Creek Care: Growing Willow from Stakes

by Laura Lovett
2025

Marin County has over 3000 miles of natural creeks. If you are lucky enough to have one cross your property, you have a special asset that can support a complex part of nature's food web. However, you may often find it is more headache than benefit.

Much of this headache comes from the fact that while some creeks remain relatively natural, others have undergone changes resulting from development within the watershed, causing damage such as channel incision, bank failures, and flooding. Many stream banks also have been overtaken with decorative but invasive species that we plant around our homes, such as English ivy. Invasive plants spread quickly and shouldn't be removed without providing a replacement being planted to prevent soil erosion and to prevent other invasives from getting a foothold in the area.

Many riparian areas can be improved by supplemental plantings that enhance stream bank stability, increase biodiversity, create wildlife habitat, and improve water quality. If you'd like to improve the look and health of your riparian areas but don't know where to start, one option is to use willow cuttings to grow a willow thicket along the stream bank. Willows provide important wildlife habitat, cover for nesting birds, forage for herbivores, and improve water quality conditions in a myriad of ways. Under the right conditions, they can grow rapidly and provide effective soil stabilization along stream banks or in other highly erodible areas.

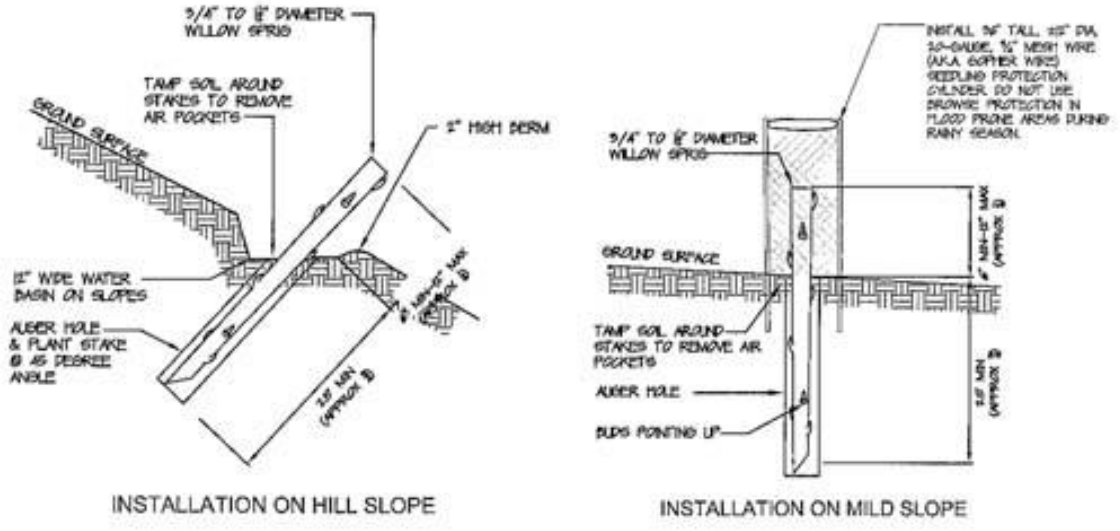
Willows have characteristics that make them resilient to high-velocity flood waters, burial by sediment, long periods of water inundation, high winds, and heavy browsing by wildlife. Willows sprout new shoots from roots and root crowns readily, and their stems possess abundant adventitious buds (i.e., buds that develop in an "atypical" place rather than at the branch tip or in leaf axils) that have the flexibility to form roots when in contact with saturated soils. This ability of willows to root quickly and easily, as well as their suitability for our local habitats, makes them a great tool to stabilize and vegetate stream banks.

In this special application, a woven willow fence with living stakes was used to protect a slope from erosion by high waters. Photo by Vicki Burns

All native riparian plants have some tolerance for long-term inundation and high velocity flood waters, but it varies by species. Willows should be planted in the mid or upper bank (sometimes called the over-bank) as they will grow into fairly large, multi-trunked shrubs, large enough to clog the flow of water in the stream if planted too close to the active water channel. Willows can tolerate being inundated fairly frequently and are a good choice for a stream's flood plain because they will bend with the flows.

Timing

Cuttings such as willow are best planted in the fall or early winter when plants benefit from more frequent rains and are using energy to develop roots. If there is a dry spell after stakes are planted, stakes will need to be hand watered to ensure they become established.



WILLOW STAKE PLANTING DETAIL

Illustration courtesy of PCI

Choosing a site

• Ensure your willow receives full sunlight at least 6 hours each day.

• Pick an area with well-drained soil to prevent waterlogging, which can lead to root rot.

• Allow ample space around the tree for its roots to spread comfortably and for it to grow to its full size. A spacing of two to four feet allows for die-offs.

• If the slope is not too steep, willows can be interspersed with large rocks or boulders on the bank. The rock works to prevent immediate erosion. As the willows become established, their roots spread in the underlying soil, binding the rocks and soil together.

Cutting the Stakes

• Ideally, make cuttings from willow shrubs near your planting location, as these species clearly thrive in your watershed. The most commonly used variety in Marin is arroyo willow (*Salix lasiolepis*). Other good choices are narrow-leaf willow (*Salix exigua*), red willow (*Salix laevigata*), Pacific willow (*Salix lucida* var. *lasiandra*), and Sitka willow (*Salix sitchensis*). Only red and Pacific willows of this group develop into tall trees.

• Remove no more than 1/3rd of the branches from any single source willow, and don't take cuttings from any branches that are overhanging a waterway as they are providing critical water quality benefits.

• Make cuttings after leaves fall and before buds burst in spring.

• The best rooting success is from cuttings made of 2- to 3-year-old limbs

• Willow stakes should be about three to five feet tall, and ideally between ¾ and 1 ½ inches in diameter. The top should be cut off cleanly.

• Cuttings should be straight with all side branches removed.

• Cuttings should be long enough to reach 8 to 12 inches into the lowest water table level of the year. A check of how high or low on the bank other riparian shrubs are growing will give you an idea where the water table is.

Planting Live Stakes

• For best success, soak live stakes in water for at least 48 hours before planting, and plant before roots emerge.

• Each stake should be planted two-thirds below the surface with only a small portion above ground to photosynthesize when spring comes. Most of the plant material must be underground to increase root growth

potential from the buds. The more buds that are underground, growing roots, the more success one will have with the method.

• Plant cuttings with point side down to access ground moisture and prevent them from being swept away during high flows. Keep the top of the stake above seasonal flows.

• Make a deep pilot hole with a piece of rebar, metal rod, or planting tool. Pilot holes allow for easier installation without damaging cuttings. In soft soils, pilot holes may not be necessary.

• At least 4 to 6 inches of stake should remain above ground, or enough to overtop competing herbaceous vegetation.

• Pound it in with a rubber mallet and stomp down the ground around it to close up the soil.

• If the top gets damaged during planting, prune it off with sharp loppers.

• Backfill and tamp soil around cuttings to ensure good soil to stem contact. Alternatively, pour a syrup-like slurry of soil and water into the hole, allowing sediment to displace any air pockets as water leaches into underlying soil. Poor soil-to-stem contact is a cause of willow stake death.

Browse protection should not be installed in the active channel during the rainy season because it may wash downstream or catch material being washed downstream. Install browse protection in the spring when plantings are beginning to leaf out, and remove before the next rainy season. Plastic tree tubes should not be used with willow, as they encourage pests. Deer like new willow shoots!

Typically, about 60–90% of live stakes survive, depending on many factors. You may need to water live stakes for the first year because they need moist soil, especially during root development in the spring and early summer. Early season drying is a common cause of live stake failure, as is competition from weeds. Watering should be done by hand as drip irrigation cannot be installed in the active channel because it may wash downstream.

Your efforts should yield a lovely riparian habitat that will stabilize the creek bank and provide habitat for many creatures in years to come.