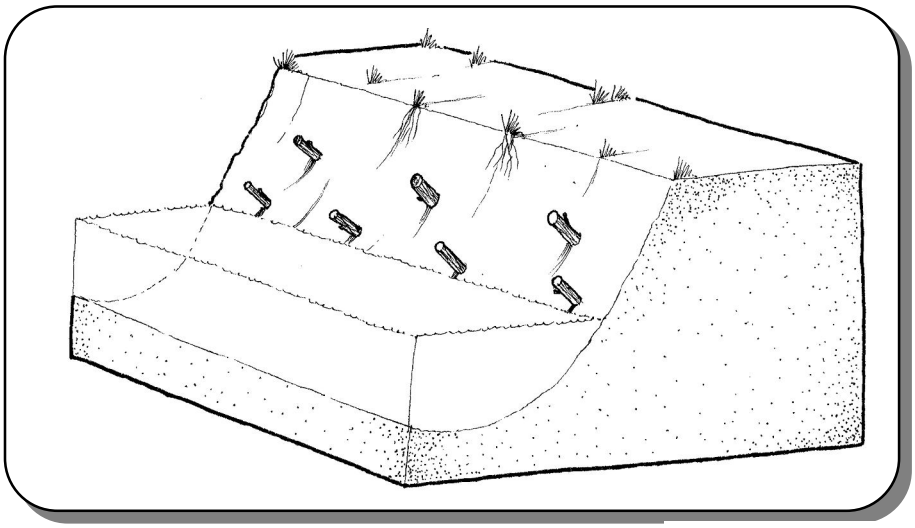
Pole Plantings



Materials:

- o willow or cottonwood cuttings
- o poly twine
- o chain saw or loppers (to harvest)
- o auger or planting bar
- o 1 person minimum

Description and Use

Pole plantings are cuttings from willow (*Salix* spp.) or cottonwood (*Populus* spp.) used to revegetate eroding streambanks. These cuttings will sprout and take root, stabilizing the streambank with a dense matrix of roots.

How To Install

1. Collect willow or cottonwood cuttings from a local, native stand that is in healthy condition. Thin no more than 2/3 of each total plant. Willow cuttings for pole plantings should generally be at least 1/2 inch in diameter or larger, depending upon the species.

Larger diameter cuttings have a greater supply of stored energy for rooting than smaller diameter cuttings. Bigger diameter and longer lengths are better suited for severely eroded areas and fluctuating water levels.

Ideally, cuttings should be collected during the dormant season to ensure the highest success rate. Cuttings can be collected during the growing season if all the leaves are removed from the stem, although establishment success will be lowered. Spring plantings are generally more successful than fall plantings.

2. Prepare cuttings by trimming off the top to remove the terminal bud, allowing a majority of the energy in the stem to be sent to the lateral buds for rooting and sprouting.

3. The cuttings can be tied into bundles for ease of transportation to the site.

4. Soak the bundles for 5 to 7 days. Cutting length is determined by site conditions. The cutting should extend several inches into the permanent water table to ensure adequate moisture for sprouting. At least 1/2 to 2/3's of the cutting should be below ground to prevent the cutting from being ripped out during high flows. Usually, at least 2 to 3 feet should be below ground. It should also be long enough to emerge above adjacent vegetation such that it will not be shaded out.

5. Pole plantings are usually planted with a power auger or a punch bar. It is critical to ensure the soil is packed around the cutting to prevent air pockets. "Mudding" (filling the hole with water and then adding soil to make a mud slurry) can remove air pockets .

6. It is often advisable to plant at least two rows of cuttings to cover the range in fluctuating water levels. The location of the cuttings will depend on the specific situation and hydrograph. In some cases where information is limited, one row can be planted at the low flow line and the other at the high flow line. Offset the rows to get better coverage (see illustration).

Pole Plantings

Inventory & Planning Considerations

1. Shrub willows such as coyote willow (*Salix exigua*) are used for planting within channel banks. Willow tree species and cottonwoods are normally planted along the upper bank and floodplain areas. Tree species usually provide more shade.

2. If this method is used in a highly erodible area, some protection will be required in front of the pole plantings. In particular, the toe of the slope is very susceptible to erosive flows and scour. Analysis and calculations of forces will provide guidance for suitable toe protection (refer to Chapter 3 of the Streambank Bioengineering Guide). In some cases, brush revetment or fiber rolls may be adequate (see other Technique Sheets), while other situations may require rock. If rock is used, careful application is required. Improperly placed rock can result in erosion problems on the opposite streambank as well as downstream.

3. As with all techniques, give careful attention to the upstream and downstream ends of the treatment area to prevent flows from getting behind the treatment. The key is to divert flows away from these endpoints. Tying into existing on site features such as trees, rocks, etc., or using brush revetment and rock barbs are some possible solutions.

4. It is important that the cuttings be placed in water immediately following harvesting if they are going to be planted during the next week. The cuttings can also be kept in cold storage (32 to 35^{o} F) for up to 6 months. After removal from cold storage, soak the cuttings for 5 to 7 days prior to planting.

5. Rooting hormones and fertilizers do not significantly improved success compared to the cost of the materials.

6. Cuttings will often require initial protection from beaver. Fine wire screen or mesh can be secured around the cuttings to offer protection.

7. Never disturb the site unnecessarily. Remember the goal is to stabilize a site. The less it is disturbed, the easier it will be to restore.

Management

To ensure the highest success for the treated area, determine the land management practices that created the eroded streambanks and modify those practices as necessary.

If the area is grazed, restrict livestock from treated areas to allow the eroded section of streambank to heal. Exclosure fences are the most efficient means to accomplish this goal. Managers should resist the temptation to put the exclosure fences at the high water line. The exclosure areas should include enough of the riparian zone to allow the stream to shift naturally over time.

If the area is farmed, a riparian buffer strip should be established and maintained. A buffer strip on both sides of the stream should be set aside to allow for natural riparian vegetation and stream function. A wider buffer strip is strongly encouraged and will yield greater benefits.

Check with your local NRCS district conservationist for cost-share programs and volunteers for fencing, planting, and other restoration activities.

Finally, a stream is an interconnected system. Land use practices both upstream and downstream will affect the success of your bioengineering work. Talk with your neighbors and work together to create a healthier riparian and stream system that can benefit everyone.

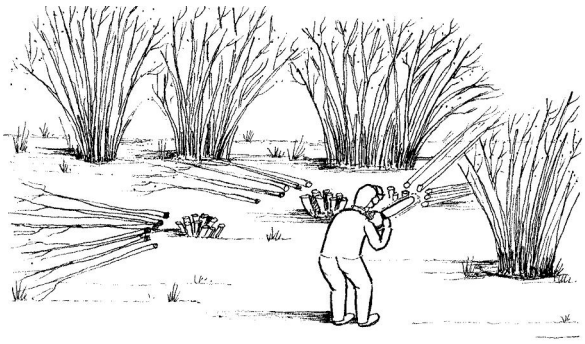
Monitoring & Maintenance

Do not ignore the project after it has been installed. Periodic monitoring of the project will provide valuable insight into the stabilization process and may offer important information for future projects.

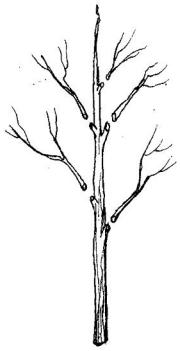
Replanting will probably be necessary to fill in areas where plantings did not grow. It is not uncommon to have some cuttings die due to highly variable water flows from year to year or from wildlife predation. Flood debris lodged around the cuttings should be removed to prevent shading and to allow growth.

Procedure for Pole Plantings

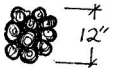
Pole cuttings can be collected from large willows and cottonwoods.



Step One: **Harvest Willow Cuttings**



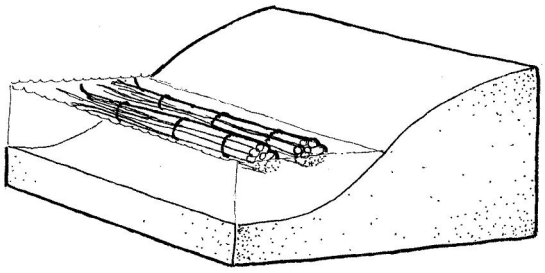
Trim off all side and terminal branches



Tie cuttings into 8-12" diameter bundles using 2 pieces of twine to facilitate transportation.

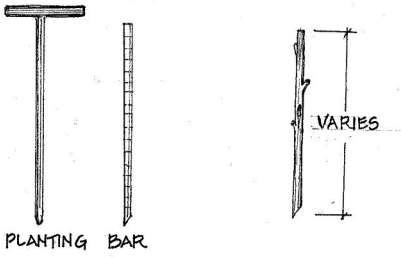
Step Two: Create Willow Bundles

Soak bundles for 5 to 7 days. Remove them from water before roots emerge.



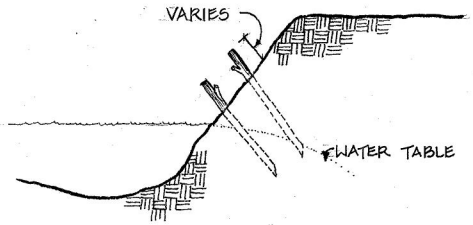
Step Three: Soak Willow Bundles

Final cutting length will vary (See "How to Install"). Punch bars or augers can be used for creating the holes.



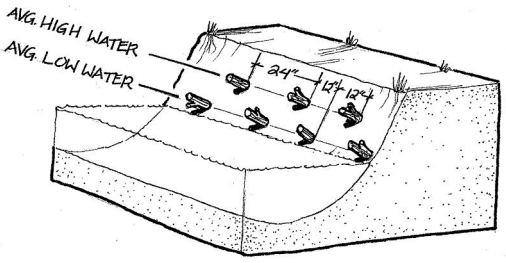
Step Four: Planting Preparation

Plant the pole such that the end of the cuttings extends into the water table. Above ground height varies (See "How to Install").



Step Five: Pole Planting

The following is a good spacing pattern to cover the variables of a fluctuating water level.



Step Six: Pole Placement