



Building a Backyard Forest

*Acts of creation are ordinarily reserved for gods and poets.
To plant a pine, one need only own a shovel.
- Aldo Leopold*

What difference does it make if I have even a single tree in my yard and how many do I actually need? Healthy streams are associated with watersheds having 45-60+% forest cover. Maryland has already lost more than half its forests since colonial days and losses are continuing. In the Mid-Atlantic region, streams originally formed in a forested landscape; healthy streams and watersheds relied on their forests. Now many other uses compete for space on the land, but we still need the trees if we want to have healthy streams, clean air, clean water, and diverse wildlife. People also appreciate trees for the beauty they bring, the comfort of summer shade, and screening and privacy. Some days, just seeing glorious fall colors or subtle greening during spring helps make the world a little better. Economic benefits don't hurt either. Homes with mature trees tend to sell faster, with higher resale values. There's nothing like standing out in the August sun to help you appreciate the incredible cooling power of the tree canopy. A well-placed large tree can save 10-30% on cooling and heating costs. Even a small area restored to trees can help support a healthier environment.



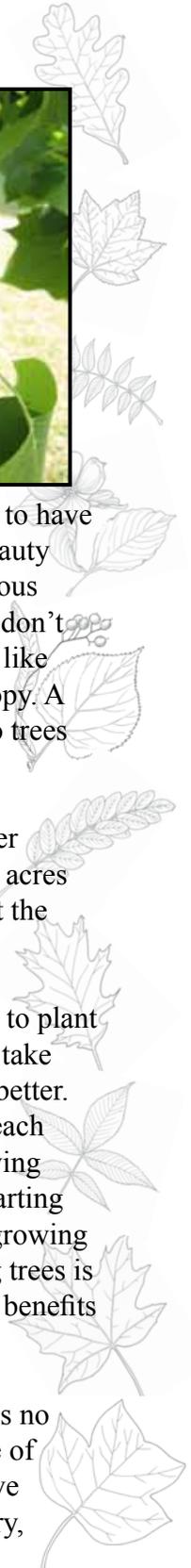
Ready to cut down on costs for mowing and shrink your lawn's carbon footprint? One gas mower running for an hour emits the same amount of pollutants as driving 100 miles. With over 1 million acres of turf grass in Maryland, that adds up. Establishing trees takes some effort and some patience, but the benefits keep growing over time along with the trees.



When should you start? Some wise person said that the best time to plant trees was 20 years ago, and the second-best time is now. Trees do take time to grow, which means sooner is better. Some fast-growing native trees can reach 15-20 feet in 5 years. Many fast-growing trees also tend to be short-lived, so starting some of the longer-lived and slower growing species along with those fast-growing trees is a good investment for the future - the benefits keep coming.



What is the best tree to plant? There's no single best tree, but there are a couple of guidelines to pick a tree that will thrive on your site. Look at soil moisture (dry,



moderate, or wet), light (full sun, partial sun, or shade), and soil type (sand, silt, clay). Conservation landscaping plant guides can help match species to site conditions (see example plant lists or reference links below). Native species are usually the safest choices. Many insects are adapted to use certain species, especially in larval stages, and can't survive on other types. Why not plant what the butterflies can breed on as well as feed on? Native species also help avoid problems with exotic invasive species taking over native woodlands. Several common landscaping plants like Norway maple, Japanese barberry, bush honeysuckle, and oriental bittersweet are now increasingly seen in our natural areas in high densities, crowding out native plants. The time of year makes a difference. Planting works best in the spring and fall when soils are moist. Trees planted in the spring usually need conscientious watering throughout the first summer whenever soils get dry.

HOW TO GET FROM TURF TO FOREST

Every oak tree started out as a couple of nuts who decided to stand their ground. - Anonymous

A tree or two isn't hard to plant and mulch, but creating a forest area from lawn takes some know-how, some preparation, and some follow-up. There are several approaches and options, depending on whether your supply of patience or money is most limiting. Start small and see what works for you in your yard, expanding year by year. Fescue, the most common lawn grass is a tough competitor for water and nutrients, making it hard to grow trees. If you want to really move away from mowing and realize the full range of forest benefits, a forest floor (where the leaves and twigs can build up) and understory shrubs should be allowed to develop. You can try it yourself using any of the techniques below, or ask your favorite landscaper for help with restoring native plants to your yard.

Techniques

A) Individual Trees

Clear away top layer of turf, dig the hole twice as wide as deep, plant tree at same depth as in pot, root ball, or root collar, firm soil around roots to make good soil/root contact without compacting the loosened soil, mulch an area large enough to mow around easily without bumping the new tree trunk.

B) Planting Beds

Wood-Chip: Cover the area with 3-4 inches of wood chips for about a year, adding piles of fall leaves up to 6-8 inches deep if desired. This helps improve the soil while keeping weeds out. Plant into the wood chip area and maintain mulch until trees shade the ground.

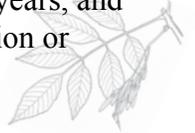
Other smothering techniques: Layered newspaper, cardboard, or landscape cloth can be placed on grass and covered with some mulch to improve appearance. This should be done several months before planting to get good control of grass and weeds.

Herbicide: Common herbicides like glyphosate can be used to kill grass and roots more quickly, and are usually highly effective. Always follow label directions for safe and effective use. Herbicides should be applied several weeks before planting.

Tilling: Grass can be tilled, but will usually resprout vigorously. Plan on a second tilling after a couple weeks to help control resprouts.

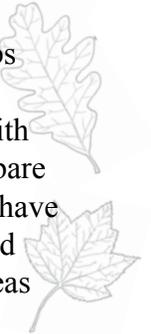


Mulch around trees at least until they are large enough to shade the ground. Fill in with perennial or self-seeding annual flowers and shrubs to develop a new bed. Weed aggressively for the first couple years, and enjoy the color and shade for decades. Beds can be expanded over time, whether in a new location or adjacent to the first.



C) Cover Crop

For a larger area, convert grass into a cover crop like clover or wildflowers and plant trees and shrubs through it. Cover crops compete less with the young trees and don't need weekly mowing. Remove grass by smothering with plastic, layered newspapers, or cardboard over several months, or spray with herbicides for results in a couple weeks. Cover crops keep out weeds that would otherwise grow in bare soil. Common cover crops are clover, alfalfa, wheat, barley, rye. Sunflowers and native wildflowers have also been used with good results. This transition can take two years; you will probably need to reseed some areas to increase density of wildflowers or native grasses after the first year. Newly planted areas will need water if it is dry shortly after planting, or during a severe drought within 2-3 years.



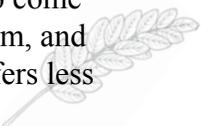
D) No-mow

Stop mowing, plant wildflowers on the edge, and encourage volunteer trees (natural regeneration). Sometimes simply stopping mowing will allow natural succession to forest conditions. Creating a wildflower edge can make this transition more pleasing to the eye (yours and your neighbors'). This is more likely to work where large trees producing seeds are very near, and where soils haven't been compacted. Many lawns were compacted during house construction, or don't have good seed sources nearby. Within a couple years, there should be evidence of young trees coming up. Start planting if trees don't volunteer. Control invasive species to allow the native plant community a chance.



Planting Stock Types

Natural Regeneration (letting trees grow that start on their own): If you have trees trying to come up around the yard, this can be a good option. The trees have already chosen a spot that suits them, and the roots get to develop in place and undamaged. It is often the least expensive approach, but offers less control over the look of the yard and species of plants.

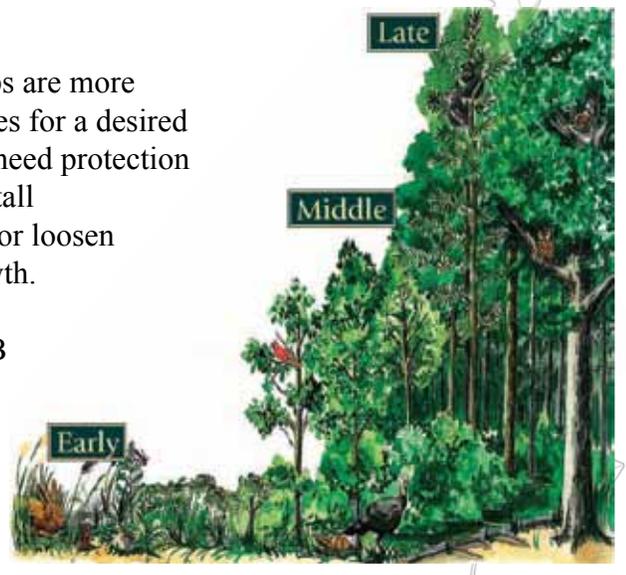


Planting Seedlings: Bare-root seedlings are inexpensive, easy to experiment with, and can rival the size of trees planted at larger sizes within a few years. They need to be protected from deer, mowers, and weed-eaters for several years with fencing or shelters.



Planting Containerized Plants: Containerized trees and shrubs are more expensive, but are available in a wide variety of species and sizes for a desired design, and give more immediate visual impact. Most will still need protection from deer browse in most suburban areas. Many people can install containerized stock themselves, but care should be taken to cut or loosen roots that have circled around the pot to allow normal root growth.

Planting Ball and Burlap Trees (larger nursery stock): B&B trees are the largest sizes and usually installed with the aid of equipment. They are the most expensive, but also the most gratifying in immediacy of results. All planting stock usually need watering during dry times for several years until roots are well-established.



Resources:

Cullina, William. 2002. Native Trees, Shrubs, and Vines, Houghton-Mifflin Co., New York, 354p.
 Dirr, Michael. 1997. Dirr's Hardy Trees and Shurbs, Timber press, Portland, 493p.
 Hairston-Strang, A. B. 2005. Riparian Forest Buffer Design and Maintenance Guide.
www.dnr.state.md.us/forests/download/rfb_design&maintenance.pdf.
 Lady Bird Johnson Wildflower Center website, University of Texas. Plant lists with growth information and search capabilities www.wildflower.org/plants.
 Low Impact Development Center website. Raingarden designs at www.lowimpactdevelopment.org/raingarden_design.
 Maryland Native Plant Society website. Plant lists and links to other resources:
www.mdflora.org/publications/natplantsframe and www.mdflora.org/plantinfo/plantinfo.
 Missouri Botanical Garden website. Plant lists, fact sheets, and search capabilities:
www.mobot.org/gardeninghelp/plantfinder.
 Mizejewski, D. 2004. Attracting Birds and Butterflies and other Backyard Wildlife.
 National Wildlife Federation. 128p.
 Native Plants for Wildlife Habitat and Conservation Landscaping. www.nps.gov/plants/pubs/nativesMD/lists.
 PLANTS database, Natural Resources Conservation Service. Plant characteristics with search capabilities and links to invasive plant lists: plants.usda.gov
 Slattery, B.E., K. Reshetiloff, and S.W. Zwicker. 2003. Native Plants for Wildlife Habitat and Conservation Landscaping: Chesapeake Bay Watershed. U.S. Fish&Wildlife Service, Chesapeake Bay Field Office, Annapolis, MD. 82pp. www.nps.gov/plants/pubs/chesapeake
 Swearingen, J., K. Reshetiloff, B. Slattery, and S. Zwicker. 2002. Plant Invaders of Mid-Atlantic Natural Areas. National Park Service and U.S. Fish & Wildlife Service, Washington, D.C. 82 pp.
www.nps.gov/plants/alien/pubs/midatlantic/.
 Tallamy, Douglas. 2007. Bringing Nature Home: How you can sustain wildlife with native plants. Timber Press, Portland. 358p.
 Forestry for the Bay: <http://www.forestryforthebay.org/>.



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Seasonal Color Grove

“Nothing is more beautiful than the loveliness of the woods before sunrise.”
- George Washington Carver

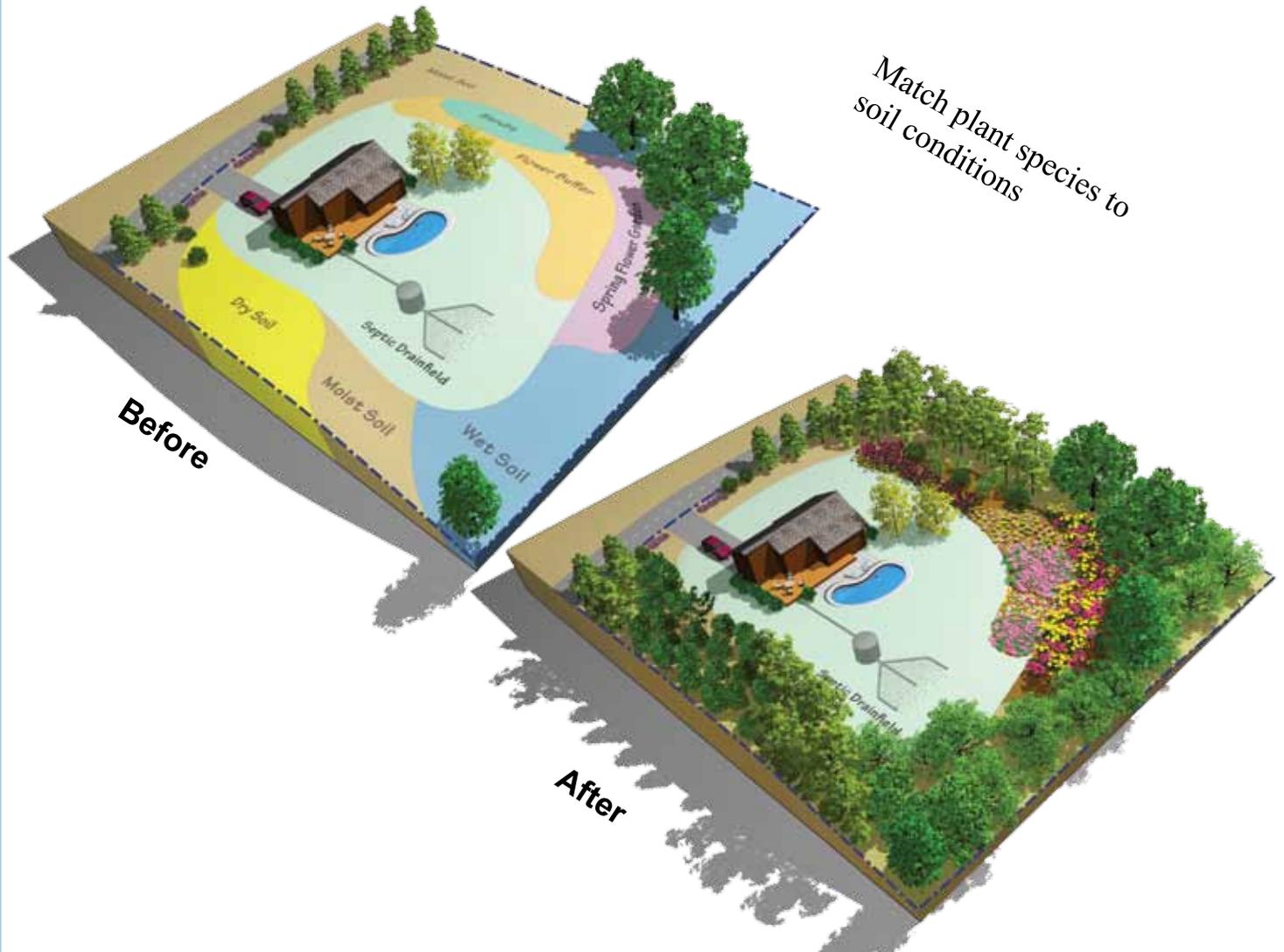
WHY

Trees are always good for water and wildlife, but most people plant trees for their beauty, comfort, and shade around the house. Plantings create a sense of place and a greater degree of privacy for the yard.

HOW

You can choose trees that give spring blooms, varying leaf textures, canopy shapes, or brilliant fall color. Others can provide attractive bark, evergreen foliage, or berries for winter interest. Plant trees on the west and south sides and around heat pumps to reduce cooling and heating costs.

Fill in under trees with shrubs and flowers to develop seasonal tableaux of color. Plants with seasonal features like flowers or fall color can be grouped for vivid points that vary in location over the year. Another approach is to interplant plants that bloom at different seasons so that most of the yard has some interesting feature during any season.



Common name	Latin name	Soil Moisture preference	Sun preference	Flower Color	Fall color	Description, Ground Cover GC	Soil Moisture Preferences:			
							All	Dry	Moderate	Wet
Eastern redbud	<i>Cercis canadensis</i>	Dry to mod.	Sun, PS, Shade	pink	yellow	Intense pink flowers in spring, heart-shaped leaves, nitrogen fixer, adaptable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pitch pine	<i>Pinus rigida</i>	Dry to mod.	Sun	no	evergreen	Medium-sized evergreen, coarse branching habit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scarlet oak	<i>Quercus coccinea</i>	Dry to mod.	Sun	no	red	Red fall color, medium to large oak, can use many other oaks too (red, white, black)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sweet birch	<i>Betula lenta</i>	Dry to mod.	Sun, PS	no	yellow	Can tolerate dry soils, but grows faster in moist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
American holly	<i>Ilex opaca</i>	Moderate	Sun, PS, Shade	white	red berries	Many cultivars, evergreen with red berries, screening, shelter from winter wind	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Downy serviceberry	<i>Amelanchier arborea</i>	Moderate	Sun, PS	white	orange, red	White flowers in spring, red-orange fall color, gray winter bark, oval crown	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flowering dogwood	<i>Cornus florida</i>	Moderate	Sun, PS	white	red	Many cultivars, white spring flowers, red fall color and red fruit, well drained acidic soils	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fringetree	<i>Chionanthus virginicus</i>	Moderate	Sun, PS	white	yellow	Small tree/shrub, white Spring flowers, yellow fall color, gray winter bark, females make olive like drupes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Red buckeye	<i>Aesculus pavia</i>	Moderate	Sun, PS	red	yellow	Small tree (30 ft), striking red spikes of flowers, attractive foliage, slow grower	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sugar maple	<i>Acer saccharum</i>	Moderate	Sun, PS	small	orange, red	Classic fall foliage tree, also tapped to make maple syrup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sweetbay magnolia	<i>Magnolia virginiana</i>	Wet to mod.	Sun, PS, Shade	white	evergreen	Fragrant showy white flowers, medium-coarse texture, semi-evergreen, small tree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Atlantic white-cedar	<i>Chamaecyparis thyoides</i>	Wet to mod.	Shade, PS	no	evergreen	Fine textured evergreen, 'Heatherbun' has rounded form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Northern white-cedar	<i>Taxus occidentalis</i>	Wet to mod.	Sun	no	evergreen	Attractive evergreen with dense foliage, prefers limestone soils	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Red maple	<i>Acer rubrum</i>	Wet to mod.	Sun, PS	no	red	Many cultivars available, great fall color and fast growing canopy tree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mountain laurel	<i>Kalmia latifolia</i>	All	Sun, PS, Shade	white	no	Needs good drainage, evergreen, white flowers in late spring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Redosier Dogwood	<i>Cornus sericea</i>	Wet to mod.	Sun, PS	white	yellow	Red twigs in the winter and yellow fall leaf color, white flowers; there is a yellow cultivar, winter fruit for birds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dwarf inkberry	<i>Ilex glabra 'Nana' or 'Densa'</i>	Wet to mod.	Sun, PS	white	no	Fine texture, evergreen shrub, shears well, 'Shamrock' a good non-dwarf cultivar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spirea, meadowsweet	<i>Spirea alba</i>	Wet to mod.	Sun, PS	white	no	Arching canes or mounding shrub, 'S. tomentosa' has pink flowers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dwarf oakleaf hydrangea	<i>Hydrangea quercifolia 'Pee Wee'</i>	Moderate	Sun, PS	white	red	White summer flowers, red fall color, coarse textured branches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fothergilla	<i>Fothergilla gardenii</i> or <i>major</i>	Moderate	Sun	white	yes	White fuzzy flowers in spring, yellow-orange-red fall color 'Mt Airy' a good cultivar, keeps shape	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Piedmont azalea	<i>Rhododendron canadense</i>	Moderate	Sun, PS	pink	no	Upright form, fragrant, light pink late spring flowers, butterflies like this, deciduous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sweetshrub	<i>Calycanthus floridus</i>	Moderate	Sun, PS	maroon	yellow	Maroon flowers ('Athens' is yellow), yellow fall color, fragrant flowers when in full sun	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
American beautyberry	<i>Callicarpa americana</i>	Moderate	Sun, PS	pink	purple berry	Striking shiny purple berries, can prune back easily	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pinkshell azalea	<i>Rhododendron vaseyi</i>	Moderate	Sun, PS	pink	no	Upright form, light pink spring flowers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flameleaf sumac	<i>Rhus copallina</i>	Dry to mod.	Sun, PS	white	red	Rich red fall foliage, can form a colony from sprouts, 'R. aromatica 'Grow Low' a good related cultivar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Black-eyed Susan	<i>Rudbeckia hirta</i>	Dry to mod.	Sun, PS	yellow	no	Maryland state flower, golden yellow flower with black center	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coralbells	<i>Heuchera americana</i>	Dry to mod.	Sun, PS	pink/red	no	Long bloom time, semi-evergreen, low foliage, straight species has red/pink flowers, many cultivars, GC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Firecracker goldenrod	<i>Solidago 'Firecracker'</i>	Dry to mod.	Sun, PS	yellow	no	Late summer, yellow perennial, birds and butterflies like it, flowers "explode" visually, many varieties	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blue False Indigo	<i>Baptisia australis</i>	Dry to mod.	Sun, PS	blue	no	Striking spikes of blue flowers 3-4' tall, does not transplant well	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green-and-Gold	<i>Chrysogonum virginianum</i>	Dry to mod.	Sun, PS, Shade	yellow	no	Abundant yellow flowers, flowers longer if moist, GC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Threadleaf coreopsis	<i>Coreopsis verticillata</i>	Dry to mod.	Sun, PS	yellow	no	Fine-textured foliage and long-lasting yellow flowers, 'Moonbeam' has pale yellow flower	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wild geranium	<i>Geranium maculatum</i>	Moderate	Sun, PS	pink	no	Pink to purple spring flowers, palmate leaves, GC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bluestar flower	<i>Amsonia tabernaemontana</i>	Moderate	Sun, PS	blue	yellow	Delicate blue flower, butterfly plant, golden fall color, Blue Ice is compact cultivar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bottlebrush grass	<i>Elymus hystrix</i>	Moderate	Sun, PS, Shade	no	no	Upright, fine texture, loose seedhead	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Columbine	<i>Aquilegia canadensis</i>	Moderate	Sun, PS	red	no	Showy red flowers, 12-18" tall, freely reseeds, short-lived perennial	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Moss-pink	<i>Phlox subulata</i>	Moderate	Sun	purple	no	Blue, pink, or pink & white striped spring flowers on evergreen mat of foliage, fine texture, butterflies like it, GC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dwarf crested iris	<i>Iris cristata</i>	Moderate	Shade, PS	purple	no	Edger, 8-10" tall, light purple early spring flowers, needs partial shade, GC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Foamflower	<i>Tiarella cordifolia</i>	Moderate	Sun, PS, Shade	white	no	Spring upright white flowers, 8-12" tall, groundcover, GC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Garden phlox	<i>Phlox paniculata</i>	Moderate	Sun, PS	many	no	Long-lasting showy flower clusters, many colors, 'David' is a mildew resistant white form, 2-3' tall,	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Obedient plant	<i>Physostegia virginiana</i>	Moderate	Sun, PS	pink, white	no	Pink to lavender, or white spike, summer flower, can tolerate wet soils but spreads more	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ostrich fern	<i>Matteuccia struthiopteris</i>	Moderate	Shade, PS	no	no	Dramatic vertical texture plant, clumps, herbaceous fern	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Virginia spiderwort	<i>Tradescantia virginiana</i>	Moderate	Sun, PS, Shade	purple	no	Intense purple flowers in A.M. in spring, adaptable; several colors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sundrops	<i>Oenothera lutea</i>	Moderate	Sun, PS	yellow	no	Spreading semi-evergreen groundcover, Bright yellow flowers in Spring, GC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Canada violet	<i>Viola canadensis</i>	Moderate	Sun, PS	white	no	Groundcover, spreading, white flowers, tinged violet on back, fragrant, attracts butterflies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coral or trumpet honeysuckle	<i>Lonicera sempervirens</i>	Moderate	Sun, PS	red	no	Climbing vine with long bloom time, bright red tubular flowers, GC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bee balm	<i>Monarda didyma</i>	Wet to mod.	Sun, PS	red	no	Marshall's Delight has bright Pink flowers, 2-3' tall, mildew resistant; needs half day of sun	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blue vervain	<i>Verbena hastata</i>	Wet to mod.	Sun, PS	blue/purple	no	Blue to purple spikes in mid to late summer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Canada lily	<i>Lilium canadense</i>	Wet to mod.	Sun, PS	orange	no	Multiple orange summer lily flowers, tall plant (up to 6')	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cinnamon fern	<i>Osmunda cinnamomea</i>	Wet to mod.	Sun, PS, Shade	no	no	Tall upright deciduous fern with cinnamon like florescence, tolerates drought, GC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Golden Alexanders	<i>Zizia aurea</i> aptera	Wet to mod.	Sun, PS	yellow	no	Loose clusters of bright yellow flowers, Z. aptera has rounder leaves, tolerates drier soil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gamma grass	<i>Tripsacum dactyloides</i>	Wet to mod.	Sun, PS	no	no	Clumping arching small grass, fall inflorescence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Goatsbeard - female form	<i>Atruncus dioicus</i>	Wet to mod.	Sun, PS, Shade	white	no	Large billowing clouds of white, up to 4' tall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lady Fern	<i>Athyrium filix-femina</i> -including ssp. <i>Asplenoides</i>	Wet to mod.	Shade, PS	no	no	Fine texture, vertical structure 2' tall, GC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Slender blue flag	<i>Iris prismatica</i>	Wet to mod.	Sun	blue	no	Linear form, blue late spring flowers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The Water-Friendly Forest

"It's a little known fact that fish grow on trees." Anonymous

WHY

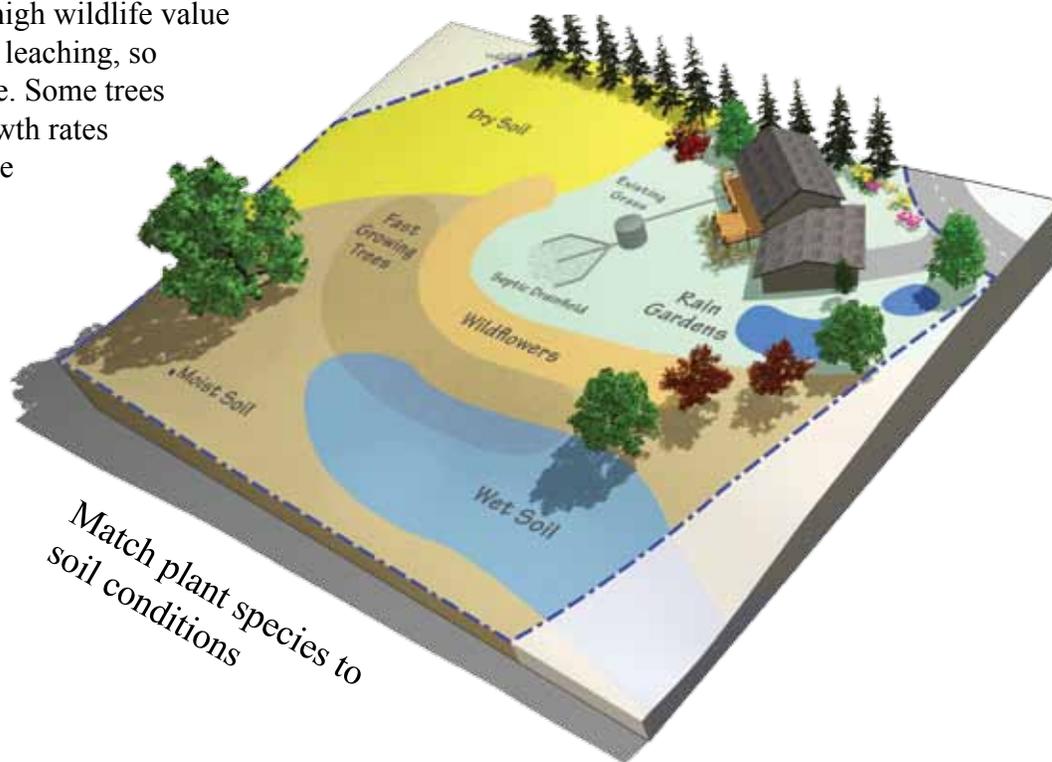
Forests are part of nature's water filter. Forests soak up more water than other land uses, catching rainfall in the canopy and developing more porous soils over time. The forest canopy uses water during the growing season, making more room to store water in the soil during storms. Forests trap and treat nutrients, keeping pollutants out of streams and groundwater. They store carbon to make cleaner air. Septic tanks work well to treat waste to control disease, but most systems do not reduce nutrients well. (Contact MD Dept. of Environment for incentives to install a denitrifying septic system). Planting trees beyond the septic field can help absorb many nutrients before they leach to local streams and groundwater. Add a rain garden to treat rooftop runoff, and rain barrels to capture water for outdoor watering.

HOW

Design an area of fast-growing trees like sycamore or yellow-poplar just beyond a septic tank drain field. A good minimum width is 100 feet wide, with more being needed on steeper slopes. Expand width 4 feet for every 1% slope to compensate for faster water movement on slopes.

Plant densely (400+ seedlings/acre, up to 800 trees per acre). Seedlings are least expensive and if sheltered with tree tubes or deer fencing, can equal or exceed size of trees planted as larger stock within 5 to 7 years. If larger trees are planted, use fewer (100-300 trees/acre). Thin after 10-15 years to encourage larger trees and continued nutrient uptake. Plan on harvesting some of the trees every 30-50 years to encourage rapid new growth. Control invasive weeds by cutting or spraying.

Add trees with more moderate growth rates and longer life spans in surrounding areas. Oaks are native species associated with high wildlife value and low rates of nutrient leaching, so they are emphasized here. Some trees with more moderate growth rates that also provide valuable winter food for wildlife and desirable wood are northern red oak, southern red oak, white oak, and black walnut.



Common name		Latin name	Soil Moisture	Sun preference	Flower color	Fall color	Description	Soil Moisture Preferences:	
								<input type="checkbox"/> All <input type="checkbox"/> Dry <input type="checkbox"/> Moderate <input type="checkbox"/> Wet	
T r e e s	Pignut hickory	<i>Carya glabra</i>	All	Sun, PS	no	yellow	Nuts for wildlife, attractive foliage, adaptable		
	Northern red oak	<i>Quercus rubra</i>	Dry to mod.	Sun, PS	no	red	Common and relatively fast-growing oak, nice fall color		
	Yellow-poplar	<i>Liriodendron tulipifera</i>	Moderate	Sun, PS	yellow	yellow	Fast-growing, tulip-shaped leaf, yellow flowers in spring		
	Eastern white pine	<i>Pinus strobus</i>	Moderate	Sun, PS	no	evergreen	Soft needles, can shear well		
	American sycamore	<i>Platanus occidentalis</i>	Moderate	Sun, PS	no	yellow	Fast-growing, white exfoliating bark, large tree		
	Bigtooth aspen	<i>Populus grandidentata</i>	Moderate	Sun	no	yellow	Fast-growing, smooth bark		
	Pin oak	<i>Quercus palustris</i>	Moderate	Sun	no	red	Adaptable, relatively fast-growing oak, can tolerate wet soils		
	American basswood	<i>Tilia americana</i>	Moderate	Shade, PS	yellow	yellow/brown	Fragrant flowers, bees like the pollen, moderate growth rate		
	Eastern hemlock	<i>Tsuga canadensis</i>	Moderate	Shade, PS	no	evergreen	Lacy texture, susceptible to hemlock woolly adelgid		
	Slippery elm	<i>Ulmus rubra</i>	Moderate	Shade, PS	no	yellow	If using American elm, get disease-resistant cultivar		
	Silver maple	<i>Acer saccharinum</i>	Wet to mod.	Sun, PS	no	yellow	Fast-growing, short-lived tree, tends to have multiple stems or low branches		
	Yellow birch	<i>Betula alleghaniensis</i>	Wet to mod.	Sun, PS, Shade	no	yellow	Shiny bark for winter interest, prefers some shade, N aspects, limestone soils		
	River birch	<i>Betula nigra</i>	Wet to mod.	Sun	no	yellow	Exfoliating bark, graceful droop to branches, dwarf, 'Heritage', and 'Dura-Heat' cultivars		
	Black-gum	<i>Nyssa sylvatica</i>	Wet to mod.	Sun, PS	no	red	Brilliant red fall color, tolerates some drought, slower-growing		
	Eastern cottonwood	<i>Populus deltoides</i>	Wet to mod.	Sun	no	yellow	Fast-growing, short-lived, smooth bark, cottony seeds		
	Swamp white oak	<i>Quercus bicolor</i>	Wet to mod.	Sun, PS	no	red/brown	Tolerates wet soils		
	Swamp chestnut oak	<i>Quercus michauxii</i>	Wet to mod.	Sun	no	red/brown	Tolerates wet soils		
	Water oak	<i>Quercus nigra</i>	Wet to mod.	Shade, PS	no	no	Tolerates wet soils, leaves persist in winter		
	Willow oak	<i>Quercus phellos</i>	Wet to mod.	Sun, PS	no	red/brown	Adaptable, relatively fast-growing oak, small acorns, thin leaves		
	Black willow	<i>Salix nigra</i>	Wet to mod.	Sun, PS	no	no	Slender flexible twigs, can grow from cuttings/live stakes, tolerates flooding and a little salt		
	Bald-cypress	<i>Taxodium distichum</i>	Wet to mod.	Sun, PS	no	no	Fine texture, deciduous conifer, soft graceful foliage, tolerates ponding		
	Red chokeberry	<i>Phloxia pyrifolia</i>	All	Sun, PS	white	red	Bright red berries, adaptable to soils		
	S h r u b s	Oakleaf hydrangea	<i>Hydrangea quercifolia</i>	Moderate	Sun, PS	white	red/maroon	'Alice' and 'Snow Queen' and 'Vaughn's Lily' are good cultivars, exfoliating winter bark, compact cultivars	
		Hazel alder	<i>Alnus serrulata</i>	Moderate	Sun, PS	no	yellow/red	Multi-stem shrub/small tree, nice winter bark, Nitrogen fixer, forms thickets on streams	
		Burtonbush	<i>Cephalanthus occidentalis</i>	Wet to mod.	Sun, PS, Shade	white	white	White balls of flowers in summer, coarse texture, likes wet feet, tolerates drought	
Summersweet		<i>Clethra alnifolia</i>	Wet to mod.	Sun, PS	white	white	Upright summer flowers, bees and butterflies like it, 'Ruby Spice' is a pink dwarf cultivar		
Silky dogwood		<i>Cornus amomum</i>	Wet to mod.	Sun, PS	white	red/purple	Clusters of cobalt blue berries		
Inkberry		<i>Ilex glabra</i>	Wet to mod.	Sun, PS	no	evergreen	Leaves similar to boxwood, retains shape well		
Sweetspire		<i>Itea virginica</i>	Wet to mod.	Sun, PS, Shade	white	dark red	Medium size arching shrub, will sucker, dark red winter stems, butterfly and bird plant, dwarf cultivars		
Marsh mallow		<i>Hibiscus laevis</i>	Wet to mod.	Sun, PS	pink	no	Several color cultivars, generally pink, 3' tall, very wet, bold texture		
Swamp azalea		<i>Rhododendron viscosum</i>	Wet to mod.	Sun, PS	white	yellow/red	White fragrant late spring flowers, likes the wetter areas of a rain garden		
Broomseage bluestem		<i>Andropogon virginicus</i>	All	Sun	no	reddish	Bunching grass		
Deertongue		<i>Dichanthelium ciliatessimum</i>	All	Sun, PS	no	no	Grassy cover		
Switchgrass		<i>Panicum virgatum</i>	All	Sun	no	varies	Fine texture, clumping, many cultivars for height and color		
Virginia creeper		<i>Parthenocissus quinquefolia</i>	All	Sun, PS, Shade	no	red	Vine with five-leaved foliage, bank stabilizer, adaptable, trim as needed		
White snakeroot		<i>Ageratina altissima</i>	Dry to mod.	Sun, PS, Shade	white	no	3' tall, white summer flowers,		
Christmas Fern		<i>Polystichum acrostichoides</i>	Moderate	Shade, PS	no	evergreen	Evergreen, 12-15" tall clumping fern, ground cover		
Common boneset		<i>Eupatorium perfoliatum</i>	Moderate	Sun, PS, Shade	no	no	Sprays of white flowers, tolerates wet soils/spring		
Creeping phlox		<i>Phlox stolonifera</i>	Moderate	Sun, PS	lavendar	evergreen	Various cultivars, evergreen groundcover, pink, blue sometimes white flowers		
Beardtongue		<i>Penstemon digitalis</i>	Moderate	Sun, PS, Shade	white	no	2-3' tall white flowers		
American speedwell		<i>Veronica americana</i>	Wet to mod.	Sun	blue/purple	no	Pretty blue/purple flower, needs wet sites		
Culver's Root		<i>Veronicastrum virginicum</i>	Wet to mod.	Sun, PS	white	no	Upright white perennial, 3' tall, summer flowers, pink cultivars		
Great blue lobelia		<i>Lobelia siphilitica</i>	Wet to mod.	Sun, PS, Shade	blue	no	Purple-blue summer flowers, needs shade in warmer areas, fragrant		
Marsh fern		<i>Thelypteris palustris</i>	Wet to mod.	Sun, PS	no	no	Fine texture, spreading, deciduous fern, 2-3' tall		
Milkweed, swamp		<i>Asclepias incarnata</i>	Wet to mod.	Sun, PS	pink	no	Wet meadows, pink clusters of flowers, Monarch butterfly larval food		
Narrow-leaved sunflower		<i>Helianthus angustifolius</i>	Wet to mod.	Sun	yellow	no	Late summer bright yellow flowers all up and down 8' tall stalks, spreads		
New York ironweed		<i>Vernonia noveboracensis</i>	Wet to mod.	Sun, PS	purple	no	Intense purple flowers in late summer, fall		
Northern blue flag	<i>Iris versicolor</i>	Wet to mod.	Sun, PS	blue	no	Medium blue-purple flowers, grows at pond edges			
Royal fern	<i>Osmunda regalis</i>	Wet to mod.	Sun, PS, Shade	no	no	Tall deciduous fern, likes wet feet, but not continuous saturation			
Turk's cap lily	<i>Lilium superbum</i>	Wet to mod.	Sun, PS	orange	no	Tall with orange summer flowers, takes several years to bloom			
Virginia bluebells	<i>Mertensia virginica</i>	Wet to mod.	Shade, PS	blue	no	Spring ephemeral, blue flowers, color can vary to pink or white			

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The Wildlife-Friendly Woodland

"He that plants trees loves others besides himself."

- Thomas Fuller, *Gnomologia*, 1732

WHY

Sharing your backyard with other creatures is a simple way to better enjoy your land. Forests offer new niches for wildlife habitat with every layer - the high-rises of the wildlife world. Trees help build the whole food pyramid for a variety of wildlife. Like everyone, wildlife is looking for places to live, eat, and raise babies. Pick a couple species from each category to provide habitat during different life stages over the seasons. Use native plants to optimize benefits to local species and minimize risks of bringing in exotic invasive plants that don't support all the local wildlife. If you want a variety of animals, birds, and butterflies, first encourage a variety of native plants.

HOW

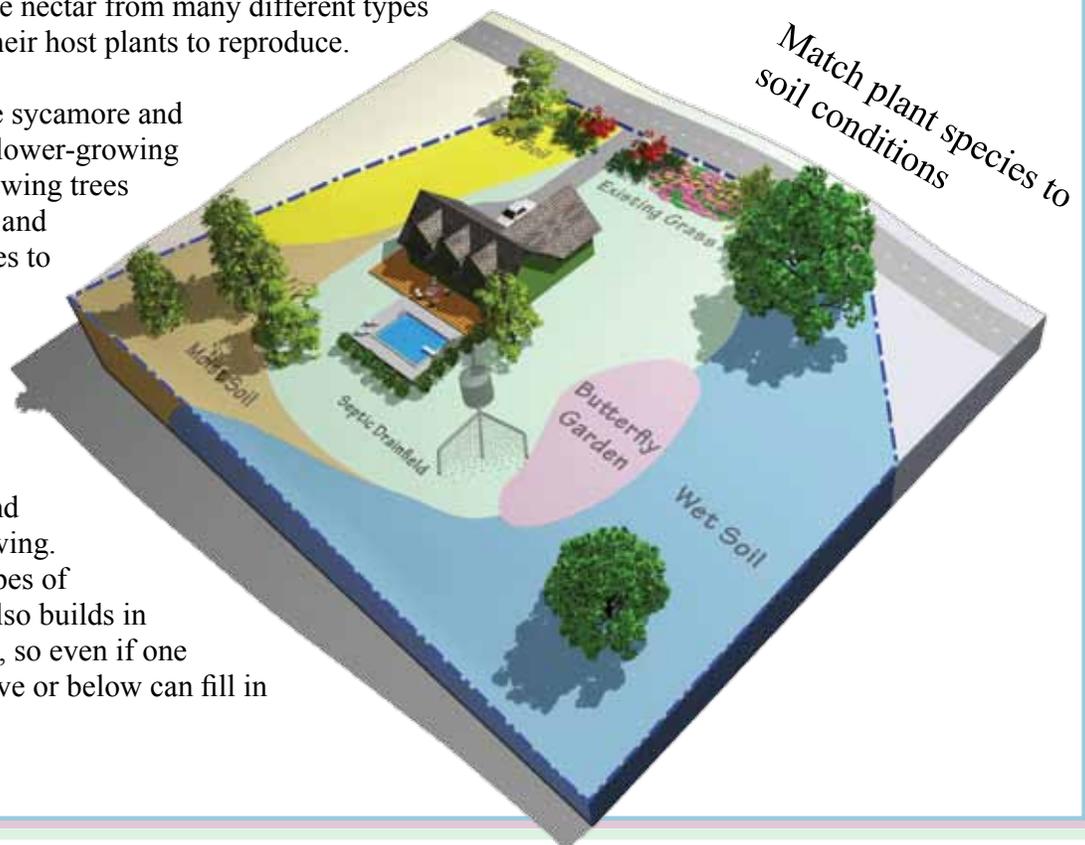
Plant a variety of trees, shrubs, and flowers that can provide food throughout the year. Fruit trees like pawpaw, persimmon, and serviceberry are good summer and fall sources of food. Trees with nuts, like oaks, hickories, buckeyes, and beech, are important winter food sources for many animals.

Wildlife need shelter and water as well as food. Evergreens like white pine, Virginia pine, holly, or eastern redcedar can provide some shelter from winter winds. Plant these in groups for a better windbreak. They can also be planted near a bird feeder to offer birds quick cover from predators. Rock piles, rock walls, dead logs, and brush piles create refuges for small animals. Nesting habitat can be improved with nest boxes for birds. Water can be provided from streams, seeps, or ponds, or even just a bird bath.

One of the delightful responses to growing native plants is the amazing variety of butterflies. Most butterflies need a particular plant to nourish their earlier life stage as a caterpillar. Oaks, willows, and cherries host over 400 species of butterflies (Tallamy 2007). You need a hackberry if you want to nurture the rare hackberry butterfly. Butterflies can use nectar from many different types of flowers, but they need their host plants to reproduce.

Mix fast-growing trees like sycamore and yellow-poplar with some slower-growing oaks or beech. The fast growing trees will help moderate the site and make it easier for other trees to grow. The slower growing trees often live longer, providing benefits for decades.

Encourage canopy layers, including shrubs and ground covers that don't need mowing. More layers mean more types of wildlife can use them. It also builds in resilience to storm damage, so even if one plant is lost, the plants above or below can fill in quickly.



Common name	Latin name	Soil Moisture	Sun preference	Flower color	Fall color	Description	Soil Moisture Preferences:
							<input type="checkbox"/> All <input type="checkbox"/> Dry <input type="checkbox"/> Moderate <input type="checkbox"/> Wet
Chinkapin	<i>Castanea pumila</i>	Dry to mod.	Sun, PS	no	yellow/purple	Sweet edible nut-like fruits (related to chestnut)	
Persimmon	<i>Diospyros virginiana</i>	Dry to mod.	Sun, PS	no	yellow/purple	Edible fruits (best after frost), fine-textured blocky bark	
Eastern redcedar	<i>Juniperus virginiana</i>	Dry to mod.	Sun	no	evergreen	Dense evergreen foliage, likes limestone soils	
Shorleaf pine	<i>Pinus echinata</i>	Dry to mod.	Sun	no	evergreen	Winter cover, seeds in cones	
Virginia pine	<i>Pinus virginiana</i>	Dry to mod.	Sun	no	evergreen	Twisty needles, winter cover and seeds	
Chestnut oak	<i>Quercus prinus</i>	Dry to mod.	Sun, PS	no	yellow-orange	Acorns for winter food, thick ridged bark	
Smooth sumac	<i>Rhus glabra</i>	Dry to mod.	Sun	no	red	Fuzzy berry clusters, drought resistant	
Pawpaw	<i>Asimina triloba</i>	Moderate	Sun	no	yellow to red	Orange fruits, yellow or red fall color	
Shagbark hickory	<i>Carya ovata</i>	Moderate	Sun	no	yellow	Interesting peeling bark texture, nuts for wildlife	
Hackberry	<i>Celtis occidentalis</i>	Moderate	Sun, PS, Shade	no	yellow	Host for rare Hackberry butterfly, drought and flood tolerant	
American beech	<i>Fagus grandifolia</i>	Moderate	Sun, PS, Shade	no	tan	Smooth gray bark, retains tan leaves most of winter	
Black walnut	<i>Juglans nigra</i>	Moderate	Sun	no	yellow	Edible nuts, attractive foliage	
Magnolia	<i>Magnolia grandiflora</i>	Moderate	Sun, PS	white	evergreen	Large, spreading tree with showy white cup-shaped flowers in spring, fragrant	
Red mulberry	<i>Morus rubra</i>	Moderate	Sun, PS	no	yellow	Berries for birds, don't plant white mulberry (invasive)	
Black cherry	<i>Prunus serotina</i>	Moderate	sun	white	yellow/red	Small fruits for birds, dark flaky bark	
White oak	<i>Quercus alba</i>	Moderate	Sun, PS	no	red	Maryland State Tree, attractive textured bark, rounded lobes on leaves	
Southern red oak	<i>Quercus falcata</i>	Moderate	Sun	no	brown	Acorns for winter food, bell-shaped bottom to leaf, drought tolerant	
Sassafras	<i>Sassafras albidum</i>	Moderate	Sun, PS	yellow	yellow	Butterfly tree, great fall color, 3 leaf shapes	
Bitternut hickory	<i>Carya cordiformis</i>	Wet to mod.	Sun	no	yellow	Nuts for wildlife, attractive foliage	
Black huckleberry	<i>Gaylussacia baccata</i>	All	Shade, PS	white	red/purple	Low growing shrub, white flowers	
Arrowwood	<i>Viburnum dentatum</i>	All	Sun, PS, Shade	white	red/purple	White summer flowers, upright form, black fruit	
Elderberry	<i>Sambucus canadensis</i>	All	Sun, PS, Shade	white	yellow	White flowers, Dark fruit, birds like it, upright coarse texture	
Highbush blueberry	<i>Vaccinium corymbosum</i>	All	Sun, PS, Shade	white	red	Many cultivars, red fall color, white spring flowers, blue fruit, birds like plant	
American hazelnut	<i>Corylus americana</i>	Dry to mod.	PS	brown	yellow	Edible nuts	
Blueberry - low bush	<i>Vaccinium angustifolium</i>	Dry to mod.	Sun, PS	white	red	3-5' tall, med-fine texture, white flowers in spring, red fallcolor	
Gray dogwood	<i>Cornus racemosa</i>	Dry to mod.	Sun, PS, Shade	white	purple	Berries for wildlife	
Shining sumac	<i>Rhus copallinum</i>	Dry to mod.	Sun, PS	no	red	Red fall foliage and red spikes of berries in winter, forms colonies	
Black raspberry	<i>Rubus occidentalis</i>	Moderate	Sun, PS	white	no	summer berries	
Possumhaw	<i>Ilex decidua</i>	Moderate	Sun, PS	no	no	Deciduous holly, use a male with females (ie 'Warren's Red'(female) and 'Red Escort' (male)), showy winter fruit	
Witch-hazel	<i>Hamelis virginiana</i>	Moderate	Sun, PS, Shade	yellow	yellow to red	Yellow flowers, yellow-orange-red fall color, good for butterflies/moths	
Serviceberry, Shadblow	<i>Amelanchier canadensis</i>	Wet to mod.	Sun, PS, Shade	white	red-orange	White flowers in spring, red-orange fall color, birds like fruit, gray winter bark	
Northern bayberry	<i>Myrica pensylvanica</i>	Wet to mod.	Sun, PS	no	semi-evergreen	Fine texture, shears well, waxy whitish-blue berries in winter, fragrant	
Spicebush	<i>Lindera benzoin</i>	Wet to mod.	Shade, PS	yellow	no	Yellow flowers, late Spring, Spicebush butterfly plant, upright coarse texture	
Wax myrtle	<i>Myrica cerifera</i>	Wet to mod.	Sun, PS	no	semi-evergreen	fragrant, can prune for a hedge	
Winterberry	<i>Ilex verticillata</i>	Wet to mod.	Sun, PS, Shade	no	yellow	Red berries in winter on females, need 1 male to set fruit, dwarf cultivars	
Blazing star	<i>Liatris spicata</i>	All	Sun, PS	purple		Feathery purple spikes of flowers in summer	
Eastern coneflower	<i>Rudbeckia fulgida</i>	Dry to mod.	Sun, PS	yellow		Perennial form of black-eyed Susan - 'Goldsturm' a common cultivar, late summer flowers	
Foxglove beardtongue	<i>Penstemon digitalis</i>	Dry to mod.	Sun, PS	white		2-3' tall white flowers, hummingbird flower	
Golden fleece goldenrod	<i>Solidago 'Golden Fleece'</i>	Dry to mod.	Sun	yellow		Late summer, early Fall yellow perennial, birds and butterflies like it	
Indiangrass	<i>Sorghastrum nutans</i>	Dry to mod.	Sun	no		Tall clumping grass with graceful seed head	
Lance-leaved coreopsis	<i>Coreopsis lanceolata</i>	Dry to mod.	Sun, PS	yellow		Long-blooming yellow flowers, spreads readily, golden yellow flowers in early summer	
milkweed	<i>Asclepias syriaca</i>	Dry to mod.	Sun, PS	pink		Dry meadows, pink clusters of flowers, Monarch butterfly larval food, spreads	
Purple coneflower	<i>Echinacea purpurea</i>	Dry to mod.	Sun	pink/purple		Many cultivars, showy summer flowers, butterflies like it, winter seeds for birds	
Bergamot	<i>Monarda fistulosa</i>	Moderate	Sun	lavendar		lavender flowers mid-summer, 4-6' tall, spreads readily (mint family)	
New England aster	<i>Symphoricarpos novae-angliae</i>	Moderate	Sun, PS	purple		Abundant purple flowers in fall, 3-6', spreads readily, dwarf cultivar available	
Woodland phlox	<i>Phlox divaricata</i>	Moderate	Sun, PS	many		Semi-evergreen, spreading, 8" tall, flowers 12" tall, fragrant	
Joe-pye weed	<i>Eupatorium fistulosum</i>	Wet to mod.	Sun, PS	mauve		Tall flower, late summer flowers sprays, butterflies	
Butterfly weed	<i>Asclepias tuberosa</i>	Wet to mod.	Sun, PS	orange		Bright orange summer flowers, Monarch butterfly larval food	
Cardinal flower	<i>Lobelia cardinalis</i>	Wet to mod.	Sun, PS	red		Bright red summer flowers, hummingbird attractor	
Turtlehead	<i>Chelone glabra</i> or <i>lyonii</i>	Wet to mod.	Sun	white/pink		Good butterfly plant, C. glabra has white summer flowers, lyonii has pink	