

Fish Habitat Restoration Methods Concept Specification

Artificial Undercut Banks (or Lunkers)

Purpose:

- To provide hiding and escape cover for both juvenile and adult fish.

Conditions Where Applicable:

- Instream location and sizing must be approved by an Adopt-A-Stream Biologist.
- In streams where cover may be limited for juvenile and adult fish.
- In streams of width greater than 3m.
- In streams exhibiting low to moderate flooding.
- In streams where ice damage is not severe.

Habitats created:

- Juvenile and adult cover and overwinter areas.
- Adult cover during spawning.

Advantages:

- Provides an abundance of hiding places for fish.
- Can protect stream banks from further scour or erosion.
- Provides a good use for dead wood and stumps, if these are available nearby.

Disadvantages:

- Can catch debris and ice if not placed properly.
- If not properly sized can constrict flow and cause damage downstream.
- If not constructed properly may have a damming effect.
- May require annual maintenance.

Design Criteria:

- Build during the summer low flow period.
- The structure can be built along an eroding bank either on the outside of a bend or along a straight stretch where water depth is 0.3 m - 1.2 m (1- 4 ft).
- It can also be built out from a natural "dead water" bay along the shore.
- The structure width can extend out to the edge of the current/eddy interface, but it should not extend into the main current more than ¼ of the way across the stream.
- The structure should protrude no more than 30 cm (1 ft) above the water surface at the front, but slope up gradually to meet the bank behind.

- No material should protrude out beyond the outer surface edge of the structure.
- Both ends of the structure should taper into the stream bank to reduce collection of debris. Depending on the amount of flooding and erosion, both ends may require stabilization with riprap.
- Length of structure is variable depending on local conditions i.e., size of stream, flooding, availability of wood.
- Typically wood logs and stumps must be readily available near the work site.
- In the absence of wooden logs and stumps, concrete slabs may be used for building the platform. AaS Biologist must be consulted before undertaking such work.

Implementation steps:

- Determine location. As mentioned above, the structure can be built along an eroding bank either on the outside bend, along a straight stretch of deep water, or built to fill in a backwater area.
- If an existing natural debris jam is to be enhanced, then the following approach should be used:
 1. Add or remove material to obtain desired shape which conforms to design criteria.
 2. Spike green logs along outside edge of structure. Spikes are 20 - 25 cm (8 -10 in). Use larger dock spikes if they are necessary. Logs are placed slightly under the water surface.
 3. Logs must run parallel to the main current; then the structure is tapered at both ends and keyed into the stream bank.
 4. Remaining material on jam is spiked together forming a complete unit.
 5. In addition, posts can be dug into the substrate and spiked to the outer perimeter of logs for added stabilization and anchoring.
 6. If work is beginning at a location where there is not an existing debris collection area, then the following approach should be followed:
 - a. Determine location conforming to design criteria.
 - b. Outline area with stakes.
 - c. Construct outer shell using green logs.
 - d. Add stumps and logs as required and secure.
 - e. If additional bank stabilization is required, more material is used along the bank to form a dense barrier to the current flow within the structure.
 - f. In most cases of newly constructed sites the bank above the structure can be planted

References:

Federal Interagency Stream Restoration Working Group (FISRWG). 1998. Stream corridor restoration: principles, processes and practices.

Ministry of Natural Resources of Ontario. Community fisheries involvement program: field manual.

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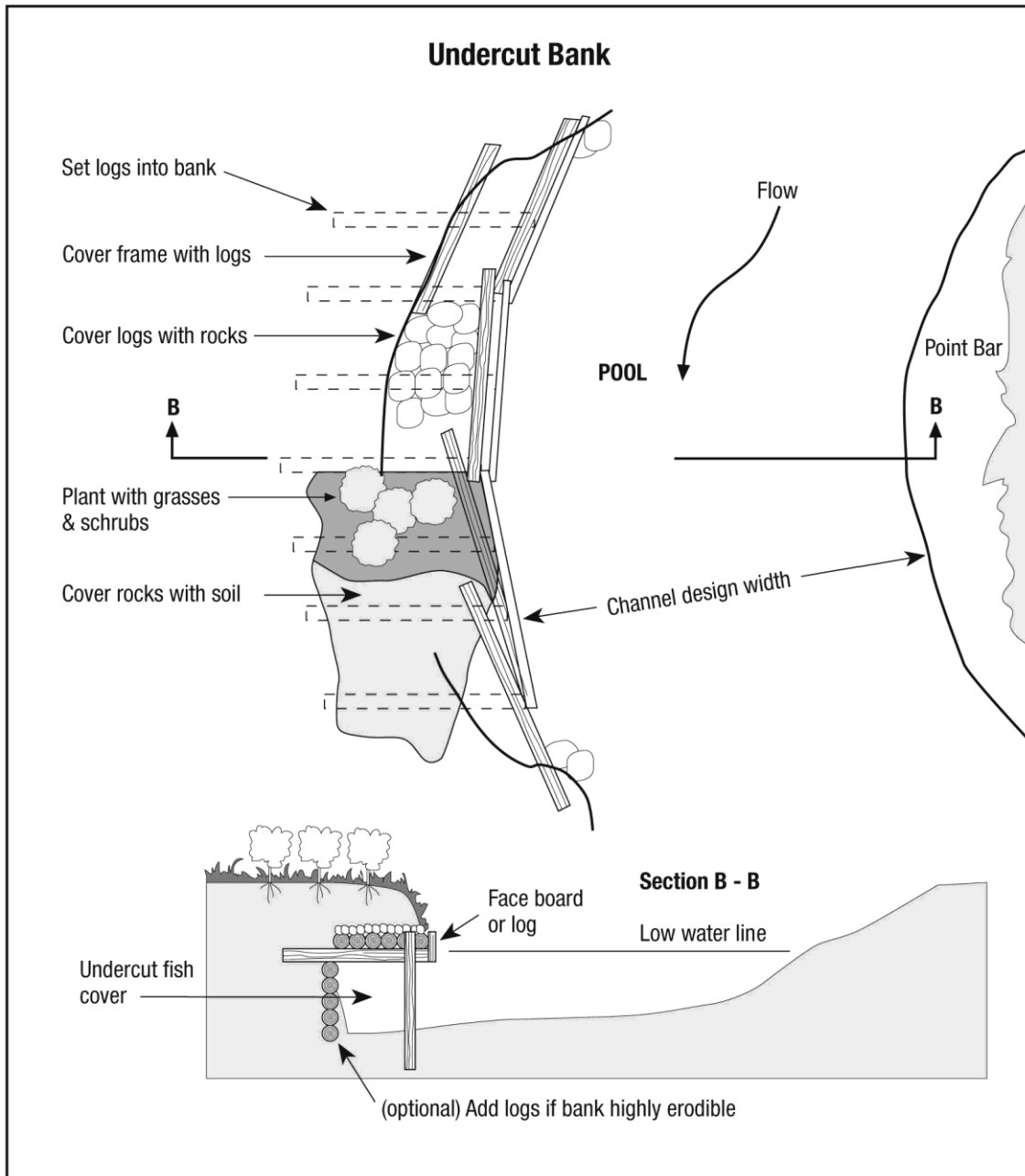


Figure 1. Conceptual drawing of an artificial undercut bank (Thaumas Environmental Consultants Ltd.).