Logging and It's Effects on Anadromous Fish of Yakutat

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EDGE Symposium March 2007

Photo courtesy of RE Johnson Photography. http://www.rejohnson.com/

Introduction

Yakutat Alaska is located in the north gulf coast of Alaska and is a community of approximately 800 people. The landscape is a combination of muskeg, wetlands, and temperate rain forests. Yakutat is home to many different species of anadromous fish: Steelhead, Eulachon, Lampreys, and King, Sockeye, Chum, Pink, and Coho Salmon.

Yakutat residents depend heavily on the abundance of salmon for local income through commercial and subsistence fishing. The Situk River is the most productive salmon river in the pacific northwest per kilometer of river, it provides more than a way of life for the residents.

The Research Behind Our Project

Salmon are anadromous fish, living in fresh and saltwater. They migrate for miles from the ocean to little streams and rivers to their birth place to spawn. Salmon end up swimming through many obstacles; from jumping up waterfalls, struggling through culverts, to avoiding predators. Salmon rely on Spruce forests, due to the protection the canopy provides. Yakutat's forests consist of mainly Sitka Spruce and Hemlock. The abundance of Spruce trees have made Yakutat a great place of logging. However, logging greatly effects the rivers, streams, and salmon species surrounding the area. Removing the canopy of the trees increases the temperature of the water, which causes the water to evaporate at an increased rate. As the water evaporates, the water level decreases, making it harder for salmon to survive.

Logging requires immense road building, which can spread over miles of land, sometimes crossing streams and rivers. Culverts are installed to keep the salmon flow going. When logging took place in Yakutat in 1984, time wasn't taken to put the proper sized culverts in. This also makes it hard for salmon to swim through, depending on how strong the currents are. If the stream flow is strong and encounters a small culvert, it shoots out the other side, making it difficult for the salmon fry to get through.

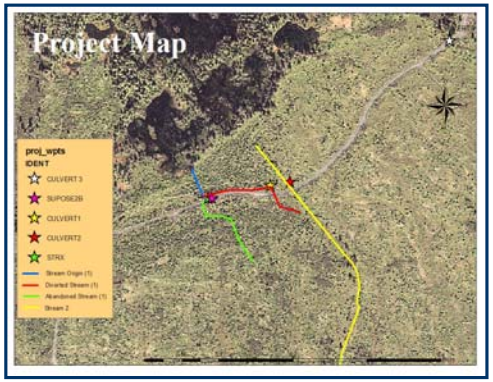
Project Description

We selected a section of logging road to complete our project, where we surveyed and identified culvert and stream crossing locations. One of our missions were to identify whether or not the culverts were suitable for fish passage, and make recommendations for replacement.

Some indicators of the culvert being inappropriate for a stream, was a pool of water built up on either side of the culvert. The culvert would most likely end up being impacted with wood debris. The culvert should be as wide as the channel at high water events.

In most cases, the roads interrupted the stream passage. The proper installation of the culverts through the roads would prevent the stream from diverting into a ditch, parallel to the road.

The roads in our study area are trenched out with banks built up on both sides, making our study site look like a valley. We surveyed for culvert elevation, culvert width, and culvert gradient using a survey grade auto level.



Results

We observed and recorded each culvert's upstream and downstream gradient, and the culvert's gradient, height, width, and length. Here are our results:

	Culvert 2	Culvert 3
Upstream Gradient	1.67	0.0018
Downstream Gradient	1.09	0.0062
Culvert Gradient	0.975	0.025

	culvert height	culvert width	culvert length
Culvert1	1.2 feet	1.2 feet	15.5 feet
Culvert2	1.5 feet	1.5 feet	22 feet
Culvert3	2.0 feet	2.0 feet	24 feet

These are some of the measurements we took from each culvert

Conclusions

This whole project has opened our eyes to what a big difference fixing each culvert or the land would do for the Situk river and the salmon that thrive in its waters.

As we mentioned before, Situk provides a way of life for a lot of Yakutat's population. It is important that the passage ways to the spawning areas are clear to swim through without struggle.

We now know that the size of the culverts are wrong and need to be replaced. Replacing a culvert wont necessarily be easy; it's going to cost a lot of money and a lot of time to fix everything to the way it should be.

Our recommendations for culvert #1 is that it should be replaced with a culvert double its current size, however, the stream is diverted into the ditch and runs along the road, so we would like to put a culvert on the other side, where it is suppose to be. The reason we recommend moving the culvert is because we found a of water that builds up behind beaver damn.

Sources

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Acknowledgments

We would like to thank Kevin Schaberg from the Yakutat Salmon board, Debbie Caron of the Yakutat School District, Bob Pate of Pate Construction, and Bill Lucy of the Yakutat Salmon Board.

For further information

Please contact *Valerie and Sylvia.*
For more information on this and related projects can be obtained from Kevin Schaberg of the Yakutat Salmon Board.