

StreamGuide

NO. 1

Guide to Native Riparian Plants of the Catskills

Landscaping with plants that are native to your location provides many benefits. Aside from their natural beauty, native plants are already adapted to their environment and are usually more resistant to local pests and diseases. They also generally do not overtake or outcompete other native species in the area, as is sometimes the case with introduced exotic species.

Many native plants also provide crucial food and habitat for other plants and animals, who need them for survival.

Without these plants, the populations of many species would be severely reduced and some might even become extinct.



In addition to these benefits, native plants that grow along streams, known as riparian plants, also provide stability to streambanks because their roots penetrate into the ground and help to protect against erosion. During high water and floods, the stems, branches and leaves of riparian plants help to slow down water as it runs over them. This helps to reduce the force of the water. Riparian plants also can slow stormwater and stop pollutants from entering streams. Plantings along streams are often referred to as a "riparian buffer".

One challenge with using native plants is that they can sometimes be difficult to find at garden centers and nurseries. The Ashokan Watershed Stream Management Program offers eligible streamside landowners free native riparian plants through the Catskill Streams Buffer

Initiative (CSBI). CSBI uses native plants for riparian buffer restoration projects. Soil and Water Conservation Districts and County Cooperative Extension offices in many areas can help people locate sources of native plants.

In this guide you will find many of the native riparian plants which the CSBI program offers in the Catskills. As you will see many of these plants are not only practical and improve the natural environment, but they are also pleasing to the eye. 💧



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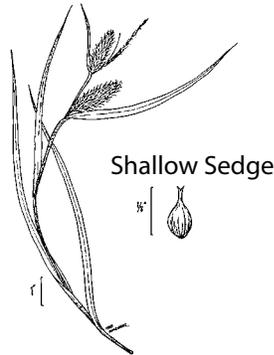
Cornell Cooperative Extension provides equal employment and program opportunities

Herbaceous Plants

Shallow Sedge (*Carex lurida*)

HEIGHT: 3 feet
SPREAD: 1-2 feet
SHADE TOLERANCE: Moderate

Shallow sedge is a perennial herbaceous plant which grows well in moderately shady areas out of direct sunlight. The seedheads resemble small sweetgum balls but do not grow above the foliage. This sedge is less prone to summer dieback and remains attractive during warm weather.

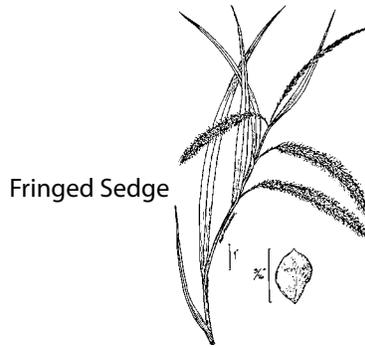


Shallow Sedge

Fox Sedge (*Carex vulpinoidea*)

HEIGHT: 3 feet
SPREAD: 2 feet
SHADE TOLERANCE: Moderate

Fox sedge prefers moist, lowland areas near water and makes an excellent riparian plant. They grow in clumps and clusters with green leaves. Flowers are green and bloom in the spring, usually from May through June. Seedheads mature in late summer and spray out from the center giving it the distinctive "fox tail" appearance.

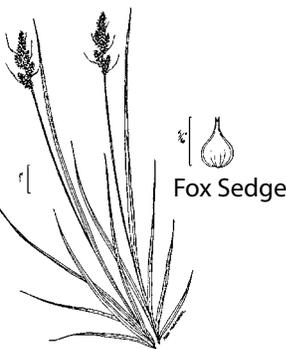


Fringed Sedge

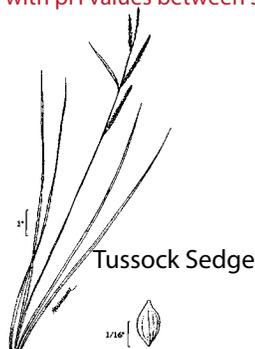
Tussock Sedge (*Carex stricta*)

HEIGHT: 4 feet
SPREAD: 1-2 feet
SHADE TOLERANCE: High

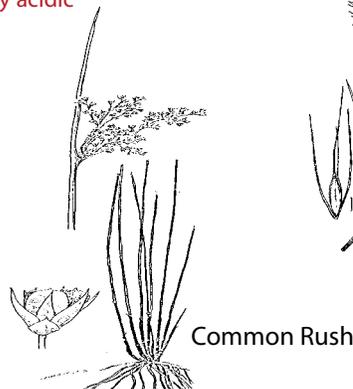
Upright sedge with green foliage and flowers that bloom in the spring. Flowers appear in late spring in reddish-brown spikes atop stems rising above the foliage. It prefers relatively acidic soils with pH values between 3.5 and 7.



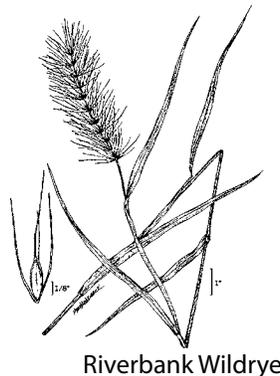
Fox Sedge



Tussock Sedge



Common Rush



Riverbank Wildrye

Fringed Sedge (*Carex crinita*)

HEIGHT: 5 feet
SPREAD: > 1 foot
SHADE TOLERANCE: Moderate

Fringed sedge prefers relatively cool weather. It actively grows in the spring and fall when the soil temperatures are the coolest. Leaves tend to be brown or reddish-brown in color.

Riverbank Wildrye (*Elymus riparius*)

HEIGHT: 4 ½ feet
SPREAD: > 1 foot
SHADE TOLERANCE: High

Riverbank Wildrye has dark green leaves which are flat and ½ to 1 inch wide. It is relatively resistant to deer browse. It grows most actively in the spring and summer.

Common Rush (*Juncus effusus*)

HEIGHT: 4 feet
SPREAD: 2-4 feet
SHADE TOLERANCE: Low

Common Rush has tiny, yellowish-green to pale brown flowers that form in clusters. The plant's foliage turns yellow in fall before browning up for winter. Many forms of wildlife rely on rush seeds to survival. In particular, muskrats enjoy eating the roots as a primary source of their food.

Common Boneset (*Eupatorium perfoliatum*)

HEIGHT: 2-4 feet
SPREAD: > 1 foot
SHADE TOLERANCE: Low

Common Boneset has interesting foliage and fragrant flowers. The upper stems terminate in clusters of white flowerheads, spanning about 2-8" across. The blooming period is late summer to early fall, which typically lasts about 1-2

The Power of Planting along Streams

Carefully cultivating a natural streamside buffer will help protect you from property loss due to flooding and erosion, and will create a healthier habitat for native aquatic and terrestrial wildlife. Deep and dense root structures of native plants can tremendously increase the strength of stream banks and reduce erosion from storm flows. Healthy streamside vegetation can filter out sediment, absorb excess nutrients and break down pollutants that impair water quality.

What makes a good buffer? Take a good look at your streamside property. Is the lawn mowed all the way to the water's edge? Has yard waste been deposited along the stream bank or in the stream? Have trees or shrubs been cut back along the stream? These might seem like minor things, but they can seriously undermine the stability and health of your stream bank. The shade provided by riparian trees and shrubs keeps water temperatures cool, improving the stream's habitat for fish. Allowing natural



vegetation to grow along the stream bank also provides greater resistance to water runoff and helps remove pollutants and sediment. This helps reduce flood damage downstream and keeps water cleaner. 💧

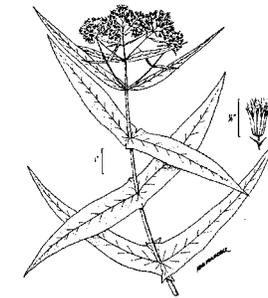
months for a colony of plants. The plant's flowers are attractive to wildlife including a variety of beneficial birds and insects. The central stem is covered in small hairs and is unbranched except for a few at the top where the flower is located.

Little Bluestem (*Schizachyrium scoparium*)

HEIGHT: 3 feet
SPREAD: 2 feet
SHADE TOLERANCE: Low

Little bluestem has gray-green foliage and the base of the stem is either green or more often than not purplish. Purplish-bronze flowers appear in 3 inch long clusters on branched stems rising above the foliage in August. Following the summer bloom clusters of fluffy, silvery-white seed heads appear and may persist into the winter. Little bluestem takes on a bronze-orange foliage color in the fall. The entire plant takes on a reddish cast after a frost.

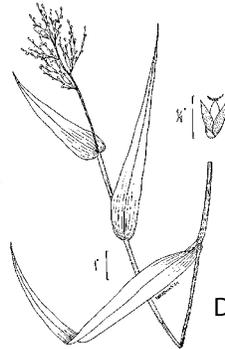
Little Bluestem



Common Boneset



Woolgrass



Deertongue

Woolgrass (*Scirpus cyperinus*)

HEIGHT: 3-5 feet
SPREAD: > 1 foot
SHADE TOLERANCE: Moderate

Woolgrass has leaves which are smooth, flat and elongated and up to ½ inch wide. The flowers occur in dense round, clusters of greenish-brown spikelets. The plant's fruits are yellow-gray to white which obtain red-brown bristles at maturity giving it a wooly appearance (hence its common name).

Deertongue (*Dichanthelium clandestinum*)

HEIGHT: 2 feet
SPREAD: > 1 foot
SHADE TOLERANCE: Low

Deertongue stalks terminate into spikelets that are about 2 ½ - 5 inches long. Leaf sheaths and stems are usually hairy. It produces copious amounts of seeds which may attract wildlife such as birds.

Herbaceous Plants - continued

New England Aster
(*Symphyotrichum novae-angliae*)

HEIGHT: 2 ½ - 6 feet
SPREAD: 2-3 feet
SHADE TOLERANCE: Moderate

New England Aster is a common perennial which is identified by its hairy stems and leaves. It has alternate leaves that are 4 inches long and about 1 inch wide with broad claspings bases and pointed tips. It has stalked flower heads which are in open rounded clusters. Each head contains about 40 bright purple, petal-like flowers surrounding a yellow central disk. Each head is about 1 ½ inches wide. It is particularly attractive to beneficial insects such as bees, butterflies, and some moths.



New England Aster

Line drawings of plants in this document are from the following sources:

USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York.

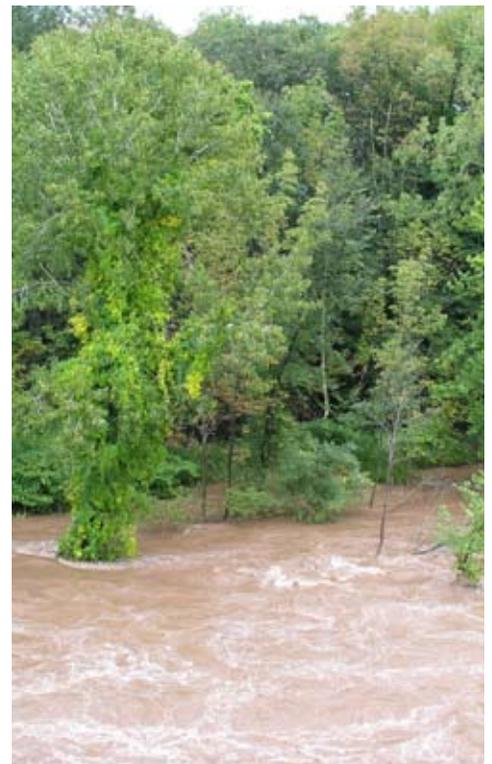
USDA-NRCS PLANTS Database / USDA NRCS. Wetland flora: Field office illustrated guide to plant species. USDA Natural Resources Conservation Service.



Common Boneset (photo: R.A. Howard @ USDA-NRCS PLANTS Database)



Riparian buffer restoration planting in Ulster County



Riparian buffer helping to slow flood waters

Transplanting ball and burlap, container and bare root trees¹

The goal in transplanting is to make every effort to allow the plant to become established quickly by encouraging the swift regeneration and regrowth of the root system. To do this, the planting hole should be wide and shallow, backfilled appropriately, and the tree or shrub planted at the proper depth.

The Planting Hole

1. Dig the planting hole 2 - 3 times the diameter (width) of the rootball and no deeper than the depth of the rootball.
2. Loosening or tilling the entire landscape bed is preferred over digging individual planting holes. If compacted, add at least 30% organic matter to the entire site - not just within the individual hole.
3. Avoid planting when the soil is very moist because wet soil has a tendency to glaze and become compacted.

Placing the Tree in the Hole and Backfilling

1. Place the plant in the hole by handling the rootball only.
2. Plant tree at the proper depth. The rootball should be set so that the trunk flare is exactly at the existing grade in loamy or sandy soils, and above the existing grade in clayey or poorly drained soils (up to 1/3 rd of the ball can be above the existing grade). Make sure that you have uncovered the trunk flare.
3. Backfill firmly, but without overly compacting the soil. Try to eliminate air pockets. Some landscapers partially backfill the hole, irrigate, then allow the water to fully drain before completing the backfilling. This helps eliminate air pockets.
4. Do not cover the trunk with soil; the backfill should come right up to the rootball, but little, if any soil should cover the rootball.
5. If you wish, form a 2 - 3" soil rim at the edge of the planting hole. The rim helps hold in water and direct it to the roots, but be sure to remove the rim within two years (roots should be beyond the planting hole by then).
6. There is no need to fertilize the tree or shrub at planting.
7. Avoid planting when the soil is very moist. It is difficult to work the soil, and the risk of glazing and compacting the soil is great.

Planting Bare Root Trees

Bare root trees are handled and planted in much the same manner as balled and burlapped and container plants. There are, however, a few techniques that you can use to increase the success of bare root plantings.

1. Research at Cornell University has shown that dipping the roots of a recently dug bare root tree in a slurry of hydrogel and water helps to prevent the drying out of the roots in transit between the nursery and the planting site. The slurry creates a reservoir of water that helps the roots avoid drying out.
2. If you must store bare root trees for a few days before planting, keep them in a cool, shaded location.
3. If root ends appear jagged or split, cut them cleanly with a sterilized pair of pruning shears.
4. When backfilling, be sure that you fill all air spaces with soil—avoid large pockets of air which inhibit root growth.
5. Stake, if necessary, and water well. 💧

¹ From Cornell University's Urban Horticulture Institute Publication "Transplanting Guide"

Shrubs

Common Buttonbush
(*Cephalanthus occidentalis*)

HEIGHT: 5-12 feet
SPREAD: 4-8 feet
SHADE TOLERANCE: High

Common buttonbush is a multi-stemmed shrub. Its leaves are 2-6 inches long and 1-3 inches wide. Its flowers bloom from June through September and form in 1 inch diameter clusters. Each flower has a projecting style which gives the flower head a pincushion-like appearance. Flower heads give way to hard, spherical fruits that resemble old-time dress buttons, hence the common name. Berries are a common source of wildlife food but are poisonous to human beings.



Common Buttonbush

interesting contrast to the clusters of small white berries which form after the flowers have dropped. Red stem color is more easily seen after the fruits are gone, and red color often persists into early winter.

Redosier Dogwood (*Cornus sericea*)

HEIGHT: 6-12 feet
SPREAD: 6-12 feet
SHADE TOLERANCE: Moderate



Redosier Dogwood

Redosier dogwood can grow up to 20 feet tall, though, more commonly in grows only in the 6-12 foot range. Its bark and twigs are reddish-purple to pink in color from autumn to late spring. The rest of the year the bark is typically a bright green color. It produces white berries which ripen late in the summer and can persist throughout the winter making it a valuable wildlife food.

Silky Dogwood (*Cornus amomum*)

HEIGHT: 7-10 feet
SPREAD: 6-12 feet
SHADE TOLERANCE: Moderate

Young silky dogwoods have stems which are bright red in the fall, winter, and early spring but turn reddish-brown in the summer. As the plant matures it maintains the reddish-brown color year round. Eventually its bark turns completely to gray as it matures. Silky dogwoods tend to grow close together and form thickets.



Silky Dogwood

White Meadowsweet (*Spiraea latifolia*)

HEIGHT: 3-5 feet
SPREAD: > 1 foot
SHADE TOLERANCE: Moderate

White meadowsweet is a perennial shrub. Its foliage is yellow-green in summer and turns golden-yellow in the fall. It has tiny white flowers which are arranged conically in terminal spikes.

Gray Dogwood (*Cornus racemosa*)

HEIGHT: 6-16 feet
SPREAD: 10-15 feet
SHADE TOLERANCE: High

Gray dogwoods typically only grow about 6 feet tall though can achieve heights of 16 feet. It flowers in June and July. The flowers are white and loosely clustered. Terminal stems holding the flowers are distinctively red and provide



Gray Dogwood



White Meadowsweet

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American Elderberry (*Sambucus canadensis*)

HEIGHT: 4-13 feet
SPREAD: 4-13 feet
SHADE TOLERANCE: Low

American elderberry is perhaps best known for its fruit which is a common ingredient in preserves, jams, jellies, pies and even wine. Its berries may be consumed, though, new growth sprouts can be toxic to livestock. It has compound leaves in a feather-like arrangement. Large, terminal, flat-topped clusters of small, fragrant, white flowers appear in spring and are followed by clusters of dark purple to black, berry-like fruits (drupes) in late summer to fall. Its fruit is also attractive wildlife.



American Elderberry



Common Winterberry

Common Winterberry (*Ilex verticillata*)

HEIGHT: 5-15 feet
SPREAD: 5-15 feet
SHADE TOLERANCE: Moderate

Common winterberry is a pervasive woody shrub with multiple stems. It is perhaps best known for its attractive bright red fruit which is an excellent wildlife food. Contrary to popular belief, winterberries are not for human consumption. It is recommended that winterberry be planted in shady, moist areas. Its bark is gray to blackish with knobby lenticels. Each leaf is 1 ½ to 4 inches long—dark green in the summer turning to yellow in the fall. Male and female plants should be planted near each other to provide adequate pollination. Without this the plants will not produce berries.



Willow stakes soaking



American Elderberry (photo: Ted Bodner @ USDA-NRCS PLANTS Database)



Volunteers planting trees along the Esopus

Trees

Red Maple (*Acer rubrum*)

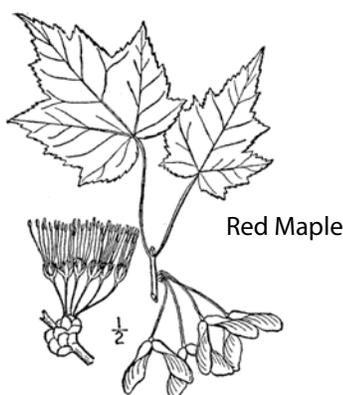
HEIGHT: 40-70 feet
 SPREAD (CANOPY): 30-50 feet
 TRUNK DIAMETER: 1-4 feet
 SHADE TOLERANCE: Moderate

Red maple is a common northern hardwood tree. It is very tolerant of wet soils. It typically grows between 40-70 feet tall but has been known to grow up to 100 feet tall. It is one of the first trees to change colors in the fall and its leaves turn a fiery red. It is also one of the first trees to bloom in the spring. Occasionally, red maples are tapped to make maple sugar products, however, it has less than ½ the sugar content of its relative the sugar maple making it less than ideal for this activity.

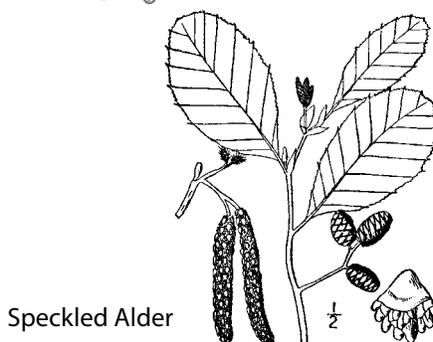
Silver Maple (*Acer saccharinum*)

HEIGHT: 40-90 feet
 SPREAD (CANOPY): 35-70 feet
 TRUNK DIAMETER: 1-5 feet
 SHADE TOLERANCE: Moderate

Silver maple is one of the fastest growing trees in the eastern US. It typically can grow between 3 and 7 feet a year and usually is found anywhere from 45 to 90 feet tall at maturity. It has an unremarkable fall foliage color. Silver maple is not a particularly attractive wildlife tree, though, it has been well-known as a nesting site for Baltimore Orioles. Currently, research is being conducted to see if this tree is a serious potential source of biofuel. It is attractive for this purpose because of its quick growth rate.



Red Maple



Speckled Alder



Silver Maple



Hazel Alder

Speckled Alder (*Alnus incana ssp. rugosa*)

HEIGHT: 6-20 feet
 SPREAD (CANOPY): Varies
 TRUNK DIAMETER: 4-5 inches
 SHADE TOLERANCE: Moderate

Speckled alder grows to a height of about 6-20 feet at maturity, though sometimes can achieve as much as 25 feet. It is an attractive wildlife tree it is used by many varieties of birds, rabbits, deer, beavers, and moose. Native Americans used these trees for a variety of medicinal purposes. Speckled alders have thicket-forming open crowns. Their bark is gray, reddish, or brown.

Hazel Alder (*Alnus serrulata*)

HEIGHT: 8-15 feet
 SPREAD (CANOPY): Varies
 TRUNK DIAMETER: 6 inches
 SHADE TOLERANCE: Low

Hazel Alder (sometimes known as Smooth Alder) is a small thicket forming tree. It has multiple stems that grow from its base and it has reddish-green flowers. Its leaves are dark green, are broad and flat, and about 2-4 inches long. It has smooth bark is dark gray or brown in color. It is a critical component of woodcock habitat.

Riparian Buffer Dos and Don'ts



DO

Plant diverse species of trees and shrubs (non-invasive and native vegetation) along riparian zones at least up to 30 feet wide

Leave naturally fallen branches and leaves in place

Compost or properly discard grass clippings and trimmings from trees and bushes

Remove discarded materials and garbage from riparian zones

Periodically observe stream channel and banks for signs of erosion and habitat degradation. Report observations of erosion and degradation to authorized officials

Preserve natural topography

Limit or restrict the use of inorganic and organic chemicals

Use non-phosphate detergents

Limit amount of fertilizers coming into the stream

DON'T

Cut trees, bushes and other vegetation along riparian corridor

Mow lawns directly to the water's edge

Dump yard clippings onto stream banks - this will suppress native vegetation and lead to erosion

Dump garbage or discard refuse in riparian zones

Excavate or modify stream channel and banks without an environmental impact assessment

Build on more than 10% of your property with impervious surfaces (asphalt, paving, etc.)

Increase the slope of your property

Use chemicals and fertilizers prior to rain or storm events

Use phosphates excessively

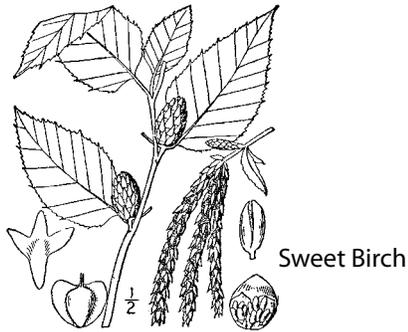
Water your lawn if it is green

Trees - continued

Sweet Birch (*Betula lenta*)

HEIGHT: 70-80 feet
 SPREAD (CANOPY): Varies
 TRUNK DIAMETER: 2-3 feet
 SHADE TOLERANCE: Low

Sweet birch typically reaches heights of between 70-80 feet. The leaves are alternate, ovate, and have a finely serrated margin. Its sap is the main ingredient of birch beer. Its bark is reddish brown to black on young trees, later turning gray to nearly black as it matures. Eventually the bark breaks up into large, thin, irregular, scaly plates.

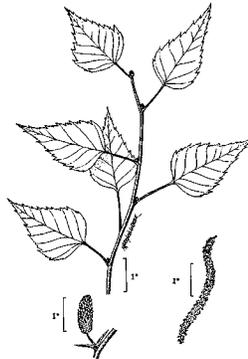


Sweet Birch

Gray Birch (*Betula populifolia*)

HEIGHT: 20-40 feet
 SPREAD (CANOPY): Varies
 TRUNK DIAMETER: 10-18 inches
 SHADE TOLERANCE: Moderate

Gray birch is considered a pioneer species because it tends to germinate on recently disturbed areas. It is also common for new sprouts to emerge from the tree's trunk that has been or cut or fallen. The bark is white and non-peeling, though, it darkens with age. It is a relatively short-lived tree living only about 50 years compared to much longer lifespans for other similar tree species.

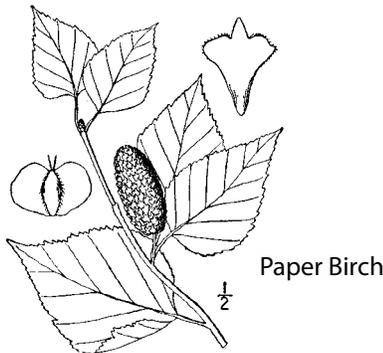


Gray Birch

Paper Birch (*Betula papyrifera*)

HEIGHT: 40-70 feet
 SPREAD (CANOPY): Varies
 TRUNK DIAMETER: 2 1/2 feet
 SHADE TOLERANCE: Low

Paper birch is known for its striking coloration and can be considered an ornamental tree. Young trees have bark that is dark red to almost black. As it matures the bark becomes reddish-brown and then eventually a creamy white color. The leaves are alternate, ovate, or triangular in shape. Fall foliage is typically a yellow color. It is a pioneer species that is one of the first to come up in disturbed areas.



Paper Birch

American Hornbeam (*Corpinus caroliniana*)

HEIGHT: 20-30 feet
 SPREAD (CANOPY): 20-35 feet
 TRUNK DIAMETER: 10-24 inches
 SHADE TOLERANCE: High

American Hornbeam (also known as Ironwood because of its heavy, dense, difficult-to-cut wood) prefers deep, fertile, moist and acidic soil. It grows best in partial shade. It has a wide spreading, flat-topped crown. Its leaves turn yellow, orange, or red in fall. The smooth, gray trunk and larger branches of a mature tree exhibit a distinctive muscle-like fluting that has given rise to another common name of musclewood.



American Hornbeam

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American Sycamore (*Platanus occidentalis*)

HEIGHT: 50-120 feet
 SPREAD (CANOPY): 75-100 feet
 TRUNK DIAMETER: 3-8 feet
 SHADE TOLERANCE: Moderate

Mature American Sycamore trees usually have diameters between 3-8 feet but can get up to 13 feet—one of the largest of any eastern tree. Its leaves are roughly star shaped with 3-5 sharp lobes. In the fall foliage typically turns an undistinguished yellow-brown. Native Americans hollowed out sycamore trunks for dugout canoes. It is relatively disease resistant, though, its limbs are highly susceptible to ice and wind damage. It is a fast growing tree that is a common street tree.



American Sycamore

Eastern Cottonwood (*Populus deltoides*)

HEIGHT: 80-100 feet
 SPREAD (CANOPY): 35-60 feet
 TRUNK DIAMETER: 3-4 feet
 SHADE TOLERANCE: Low

Eastern cottonwood is a fast-growing but short-lived tree that typically will survive for no more than 80 years. It grows well in moist, fine sandy loams or silt loams. It has yellowish twigs, coarsely toothed leaves and gummy end buds which distinguish this species from the other similar poplars. It is very susceptible to ice and wind damage, however, it withstands flood very well.



Eastern Cottonwood

White Oak (*Quercus alba*)

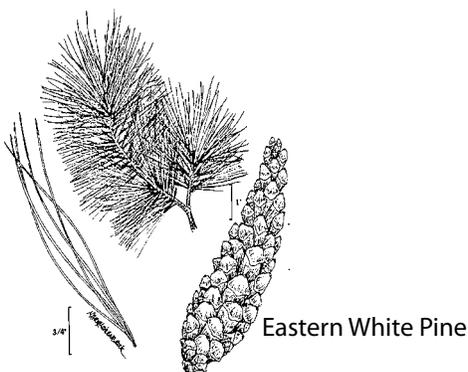
HEIGHT: 60-80 feet
 SPREAD (CANOPY): 50-80 feet
 TRUNK DIAMETER: 2-5 feet
 SHADE TOLERANCE: Moderate

White oak is a common forest and street tree in the eastern and Midwestern US. Its bark is whitish or light gray. Its leaves are simple and alternately arranged on the stems, between 5-6 inches long with rounded tips which turn a purplish-red to violet-red in the fall. It produces abundant amounts of acorns which attract a variety of wildlife from squirrels, chipmunks to deer and blue jays. It has a high quality wood that is used in furniture, flooring, and interior woodwork.

Eastern White Pine (*Pinus strobus*)

HEIGHT: 80-100 feet
 SPREAD (CANOPY): 20-40 feet
 TRUNK DIAMETER: 2-3 feet
 SHADE TOLERANCE: Moderate

Eastern white pine can grow to heights of 150 feet though more typically it only attains heights of 80-100 feet. Young trees have bark that is thin, smooth and greenish-brown. Older trees have bark that is deeply fissured and is dark grayish-brown. Needles are in clusters of 5, are soft, flexible, bluish-green in appearance and 2 1/2 to 5 inches long. Cones are about 4 to 8 inches long and 1 inch thick. Historically it has been planted as a windbreak tree, though, it also has many benefits for wildlife including nesting sites for birds and bedding areas for deer among other animals.



Eastern White Pine



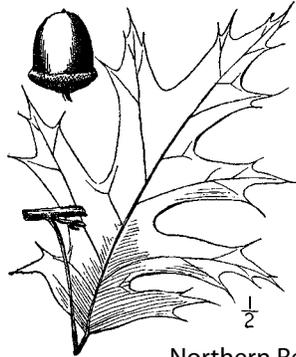
White Oak

Trees - continued

Northern Red Oak (*Quercus rubra*)

HEIGHT: 65-100 feet
 SPREAD (CANOPY): 50-75 feet
 TRUNK DIAMETER: 20-40 inches
 SHADE TOLERANCE: Moderate

Mature northern red oak trees typically obtain heights between 65 and 100 feet, though, occasionally they can obtain heights of over 150 feet. It does not produce the same large amounts of acorns as White Oak, though, it still attracts similar species. Northern red oak provides good cover and nesting sites for a wide variety of birds and mammals. Its leaves turn a bright red color in the fall. Like the white oak it too has good quality wood that is used in the manufacture of flooring, furniture, cabinets, and other high quality wood products.



Northern Red Oak

Eastern Hemlock (*Tsuga canadensis*)

HEIGHT: 40-70 feet
 SPREAD (CANOPY): 25-35 feet
 TRUNK DIAMETER: 5 feet
 SHADE TOLERANCE: High

Mature eastern hemlock trees can grow up 100 feet tall, though more typically achieve heights of 40 to 70 feet. Hemlock bark is brownish, scaly and fissured. Its needles are flat and evergreen. Historically, eastern hemlock was an important tree in the Catskill region because of the use of its bark in the leather tanning process. Currently, it is under threat from an invasive species known as the hemlock woolly adelgid, a small insect that attacks the needles, causes branch dieback and typically kills the tree after several years of infestation.



Eastern Hemlock

Cedar Arborvitae (*Thuja occidentalis*)

HEIGHT: 30-50 feet
 SPREAD (CANOPY): 10-15 feet
 TRUNK DIAMETER: 10-15 inches
 SHADE TOLERANCE: Moderate

Cedar Arborvitae (as its name may suggest) is a member of the cedar family. Technically it is a special cultivation of northern white cedar. There are currently more than 120 different varieties of arborvitae, therefore, there is a fairly significant amount of variation among the different species. Its bark is a gray to reddish-brown color. Its leaves are evergreen, scale-like and abruptly pointed either bright-green or pale-green in color, sometimes turning yellow-brown in winter. Its wood is light and resistant to decay. White-tailed deer use it as a cover in the winter.



Cedar Arborvitae

Willows and Streambank Stabilization

Native willow species have the unique characteristic of adventitious rooting, meaning that live cuttings of stems and branches have the ability to sprout roots wherever they make contact with the appropriate soils. They are actually difficult to grow from seed. The formation of a dense network of root systems helps to bind the soil particles of the stream bank together, therefore increasing the overall bank stability and lowering susceptibility to erosion and property loss.

Once willows mature, their stalks, stems and branches create a roughness on the bank that resists flow and slows down the velocity of the water in critical areas that are susceptible to erosion. Willows serve as an effective natural source of erosion control and can often be engineered into living structures that help to protect stream banks. Under the right conditions this practice of using live materials for stream-side restoration, called bioengineering, can offer a less expensive and more environmentally sustainable alternative to hard unnatural bank stabilization measures such as rock walls and sheet piling.

It is because of these characteristics that native willows are used extensively in the watershed for bioengineering practices such as live staking, fascines, and brush mattresses. 💧



Willows

Heart-Leaved Willow (*Salix eriocephala*)

HEIGHT: 5-20 feet
 SPREAD: 3-6 feet
 SHADE TOLERANCE: High

Also known as the Missouri River Willow, this small tree/shrub has dark gray-scaly bark. Heart-leaved willows commonly have multiple stems growing from a single point. Its leaves are lance or heart-shaped (hence its name), are thick and have soft hairs on the underside. It has green foliage and green flowers which bloom in the early spring. This plant grows rapidly and has been known to achieve heights of up to 52 feet in certain circumstances (though 20 feet is far more typical).



Heart-Leaved Willow

Silky Willow (*Salix sericea*)

HEIGHT: 5-15 feet
 SPREAD: 3-5 feet
 SHADE TOLERANCE: Moderate

Like the heart-leaved willow, silky willow has gray colored bark is typically found in wet areas, such as sand and gravel bars along streams. Its leaves are covered with soft, silky hairs more so than the heart-shaped willow. Its root system is extensive and helps hold in the streambank soil.



Silky Willow



Pussy Willow

Shining Willow (*Salix lucida*)
 HEIGHT: 13 feet
 SPREAD: 6-8 feet
 SHADE TOLERANCE: Moderate

Shining willow is a shrub or small tree that grows in swamps, shores and wet meadows. The twigs are gray to yellowish-brown. Leaves are lance shaped, 1.2-4.7" long yellowish green to green and semi-glossy above, pale beneath. Catkins emerge with the leaves. When ripe, the capsules open to release tiny wind-born seeds with silky hairs at their base. Shining willow flowers in May and fruits in June.



Shining Willow

Pussy Willow (*Salix discolor*)
 HEIGHT: 20-15 feet
 SPREAD: 18-20 feet
 SHADE TOLERANCE: High

Pussy Willow has multiple trunks with dark-gray scaly bark. The familiar, silvery-gray furry catkins appear prior to leaf emergence and are some of the first catkins to appear each year and are recognized as being an early sign of spring. Some twigs of this plant will produce golden stamens while others will produce slender greenish pistils. The Latin name for the species refers to the contrasting colors of the leaf surfaces which help aid in identifying this plant. [S](#)

Pole Planting Technique for Establishing Willows¹

Willows are often used in stream restoration projects. The Stream Management Program often takes willow cuttings from local areas and then uses them in these projects.

The NRCS, Plant Materials Center, Los Lunas, New Mexico, in cooperation with the U.S. Fish and Wildlife Service, developed a pole planting technique for establishing willows which is outlined below:

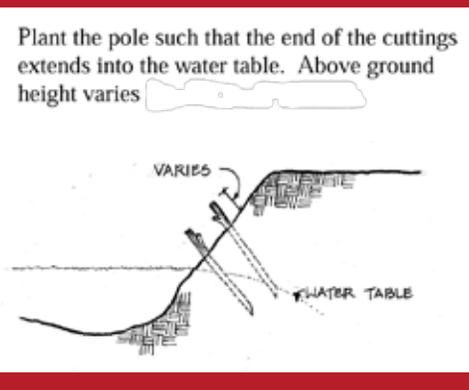
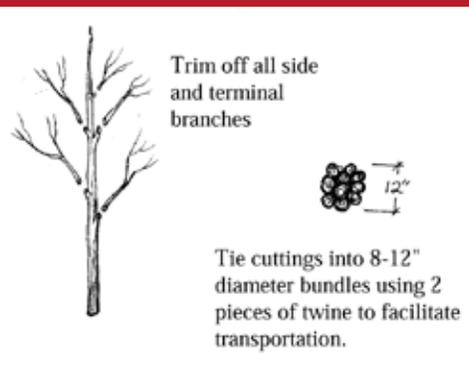
1. Select collection sites as close to the area as possible to conserve genetic diversity. Try to match donor site and revegetation site in terms of soils, elevation, hydro-dynamics, permanent groundwater table, and soil salinity (which should be low).

2. Select willow cuttings from a local, native stand in healthy condition. Prune no more than 2/3 of plants in an area.

3. Willow cuttings for pole plantings should generally be at least 1/2 inch in diameter or larger. Select the longest, straightest poles available. Use only two to four-year old wood.

4. The total length of the poles needed depends upon the water table depth. Measure water table fluctuations in the planting area for at least 1 year, preferably longer, to determine the lowest water table depth. Take a reading at least once a month, preferably more often during the driest months of the year.

5. Cut poles while dormant. Remove all side branches except the top two or three. 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 root and shoot development. Soak poles in water for at least 5 to 7 days before planting.

6. Dig holes to the depth of the lowest anticipated water table. The cuttings 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.

7. Place the cuttings in the holes the same day they were removed from the soak treatment. Set the butt as close to the lowest annual water table elevation as possible.

8. It is critical to ensure that the soil is packed around the cutting to prevent air pockets. "mudding" (filling the hole with water and then adding soil to make mud slurry) can remove air pockets.

9. As buds begin to swell (usually in April or May), remove them from the lower two-thirds of the pole. This will reduce evapotranspiration water loss and stimulate root growth. 💧

¹ USDA NRCS Plant Material Center, Los Lunas, NM and US Fish and Wildlife Service

Catskills Stream Buffer Initiative

Any landowner in the New York City West of Hudson Watershed who owns property adjacent to a stream is potentially eligible for the CSBI Program. Landowners who believe that their property lies within a riparian (streamside) area should contact the CSBI Program Coordinator for their watershed to see if their property is eligible.

If the property is eligible then the CSBI Coordinator will create a management plan for the property to determine what species should be planted, approximately where they should be planted as well as maintenance procedures to keep the plant material healthy. Once the plan is complete, landowners can apply to receive funding from CSBI to complete plan recommendations.

If landowners are granted funding then they may receive up to \$50,000 worth of plants and technical assistance depending upon the size and scale of the project.

Landowners may apply in subsequent years for further funding with a lifetime maximum of \$150,000. Landowners who enter into the CSBI program are expected to contribute toward their projects either monetary (i.e. matching funds) or by in-kind services (i.e. assisting with the actual planting/recruiting of volunteers).

For more information, or to pick up an application, you can either visit our program office or contact:

Ashokan Watershed
CSBI Coordinator: Adam Doan
Ulster County SWCD
phone: (845) 688-3047
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