PROJECT COMPLETION REPORT

CLOVER CREEK RIPARIAN RESTORATION

OWEB Project # 99-304

Figure 1
View of Clover Creek from the headwaters of the watershed

Prepared by

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Umpqua Basin Watershed Council

December 11, 2001

Clover Creek Riparian Restoration

BACKGROUND

Landowner(s):

George and Cathy Sandberg
2773 Sunshine Road
Roseburg, OR 97470
541-673-3604

Larry and Terry Johnston
3890 Sunshine Road
Roseburg, OR 97470
541-673-6414

Andrew and Shirley Kahn
5120 Sunshine Road
Roseburg, OR 97470
541-672-0355

W.T. and Joyce Dawson, Trustees
Dawson Living Trust
2418 W Crestview Ave.
Roseburg, OR 97470
541-672-4047

Rhyun and Kim Rinnert
3576 Sunshine Road
Roseburg, OR 97470
541-672-3902

Project Location:

T26S, R5W WM, Sections 26 & 35; and T27S, R5W WM, Section 3

Scoping:

The watershed surrounding Clover Creek, a tributary to the lower North Umpqua River, was converted from forest land to grazing land during the 1960's and 1970's; snagging and clearing in the actual stream channel occurred at the same time. Some stream side vegetation has come back in the form of trees and shrubs, but much was grazed down by past grazing practices. The result is a severely down cut stream bed 6 to 25 feet deep with steep banks. Livestock crossing the stream and saturated soils resulted in mud crossings and large chunks of soil dropping into the stream. During heavy rainfall, intermittent side draws contributed to this bank slumping as well resulting in deep gullies forming at right angles to the stream. Both events reduced water quality and contributed to poor quality fish habitat.

The Clover Creek watershed is approximately 5,400 acres and is owned almost exclusively by a small handful of individuals. Those include the individuals listed in the previous section as well as Robert and Annette Spainhower, Nina M. Dunn, Rodney Lower, and Ben Dawson, Jr. Ben Dawson and Nina Dunn chose not to participate in this project. The Spainhower's let their property go back to the Johnston's and Rod Lower sold his property to the Sandberg's. All landowners have been interested in improving the Clover Creek riparian area since the Douglas Soil and Water Conservation District proposed a project in 1987 that would reduce erosion and rebuild the stream bed as well as re-establish stream side vegetation.

Bob Kinyon, Umpqua Basin Watershed Council coordinator, met with a variety of landowners in late 1998 regarding the project proposal. Because of the complexity of the proposed project, it became clear that a local landowner was needed to coordinate development and implementation. George Sandberg came forward to fill that role. George was very committed to restoring Clover Creek, both on his property near the upper end of the stream, and the rest of the length to the river. He and his wife Cathy have been instrumental in keeping this project moving along with full landowner cooperation. They have always been available to meet with the many individuals and groups that have visited the

project during it's life even though their livestock business keeps them busy from dawn to dark and after.

The original project proposal was to fence 42,455 feet of the stream bank to exclude cows, sheep, and horses from Clover Creek, install 3 culverts and 8 hardened crossings to facilitate access to fenced pastures, establish 10 stock water sites where appropriate, and plant 10 acres of the riparian zone with hardwoods and willow.

The project was proposed to be funded by State R & E funds, OWEB, US Fish and Wildlife Service, Umpqua Fishery Enhancement Derby, EPA, and Joe Merchep Umpqua River Foundation.

FISHERY

ODFW conducted an aquatic habitat survey in 1994.

Clover Creek feeds directly into the North Umpqua River and landowners have often seen coho salmon and winter steelhead during high flows in the fall. In recent years these sightings have been in the lower 2 miles of the stream, but Larry Johnston observed them above that area 30 to 40 years ago. Sam Dunnavant, ODFW Fish Biologist, considers this stream important both as fish habitat and for water quality.

FISCAL

Agency/Organization:

Oregon Watershed Enhancement Board
775 Summer St. NE
Suite 360
Salem, OR 97301-1290

Program:

Watershed Management Grant
Contact: Mark Grenbemer, Region 2 Rep.
Phone: 541-471-2886 Fax: 541-471-2876

Grant Number: 99-304

Amount Obligated: $ 95,931

Dates:

Award:	December 3, 1999
Completion:	June 30, 2001
Amendment 1:	December 31, 2001

Budget:

OWEB funds:

	Budget	Actual
• UBWC Coordinator travel	$ 40	$ 40.00
• UBWC Technician travel	170	2,509.62
• UBWC Technician	10,000	15,743.02
• Fence Construction	25,761	38,112.95
• Stock Water Installation	15,000	4,224.48
• Bridge Installation	2,400	2,025.00
• Culvert Installation	4,500	21,444.83
• Hardened Rock Crossings	10,000	9,921.02

• Tree and Shrub Planting	1,000	1,896.58
• Power Drops	9,000	0
	Budget	Actual
• Electric Pumps	2,500	0
• Nose-pumps	800	0
• Fiscal Management	6,538	0
• Monitoring	2,222	0
• Signage	1,000	13.50
• Site Preparation	5,000	0
Total	$95,931	$95,931.00

Landowner Contribution (In-Kind):

• Labor – Sandberg (254 hours x $20/hour)		$ 5,080
• Labor – Other landowners (181 hours x $15/hour)		2,715
• Equipment use – Sandberg (tractor, 4-wheeler)		743
• Pick up materials – Sandberg (pickup, trailer)		360
Total Landowner Contribution	$ 7,951	$ 8,898

Other Contributions (In-Kind):

• Monitoring – ODFW	$ 996	$ 996
• Water quality/quantity monitoring – DEQ	500	500
Total Other Contribution	$ 1,496	$ 1,496

Cash Contributions:

• DEQ 137-00	10,000	10,000
• FWS 13420-0-J108	30,845	30,845
• Joe Merchep Umpqua River Foundation	150	150
Total Cash Contribution	$ 40,995	$ 40,995

Total project cost	**$146,373**	**$147,320**

PROJECT DESCRIPTION

The Umpqua Basin Watershed Council made a commitment to accomplish all the work on this project with individuals based in the Clover Creek watershed. Three individuals were general contractors or had access to heavy equipment and we negotiated contracts with them to accomplish all work that wasn't performed by the individual landowner. We either issued purchase orders or entered into Watershed Improvement Project contracts with George G. Sandberg Contracting to perform much of the fence construction, tree planting, and some of the stock water installation; Rod Lower Trucking to install portions of the stock water sites, construct the hardened livestock crossings and install culverts; and Clover Creek Industries (Cody Sandberg) to do any bulldozer work and install part of the stock water sites. These contracts provided an employment opportunity for three to seven people and provided money to local businesses for rock, lumber, hardware, concrete, culvert delivery, and equipment rental which in turn provided employment to employees of those companies.

Stock Water System and Culvert Installation

Work began in mid-August, 2000 on installation of stock water sites and some of the culverts. At the Sandberg property a 2,500 gallon holding tank was installed to catch overflow from a neighbor's spring to serve 2 stock tanks. A small spring was developed to supply 1 more tank. While at Sandberg's three small culverts (provided by the landowner) were installed in small intermittent side draws for livestock and equipment crossings. Rip rap rock and old Christmas trees were placed in 4 wash backs feeding into Clover Creek in an effort to slow down or stop erosion sediment flowing into the stream. If this method works as projected by Walt Barton, Douglas Soil and Water Conservation District Engineering Technician, further work will be done on other wash backs along the main Clover Creek.

Moving to the Johnston property next, 4 culverts were installed in small intermittent side draws for livestock and equipment crossings. One side draw crossing has been an annual wet season mud hole because livestock have to cross a wet area to get from pasture land to their winter feeding area. Since it is also a dry weather equipment crossing, the surface was graded and shale was placed on it to create a "road" that cattle follow. Sediment from this area will be reduced tremendously. Two springs were developed to serve 5 stock tanks.

Once finished at the Johnston property, work started on the Kahn property. One spring was developed to serve the south end of this large property and 2 stock tanks were installed. Another spring site was explored but did not yield enough water for even one stock tank. Two stock tanks were installed using overflow from the main house spring and the caretaker's house spring, Two more stock tanks were installed at each end of the irrigation mainlines. These tanks will be seasonal during the irrigation season. Two more stock tanks were provided by the landowner at the barn and the main house using domestic water faucets. This was the last work on stock water in 2000.

In September, 2001 the stock water was installed on the Rinnert property. Rhyun and Kim Rinnert are new property owners, having bought a 160 acre portion from Johnston's. The location of the property made it necessary to develop more stock water sites. A spring that had been partially developed in the past was finished and supplies 5 stock tanks – 1 on the Johnston property, 4 on the Rinnert property.

The Spainhower (Johnston) property is in the process of selling again and the stock tank planned for that property was installed as well, connecting it to domestic water.

In summary: 5 springs developed; 20 stock water tanks installed; 7 small culverts installed.

Standard stock tank installation on this project included 1 inch poly pipe main supply lines buried 18-24 inches deep; valves in the main supply line below each tank lateral line so the remainder of the system can be shut off if desired; faucets and washing machine hoses from lateral lines to tanks to facilitate maintenance and cleaning of the tanks; filter cloth beneath the rock tank pad; 16-20 foot diameter shale rocked pad around the tank to prevent or reduce muddying the area by livestock while drinking; tank installed and rock pushed around it to prevent livestock from moving the tank; and floats on the bottom of the tank with a chain and ball float. The chains for the float are the weak point and usually need to be replaced with a stainless steel chain.

Riparian Fence Construction

Prior to starting fence construction, Dan Perritt and Rob Burns from U.S. Fish and Wildlife Service met with UBWC, interested landowners, ODFW, and Douglas SWCD to determine appropriate fence heights along Clover Creek, a Columbia whitetail deer habitat area. It was determined that 42 inches high (9-39-12 woven wire plus a single strand of barbed wire above) was the appropriate height to allow wildlife passage. In late April, 2001 this was modified to include another top strand of barbed wire to assure livestock won't break down the fence.

George Sandberg and the UBWC Field Technician laid out the Spainhower and Sandberg fence locations in early August. Fence location on these properties and those of all other landowners generally averaged setbacks of two times the bank height plus 10 feet. Because the creek banks have lots of curves and bends distances varied from as little as10 feet from the bank to as much as 150 feet. We also took in to account where the traditional edge of a hay field was (making the riparian area narrower), and often included forested areas, odd corners, and wet areas within the riparian zone (making the riparian area wider). An attempt was made to have at least 200 feet between turns of the fence requiring H braces.

Work began on the Spainhower (Johnston) property in mid-August. Fence was completed on both sides of the stream – a total of 2,483 feet - in early September. A livestock crossing with 2 gates was included in the fence.

Next, the Johnston property fence was laid out and work began on it. The Johnston riparian fence was completed in three segments – 7,426 feet in late September, another 223 shortly after that, and a final 172 feet in early spring 2001, for a total of 7,821 feet. Some riparian fence was already in place around the area of the barns and weaning pasture and gates were in place for an existing culvert crossing and a partially usable railroad flatcar bridge. A new livestock crossing with 2 gates was included in the fence.

In mid-October, 2000, George and the Field Technician laid out the Kahn property riparian fence for the upper end of the property, and then in early December, the lower end of the property. Some of the riparian zone had been fenced in the lower end, but fence condition of much of that portion was poor and not suitable for keeping livestock out of the stream, so would be replaced where needed. There was also a stretch of extremely steep, rocky ground that would have to be fenced with T posts and livestock panels because traditional fencing could not be built. The riparian fence was completed in two segments – 5,441 feet in mid-November 2000, and the remaining 5,046 feet in mid-April 2001, for a total of 10,487 feet. Three livestock or livestock/equipment crossings with a total of 7 gates were included in the fence.

In May 2001 work began on the Sandberg property riparian fence. They chose to install a high tensile smooth wire fence that could be electrified since they graze cattle and sheep on their pastures. Cost of materials for this type fence was less than the more traditional netting and barbed wire fence. This fence was completed in two segments - 2,894 feet in May 2001 and 827 feet in August 2001 for a total of 3,721 feet. One gate was installed for an existing equipment only crossing and 2 gates were installed for a planned livestock and equipment crossing.

The final riparian fence segment – the W.T. Dawson ranch – was a late arrival in the Clover Creek project. W.T. became interested in participating once he saw the outcome on other segments of the stream. In mid-April this property's riparian fence was laid out and work began as soon as ground conditions allowed. Total length of 9,741 feet was completed in August. Gates (4) were included in the fence for two existing livestock/equipment crossings and 2 gates were placed in the fence for a future livestock crossing.

The final touch for the Clover Creek riparian fence was to install livestock panels or regular fence along the sides of each of the 5 newly constructed hardened livestock crossings. Construction was such that the fence could be raised during high water. This segment of the project was completed in mid-October 2001 with a total of 1,500 feet of fence.

In summary: 35,753 feet of riparian fence completed.

Fence materials are being provided to landowners, under agreement, to build fence on an additional 4,145 feet of significant perennial tributaries to Clover Creek. Grand total – 39,898 feet.

Tree and Shrub Planting

Planting of 2,185 tree seedlings was accomplished in the last half of January 2001. Species included Ponderosa Pine, Douglas-fir, Incense Cedar, Big Leaf Maple, Oregon Ash, Oregon White Oak, and Western Red Alder planted in appropriate micro sites. George Sandberg and family planted a number of tree willow in appropriate spots along the stream on the Johnston and Sandberg properties and contributed 100 Ponderosa pine to mix in with UBWC seedlings on their property. Because cost of seedlings, planting, and protection were nearly 3 times the amount planned, the decision was made to plant only on the west side of the stream in predominately open areas starting from Sandberg's and moving downstream toward Kahn's where stream side trees and shrubs were more dense. All conifers had rigid vexar covers placed on them and anchored with bamboo stakes to protect seedlings from deer browse. Sandberg's placed 150 of their covers on additional seedlings and hand sprayed herbicide around each tree on their property. The last survival check in September was still showing an average of 85% survival in spite of the dry summer.

Another grant proposal has been submitted to plant an additional 12,000 seedlings in fenced riparian areas not planted on this project.

Hardened Rock Crossings

Installation of 5 hardened livestock or livestock and equipment crossings began on August 23, 2001. The contractor, Rod Lower Trucking, started at the uppermost livestock crossing, Spainhower (Johnston), and completed that crossing in 1½ days. Excavation took much longer and created much more waste material than we had planned, but laying the road fabric and placing shale on the crossing went quickly. We left the natural creek bottom in this crossing as well as the other 4 crossings, as they already had natural gravel or bed rock stream bottoms.

The next crossing to be completed was on the Johnston property, a livestock crossing. That was completed in one day even though there was quite a bit of excavation.

The last 3 crossings were on the Kahn property. The first to be completed was a livestock/equipment crossing. It has been used for an equipment crossing for 40 years or more, so one side didn't require any work, while the other side had a deep mud hole and required excavation and filling with shale. The approach to this crossing runs through a wet area created by irrigation runoff in summer and rain runoff in winter. The contractor laid road fabric for approximately 150 feet and placed shale on that to create a high and dry approach to the crossing.

The second to be completed was also a livestock/equipment crossing and required minimal excavation and shale fill to make it effective.

The last crossing, called the 3-way crossing because it accessed 3 pastures, required less excavation than originally planned and since much of one side was already shale rock, we left that side alone after excavation to proper slope (3:1). Fence construction left no access from the 3-way crossing to the south end of the hilly third pasture, so the contractor built about 300 feet of low impact tractor/4-wheeler road across the hillside to connect with the original road. Portions of this road were surfaced with shale to improve traction and reduce runoff.

Lessens learned from this part of the Clover Creek project were that hardened crossings should be built before the riparian fence and creating hardened crossings in deeply down cut stream beds creates a lot more excavation and soil disturbance than installing a large culvert and the culvert may be a much better year-round crossing. Cost for the culvert and installation is much more in the short term than a hardened crossing.

Culvert Livestock Crossing Installation

This crossing, the uppermost in this project, was in a heavily down cut area (approximately 22 feet) of Clover Creek on the Sandberg property. We decided on a culvert because of the need to have equipment access to that part of their property and the frequent movement of livestock across the stream necessary in their operation. The total cost - $29,526 – was 3 times the cost of installing 5 hardened rock crossings, but long term impact to the stream should be much less and effective use will be much more - year round vs. the ability to use hard crossings only when stream flows are low.

This crossing was completed in two stages. The first segment, the west approach to the culvert from the riparian fence, was completed at the same time as the Spainhower hard crossing. This approach was approximately 150 feet long and included installing a 4 foot diameter culvert in an intermittent side draw that runs parallel to Clover Creek. A good quality used culvert belonging to Silver Butte Timber Company was donated and delivered to the site at a savings of roughly $650 to this project. The approach was graded and surfaced with shale rock to the west stream bank.

After a short turnaround permit application (see below) for installing the main culvert, a 137" x 87" pipe arch (114" round) 56 feet long, was delivered to the installation site on September 10, 2001. Upon receipt of the permit on September 11, the contractor, Rod Lower Trucking, proceeded with excavation of the site. To keep costs at a minimum he used shale rock as compacted bedding material, then placed the culvert. At the recommendation of Civil Engineer Don Porior the contractor used a concrete slurry around the bottom half of the culvert. The advantage of slurry is that it is a less expensive and faster way to compact around the culvert. The time saved was important since we were very close to the September 15 instream deadline. The slurry was poured on September 13 and 14 and let cure for one day as recommended, then fill was placed over the culvert and compacted. Rip rap was placed on both fill slopes and the fill was surfaced with shale rock on September 16. The next day the landowner moved a 13 foot wide seed drill across the completed crossing to demonstrate it's effectiveness.

The landowner seeded and fertilized all bare soil created in the construction of the 5 hardened crossings and the culvert crossing. Some of the seed and fertilizer was provided by UBWC and some by the landowner.

PERMITS/AGREEMENTS

A Joint Permit Application was submitted to COE/DSL for hardened livestock crossings on the Kahn and Johnston properties April 5 and 12, 2001 respectively. The COE replied May 17, 2001 with Nos. 2001-00315 and 2001-00355 respectively that this activity was exempt from a permit from them. On July 12, 2001 DSL issued a General Authorization for Erosion Control under 23975-GA for the Johnston crossings, and on August 15, 2001 issued a General Authorization for Erosion Control under 23918-GA for the Kahn crossings.

A Joint Permit Application was submitted to COE/DSL for a livestock crossing culvert on the Sandberg property on August 21, 2001. A site plan for the culvert was submitted with that application. COE responded September 4, 2001 that the culvert fell under the General Authorization and required no permit from them. DSL responded on September 11, 2001 with Removal/Fill Permit No. 24604-RF. **UBWC would like to commend DSL staff for being so responsive to our need and moving this permit through the process quickly**.

MONITORING

Post-project effectiveness monitoring will start in the winter of 2001/02 and continue annually for five years. The UBWC field technician will photograph the project from established photo points and will complete an interim report, which will be submitted to OWEB and the project landowner. Changes in stream side vegetation will be noted as well. Accumulated data and photo points will be entered into the UBWC database.

Some restoration techniques were used on this project that were different from normally accepted practices and those will be monitored for effectiveness and may be used in future projects if they prove effective. Specifically – use of rip rap rock and old Christmas trees to reduce or stop wash backs, use of shale rock under stock water tanks and on hardened crossings, use of large culvert crossings for livestock/equipment in deeply down cut streams vs. hardened rock crossings, and use of shale bedding material and concrete slurry under and around large culverts.

SUMMARY COMMENTS

This project involved a number of landowners and a variety of work. Having one of the local landowners, who is respected and liked by the other landowners and has a high level of technical ability, coordinate the day to day project work was very effective. Having local landowners contract the work was also beneficial, because doing work on neighbor's property was an incentive to do an extra good job!

There was a lot of restoration work accomplished on this project, and there is still a lot that can be done. This project can well be a model for treating a whole watershed in which willing private landowners are active participants in accomplishing the restoration work.

Figure 2
Completed stock water tank on Sandberg's – Oct. 2000.

Figure 3
George and Cody Sandberg along with Nick Paradise doing some last minute repacking of mud on Kahn spring that serves the south end of the property. September 2000.

Figure 4
Sandbergs and Serge driving posts for Johnston fence near Kahn property line. Cathy is operating the post pounder, George is holding the post, Serge is watching, and Missy is supervising.

Figure 5
Corner of Sandberg high tensile riparian fence next to Clover Creek. Photo Point. March 2001.

Figure 6
Completed Kahn "3-way crossing". September 2001.

Figure 6
Completed culvert installation with riprap visible at the inlet end of the pipe.