West Babine Fish Passage Restoration Project – Heal Creek 40.5km Nilkitkwa FSR

Project Completion Abstract - *Fish Salvage Component*

Biological Goals of the Project

The objective of the project was to improve upstream fish passage through the existing structure for all life stages of fish spp. known to inhabit the stream. To achieve this, the method chosen was to backwater the existing crossing structure, thereby eliminating the outfall drop, reducing the gradient of the water inside the culvert and reducing the water velocities within the culvert at the majority of flows. This would allow adequate fish passage to approximately 11.4km of good quality fish habitat upstream of the crossing.

FIA Information

FIA Invest. Schedule. No.: NOTSA032230
Project No.: 2230006
Fiscal Year: 2003/2004

Recipient

Pacific Inland Resources – a Division of West Fraser Mills Ltd.
MoF Region: Northern Interior Forest Region
MoF District: Skeena Stikine Forest District

Registered Professionals involved in the Project

Mr. Ralph Kossman, RPBio., Silvicon Services Inc. (Smithers) supervised the initial Fish Passage Culvert Inspections in the West Babine Watershed and conducted the fish salvage operations prior to the in-stream work. Mr. Jay Baker, Silvicon Services Inc. represented the recipient and handled the administrative aspects of the project.

Project Completion Abstract Completed by:

Ralph Kossman, RPBio.
Silvicon Services Inc.
PO Box 490
Smithers, BC V0J 2N0
(250) 847-3680
general@silvicon.com

Project Location

Heal Creek is located within the West Babine watershed. It passes under the Nilkitkwa FSR at ~40.5km (UTM 09 E6649768 N6123028), approximately 0.75km upstream of it's confluence with Babine Lake. Heal Creek is a third order watershed that flows eastward into Babine Lake approximately 2 kilometres south of the outlet of Babine Lake.

Introduction and History

Silvicon Services Inc. was contracted to provide fish salvage services for this FIA funded fish passage restoration activity. Heal Creek (watershed code 480 – 430700) is a third order, S2 stream. 1:20,000 scale inventory information indicates Dolly Varden(DV) and rainbow trout(RB) are present at the Nilkitkwa FSR crossing and Prickly Sculpin(CAS), Coho salmon(CO), Burbot(BB), Lamprey(L) and Kokanee(KO) are present downstream nearer to the confluence of Heal Creek with Babine Lake. Heal Creek crosses the Nilkitkwa FSR through a 2400x3800mm pipe-arch steel multi-plate culvert. The culvert is 30m in length and has a slope of 2%. The culvert is fitted with concrete head walls, aprons and wing walls on both the inlet and outlet of the culvert. This site with a priority score of 46 was ranked as a high priority site for fish passage restoration following a Fish Passage Culvert Inspection project (procedures as per WRTC#11) conducted in the West Babine watershed in 2001. Fish Passage Culvert Inspections at the site concluded that the crossing structure represents a partial barrier to juvenile fish due to the water velocity within the culvert and on the outlet apron. The West Babine watershed was identified in the Torkelson Watershed Restoration Plan (Sept. 2001) and the documents which preceded it; Interim Interior Watershed Restoration Plans (October 2000) and Integrated Watershed Restoration Plan-West Babine Watershed (December 2000), as a targeted, high-priority, watershed sub-basin.

Description of Completed Work

Isolation of the site and fish salvage began in the afternoon of September 9, 2003. Isolation nets were installed approximately 7m upstream of the culvert inlet and approximately 20m downstream of the in-stream work area and remained in place until all in-stream work was completed. Before fish salvage began, a 27m section of the stream with habitat similar to that within the isolated in-stream work area was sampled above (and upstream of the culvert) the work site. The length of stream sampled was roughly equal to the length that fish salvage occurred in. This sample was intended to be used for comparative purposes between populations above and below the culvert and to serve as a baseline for possible future monitoring (or Routine Effectiveness Evaluations). The first salvage pass was conducted utilizing a Smith-Root 12B POW electroshocker. A dip net and pole seine were used to recover the shocked fish and transfer them to holding buckets for recovery and identification. Following the recording of the captured fish, they were released downstream of the lower isolation net. The second salvage pass consisted of setting twelve baited minnow traps within the isolated area and leaving them overnight. The following morning (Sept.10) the traps were removed and the captured fish were transferred to holding buckets for identification and recording. Sediment control was erected downstream of the work site prior to the commencement of in-stream work.

Fish Salvage

The first salvage pass utilizing an electroshocker resulted in the capture of 53 fish, 1 DV/BT, 46 CO, 5 CH and 1 unidentified salmonid. The second salvage pass; twelve baited minnow traps set overnight, saw the capture of 14 more fish. The overnight minnow trapping resulted in the capture of 1 RB, 2 CO, 8 CH and 3 DV/BT. The upstream baseline sample resulted in the capture of 21 fish; 19 CO and 2 DV/BT. All fish salvaged/captured were juveniles (parr) or possibly dwarf adult residents in the case of the DV/BT. No CH were captured upstream of the site and no RB were captured downstream of the site. CO ranged in length from 22 – 58mm fork length, CH ranged in length from 65 – 85mm fork length, DV/BT ranged in length from 45 – 125mm fork length and the lone RB captured was 90mm fork length.

Discussion

Backwatering of the culvert has reduced the water gradient to 0% for approximately 2/3 of the lower culvert length and has considerably reduced the water velocities within the same 2/3 of the culvert. The restoration work has undoubtedly facilitated both adult and juvenile fish passage through the culvert, making it easier to access the good quality fish habitat upstream of the crossing site. DV/BT and CO were captured both upstream and downstream of the pre-restoration work culvert. No CH were captured upstream of the site and no RB were captured downstream of the site, however the number and size of the samples conducted are likely too small to attach any real significance to these observations. Also, some juveniles with extremely good fitness were likely able to overcome the velocity barrier and successfully migrate upstream through the culvert.

Monitoring

Routine Effectiveness Evaluations should be conducted at this site to assess the effectiveness of the removal of the partial barrier to fish passage. The sampling conducted upstream of the site could be used as baseline information. Post restoration treatment water velocities in the culvert should also be compared to those from the FPCI reports.

Post Construction Inspection:

It is recommended that the site be visited after the spring and fall freshets in 2004 to ensure that the structure is functioning as designed.

Photographs:

Fig.1 Downstream isolation net shortly after it was erected.

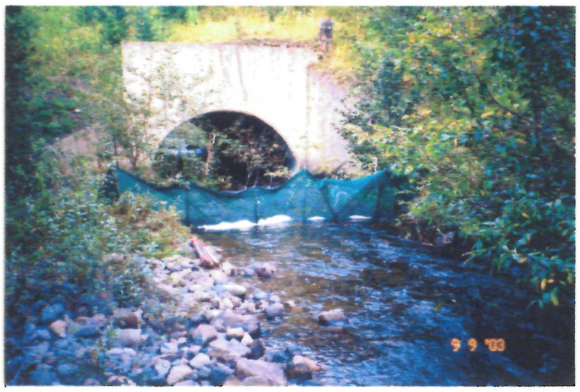

Fig.2 Upstream isolation net shortly after it was erected.

Fig.3 Upstream baseline sampling using a Smith-Root 12B POW backpack electroshocker and dipnet.

Fig.4 Coho parr captured during upstream baseline sampling.

Fig.5 Weir/riffle structure approx. 1.5mo after construction.