Lake Soil & Water
Estd Conservation District 1947

# Hand-Placed Woody Structures and Livestakes in DIY Stream Restoration

***What Are Hand-Placed Woody Structures?***

- **Logs, branches, and root wads placed manually in and along streams to manage flow, reduce erosion, and create habitat**
- **Messy, mimic nature**

**Benefits of Woody Structures**

- **Erosion Control: Reduce stream velocity and stabilize banks**
- **Habitat Creation: Provide shelter for fish, amphibians, and invertebrates**
- **Stream Structure: Encourage natural flow patterns and sediment deposition**
- **DIY Feasibility: Minimal tools and locally sourced materials**

**Placement and Anchoring Techniques**

- **Get the wood stuck in the smaller headwater streams**
- **This is a debris-trapping practice and will pond water**
- **Must prevent floating**
  - **The more wood you have in a channel the less mobile it is**
  - **Mobility decreases with more frequent log jams**
  - **Anchor behind live trees**
  - **Weave brush in**
  - **Install as channel-spanning jams- long pieces, large diameters, with branches**
  - **Wedge into channel**
- **Key logs serve as anchors**
  - **Length > 0.5 x bankfull width; 1.5 x bankfull is much better**
  - **Diameter > 0.5 x bankfull depth**
  - **Diameter not as important as length- want to be able to carry the logs. Think long and skinny**
- **Spacing**
  - **Every vertical foot- as rough guidance**
  - **Find locations where you can anchor them**
  - **The more frequent, the better**
  - **Use where grade-control is needed**
  - **Use at base of eroding banks to deflect flow to thalweg (center of channel)**
- **Style**
  - **Messy, fill up space, weave in branches, mimic naturally occurring wood**

    - **V shape: V pointing upstream, long pieces, cross channel**
    - **Zig Zag: cross-channel**

***What Are Livestakes?***

- **Cuttings from live woody plants (e.g., willows, dogwoods) inserted into banks**
- **Easily propagated and highly effective for stabilizing stream banks**

**Benefits of Livestakes**

- **Soil Stabilization: Roots anchor soil, reducing erosion**
- **Low Cost: Readily available and easy to install with basic tools**
- **Ecological Impact: Enhance riparian vegetation and biodiversity; provide shade, cool water temperature, and food source for macroinvertebrates**

**How to Collect and Install Livestakes**

- **Collection: Harvest during dormancy (fall to early spring) from native plants**
- **Installation:**
    - **Drive stakes 2/3 of their length into moist soil along stream banks**
    - **Space 2-3 feet apart for effective coverage**
    - **Cut off top if less than 2/3 is in the soil so 2/3 is in the soil**
- **Maintenance: Regularly monitor for growth and replace any failed stakes**

**Best Practices for Livestake Success**

- **Use native species suitable for the site's soil and moisture conditions**
- **Install in areas close to the stream for consistent hydration**

***Combine Livestakes and Woody Structures***

- **Livestakes provide long-term vegetative stability, while woody structures offer immediate structural support**
- **Together, they mimic natural stream restoration processes**
- **Place woody structures in eroding areas, plant livestakes around and through them**
- **Sediment buildup around structures promotes vegetation growth**

***Practical Tips for DIY Stream Restoration***

- **Site Assessment**
    - **Identify erosion hotspots and high-priority areas for intervention**
    - **Evaluate flow dynamics, soil type, and stream width**
- **Tools and Materials**
    - **Tools: Mallets, shovels, pruners, planting bars, hand saws**
    - **Materials: Native livestakes, fallen logs, branches, rocks for anchoring**
- **Timing and Weather**
    - **Perform work during low-flow conditions for easier access**
    - **Plant livestakes during dormancy for optimal rooting success**
- **Regulatory Considerations**
    - **Check for any local or state permits required for stream work**

    - **Rule of thumb no needed if not using equipment in the stream**
- **Monitoring and Maintenance**
    - **Inspect regularly after high-flow events to ensure stability**
    - **Check for water cutting around the structures**
    - **Replant livestakes and adjust woody materials as necessary**