North Fork John Day Dredge Tailings Restoration Project

Final Report
1997 - 2002

DOE/BP-00004994-1

December 2002

This Document should be cited as follows:

Sanchez, John, "North Fork John Day Dredge Tailings Restoration Project", Project No. 1996-05300, 22 electronic pages, (BPA Report DOE/BP-00004994-1)

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

This report was funded by the Bonneville Power Administration (BPA), U.S. Department of Energy, as part of BPA's program to protect, mitigate, and enhance fish and wildlife affected by the development and operation of hydroelectric facilities on the Columbia River and its tributaries. The views in this report are the author's and do not necessarily represent the views of BPA.

North Fork John Day Dredge Tailings Restoration Project

Final Report

By:

John Sanchez, Project Leader USFS

USDA, Forest Service
2517 SW Hailey Ave
Pendleton, Oregon 97801

Funded by:
U.S. Department of Energy
Bonneville Power Administration
Division of Fish and Wildlife

Contract # 97 A1 34715
Project # 199605300

John Baugher, C.O.T.R.

December 2002

Table of Contents

Abstract

The USDA Forest Service (USFS) and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) worked together to rehabilitate 2.1 miles of Clear Creek floodplain, a tributary of the North Fork John Day River Basin. Dredge tailing were deposited from mining operations on Clear Creek's floodplain from the 1930's to the 1950's. These tailing confined the stream channel and degraded the floodplain. The work was completed by moving dredge tailing piles adjacent to the Clear Creek channel, using track-mounted excavators and dump trucks. A caterpillar tractor was used to contour the material placed outside the immediate floodplain, blending it into the hillside. The restored floodplain was very near channel bankfull level following excavation and contoured to accept future flood flows. Monitoring was initiated through pre and post-project photo points and cross-section measurements.

Work was completed in two efforts. In 1997 and 1998 floodplain restoration was adjacent to the reconstruction of Road 13 from the junction with Road 10 from Clear Creek River Mile 1.9 to 3.1 for a distance of 1.2 miles. In 1999 the Environmental Assessment for Lower Clear Creek – Granite Creek Floodplain Restoration Project was completed for work proposed on Clear Creek from the mouth up to River mile 1.9 and the Granite Creek floodplain from River miles 5.9 to 7.7. Restoration proposed in the 1999 Environmental Assessment is the subject of this report.

Introduction

This project was initiated in 1997 under Bonneville Power Administration contract #199605300 and is specific to Dredge Tailing Restoration. The project is closely tied to the, ODFW, John Day Subbasin Habitat Enhancement Project # 198402100, the North Fork John Day River Habitat Restoration Project, being implemented by the Confederated Tribes of the Umatilla Indian Reservation Project and the Warm Springs, John Day Habitat Improvement Project, being implemented by the Warm Springs Tribe. All projects have received funding by the Bonneville Power Administration.

Purpose

The purpose of this project is to create better Mid-Columbia spring chinook *Oncorhynchus tshawytscha* and Mid-Columbia steelhead *Oncorhynchus mykiss* habitat for all life stages, and to improve stream channel dynamics and riparian function. The spring chinook populations in the John Day River basin have been identified as a remaining healthy stock of wild spring chinook in the Columbia River basin. The Mid-Columbia steelhead trout are listed as threatened under the Endangered Species act. Other salmonid species including redband trout *Oncorhynchus mykiss*, Columbia Basin bull trout *Salvelinus confluentus,* and Westslope cutthroat trout *Oncorhynchus clarki lewisi* will also benefit from the project.

Dredge tailings were removed from the waters edge back approximately 150 feet. This will allow spring high flows and flood flows to overtop the floodplain dissipating stream energy and depositing fines. The recruitment of spawning gravel and fines will create a more natural channel, and will promote growth of riparian vegetation.

Location

Rehabilitation was started in 1997 after relocation of the first mile of Road 13. The road section was constructed on a tailing pile within the Clear Creek floodplain. Project work reduced tailing encroachment on the floodplain and restored the abandoned portion of Road 13 by filling the road cut, and re-vegetating the hill slope. Work was completed in 1998 and is not detailed in this report.

The lower Clear Creek-Granite Creek Floodplain Restoration Project was the second portion of the BPA contract. The project site is located on the North Fork John Day Ranger District, Umatilla National Forest, approximately three air miles west of Granite, Oregon in Grant County (Figure1). The project area includes portions mapped as T9S, R35E, sections 2,10 and 11, Willamette Meridian (Figure 1). The project area is immediately downstream from work completed in 1998 following Forest Road 10 (County Road 240) and parallels Clear Creek for approximately 1.1 miles. Floodplain on private land from the mouth of Clear Creek to River Mile 0.8 was not restored. Clear Creek flows into Granite Creek a tributary of the North Fork of the John Day River.

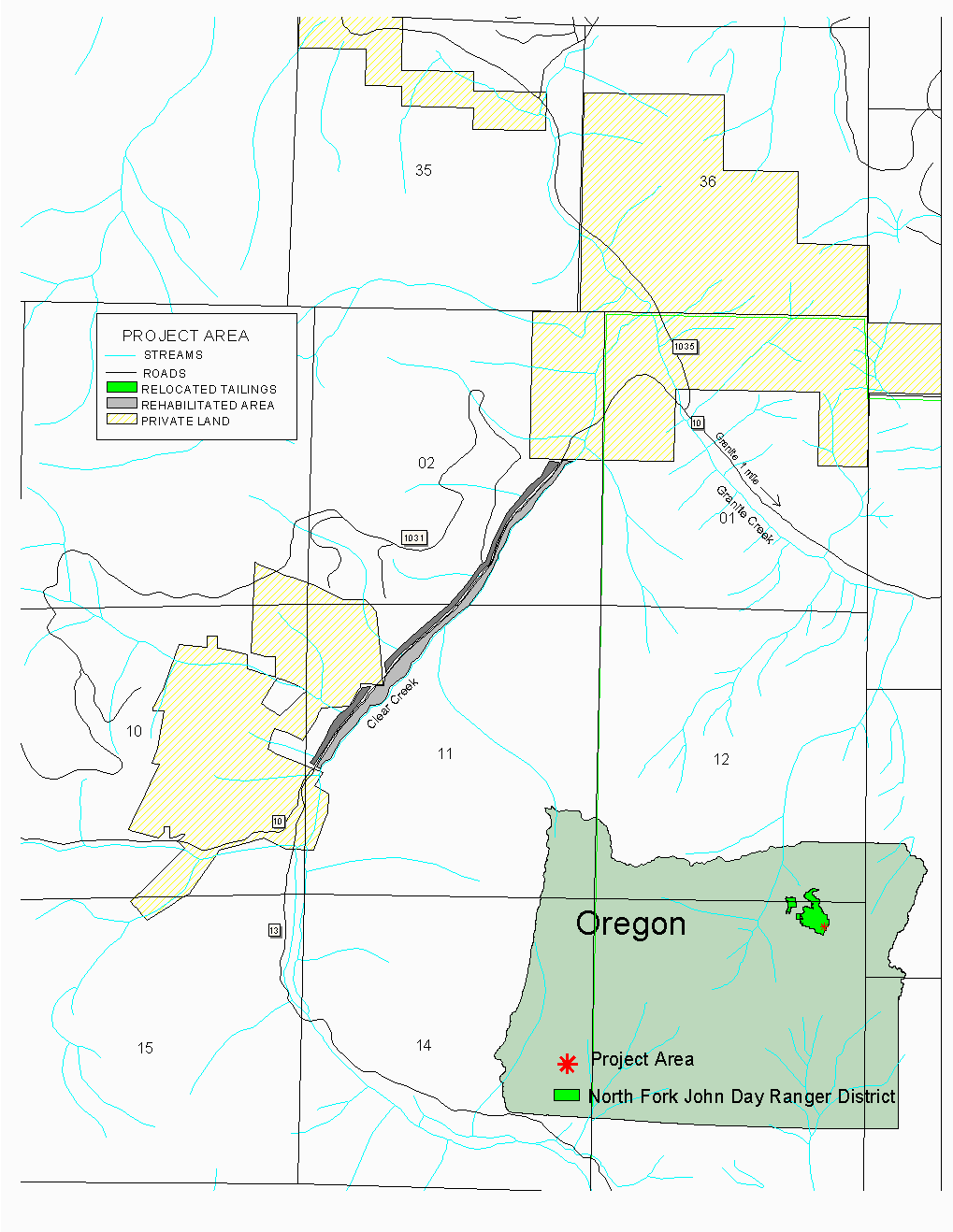

Figure 1. Project Area.

Background/Need

Minors in search of gold in the late 1930's through the early 1950's operated gold dredges on Clear Creek. Dredges excavated river rock down to bedrock where miners expected to find gold. These activities altered a centuries old riparian environment leaving behind thousands of cone shaped piles of river rock called "Tailings". These tailings are still present and have changed little over time. The tailings are very resistant to the river's erosive forces.

These cone shaped piles of tailings confine the stream to a straight, narrow high velocity channel that results in very little channel habitat complexity, low riparian vegetation potential, and no side channel fish habitat. Fines and small gravel are flushed through the system resulting in the loss of potential riparian soil, poor pool scour potential, and little spawning gravel retention. Spawning gravels are present but limited and have been artificially introduced in some reaches. Confined high flows have continued to batter riparian vegetation with scouring bedload, removing a large percentage of vegetation that regenerates. Remaining vegetation is sedge, grasses, willow, weeds and a few small conifers. The lack of streamside vegetation has contributed to high water temperatures and the lack of large wood for fish habitat complexity. Flows have not changed the channel in 50 years and there is no slow velocity overflow area to catch fines. Since dredging was discontinued over 40 years ago there has been very little natural instream or riparian recovery and there was little natural recovery expected for many years.

Stream Survey Information Summary

Current stream conditions as per Forest Service stream survey information and direct observation.

Sediment:
Fine bedload and spawning sized gravel is very limited, the substrate is dominated by medium to large cobble.

Large woody debris:
Large wood accumulation is at the low end of expected levels at 24 pieces per mile. Many of the pieces of large wood counted were introduced as pool forming structures in instream projects in the 1980's. There is little available potential large woody debris for the future because few large trees are found growing close to the stream.

Pool frequency and quality:
The stream is restricted to a narrow riffle dominated channel. Most pools observed were introduced as part of a stream rehabilitation project.

Wetted width to Depth Ratio:
Clear creek is generally wider and shallower than desirable. This is the result of the past mining activity.

Refugia:
There are very few areas of salmonid refugia. High summer water temperatures, low pool abundance and lack of riparian vegetation are indications of degraded fish habitat.

Bank Stability:
Dredge tailing banks are very stable, but also void of vegetation.

Fisheries

Clear Creek is a headwater tributary of the North Fork John Day River. The North Fork drainage is a major contributor of wild Mid-Columbia spring chinook salmon, a species of special concern, and wild Mid-Columbia summer steelhead, listed as threatened under the Endangered Species Act (ESA). Bull trout listed as Threatened under the ESA are found within the North Fork subbasin, including a resident population in the headwaters of Clear Creek and winter foraging habitat in the North Fork John Day River below this project site. Bull trout have not been documented within the project area. Redband trout are found within the project area.

The project site is a known migration corridor for adult summer steelhead and spring chinook and a known spawning area for spring chinook. Adult chinook salmon are present annually from early August through mid-September and adult steelhead trout are present during June of each year. The reach supplies holding areas for all adult salmonids. Juvenile salmonids use the project area for rearing.

The project site was probably historic bull trout habitat before habitat destruction from dredge mining. In the future bull trout could use this area as a travel corridor during the winter. Restoration of floodplain function within the project area could help connect the resident bull trout population upstream to potential habitat downstream.

Similar Projects

Similar projects have been undertaken in the North Fork John Day River, other areas on Clear Creek, and on Granite Creek downstream of this project area. Over 9 miles of river have had tailings pulled back to restore floodplain function and riparian habitat. In project areas the river has reclaimed its floodplain by dissipating the energy of high flow events and depositing sediment to promote riparian growth, promote channel complexity and improve fish habitat quality and quantity. Project implementation in other areas has resulted in no negative impact to salmonids during work periods. The techniques used on past projects have served to refine techniques used on this project.

Concurrent with this project ODFW has done dredge tailings floodplain restoration on a similar reach in Granite Creek. Their effort is largely on private property and involves redistribution of the tailings on the floodplain.

Methods

Pre-construction preparation

NEPA was completed for the Lower Clear Creek-Granite Creek Floodplain Restoration Project in April1998. Consultation was initiated with NMFS in 1998 with the North Fork John Day Multi-species BA. The Level 1 Consultation Team member from the National Marine Fisheries Service supported the proposed restoration project. A difficulty

concluding consultation was not anticipated by the Level 1 Team. The original consultation was never completed as requested.

In the spring of 1999, with the Level 1 Consultation Team support, steps were taken to begin project work in the summer of 1999. In June of 1999 the Not Likely to Adversely Affect portion of the project was separated from the original consultation batch and completed in August 1999 with a letter of concurrence. An equipment rental contract awarded in May of 1999 was extended because consultation was concluded too late to begin project work in 1999. The contractor negotiated an increase in the $141,760 contract of $27,840 for increased fuel costs and hourly rental rate increases bringing the new contract cost to $169,600 for work completed in 2000. The cost of untimely consultation ($27,840) was paid with USDA Forest Service project funds. A second equipment rental contract was awarded in 2001 for work in 2001 and 2002 to complete the project (Table 1).

Implementation

Two track-mounted excavators, 4 dump trucks and a D-6 cat were used to remove and level dredge tailings in a reach 1.1 miles long on the Clear Creek floodplain. Removed tailings were transported to one of three locations; the opposite side of County Road 24 in a 12-foot high tailings pile that was contoured to look like dredge tailings, volume was used to fill holes and ditches left by the original dredging, and tailings were hauled to the town of Granite, Oregon, to be used as fill for roads.

Whenever fines were encountered by excavators they were piled and saved to spread over the reconstructed floodplain and deposited tailings to promote vegetation recovery. These fines were spread at the end of the contract. Care was taken to avoid contact with the stream channel and flowing water.

Existing vegetation within the project area was flagged and avoided wherever possible. Small ponds among the tailing piles were not affected by our operations. A balance was struck between movement of the tailings and leaving established vegetation. It was often a challenge to leave small trees, shrubs or grasses where they grew on or near large dredge tailing piles, but the extra effort paid off and will help speed floodplain recovery.

A contract inspector was on site at all times when machinery was operating. Contract inspectors from the Forest Service and the CTUIR coordinated on site assuring that the project met all objectives.

The National Marine Fisheries Service would not issue a Biological Opinion on work proposed that was Likely to Adversely Affect Mid-Columbia steelhead. There was no in-channel work completed with this project even though it was included in the selected alternative. The placement of large wood on the newly constructed floodplain was not accomplished. Our wood source was on the opposite side of Clear Creek. Rock and log weirs within the project area constructed in the 1980's were in need of maintenance. They were not repaired because we could not work within the stream channel.

Hard rock miners in the late 1800's and early 1900's excavated and processed gold ore. There are three hard rock addit mines in the vicinity of this Clear Creek Floodplain Restoration project. The stream cobble and gravel within this reach was coated with red iron precipitate when effluent was flowing directly into the creek. The stream was seen as sterile for several hundred yards. These mines still drain acid water effluent. In the 1980's the USFS piped the effluent into side channel ponds to reduce the flow of contaminants into Clear Creek. These bog ponds are in the Clear Creek floodplain, separated from the creek by roadbed or dredge pile berms. These mine effluents are now drained to bogs that are heavily vegetated. The bog water filters through river-rock roadbeds and thick berms before reentering the stream through subsurface flow. Pipes from the addit of both Blue Bird and Black Jack mine were proposed for replacement with larger diameter pipe to prevent pipe plugging. The small diameter pipe has not been replaced because the National Marine Fisheries Service would not issue a Biological Opinion on the instream portion of pipe replacement which was determined "Likely to Adversely Affect" ESA listed Mid-Columbia steelhead trout.

Native grasses were planted on the area of newly created floodplain and fill sites sloped to blend into the hillside. Willows and shrubs were planted in the riparian area in the spring of 2001. Planting will be completed in the spring of 2003 with USDA Forest Service funds.

Results

The dredge tailings were pulled back approximately 150 feet from the stream channel creating a wider floodplain that stretched from the streambank to the shoulder of the road. Project costs and estimated volume of rock moved is displayed in Table 1. The lowest average cost by volume of rock moved was in 2001. Project work in 2001 was focused on moving rock and the contractor worked efficiently. In 2002 the finish work was not separated from the rock haul resulting in higher average costs for volume moved. Floodplain shape was surveyed and staked by our Hydrology staff for contouring with the dozer. Salvaged fines were spread over the newly constructed floodplain and grass was seeded to start vegetation recovery.

High water will now be able to move out across this floodplain slowing water velocities and depositing fines and small gravel. The project reach will experience lower high flow velocities and should retain more fines and spawning sized gravel. Lower velocities can be expected to catch large wood moving downstream and deposit it on site creating more instream and riparian complexity as well as potential natural pool formation. Lower velocities should not only deposit fines but should also allow riparian vegetative growth to remain in tact.

Table 1. Rock haul contract cost summary with estimates of rock volume moved.

	BPA Costs	FS Costs	Rock Volume in Cubic Yards	Average Cost per Cubic Yard
2000	$53,415	$104,532	41,570	$4.09
2001	$ 7,980	$ 33,873	16,660	$2.51
2002	$10,910	$ 20,650	8,140	$3.88
Total	$72,305	$159,055	66,310	$3.67

The project area is classified in the Umatilla National Forest Land and Resource Management Plan as:
A3—Viewshed: (Forest Plan Chapter 4, pp. 4-99): The goal is to manage the area as seen from a primary travel route where forest visitors have major concern for scenic qualities as a naturally appearing landscape.
C7—Special Fish management Area: (Forest Plan Chapter 4, pp 167-170): The goal is to maintain or enhance water quality and produce high levels of anadromous fish habitat on an area wide basis. The desired future condition in riparian areas will be a natural or near natural setting, with vegetation development predominating. Anadromous fish habitat will be managed to promote anadromous fish recovery and long-term fish population goals.
The end result for this project also includes meeting objectives for an A3 Viewshed, and C—7 Special Fisheries Management Area. Periodic assessments were made during project implementation to assure that these management objects were being met or exceeded.
No activity was completed instream. Excavators worked within a few feet of the steam and did not excavate below the water level of the stream. There was no adverse effect to fish habitat during construction.

Grasses are growing in the tailings deposition areas where they were planted in 2000 and 2001.

Monitoring and Evaluation

Photo points were established and permanently staked prior to the initiation of ground disturbance and immediately following this years project completion, Appendix II. Photos will be taken in the future on a yearly basis to monitor recovery. Floodplain cross sections were also permanently staked and measurements taken. These sites can be re-measured at periodic intervals in the future.

Visuals within the project area were monitored on a regular basis. The project area where material was removed and where deposited does look natural.

Spawning ground surveys are completed in this area and are reported by ODFW annually.

Discussion

The dredge tailings project during 2001 and 2002 was executed as planned. The use of existing technology developed over several years has been successful in restoring the floodplain to a functional condition. We can expect high water to flow outside of the channel onto the floodplain decreasing water velocities allowing deposition of fines, gravel, and wood on the riparian area and in the channel. Natural soil and vegetative recovery will probably take several years, however the base conditions are now in place.

Tailings removed from the created floodplain were disposed of in a manor that is consistent with current visual and fish management objects for this area. One waste area was constructed with furrows to mimic a tailing pile from dredge mining. Tailings were used as fill and contoured into the hillside to meet visual objectives of near natural landscape. The project area is in the earliest stages of recovery and appears like other areas that have since recovered substantially.

Future floodplain restoration sites are found in the vicinity of the project area. Work continues on Granite Creek primarily on private land. An additional three miles of floodplain restoration could be accomplished on Granite Creek from the confluence with Clear Creek upstream to the town of Granite, Oregon. There is also more work to be done on Clear Creek. Upstream from the project area an estimated 200,000 cubic yards of dredge tailing is deposited on the floodplain of Clear Creek from River Mile 2.5 to 3.5.

Appendix 1
BPA Quarterly Billing Summary

BPA QUARTERLY BILLING SUMMARY FORM

Project Title: 1996-53-0 North Fork John Day Dredge Tailings Restoration

Project Number: 0002494 Contract #: 00004994 Estimated Total Budget: $94,705.48

COTR: John Sanchez, 541-278-3819 Contract Billing Contact: Roxi Lovell, 541-278-3807

Contractor: Umatilla National Forest Agreement Period: 5/30/97 - 11/30/02

Object Class	Bill # BD 06141010058 5/1--7/30/01	Accum.	Bill # BP P0127300283 8/1--9/30/01	Accum.	Bill # BP P0133400233 10/1--11/30/01	Accum.	Bill # BP P0212100271 12/1/01--4/30/02	Accum.
1. Salaries/Benefits								
-Direct Pay	1,412.50	1,412.50	578.70	1,991.20	7,476.89	9,468.09	304.31	9,772.40
-Insurance/Tax	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-Training	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Labor Overhead %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Travel/Per Diem	0.00	0.00	0.00	0.00	603.00	603.00	0.00	603.00
4. Expendable Equip.	0.00	0.00	0.00	0.00	6,687.56	6,687.56	92.37	6,779.93
5. Non-Exp. Equip.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6. Rent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7. General Services	3,865.46	3,865.46	819.90	4,685.36	8,654.70	13,340.06	0.00	13,340.06
8. Indirect Overhead %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9. G&A Overhead 10.7%	564.74	564.74	149.65	714.39	2,506.17	3,220.56	42.44	3,263.00
10. Profit %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11. Subcontracts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12. NEPA Cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Cost	5,842.70	5,842.70	1,548.25	7,390.95	25,928.32	33,319.27	439.12	33,758.39
Declining Balance		88,862.78		87,314.53		61,386.21		60,947.09

BPA QUARTERLY BILLING SUMMARY FORM

Project Title: 1996-53-0 North Fork John Day Dredge Tailings Restoration

Project Number: 0002494 Contract #: 00004994 Estimated Total Budget: $94,705.48

COTR: John Sanchez, 541-278-3819 Contract Billing Contact: Roxi Lovell, 541-278-3807

Contractor: Umatilla National Forest Agreement Period: 5/30/97 - 11/30/02

Object Class	Balance from Page 1	Accum.	Bill # BP P0215200295 5/1--5/31/02	Accum.	Bill # BP P0218200474 6/1--6/30/02	Accum.	Bill # BP P0221300421 7/1--7/31/02	Accum.
1. Salaries/Benefits								
-Direct Pay	9,772.40	9,772.40	0.00	9,772.40	0.00	9,772.40	3,884.73	13,657.13
-Insurance/Tax	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-Training	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Labor Overhead %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Travel/Per Diem	603.00	603.00	1,012.71	1,615.71	0.00	1,615.71	464.00	2,079.71
4. Expendable Equip.	6,779.93	6,779.93	0.00	6,779.93	56.49	6,836.42	0.00	6,836.42
5. Non-Exp. Equip.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6. Rent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7. General Services	13,340.06	13,340.06	0.00	13,340.06	0.00	13,340.06	5,265.00	18,605.06
8. Indirect Overhead %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9. G&A Overhead 10.7%	3,263.00	3,263.00	108.36	3,371.36	6.05	3,377.41	1,028.67	4,406.08
10. Profit %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11. Subcontracts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12. NEPA Cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Cost	33,758.39	33,758.39	1,121.07	34,879.46	62.54	34,942.00	10,642.40	45,584.40
Declining Balance		60,947.09		59,826.02		59,763.48		49,121.08

BPA QUARTERLY BILLING SUMMARY FORM

Project Title: 1996-53-0 North Fork John Day Dredge Tailings Restoration

Project Number: 0002494 Contract #: 00004994 Estimated Total Budget: $94,705.48

COTR: John Sanchez, 541-278-3819 Contract Billing Contact: Roxi Lovell, 541-278-3807

Contractor: Umatilla National Forest Agreement Period: 5/30/97 - 11/30/02

Object Class	Balance from Page 2	Bill # BP P0224400472 8/1--8/31/02	Accum.		Accum.		Accum.
1. Salaries/Benefits							
-Direct Pay	13,657.13	1,606.94	15,264.07	0.00	0.00	0.00	0.00
-Insurance/Tax	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-Training	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Labor Overhead %	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Travel/Per Diem	2,079.71	954.86	3,034.57	0.00	0.00	0.00	0.00
4. Expendable Equip.	6,836.42	0.00	6,836.42	0.00	0.00	0.00	0.00
5. Non-Exp. Equip.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6. Rent	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7. General Services	18,605.06	5,645.00	24,250.06	0.00	0.00	0.00	0.00
8. Indirect Overhead %	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9. G&A Overhead 10.7%	4,406.08	878.12	5,284.20	0.00	0.00	0.00	0.00
10. Profit %	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11. Subcontracts	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12. NEPA Cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Cost	45,584.40	9,084.92	54,669.32	0.00	0.00	0.00	0.00
Declining Balance	49,121.08		40,036.16				

Appendix II
Project Photos

	
Photo Point 1 Before Floodplain Restoration	Photo Point 1 After Floodplain Restoration

	
Photo Point 2 Before Floodplain Restoration	Photo Point 2 After Floodplain Restoration

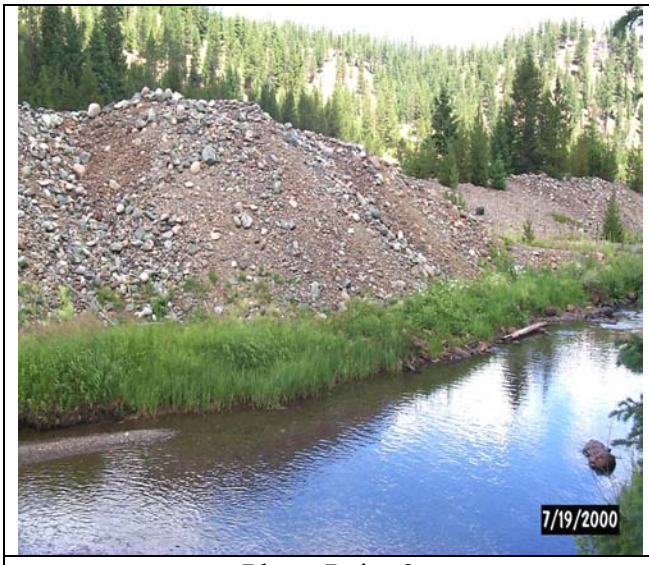	
Photo Point 3 Before Rock Haul	Photo Point 3 After Rock Haul 10/24/2000

	
Photo Point 4 Before Floodplain Restoration	Photo Point 4 Before Floodplain Restoration

	
Photo Point 5 Before Floodplain Restoration 10/2001	Photo Point 5 Before Floodplain Restoration

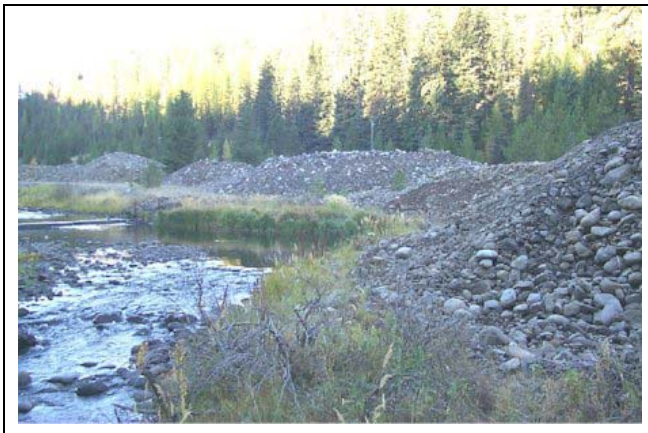	
Photo Point 6 Before Floodplain Restoration 9/2001	Photo Point 6 Before Floodplain Restoration

	
Photo Point 7 Site Prep for the waste site	Photo Point 7 Waste site hillside restoration completed

	
Thinleaf Alder *Alnus incana* 5/21/2001	Planting Crew on Clear Creek 5/21/2001

Spawning Mid-Columbia Chinook salmon