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File 2131

2005 Elk River Channel Stabilization Project

PROJECT DESCRIPTION

The 2005 Elk River Channel Stabilization project is a continuation of the work that was begun in 2004. This project focuses on the lower 13 km of the Elk River, the main tributary to Upper Campbell Lake. Studies completed over the last 10+ years have found that the lower Elk River has shifted from a comparatively narrow, single thread, stable channel to a multi-thread, laterally unstable, gravel in-filled channel. Many factors are believed to have facilitated this change including extensive valley bottom logging, channel relocation or diversions due to road construction and the increase in flows in the river due to the construction of the Crest Creek/Heber River diversion. This change in river regime has resulted in a 4 to 7 times increase in the un-vegetated channel width. There also appears to be a corresponding reduction in the quality of fish habitat, including a lack of stable spawning habitat, few pools, little large woody debris (LWD), eroding banks and low quality riparian vegetation.

The goal of this project is to expedite the reformation of a stable, single thread mainstem channel and its associated fish and wildlife value in the lower Elk River. This is to be done through the soil bioengineering process of live gravel bar staking of select, exposed gravel bars. Soil bioengineering is the use of living plant materials to construct structures that perform some engineering function. The staking is used to initiate natural vegetation succession processes on unstable gravel bars that have developed as a result of excess sediment in the stream. Over time as the stakes grow sediment builds up on the bars until eventually the river no longer tops them during peak flows. This forces the river back into a single channel and speeds the recovery of the gravel bars to productive alluvial forests by encouraging riparian vegetation colonization.

Due to the coarse nature of the gravel bars the live gravel bar staking is carried out using an excavator to place the cuttings well down in the gravel bar where moisture is available. The excavator does not actually dig a hole but rather the bucket is sunk into the gravel bar and pulled back slightly so that a gap in the gravel is opened into which the cuttings may be inserted. The excavator works by backing upstream so that the cuttings are angled downstream. This minimizes the potential for the cuttings to snag large

woody debris that may be floating downstream during the first season prior to growth of the stakes.

SUMMARY OF 2004 ACTIVITIES

During the first year of the Elk River Channel Stabilization Project a total 1.86 ha was planted at three sites along the lower Elk River. The live stakes were planted at an average density of 17,200 stems ha⁻¹. The dominant species planted were Scouler's willow (*Salix scouleriana*) and Sitka willow (*Salix sitchensis*) with some cottonwood (*Populus balsamifera*) and red-osier dogwood (*Cornus stolonifera*) also planted. Following planting completion, as-built surveys and baseline monitoring assessments were completed. The perimeters of the planted areas as well as longitudinal and cross-sectional profiles were surveyed at each site using a total station. Benchmarks were established at each site for future reference during surveys and monitoring. Fifty-one research and monitoring plots, including seven control plots, were established at various locations within the project area. A subset of 16 research plots was also established to monitor changes in substrate composition. Vegetation surveys were conducted at each of the 51 monitoring plots. Finally, 3 photo points were established at each treatment site to facilitate monitoring the success of the completed plantings. Complete details of the 2004 activities can be found in the final report, which is located on the Bridge Coastal Fish and Wildlife Restoration website at URL: http://www.bchydro.com/bcrp/completed_projects/04CA01a.pdf.

PROPOSED 2005 ACTIVITIES

The work proposed for 2005 consists of two components:

- Further effectiveness evaluation and monitoring of the areas, which were live staked in 2004, will be undertaken to determine the success of the treatments in achieving the project goals. This work will be carried out during summer months.
- Live staking of Site 6B.

Site 6B

During the site selection process carried out in 2004 Site 6B was selected as an appropriate location for live staking in 2005 (MMA, 2004). Site 6B is located 3.9 km upstream of Upper Campbell Lake. The site has changed significantly since the 1995 air photos (Figure 1). The main flow of the channel now runs along the left bank of the river as opposed to the right bank as seen in Figure 1. What was previously the main channel along the right bank now appears to only receive water during high flow conditions. The site has been separated into two areas for treatment (6A and 6B). Site 6A is 4950 m² in size and is a sediment deposition area near the active channel. Approximately 3482 m² of Site 6A was live staked in 2004. Site 6B is approximately 7500 m² in size and used to be the active channel along the right bank. This area includes the roughly 1500 m² of 6A that did not get planted in 2004. An existing trail from Highway 28 will be the basis of

the access to Site 6B. The trail was used in 2004 and excavator access onto the gravel bar can be gained without removing any vegetation.

Collection of donor stock is scheduled to take place from September 19th to 23rd, 2005. A suitable donor site has not yet been selected. It is anticipated that the donor site will be located as close as possible to the treatment site and that the species will consist primarily of Scouler's willow and Sitka willow. Some cottonwood and red-osier dogwood will also likely be used. Donor site selection will be completed during the summer when the monitoring of the 2004 work is carried out. Once collected the cut stock will be soaked in a pond located approximately 2.5 km west of the Highway 28 Elk River crossing. The planting of the live stakes will be completed from October 3^d to 7th, 2005. As in 2004 crews from the Mowachaht/Muchalalt First Nation will complete the collection and planting of the live stakes.

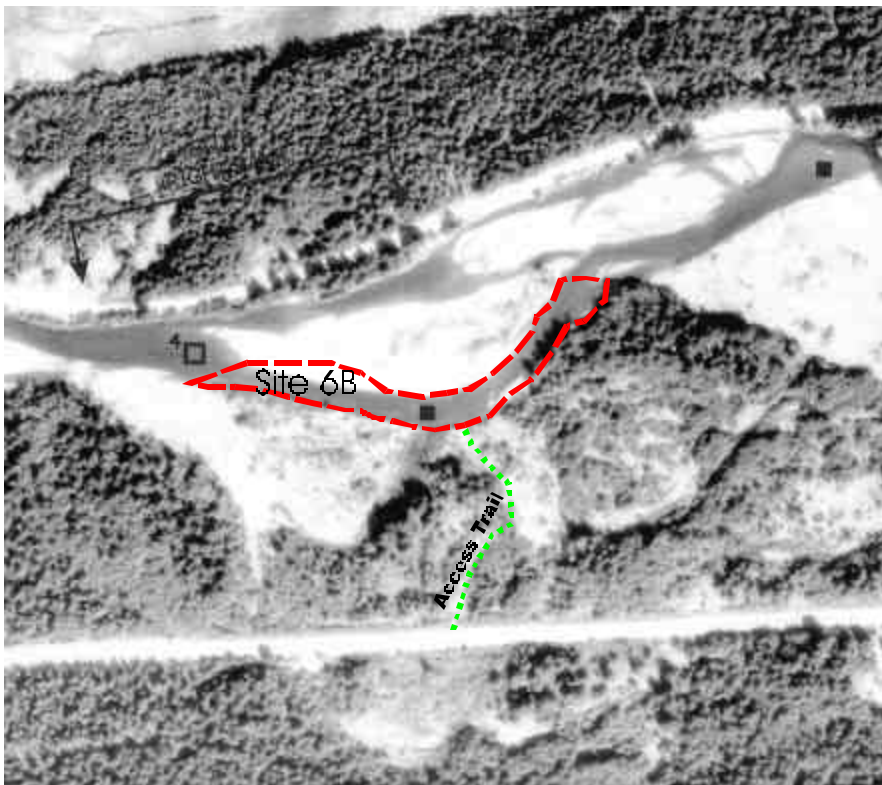


Figure 1. 1995 Aerial Photograph of Site 6B.

Following the completion of the 2005 live gravel bar staking baseline monitoring of the vegetation and substrate characteristics will be completed at Site 6B. The effectiveness evaluation and monitoring program for Site 6B will be the same as for the sites live staked in 2004.

REFERENCES

M. Miles and Associates Ltd. 2004. *Selection of Sites for Live Gravel Bar Staking: Lower Elk River in Strathcona Park*. Unpublished report prepared for BC Hydro Bridge Coastal Fish and Wildlife Restoration Program, Burnaby, B.C.