



Revelstoke Rod & Gun Club
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Project Title: Bridge Creek Enhancement Project

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FINAL REPORT

Introduction:

In 2015, the Revelstoke Rod & Gun Club made application to the Fish & Wildlife Compensation Program for funding to enhance the existing spawning channel on Bridge Creek.

Background:

In 1982, a co-operative project between the Ministry of Environment, City of Revelstoke, the Revelstoke Rotary Club, and the Revelstoke Rod & Gun Club created a kokanee spawning channel out of what had been a mere creek flowing through a culvert under the Trans-Canada into the Illecillewaet River.

The MOE provided the blueprint and biological expertise while the other three partners provided the on the ground labor. The channel was constructed such that the 2.4m x 800m channel full of imported clean gravel provided virtually 100% spawning habitat for kokanee. A narrow intake at the mouth of the creek, with successive upstream berms of logs separating large pools enable returning kokanee to have easy access to good quality spawning habitat.

The channel supported thousands of kokanee over the years to the present time, with the counting station recording a peak high of 30,000 kokanee in 1993. Since 1993, Bridge Creek has been scarified twice to clean the existing gravel of silt and human generated garbage. Since 1982, each year hundreds of school-children have been bussed to Bridge Creek as part of their curriculum to learn about the kokanee life-cycle from biologists and other educators.

Since 1993, the returning spawning kokanee numbers have declined steadily up to the present time, to where the average number of returning kokanee have averaged only 20 fish/year over the past 5 years. This decline is thought to be a combination of several environmental factors, but no single major cause has been identified. In previous low-water years, the Bridge Creek water flow was supplemented by a fire-hydrant located just below the CPR siding. This option is no longer available as the water-source to the hydrant is chlorinated.

The Bridge Creek habitat has been a tremendous value to the community from an educational, environmental and ecological perspective. Many citizens of Revelstoke, the general public, tourists, and physically challenged people enjoy visiting the creek, which is also accessed by a green-belt along the Illecillewaet River. Given these values, the invested resources in terms of labour and capital, and the potential tremendous future value to the community of Revelstoke and tourists alike, the

Revelstoke Rod & Gun club took the first step in attempting to retain and improve the Bridge Creek heritage by applying for funding to enhance the spawning channel habitat.

Goals and Objectives:

Through consultation with several biologists concurrent with several field trips, the clubs' goals for Bridge Creek were set:

1. Enhance existing stream spawning capacity and quality for kokanee
2. Partner with CPR to coordinate cleaning the culverts on their adjacent upstream private land
3. Replace the Bridge Creek kiosk and update the information displayed therein
4. Emphasize the tremendous educational value to children and the public alike

Study Area:

Bridge Creek is located on the east boundary of Revelstoke within the City limits; running south from the Mount Revelstoke National Park underneath the Trans-Canada Highway, under the CPR main tracks and a railroad siding to the start of the spawning channel which runs for 800 meters to the Illecillewaet River.

Powerhouse road crosses Bridge Creek 600 meters upstream from the mouth, and an access road from Powerhouse parallels the creek on the east side, separated from the creek by a 5 meter riparian zone.

The channel is about 2.4m wide, and is separated at irregular intervals by log berms which have v-notches to direct flow and facilitate fish travel. A fish-counting station is located 20 meters upstream from the mouth of Bridge Creek.

Methods:

Our club retained Alan Bates, P. Eng.. of Streamworks Consulting Inc. ,of Salmon Arm, to prepare the prescription for stream enhancement. Mr. Bates visited Bridge Creek several times, one trip in conjunction with two other biologists; after which he prepared the Section 9 Application and supervised the project on-site operations.

Volunteers from the Revelstoke Rod & Gun Club hand-cleaned the garbage from the mouth of Bridge Creek up to the mouth of the CPR siding culverts just after CPR cleaned the culverts and dredged the pools on the intake and outlets. The volunteers then scarified the creek from the CPR culverts downstream to the mouth of the creek. Machines under direction of the project biologist then strategically placed trucked-in organic material (2-3' boulders and stumps) at suitable locations to provide enhanced spawning sites which are to provide more complex microsites in terms of cover, nutrients, shade, and resting spots. Supervision of the placement of material was critical

to protect the existing riparian zone on the east bank of the creek as material had to be swung over top of the leave-strip by a crane and then lowered to specific locations.

Results:

Retaining Mr. Bates was the key factor in successfully completing the Bridge Creek Enhancement Project. His professionalism in completing the prescription and in conducting the on-site project supervision was self-evident. Our club is pleased with his abilities and achievements and will certainly retain him on future projects.

The stream was easily cleaned of human generated garbage. Stream-flow was seasonally low (about 2/3 of normal flow); and slow water flow reduced the effectiveness and increased the time to adequately reduce the silt to desired levels. Stream-side vegetation in the riparian zone and larger organic logs in the creek reduced the ability to scarify some areas.

Overall spawning habitat was increased, but if future water-flows during the spawning windows are sub-standard as occurred in 2016, net area will be reduced quantitatively. However, quality habitat has been improved substantially.

CP Rail conducted their operation successfully, co-ordinating their project to dovetail with ours, dredging the intake/output ends of the culverts and cleaning the culverts themselves; still maintaining water-flow to the stream by damming off the output pool and pumping over the tracks with a volume pump; all under supervision of their own biologist.

Co-ordination of machinery and placement of the organic material was the most challenging aspect of the project. The crane had to lift the laden-sling up and over the riparian leave-strip with the extended boom and then lower the material down as close as possible to the biologist and helpers, who then manipulated the material into exact position at specific locations. This procedure was time-consuming and was the most expensive part of the project. Further, in the upstream portion that was not accessed by road and could not be accessed by the crane, only that portion that could be reached by the crane boom was enhanced; leaving approximately 15-20% of the spawning channel inaccessible.

Future Implications:

Low returns in successive years strain the credulity of Bridge Creek as an educational wonder when fish have to be brought in from another stream for dissection. Children may or may not see kokanee on their field-trips, when in the past, hundreds were visible for enjoyment.

Low spawning returns are a primary concern. Now that the habitat has been enhanced, we will be monitoring and documenting the returns of 2017/2018 to determine if quality of habitat before this project was a major limiting factor in kokanee returns. If returns do

not increase, our club will be reviewing options with a biologist; such as to increase the number of spawning kokanee, including seeding the stream with fertilized eggs. Low water flow to the site appears to be chronic, and it is unknown if this is a cyclical/global warming factor. Consideration will also be given to year-around supplementation of the water-flow by pipeline from the Illecillewaet River along the edge of the access road to the CPR culvert outlets.

Acknowledgements:

Community and media events: The Kokanee Festival was held on October 19, 2016 and was a great success. About 200 school-children viewed kokanee in the creek, observed dissected kokanee, and learned about the kokanee life-cycle through an on-site biologist. B.C. Hydro, Parks Canada, Bear Aware, MOE personnel, and Rod & Gun Club volunteers provided other information for the children through event booths and other presentations. The educational and recreational benefit that Bridge Creek offers to the community cannot be over-stated.

Our Club appreciates and thanks the Fish & Wildlife Compensation Program, the City of Revelstoke, the Ministry of Environment, B.C. Hydro and other sponsors that assisted us in funding and supporting this project. We acknowledge and thank School District 19, the Rotary Club; our consultant, contractors, volunteers, and the pioneers of the Bridge Creek Spawning Channel for their sponsorship. A notice was published in the local newspaper thanking all of our sponsors and partners for funding and sponsoring this successful project.

Our Club would like to express again our appreciation to the FWCP for the opportunity to enhance a great existing community asset; and we would also like to thank Karen Bray and Angus Glass for their support of this project.

Regards,

G.D. Krestinsky
Past President
Revelstoke Rod & Gun Club