Good Neighbor Handbook

Tips and Tools for River-Friendly Living in the Middle Potomac Region

Acknowledgements

Editors: Matt Berres, Managing Director & Director of Community Action, Potomac Conservancy; Stephanie Flack, Potomac Gorge Project Director, The Nature Conservancy of Maryland/DC; Meredith Lathbury, Director of Land Protection & General Counsel, Potomac Conservancy; Jennifer Schill, Communications & Membership Manager, Potomac Conservancy

Designer: Kim Roberts Design

Reviewers: Jaimye Bartak, Don Briggs, Paul Carlson, Gary P. Fleming, Matthew Logan, Brent Steury, R.H. Wiegand

Photographers: K.D. Aleda, Matt Berres, Skip Brown, Don Chernoff, Sally Claggett/USDA Forest Service, Gary P. Fleming, Anthony Hathaway, Hal Malde, Joanne Miller, Ed Neville, Katrin Scholz-Barth, Roy Sewall, Ed Tenney, Emily Truckenmiller, R.H. Wiegand

Cover photography: blue heron © Don Chernoff

Selected invasive plant images reprinted with permission from Invasive.org, © University of Georgia, and the photographers Chuck Bargeron, University of Georgia; Leslie Mehrhoff, University of Connecticut; James Miller, USDA Forest Service; David Moorhead, University of Georgia; Paul Wray, Iowa State University; Dan Tenaglia, missouriplants.com; and USDA NRCS. Selected images also provided by the Low Impact Development Center, Catch the Rain, USDA Forest Service, NOAA, and NatureServe.

Produced with generous support from the National Fish and Wildlife Foundation, the Environmental Protection Agency, the National Park Service, and the U.S. Fish and Wildlife Service.

Printed with soy-based inks on recycled paper.

About the Editors

www.potomac.org

For more than ten years, the Potomac Conservancy has been protecting the health, beauty, and enjoyment of the Potomac River and its tributaries. The Potomac Conservancy provides conservation options and hands-on restoration opportunities throughout the Potomac River region, including in the Middle Potomac corridor, which it has identified as a critical landscape meriting special protection.

SAVING THE LAST GREAT PLACES ON EARTH

www.nature.org

The Nature Conservancy (TNC) is a global conservation organization whose mission is to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. Through a strategic, science-based planning approach, TNC identified the Potomac Gorge as a priority conservation area. With the National Park Service, TNC co-owns Bear Island in the heart of the Gorge and is helping to implement a comprehensive Potomac Gorge Site Conservation Plan to protect the area's extraordinary natural diversity.

The Potomac Conservancy and The Nature Conservancy are working in partnership to protect the Potomac River, which provides nearly 90 percent of the Washington, DC metro region's drinking and household water.

Table of Contents

A Message from the Editors

The recommendations in this guide will help protect our region's streams, forests, and wildlife.

One of the many benefits of living in this region is its proximity to the Potomac River. As a property owner living on or near the Potomac or one of its many tributary streams, you have the opportunity to help preserve the health and beauty of the Potomac River and its adjoining lands through your daily decisions about your land.

This handbook is designed to help landowners build on their desire to explore and better understand their land. It is intended to serve as a primer for how you can enhance the natural beauty and value of your property while protecting the Potomac River, the Chesapeake Bay, and the plants, animals, and human communities that rely upon them to survive and flourish.

Each chapter of this handbook introduces an important issue facing landowners in our region and some simple practices that can help to ensure a healthier and more natural Potomac River. The possibilities run the gamut from using native plants to create colorful and diverse gardens for native pollinators, to reducing pesticide and herbicide use on your lawn, to permanently protecting private land with conservation agreements.

The handbook also provides a list of available resources, publications, and sources of additional information for specific subject areas. It is not intended to be an exhaustive compilation of all available information, nor an explicit endorsement of any resources or organizations. References are provided for information only.

It is our goal that this handbook raise awareness of important challenges and opportunities facing the Potomac River and its tributaries in the Middle Potomac Region of Maryland, Virginia, and Washington, DC. We also hope that it will provide a starting point for landowners to take voluntary steps toward more river-friendly living in the Potomac River watershed, the area of land that drains into — and affects the health of — the Potomac River and the Chesapeake Bay.

–The Editors

Why a River-Friendly Living Handbook?

The Washington, DC region boasts the wildest, most intact river corridor running through a major metropolitan area anywhere in the world. The Potomac River possesses an impressive combination of natural, scenic, cultural, historic, and recreational resources. The river supplies nearly 90 percent of the region's drinking and household water. Millions of paddlers, fishermen, joggers, hikers, bicyclists, climbers, and bird watchers take advantage of the Potomac's unique and world-class recreational opportunities. The second largest tributary of the Chesapeake Bay, the Potomac is also home to national wildlife treasures such as the great blue heron and the bald eagle.

As it flows toward Washington, the Potomac River is constricted into a narrow gorge where over millennia, the river has carved a deep valley. In the heart of the Middle Potomac Region, the Potomac Gorge is the 15-mile river stretch from just above Great Falls to Georgetown, including portions of the C&O Canal National Historical Park, George Washington Memorial Parkway, county parkland, and private lands. After big storms or snowmelts, the river's floodwaters rage through this narrow gorge, creating a

Beneath Chain Bridge, which connects Washington, DC to Arlington, Virginia, is a flood-scoured woodland habitat likely found nowhere else in the world.

Awe-inspiring in its power and beauty, the Great Falls of the Potomac mark the upstream extent of the Potomac Gorge.

dynamic environment where rare plants and natural communities adapted to these intense conditions can thrive. The combination of protected lands and regular flooding makes the Potomac Gorge one of the most biologically rich natural areas in the eastern United States, with more than 200 rare species and natural communities. But this tremendous natural resource is at risk. The Middle Potomac Region — the 42-mile stretch of the river from Point of Rocks, Maryland, to its confluence with Rock Creek in Washington, DC, including the Potomac Gorge — was recently designated by Scenic America as a "Last Chance Landscape." This recognition is given to places with outstanding scenic and recreational resources that are threatened by development and other challenges.

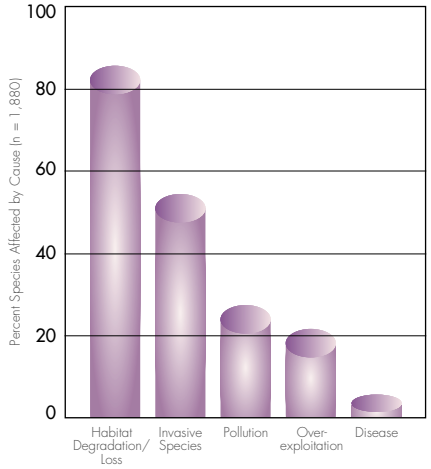
The threats that confront the Middle Potomac Region and its nationally significant natural resources include growing residential development, new riverfront industrial and power plant construction, proposals for new roads and bridge crossings, rapidly spreading invasive plant species, overconsumption of native vegetation by deer, and insensitive recreational use of parks and other natural areas.

With the help of riverfront landowners, regional residents, and local governments, the Potomac still has a "last chance" to overcome these threats and retain its scenic and ecological integrity.

Weeds Gone Wild:

The Threat of Invasive Plants

Invasive plant and animal species are believed to be the number two threat to our nation's rare, threatened, and endangered species, second only to habitat loss and degradation. Nationwide, these species have cost billions of dollars in property damage and lost productivity.



Invasive species are the second greatest threat to federally listed threatened and endangered species in the United States.
Source: Precious Heritage: The Status of Biodiversity in the United States

Thousands of plant and animal species have been brought to North America since European settlers arrived more than 300 years ago. Some of these species were brought intentionally as food, ornamentals, or medicines. Others were introduced by accident in soil, crop seed, packing materials, or ships' ballast.

Many introduced species are integral parts of our culture and economy and rarely invade natural areas. Several hundred nonnative species, however, have no natural controls here in the Middle Potomac Region. As a result, they can spread unchecked, overrunning our yards and parklands and outcompeting native species, even deep in forests and otherwise undisturbed habitats.

The plants that evolved in the Middle Potomac Region are adapted to its specific soil, rainfall, and temperature conditions. These native species have natural defenses against many insects and diseases, but they often cannot compete with invasive species. In many cases, park and natural resource managers must take direct action to control invasives in order to protect and restore our natural habitats.

Some of our region's worst invasive plants are popular landscaping species, such as Japanese honeysuckle, wisteria, and English ivy. Yet many landowners continue to use these and other invasive species

Invasive nonnative vines like kudzu can kill trees by blocking their sunlight and causing limb breaks and tree falls.

in their yards, largely because they are unaware of their adverse effects or of the good alternatives that exist. For many of these popular invasive landscaping plants, there are equally desirable noninvasive substitutes that offer comparable beauty and benefits.

When you make landscaping decisions, it is important that you know which plants have the potential to become invasive (see Appendix III for a list of the worst invaders in our region). Using native or known noninvasive plants in your yard and garden helps to preserve the balance and beauty of our Middle Potomac Region. Simply selecting the right plants is an easy and important way that you can maintain and restore the natural ecosystems that clean our air and water, stabilize our soil, provide a buffer against floods, and offer food and shelter for wildlife.

Six easy ways to combat invasive species:

- Verify that the plants you are buying for your yard or garden are not invasive. Replace invasive plants with noninvasive alternatives. Ask your local nursery for help in identifying invasive plants.
- Don't release aquarium fish and plants, live bait, or other exotic animals into the wild.
- Clean your boots or shoes before you hike in a new area to remove hitchhiking weed seeds.
- Clean your boat bottom thoroughly before transporting it from one body of water to another.
- Don't "pack a pest" when traveling. Fruits, vegetables and other plants, insects, and animals can carry pests or become invasive themselves.
- Volunteer at your local park, refuge, or other wildlife area to help remove invasive species. Help educate others about the threat.

Books and Publications

Swearingen, J., K. Reshetiloff, B. Slattery, and S. Zwicker. Plant Invaders of Mid-Atlantic Natural Areas. National Park Service and U.S. Fish & Wildlife Service. 2002. Available at http://www.nps.gov/plants/alien/pubs/midatlantic/index.htm.

Thompson, L. Control of Invasive Non-Native Plants: A Guide for Gardeners and Homeowners in the Mid-Atlantic Region. 1999. Available at www.mdflora.org/publications/invasives.htm.

Internet Resources

- Maryland Invasive Species Council – www.mdinvasivesp.org
- Mid-Atlantic Exotic Pest Plant Council – www.se-eppc.org/states/midatlantic.cfm
- The Nature Conservancy Wildland Invasive Species – tncweeds.ucdavis.edu/
- Virginia Department of Conservation and Recreation's Natural Heritage Program – http://www.dcr.state.va.us/dnh/invinfo.htm

Financial and/or Technical Assistance

- Pulling Together Initiative grants – www.nfwf.org/programs/pti.htm

Content Credit

- Thompson, L. Control of Invasive Non-Native Plants: A Guide for Gardeners and Homeowners in the Mid-Atlantic Region. 1999.
- U.S. Fish & Wildlife Service. Native Plants for Wildlife Habitat and Conservation Landscaping – Maryland: Piedmont Region. 2001.

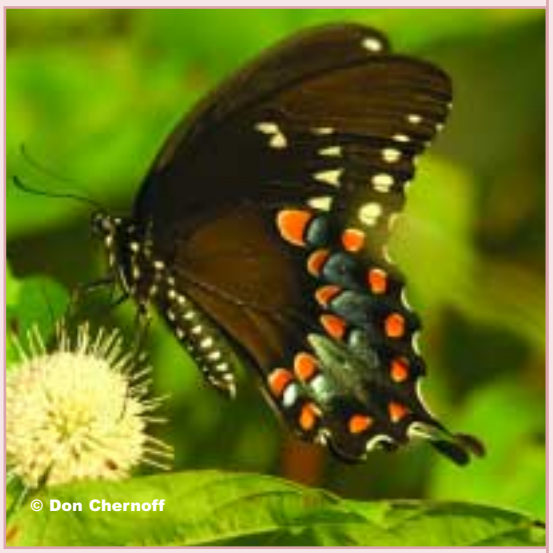
Going Native:

Landscaping with Native Plants

Native plants, such as this iris, can provide color and interest in your yard or garden.

Plants native to the Potomac region are species that evolved here and are adapted to its climate and soils, meaning that they occur in the wild and were not brought in from an outside area. Hundreds of species of trees, shrubs, and wildflowers are native to the Potomac River region, offering a stunning diversity of colors, textures, and blooming and fruiting seasons. It is possible to use only native plants in your landscaping and still add as much variety as that provided by many nonnative or "ornamental" landscaping plant choices.

Native plants have a number of advantages over nonnative plants. Because they are adapted to regional conditions, they are typically hardier and require less care. They tend to be more drought-resistant, require less fertilizer, and ward off pests and diseases well, reducing the need for pesticides and other chemicals. Using native plants in your landscaping will generally reduce your yardwork, as well as cut down on the need for chemicals that harm water quality and wildlife.



Planting native species in your yard can attract beautiful insects such as butterflies, which pollinate plants and play a key role in maintaining the web of life.

Native plants also provide important food sources for many species of birds, amphibians, and butterflies and other insects that are essential for plant pollination, thereby attracting an array of desired wildlife to your yard or garden. Landscaping your yard with native plants also helps to maintain ecological balance in the region.

You do not need to "go native" all at once. Getting started with native plant landscaping can be as simple as planting a small garden area with a mix of colorful native wildflowers that attracts butterflies. Look at your property and choose an area where you will be able to enjoy the wildlife you attract. A small plot near your front door or off a back deck might be the perfect place to plant a new garden that you can observe on a regular basis.

If you work with a landscape architect or garden planner, ask about native plant choices that would be appropriate for your property's soils and sun exposure. Some area garden centers are familiar with native plants and can make recommendations. There is also a vast amount of literature available on this topic. (See Appendices I and II for a list of recommended native plants and suppliers.)

Native plants provide food for our region's wildlife, such as these Carolina chickadees.

Books and Publications

Boring, J.K. et al. Natural Gardening. Time-Life, Inc. 1996.

Ferguson, N. Right Plant, Right Place: The Indispensable Guide to the Successful Garden. Fireside Publishing. 1984.

Northern Virginia Soil and Water Conservation District. You and Your Land: A Homeowner's Guide for the Potomac River Watershed. Available at http://www.fairfaxcounty.gov/nvswcd/youyourland/intro.htm.

Slattery, B.E., K. Reshetiloff, and S.M. Zwicker. Native Plants for Wildlife Habitat and Conservation Landscaping: Chesapeake Bay Watershed. U.S. Fish & Wildlife Service, Chesapeake Bay Field Office, Annapolis. 2003. Available at www.nps.gov/plants/pubs/chesapeake/index.htm.

Internet Resources

- National Park Service – http://www.nps.gov/plants/pubs/nativesMD/info.htm
- River Network, RiverSmart Gardening Tips – www.riversmart.com/gardening.cfm
- U.S. Fish & Wildlife Service, Chesapeake Bay Program. Bayscapes. – http://www.fws.gov/r5cbfo/bayscapes.htm
- Virginia Department of Conservation and Recreation, Division of Natural Heritage – www.dcr.state.va.us/dnh/native.htm

Financial and/or Technical Assistance

- Maryland Native Plant Society – www.mdflora.org/
- Virginia Native Plant Society – www.vnps.org/
- Native plant nurseries in the Chesapeake Bay region – www.fws.gov/r5cbfo/bayscapes.htm

Creatures Among Us:
Creating and Managing Wildlife Habitat

Native trees and shrubs provide food, shelter, and nesting habitat for birds and other wildlife.

Many people assume that creating wildlife habitat requires a great deal of money and acres of land, but every yard can become habitat for birds and other wildlife. All you need are a few critical elements: sources of food, water, and cover. Most of these probably already exist in your neighborhood. You might only need to enhance the area by supplying a few missing features.

The best way to get started is by assessing your property. What sorts of animals are already found in your area? Where do they stay? Is there a reliable source of water and food for wildlife? What sorts of trees, shrubs, and wildflowers grow nearby? Do they produce berries and seeds?

Installing birdbaths, feeding stations, and bird houses are simple ways to turn any landscape into a home for wildlife. Planting native fruiting trees and shrubs can provide a year-round source of

nourishment for many birds, mammals, and reptiles. (See Appendix I for a list of recommended native plants.) Retaining dead or dying trees onsite provides excellent "condominiums" for wildlife. They are excavated and used for food or homes by woodpeckers, squirrels, and a multitude of insects and cavity-nesting birds, such as owls, bluebirds, chickadees, and wrens.

Instead of hauling branch trimmings, rotten logs, or your old Christmas tree to the curb, consider making a brush pile on the edge of your yard. Brush, rock, and log piles are ideal places for birds, rabbits, chipmunks, and a variety of other animals to hide from predators and the weather and to raise their young.

Water is also essential to keeping wildlife nearby. Many properties in the vicinity of the Potomac are rich in springs, seeps, streams, and seasonal pools. The Potomac River itself may be in your backyard. If not, maintaining or creating a pond with fish, amphibians, and plants may enhance your yard's habitat value. Even a simple birdbath can help support birds, butterflies, and other animals. Remember to change the water in the bath every few days, or add a small pump to keep the water circulating, as still or stagnant water can provide a breeding ground for mosquitoes.

Whether you create elaborate habitat features or just add simple modifications to your property, you will gain years of enjoying nature in your own backyard.

Dead and dying trees can provide valuable hiding places for wildlife to store food for winter months.

Water is an essential element of backyard habitat that not only provides a drinking source for wildlife, but also offers species like amphibians a place to live.

Creatures Among Us

Books and Publications

Ernst, R.S. The Naturalist Garden. Globe Pequot. 1996.

U.S. Fish & Wildlife Service. Native Plants for Wildlife Habitat and Conservation Landscaping – Maryland: Piedmont Region. 2001. Available at www.nps.gov/plants/pubs/nativesMD/pdf/MD-Piedmont.pdf.

Internet Resources

- Backyard Wildlife Habitat – www.backyardwildlifehabitat.info/
- National Wildlife Federation, Backyard Wildlife Habitat Program – http://www.nwf.org/backyardwildlifehabitat/
- USDA Natural Resource Conservation Service, Backyard Conservation – www.nrcs.usda.gov/feature/backyard/

Financial and/or Technical Assistance

- Maryland Department of Natural Resources Wildlife and Heritage Service – http://www.dnr.state.md.us/wildlife/habitatfw.html
- Virginia Department of Game and Inland Fisheries, Habitat Partners® – www.dgif.state.va.us/wildlife/habitat_partners/index.html

Deer Not So Dear:
The Dark Side of Bambi

Deer numbers have increased dramatically in the region, exceeding the carrying capacity of natural areas and resulting in significant damage to plant life and tree seedlings.

The white-tailed deer (*Odocoileus virginianus*) is an important and valued part of our region's natural heritage. But for the many residents whose landscapes have been devastated by deer, or who have had the frightening and costly experience of hitting a deer with their car, there is serious concern about rising deer numbers in the Middle Potomac Region.

With no natural predators or other controls, deer populations in this region have increased dramatically in the past two decades. Continued development and human population growth force deer into smaller and smaller areas, resulting in increased human conflicts with deer, including car collisions, damage to residential gardens, and the spread of Lyme disease, a bacterium borne in deer ticks.

White-tailed deer feed primarily on leaves, buds, and twigs. An average deer eats between six and eight pounds of vegetation a day, or one to one-and-a-half tons per year. The overabundance of deer in our region is having a profound impact on native vegetation and wildlife habitat. Foods preferred by deer, including rare plants like orchids, may completely disappear from the landscape. Areas with extreme deer overpopulation have little vegetation or tree regeneration on the forest floor. When this happens, trees cannot reproduce and replace themselves, and habitat for forest and ground-nesting birds and other wildlife is severely degraded. We are at risk of losing the woodlands

Mountain laurel, a native evergreen species, is relatively unappealing to deer.

that contribute to the quality of life in our region.

The Middle Potomac Region's patchwork of natural areas and landscaped suburban yards is ideal deer habitat. But there are ways to protect your landscaping from the effects of the deer population boom. In your yard and garden, you can use tall fences or other physical barriers to protect plants that are deer favorites. You can also choose to landscape with native plants not favored by deer. Note that there are no completely deer-resistant plants — deer will eat anything if they are hungry enough.

Flexible tree tubes can help protect tree seedlings from being eaten by deer, enabling trees to reach a size at which they are better able to survive.

Noninvasive species not favored by deer that can protect your garden and help you avoid feeding the growing regional deer population:

Trees

Amelanchier canadensis	Serviceberry, shadbush
Betula lenta, nigra	Sweet or black birch, river birch
Carpinus caroliniana	American hornbeam
Fagus grandifolia	American beech
Ilex opaca	American holly
Juniperus virginiana	Eastern red cedar
Liquidambar styraciflua	Sweet gum
Sassafras albidum	Common sassafras

Small Trees and Shrubs

Asimina triloba	Pawpaw
Clethra alnifolia	Sweet pepperbush (or Summersweet)
Hamamelis virginiana	Witch hazel
Kalmia latifolia	Mountain laurel
Lindera benzoin	Spicebush

Annuals, Perennials, and Bulbs

Andropogon gerardii	Big bluestem
Coreopsis tripteris	Tall coreopsis
Dryopteris marginalis	Marginal shield fern, evergreen wood fern
Onoclea sensibilis	Sensitive fern
Panicum virgatum	Switch grass
Rudbeckia spp.	Coneflower, black-eyed Susan

Note: Before planting any of these species, make sure that they are suited to your specific yard conditions.

Books and Publications

Maryland Cooperative Extension, University of Maryland. Wildlife Damage Management – Resistance of Ornamentals to Deer Damage. Fact Sheet 655. Available at www.agnr.umd.edu/ces/pubs/pdf/FS655.pdf.

Maryland Cooperative Extension, University of Maryland. Managing Deer Damage in Maryland. Bulletin 354.

Maryland Cooperative Extension, University of Maryland. Lyme Disease and the Deer Tick in Maryland. Fact Sheet 595.

Internet Resources

- The Centers for Disease Control – www.cdc.gov/ncidod/dvbid/lyme/index.htm
- Fairfax County, Virginia – www.co.fairfax.va.us/comm/deer/deermgt.htm
- The Lyme Disease Foundation – www.lyme.org
- Montgomery County, Maryland – www.mc-mncppc.org/environment/deer/index.shtm

Financial and/or Technical Assistance

- Centers for Disease Control (Lyme Disease): 800.886.5963
- Fairfax County Park Authority: 703.324.8700
- Maryland Cooperative Extension Master Gardeners: 301.590.9650
- Montgomery County Deer Information Line: 301.495.3585
- Maryland Nuisance Wildlife Information line: 877.463.6497
- Northern Virginia Regional Park Authority: 703.352.5900

Content Credit

- The Montgomery County Deer Management Work Group and The Humane Society of the United States. Living with White-Tailed Deer in Montgomery County, Maryland. 2000.

Minding Your Turf:

Healthy Lawns for a Healthy Bay

Hundreds of thousands of lawns drain to the Potomac River and five million drain to the Chesapeake Bay. Each yard has the potential to send a potent dose of chemicals and fertilizers into local streams, the Potomac, and ultimately the Bay. Improper or excessive lawn fertilization is a significant source of nutrient runoff, the most serious problem facing local waterways and the Bay. Yard runoff carries nutrients from fertilizers, increasing the growth of algae and reducing water clarity, which stresses aquatic plant and animal life. Furthermore, poisonous pesticides and herbicides washed off chemically treated lawns can kill fragile aquatic insects, depriving fish of critical food supplies.

Seven simple steps to help maintain a healthy and attractive lawn while protecting the health of the Potomac River:

- **Mow high with a sharp blade.** The easiest way to ensure a greener, fuller lawn is to avoid cutting more than one-third of the length of the grass blade. For cool-season grasses (such as tall fescue, Kentucky bluegrass, and perennial ryegrass), leave your lawn two to three inches long; for warm-season grasses (like Bermuda grass and Zoysia grass), a length of one to one-and-a-half inches is ideal. Cutting the grass too short will dry out your lawn. Also, take care not to mow your lawn when the grass is wet or under drought stress.
- **Leave clippings on your lawn.** Grass clippings reduce the need for extra nitrogen fertilizer by as much as one-third, saving you money and time. If clippings clump, spread them over your lawn with a rake or pick up extra clippings for compost. Many mulching mowers on the market are designed to finely shred grass clippings, eliminating extra yard waste and work.
- **Apply the correct amount of fertilizer for your lawn's needs.** Over-fertilizing is a common mistake. The best way to determine whether your lawn needs fertilizer is to test the soil. You can get soil tests through your local cooperative extension agent (see Internet Resources at the end of this section). However, soil tests do not determine nitrogen needs. Nitrogen should be applied based on established requirements of grass species and their growth seasons. Remember, more is not better. Lawn fertilizer is measured in pounds per 1,000 square feet. Never apply more than one pound of soluble nitrogen per 1,000 square feet of lawn at one time. For more information, contact your local nursery.

By choosing to landscape with native grasses, you can help protect our region's natural diversity.

- **Choose the right type of fertilizer.** All fertilizer packages have three numbers on them, such as 10-10-10 or 16-4-8. These numbers represent the percentages of nitrogen (N), phosphorus (P), and potassium (K), in that order, by weight. This is also referred to as the N-P-K ratio. So, 16-4-8 fertilizer is 16 percent nitrogen, four percent phosphorus, and eight percent potassium. While all three are necessary for proper growth, many soils naturally have enough of certain nutrients. Your soil test will help you understand which nutrients your lawn lacks. When selecting fertilizers, look for those with high levels of water insoluble nitrogen (WIN). These release fertilizer slowly so your lawn can make better use of it.
- **Fertilize at the correct time.** Fertilize when your grass is actively growing and can take up the nutrients. Never fertilize during the cold winter months when your grass is dormant. The proper timing for fertilizer application varies with the species of grass. Summer is best for warm-season grasses, while September through November is best for cool-season grasses. If you don't know what type of grass you have, ask your local cooperative extension agent or a landscape professional.
- **Apply fertilizer properly.** Nitrogen fertilizer will generally "green up" a lawn. Therefore, it is important to apply the fertilizer uniformly. Use a drop-type or rotary spreader, and be sure to overlap applications adequately. Check the applicator settings often to be sure you're applying the fertilizer at the proper rate. Applying fertilizer by hand is not recommended. To ensure uniform fertilizer application, apply half in one direction and the other half in a perpendicular direction.

Runoff from pesticides and other lawn chemicals can harm and even kill aquatic life, including dragonflies, which live in streams and ponds during their larval stage.

- **Choose certified yard care companies.** If you pay a yard management company to help care for your lawn, consider those certified by the extension agency in your state. Virginia and Maryland both maintain lists of companies that follow "green" yard care practices, including proper fertilizer use and waste disposal.

Books and Publications

Chesapeake Bay Program. Better Backyard: A Citizen's Resource Guide to Beneficial Landscaping and Habitat Restoration in the Chesapeake Bay Watershed. 2001. Available at www.chesapeakebay.net/pubs/781.pdf.

Virginia Department of Conservation and Recreation, Chesapeake Bay Program Office, and Virginia Polytechnic Institute. Tips on keeping your lawn green and the Chesapeake Bay clean. Available at www.fairfaxcounty.gov/nvswcd/lawntips.pdf.

Internet Resources

- Arlington County Department of Environmental Services – www.co.arlington.va.us/des/swd/cmm.htm
- Chesapeake Bay Program Office – www.chesapeakebay.net (or 800.YOUR.BAY)
- Montgomery County Department of Environmental Protection – www.askdep.com
- Virginia Department of Conservation and Recreation – www.dcr.state.va.us/

Financial and/or Technical Assistance

- Virginia Cooperative Extension – www.ext.vt.edu/ or 877.42.WATER
- Maryland Cooperative Extension – www.agnr.umd.edu/MCE/ or 301.405.2833

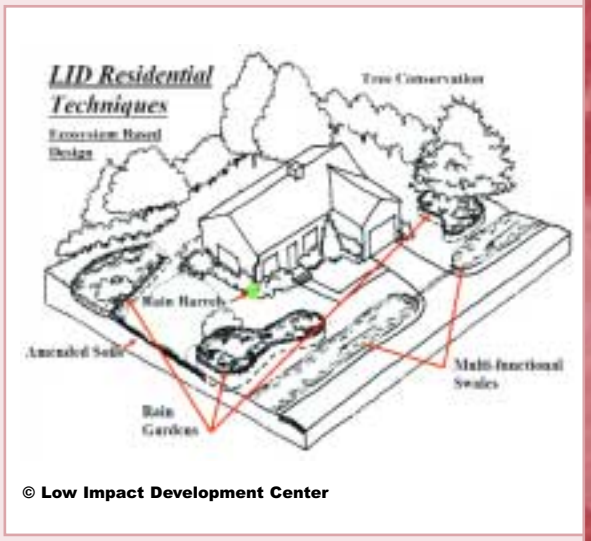
Content Credit

- Virginia Department of Conservation and Recreation, Chesapeake Bay Program Office, and Virginia Polytechnic Institute. Tips on keeping your lawn green and the Chesapeake Bay clean.

Waste Not, Want Not:

Capturing and Using Stormwater

Land development and building construction can severely alter the natural features of our landscape. New development replaces trees and other vegetation with hardened or impervious surfaces, such as roofs and pavement. Water that flows over these impervious surfaces can be heated to high temperatures before it runs directly into streams and other water bodies, increasing their temperature. Further exacerbating the situation, construction equipment often compacts soils, making them less able to absorb rainwater. As a result, developed areas create a significant increase in stormwater runoff.



© Low Impact Development Center

There are many low-impact development strategies that you can apply to your house and yard to protect the health of the Potomac River and its tributary streams.

Stormwater runoff is water that washes off the land after a rainstorm or snowmelt, carrying sediments, excess nutrients, and other toxins and contaminants directly into streams and rivers. Unchecked stormwater runoff can severely degrade water quality and fish and wildlife habitat in the Potomac's tributaries, the mainstem Potomac itself, and ultimately, the Chesapeake Bay.

Low Impact Development, or LID, is an ecologically friendly approach to new construction and redevelopment of existing properties that uses natural systems as a model for the design of man-made environments. Rather than collecting and carrying stormwater offsite — through pipes, curbs, and gutters — LID uses native vegetation and landscaping to capture, treat, and promote the infiltration of stormwater into more permeable surfaces.

An LID-designed or retrofitted site helps protect sensitive areas, such as streams and wetlands, by preserving natural water flow patterns and reducing the volume of stormwater runoff.

Five ways to integrate LID into your home and yard:

- **Downspout diversion.** The simplest LID strategy you can adopt is to direct runoff from impervious areas, such as your rooftop and driveway, onto landscaped and vegetated areas. This is an easy way to reduce the volume of water that goes directly down storm drains and into waterways. By simply directing your downspouts onto your lawn instead of your driveway, rainwater can be absorbed into the ground, where it is cleaned before reaching the Potomac or its tributaries.

- **Rain barrels.** You can easily conserve water and reduce runoff by collecting rainwater from rooftops in rain barrels for later use. Rain barrels come in many shapes, sizes, colors, and styles, ranging from simple plastic barrels to elaborate oak-stave barrels. You can even make your own rain barrel from a food-grade plastic barrel, often for as little as 25 dollars.

Practicing low-impact development on your property can be as simple as capturing rainwater from downspouts in a rain barrel, which reduces stormwater runoff and conserves water for use in your garden.

- **Rain gardens.** Rain gardens are specially designed gardens that are strategically placed in low-lying areas, where they capture stormwater runoff from paved surfaces and downspouts and promote its infiltration into the ground. Any pollutants — such as fertilizers, pesticide residues, or even oil, grease, and heavy metals from roadways — can be trapped by the rich organic soil and root systems in the garden, permitting clean water to seep slowly through the soil and subsoil until it merges with groundwater. You will want to construct your rain garden with specialized soil and a mix of attractive native plants that require less maintenance than traditional landscaping.

Waste Not, Want Not

- **Permeable pavements.** Pavement blocks, porous concrete, and porous asphalt let water infiltrate into the ground. When repairing your sidewalk, driveway, or patio, consider replacing existing asphalt and concrete with attractive pavers or even "grasscrete," concrete pavers with spaces where grasses and other vegetation can grow and allow water to be absorbed into the ground.

Using permeable pavers in parking lots or driveways promotes stormwater infiltration and reduces runoff to our streams and rivers, improving both water and habitat quality.

- **Vegetated ("green") rooftops.** If you are adventurous, a vegetated roof is a time-tested system that can yield multiple benefits. Europeans used vegetated roofs for centuries before the concepts of LID were formalized to reduce the impact of stormwater. Green roofs use a combination of specialized planting media and vegetation — typically sedum, a hardy succulent plant — that helps filter pollutants, reduce runoff, and reduce energy demands for heating and cooling the building. Though initially more expensive to install than a traditional roof, green roofs are

This attractive garden is actually a green roof, a carefully designed system that captures stormwater runoff and reduces energy costs for the building beneath it.

cost-effective in the long run, outlasting traditional asphalt shingles and dramatically reducing heating and cooling costs. In some areas, installing a green roof could even qualify you for tax credits.

Books and Publications

Prince George's County, Maryland, Department of Environmental Resources Programs and Planning Division. Low Impact Development Design Strategies: An Integrated Design Approach. 1999. Available at www.epa.gov/owow/nps/lid/lidnatl.pdf.

U.S. Environmental Protection Agency Office of Water, and Low Impact Development Center. Low Impact Development: A Literature Review. EPA-841-B-00-005. 2000. Available at www.epa.gov/owow/nps/lid/lid.pdf.

Internet Resources

- Greenroof – www.greenroof.co.uk
- Maryland Environmental Design Program – www.dnr.state.md.us/ed
- Potomac Conservancy and Montgomery County Department of Environmental Protection RainScapes – www.rainscapes.org
- Riversides – www.riversides.org
- U.S. Environmental Protection Agency – www.epa.gov/owow/nps/lid/
- Virginia Department of Forestry – www.dof.virginia.gov/rfb/rain-gardens.shtml

Financial and Technical Assistance

- National Low Impact Development Center – www.lowimpactdevelopment.org
- Rain Barrels Made Easy – www.montgomerycountymd.gov/mc/services/dep/rainscapes/barrels.htm
- Stormwater Manager's Resource Center – www.stormwatercenter.net

Twinkle, Twinkle, Little Star:

Minimizing Bright Outdoor Lighting

This satellite photo shows the Eastern Seaboard's night sky from space.

While many people are aware of air and water pollution as serious forms of environmental degradation, few recognize light pollution — the artificial illumination of our night sky — as a significant problem in our country's urban and suburban areas. Bright floodlights and poorly designed outdoor light fixtures are the primary cause of our diminished ability to view stars and planets in urbanized areas.

Poorly designed light fixtures do more than just blot out our view of the starry sky. They disrupt our natural body rhythms, cause accidents on roadways, and waste billions of dollars in energy costs. Bright, artificial lights also confuse nocturnal wildlife like owls, migrating birds, and insect eaters such as toads and bats that rely on a dark night sky.

Outdoor illumination should be aimed downward where the light is needed, not upward or sideways. Light that shines horizontally (or even worse, upward) does not address most lighting needs. It merely dissipates into the distance — a waste of energy and money, and a nuisance to neighbors. The International Dark-Sky Association estimates that one-third of all lighting in the United States is wasted, at an annual cost of about two billion dollars.

Full-cutoff shielding in light fixtures is a simple remedy for both glare and skyglow, the ambient haze in the night sky created from light pollution. Full-cutoff means that no light rays from the fixture shine above the horizontal plane, and that at least 90 percent of the light is blocked from up to 20 degrees below the horizontal plane. By retrofitting with full-cutoff fixtures, you will greatly enhance your ability to observe constellations, meteor showers, and other celestial wonders right from your backyard. Plus, you will save money in lighting costs.

Light pollution disrupts nocturnal animals' behavior and disorients migratory species that travel by night.

The initial cost of retrofitting is quickly counterbalanced by savings in electricity, with a full recoup within approximately three years. The city of San Diego, for example, is now saving about three million dollars per year through outdoor lighting retrofits.

Be courteous to your neighbors and wildlife: shield your outdoor lights and do not leave them on all night. By adding motion sensors and timers to your outdoor lighting, you can direct light to where you need it for safety and convenience without unduly disturbing nature's creatures.

Internet Resources

- Artificial Lighting Impacts seen from space – antwrp.gsfc.nasa.gov/apod/ap010827.html
- Enlighten Maryland – www.enlightenmaryland.org/what_light_pollution/
- International Dark-Sky Association – www.darksky.org/
- Montgomery County, Maryland, Light Pollution Information – www.montgomerycountymd.gov/mcgtmpl.asp?url=/content/dep/Energy/light/light.asp
- Sky & Telescope, Saving Dark Skies – skyandtelescope.com/resources/darksky/

Financial and/or Technical Assistance

- Good Lighting Fixtures – www.darksky.org/fixtures/fixtures.html
- Outdoor Lighting Code Handbook for Communities – www.darksky.org/ordsregs/lchintro.html

Content Credit

- Upgren, A.R. "Dissecting Light Pollution," *Sky & Telescope magazine*. Available at skyandtelescope.com/resources/darksky/article_83_1.asp.

Seeing the Forest for the Trees:

Proper Pruning Etiquette

In the early 1600s, forests covered more than 95 percent of the Potomac River watershed. By the early 1990s, only 60 percent of the forest remained. Today, 28 to 43 acres of green space in the greater Washington, DC region are lost to development each day. If the present rate of forest destruction continues without significant replanting efforts, Maryland alone will lose more than 500,000 acres of forests and farmlands to urban sprawl in the next 25 years — as much as has been lost in the last 300 years.

Maintaining a wooded buffer between homes and the river prevents erosion and sedimentation, and keeps the river corridor wild and scenic.

River- and stream-side forests in particular are critical to the health of our region. Often called riparian buffers, these forests protect water quality and provide critical wildlife habitat. They shade the shoreline, filter pollutants such as fertilizers and sediment from runoff, reduce streambank erosion, keep water temperature more constant, and shelter and enhance aquatic habitats.

Riparian buffers are widely accepted as one of the most cost-effective measures for protecting the health of rivers and streams. According to a 2002 United Nations study, every dollar invested in watershed protection measures, such as the maintenance of buffers, can save up to 200 dollars in water treatment costs.

Trees also contribute to our human environment and property values. You can save as much as 25 percent in annual energy costs by planting deciduous trees to shade your home and evergreen trees or bushes to block the wind. Beyond reducing noise and increasing privacy, residential trees and forest buffers can provide a

Simple pruning methods can allow you to enjoy scenic views from your yard while maintaining a healthy forest buffer between your home and the river.

nature sanctuary in your backyard, and a cool shaded refuge from the summer heat.

Trees also hide houses and buildings from view from waterways, preserving the feeling of wilderness that makes the Middle Potomac so special. Where else in the world can you wander just a few miles from a major urban center and enjoy virtually undisturbed river views?

There are several simple and inexpensive ways that you can protect the beauty of the Middle Potomac Region while maintaining scenic views from your property. Light pruning may be all that is needed to preserve your view of the river while also maintaining a healthy riverside forest. If you live adjacent to public parkland, check your property's deed before doing any pruning, as your options may be restricted by a conservation agreement.

Tree topping — or removing the tops or large mature branches of trees — can damage a tree's trunk or roots, weaken its limbs, and increase the likelihood that it will fall in a storm, endangering people or property. It can also be expensive. Instead, selectively removing branches, or selective pruning, can help to frame views.

When thinking about your view of the river or a stream, you might also imagine what your property looks like from the water or neighboring yards. Trees that screen structures from view help protect your privacy, as well as the river's scenic qualities.

Three ways you can selectively prune for views:

- **Thinning** is the process of removing some of a tree's foliage without altering its basic form or compromising its long-term survival. It is recommended that less than one-quarter of the total leaf area be removed when thinning.
- **Windowing** involves pruning select boughs to frame a view. This method is particularly useful for close-in trees blocking a view from a window, for example.
- **Skirting** is the process of removing limbs near the bottom of a tree in order to open up a view, a method useful for mid-range trees. Not more than a third of a tree's limbs should be removed.

Thinning involves removing selected branches (such as those in blue above), keeping major branches intact while improving sight lines and scenic vistas.

Choosing a Tree Service or Arborist

Tree pruning or removal should be conducted with the help of an arborist and in compliance with local ordinances. Choosing a certified arborist is an important decision when planning the pruning or thinning of trees on your property. Unfortunately, there are some unqualified individuals who offer tree trimming services in our area, showing up at the door with a chainsaw and pickup truck. Homeowners who accept their services may be left with poor quality work and greater long-term problems and expenses. Check with your local cooperative extension office or state forestry office (see Internet Resources at the end of this chapter) for assistance in selecting a certified arborist.

Be sure to ask these questions before selecting a tree service company or arborist:

- Does the company have an occupational license? Are they familiar with local tree cutting ordinances? Make sure the individual helping you is a member of a professional association such as the National Arborist Association, the International Society of Arboriculture, or the American Society of Consulting Arborists.
- Are they a bona fide business in the community? Are they listed in the Yellow Pages under "tree service"?
- Are they fully insured for property damage, personal liability, and workers' compensation?

Books and Publications

Klapproth, J.C. and J.E. Johnson. Understanding the Science behind Riparian Forest Buffers: Benefits to Communities and Landowners. Virginia Cooperative Extension Publication Number 420-153. 2001.

Potomac Conservancy. Riparian Buffers. 2000. Available at www.potomac.org/about/news/fact.html.

Internet Resources

- Maryland Department of Natural Resources – www.dnr.state.md.us/forests/publications/buffers.html
- Plant Amnesty Tree Pruning Tips – www.plantamnesty.org/pruning_tips_content.htm
- TreeHelp.com – www.tree-pruning.com/
- Virginia Cooperative Extension Deciduous Tree Pruning Calendar – www.ext.vt.edu/pubs/nursery/430-460/430-460.html
- Virginia Department of Forestry – www.dof.state.va.us/rfb/index.shtml

Financial and/or Technical Assistance

- American Association of Consulting Arborists – www.asca-consultants.org/resources.html
- International Society of Arboriculture – www.goodtreecare.com/
- Riparian Buffer Tax Credit – www.dof.virginia.gov/rfb/rbtc-code.shtml.
- Society of American Foresters – www.safnet.org
- Tree Care Industry Association – www.natlarb.com/

Content Credit

- PlantAmnesty. Saving Trees & Views. Available at www.plantamnesty.org.

Protecting for Posterity:

Saving Money and Land through Conservation Agreements

The owner of this riverfront property placed a conservation agreement on her land to prevent future subdivision and additional development.

One of the most effective ways to ensure that future generations will enjoy your land as it is today is by donating a conservation agreement. A conservation agreement is a legal tool in which the special qualities of a property are protected in perpetuity by a qualified conservation organization — such as the Potomac Conservancy or The Nature Conservancy. As the holders of conservation agreements, these organizations take on the responsibility of ensuring that the property is forever managed according to the terms of the agreement.

Many landowners want their property to remain much as it is right now. This can be achieved by preventing future subdivision and establishing other limitations to help protect natural features such as woodlands, wetlands, ravines, springs, and river- and stream-side areas. Conservation agreements are tailored to protect a property's individual natural features, while providing flexibility for continued selected uses of the land such as passive recreation, hiking, hunting, and fishing.

Donating a conservation agreement can also offer you significant tax benefits now and in the future. Donors may take advantage of a federal income tax deduction for their charitable contribution, a state income tax credit (for Maryland and Virginia landowners), and sometimes a reduction in property taxes.

In addition, Virginia has two unique tax benefits for landowners who donate conservation agreements or sell land for conservation purposes. First, these individuals can take advantage of a state income tax credit, in which any unused portion of the credit can be sold to other Virginia taxpayers who need additional tax credits. Second, those who sell their land for conservation purposes in Virginia can take a reduction in state capital gains taxes.

Estate tax laws provide for a significant reduction in the valuation of properties protected by conservation agreements, which can help heirs hold onto family lands. As our population ages, more and more family properties are being broken up and sold off because the heirs have no other way to pay the estate taxes. Conservation agreements have become an essential tool in estate planning, helping to keep taxes low and prevent families from losing their land.

Books and Publications

The Nature Conservancy. Conservation Easements: Conserving Land, Water, and a Way of Life. 2003.

Potomac Conservancy. A Lasting Legacy. 2002.

Potomac Conservancy. Conserving Land for the Next Generation. 2001.

Internet Resources

- A Guide for Citizens on Preserving the Natural Environment – www.fairfaxcounty.gov/dpwes/publications/preserve.htm
- Land Trust Alliance – www.lta.org
- The Nature Conservancy – www.nature.org
- Northern Virginia Conservation Trust – www.nvct.org
- Northern Virginia Soil and Water Conservation District – www.fairfaxcounty.gov/nvswcd/newsletter/easement.htm
- Potomac Conservancy – www.potomac.org/pdfs/easement.pdf and www.potomac.org/land/conserve.html

Financial and/or Technical Assistance

- Conservation Incentive Programs for Virginia Landowners – www.vdof.org/mgt/cip-summary.shtml

Keeping It Legal:

Understanding Local Conservation Ordinances

Local conservation ordinances are designed to protect our water resources by minimizing problems like erosion and sedimentation, which can result in sediment plumes like that along the shoreline above.

To help prevent pollution from flowing into our rivers and streams, and ultimately into the Chesapeake Bay, local governments have special provisions protecting stream- and river-side areas, steep slopes, wetlands, floodplains, and other features significant to maintaining water resources. As a landowner, especially if your property is adjacent to a stream or river, it is essential that you be aware of these regulations to help maintain and enhance water quality. Simple activities such as cutting down trees, digging up earth, clear-cutting vegetation, and building accessory structures may seem harmless, but in the aggregate, they can result in serious water quality degradation. That's why each state and county has ordinances and rules designed to protect water resources.

Before using a chain saw or shovel, landowners are strongly encouraged to check with their county to be certain that the activity does not require a special permit. Many counties prohibit or require special permits for any construction or vegetation disturbance in areas along creeks, streams, or rivers. In addition, if you live adjacent to public parkland, there may be terms in your deed that restrict your development or vegetation management options.

Types of activities within riverside vegetation buffers that typically require special permission or may be prohibited include disturbing more than 2,500 square feet of soil or vegetation; cutting down healthy trees and clearing vegetation; and building structures, such as decks, stairs, docks, piers, swimming pools, or paved roads.

Activities within vegetation buffers that typically are permitted but may require notice or special permission from the county include redevelopment (but not expansion) of existing structures; removal or control of invasive species, such as English ivy; cutting of dead, diseased, or insect-infested trees; and agricultural activities, such as crop production and harvesting or mowing hay.

Key ordinances in Maryland and Virginia include:

- Forest Protection / Tree Preservation ordinances
- Erosion and Sediment Control ordinances
- Chesapeake Bay Resource Preservation Act (Virginia only)
- Chesapeake Bay Critical Area Act (Maryland only)

Each county and jurisdiction in the Washington, DC metro region has slightly different versions of these ordinances. In some cases, violators may be subject to criminal penalties and large fines. Check with your local jurisdiction before planning any development or tree removal to avoid a costly mistake.

Books and Publications

Fairfax County Department of Planning and Zoning. Fairfax County Chesapeake Bay Preservation Ordinance. Wetlands Permit Information for Waterfront Property. Available at www.fairfaxcounty.gov/dpz/environment/wetlandspermit.pdf.

Internet Resources

- Arlington County – www.co.arlington.va.us
- Chesapeake Bay Commission – www.chesbay.state.va.us/home.htm
- City of Alexandria – ci.alexandria.va.us
- Fairfax County Municipal Code (Searchable Ordinance Database) – www.fairfaxcounty.gov/government/ (select county code link)
- Loudoun County – www.co.loudoun.va.us
- Montgomery County – www.montgomerycountymd.gov
- Washington DC Resident Resource Center – www.rrc.dc.gov

Appendix I:

Recommended Native Plants

For more details on the habitat, growing conditions, and wildlife value of the species mentioned below and others, please refer to: "Native Plants for Wildlife Habitat and Conservation Landscaping: Chesapeake Bay Watershed," published in 2003 by the U.S. Fish & Wildlife Service's Chesapeake Bay Field Office and available at ww.nps.gov/plants/pubs/chesapeake/index.htm.

Native shade trees

White oak (*Quercus alba*), **northern or southern red oak** (*Q. rubra, Q. falcata*), and **mockernut hickory** (*Carya tomentosa*) are widely adapted shade trees. Other oaks and hickories are suited to very dry, wet, or steep sites. **Tupelo**, also called black or sour gum (*Nyssa sylvatica*), has brilliant red fall foliage and small fruits eaten by birds. In moist, rich soils, **tulip poplar** (*Liriodendron tulipfera*) is fast-growing and has the benefit of being immune to damage from gypsy moths. Other regionally appropriate native trees include **American beech** (*Fagus grandifolia*), **sycamore** (*Platanus occidentalis*), and **chestnut oak** (*Q. prinus*).

Small native ornamental trees

Serviceberry (*Amelanchier canadensis*), **fringetree** (*Chionanthus virginicus*), **black haw viburnum** (*Viburnum prunifolium*), and **red chokeberry** (*Aronia arbutifolia*) are beautiful flowering trees that also produce fruit for birds.

Native trees for hedges

American hazelnut (*Corylus americana*) makes an excellent hedge. In damp soils, **slippery elm** (*Ulmus rubra*) is a good substitute for Siberian elm. On sunny, dry sites, **staghorn sumac** or **shining sumac** (*Rhus typhina, R. copallina*) form thickets.

Native shrubs

Spicebush (*Lindera benzoin*), which is covered with tiny yellow flowers in March, is our most common native shrub. It needs rich soil, as does **strawberry bush** (*Euonymus americanus*). **Maple-leaf viburnum** (*Viburnum acerifolium*) is suited to dry shade and thinner soil, while the **arrowwoods** (*Viburnum dentatum, V. recognitum, V. nudum*) grow in moist soil. **Wild hydrangea** (*Hydrangea arborescens*), parent of some cultivated varieties, is a somewhat vining shrub. **Highbush blueberry** (*Vaccinium corymbosum*), the parent of cultivated blueberries, and **lowbush blueberry** (*V. vacillans*) need very acidic soil. They tolerate shade but fruit best in sun. Both turn red in fall.

Native ornamental vines

Trumpet honeysuckle (*Lonicera sempervirens*), a semi-evergreen twining shrub with tubular red flowers attractive to hummingbirds, is uncommon but indigenous to our region. **Trumpet vine** (*Campsis radicans*) has dramatic flowers attractive to hummingbirds and **Virginia creeper** (*Parthenocissus quinquefolia*) has spectacular red fall foliage, but be aware that both are aggressive growers. **Native grapes** (*Vitis* spp.) provide an enormous amount of food for birds but are aggressive and not ornamental.

Native ground covers

Golden ragwort (*Senecio aureus*) and **green-and-gold** (*Chrysogonum virginianum*) have showy yellow flowers in spring and grow in moist shade. **Wild stonecrop** (*Sedum ternatum*) has lacy white flowers; it grows in thin, rocky soil in light shade. **Moss phlox** (*Phlox subulata*), a familiar landscape plant that usually has white flowers, tolerates very poor soil but requires good drainage. **Wild ginger** (*Asarum canadense*) has kidney-shaped leaves that seem to sparkle in spring. Though not a culinary plant, its roots do have a gingery scent. It requires moist shade. All of these ground covers are evergreens, except wild ginger.

Native grasses and ferns for groundcover

Native grasses usually grow in small clumps in a mix of several species. Tall ones include **Indian grass** (*Sorghastrum nutans*), **big bluestem** (*Andropogon gerardii*), and **purple top** (*Triodia flava*). Small to medium grasses include **little bluestem** (S*chizachyrium scoparium*), **bottlebrush** (*Hystrix patula*), and **wild oats** (*Uniola latifolia*). Native grasses provide nest sites for meadow birds, as well as food, cover, and shelter for a wide variety of animals. In the garden, they offer textural contrast and fall and winter features. Native ferns that do well in the region include **Christmas fern** (*Polystichum acrostichoides*) and **cinnamon fern** (*Osmunda cinnamomea*).

Native wetland plants for water gardens

Turtlehead (*Chelone glabra*), **lizard's tail** (*Saururus cernuus*), **cardinal flower** (*Lobelia cardinalis*), **New York ironweed** (*Vernonia noveboracencis*), **blue flag** (*Iris versicolor*), **Virginia bluebells** (*Mertensia virginica*), **wild blue phlox** (*Phlox divaricata*), **arrowhead** (*Sagittaria latifolia*), and **pickerelweed** (*Pontederia cordata*) are all recommended. Also use native reeds, rushes, and sedges.

Alternatives to bamboo

Instead of bamboo, use native grasses or shrubs (see above).

Appendix II:

Purchasing Native Plants

Native plants are gaining widespread popularity because of their natural beauty and their ability to withstand most of our region's challenging weather conditions: record-setting drought, hot summer temperatures, and cool, wet weather that makes soil soggy. You can now find almost any native plant you want by shopping at local garden centers, ordering by catalog from specialty nurseries, or purchasing online from growers across the country. A number of the nurseries listed below have plant catalogs posted online to facilitate ordering. Please remember to deal only with reputable nurseries and growers, and never collect plants from the wild or purchase wild-collected plants. Wild plant collection threatens native species and ecosystems, and if they are collected from far away, you could end up with plants that have a reduced likelihood of surviving in your garden.

For additional information on the better known native plant nurseries in our area, visit the U.S. Fish and Wildlife Service Chesapeake Bay Field Office website at www.fws.gov/r5cbfo/Nursery.htm.

Please note: This list is provided for information only and does not constitute an endorsement by the editors of this publication or its affiliates.

Retail and Wholesale

Adkins Arboretum
Ridgely, MD
410.634.2847
adkinsar@intercom.net
www.adkinsarboretum.org

Lou Aronica
Washington, DC
202.722.1081

Behnke's Nurseries
Beltsville, MD and Largo, MD
301.937.1100 and
301.249.2492
www.behnke.com

Botanique Nursery
Stanardsville, VA
kbailey@mail.rlc.net
www.pitcherplant.com

Carroll Gardens
Westminster, MD
800.638.6334
www.carrollgardens.com

Chesapeake Native Nursery
Takoma Park, MD
301.270.4534
www.chesapeakenatives.com
(plants and seeds)

Doyle Farm Nursery
Delta, PA
717.862.3134
(herbaceous species only)

Enchanter's Garden
Hinton, WV
304.466.3134

Fiddler's Green Nursery
Taneytown, MD
410.751.0424

Jay's Native Trees
Beavertown, PA
570.658.7568
jayleodi@ptd.net

Retail and Wholesale, cont.

Kollar Environmental Service
Pylesville, MD
410.836.0500

Lower Marlboro Nursery
Dunkirk, MD
301.812.0808
www.lowermarlboronursery.com
(mostly herbaceous species)

Noback's Farm Nursery
Brodbeck, PA
717.235.0419
(herbaceous species only)

Sunshine Farm & Garden
Renwick, WV
304.497.2208
(herbaceous species only)

Virginia Natives
Hume, VA
540.364.1665
www.vnps.org
(herbaceous species only)

WaterWays Nursery
Lovettsville, VA
540.822.5994
(herbaceous species only)

Wildlife Landscapes
Monkton, MD
410.667.9453
wildland@erols.com

Wholesale Only

Appalachian Nurseries, Inc.
Waynesboro, PA
717.762.4733

Atlantic Star Nursery
Forest Hill, MD
410.838.7950
atlanstr@magnus.net
(woody species only)

Bluemount Nursery
Monkton, MD
410.329.9226
www.bluemount.com

Bobtown Nursery
Melfa, VA
757.787.8484

Clear Ridge Nursery, Inc.
Union Bridge, MD
410.848.5806

Heartwood Nursery
Monkton, MD
410.357.8799
(woody species only)

Maryland Natives
Baltimore, MD
410.529.3883
mdn@qis.net
www.maryland
nativesnursery.com

Octoraro Native Plant Nursery
Kirkwood, PA
717.529.4099
octoraro@epix.net
www.octoraro.com

Signature Horticultural Services
Freeland, MD
410.329.2156
(herbaceous species only)

Sylva Native Nursery & Seed
New Freedom, PA
717.227.0486
recins@aol.com

Three Springs Nursery
Laytonsville, MD
301.774.7406
threespg@erols.com
(mostly woody species)

Water's Edge Nursery
Federalsburg, MD
410.479.9037
(herbaceous wetland plants)

Nonprofits

Environmental Concern, Inc.
St. Michaels, MD
410.745.9620
www.wetland.org

Appendix III:

Worst Invasive Species in the Middle Potomac Region

These plants, the "Terrible Twenty-five" of the Middle Potomac Region, are some of the worst invaders of our natural areas. Many of them also overrun our yards and gardens. Allowing these invaders to persist on private land guarantees a never-ending seed source, undermining eradication and control efforts in natural areas. These aggressive invasive species may disrupt natural ecosystem processes, outcompete rare and threatened native species, and cause major alterations in plant community composition and structure. Photos of some of these species appear on the following pages.

Ailanthus altissima.....Tree-of-heaven
Albizzia julibrissin.....Mimosa
Alliaria petiolata.....Garlic mustard
Celastrus orbiculatus.....Oriental bittersweet
Cerastrium spp. .....Non-native chickweeds
Euonymus alata.....Winged burning bush
Glechoma hederacea.....Ground ivy
Hedera helix.....English ivy
Humulus japonicus.....Japanese hops
Lonicera spp. .....Bush and vine honeysuckles
Microstegium vimineum.....Japanese stiltgrass
Perilla frutescens.....Beefsteak plant
Polygonum cespitosum var. *longistem*.....Smartweed
Polygonum cuspidatum.....Japanese knotweed
Polygonum perfoliatum.....Mile-a-minute
Ranunculus ficaria.....Lesser celandine
Rosa multiflora.....Multiflora rose
Rubus phoenicolasius.....Wineberry
Saponaria officinalis.....Soapwort
Stellaria media.....Common chickweed
Urtica dioica.....Stinging nettle
Veronica hederifolia.....Ivy-leaved speedwell
Viburnum dilatatum.....Linden viburnum
Vinca minor & V. major.....Periwinkle
Wisteria sinensis.....Chinese wisteria

Are Invasive Species Living in Your Backyard?

Be on the lookout for these common invaders

Lesser celandine *(Ranunculus ficaria), a fast-spreading relative of the buttercup that is still sold commercially, can form a dense ground layer in natural areas, squeezing out native species including spring wildflowers.*

Originally introduced as a culinary herb in the 1800s, **Garlic mustard** *(Alliaria petiolata), an aggressive invader, can produce hundreds of seeds and displace native spring wildflowers.*

Likely the fastest-spreading invasive plant in our region, **Japanese stiltgrass** *(Microstegium vimineum) is an aggressive grass that expands into disturbed shaded areas, displacing native forest and wetland vegetation. Note the characteristic silvery line along its central vein.*

Tree-of-heaven *(Ailanthus altissima) thrives in developed areas and along roadsides, producing vast quantities of seeds and growing in dense stands that outcompete native plants. Be sure to distinguish this species from its native look-alikes (staghorn sumac, ash, and black walnut) before beginning control efforts.*

Its fiery red fall foliage and distinctive winged stems make **winged burning bush** *(Euonymus alata) a popular landscaping choice, but this invasive shrub forms dense thickets in natural areas, preventing many other native woody and herbaceous plants from growing.*

An ornamental evergreen vine that escaped cultivation, **Japanese honeysuckle** *(Lonicera japonica) invades natural areas where it strangles most vegetation in its path, blocking sunlight from young trees and shrubs.*

Although **English ivy** *(Hedera helix) is a popular groundcover, when this invasive vine climbs trees, it blocks sunlight from reaching the tree's leaves, causing branch loss and eventual tree death.*

First introduced in 1866 as rootstock to propagate ornamental roses, each **multiflora rose** *(Rosa multiflora) shrub yields an average of one million seeds per year, resulting in its aggressive expansion into natural areas.*

Periwinkle *(Vinca minor) is a popular evergreen landscaping plant that has an attractive blue flower, but when it spreads from yards to natural areas, it forms a dense groundcover that displaces most native plants.*

For more information on these species, control methods, and native alternatives, see *Plant Invaders of Mid-Atlantic Natural Areas*, by the National Park Service and U.S. Fish and Wildlife Service, available at http://www.nps.gov/plants/alien/pubs/midatlantic/index.htm.

Good Neighbor Handbook

Tips and Tools for River-Friendly Living in the Middle Potomac Region

potomac conservancy
www.potomac.org

The Nature Conservancy
SAVING THE LAST GREAT PLACES ON EARTH
www.nature.org