

# Half Log Cover



## Description

The half log cover is a semi-natural arrangement of a cedar or oak log cut lengthwise. It is secured above the channel bottom using wood spacer blocks and steel stakes. The resulting unobtrusive space attracts fish. This is commonly referred to as the classic log cover from Wisconsin. Here in Ontario, we tend to refer to them as the "Wilkins" and "Hunt" designs that are described here in detail.

## Purpose

Half logs and variations of this design attract juvenile and adult fish by providing overhead cover where it did not previously exist. This technique is especially useful in stable, low gradient headwater streams where existing cover habitat limits productivity.

## Application

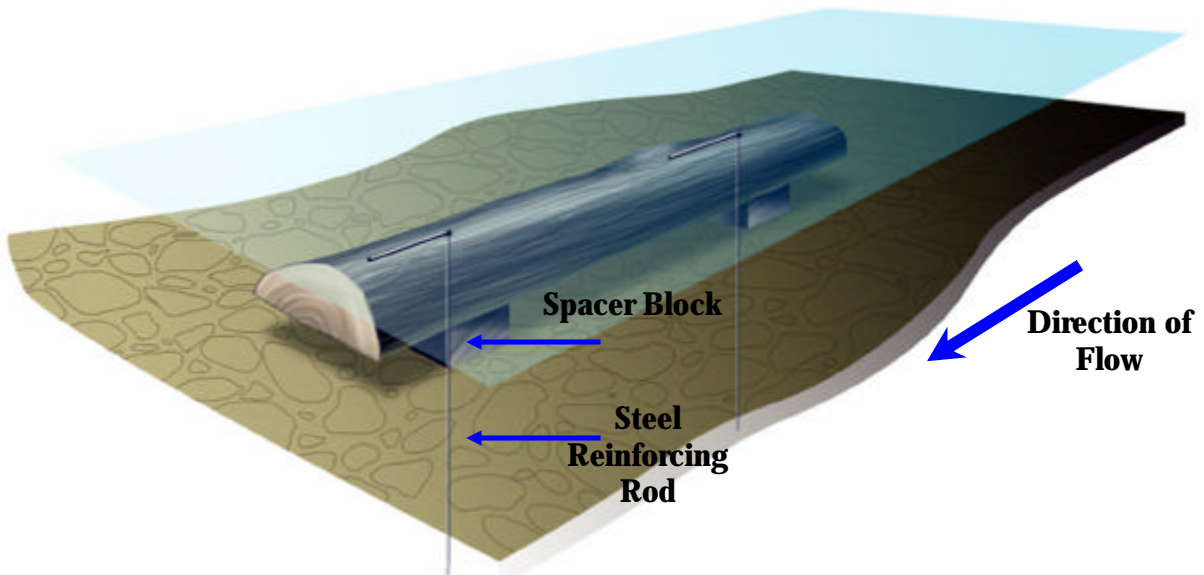
This form of cover structure is installed at the channel thalweg or adjacent to it. Choice streams and rivers are less than 10 m wide, with little sediment load and a secure substrate for anchoring. They are always placed such that they are entirely submerged. The linear orientation is slightly off line with the low flow channel which allows for some continuous cleaning of the substrate beneath. Half log covers can be applied independently or in tandem with boulder placements. Ice damage and sediment deposition are two potential downfalls which would result in failure. Care and forethought are necessary prior to locating and installing this structure.

As with other habitat improvement structures, a well established knowledge of the channel characteristics within a reach of stream is essential for determining suitability and placement. Look for typical characteristics of the steeper gradient B channels. Boulder, cobble, gravel and silt/sand base are your determining features for suitability. Gravel/cobble point bars with a cobble or bedrock base are good indicators of the few C channels that are also appropriate for these structures. Half log covers are susceptible to sediment deposition and ice damage, so be wary of streams carrying large volumes of sediment during higher flows.

## Construction Guidelines

The first design is a product of Robert L. Hunt of Waupaca, Wisconsin and the second illustration was devised by Gary Wilkins of the Toronto and Region Conservation Authority. Both arrangements involve a fabricated unit which can be built on shore and secured in place with steel anchors. Green cedar or oak are the preferred varieties of wood to use. Logs should have a 15-30 cm butt diameter and length of around 2.5 m. Local lumber mills are often the best place to have the logs cut lengthwise. Make certain that the structure is totally submerged at low flow stage as this will retard decomposition of the wood.

The Hunt design uses one single half log, two 10-15 cm square spacer blocks and two 1.5 m lengths of steel reinforcing rods. Two 1.5 cm holes, each setback 15 cm from either end, are drilled through the log and through each spacer block. A length of reinforcing rod is inserted into the spacer block and driven into place with a post pounder being careful to leave sufficient length to accommodate the width of the half log and a 30 cm exposed tip. The steel rod should be driven on a slight angle directed downstream to maximize holding strength. Place the half log on top of the secured spacer block flat side down. The next reinforcing rod goes through the remaining hole in the log and second spacer block. Orient the log slightly offset from the stream current and pound the steel rod into place. At this point, a 1.0 m piece of 2.5 cm steel pipe is slipped over the remaining tip and cranked like a handle forcing a bend in the rod. Ideally, the bent section of rod should be flat on the log and facing downstream.



The Wilkins design incorporates two half logs, a 2.0 m steel T bar, 15 to 20 cm galvanized ardox spikes, 14 or 16 gauge page wire and 3.5 cm fence staples. A 20 to 25 cm section is cut from each log and used as the spacer to keep the cover structure off the bottom of the stream. Both half logs are placed flat-side up and side by side. Leave a 6 cm gap between them for the T bar. Place the spacers perpendicular and flat-side down on the logs at least 20 cm from either end. Nail them into place using the ardox spikes. The structure can then be placed in the stream with a similar orientation in the current as the first example. The T bar is cut in half using a steel chop saw to create two anchors. Each is placed in between the half logs on the downstream face of the spacer block. A post pounder will help you drive the anchor into the substrate on a similar slight angle as before. The anchor should end up being flush with the tops of the logs and you can then lash the anchor to the logs using the page wire. The page wire is then secured using the fence staples. Alternately, if there are holes available in the T bar, you can nail the post into the spacer block.

Select streams that are less than 10 metres wide and have little ice accumulation, debris movement or sediment deposition. You want to be assured that the structure does not become dislodged or smothered. Place them in runs or along the banks of riffle areas adjacent to the thalweg of the



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channel at a minimum depth of 30 cm. The maximum depth recommended is 90 cm. Directly downstream of a large boulder is ideal provided that you avoid placement in the deposition area.

## Materials

For both applications, you will need the following tools for construction and placement:

- sledge hammer and post pounder
- drill with 1.5 cm auger bit, 30 cm long
- steel chop saw

Hunt Design uses:

- one 20-30 cm diameter, green cedar or oak log, 2.6 m long
- two 10-15 cm square spacer blocks
- two 1.5 m long 1.5 cm diameter steel reinforcing rods 1.0 m long, 2.5 cm diameter steel pipe

Wilkins design uses:

- one 20-30 cm diameter, green cedar or oak log, 2.6 m long
- 15-20 cm galvanized ardox spikes
- one 2.0 m T bar post
- one roll of 14 or 16 gauge page wire
- fence staples

## Cost and Maintenance Needs

It is a simple and inexpensive technique that can be easily constructed and installed by a crew of two in a couple of hours. Cost is less than \$20.00 per unit. In stable channels, the expected life of the structure is 7 to 10 years provided the recommended type of wood is used and the location is not subject to sediment deposition or ice scour. Frequent monitoring is required for the first year to ensure proper installation and function. Annual maintenance is recommended after the first successful year.

## Integration

Half log structures can be integrated into other stream rehabilitation projects such as:

- boulder placements
- K dam
- wedge dam
- cabled log jam



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## **Demonstrations**

This type of habitat structure has been applied in the following demonstration projects:

- Project #118, Rouge River Headwaters Rehabilitation Project
- Project #109, Morningside Tributary Aquatic Habitat Rehabilitation Project

## **For More Information**

Please refer to the following authors and their respective publications located in the bibliography:

Hunter, C. J. 1991

Hunt, R. L. 1993

Rosgen, D. 1996



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