MAP CODE
BIOE

BIOENGINEERING

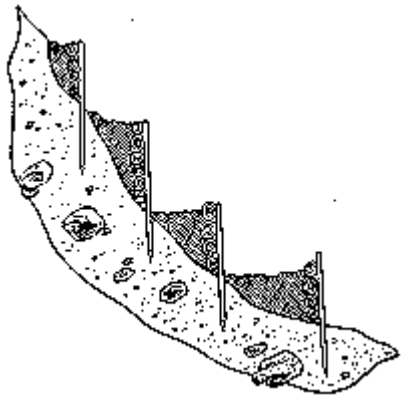
USE
Erosion
Sediment
Stormwater

What

- Erosion and sediment control structures made from stalks of live willow shrubs that continue to grow once emplaced into the soil.

Purpose

- To prevent erosion with their physical structure until established plants can provide permanent erosion protection.
- To jump-start the establishment of self-sustaining vegetation on exposed hillsides and gullies, which stabilize the slopes and stop erosion and sediment production.



Source: Polster Environmental Services

Wattle Fencing - Sideview

Where

YES: Areas of disturbed soil or hillsides, streambanks and lakeshores, and where soil stabilization and erosion control is required because of stormwater runoff or high water table.

NO: Areas where there is severe soil or water contamination, the stream bottom is degrading, human or animal traffic cannot be controlled, or where shade is too dense for selected plant species to thrive.

Materials, Equipment & Costs

- Live willow stakes, timber stakes, twine, rope, pots or mats, plant material
- Backhoe, shovel, sledge hammer.
- $ Low to medium.

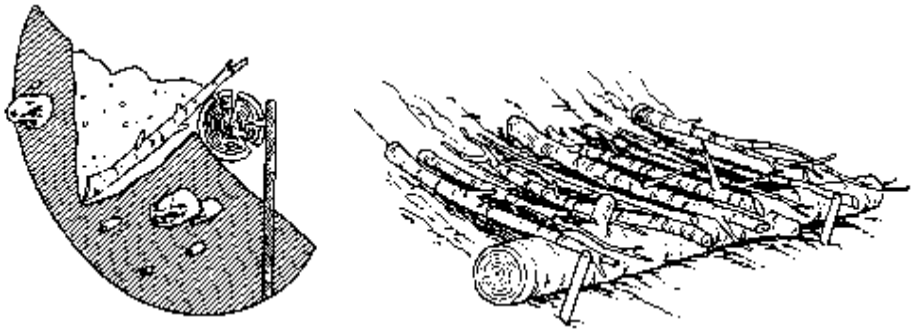
Plans & Specs

- If using for first time, consider obtaining expert help from environmental or erosion control engineers and/or consultants.

Options

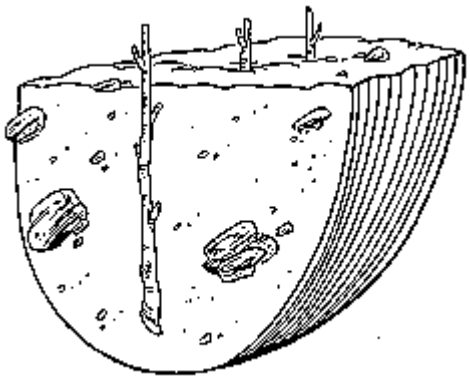
- Wattle Fence
  Small retaining walls built of willow stakes. Useful on hill slopes and gullies with minimal ravelling.

- Modified Brush Layer
  Robust short retaining walls (1-2 metres wide) made with 2 metre long rough cut 2x6 planks or logs and live willow stakes. Excellent for stabilizing ravelling or actively eroding hill slopes and gullies. Used in patterns to give complete coverage of a hillside or gully wall.



Source: Polster Environmental Services

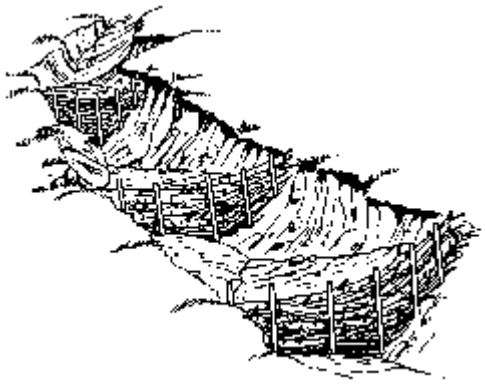
- Live Cuttings
  Stakes of willow planted into exposed or eroding hill slopes and gully walls. Provide quick coverage of shrubs over an entire area and are effective alone or between modified brush layers.



Source: Polster Environmental Services

Live Staking

- Live Gully Breaks
  Large wattle fences constructed across an eroding channel. Live gully breaks are designed to control the initiation of torrenting by reducing the effective gradient of the eroding channel.



Source: Polster Environmental Services

- Interplanting Riprap
  Riprap is often used to protect stream banks and lakeshores. Live cuttings can be inter-planted in riprap to provide additional slope stability. Root growth below the riprap will improve soil strength and live vegetation will hide the rocks, providing a more natural look.

Maintenance

- Provide regular monitoring and maintenance, especially in the first year, to assure adequate plant survival.
- Be aware that flood or drought conditions could impact the installation. Severe weather will reduce seedling survival and supplemental planting may be needed.

Sources

Polster, D. (1998): **Introduction to Soil Bioengineering;** *British Columbia Ministry of Forests*, Resource Tenure & Engineering Brach.

Thomas G. F. (1997): **Bioengineering for Hillslope, Streambank and Lakeshore Erosion Control.**; *Institute of Agriculture and Natural Resources*, University of Nebraska-Lincoln

Lewis, L., Salisbury S.L. and Hagen, S. (2000): **Soil Bioengineering for Upland Slope Stabilization;** *Washington State Department of Transportation*, Research Project WA-RD 491.1.