2001 Restoration Project Effectiveness Monitoring Report

South Coast and Lower Rogue Watershed Councils plan to submit a Project Effectiveness Monitoring Report as a series of chapters for each Project Type listed below. Representative samples are monitored for each project type, and the reports should apply to all grants from different agencies that funded a particular project type. The attached chapter is the second in the series.

Fish Passage Improvements

- GWEB SC-42 Indian Creek Watershed Restoration
- GWEB SC-51 Bagley Creek
- WEB SC-74 Deadline Creek Fish Passage
- OEDD/USFWS South Fork Hubbard Creek Bridge Replacement Project
- USFWS 196-670 Hubbard Creek Fish Passage (Fir Road)
- EDD Squaw Creek Fish Passage and Wetland Enhancement
- OEDDUSFWS Schoolhouse Creek Fish Passage
- OEDD/USFWS Boulder Creek Fish Ladder
- GWEB 97-096 South Coast Fish Passage
- GWEB 97-242 Riparian Demo Project II (Little Bio) - Jenny Creek

Upland - Road Treatments

- GWEB SC-72 Lobster Creek Road Stormproofing
- DEQ 005-97 Lobster Creek and Quosatana Creek Storm Proofing
- GWEB 97-097 Lower Rogue Enhancement Project (Roads &Boats)
- DEQ 009-99 Lobster Creek Stormproofing
- GWEB 99-067 L. Rogue Sediment Reduction

Large Wood Placement

- GWEB 97-148 Stream Partnership

Riparian Improvements

- GWEB SC-37 Bio-engineered WS-Restoration (Euchre Creek)
- GWEB 96-039 Riparian Restoration Demonstration (Floras Ck., Elk R., Winchuck R)
- GWEB SC-42 Indian Creek Watershed Restoration
- GWEB SC-45 Floras Creek Watershed Enhancement
- DEQ 112-96 Off-Stream Watering - Wahl, Elk River
- OEDD/USFWS Edson Creek Riparian Enhancement (L. Rogue)
- OEDD/USFWS Riparian Restoration/Enhancement (Wild Bunch)
- GWEB 97-148 Stream Partnership
- GWEB 97-095 South Coast Riparian Restoration Project

Bio-Engineering

- GWEB 94-002 Elk River Bio-Engineered Erosion Control (Wagner)
- GWEB 96-039 Riparian Restoration Demonstration (Winchuck R)
- GWEB SC-37 Bio-engineered WS-Restoration (Euchre Creek)
- GWEB SC-45 Floras Creek Watershed Enhancement
- DEQ 100-95 Euchre Creek Bioengineering WS Restoration
- DEQ 15-96 Bio-Engineering WS Restoration - Euchre Creek
- OEDD/USFWS Riparian Rest & Bioengineering of Coho Streams (Bio North)
- GWEB 97-148 Stream Partnership

GWEB 97-242 Riparian Demo Project II (Little Bio)

Special Projects

Water Quality/Wetlands

GWEB SC-53 Wetlands Enhancement Pilot
GWEB SC-88 Lower Rogue Interpretive Tour
GWEB SC-65 Pilot Educational Restoration
USFWS 196-658 Indian Creek Wetlands

Estuary Improvements

OEDD/USFWS Estuary Fish Enhancement (Euchre, Pistol, Winchuck)

2000-2001 Project Effectiveness Monitoring Report
Road Stormproofing Projects

South Coast and Lower Rogue Watershed Councils
July, 2001

Summary

Road stormproofing project sites continue to function as designed, ready to withstand large, infrequent storm events without failure or erosion of sediment into streams. All of the projects we monitored are in place and functioning with little change since the previous monitoring report. In the first few years, stream channels adjusted by armoring and downcutting through perched fill deposits. Downcutting and upstream migration of a headcut is the result of upgrading to a larger culvert size that must be installed at a lower inlet base level. Vegetation has now firmly rooted on the disturbed soils and the downcutting taking place in some of the channels has slowed.

Introduction

Road stormproofing or sediment abatement projects have been focused within the Lobster Creek Watershed as a result of recommendations received from members of the Lobster Creek Partnership. Sediment sources from roads immediately upslope and upstream of critical spawning and rearing areas were identified as a substantial risk to anadromous fish in the watershed. Road projects beginning in 1995 were funded by three OWEB and two DEQ 319 grants. Additional road projects have been funded solely by the primary private industrial timberland owner within the watershed, currently Lincoln Timber, managed by the Campbell Group (formerly Hancock Resource Group managed by Olympic Resource Management). This
report summarizes monitoring that followed the winter of 1999-2000, including projects that were completed as of summer 1999. In the winter of 2000-2001, precipitation levels were below normal, and storms lacked the intensity that would be expected to alter the road project sites. Representative sites completed during the summer of 2000 and 2001 will be observed following winter 2001-2002.

The numbers of sites completed as of the winter 1999-2000 are tabulated by type of road treatment below.

Road Treatment Type	Total: DEQ & OWEB-Funded	Total Monitored	OWEB-Funded	OWEB Monitored
Road/Stream Crossing Culvert Upgrade	45	17	27	12
Additional Cross-Drains	11	10	2	1
Road Fill Pullback	2	0	2	0
Crossing Excavation	11	3	11	3

Methods

Representative project sites that had post-installation photos available were selected for monitoring. The effectiveness of these projects is assessed by comparing repeated photo points and narrative documentation of observations of at the site. The Grant Agreement provides a

Field Checklist monitoring format to document observations and actions (Schedule D: Monitoring). Following the winter of 1998-99, early spring field observations were documented on April 6, 1999 by Cindy Ricks Myers. Photos were retaken at many of the original photo points, and additional photo points were established to document future changes. Two additional sites were documented during our spring 1998 Landowner Road Inventory. Following the winter of 1999-2000 (actually during the winter of 2000-2001), Matt Swanson visited the original group of sites and added four new sites. Photographs of new sites are included along with photos that illustrate changes on the older sites.

Results

Road treatments were expected to reduce the potential for mass failure or large scale erosion during large storm events. To date, no mass failure or large scale erosion has been observed at any of the monitored sites. For the sites that were monitored since the previous observations in the spring of 1999, no changes were expected due to a lack of significant runoff events.

At two sites, streams had downcut into a "perched" fill deposit following installation of the inlet at a lower base level (to accomodate an increased culvert size). Both of these streams appear to have reached an equilibrium slope, but their downcutting created low terraces of unconsolidated bedload that will likely move during the next large event (at Big Draw Road MP 2.25 and Bark Coffee MP 0.02).

Oversteepened fills can also be undercut when culverts are oriented at an angle to the preexisting channel or when the culvert is too short. Sediment losses from undercutting and failure of oversteepened fill have been minor to date, but new photo points were established to help estimate the extent of any future loss.

In the first few years, excavated stream channels adjusted by widening and downcutting, with more erosion where the original channel width, profile, or sideslopes were not reestablished. Very little new erosion was observed from this process.

Most of the sites now have extensive grass cover on the disturbed soils, and the older sites are beginning to be dominated by alder and salmonberry. On a few sites, rills were beginning to develop on the outlet side fill slope due to road runoff over the fill, but none were significant.

Seepage into the road fill below or around the newly installed culverts was observed at two sites. Intercepting this water could require expensive drainage trenches and/or fabrics, and it is unknown whether the subsurface water will lead to mass failure of the road fill. Fill stability will be examined at these sites during future monitoring trips.

Sites with new larger culverts installed:

Big Draw Road MP 2.25. No significant changes have occurred at the site since the Final Report. Alders are growing on the outlet fillslope. Lowering of the inlet base level (culvert increased from 24" to 42") had caused a headcut above the inlet, but it is now stabilizing. At the outlet, downcutting below a 5-6’ drop continues to be controlled by an old pipe creating a step in the stream bed. A spring from the cutbank seeps into the ditch and out below the culvert with a rusty stain - watch for future effects on the road fill. [Note: site at MP 2.25 was reversed with site MP 2.15 in the Final Report for SC-72: Table of Final work sites and in the photo caption].

Big Draw Road MP 2.55. Both fill slopes are still well-vegetated and the undercutting below the 3-4 ft outlet drop has not increased. Sediment up to cobble-sized is still depositing in the culvert and the invert is showing signs of surface rust . On the outlet slope a few small rills are developing from road runoff diverting over the fill edge (see photos).

Big Draw Road MP2.25

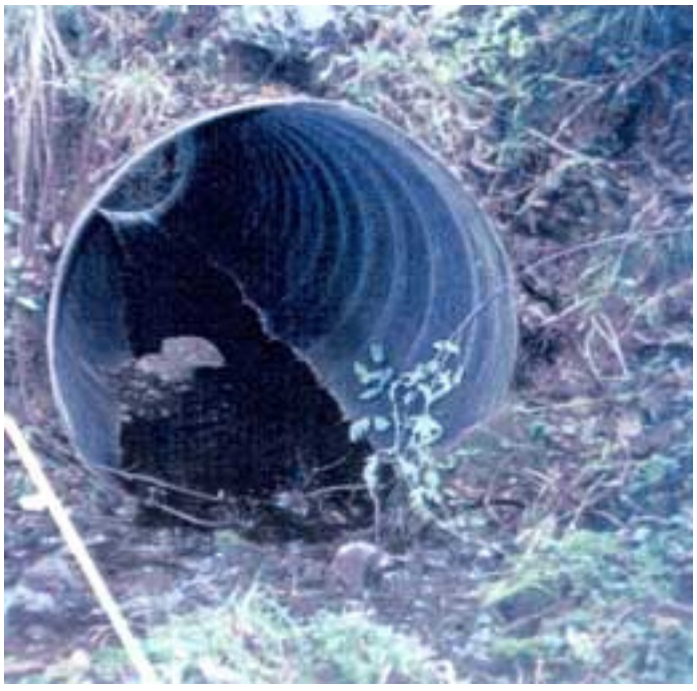
Deposit upstream of inlet with headcut, view from side, 04/06/99

Old pipe creating step in channel, preventing downcutting 01/10/01 Headcut stabilized, view upstream, 01/10/01.

Big Draw Road MP2.55

Outlet showing small undercut erosion site, side view, 04/06/99

Outlet view from downstream, small rills on fill, 01/10/01



Inlet with rusting invert and substrate deposit, 01/10/01

Deadline Road MP 0.25. Both the inlet and the outlet fillslopes are becoming densely vegetated by small alder, salmonberry, and black raspberry (see photos). The hillslope to the left of the outlet (looking downstream) is comprised mostly of fill from an old landing, and is beginning to fail. The stream appears to be undercutting the toe of the slope, and thus causing the failure. The orientation of the culvert may have contributed to the erosion.

Deadline Road MP 0.40 - upgraded from 18" to 36". No significant changes have occurred at the site since the installation. Both fill slopes are covered with creeping blackberry and the outlet slope is supporting alder saplings. The rusting of the culvert invert identified during the previous visit has intensified. It is unknown whether the accelerated rusting is the product of water chemistry, inferior metal, or some other factor. The inlet of the culvert is set slightly above the streambed, which is causing some water to pond before entering the pipe, and depositing fine sediments in a wide channel upstream. Downcutting below the outlet may have occurred prior to installation.

Bark Shanty Road MP 0.50: The plastic cross-drain improves the drainage along an unstable seeping cutbank with ponding and water-loving vegetation in the ditch. In 1998 the fill was saturated from seepage under the new pipe and a small fill failure was evident. During the November, 2000 visit some ponding was still evident, but the fill was not saturated (top photo). The new pipe is intended to reduce the rate of failure of the fill or prevent enlargement. Saturation likely prevented adequate compaction of the fill during culvert installation, and contributed to the small fill failure. Recent signs of additional cracking along the edge of the fill were evident during the November 2000 visit (bottom photo).

Big Draw Road MP 0.65, 1.45, and 1.78
Each of these pipes was installed at small stream channels that were flowing in April, 1999. The 36" pipe at MP 0.65 intercepts flow from a multiple channels off of a cutbank. The 36" pipe at MP 1.45 drains a small channel flowing on bedrock. At MP 1.78, a 24" pipe drains the channel and ditch (see photo). See also Big Draw Road cross-drains below.

Upper Fall Creek MP 3.097
This pipe was installed to pass flow from a fork of the South Fork of the South Fork of Fall Creek. This pipe also serves as an overflow in case the pipe at the South Fork of the South Fork of Fall Creek plugs. The overflow channel was not used as of the winter of 1998-99, and has good grass cover for erosion control. The outside edge of the fill is cracking where it was not adequately compacted (see photos).

Upper Fall Creek MP 3.203 North Fork of South Fork of Fall Creek.
The inlet is well armored with rock, and the ditch runoff that flows into the inlet basin will not erode at the armored section (see photos). In 1999, the fill had settled and contained some cracks and moisture.
Bark Coffee MP 0.015 - 48" culvert replaced by 84" culvert in 1999.
This culvert was identified as a fish barrier during a 1998 road survey, but upon review of the available habitat above and considering a natural barrier downstream, fish passage was not an objective for this site. The increase in culvert size and the lowering of the base level created a headcut that migrated approximately 200’ upstream (middle photo). At the time of this visit the stream appeared to be at a stable gradient. Both fillslopes are growing grass with the exception of a small section to the right of the inlet where the ground is saturated due to ditch flow (top photo). The outlet jump height was reduced by approximately 1 foot (bottom photo).

Deadline Road MP0.25

Inlet view showing vegetation, 04/06/99

Inlet view note alders in foreground, 01/10/01

Outlet side view overgrown by vegetation, 01/10/01

Bark Shanty Road MP0.50

Inlet view, note ponding, 11/20/00

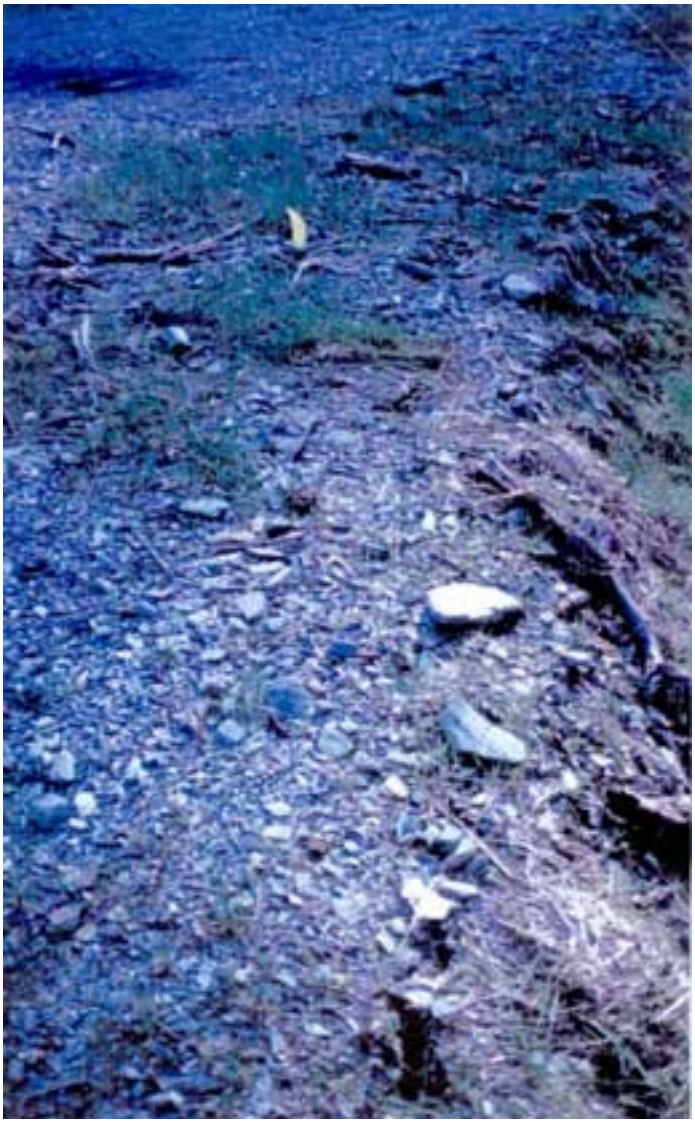
Outlet view, note cracking along edge of fill, 11/20/00

Upper Fall Creek MP3.097

From left bank at inlet, showing old overflow channel, now covered with grass, 04/06/99

From right bank at outlet, 04/06/99

From left bank at outlet, new pipe in foreground, 04/06/99



Outside edge of outlet fill, note crack from settlement, 04/06/99

Upper Fall Creek MP3.203

View of Fall Creek looking upstream, 04/06/99

View of armored inlet, ditch runoff into inlet basin, 04/06/99

Outlet, view from downstream, right bank on flat rock in channel, 04/06/99

Bark Coffee Road MP0.015

Inlet showing deposition at left after headcut migration, 01/10/01

Inlet showing headcut, 01/10/01

Outlet with drop height reduced, 01/10/01

Coffee Butte spur 2 MP 1.711
The installation appears to be stable and revegetated (see photos).

Coffee Butte spur 2, MP 1.834
The installation appears to be stable and revegetated (see photos).

Lobster Creek Road, MP 4.81 - Culvert replaced by 24" plastic pipe in 1999.
As of January 2001 both the inlet and outlet slopes were revegetated with grass and there were no signs of surface erosion. There is evidence of a fillslope slide at the outlet but it appears to have happened during installation. The outlet is extended with approximately 15' of downspout that is anchored in place with metal posts (see photos).

Lobster Creek Road, MP 4.87 - 30" culvert replaced by 48" culvert in 1999.
The remains of the 48" pipe from Bark Coffee MP .015 site were salvaged and brought to this site to be used as a downspout. At the time of this visit the downspout was functioning well. Both fillslopes were vegetated with grass (see photos).

Lobster Creek Road, MP 8.10 - Failing 36" culvert replaced by 48" culvert in 1999.
As of January 2001, no problems were visible. Both slopes were well vegetated with grass, and the outlet posed no threat of undercutting (see photos).

Sites with overflow pipes installed:

Big Draw MP 2.15: No sign of change was observed at this site, and the overflow pipe is still unused. The downspout will reduce the formation of gullies on the fill slope when the overflow pipe is in use. Both slopes are well vegetated. This was a good location for installing an overflow pipe rather than a larger culvert at a lower base level that could cause downcutting and headcut migration through the broad depositional area behind the crossing.

Coffee Butte Road MP 0.80: No changes were observed at this site, and the overflow pipe is still unused as of January, 2001. The original culvert has been mitered at the inlet to increase its flow capacity, and drains a sizable volume of fill. For these reasons, the overflow pipe was an appropriate treatment. Close examination of the overflow showed that two bolts fastening the downspout to the pipe on will not last much longer. We recommend that metal stakes be used to help anchor the downspout pipe.

Sites with other drainage improvements, such as cross-drains:

Big Draw Road, MP 0.30 to MP 1.55 - nine cross-drains installed:
These installations successfully controlled erosion that had been present on this road. Crossdrains were well-located in response to water sources, rather than at a prescribed regular spacing. At some sites the plastic pipes drain seeping and flowing cutbanks and active slides in the road bed.

Sites with crossings excavated to restore stream channels:

Upper Fall Creek - Top Spur MP 0.50: It appears that no additional downcutting occurred in the stream bed between April, 1999 and January, 2001. The sideslopes are beginning to revegetate, though the oversteepened slope on the left recently failed and appears to still be unstable. It appears that >90% of the original fill remains in a stable location on site (see photos).

Coffe Butte Spur 2 MP1.711

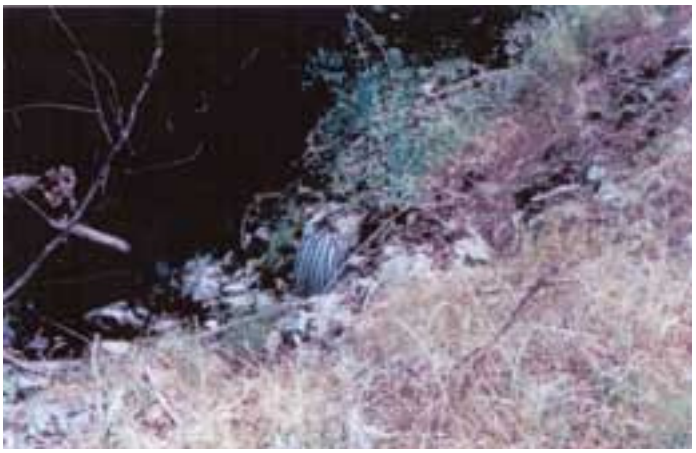
View of new culvert inlet, 07/26/99

View of new culvert outlet, 07/26/99

Pipe that was replaced

Coffee Butte Spur 2 MP1.834

48" pipe, inlet on rock, 07/26/99



Outlet on rock, 07/26/99

Lobster Creek Road MP4.81 (Mainline, cost share road)

Inlet after installation, 09/17/99

Inlet, 01/10/01

Outlet, 01/10/01

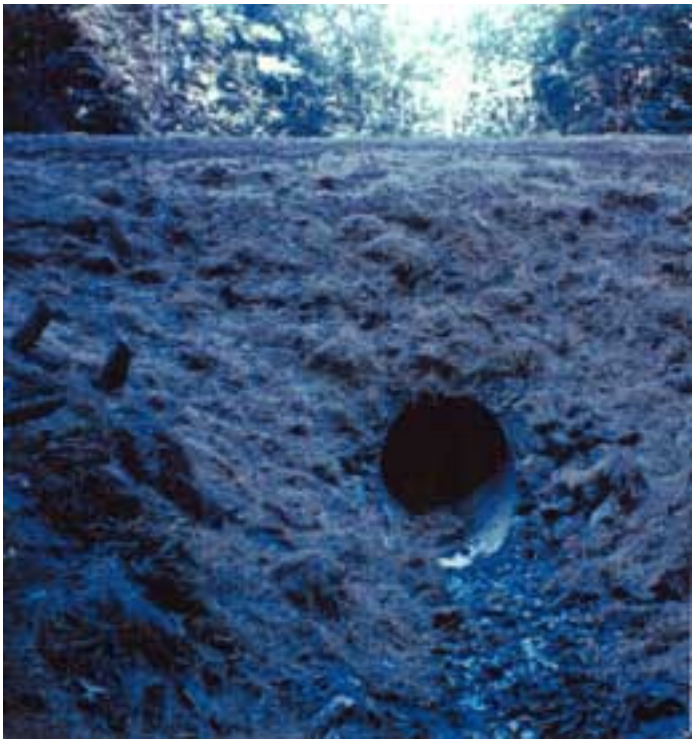
Lobster Creek Road MP4.87 (Mainline, cost share road)

Inlet, 09/17/99

Inlet, 01/10/01

Outlet with downspout, 01/10/01

Lobster Creek Road MP8.10 (Mainline, cost share road)



Inlet, 10/01/99

Inlet, 01/10/01

Outlet, note stable bank, 01/10/01

Upper Fall Creek "spur 3" (as labelled in 1998 Landowner Road Inventory)
MP 0.111 Excavated in 1998. The sideslopes are still driveable, so vehicles are tearing down the banks. As of April, 1999, needed a barricade to allow revegetation.
MP 0.180 Excavated in 1998. Sideslopes have 35% gradient, and stable surface. Photos show downcutting through the stream bed of about 18" vertical.

Adaptive Management

Installation of culverts that are too short for the road fill can result in oversteepened fills that erode and/or fail over time. We have modified our road inventory form to measure lengths of culverts that are 36" diameter and larger (rather than using geometry to estimate lengths). The inventory also notes the presence and length of any perched fill deposits that may need to be excavated at the time of culvert installation.

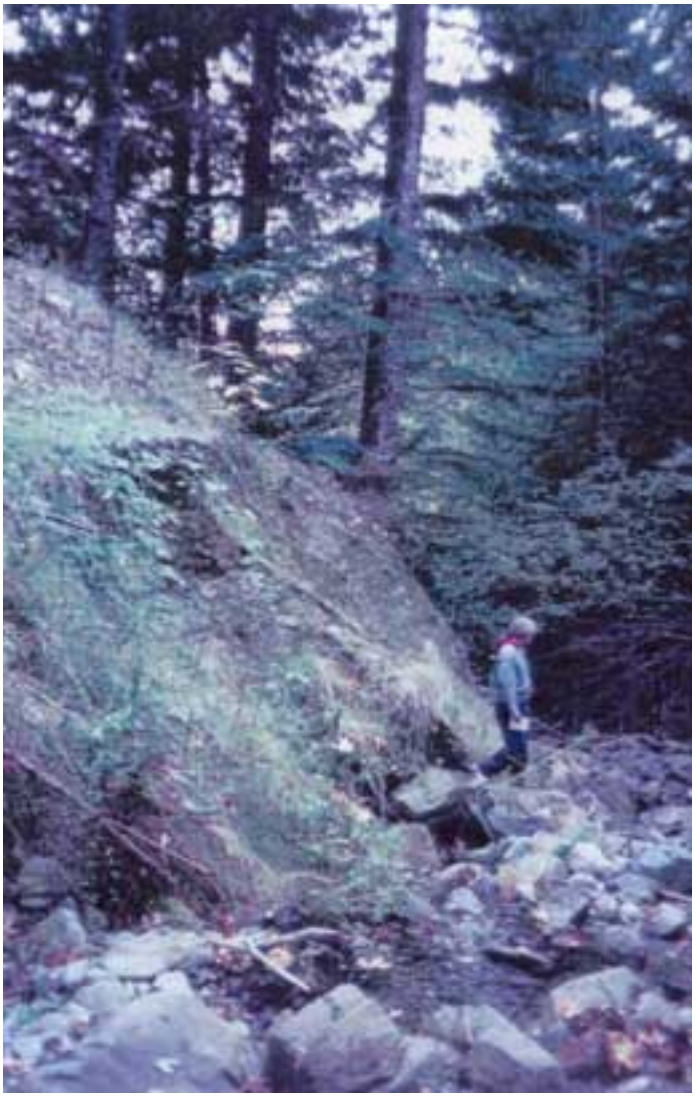
On excavated road crossings with gentle slopes on the approach, vehicles may continue to be driven across stream banks, leading to continued erosion and poor revegetation. We will be recommending barricading structures such as deep trenches (aka tank traps) or boulders to block vehicle access.

We modified our monitoring techniques in order to detect the expected change or effect at the project site. In addition to observing recent erosion or fill failures to infer the cause(s) of sediment loss, we have located photo points to document the magnitude of change over the required 5-year monitoring period. Photo points have been established at a representative sample of the stream crossings, positioned to detect upstream and downstream effects. Due to the lack of intense storms during the past two winters, changes have been minor. These photos may become interesting and informative following a season with rain sufficient to cause stream channel adjustments.

Upper Fall Creek Top Spur MP0.50

View looking downstream, 11/20/00

View looking downstream, 04/06/99

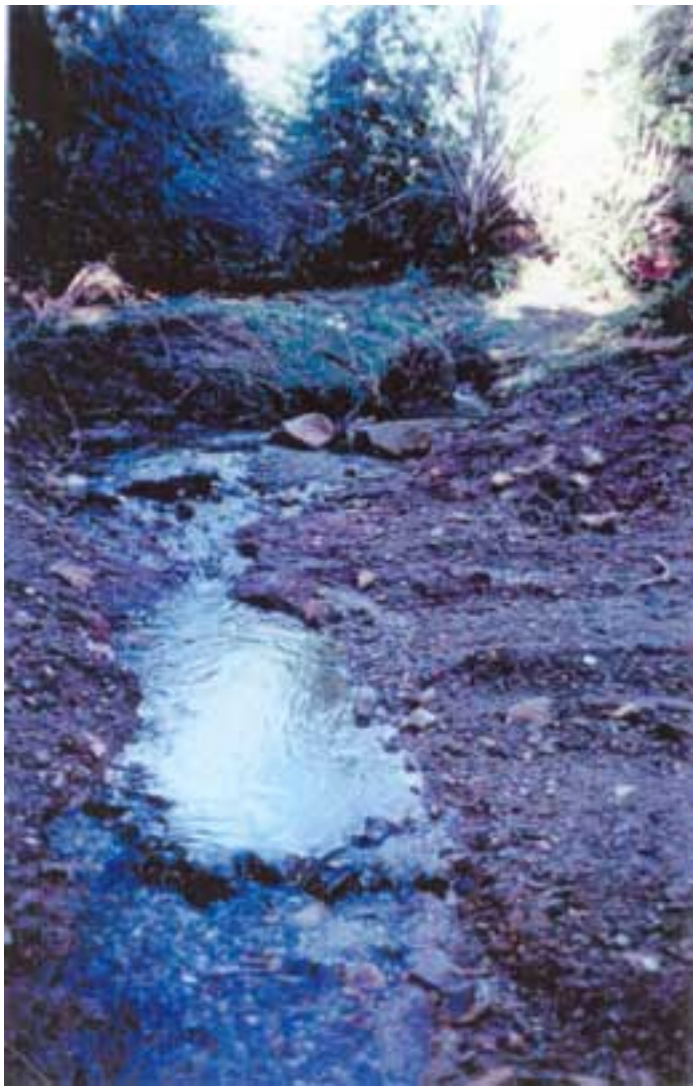


View of left bank looking downstream, 11/20/00

Upper Fall Creek Road MP1.28

Typical 18" plastic ditch relief pipe also drains small springs form cutbank, 04/06/99

Upper Fall Creek Road Spur 3 MP0.111---1998 Excavated crossing



View upstream, 04/06/99

View downstream, 04/06/99

Upper Fall Creek Spur 3 MP0.180

Pulled existing 18" pipe and excavated crossing fill in 1998

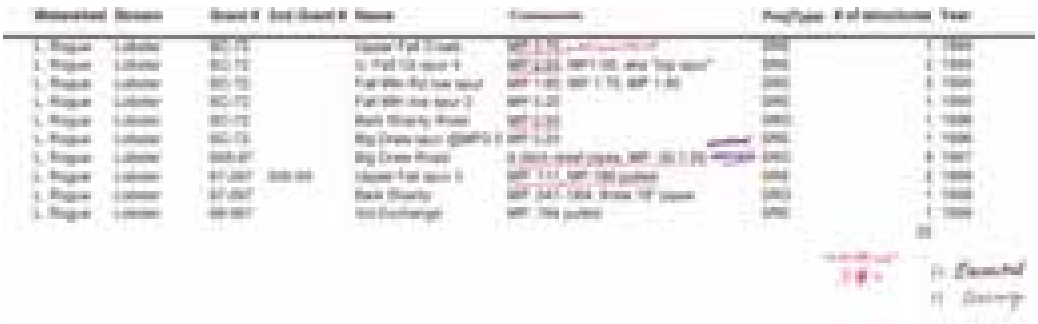
View upstream of deposits exposed from migration of headcut, 04/06/99

View downstream, 04/06/99

View to north of 18" downcutting, sideslopes, 04/06/99

Roads Report: Road/Stream Crossings—Lobster only 07/23/01

Roads Report: Drainage Improvements and Excavated Crossings—Lobster only 07/23/01



Roads Report: Fill Failures—Lobster only 07/23/01