit was to discuss the retrofit option for the existing culvert. This alternative to the bridge design included retrofitting the existing culvert with baffles and constructing a roughened channel of downstream weirs (to backwater the culvert) and engineered streambed material. Habitat specialists from CDFG (Mark Elfgen & Kevin Gale), CDFG engineer Marcin Whitman, consulting hydraulic engineer Mike Love, fishery biologists Ross Taylor (5C) & Nat Pennington (SRRC), Christine Jordan (5C), and Scott Waite (Siskiyou County Senior Civil Engineer) were all in attendance. Pennington described the fisheries resources of Whites Gulch and the importance of improving fish passage considerations for the site. The lower ¼ of the channel has runs of adult steelhead and Chinook salmon and is utilized as thermal refugia by juvenile spring Chinook during summer months when the North Fork Salmon reaches high temperatures (>72° F). Based on this fact, it was concluded that providing upstream passage for juveniles was an essential requirement for the project. The retrofit option involved use of a roughened channel below the culvert outlet to build up the grade of the downstream channel and installation of baffles. The recommended maximum slope for a roughened channel is about 5% and the County surveying estimated average channel slope below the outlet pool at  $\sim 4\%$ . From the long profile data, the roughened channel would have needed to extend for nearly 100 feet downstream of the culvert outlet and the longevity and stability of such a structure, given that

Whites Gulch is a high-energy system capable of transporting large rock, would be minimal. The culvert retrofit would have also required installing corner baffles inside the culvert, due to their improved ability to pass debris. CDFG biologists and engineers discussed the difficulty of designing baffles to provide juvenile passage and even though corner baffles are less prone to debris plugging, the DPW would be responsible for maintaining the baffles on a regular basis. Baffles also reduce hydraulic capacity of culverts and increase the risk of overtopping during storm events. The DPW engineering staff conceded that the culvert was sized for less than the 100-year peak flow, so further reduction in capacity was not preferred. The high passage design flows for the site are roughly 180 cfs for adults and 95 cfs for juveniles and it would have been difficult to meet the NMFS and CDFG fish passage criteria at these high flows, requiring both CDFG and NMFS to grant a design exception to the existing fish passage guidelines. The consensus at the end of the November 2006 site visit was to move forward with a bridge design due to meeting all species' passage and flow criteria, the potential for high-intensity rain and rainon-snow events, the remote location, and the high quality upstream habitat.

The existing culvert's excessive slope and lack-of-depth were the primary barrier features and the outlet was perched approximately 2-3 feet above the surface of the outlet pool. The 100-year flow for the watershed is ~2,511 cfs with a 13-square mile watershed area above the crossing. The replacement design was a 60-foot long, 24-foot wide pre-cast concrete bridge set on spread footing concrete abutments. The design complies with the 2001 NMFS and 2002 CDFG Guidelines for salmonid passage at stream crossings utilizing the stream simulation design that meets conveyance of the 100-year flow and associated bedload and debris.

### Permitting

This project was subject to both CEQA and NEPA due to the state and federal funding sources, proximity to, and use of federal lands. Siskiyou County DPW Environmental Compliance Specialist Kyla Burton and Christine Jordan (5C) completed the environmental review process and permit procurement in cooperation with the following: Samuel Cuenca, Wildlife Biologist, Scott & Salmon River RD, KNF; Gary Flosi and Mark Elfgen, CA Department of Fish and Game Biologists; and Kristen Hiatt and Adam Nickels from the Bureau of Reclamation.

The project received funding from the California Department of Fish and Game's Fisheries Restoration Grant Program (FRGP) and these projects receive federal coverage under the Regional General Permit No. 12 between CDFG and the Army Corps of Engineers. The RGP No. 12 provides: the NOAA Biological Opinion; the USFWS Biological Opinion; the Section 404 and 401 compliance under the Clean Water Act; and compliance under Section 106 of the National Historic Preservation Act for projects funded under the FRGP. Projects shall be constructed per the required Best Management Practices and per standard LOPs and other Resource Protection Measures outlined in the RGP No. 12. Bureau of Reclamation archaeologist Adam Nickels completed a subsequent archaeological review on April 1, 2009 to assure BOR compliance with Section 106. Christine Jordan completed the botanical resource surveys in 2006 and 2007. Jordan also completed the fisheries, wildlife, and botanical resources reports and outreach with KNF staff Julie Perrochet (Fisheries Program Manager), Sam Cuenca, and Marla Knight (Botanist)

as part of the Environmental Assessment (EA) required by the Bureau. Both Kristen Hiatt and Jordan developed the EA, and the FONSI was issued in June 2009. Siskiyou County DPW met consistently with KNF Roads Manager Jim Davis to discuss and resolve the right-of-way issues, tree removal plans and spoils disposal locations. The required CEQA (California Environmental Quality Act) for the project was completed under the FRGP's Mitigated Negative Declaration.

In addition to the above listed environmental compliance documentation, the California Department of Fish and Game also required a Stream Alteration Agreement prior to construction. Kyla Burton prepared the Notification package and the permit was issued in May 2009 (Document No. R1-09-0172).

As a project under the 5C Program, it was subject to the applicable Best Management Practices (BMPs) for stream crossing replacement, water diversion installation, spoils disposal and revegetation outlined in the 5C Water Quality and Stream Habitat Protection Manual for County Road Maintenance in Northwestern California Watersheds (Roads Manual). The Manual is available online at: <u>http://www.5counties.org/Projects/FinalGeneralProjectPages/RoadsManual800.htm</u>

## **Construction Activities**

#### Aquatic Species Relocation

Mark Elfgen (CDFG fisheries biologist) conducted the fish relocation and installed fish screens upstream and downstream of the project construction area prior to project construction activities. DPW and DFG staff routinely inspected the fish screens during project construction to make sure they remained in place and effective. Observations for impinged fish on the screens were made with no fish observed.

### Construction

Construction was completed between July 13 and October 30, 2009 by Siskiyou County DPW bridge crew staff led by Timothy Akana. General activities consisted of the following: short-term relocation of buried phone cable; road construction notice and signage; mobilization (move in/out); grubbing and tree removal; excavation and temporary storage of roadfill material; excavating, forming and placing the new abutments; installing rock slope protection along the new abutments, and upstream and downstream banks; realigning the roadway approaches; installing the bridge deck sections (crane use); endhauling and storing excess spoils material; importing and placing structural road base and surfacing the bridge deck and approaches; installing guardrail; and conducting the revegetation work.

The bridge was constructed according to the original plans except for a few minor changes. The existing culvert was left in place during construction to avoid installing the temporary Bailey bridge for the traffic detour and minimized the impacts to trees and the stream banks. Fifteen (compared wit the original estimated 30) trees (11, 12-inch DBH and 4, 12-inch DBH) trees were removed. Instead of installing the Bailey bride, the downstream portion of Whites Gulch Road was narrowed to a single lane road that allowed for through traffic while the bridge was constructed. For the majority of project construction, water was allowed to flow through the existing culvert. Excavation of the roadfill from around the upstream

end and mid-section of the existing culvert was completed first to allow for the forming and placing of the abutment footings. The abutment footings and abutments were excavated well outside of the active channel width and ponding water (although minimal) was pumped from the excavation areas and outlet in a small depression at least 25 feet away from the stream in a heavily vegetated area. After the abutment excavations were complete, the footings were placed and the abutments were framed (refer to the Photo Log) and placed. To prevent scour, 1/4ton rock-slope protection was installed along the abutments after they had cured. Five sections of 4-foot wide by 24-foot long pre-stressed concrete beam sections were placed on the abutments with a crane and secured with rebar. Once the bridge deck was installed and secure, the remaining road fill material (downstream one-lane portion) and culvert were excavated. The bridge approaches and realignment of the roadway to tie into the existing road were roughed in prior to the abutment excavation/construction and once the culvert was removed, the road surface was compacted, rocked and surfaced and the guardrail was installed. An oiltrapping absorbent floating boom system was also installed across the outlet pool at the start of construction to protect the stream from any accidental oil or petroleum discharge (none occurred) and silt fences and straw bales were utilized for erosion control during construction. All disturbed areas, including the old roadway approaches, were re-vegetated in early November with native grass seed (donated by the KNF) and mulched with certified weed-free straw and chipped tree material donated by DPW. Note that additional conifer and riparian tree species will be planted in fall 2010. All excess spoils material was end-hauled to the preapproved permanent disposal site on FS lands as well as adjacent private property where it was permanently stabilized to prevent delivery to any watercourse in accordance with the Roads Manual BMPs.

### Monitoring

A monitoring plan to assess the physical and biological effectiveness of the project is included in the project's design. All monitoring has been and will continue to be conducted by Siskiyou County DPW staff, CDFG biologists, 5C staff & consulting fishery biologist and/or SRRC staff and KNF biologists.

### Photo Monitoring

Permanent photo points have been established at the project site and photo documentation of site conditions pre, during and post-project implementation has been completed (

). Pre-project low and high-flow photo monitoring has also been completed.

### Physical Monitoring

Pre-project longitudinal and thalweg surveys were completed in 2006. A postproject longitudinal survey will not be completed unless Siskiyou County engineering staff start to notice that there is a potential barrier forming downstream of the bridge. Current conditions show that the downstream outlet pool is filling in and the channel is adjusting downstream of the bridge to a more natural grade. There are several small jump pools and the reach from 25 feet downstream of the bridge; up through the bridge inlet can best be characterized as a low gradient riffle. Siskiyou DPW staff continues to monitor the channel adjustment as well as the revegetation success.

### **Biological Monitoring**

Spawning and presence/absence surveys will be conducted by the SRRC. These surveys (spring Chinook dives) are already conducted by the SRRC on an annual basis, and it is presumed that extension of these surveys above the county road crossing will be conducted well after project implementation.

### Funding Procurement

The California Department of Fish and Game's Fisheries Restoration Grant Program, the United States Bureau of Reclamation's Klamath River Watershed Restoration Program and the Siskiyou County Department of Public Works (DPW) funded project design and construction (Table 1). The majority of the engineering expenses, including the geotechnical investigation, was reimbursed to Siskiyou County through the 5C Program's CDFG Program grant (also under the Fisheries Restoration Grant Program).

| Defer  | Whites Gulch Migration Barrier Removal Project<br>Expense By Project Phase |              |            |            |
|--|--|--------------|------------|------------|
| Partners   | Engineering/<br>Permitting   | Construction | Monitoring | Total      |
| Siskiyou County Department of<br>Public Works                                    | \$ 3,000   | \$ 5,005     | \$ 2500    | \$10,505   |
| Bureau of Reclamation Klamath<br>River Restoration Program                       | \$ 12,793  | \$ 221,888   | \$ 500     | \$ 235,181 |
| California Department of Fish and<br>Game Fisheries Restoration Grant<br>Program | \$ 35,000*   | \$ 148,741   | \$ O       | \$ 183,741 |
| Total  | \$ 50,793  | \$ 375,634   | \$ 3,000   | \$ 429,427 |

Table 1: Grant Funding Allocation by Project Phase

\*Includes funding from the 5C Program FRGP Program grant for the engineering portion of the project

### **Quantitative Results**

- A. Stream length treated/assessed/made more accessible (mi): **3.5 miles**
- B. Instream habitat structures installed (number): 0
- C. Fencing length to be installed/repaired (distance in feet): 0
- D. Road length treated/assessed (distance in miles): **100 feet due to** realignment and surfacing
- E. Stream crossings treated (number): 1 stream crossing
- F. Sediment prevented from entering the stream (volume in cubic yards): A minimum of 826 cubic yards (potentially more if the channel banks or channel bottom scour had occurred as a result of culvert failure)
- G. Trees planted (number): 20 trees (to be completed in Fall 2010)
- H. Area planted/preserved/assessed (area in acres): 0.25 acres
- 1. Public meetings (number): O as a Public meeting was not required. The CEQA Mitigated Negative Declaration prepared by CDFG was posted for Public Review.

The project removed the existing 10-foot tall x 14-foot wide x 90-foot long metal

pipe arch set at 3% grade and replaced it with a 60-foot long, 24-foot wide pre-cast concrete bridge set on spread footing concrete abutments. All instream work was completed from July 13 through October 15, 2009 as stipulated by the California Department of Fish and Game Stream Alteration Agreement and project construction was completed on October 30, 2009. The bridge design complies with the 2001 NMFS and 2002 CDFG Guidelines for salmonid passage at stream crossings utilizing the stream simulation design that also conveys the 100-year flows and associated bedload and debris (refer to Attachment 3 for the As-Built Diagrams). Siskiyou County DPW engineering, permitting, and bridge/road crew staff managed all elements of the project with assistance from 5C Program staff for the design, permitting, monitoring and funding procurement. As the bridge is located on a County road, it will continue to be maintained by Siskiyou County DPW.

## Additional Upstream Work

In October 2008, the Salmon River Restoration Council, in cooperation with the California Department of Fish and Game and NOAA Open Rivers Initiative, removed two dams from the upstream reaches of Whites Gulch. Both of the dams were remnants of the historic mining activity that had occurred within the watershed. The removal of the dams (both shown below), and the subsequent removal of the culvert barrier on Whites Gulch Road, restored access to 3.5 miles of refugia, rearing and spawning habitat in Whites Gulch.



## Acknowledgments

This project would not have been possible without the dedication of the Siskiyou County Engineering, Permitting and Bridge and Road crew staff members who worked long hours to complete yet another restoration project, the staff at the Salmon River Restoration Council, including Jim Villeponteaux who coordinated and accomplished the upstream dam removal projects, and the State and Federal grant and permitting agencies.

## **Attachments**

Attachment 1 – Project Location Map Attachment 2 – Project Photo-log Attachment 3 – As-Built Diagrams

## Appendix A

### Whites Gulch Migration Barrier Removal Project Grant No. R10AP20673 (vice 07FC200119)

## Final Performance Progress Reporting Metrics

**Reporting Element1:** *Comparison of actual accomplishments with the goals and objectives established for the period.* 

The primary goal of this project is to restore access to rearing and spawning habitat for steelhead, Chinook and Coho salmon in Whites Gulch, a tributary to the North Fork Salmon River in Siskiyou County, California. The objective was to construct a bridge upstream of, and remove the existing 10-foot tall, 14-foot wide, 90-foot long multiplate arch culvert that is perched on rock, crating an effective jump barrier. The bridge would also convey the 100-year flows for the watershed. The project was planned for construction 2009 and was completed from July 13- October 30, 2009. Additional revegetation work will occur in fall 2010 (planting of riparian and conifer tree species). Refer to the complete submitted Final Report for more detail.

| Task Proposed           | Completion Date         | Status                  |  |
|-------------------------|-------------------------|-------------------------|--|
| 1) Design & Engineering | April 30, 2009          | Complete                |  |
| Specifications          |                         |                         |  |
| 2) NEPA & CEQA          | June 2009 – NEPA        | Complete                |  |
| Permitting & Compliance | June 2009 - CEQA        |                         |  |
| 3) Project Construction | July 2009-November      |                         |  |
|                         | 2009                    |                         |  |
| 3a) Temporary Detour    |                         | Not Required            |  |
| 3b) Fish Relocation &   | July 2009               | Complete                |  |
| Stream Dewatering       |                         |                         |  |
| 3c) Clearing & Grubbing | May – June & August     | Complete                |  |
|                         | 2009                    |                         |  |
| 3d) Bridge & Roadway    | July 13-October 15,     | Complete                |  |
| Construction            | 2009                    |                         |  |
| 3e) Erosion Control &   | October 15 – November   | Complete                |  |
| Spoils Disposal         | 15, 2009                |                         |  |
| 4) Progress & Final     | April 2008-July 2009    | Complete                |  |
| Reports                 |                         |                         |  |
| 5) Post Project         | November 2009-          | In Progress by Siskiyou |  |
| Monitoring              | December 2011 (and      | County DPW & Salmon     |  |
|                         | longer for County       | River Restoration       |  |
|                         | structural              | Council under other     |  |
|                         | inspections/maintenance | funding sources         |  |
|                         | requirements)           |                         |  |

The schedule that was included in the Grant Agreement is included below as Table 2. All of the goals and objectives of this project have bee met.

## Reporting Element 2. Project Output Quantification.

Please refer to the <u>*Quantitative Results*</u> section on page 8 of the Final Report for a full description of the project purposed and need, and construction. One bridge was constructed resorting access to 3.5 miles of habitat. Approximately 826 cubic yards of roadfill was excavated from the crossing, thereby eliminating the potential for that sediment to deliver to Whites Gulch and the North Fork Salmon River in the event of culvert failure. Approximately 0.25 acres of disturbed area and 'decommissioned' roadway (due to a roadway realignment to conform to the new bridge location) were revegetated with native grass seed. Additional tree planting is planned for fall 2010.

### Reporting Element 3. Reasons why Goals and Objectives were not met.

All of the goals and objectives were met in the stated timeframe with the exception of complete revegetation plans. Trees were not planted in fall 2009 as the donated trees were not available in the time needed for planting and also due to a lack of rain events. Approximately 20 trees will be planted in 2010.

### Reporting Element 4. Other Pertinent Information.

Two dams were removed from the upper reaches of Whites Gulch in 2008 by the Salmon River Restoration Council. This project at Whites Gulch Road completes the removal of all natural barriers in the watershed. SRRC will continue to monitor fish presence in Whites Gulch as part of the spring Chinook dives that are hosted and conducted each year.



## Attachment 2: Project Photolog Whites Gulch Migration Barrier Removal Project

Siskiyou County , California



Top: Outlet of 10' tall x 14' wide x 90' long multiplate arch culvert on Whites Gulch Road (August 2006)

\*Note culvert perch on bedrock and alder trees on left & right banks Bottom: View upstream to constructed bridge (August 2010)



## Pre-Project Conditions: April 2006 through October 2008



Top: Culvert inlet in April 2006 with moderate flows Bottom: Same view in August 2006 shows lack of depth & sub-structure flow



# Pre-Project Conditions: April 2006 through October 2008



Top: Culvert interior in October 2008 Bottom: Inlet with large rock/streambed material typical of channel & subsurface





Top: Installed upstream fish screen with screened water pump just downstream to pump





Left : Fish screen and pump Right: Excavation of Footing area for Abutment One





Top: Finishing the pour for Abutment One Footing

Center: Preparing to pour Abutment One after framing installed

Bottom: Footing and Framing for Abutment One with rebar ties





Top: Finished Abutment One & Footing

Bottom: Footing excavation for Abutment Two (note one-lane road at right & culvert as bypass)





Top: Framing Abutment Two (note pump & culvert diversion

Center: View of Abutment One with rock slope protection installed

Bottom: Existing culvert as bypass with separation shown between Abutment Two pour area & active stream channel







Top: One-lane road through project area (bridge decks set at right with culvert as diversion Bottom: Existing Culvert as bypass with bridge deck sections & one guardrail installed





Top: Bridge decks set with guardrails installed Bottom: Approach compacted & rocked with one-lane road still at right





Top: Revegetating with native grass seed & straw mulch (November 2009) Bottom: Looking upstream at bridge prior to revegetation efforts in November 2009



## **Post Construction: Revegetation & Flow/Channel Adjustment**



Old roadway approaches excavated and revegetated. Upstream is to the left: note road realignment in upper left portion of photo Native grass seed donated by the Klamath National Forest: Conifer & Riparian tree species to be planted in Fall 2010





Top: Channel adjustment through the historic outlet pool area

Center & Bottom: January 2010 flows under the bridge





STATE CALIFORNIA · OF

## INDEX TO SHEETS

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| SHEET <b>#</b> 5                 | BRIDGE RAIL POST DETAILS<br>ELEVATION & CORNER REINFORCEME<br>DETAIL |
|                                  | CORNER REINFORCEMENT - PLAN<br>RAIL POST - SECTION                   |
| SHEET #5A                        | AS-BUILT CONCRETE FILL AT<br>ABUTMENT #1                             |

## APPLICABLE STANDARD PLANS

| AIOA    | ABBREVIATIONS & ACRONYMS           |
|---------|------------------------------------|
| A10B    | SYMBOLS                            |
| A77A1   | METAL BEAM GUARD RAILING -         |
| 47701   | WTHINE WOOD FUST W/WOOD BLOCK      |
| ATTOI   | METAL BEAM GUARD RAILING -         |
|         | STANDARD HARDWARF                  |
| A77C1 . | METAL REAM CLIARD DAILING          |
|         | WOOD DOST & WOOD DLANG -           |
| A77F1   | METAL PEAN OWNED BLOCK DETAILS     |
|         | METAL BEAM GUARD RAILING - TYPICAL |
|         | LAYOUTS FOR STRUCTURE APPROACH     |
| BO-1    | BRIDGE DETAILS                     |
| BO-3    | BRIDGE DETAILS                     |
|         |                                    |
|         |                                    |



NOT TO SCALE

Attachment 3: As-Built Diagrams for Whites Gulch Migration Barrier Removal Project



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Attachment 3: As-Built Diagrams for Whites Gulch Migration Barrier Removal Project



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