



# STREAM GUIDE

## LANDOWNER'S GUIDE TO LIVE STAKING

### Planting Streambanks with Native Vegetation

Planting native vegetation on streambanks is one of the cheapest, easiest, and most beneficial activities streamside landowners can do to reduce erosion and maintain healthy streams. There are two basic approaches to planting near streams – using potted plants, or “live staking.” Live staking is the process of driving cut stems of certain plant species into the soil. When done properly, the stakes will sprout roots and grow into a new plant!

This Stream Guide provides information on native plants of the Catskills that can be live staked, focused primarily on willow and dogwood species, the required materials, and step-by-step instructions for gathering, installing, and caring for live stakes.

#### Common Catskill Native Willow and Dogwood Species that can be Live Staked

- Pussy willow (*Salix discolor*)
- Silky willow (*Salix sericea*)
- Heart-leaved willow (*Salix eriocephala*)
- Shining willow (*Salix lucida*)
- Red Osier Dogwood (*Cornus sericea*)
- Silky Dogwood (*Cornus amomum*)

PUSSY WILLOW



SILKY WILLOW



RED OSIER DOGWOOD





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### Materials needed

(All non-plant materials are likely available from your local hardware store)

- **Dormant live stakes** (purchased or sustainably harvested)
- **Dead-blow hammer**, rubber mallet, or another hammer that minimizes damage to the live stake
- Three-foot length of  $\frac{3}{4}$ " diameter **concrete form pin** (see image below, do not use rebar as it will be much harder to remove after creating the pilot hole)
- **Sledgehammer** for driving the form pin
- **Loppers or other cutters** able to cut through 1"-3" woody material
- **Waterproof (or water friendly) footwear** for standing in or near the stream
- **Work gloves**



Required tools, from left to right: willow stake, concrete form pin, sledgehammer, dead-blow hammer, work gloves, rubber mallet, willow stakes, loppers.

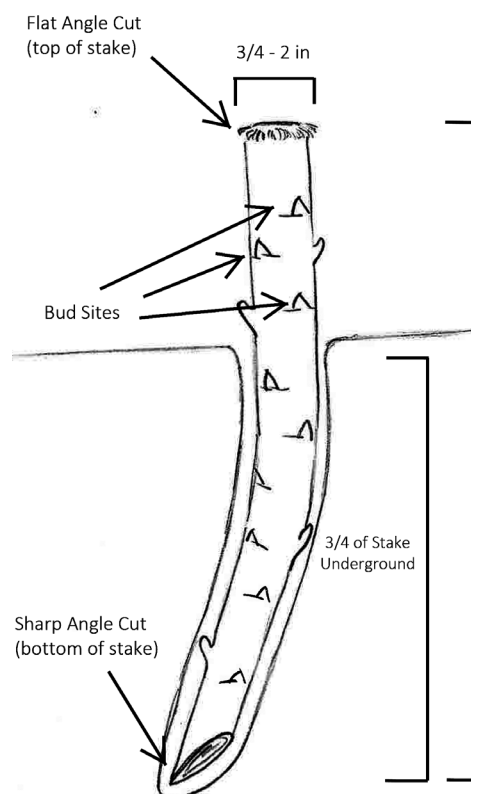
### Procuring Live Stakes

Live stakes can be purchased from some nurseries and garden centers. If purchasing live stakes, be sure they are a species that is native to the Catskills. If you are unsure if a particular willow is native, refer to any reputable plant guidebook or check with your local Soil & Water Conservation District. The Ashokan Watershed Stream Management Program (AWSMP) has also published multiple fact sheets, including a Guide to Native Riparian Plants of the Catskills. Contact information for the AWSMP can be found at the end of this guide.

Residents of the Ashokan Reservoir watershed may be eligible to receive live stake material at little to no cost from the Ulster County Soil & Water Conservation District through the Catskill Streams

Buffer Initiative (CSBI) program. More information on the CSBI can be found at the end of this Stream Guide and at <https://catskillstreams.org>.

Another option for procuring live stakes is to harvest them from existing healthy plants on your property or where you have permission to do so. It is illegal to harvest plants from public lands. For best results, harvest live stakes when the host plant is dormant and leafless. In the Catskills region this is typically between November and April. We recommend harvesting and installing live stakes in late March or early April to avoid damage and/or desiccation during the winter months. It is best to harvest the stakes shortly before they are installed. Soaking the stakes fully submerged in a bucket for a period of 48 hours to 7 days prior to installation will



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improve results. If stakes must be stored for more than two hours, store them in water or wrapped in soaked paper or burlap.

Live stakes can be harvested from healthy willow and dogwood shrubs without damage if the harvest does not reduce the host plant's original biomass by more than 50%. Cut stems near the base of the plant, approximately one foot above the ground

surface, and trim off any smaller lateral (side) branches. Longer stems may be able to provide multiple stakes. For best results, stakes should be approximately 3 feet long with a diameter of at least  $\frac{3}{4}$ " (about the size of your thumb) up to 2 inches.

The bottom end of each stake should be cut at a sharp angle and the top of each stake should be cut flat. An angled cut will

make inserting into the ground easier and help determine orientation when installing. A flat top will make pounding with a hammer more efficient. These two cuts will also allow the installer to remember which ends are up and down with regards to the parent plant. Live stakes will not grow if planted upside down.



Cut stakes approximately 1 foot above ground.



Remove all lateral (side) branches.



Stakes should at least be the size of your thumb.



Bottom end of stake cut at an angle.

## Installing Live Stakes

The most important factor in successfully installing live stakes is ensuring that the stakes are installed deep enough to reach the summer water table. Stakes planted near the toe, or lower portion of a stream bank, can be as short as 18" long. If installing higher on the bank, the stakes need to be long enough to reach the groundwater table to succeed. Three-foot-long stakes are often effective, but on a high bank they may need to be longer. On very high banks, live staking may not be the best option since it will be difficult for plant roots to reach the summer water table.

In some places the stakes can be driven directly into the stream bank. However, if the planting site is rocky, it may be necessary to create a pilot hole for the stake by driving a properly sized concrete form pin into the ground. After the form pin is removed, the stake can then be driven into the pilot hole much easier and with less damage.

Each live stake has the potential to grow into a large shrub. Thus, stakes should be spaced between 1 and 3 feet apart for a dense planting with sufficient root mass for mitigating erosion.

## Maintenance

Live stakes are not only cheap and easy to install, but they also require very little maintenance if installed properly and in the right location. Some areas will require periodic watering for the first growing season if soil is not moist enough. Depending on the deer population in your area willow and dogwood stakes may need to be protected from deer browse during the first few growing seasons. Even when properly installed, it is likely that some stakes will not establish roots and may need to be replaced.



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### Installation Instructions

1. Stakes should be planted perpendicular or at a 90o angle from the slope of the bank.
2. Use a concrete form pin and sledge-hammer to create a pilot hole, if needed.
3. Place the angled end of the stake into the pilot hole or directly into the soil.
4. While holding the stake steady with one hand, strike the flat top of the stake with the dead-blow hammer hard enough to drive the stake into the ground.
5. Drive the stake 3/4 of its length into the soil or as deep as possible but be sure to leave a few (at least 3) of the bud sites above the ground.
6. Make a final clean cut on the top of the installed stake with a set of loppers. Cut as low as necessary to clean up any splintered, split, or mushroomed tops.



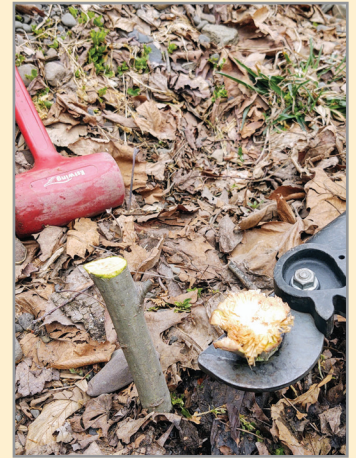
Use form pin to create a pilot hole.



Drive stake into soil using a dead blow hammer or mallet.



Drive stake deep, but leave 3-5 bud sites above ground.



Clean the stake up after driving by creating a clean, flat cut at top.

You should see some leafy growth and small branches from the live stakes in the first growing season, especially if installed during the dormant season. However, in the first year the stake focuses much of its energy on establishing a new root system. Do not assume the stake was unsuccessful based on a lack of significant above-ground growth in the first year. At the end of the first growing season, a gentle tug on the stake will indicate whether the stake has rooted or not. If the stake slides out of the ground easily, it was unsuccessful at establishing roots and should be replaced.

After the first year the above-ground leafy growth will increase rapidly. After a few growing seasons, the shrubs that have grown from your live stakes may serve as

the source plant for successive plantings. New cuttings can be used elsewhere on your property or given to a neighbor who has watched your streambank come to life with native vegetation.

### Other Options for Enhancing Your Streamside Buffer

If you are a resident of the Ashokan Reservoir watershed and are interested in enhancing your streamside vegetation but cannot install live stakes yourself, or if you want to add additional native riparian species to your streamside property, the Catskill Streams Buffer Initiative (CSBI) can help by providing technical guidance, plant material, installation services, and planning and management guidance at

no cost. Contact the Ashokan Watershed Stream Management Program at (845) 688-3047 or [info@ashokanstreams.org](mailto:info@ashokanstreams.org). Additional information and publications can be found at <https://ashokanstreams.org/publications-resources/>.



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