



Edible and Floral Riparian Plants

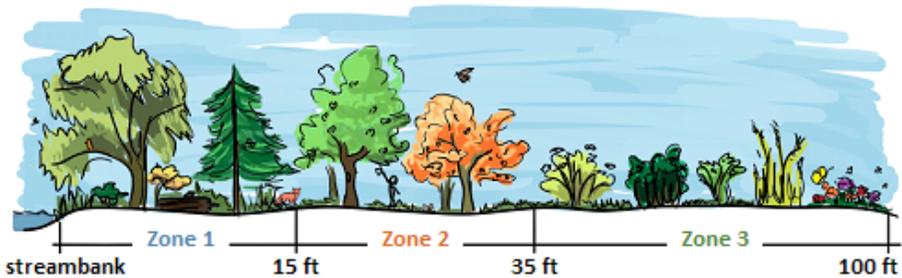
A short list of plants for your
multifunctional riparian forest buffer

What are **multifunctional riparian forest buffers**?

Riparian forest buffers are the strips of trees and shrubs along waterways that help protect stream health by filtering runoff and stabilizing soil.

Multifunctional riparian forest buffers offer additional benefits through their potential to produce perennial crops of fruits and nuts, as well as floral trees and shrubs! These products can be harvested and sold, or used in your own home.

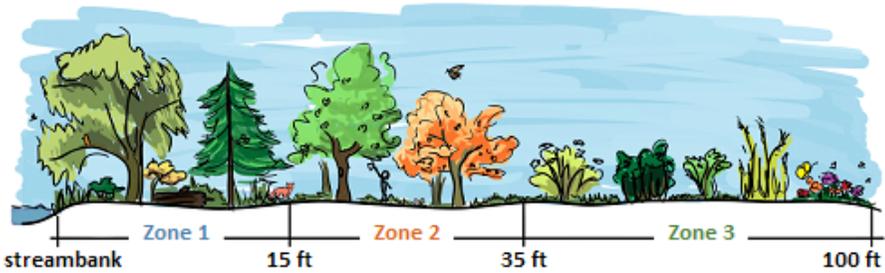
Multifunctional riparian forest buffers are divided into three management zones



Countless design options exist for multifunctional buffers. When developing a planting plan, consider:

- What are your conservation objectives— improving water quality, stabilizing stream banks, and/or creating wildlife habitat?
- Do you want to produce fruit and nuts for commercial production, for personal consumption, or for wildlife?
- Will your production objectives and design be compatible with your conservation objectives?

This booklet provides a starting point to help you decide which trees, shrubs, and herbaceous plants could be planted in each zone, and how each can meet conservation and personal objectives. Choosing plants that are right for you and your land when designing your **multifunctional riparian forest buffer** can add value to your property, income to your operation, and enhance recreational opportunities, all while helping to enhance and protect water quality.



ZONE 1

Tree and Shrub Species

A forested area along the streambank planted with native trees and shrubs to improve water quality and wildlife habitat.

Zone 1 is the undisturbed zone nearest the stream that's occupied by trees. Some maintenance in this zone, like controlling competing vegetation, may be required to encourage growth of desired species. **If you harvest products in this zone, only hand-harvest to prevent disturbing the land and potentially harming the stream.**

Only native trees and shrubs should be planted here. Choose plants that develop rapidly and tolerate wet conditions. Functions of this zone include streambank stabilization, slowing stormwater runoff and floodwaters, creating shade to reduce stream temperature fluctuations, and providing leaf litter and woody material to the stream as food and shelter sources for aquatic organisms. Choose a variety of flood-tolerant native species to create a diverse habitat for wildlife.

ZONE 1 *tree species*

Black Willow

Salix nigra



Soil pH: 5.0—8.0

Soil Type: Clay, loam, sand

Light: Full sun to full shade

Hardiness zone: 4 to 9

Flowers: Apr—Jun

Fruit: Seeds, after 10yrs

Fall Color: Insignificant

Height: 10'—40'

Deciduous lowland tree. Grows in moist and saturated soils along streams and other floodplain or wetland areas. Easy to establish from cuttings. Supports native pollinators and wildlife. Fibrous root system prevents stream bank erosion.

Silver Maple

Acer saccharinum



Soil pH: 5.5—7.0

Soil Type: Loam, sand

Light: Full sun to part shade

Hardiness zone: 3 to 9

Flowers: Feb—May

Fruit: Apr—Jun

Fall Color: Pale yellow

Height: 40'—60'

Deciduous lowland tree. Grows in well-drained, moist soils in floodplains. Provides seed and nesting sites for birds. Early pollen producer. Rapid growth beneficial in riparian reclamation but may shade out other species.

American Sycamore

Platanus occidentalis



Soil pH: 5.0—6.5

Soil Type: Loam, sand

Light: Full sun to part shade

Hardiness zone: 4 to 9

Flowers: Apr—Jun

Fruit: Oct—Winter

Fall Color: Yellow-brown

Height: 50'—130'

Deciduous lowland tree with an irregular crown and unique bark. Grows in moist and saturated soils along streams and other floodplain or wetland areas. Supports beneficial insects, pollinators, and wildlife.

ZONE 1 *tree species*

Swamp White Oak

Quercus bicolor

Soil pH: 4.3—6.5

Soil Type: Clay, loam, sand

Light: Full sun to part shade

Hardiness zone: 3 to 8

Flowers: Mar—May

Fruit: Acorns, fall

Fall Color: Gold to red

Height: 60'—70'

Large deciduous tree that grows well in swamps and along stream edges. Leaves are dark green on top and light green and fuzzy on the underside. Valuable wildlife tree that provides dense shelter and shade, as well as acorns.



River Birch

Betula nigra

Soil pH: 4.0—6.0

Soil Type: Clay, loam

Light: Full sun to part shade

Hardiness zone: 4 to 9

Flowers: Apr—May

Fruit: Jun—Aug

Fall Color: Yellow

Height: 50'—75'

Deciduous, occasionally multi-trunked tree with papery bark and open canopy. Commonly used riparian tree that enjoys wetter conditions along streams, rivers, and swamps, and grows fairly rapidly. Provides food and shelter for birds.



Black Tupelo

Nyssa sylvatica

Soil pH: 5.0—7.5

Soil Type: Clay, loam, sand

Light: Full sun to part shade

Hardiness zone: 3 to 9

Flowers: May—Jun

Fruit: Oct

Fall Color: Yellow to red

Height: 30'—50'

Deciduous, lowland tree that prefers moist, acidic soils. Female trees need a male pollinator to set fruit. Flowers are an excellent nectar source and fruits are enjoyed by birds and other wildlife. Spectacular fall color.



ZONE 1 *tree & shrub species*

Eastern White Pine

Pinus strobus



Soil pH: 4.0—6.5

Soil Type: Clay, loam, sand

Light: Full sun to part shade

Hardiness zone: 3 to 8

Flowers: Non-flowering

Fruit: Cone

Fall Color: Evergreen

Height: 50'—over 100'

Grows best in well-drained, fertile soils in full sun.

Tolerates a wide range of soil conditions and is intolerant of many air pollutants. Rapid-growing and long-lived. Provides valuable winter cover for wildlife and bird nesting habitat.

Northern Spicebush

Lindera benzoin



Soil pH: 4.5—6.0

Soil Type: Loam, sand

Light: Full sun to part shade

Hardiness zone: 4 to 9

Flowers: March

Fruit: Apr—Jun

Fall Color: Yellow

Height: 6'—12'

Aromatic shrub that produces attractive bright red berries. Grows rapidly and provides dense shade. Serves as a host plant and early nectar source for beneficial insects and pollinators.

Catalpa

Catalpa speciosa



Soil pH: 5.5—7.0

Soil Type: Loam, sand

Light: Full sun to part shade

Hardiness zone: 4 to 8

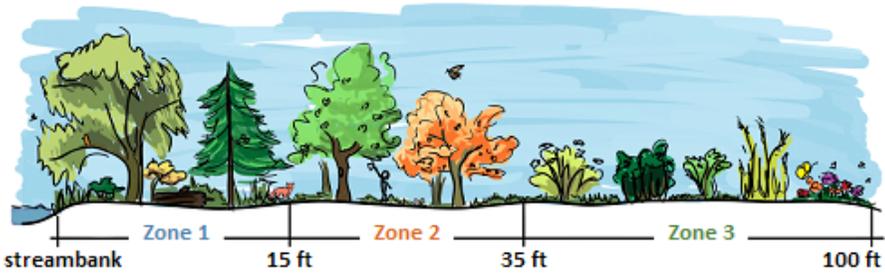
Flowers: May—Jun

Fruit: Oct—Winter

Fall Color: Yellow-brown

Height: 40'—60'

Medium-sized deciduous tree that grows well in a wide range of soil conditions. Tolerant of seasonal flooding. An attractive tree with large, heart-shaped leaves and showy flowers that are important to pollinators and insects.



ZONE 2

Fruit and Nut Producing Species

The buffer area planted with fruit and nut producing trees intended for harvesting for profit or personal use.

Zone 2 is the managed, woody zone that absorbs and stores nutrients, degrades pesticides, and slows floodwaters. You can begin incorporating edible fruits, nuts, or other harvestable products here. **Since this zone is still close to the stream, limit site disturbance by harvesting the products by hand.**

Choose trees and shrubs that are fast-growing and can tolerate periodic flooding. Fruit and nut trees provide people with home-grown food and attract wildlife. To get the most out of your planting, use cultivars and hybrids in this zone. Customize your buffer to fit your goals while improving water quality and wildlife habitat!

ZONE 2 *fruit & nut producing species*

Pawpaw

Asimina triloba



Soil pH: 5.0—8.0

Soil Type: Loam, sand

Light: Full sun to full shade

Hardiness zone: 5 to 9

Flowers: Apr—May

Fruit: Aug—Oct

Fall Color: Yellow-red

Height: 10'—35'

Grows in well-drained fertile soils. Large fruits taste similar to banana, mango, and cantaloupe, and have a custard-like texture. Fruit can be eaten raw or preserved into frozen pulp, jams or jellies, canned, or dehydrated.

Persimmon

Diospyros virginiana



Soil pH: 5.0—7.0

Soil Type: Clay, loam, sand

Light: Full sun to full shade

Hardiness zone: 4 to 9

Flowers: May—Jun

Fruit: Aug—Oct

Fall Color: Orange/yellow

Height: 30'—50'

Deciduous tree that produces edible bright orange fruits. When well-ripened, fruit can be eaten fresh, or it may be frozen or dried. Fruit is used in pies, cookies, cakes, salads, or pudding.

Serviceberry

Amelanchier arborea



Soil pH: 4.5—7.0

Soil Type: Loam, sand

Light: Full sun to full shade

Hardiness zone: 4 to 9

Flowers: Mar—Jun

Fruit: June

Fall Color: Golden

Height: 15'—25'

Grows as an understory tree or multi-stemmed shrub with an open canopy. Produces berries that are enjoyed by not only humans, but also birds and mammals. Berries can be eaten fresh or made into jams or pie filling.

ZONE 2 *fruit & nut producing species*

Black Walnut

Juglans nigra

Soil pH: 5.5—8.0

Soil Type: Loam

Light: Full sun

Hardiness zone: 4 to 9

Flowers: Apr—Jun

Fruit: Oct—Nov

Fall Color: Yellow

Height: 70'—100'

Produces edible nuts and fruit husks that can be used as a natural dye. Produces a chemical called juglone that reduces growth of many species—plant juglone-tolerant species near black walnut like Pawpaw or Hazelnut.



American Hazelnut

Corylus americana

Soil pH: 5.5—7.0

Soil Type: Clay, loam, sand

Light: Full sun to part shade

Hardiness zone: 4 to 9

Flowers: May—Jun

Fruit: July—Sept

Fall Color: Yellow to red

Height: Up to 10'

Dense, deciduous shrub that can grow well in disturbed areas. Nuts are a great source of income and are a great source of fiber. Can be sold in-shell or shelled, or made into flours, candies, butters, and oils.



Highbush Blueberry

Vaccinium corymbosum

Soil pH: 4.5—6.5

Soil Type: Loam, sand

Light: Full sun

Hardiness zone: 5 to 8

Flowers: May—Jun

Fruit: Jun—Sept

Fall Color: Bright red

Height: Up to 12'

Thicket-forming shrub that prefers moist, acidic soils. Berries are popular for numerous uses, including eating raw or making jams, jellies, syrups, pie fillings, and so much more! Fruit is also enjoyed by birds and other wildlife.



ZONE 2 *fruit & nut producing species*

Common Elderberry

Sambucus canadensis



Soil pH: 5.0—7.0

Soil Type: Clay, loam, sand

Light: Full sun to full shade

Hardiness zone: 3 to 9

Flowers: Jun—July

Fruit: Aug—Oct

Fall Color: Insignificant

Height: 3'—10'

Fast-growing and easily established from cuttings. Prune heavily in winter to maintain thick cover. Fruit eaten by wildlife. Considered “Nature’s Medicine Chest.” Berries can be made into juice, syrup, cough drops, and wine.

Black Raspberry

Rubus occidentalis



Soil pH: 6.8 or less

Soil Type: Clay, loam, sand

Light: Full sun to full shade

Hardiness zone: 5 to 8

Flowers: Mar—Jun

Fruit: Jun—Aug

Fall Color: Insignificant

Height: Up to 6'

A native shrub with purplish stems and thorns. Produces black raspberries enjoyed by humans and wildlife. Brambles also provide nesting sites for small mammals and birds. Berries can be eaten fresh or used in jams, pies, and teas.

Black Chokeberry

Aronia melanocarpa



Soil pH: 6.5—8.0

Soil Type: Clay, loam, sand

Light: Full sun to full shade

Hardiness zone: 3 to 8

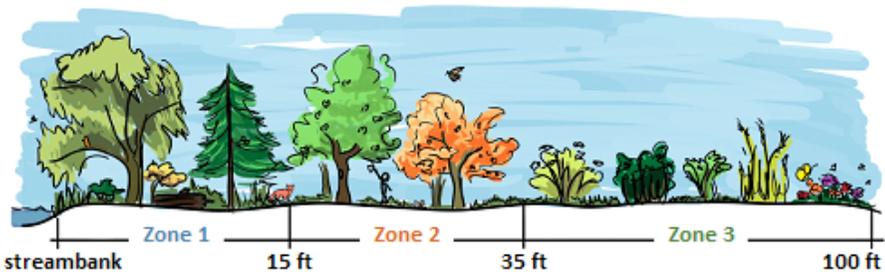
Flowers: May

Fruit: July—September

Fall Color: Crimson

Height: 3'—6'

Small deciduous shrub that grows well in lowland woods. Dark purple berries are enjoyed by birds and mammals. Best fruit production usually occurs in full sun. Berries can be made into jellies and jams.



ZONE 3

Floral and Woody Plant Species

The “working” part of your buffer— mechanical planting and harvesting of crops that capture, process, and remove excess nutrients from upland runoff.

Zone 3 is the first area to intercept nutrient and sediment runoff from farms, developments, and lawn areas upland. This zone disperses surface water to slow it down and promote soil infiltration, allowing nutrients and pesticides to be processed. **Short-rotation woody plants, grasses, or perennial wildflowers that can be harvested with mechanical equipment are the ideal choice for this zone.**

Zone 3 allows for the most flexibility in plant species, crop maintenance, and harvesting methods. Choose plant species that are edible, can be used as biofuel, or that have aesthetic qualities. A variety of cultivars and hybrids as well as non-native plants without invasive qualities can be planted in **Zone 3** to boost production, enjoyment, and variety!

ZONE 3 *floral & woody plant species*

Flowering Quince

Chaenomeles speciosa



Soil pH: Wide range

Soil Type: Clay, loam, sand

Light: Full sun

Hardiness zone: 4 to 8

Flowers: Mar—Apr

Fruit: Fall

Fall Color: Insignificant

Height: 6'—10'

Small, multi-stemmed aromatic shrub with showy flowers. Tolerates a range of soil conditions. Attractive to wildlife like rabbits and hummingbirds. Popular woody floral. Large fruit can be used to make jams and jellies.

Red-Osier Dogwood

Cornus sericea



Soil pH: 4.5—6.0

Soil Type: Clay, loam, sand

Light: Full sun to part shade

Hardiness zone: 3 to 7

Flowers: May—Aug

Fruit: Jul—Oct

Fall Color: Red-green

Height: Up to 10'

Multi-stemmed lowland plants with showy flowers and fruit. Twigs and fruit eaten by wildlife. Attracts pollinators. Bright red stems add color in winter. Yellow twig dogwood (*Cornus sericea* “*Flaviramea*”) has bright yellow stems.

Chestnut

Castanea sp.



Soil pH: 5.5—6.0

Soil Type: Loam, sand

Light: Full sun

Hardiness zone: 5 to 8

Flowers: June

Fruit: Sept—Oct

Fall Color: Yellow-orange

Height: 50'—75'

Grows in moist, well-drained soils in full sun. **Species plants should not be planted due to susceptibility to chestnut blight.** Nuts are sweet and edible, and are encased in spiny burrs. Cannot self-pollinate.

ZONE 3 *floral & woody plant species*

Winterberry Holly

Ilex verticillata

Soil pH: 3.5—6.0

Soil Type: Clay, loam, sand

Light: Full sun to part shade

Hardiness zone: 3 to 9

Flowers: Jun—July

Fruit: July—Sept

Fall Color: Yellow

Height: 3'—12'

A deciduous holly that produces a bounty of bright berries that are popular in the floral industry. Male and female plants are separate, and one male plant is needed for every 10 female plants. Prune to shape in early spring.



Pussy Willow

Salix discolor

Soil pH: 5.5—7.0

Soil Type: Clay, loam, sand

Light: Full sun to part shade

Hardiness zone: 4 to 8

Flowers: Feb—May

Fruit: Apr—Jun

Fall Color: Insignificant

Height: 15'—25'

Small tree or shrub with upright, spreading stems. Grows in damp lowlands. Short-lived, but fast-growing. Fuzzy catkins are often cut and sold on the floral market. Many cultivars are available with a wide range of color variations.



Harry Lauder's Walking Stick

Corylus avellana "Contorta"

Soil pH: 5.0—7.5

Soil Type: Clay, loam, sand

Light: Full sun to part shade

Hardiness zone: 4 to 8

Flowers: Mar—Apr

Fruit: Not produced

Fall Color: Yellow

Height: 8'—10'

Small shrub with twisted and spiraling branches, twigs, and leaves. Branches are aesthetically pleasing, especially in the winter, and can be cut and sold as a unique floral specimen. Usually does not produce nuts.



ZONE 3 *floral & woody plant species*

Hydrangea

Hydrangea sp.



Soil pH: 6.0—8.5

Soil Type: Loam, sand

Light: Full sun to full shade

Hardiness zone: 3 to 9

Flowers: Jun—Aug

Fruit: Sept—Oct

Fall Color: Insignificant

Height: 3'—6'

Fast-growing, short-lived understory shrub with showy flowers. Natural habitat is on rocky banks and ravines.

Grown for its pleasant aroma and attractive flowers. Also beneficial for pollinators and insects.

Perennial Wildflowers



Potential Species: Cardinal flower, Canada mayflower, bee balm, milkweed varieties, beardtongue, and lupine

With root systems that run deep into the soil, perennial wildflowers are the first line of defense in “buffering” the effects of nutrient and sediment runoff. Numerous native species can be planted that serve as host plants and nectar sources for beneficial insects. Perennials can be cut for floral use year after year!

Warm and Cool Season Grasses



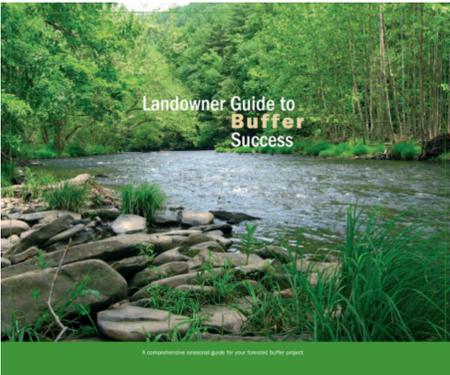
Potential Species: Switchgrass, big and little bluestems, gamagrass, orchardgrass, ryegrass, and Kentucky bluegrass

Grasses have extensive root systems that reduce soil erosion, intercept nutrients and sediment, and slow water entering waterways. Environmental benefits vary based on when its growing season is (warm or cool weather) and individual characteristics. Switchgrass is used for biofuel production. Grasses can also be harvested for floral uses.

Additional Considerations

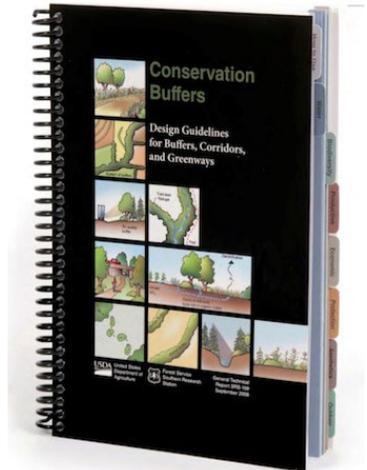
Managing your investment is critical while the planting is establishing. It takes many years for riparian trees and shrubs to mature and achieve some of the intended conservation and production functions.

You must also consider maintenance when designing your multifunctional riparian forest buffer. Maintenance includes, but is not limited to: watering, controlling weeds, staking trees for support, and replacing plantings for those that did not survive. Once fully established after several years, the buffer will likely need less frequent maintenance.



The ***Landowner Guide to Buffer Success*** is available from your local NRCS office. Each season has different management considerations and needs, and this guide helps you throughout the year!

Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways from the USDA's National Agroforestry Center is a great guide to help with planning and designing riparian forest buffers.



Questions?

Contact your local DCNR Service Forester!

Visit www.dcnr.pa.gov



Riparian forest buffers (or simply, streamside forests) have a wide range of functions that lead to **improved quality water** and **enhanced habitat for wildlife**. Here's a short list of benefits provided by riparian forest buffers!

- Stabilize streambanks and reduce soil erosion
- Limit nutrient and sediment runoff into water
- Shade streams which lowers the water temperature
- Provide cover and food for aquatic and terrestrial wildlife
- Create and improve recreational opportunities



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