Clisbako River Restoration

Objectives

The objectives of this project were to create a more complex habitat for salmonids through the introduction of large woody debris (LWD) structures and the construction or improvement of rock riffles.

FRBC Region / MELP Region/MOF Region

Cariboo-Chilcotin / Cariboo / Cariboo

Author

Colin Lake

Proponent

Slocan Forest Products, Quesnel

Watershed / Stream

Nazko / Clisbako

Location

The Clisbako River is located approximately 125 kilometers west of Quesnel. Access via Nazko highway, Honolulu FSR and 7000Z Road.

Introduction

The Clisbako River is a tributary to the upper Nazko River, in the Chilcotin Plateau. The total area of the Clisbako River watershed is 816 km2. As a result of logging in the upper watershed, LWD recruitment is low and the resulting lack of channel complexity may limit available holding and rearing habitat. Also, compacted gravel likely preclude spawning success(LGL Ltd. 1998). The target species are resident Rainbow Trout and anadromous Chinook.

Assessments and Prescriptions

The Clisbako River was included in a watershed wide IWAP Assessment of the Nazko River completed in 1996 (Carmanah Research Ltd., 1997). A Level 1 FHAP was then conducted (Carmanah Research, 1998), identifying a lack of channel complexity as a limiting factor of fish production. Large woody debris structures and pool construction were identified as possible remedial techniques. In 1998 LGL Ltd. Completed a Level 2 FHAP, Clisbako Watershed Restoration Program – Fish Habitat Prescriptions. The report identifies the lower reach of the Clisbako as having 52% glide 35% riffle and 12% pool habitat. Compaction and siltation were found to be high, whi8le LWD density was low. This report also outlines structure design and location of those structures.

Past Rehabilitation Work

None.

Rehabilitation Work

Implementation of the restoration plan was carried out by Erosion Control Incorporated (ECI). As outlined by the restoration prescriptions, rehabilitation works was conducted in Reach 1 of the Clisbako River.

A total of 13 LWD structures were built, using one of three designs. Variations in design reflected the structures' location and function in the stream. For example, one design was used areas where bank erosion was a concern, on structure was used on outside bends, and another was used on the relatively straight sections of the river to increase habitat complexity. Logs used in these structures were anchored in a variety of ways including: boulder ballast pairs, deadman anchors, and cabling to trees or stumps. Ease of installation and effectiveness of each method dictated which type of anchor was used on each site.

Most LWD structures also had a riffle enhancement associated with them (7 sites). Three sites were riffle enhancements alone, without an associated LWD structure. Riffles were constructed using boulders varying from 0.4m to 0.8m diameter. Generally, the larger boulders were used to construct the crest of the riffle with the smaller material making up the downstream portion. If pool excavation was prescribed, natural substrate excavated during construction was also used.

Upon completion of work, any access trails along or to the river were deactivated. This was done for aesthetic reasons and to prevent access by free-range cattle.

Cost Summary

Item	Cost
Labour	$42,800
Equipment	$16,165
Materials	$6,235
total	**$65,200**

Outputs

Approximately 960 meters of channel was rehabilitated with 20 separate structures.

Production Estimates

After similar projects (habitat complexing) anadromous adults experienced a 9.3 fold increase in numbers. Resident rainbow have also shown modest increases in numbers following this type of habitat enhancement, with a 1.3 fold increase in >15cm fish(Koning and Keeley 1997).

Proposed Work

There is no further work proposed for the Clisbako, aside from routine effectiveness monitoring.

For Further Information, Contact:

Reg LeBlanc
Erosion Control Inc.
391 Johnston Ave., Quesnel, BC V2J 3M6
(250) 992-3707; westfor@quesnelbc.com

Figure 1: Rock riffle construction on the Clisbako River, Cariboo Region.

Figure 2: Lateral LWD placement on the Clisbako River.

Watershed code: 100-596500-64100

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