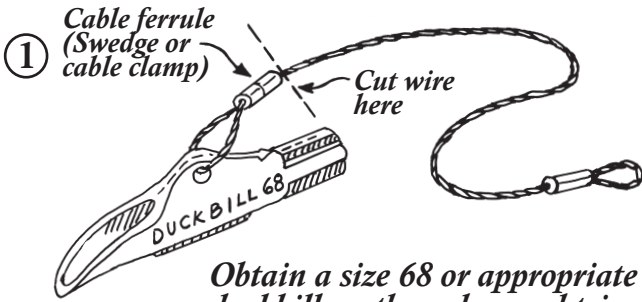


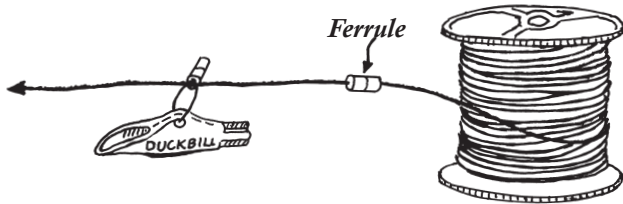
Spruce Tree Revetment

Step-by-Step

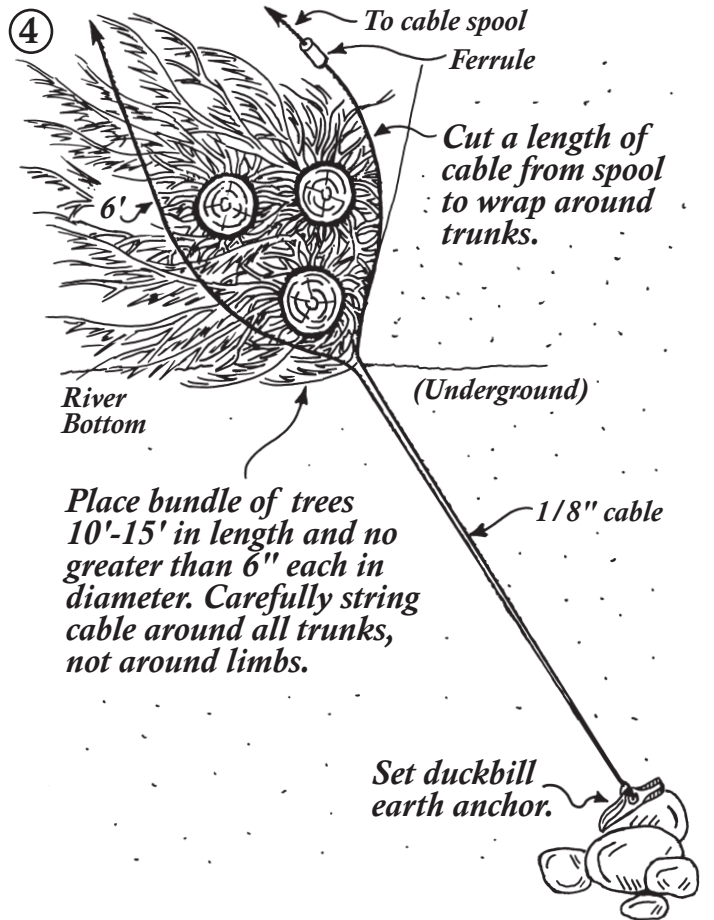
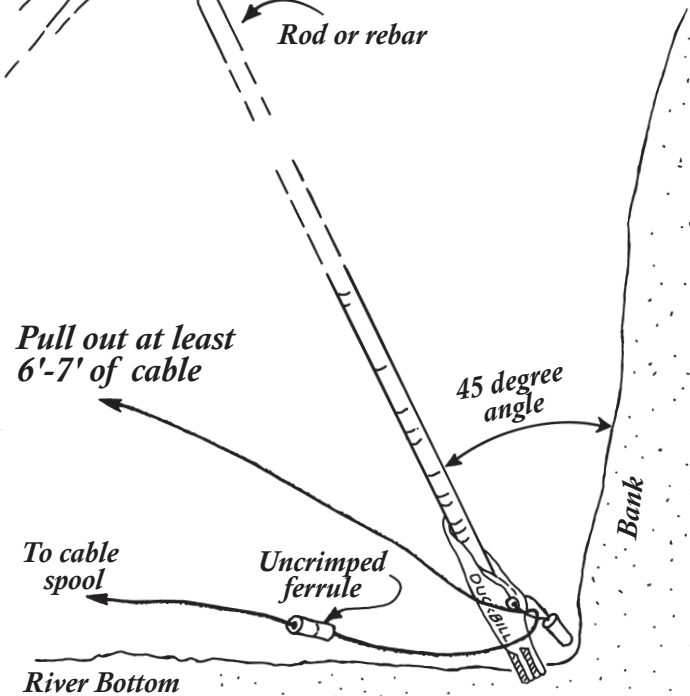


Obtain a size 68 or appropriate duckbill earth anchor and trim wire as indicated.

- ② Obtain a spool of 1/8" diameter stainless steel cable and thread through an uncrimped cable ferrule then the duckbill earth anchor.

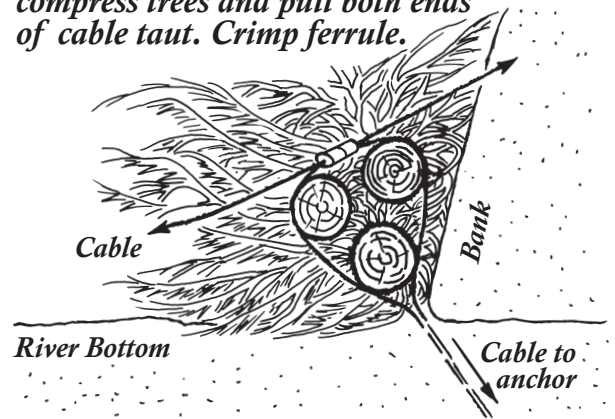


- ③ Insert driving rod into the earth anchor. Drive the anchor at a 45 degree angle into the bank to refusal. Remove rod and set anchor by pulling the cable.

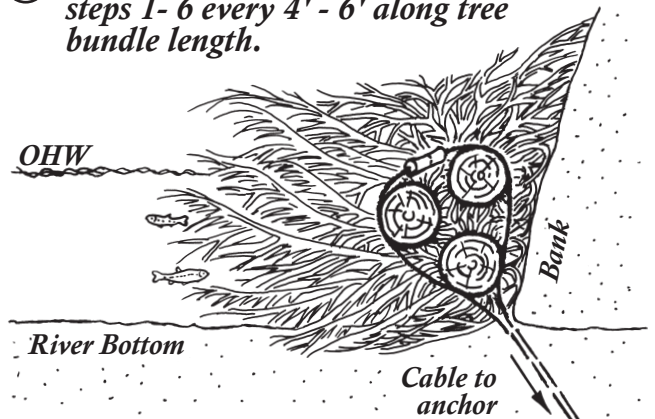


Place bundle of trees 10'-15' in length and no greater than 6" each in diameter. Carefully string cable around all trunks, not around limbs.

- ⑤ Thread loose end of cable through ferrule, compress trees and pull both ends of cable taut. Crimp ferrule.



- ⑥ Cut and remove excess wire. Repeat steps 1- 6 every 4' - 6' along tree bundle length.



Spruce Tree Revetment

Spruce tree revetments protect streambanks from erosion and provide increased bank protection. This is a relatively inexpensive and functional bank protection technique. Spruce tree revetments trap sediment, and over time, aid in rebuilding bank structure and establishing long-term bank stability. The tree limbs reduce near-bank water velocities, provide protection from scour and erosion, provide cover for juvenile fish, and act as a source of organic debris.

Spruce tree revetments are often used in combination with revegetation techniques. They provide immediate cover for fish until living plant cover is provided by the revegetation techniques. Consultation with a streambank revegetation specialist is necessary to determine site needs and revetment design. Spruce tree revetments may involve a single layer of spruce trees, multiple spruce trees cabled together, or single layers stacked. All revetments require an adequate cable and anchoring system. Selected spruce trees should be green and limber with many branches. When collecting, be careful not to damage surrounding vegetation when harvesting and transporting spruce trees. Anchor spruce tree revetment into well-vegetated and non-sloughing banks at both upstream and downstream ends.

Install 4-6 inch diameter spruce trees parallel to the streambank and overlap 1/3 to 1/2 of their length in a shingle fashion. The top of the tree should be orientated downstream. Care should be taken to avoid unnecessary damage to, or removal of, tree limbs. The trees are secured tightly to the bank with 1/8-inch cable and earth anchors, every 4-6 feet (See *Spruce Tree Revetment Step-by-Step*). In higher velocity systems, 3/16 cable and larger and more frequent earth anchors may be used.

Maintain spruce tree revetments by adding new trees every 1-3 year(s). Fresh, bushy trees may be cabled directly in front of the original revetment. Spruce trees must be anchored securely and checked yearly to replace cable and add new trees. Remove excess cable and retighten any loose cable around trees. If the trees are not maintained and the trees deteriorate over time, any visible cables or anchors should be removed from below ordinary high water.

Advantages:

- Easily installed, no heavy equipment needed
- Materials readily available
- Inexpensive
- Provides soil erosion protection and fish habitat
- Least intrusive of bank protection techniques

Disadvantages:

- Maintenance required every 1-3 year(s)
- Must remove excess cable/visible anchors and add new trees as necessary