



A Guide to Streamside Planting

Planting trees can be an effective and inexpensive practice for those interested in improving their favorite stream. Reestablishing some streamside forest growth, aka a riparian corridor, protects streams from bank erosion and sedimentation and can help absorb and filter run-off and floodwaters. These trees also provide food and shelter for wildlife and regulate water temperature in streams by providing shade. Stream Team volunteers can order seedlings from the George O. White State Forest Nursery free of charge.



A stream with a healthy riparian corridor has plenty of woody vegetation within at least 100 ft of both banks.

Where to Plant

The best sites for doing a streamside planting are areas where a woody riparian corridor is currently absent or sparse. Planting in open areas such as this will also ensure your seedlings have plenty of sun to grow. Riparian corridors are ideally a minimum of 100 ft wide from the edge of each stream bank. If a stream site is lacking woody vegetation within this distance, it may be a good candidate for a planting.

Site accessibility is important to consider for planting projects, especially for large plantings involving many people. Keep in mind that your site may also flood in spring when you wish to plant, so plan accordingly. Very steep eroding streambanks and sites that are still subject to grazing by livestock should not be planted to ensure seedling survival and long-term success of the planting.

Preparation

Depending on the site and scale of your planting,

some site preparation may be useful. Mowing or weed-whipping the existing herbaceous vegetation can make planting much easier. If the existing vegetation is undesirable, such as fescue, treating the site with an herbicide approved for use near streams can help keep the site clear. Do this during the growing season prior to your planting.

For large plantings, get advice from a professional forester. Missouri Department of Conservation regional foresters can assist with important details like site preparation, weed control, mechanical tree planters, and labor requirements. They can also make recommendations for species selection and planting density and know about eligibility for various state and federal cost share programs depending on the amount and type of acreage planted.

Know how big your planting site is to gauge how many seedlings you'll need. A spacing of 10-12 feet works for most tree plantings, or 435-302 seedlings per acre, while shrubs can be spaced closer, at 3-6 feet apart.

Order seedlings well in advance to ensure supply. The George O. White State Forest Nursery accepts orders from September to April, and usually starts delivering around late February. Keep seedlings in a cool, moist place before planting and protect them from freezing temperatures.

Planting Instructions

The best time to plant trees is in late winter and early spring when the ground has thawed, late February through April, or in fall. This gives the seedlings' roots time to establish before the peak growing season. Late spring or summer planting will result in higher mortality.

Plant seedlings no deeper than the root collar (zone of transition between roots and stem) and ensure the hole is deep enough so the whole root system fits and points downward. Planting with the roots pointing upwards will eventually kill the tree, as will exposed roots. Pat the soil down around the seedling as you are planting with your hands or feet to remove large air spaces around the roots, but avoid overly compacting the soil. Be sure to use appropriate spacing between seedlings. Refer to the Stream Team Tree Planting guide at mostreamteam.org/assets/factsheet1.pdf and other sources for planting techniques.

Maintenance

Weed control is often necessary during the first two growing seasons following a planting to prevent grass and herbaceous weeds from outcompeting the seedlings. Mowing and cutting weeds with string trimmers between tree rows a few times a year is effective, as are herbicides when applied carefully. Tree tubes and weed mats can also be installed during the planting to limit weed competition and protect seedlings.

Fertilizing is not recommended and will encourage weed growth and may burn the tree roots. Watering seedlings is usually impractical and many riparian sites maintain good soil moisture. However, some mortality from water stress, herbivory, or disease should be expected. When possible, track the progress of your planting over time by taking pictures of the site in consecutive years.

Species Selection

When deciding which species to use in a planting, it's important to consider the physical conditions of your site. Most plant species have certain needs regarding soils, moisture, and light, and riparian conditions can vary widely. Soils in stream bottoms can range from gravel and sand to fertile loam or heavy clay. Some low-lying sites may flood every year in spring, while areas on higher terraces or along smaller streams may never flood, so choose species accordingly. Planting a diversity of species can help ensure better survival of the planting as a whole. Observe what trees are currently growing near your site, and research what species you're planning to use. You can also contact your Missouri Department of Conservation regional forester for advice.

Below is a list of common species native throughout Missouri that are well suited to riparian areas and are offered at the George O. White State Forest Nursery.

Trees

Trees should make up the bulk of plantings. Most seedlings need full sun in order to thrive and grow rapidly. Many can reach large sizes in 20-30 years.



American Sycamore (*Platanus occidentalis*)

This tree is well-known for its white bark and large size. It's common along streams and rivers and is flood-tolerant and fast-growing. Grows on most soil types on moist sites.



Eastern Cottonwood (*Populus deltoides*)

A large tree is often found growing along large rivers in deep loam or sand-loam soils. It is very fast growing and flood tolerant. Sold as cuttings (see directions for planting).



River Birch (*Betula nigra*)

A medium sized, fast-growing and flood-tolerant tree. Will grow on a variety of soils. The attractive peeling bark of birches also make them popular ornamentals.



Silver Maple (*Acer saccharinum*)

A very fast-growing and flood tolerant tree. Grows on moist sites in most soils types. Has brittle wood and is fairly short-lived. Wildlife eat the large seeds and live within the cavities that often form.



Sandbar Willow (*Salix interior*)

A small tree or thicket-forming shrub. Very flood tolerant and a good choice for stabilizing streambanks. Often grows on muddy banks or sandbars. Sold as cuttings (see directions for planting).



Pin Oak (*Quercus palustris*)

A tall, fast-growing oak popular in landscaping. Naturally found in bottomlands across the state and is very tolerant of dormant-season flooding. Grows well on clay or loam soils. Wildlife eat the acorns.



Bur Oak (*Quercus macrocarpa*)

This large oak grows on uplands and lowlands on many soil types and thrives in well-drained bottomlands. Tolerates some dormant-season flooding. Produces the largest acorn.



Swamp White Oak
(*Quercus bicolor*)

Native to northern, central, and eastern Missouri, this oak often grows along streams and bottomlands in moist soils and tolerates some dormant-season flooding.



Black Walnut
(*Juglans nigra*)

This large tree does best in the rich, well-drained loam soils of bottomlands but doesn't tolerate flooding, so plant it where flood risk is minimal or none. Produces edible nuts.



Pecan
(*Carya illinoensis*)

A native hickory, this large tree grows naturally on well-drained rich loam soils in river bottomlands and will tolerate some dormant-season flooding. The nuts are relished by both people and wildlife.



Hackberry
(*Celtis occidentalis*)

Often found in bottomlands. Somewhat flood tolerant and grows on many soil types. Its warty bark is a distinguishing feature. The small purple fruits are an important winter food for birds.



Persimmon
(*Diospyros virginiana*)

A medium sized tree with dark, blocky bark. Found on upland and bottomland sites on most soils. It tolerates shade and dormant-season flooding. The large orange fruits are eaten by wildlife.

Other Native Trees Suitable for Riparian Plantings:

- Butternut
- Shumard Oak
- Kentucky Coffee Tree
- Shellbark Hickory

Shrubs

Species that are 15 feet or less and often have several stems. Add shrubs to a planting to increase wildlife value, diversity, and erosion control.



Pawpaw
(*Asimina triloba*)

Often a small understory tree that spreads by suckers. It grows in rich, well-drained bottomland sites statewide. Tolerates heavy shade and some flooding. The banana-like fruits are edible.



Spicebush
(*Lindera benzoin*)

A multi-stemmed shrub found in moist bottomlands or rich streambanks. Tolerates some flooding and heavy shade. Produces waxy red fruit that are consumed by birds in fall.



Buttonbush
(*Cephalanthus occidentalis*)

This shrub often forms thickets on moist sites. It does best in full to part sun on moist or wet sites and tolerates long periods of standing water. The round flower clusters attract pollinators and birds.



False Indigo/Indigo Bush
(*Amorpha fruticosa*)

A large multi-stemmed legume that forms thickets in moist areas. It grows in full sun and tolerates flooding. The purple flower clusters attract pollinators and the seeds are eaten by birds.



Ninebark
(*Physocarpus opulifolius*)

An attractive multi-stemmed shrub native to eastern and southern MO. Grows in full or part sun on moist sites. Often grows on gravel bars and rocky streambanks. Used for streambank stabilization.



**Deciduous Holly
(*Ilex decidua*)**

Unlike other hollies, this large shrub sheds its leaves for the winter. Often found growing in bottomland areas or moist streambanks in full sun or light shade. The red berries feed birds in the winter.



**Elderberry
(*Sambucus canadensis*)**

A multi-stemmed shrub that forms thickets. Grows in full sun on moist, well-drained streambanks. Produces white flower clusters and small edible berries.



**Rough-leaved Dogwood
(*Cornus drummondii*)
& Gray Dogwood
(*Cornus racemosa*)**

Two similar shrubs that form thickets. Can grow in shade or sun and do well in moist soils near streambanks. Birds eat the white fruits.



**Silky/Swamp dogwood
(*Cornus amomum*)**

This dogwood will grow in many moist or wet sites in full sun or part shade. It is often found in wetlands and along streams or ponds. Its white blooms attract pollinators and birds eat the blue fruits.



**Wild Plum
(*Prunus sp.*)**

These large shrubs can spread to form extensive thickets. Grows well on moist, well-drained streambanks in full sun on many soil types. Good for erosion control and wildlife food and cover.

Other Native Shrubs Suitable for Riparian Plantings:

- Ozark Witchhazel
- American Hazel
- Green Hawthorn

Planting Willow/Cottonwood Cuttings

Cut willows and cottonwood stems are able to grow roots and form new trees when planted in late winter-early spring. Nursery cuttings are generally 12-18 in long. Plant all but the top 2-4 inches of the cutting in the ground. Make sure the buds on the stem are pointed upwards. You can also try making your own willow cuttings of various sizes from local native willows. See "Restoring Stream Banks with Willows" at mostreamteam.org/assets/willow.pdf for more details and techniques.



A planting of willow stakes along a streambank

Missouri Stream Team is sponsored by
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