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Technical Tips

Channel Rehabilitation: Constructing Debris Groins as a Bank Stabilization Option

Rheal Finnegan

Debris groins, which can be used to stabilize eroding streambanks and create desirable fish habitat, were discussed as a viable technique in the "Technical Tip" section of a previous Streamline publication (Vol. 4 No. 2). This additional information on construction design steps is provided to supplement the original Tech Tip.

Debris groins are currently being considered for a reach of the Horsefly River which lacks riparian vegetation as it flows adjacent to an open field (Figure 1). The heavy machinery required to construct the groins will access the site from the open field. Since the proposed groins can be installed with the required machinery operating adjacent to the river, it is anticipated that construction activity necessary for debris groins will not affect the water quality in the mainstem during construction.

Figure 1. A section of the Horsefly River where debris groins are a bank stabilization option.

Continued on page 7...

Technical Tips

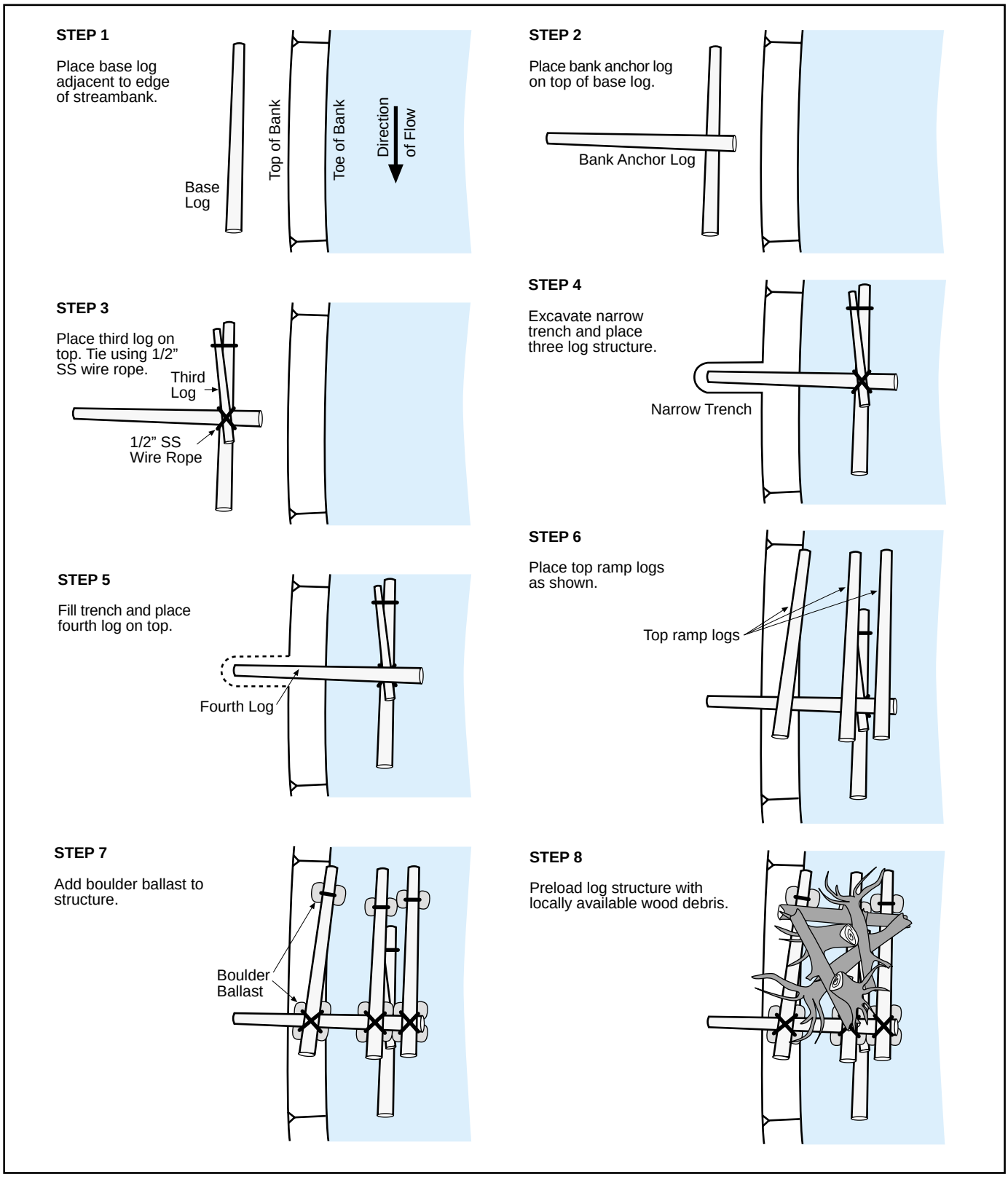

Figure 2. Steps 1 through 8 of the construction of a multiple-log debris catcher.

...continued from page 6.

Technical Tips

The proposed conceptual design and sequence of construction for the Horsefly debris groins are shown in Figure 2. Several debris groins will be spaced evenly along the actively eroding outside bank of the river. The groins will be spaced at intervals of approximately four times the distance that the individual structures extend out into the river.

Noteworthy items and features regarding debris groins are:

- Individual structural members (logs) of debris groins and necessary ballast can be easily maneuvered into place using readily available machinery.
- The top logs are positioned so as to capture submerged and floating debris carried by the stream during storm events.
- Properly constructed debris groins will eventually capture sufficient floating debris to function similarly to natural large wood debris structures.
- In time, smaller wood debris captured in debris groins will decay and become ineffective, but subsequent floods will deliver a new supply of wood debris to the debris groins.
- Smaller wood debris captured by the structural members provides a significant degree of protection to the structural members themselves.
- The top logs are arrange in such a manner as to redirect the horizontal forces (created by the water pressure) downwards, thereby significantly reducing the amount of ballasting required to stabilize the structures. This principle is similar to that employed when constructing typical "A-frames" which are frequently used to support fish fences.
- Appropriately located and spaced, debris groins in series can be used to provide bank protection where desirable and are a more "fish-friendly" alternative to conventional shot-rock.
- Debris groins should be constructed so as not to be overtopped during extreme flood events. Otherwise, smaller debris accumulated at lower discharges may be washed downstream during extreme floods and groins may not function as well as intended.

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Mineral Tenures and Road Deactivation

R.Tim Henneberry

This article outlines two key aspects of mineral tenures and road deactivations: mineral exploration impacts in coastal watersheds, and identifying active mineral tenures in a specific watershed.

Mineral exploration impacts in coastal watersheds
The Mineral Tenure Act and Regulations govern mineral exploration and the Mineral Exploration Code sets the guidelines for acceptable practices in British Columbia. Mineral exploration is a success-contingent, progressive business. The first task is to locate and acquire a property of merit, which may be either a previously known occurrence, or a new occurrence. The latter is located by grassroots exploration of areas of known exploration potential, government surveys (e.g. for regional geochemistry programs and regional mapping programs) or prospecting of new road construction, primarily by forest industry.

Mineral exploration usually takes place in stages; positive results in each phase of exploration are required to initiate the next phase. Four-by-four road access is required at all stages. Stage I (Preliminary) involves prospecting, geological mapping photographs, and sampling rocks, silts and soils for analysis, as well as preliminary ground geophysical surveys, including VLF-EM and magnometer. Ground disturbance is minimal, and the only direct impact on the watershed is the establishment of cut grids.

Stage II (Initial Advance Exploration) involves detailed sampling of occurrence at regular intervals, and possible use of plugger and explosives to loosen surface materials. Ground disturbance remains minimal in stage II. The area disturbed by blasting would be less than 10 m^2 and only 10 to 20 cm deep.

Stage III (Trenching) involves excavator or backhoe