

Lost River Restoration

Monitoring Report 2016

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Goal: The goal of this project is to monitor the effectiveness of a stream channel restoration project implemented in the Lost River Watershed in 2010-2012. We evaluated flow, fish presence in the restored channels, and the recovery of vegetation along the route used to move personnel and equipment to the project site.

Introduction:

In the late 1960's, oil and gas exploration activities created a two mile trench across wetlands in the Lost and Situk River Watersheds. This trench, known as Colorado Road, persisted as a hydrologic feature, dewatering segments of over twenty small tributaries. In some cases, water from the Situk River Watershed was diverted into the Lost River Watershed. Starting in 2010, the Yakutat Ranger District and the Yakutat Tlingit Tribe (YTT) partnered to restore some of the stream channels impacted by Colorado Road.

We used two techniques to restore portions of the original stream network. In the first, small dams were built from jut matting, burlap sandbags, coir logs, and on site material (gravel, sand, organic matter), and installed across the trench to direct surface flow back down the original channels. Second, a mini excavator was used to dredge out the vegetation and sediment that had built up in the degraded channels over the previous forty years. In this project we restored 1.4 miles of stream habitat,



Fig 1. (Top Left) The Colorado Road altered hydrology in the Lost and Situk River Watershed. (Top Right) Coir log dams divert water back down the original channels. (Lower) An excavator is used to remove vegetation from a dewatered channel. (Lower Right) Coir log dam

connected 19 miles of upstream habitat, and improved flows to over 40 miles of channel downstream from the project area.

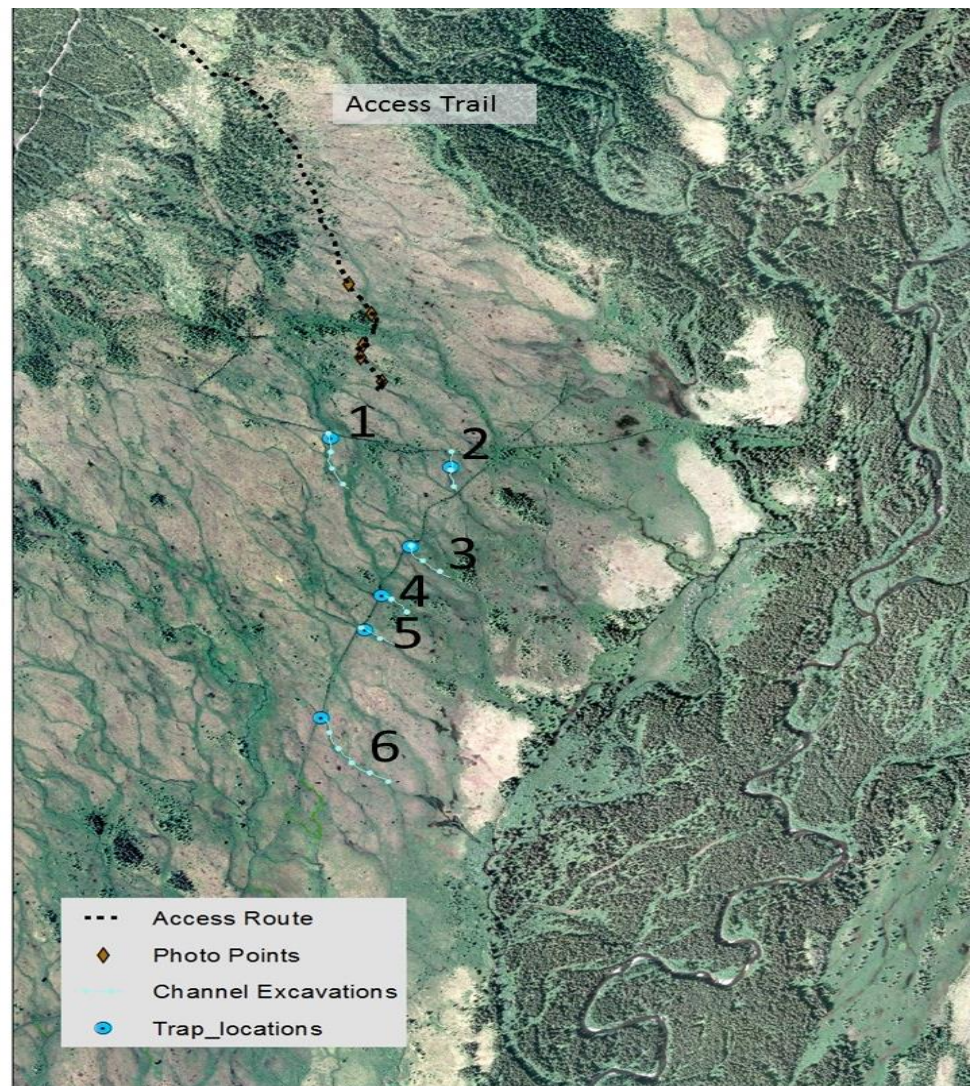
In the first year of implementation, 2010, concerns arose that the access route used by the (YTT) crew to move personnel and equipment to the project sites was being damaged. Accessing the site by ATV was halted, but some heavy rutting had already occurred. Approximately 500 feet of rutted trail through muskeg was created by ATV traffic. In total, roughly 5% of the entire trail (1.7 miles) was rutted with 6 by 6 ruts. It was estimated that wetlands in the area were exposed to a maximum of 70 passes with an ATV (2 ATVs twice per day for 15 days).

Methods:

Standard trapping protocol, in which minnows traps baited with salmon roe are placed in the stream channel, was employed in each restored tributary. Traps were placed within reaches of channels that had been excavated—places where there had been no flow prior to the restoration project. Trap time, trap location, species captured, and age class break down was recorded for each trapping session. Flow was evaluated qualitatively, with observers checking for the presence of flow, and verifying that dams and excavations were functioning as designed. Photo points, set up along the access trail in 2012, were repeated to evaluate the natural regeneration of vegetation.

Results:

The restored stream channels provided fish habitat and maintained flow throughout the field season. No intermittent flow was observed in the restored channels, even when water levels were low in other streams on the Yakutat Forelands.



Juvenile coho salmon were the most abundant fish species found in the restored channels. Coho were detected in each restored channel in the project area. In some cases they were abundant in places that pre-restoration would not have supported flow or fish. Following age class size thresholds identified by Schaberg (2006), who worked in palustrine channels just a few miles from the project area, coho salmon in both their first and second years of freshwater residency were detected in the project area. Jaw bones from an adult coho salmon were found just above an area of restored channel. This might indicate that adults are passing through the project area on their way to spawning habitat higher in the watershed.

Juvenile Dolly Varden char and juvenile cutthroat trout were also found in the restored channels. Trap yields appeared slightly lower than those observed in 2012 immediately after the project's completion, indicating that fish density may have declined slightly after the restored channels were initially recolonized. Catch data can be found in Appendix A.

The excavated channels were functioning intended: mimicking the natural palustrine channels in the area. There was no evidence of stream channel instability, e.g. erosion, widening, scouring, or excessive bedload movement. There was no regeneration, or encroachment from the banks, of vegetation in the excavated channels.

In some places, particularly channel 2, orange flock was present in the channel. This was noted when the project was implemented but was less prominent than when the excavations were fresh. One channel, stream section 5, displayed a much lower water velocity than the other channels in the project area. While the stream was never dry, the water in the channel appeared almost stagnant. Only one coho salmon and one stickleback were captured in this reach during the first sampling session in June, but trapping in August documented more abundant coho using the site. The slow water velocity at this site was probably due to beaver activity downstream of the restored reach and a natural part of the area's ecology.

Most of the dams in the project area showed evidence of being overrun during high flow periods. Matted down vegetation, indicating over-flow, could be readily observed around the structures. The dams themselves are degrading significantly since their installation. However, it did not appear that the dams were compromised at most flow levels, and still functioned to divert water down the restored channels. Flow patterns have adjusted to the excavated channels patterns and the integrity of the dams is less critical. There is very little vertical relief in the project area, and at times, in a place with annual levels of precipitation exceeding 130 inches, water may flow across the area's wetlands unconfined to specific stream reaches.

Vegetation and soils were well recovered along the access trail. There was no evidence of changes in the plant community. Ruts from the ATVs were barely evident in only a few sites where ATV traffic had passed through especially boggy areas. These type of sites, where the water table is close to the surface, are known to be vulnerable to ATV traffic and frequently take a long time to recover. Photo monitoring details can be found in appendix B.

Discussion

While somewhat unorthodox, this project has proved itself to be beneficial in the long term. In addition to creating new habitat used by coho salmon and other fish species, the project also reconnected the miles of tributary above the trench with their original channels below. Although more difficult to quantify, this return to a natural hydrologic pattern benefited both the surrounding wetlands and the fish in the channels above and below the project area. In the future, the benefits of this type of project should be quantified to the whole tributary stream and its surrounding wetlands.

Recommendations

- Continue to monitor channels especially in dry conditions.
- Plant willows in and around the dams to fortify them and improve moose habitat.
- Evaluate other locations on the Forelands where similar impacts from oil and gas exploration are affecting fish habitat.
- If another project is implemented, excavate the channels first and then build the dams

Appendix A

6/30/16	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6
GPS	Croad12016	Croad22016	Croad32016	Croad42016	Croad52016	Croad62016
Lat/Long	N 59.54098 W139.55542	N 59.54022 W 139.54875	N 59.53726 W 139.55035	N 59.53541 W 139.55170	N 59.53415 W 139.55231	N 59.53086 W 139.55414
Flow P/A	P	P	P	P	P	P
Fish P/A	P	P	P	P	P	P
Species ct.	30 SS 1 DV 1 STK	7 SS 2 DV 9 STK	16 SS 2 CT	4 SS 1 DV 6 STK	1 SS 1 STK	1 STK 1 SS or trout (1+) observed in stream, not trapped
Age*	1 and 1+		1 and 1+	1+		
Total Trap Time	1.5 hrs	2.5 hrs	1 hr	0.5 hrs	40mins	50mins
# traps set	2	1	2	2	2	2

8/5/2016	Site 5	Site 6
GPS	Croad52016	Croad62016
Lat/Long	N 59.53415 W 139.55231	N 59.53086 W 139.55414
Flow P/A	P- fairly stagnant in some parts	P
Fish P/A	P	P
Species ct.	15 SS, 37 STK	7 SS
Age*	1 and 1+	1+
Total Trap Time	1.5 hrs	1.5 hrs
# traps set	3	3

Appendix B

Photo Site 1



Update taken 7/8/16



Original taken 9/24/10



Update taken 10/2/12

Photo Site 2



Update taken 7/8/16



Original taken 9/24/10

Update taken 10/2/12

Photo Site 3



Update taken 7/8/16



Original taken 9/24/10



Update taken 10/2/12

Photo Site 4



Update taken 7/8/16



Original taken 9/24/10



Update taken 10/2/12

Photo Site 5



Update taken 7/8/16



Original taken 9/24/10



Update taken 10/2/12

