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A GUIDE TO PLANTING WILLOW

*Created by the Grays Harbor Stream Team
Sponsored by the Grays Harbor
Conservation District*



SELECTING WILLOWS

Different species of willows are well suited for different environments.

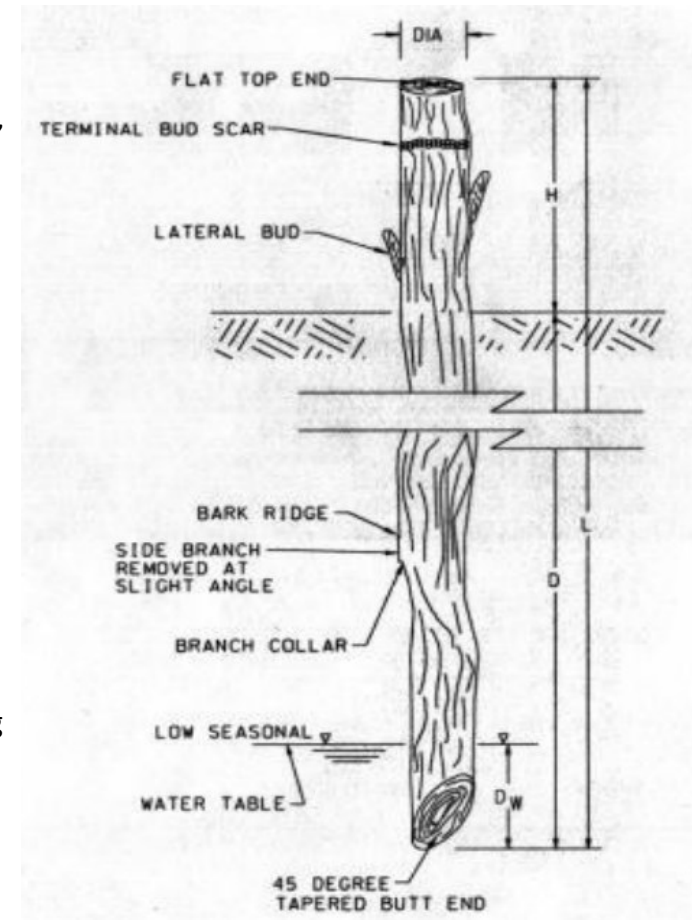
Common Name	Scientific Name	Best Conditions	How tall do they get?
Sitka willow	<i>Salix sitchensis</i>	Good rooter, common on streams banks of fast moving creeks, wetlands, and disturbed sites	up to 26 ft
Pacific willow	<i>Salix lucida</i>	Good rooter, common in wetlands and riparian zones, somewhat brittle and thus more difficult to pound	13-36 ft
Scoulers willow	<i>Salix scouleriana</i>	Drier sites and marine shores, roots slowly, often lower success rate than other willows	32-65 ft
Hooker willow	<i>Salix hookeriana</i>	Occurs mainly within 5 miles of salt water, good rooter	10-20 up to 26 ft
Black Cottonwood	<i>Salix geyeriana</i>	Good rooter	Can exceed 100 ft

PLANTING WILLOW STAKES

Place the cutting with the sharp end pointing down, in the hole, and the flat end up. If unsure of which way to plant, ensure the buds are pointing skyward when planted. Refer to [WSU's Plant It Right](#) video to see how it's done!

Plant the stake so that **at least** half the length of the cutting goes into the soil, 2-3 foot long stake making sure that some buds are exposed at the top. Tamp in around the cutting to ensure that there are no

air pockets along the stem. After pounding in the stake, push the planting bar into the soil a few inches away from the stem and pull the soil back toward the plant, thereby ensuring good soil contact all



HOW TO USE LIVE STAKES

Willow stakes can be planted but there are many other ways cuttings can be used.

Bioengineering Technique

What you will need

Live cuttings/ poles

- Live cuttings—3/4 to 2 inches in diameter, 5 to 15 feet long
- Cord, braided manila, sisal or pre-stretched cotton twine, or small-gauge, nongalvanized wire
- Dead stout stakes—wedge-shaped wooden stakes, 2 to 3 feet long depending on soil conditions
- Tools—machete, shovels, clippers, hammer, sledge hammer, saw, and chain saw
- Fertilizer and other soil amendments

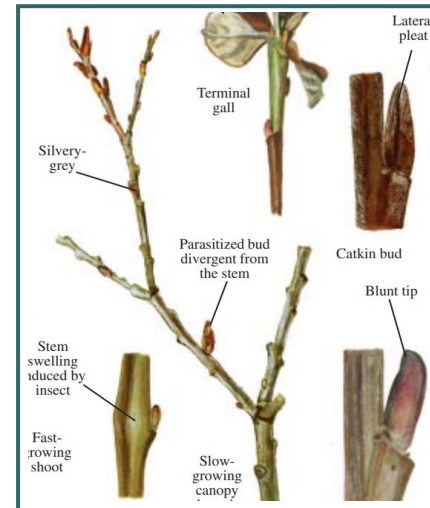
Live Cuttings



In soft soils, live stakes can be pushed directly or gently pounded into the soil with a rubber mallet. However, with hard, compact soils a tool called a planting bar must be used to punch a deep, narrow hole for the live stake.

WILLOW IDENTIFICATION

If you are cutting your own willow it can be nice to know what species it is. When it is dormant it can be hard to identify.



Sitka willow

Stems from fast-growing suckers, shiny reddish-brown; slow-growing upper canopy twigs knobby at the leaf scars, silvery gray, catkin buds flattened on the back like a duck bill early in the winter, only slightly larger than the leaf buds that are blunt at the tip. A coastal species, grows in disturbed sites and creekbanks in the forest.



Pacific willow

Trunk grayish-black, deeply furrowed, numerous twigs sprouting for the whole length of the trunk; twigs feeling wax coated to the touch, brown or grayish green in midwinter, yellow-green in spring; catkin buds slightly larger than leaf buds; dried leaves grey, lance-shaped.

Salix lasiandra

Leaf lance-

WILLOW IDENTIFICATION

There are around 350 willow species worldwide, the species listed here are the most common in the Pacific Northwest.



Hooker willow

Large shrub to small tree-type willow with a multi-branched crooked trunk. Buds mostly dark red to orange, occasionally with hairs, alternating on the stem. Twigs red, reddish-green or green and brittle at the base. Older limbs gray and smooth.



Cottonwood

Black cottonwood is a large tree with narrow or pointed crown. Trunk straight and tall. Young bark is smooth, thin, and older bark is thick, grayish-brown, and deeply furrowed with scaly ridges. Younger stems and twigs are yellow-gray. Found in deep river soils to drier valleys and canyons.

Planting willow can help reduce stream bank erosion and increase shade for the stream.

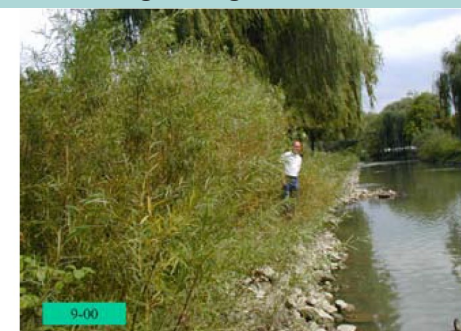
Wattle Fence - After installation and one growing season later.



Brush Layering - Excavation of brush bench and cutting placement.



Brush Mattress - After installation and one growing season later.

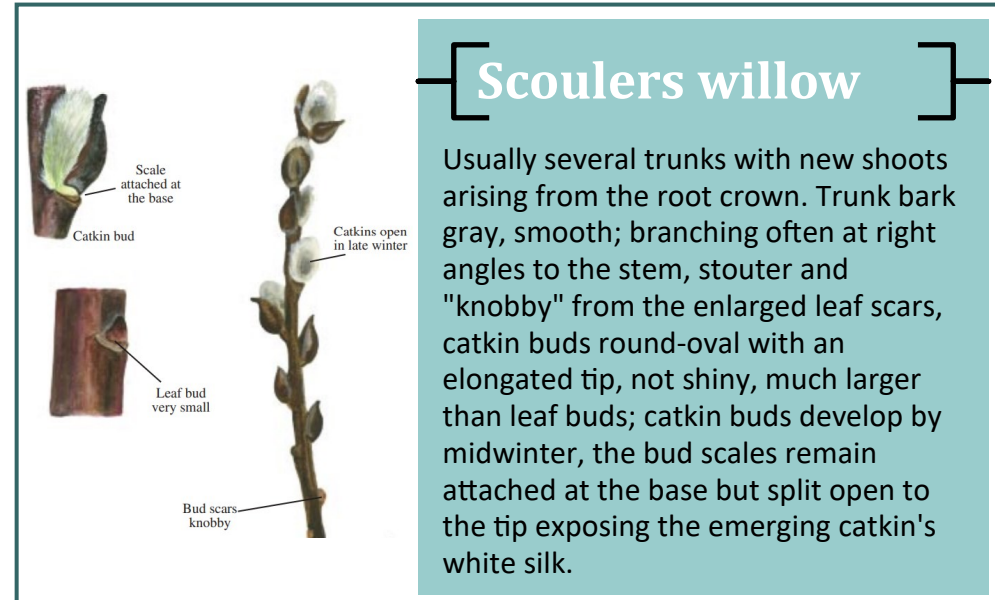


HOW TO USE LIVE STAKES

There are many ways to utilize willow cuttings depending on your planting site and project requirements.

Bio-engineering Technique	What you will need
Wattle Fence	<ul style="list-style-type: none"> • Live cuttings—2 to 4 inches in diameter, 3 to 4 feet long • Wattling materials—flexible branches that are 3/4 to 1 inch in diameter and 4 to 10 feet long • Tools—machete, shovels, hammer, punch bar, clippers, and saw
Brush Layering	<ul style="list-style-type: none"> • Live cuttings—3/4 to 3 inches in diameter and 3 to 6 feet long. The branches must be long enough so that the cut basal ends of the branches touch the back of the excavation, and the growing tips protrude 6 to 18 inches from the face of the slope. • Tools—machete, shovels, mattock, clippers, saw, and hammer • Fertilizer and other soil amendments
Brush Mattress	<ul style="list-style-type: none"> • Live cuttings—3/4 to 1 inch in diameter. The cuttings should be approximately 2 feet taller than the bank face. This will allow the basal ends to be placed in or at the edge of the water. Up to 20 percent of the cuttings can be dead material to add bulk. • Dead stout stakes—wedge shaped, 1.5 to 4 feet long, depending on soil texture • Ties—string, braided manila, sisal or prestretched cotton twine, or galvanized wire • Tools—machete, shovels, clippers, hammer, sledge hammer, punch bar, saw, and machine to shape the bank • Fertilizer and other soil amendments

It is important to pay attention to the color of the bark and the size and shape of bud and leaf scars.



Scoulers willow

Usually several trunks with new shoots arising from the root crown. Trunk bark gray, smooth; branching often at right angles to the stem, stouter and "knobby" from the enlarged leaf scars, catkin buds round-oval with an elongated tip, not shiny, much larger than leaf buds; catkin buds develop by midwinter, the bud scales remain attached at the base but split open to the tip exposing the emerging catkin's white silk.

Why use live stakes?

Stem cuttings from dormant trees and shrubs are called "live stakes." Once planted, the section below ground will root in moist soil, helping stabilize slopes and banks. The above-ground part becomes branches. Live stakes offer clear benefits for revegetation projects: they are inexpensive and allow many plants to be installed in hard-to-dig soils.

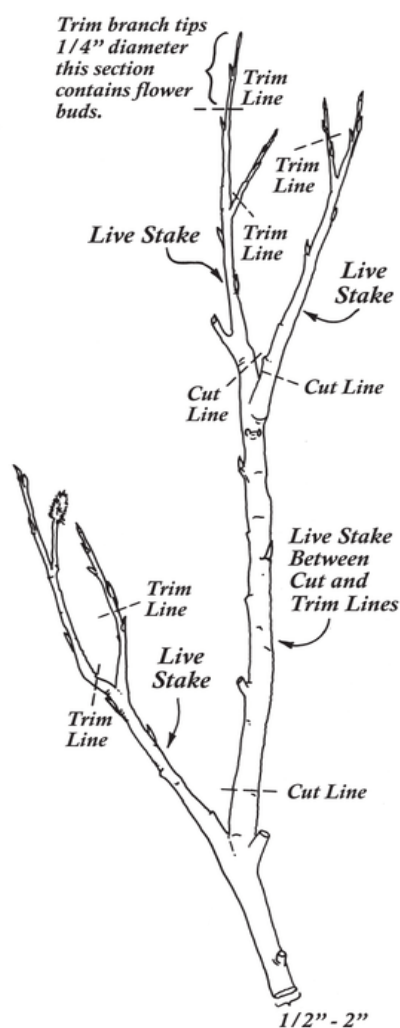
CUTTING WILLOW

Paying close attention to the details will increase the survivability of your willow cuttings.

Hardwood propagation is defined as a cutting taken from a mature woody stem for the purpose of propagation. Hardwood cuttings are made from branches, stems, or trunks. They are collected when the plants are dormant. Dormant hardwood cuttings can be divided into three general categories; whips, bundles, and live stakes.

Whips are typically the current year's growth or 1-year-old materials. Because of their small size, they should generally not be used in drier areas or areas without consistent deep watering. Pole cuttings or live stakes can be fabricated from shrub and tree species and usually range in diameter from 3/4 to 2 inches. All leaves are removed from live stakes. Bundles are packages of smaller diameter cuttings with the branches left intact.

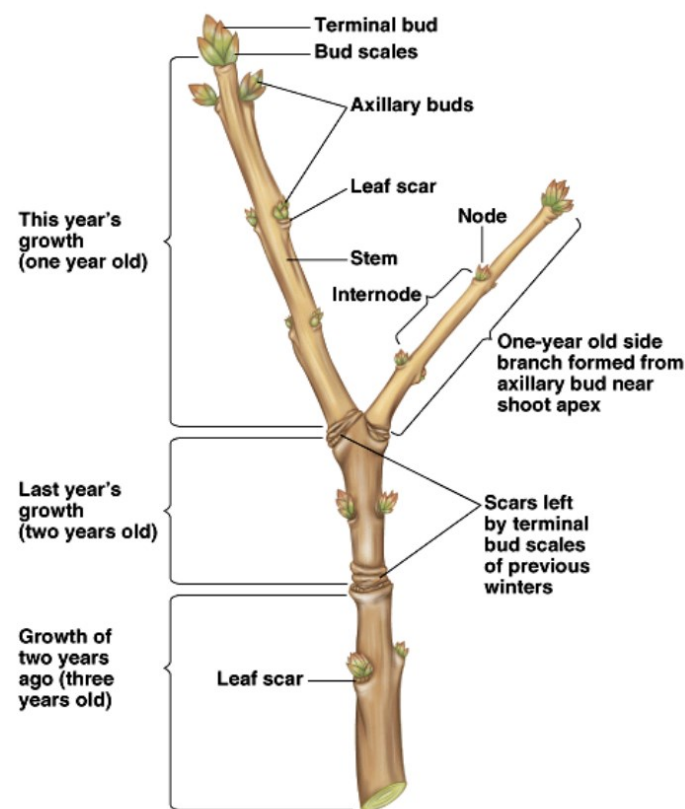
Most species should be harvested when the plants are dormant or entering dormancy. This is typically in the late fall to early spring, after leaves fall and before the buds swell. Choose and harvest healthy material that is free of splits, rot, disease, and insect infestation. While it is often



appropriate to include material that ranges in age up to 7 years, material should be harvested from plants that are at least 2 years old. In drier areas, current year's growth to 1-year-old stock should not be used. This younger material is often too small and does not have enough stored energy for good root establishment, and its small diameter makes it prone to drying. Harvesting of live materials should leave at least a third of the parent plant intact. The

equipment should be sharp to make clean cuts.

Soaking the material is desirable. Soaking hydrates the stem and starts swelling the root primordia. The roots will start to emerge from the bark in 15 to 30 days depending on the species and temperature. The optimum time for soaking is 14 days. Alternatively, live cuttings can be installed the same day they are harvested.



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