

L.U.N.K.E.R.S.



Description

L.U.N.K.E.R.S. is the short form of the structure called "Little Underwater Neighbourhood Keepers Encompassing Rheotactic Salmonids". The design of this compartment-type structure evolved from work in southern Wisconsin streams. They are constructed with hardwood or cedar planks and imbedded into the bed of the channel, usually on the outside of a bend in the stream or river.

Purpose

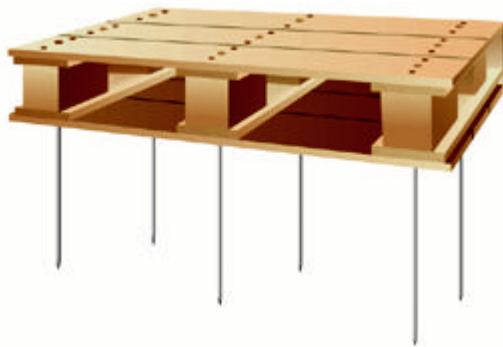
L.U.N.K.E.R.S. are primarily used to introduce overhead cover for fish where existing habitat is limited. They can be used in rivers or streams independently or in conjunction with erosion control measures such as native material revetments.

Application

This structure is placed below the elevation of the low flow channel typically along the outside bends of a stream where the channel depth is consistently higher than the top of the L.U.N.K.E.R.S.. Usually, it is placed in a location that allows for a gentle flow through in order to reduce sediment accumulation.

Prior to installing, the reach of stream should be carefully assessed in order to better understand the channel characteristics of bankfull and baseflow, ice formation and spring flooding as well as sediment movement. L.U.N.K.E.R.S. are ideal in B and C channel situations where there is predominately cobble and boulder lining the channel with an average grade of less than 4%. These rock-lined streams are gently meandering and have defined pools, rapids and riffles. Streams and rivers which move large volumes of sediment, such as E channels, are not appropriate for the placement of L.U.N.K.E.R.S. since they are typically well entrenched and actively moving laterally. In addition, C channels with gravels and sand in the riffles are also unsuitable.

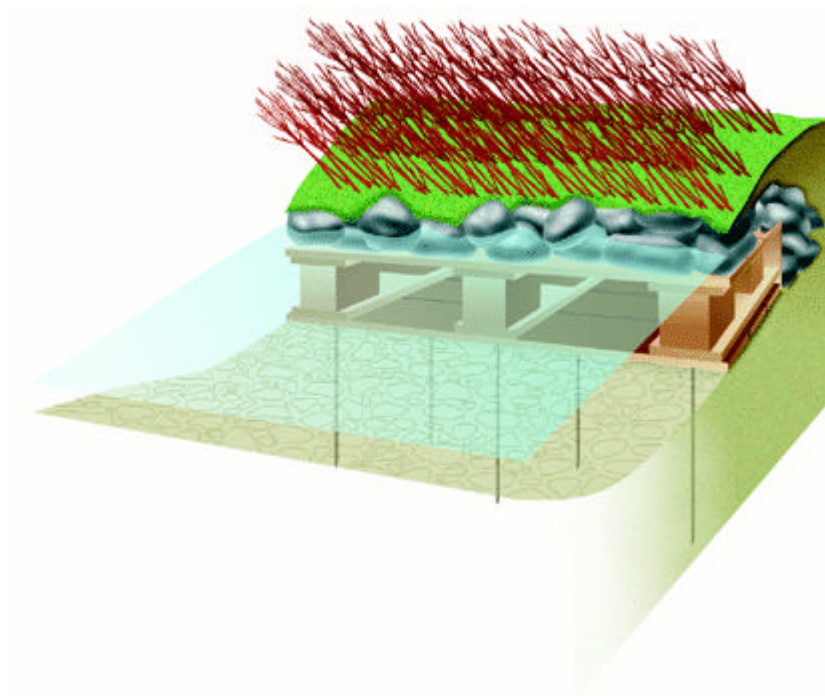
Construction Guidelines



This is a fabricated 1.8 to 2.4 m long structure constructed of rough-cut 5 cm by 25 cm hardwood or cedar lumber for durability and long-life underwater. Six 15 to 20 cm thick spacer blocks are used to create the 25 to 30 cm wide gap between the six 1.6 m long stringers. The stringers are positioned at right angles to the bank and secured to the blocks with 10 cm nails or ceramic coated deck screws. Two blocks per pair of stringers are positioned such that one is located flush with the outside edge and the other is recessed 60 to 75

cm toward the rear. The 1.8 to 2.4 m boards are then secured to the stringers that have been positioned with one in the middle and one at either end. Each board is laid flush to the next. One additional board is secured to the inside as a backboard. Six 1.6 cm holes are then drilled through the bottom board, stringer and block to allow for the placement of the 1.5 m long by 1.6 cm diameter steel reinforcing rods. Larger reinforcing rods will require larger drilled holes.

The outside bends of stream are the target locations with the structure being excavated into the bank and below the waterline of the low flow channel. In most cases, the structures can be placed using hand tools, but in larger projects the use of heavy machinery may be the best means of excavating,



installing the structures and restoring the river bank. Generally the L.U.N.K.E.R.S. are placed flush with the bank or exposed within 10% of the low flow channel width.

The L.U.N.K.E.R.S. are placed individually or in series depending on the available area and size of stream or river. Each unit is anchored to the bed by steel rods or "T" bar posts and covered with stone to secure it in place. The largest stones are placed along the toe of the newly formed bank. Soil, seed, mulch and native shrubs are then applied to create a stable 2:1 slope.

Materials

For building and installing a L.U.N.K.E.R.S., you will need the following:

- seven 5 x 25 cm rough cut boards, 1.8 to 2.4 m long
- six 5 x 25 cm rough cut stringers, 1.6 m long
- six 15 to 20 cm square spacer blocks, 25 cm long
- six 1.6 cm x 1.5 m steel reinforcing rods
- 66 - 90 10 cm long galvanized ardox nails or ceramic coated deck screws
- 1.6 cm wood auger bit at least 25 cm long
- shovels, rakes, tape measure, hammers, drill and screwdriver
- 2 tonnes of field stone
- sod or seed/mulch mat, shrubs



L.U.N.K.E.R.S.

Cost and Maintenance Needs

Each unit costs approximately \$400.00 for materials and it takes one day to construct and install for a group of three. Units can be constructed off-site and carried to the stream for installation. Frequent inspection is suggested within the first full year to ensure proper placement and growth of vegetation. Annual inspection after this period is recommended. In stable channels, the expected life of the structure is 10 to 15 years.

Integration

L.U.N.K.E.R.S. can be integrated into larger erosion control and habitat enhancement projects such as:

- native material revetments
- live crib walls
- wing deflectors
- sweepers
- log/brush shelters

Demonstrations

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

- Project #15, Black Ash Creek Rehabilitation Project
- Project #17, Hiltz Farm
- Project #26, Mini L.U.N.K.E.R.S.
- Project #67, East Humber River Rehabilitation Project
- Project #73, Hopefull Creek Rehabilitation
- Project #106, Spooner's Hole
- Project #109, Morningside Tributary Aquatic Habitat Rehabilitation Project
- Project #116, Spring Creek
- Project #118, Rouge River Headwaters 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



L.U.N.K.E.R.S.