Dear Homeowner:

Welcome to Montclair and congratulations on the purchase of your new Lakefront home! While living along the lake has many benefits, including uninterrupted views of nature and direct access to the water to participate in a plethora of activities, lakefront ownership also brings great responsibility. The area surrounding the lake, including portions of your property is called a **Resource Protected Area (RPA)**. RPAs "are corridors of environmentally sensitive lands that lie alongside or near the banks of streams, rivers and other waterways in tidal areas of Virginia. The RPA buffer extends 100 feet inward from the shoreline and protects the wooded buffer along the water, which in turn helps to filter out pollutants and prevent erosion along the shoreline. All waters in Prince William County eventually flow into the Potomac River then into the Chesapeake Bay, **so safeguarding these areas is critical for water quality protection**." These guidelines are part of the Chesapeake Bay Preservation Act adopted into Prince ordinance in 1990. In general, no development, land disturbance, or vegetation removal is allowed in an RPA.

There are many simple actions that you can take to protect the RPA and subsequently the water quality of Lake Montclair. Some of these include:

- Plant a variety of native, non-invasive plants on your property, especially in the buffer area surrounding the lake.
- Do not cut down existing trees. Trees and native vegetation help to prevent erosion and nutrient run-off into the water.
- Do not plant and mow grass/sod leading the entire distance to the lake.
- Limit fertilizer usage. Fertilizers, chemical herbicides, and pesticides affect the ecology of the water and will contribute to the growth of hazardous algae blooms.
- If you must fertilize, do so in the fall September or October and be careful to use the correct amount of fertilizer.
- Remember: all storm drains empty into Lake Montclair.

As part of our overall community plan to protect the lake, the Lake Management Committee (LMC) was formed, and is responsible for providing lakefront homeowners and all residents with educational information and guidance about the lake. The LMC oversees and manages: lake dredging, maintenance of the dam, various projects at the beaches and surrounding shorelines, and the overall protection of the lake ecology. This includes conducting an annual lake lowering in November of each year and completing various activities to support fish and wildlife, including: scheduling fish and geese surveys, the building and placement of fish habitats, and fish stocking as needed.

The following packet includes everything that you need to know in order to be a responsible lakefront homeowner, and to help Montclair protect OUR biggest and most important asset.

- RPA Information
- Storm Drain Protection
- Management of Waterfront Properties
- Buffers
- Native Plants
- Invasive Plants
- Annual Dock/Shoreline Improvement

Again, welcome to the Montclair community! If you have any questions or would like more information about the lake or shoreline, please contact the MPOA Assistant General Manager at AGM@montclairva.com

Prince William County Department of Public Works Doing Our Part to Protect the Bay

Chesapeake Bay Resource Protection Areas

Waterways enhance our quality of life by giving us a visual and recreational treasure. These waters also support a wide variety of plants, animals and aquatic life.

What are Resource Protection Areas (RPAs)?

RPAs are the corridors of environmentally sensitive land that lie alongside or near the shorelines of streams, rivers and other waterways. In their natural condition, RPAs protect water quality. RPAs filter pollutants out of storm water runoff, reduce the volume of storm water runoff, prevent erosion and perform other important biological and ecological functions.

Preservation Act. The Act requires local governments to include water quality measures in their zoning and subdivision ordinances and in their comprehensive plans. In 1990, Prince William County embraced this act and enacted stringent local requirements to protect the RPAs as a means to safeguard the Bay. Prince William County features over 1200 miles of streams and rivers. Our important rivers include the Occoquan River, which serves as a major source of drinking water to Northern Virginia and the Potomac River, a legendary river that flows directly to the Bay.

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Consequences for 4 violating requirements

Please remember

- All Waterways in Prince William County eventually flow into the Chesapeake Bay
- Leading concerns for our local waters are materials dumped into storm drains, animal wastes, excess fertilizers from lawns and excess pesticides.
- Citizens can help by picking up litter, helping with stream cleanups and be mindful of your waste disposal, use of fertilizers and pesticides

RPAs include:

- Tidal Wetlands
- Tidal Shorelines
- Nontidal wetlands next to tributary streams
- 100-foot buffer along all waterways

All waters in Prince William County eventually flow to the Chesapeake Bay. In 1988, Virginia enacted the Chesapeake Bay



Is there a RPA on your property?

In 1990, Prince William County adopted the Chesapeake Bay Preservation Act into its local ordinance. RPAs were designated on all properties, both new and existing, along all waterways in the County.

Owners are responsible for determining if an RPA exists on their property, whether the owner just purchased it or has owned it for years. Please know that if you apply for permits to undertake a project that will disturb land or add a structure to your land, the RPA will appear on our maps. RPAs may exist even if they are not shown on your plat. You will still be required to comply with the RPA requirements.

Please call Public Works at (703) 792-7070 if you would like to learn if RPAs exist on your property. We can provide tips to help maintain it so you can do your part to protect our waters.

Why is it so important to protect RPAs?

Trees and other plants help stabilize stream banks, limit erosion and reduce the volume of storm water runoff rushing into the waterways. Trees also provide shade to help maintain water temperatures which helps support aquatic life. The trees also provide habitat for wildlife.

Vegetation in the RPA also reduces the amount of sediment and nutrients that are carried by stormwater runoff. This runoff is slowed by the vegetation on the ground and can be used by the plants as food.

Trees and plants can also change the structure of pollutants to make them useful substances for the environment. Soil can help change nitrogen into a useful protein for plants and bacteria. Toxic chemicals can be broken down into non-toxic forms.

Vegetation can store nutrients such as nitrogen and phosphorus in plant tissue. This keeps it from entering A naturally vegetated RPA or buffer serves a critical function by removing pollutants from storm water runoff. It acts as a protector, filter and a system to change pollutants into useful substances.

streams where it can make algae grow too fast, choke fish and block sunlight.

Why we need RPAs

When RPAs are disturbed, more pollutants are able to enter our waters and eventually the Bay. Water runoff from storms carries oil from the roads, soil from construction sites, fertilizers and pesticides from lawns and farms, harmful bacteria from animal waste and trash. In fact, runoff is one of the leading causes of surface water pollution.

If RPAs are not preserved or the stream corridor is not protected, then other impacts can occur including stream bank erosion, habitat destruction and a reduction in the stream's biodiversity.

We ask for your help in our efforts by learning more about RPAs and protecting these important areas on your property.

What activities in the RPA require County approval

You will need to discuss and apply for permits with the County before undertaking any activity within the RPA. A 100-foot buffer is required as part of the RPA to help prevent runoff and erosion, as well as filter non-point source pollution. The following activities and uses are permitted in the RPA with County approval, as long as water quality is maintained

- Water dependent facilities such as docks, piers and public beaches
- Rebuilding existing structures to original footprint
- Water wells, boardwalks, trails, pathways and public utility structures
- Selective removal of trees for reasonable sight lines, vistas or walkways (using natural materials)
- Removing dead, dying or noxious vegetation

Please note that any removal of trees must be approved by the County. Any vegetation that is removed must be replaced by another type of vegetation that offers an equal level of water quality protection, such as shrubs or ground cover that don't grow as high. We recommend selective pruning of branches at viewing level so that the tree does not have to be removed.

Some activities may or may not be permitted by the County. These projects require a longer special review process, perhaps a Public Hearing and payment of various fees. Activities that may or may not be permitted include:

- Additions to existing structures
- Secondary structures such as sheds, gazebos and pools



All Prince William rivers, streams and waters flow into the Potomac River and the Chesapeake Bay. Help protect our unique habitats and water wonders!

What activities are NOT permitted in the RPA

The following activities are not permitted in the RPA:

- New development
- Parking lots
- Clear-cutting trees
- Filling and grading activities
- Establishing lawns



Prince William County Department of Public Works Doing Our Part to Protect the Bay

4379 Ridgewood Center Drive Prince William, VA 22192

Phone: 703-792-6819 Fax: 703-792-6828 Email: publicworks@pwcgov.org

In harmony with nature.

Learn more:

www.pwcgov.org

The Environmental Services Division of Public Works is responsible for enhancing water quality, monitoring air quality, protecting properties and the public from flooding due to storms and preventing pollution. We share information with the community through a variety of outreach programs. Staff manages the County's water resources through protection of wetlands, control of storm water runoff, implementation of pollution prevention activities, public education, review of site development plans and inspection of developments for proper drainage and erosion control. Additionally, staff investigates and corrects vegetation ordinance violations, inspects trash violations and provides maintenance for right-ofway landscaping.

Did you know? You can help prevent runoff of oils, gas and petroleum products by maintaining your car and disposing of these products properly. Used motor oil and antifreeze are recycled at the County Landfill. Gasoline and other fluids from vehicles are accepted as part of our Household Hazardous Waste Collection. Call (703) 792-5750 for details.

What happens if you violate the RPA requirements?

If you violate RPA requirements, you will also violate county ordinances that may result in penalties. Violators will be required to restore the RPA in accordance with county guidelines. A plan must be submitted and approved by Public Works. The objective of the plan will be to restore the RPA's ability to protect the stream from runoff and erosion.

The restoration plan requires proposed plantings and a schedule for restoring the disturbed RPA. You will not be allowed to just wait for vegetation to grow back on its own, since it will take too long.

Plantings should include ground cover, shrubs, small trees and large

trees. Be sure to provide a layout to show where the plantings will go. The layout should show the type, number and size of the vegetation to be planted. It should also include information on the timing for the planting.

The County will require an escrow to be posted to cover the cost of plant material and labor for installation. This escrow will be returned once the work is completed and established.

Looking to restore a previously disturbed RPA?

Call Public Works if you would like guidance on restoring property that was disturbed by a previous owner. We can also offer ideas on ways to enhance an existing RPA. Please call us at (703) 792-7070 for ideas on plants and proper planting techniques.





As a citizen of Prince William County you can help protect the environment for future generations. Here are some steps you can take:

1) Only stormwater is allowed to enter storm drains. Do not dump automotive fluids such as oil or antifreeze, cleaning products, paint, grease, trash, yard waste, or anything else. It is against the law and can result in a violation of County Ordinance.

2) Washing your car: Be sure to use phosphate-free soap. When possible, wash your car on grass or gravel so that it seeps into the ground and doesn't run into the storm drain.

3) Lawn Care: Don't apply more fertilizer than is necessary. It is expensive, wasteful, and the excess pollutes our streams and rivers. For a healthy, beautiful lawn, call the Cooperative Extension for free advice at (703) 792-6285

4) Pet Waste: Always pick up after your pet. Pet waste has bacteria that washes into streams and can cause sickness in humans that come in contact with the water. It is also harmful to fish and other aquatic life.

5) Trash and Recycling: Trash makes our communities unattractive and unhealthy. Keep outdoor trash bins covered at all times to avoid trash being blown away. Recycle plastics, metals, paper, and glass whenever possible. Trash can hold water and provide a place for mosquitos to breed. Mosquitos can spread diseases such as the West Nile Virus.

6) Household Chemicals and Products: Properly dispose at either the Landfill or Balls Ford Road facility. Call the landfill beforehand for more details at (703) 792-5750.

7) Septic Systems: Must be pumped every 5 years. Call the Health Department for more information at (703) 792-6310.



Thank you for helping us keep our community healthy and beautiful. If you want to learn more, please visit www.pwcgov.org/cleanwaters. If you have any concerns about the environment, please call Prince William County Environmental Services at (703) 792-7070.



MANAGEMENT OF WATERFRONT PROPERTIES FOR HOMEOWNERS

Living along the shoreline brings many rewards for the property owner: a great view, a closeness to nature and a tranquil setting for your family. It also brings responsibility. Property owners need to take great care to help protect water resources. Owners must plan their activities and improvements on their property with consideration for the environment. Your actions can have a real impact on the river, the shoreline and the community's sources of drinking water. This brochure provides guidelines and recommendations to help property owners become better stewards of their land. You will learn more about:

- Shoreline protection and stabilization
- Life along the shoreline
- Resource Protection Areas (RPAs)
- Wetlands
- Sea Levels and Sustainable Shorelines
- What you can do to protect your property and water resources

SHORELINE PROTECTION & STABILIZATION



Natural Buffer along the Occoquan River

There are many types of waterfront property: some are nestled in quiet coves or along small creeks, while other front open water and wave or current action. Some properties are suffering loss of land from the effects of steady erosion, while other are stable or even growing from accumulated sand. In the past, despite the differences in shoreline types, there has mostly been a "one-size-fits-all" approach to shoreline protection—building bulkheads or riprap revetments (stone embankments).

In recent years we have learned much about the conditions that make for a healthy river and bay environment. Recent studies have shown that vegetated shorelines can provide for erosion protection while allowing the natural shoreline ecosystem to flourish. Natural shoreline ecosystems include the vegetation along the shorelines as well as bottomdwelling organisms and any aquatic life which inhabits the area.

LIVING SHORELINES

In many cases, where waterfront is subject to waves of low to moderate energy, there are effective alternatives to shoreline hardening (use of rocks and riprap). These methods of shoreline protection employ plants, grading and the use of natural materials such as live trees and matting and are referred to as "soft" or "living" methods of shoreline protection. Some of the benefits to this approach are:

- Lower construction costs when compared to bulkheads or revetments
- Reduce both sediment and pollutant flow into the creek or river
- Maintain a link between the aquatic and upland habitats
- Create a natural shoreline appearance

• Restore or maintain a spawning or nursery area for fish and aquatic life



Lake Jackson

RESOURCE PROTECTION AREAS (RPAs)

RPAs are corridors of environmentally sensitive lands that lie alongside or near the banks of streams, rivers and other waterways in tidal areas of Virginia. The RPA buffer extends 100 feet inward from the shoreline and protects the wooded buffer along the stream, which in turn helps to filter out pollutants and prevent erosion along the shoreline. All waters in Prince William County eventually flow into the Potomac River then into the Chesapeake Bay, so safeguarding these areas is critical for water quality protection.

Virginia enacted the Chesapeake Bay Preservation Act in 1988. This Act required local governments to adopt water quality protections into County Ordinances and enact stringent local requirements to protect RPAs as a means to safeguard the Chesapeake Bay from nutrient and sediment pollution. Violations and fines may be imposed for RPA disturbance without prior authorization.

For additional information on activities permitted and not permitted within the RPA, please visit our website at www.pwcgov.org and click on protecting water resources. You can also call Watershed Management at (703) 792-7070.



Neabsco Creek Restoration Project

NON-TIDAL WETLANDS AND STREAMS

Some of our important shoreline resources include non-tidal wetlands and streams, which can be found throughout the fresh water areas in the Potomac River watershed. These non-tidal wetlands may also border coastal tidal zones and tidal wetlands. Non tidal wetland areas are dominated by grasses, shrubs, and forest that have adapted to the wet conditions present in a wetland.

Non tidal wetlands and streams are protected by the Clean Water Act and are regulated by the U.S Army Corps of Engineers (USCOE) and Virginia Department of Environmental Quality (VADEQ). They are important resources to protect since they can be a habitat and nursery ground for a wide variety of coastal creatures, including fish, amphibians, reptiles, waterfowl and birds. These wetlands act as a filter of storm water runoff and improve the quality of water feeding into our coastal region by breaking down and removing pollutants in the storm water. They also act as a sponge and help prevent flooding during large rain events by storing floodwaters and slowly releasing them into our streams.

Any construction or development activity in areas identified as non tidal wetlands or streams will require a permit. If the development activity or construction results in impacts to these resources, mitigation for these impacts may be required. Violations and fines may be imposed for activity conducted without permits. Property owners should contact these agencies **prior** to any land disturbance:

U.S. Corps of Engineers 703-221-6575 www.usace.army.mil

Virginia Department of Environmental Quality 703-583-3800 *www.deq.virginia.gov*



Photos taken at the Wetland Mitigation Site near Manassas Airport





TIDAL WETLANDS

If you live by the water in Tidewater Virginia, you probably live near tidal wetlands. You'll find tidal wetlands along salty, brackish or fresh water, where tides influence the flow in the water body. In Prince William, our tidal wetlands are fresh water. Generally speaking, these are the marshes, sand beaches, mudflats and the shallow waters of our rivers and creeks. Tidal wetlands directly benefit our waterways, the community and the environment:

- Filter storm water from uplands
- Provide beautiful vistas for our viewing pleasure
- Provide flood control by acting as a sponge
- Slowly release storm water
- Provide habitat to plants, fish, birds, reptiles, amphibians and mammals



Powells Creek Tidal Wetlands

There are two types of tidal freshwater wetlands in Prince William County:

- vegetative wetlands
- non vegetated wetlands (ex. mudflats)

These areas are controlled by a number of federal and state laws. Projects proposed within the Tidal Wetlands of Prince William County are reviewed by the Prince William County Wetlands Board and the Virginia Marine Commission (VMRC) in the form of a Joint Permit Application. These applications are submitted for approval before the project can be undertaken.

Impacts to wetlands from various projects such as the construction of a bulkhead, rip rap revetment or commercial pier will not only require a permit but often a mitigation fee per square foot for impacts.

For more information on freshwater tidal wetlands, please call Public Works at (703) 792-7070 or the VMRC at (757) 247-2256.

Copies of the joint permit application form and additional information about Tidal Wetlands can be obtained directly from VMRC at www.mrc.state.va.us.



Coastal Primary Sand Dunes and Beaches Act

Prince William County also has valuable coastal sand dunes and beach resources. These vital areas provide wildlife habitat, buffer areas for water resources and a recreational amenity for residents.

The Virginia Institute of Marine Science (VIMS) conducted a number of studies on dune and beach resources. They found shoreline structures designed to control shoreline erosion can threaten, damage or impact these beach resources.

As of July 2008, a law was enacted to protect Virginia's coastal sand dunes and beaches. This law applies to all tidal Virginia localities. Currently, VMRC regulates all the development or construction activities that may impact dunes and beaches in Prince William County.

For more information about this regulation or proposed projects that may impact beaches, please contact VMRC at (757) 247-2256 or visit their website at <u>http://</u>www.mrc.state.va.us/regulations/regindex.shtm.



Potomac River Shoreline

SEA LEVEL RISE/ SUSTAINABLE SHORELINES



Occoquan Reservoir

One of the threats to shorelines has always been the rise of water levels and the effects of storm surges or flooding from large coastal storms. Rising sea levels inundate wetlands and other low-lying lands, erode beaches and shorelines and increase salinity in rivers, bays and groundwater tables. Recently these issues have received more prominence due to concerns about possible climate change and higher temperatures. Some are predicting further sea level rise due to expanding ocean water, melting of glaciers and the partial melting of large ices sheets. Shoreline property owners should be aware of these concerns and monitor their shorelines for evidence of water level rise such as excessive shoreline erosion and previously dry areas becoming flooded by higher water levels. More information on these issues can be obtained from EPA at www.epa.gov.

Locally, a program that is addressing issues of sea level rise and storm surge flooding is entitled **Sustainable Shorelines and Community Management Project.** This project is overseen by Northern Virginia Regional Commission (NVRC) and addresses the local impacts of sea level rise to Northern Virginia communities including Prince William County. More information is available from the NVRC at www.novaregion.org.

What You Can Do To Help Protect Your Property and Our Water Resources

You know the monetary and intrinsic value of your property on the water. We want to provide you with tools and tips to protect the value of your land, as well as safeguard our water resources. You have the opportunity and responsibility to be the primary steward in the protection and preservation of water resources and our source of drinking water.

Please help by:

- Prevent erosion from your property by planting cover on bare soils and maintaining a buffer of trees and shrubs along the shoreline
- Do not disturb or remove plants, ground cover and natural materials along the shoreline (pruning dead material is permitted)
- Inspect your property often for signs of erosion or other sources of soil loss from your property
- Pick up litter and debris on your property to prevent it from blowing into the river
- Secure materials and debris that could become litter
- Consult with local experts and the County before you undertake any stabilization along the shoreline
- Use soft or living methods of shoreline protection when needed
- Protect and provide habitat for animals living along the shoreline
- Honor the RPA designation and rules along the river
- Keep an eye on your property for signs of a change in the water level and take steps to offset damage created by flooding



Tree Planting Project to protect stream at Cloverdale Park



Learn more about your opportunity to help protect water resources!

Prince William County Department of Public Works Environmental Services, Watershed Management Branch 5 County Complex Court, Suite 170 Prince William, VA 22192

> (703) 792-7070 www.pwcgov.org

Virginia Cooperative Extension

Stormwater Management for Homeowners Fact Sheet 6: Buffers

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This fact sheet is part of a series. Please refer to definitions in the glossary at the end of this fact sheet. Glossary terms are italicized on first mention in the text.

When rain falls on *pervious surfaces*, like soil, mulch, and vegetative groundcovers, it soaks in through a process called *infiltration*. The water can be used by plants, or it can recharge underground water storage areas called *aquifers*.

When rain falls on *impervious surfaces*, like roads, driveways, and rooftops, it does not infiltrate. Instead, water quickly collects and flows off these surfaces to the nearest stream, river, pond, lake, reservoir, bay, sound, or ocean. Water that moves in this way is called *runoff* or *stormwater*. It carries *pollutants* with it, including fertilizer, pesticides, fluids from cars, *sediment* from bare soil areas, bacteria from animal waste, plant debris like leaves and grass clippings, and trash like plastic bottles

and cigarette butts. The more area covered in impervious surfaces, the greater the amount of pollution and volume of runoff, which increases the likelihood of flooding, stream *erosion*, harm to wildlife and the environment, and degradation of water quality.

Stormwater best management practices, or *BMPs*, are tools for managing runoff. They reduce the speed and volume of runoff and clean up the pollutants in it. Homeowners can use different practices, like *rooftop redirection, rain barrels, permeable pavement, grass swales, rain gardens,* and *buffers*, in their landscapes to manage runoff at the source. This prevents large volumes of polluted runoff from going into storm drains that flow directly into nearby water bodies. Some additional benefits of BMPs include improved drainage, a healthier and more attractive landscape, increased property value, wildlife food and habitat, improved water quality, and a cleaner environment.

What Is a Buffer?

Buffers are a simple and inexpensive way of managing stormwater and the pollutants it carries. A buffer is an area of vegetation next to the water's edge that protects water quality by slowing runoff and filtering out pollutants and sediment (see figure 1). The terms



Figure 1. Cross section of a buffer.

www.ext.vt.edu

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Virginia Cooperative Extension programs and employment are open to all, regardless of age, color, disability, gender, gender identity, gender expression, national origin, political affiliation, race, religion, sexual orientation, genetic informa-tion, veteran status, or any other basis protected by law. An equal opportunity/affirmative action employer. Issued in furtherance of Cooperative Extension work, Virginia Polytechnic Institute and State University, Virginia State University, and the U.S. Department of Agriculture cooperating. Edwin J. Jones, Director, Virginia Cooperative Extension, Virginia Tech, Blacksburg; M. Ray McKinnie, Administrator, 1890 Extension Program, Virginia State University, Petersburg. "vegetated," "conservation," and "riparian" are often used to describe buffers. Buffers can also be called "buffer zones" or "strips."

Where Can a Buffer Be Used?

Buffers are very adaptable and can be used next to any water body, including ditches, streams, rivers, lakes, reservoirs, *stormwater ponds*, the Chesapeake Bay, sounds, or the ocean. They can be formally landscaped or they can be natural — or anywhere in between — and should be designed to blend with the surrounding landscape. They can be used in flat or sloped areas, sun or shade, sandy or clayey soil, and next to fresh or brackish/salt water. Buffers can be part of a *living shoreline* system and can be connected to *wetlands*. Each site is different, so a site evaluation is recommended to make sure the right plants are selected and installed correctly so the buffer will work properly.

A site evaluation should include:

- Uses of the water and adjacent land.
- Type of water (fresh or brackish/salt).
- Steepness of slope.
- Erosion on the slope or at the water's edge.
- Existing plants, if any.
- Amount of sun or shade.
- Amount of wind (this is important for bay or ocean sites).
- Amount of runoff flowing into the buffer area.

How Do Buffers Work?

Buffers protect water quality by managing runoff from impervious surfaces and disturbed areas in surrounding and upslope lands. Activities like tilling, construction, and fertilizer or pesticide applications increase the potential for pollutants in runoff. Buffers slow down and spread out runoff, filter pollutants, and trap sediment. They have naturally occurring or planted vegetation, including perennials, grasses, shrubs, and trees. The plants, soil, and microorganisms in the soil serve as a biofilter; they use pollutants or break them down into harmless components. The thick plant canopies and root systems trap sediment. The overall runoff amount is reduced, and the runoff is cleaner when it flows into the water body.

Buffers do many other things, including:

- Stabilize the shoreline and prevent erosion.
- Provide food and habitat for wildlife.
- Add visual and plant diversity to the landscape.
- Reduce and moderate flooding.
- Create shade to lower water temperature.

Buffers are unique to each site. They can range in width from 5 feet to 300 feet. The wider the buffer, the more effective it is, but any size buffer is better than none.

Sometimes an entire property can be considered part of the buffer. Buffer width is usually determined by property use(s) or by a delineating feature such as the top of the slope or the edge of a turf area. Buffer width often varies as it follows along or around a water body and especially if it crosses property lines, for example, homes around a stormwater pond. Buffers are frequently designed with views or pathways through them. They have the biggest impact on improving water quality for the least amount of money, effort, and long-term maintenance.

Plants for Buffers

A planting list should include:

- Plants that tolerate wet and dry conditions. Plants closer to the water's edge will need to tolerate wet or periodically wet conditions, while plants farther upslope will need to tolerate dryer conditions. Plants in buffers adjacent to brackish water should also be tolerant of salt from the air and water, for example: buffers along tidal wetlands, the Chesapeake Bay, or the Atlantic Ocean.
- Plants that have wildlife food or habitat value: flowers for pollinators; berries for birds and other animals; different canopy heights; leaves, bark, and branches for nesting.
- A mix of *herbaceous* and *evergreen* plants, groundcovers, perennials, shrubs, and trees. A variety is important for seasonal interest, to support wildlife, and because different plants filter pollutants differently.

• Native and/or non-native plants that are adapted to the local environment and the specific site conditions. Pick the best non-invasive plant for the location.

Space and install plants according to their mature size. Groundcovers and perennials should be spaced so that their canopies will grow together and cover the ground to minimize weeds — usually 18 to 24 inches apart. Shrubs should be planted so their canopies touch but do not compete with each other. For example, inkberry shrubs that grow 4 feet wide should be planted 4 feet apart on center. Several of the resources listed include plant lists.

Spread a 3-inch layer of organic mulch (pine bark, shredded hardwood, or pine straw) around plants when they are first planted. Mulch provides organic matter that supports beneficial microorganisms and improves water infiltration so plant roots establish quickly. It also prevents weeds from competing with the desirable plants.

Cost

Costs for buffers are generally very low unless modifications such as grading or shoreline stabilization are needed. A buffer could be as easy and inexpensive as not mowing to the water's edge and letting existing plants grow and fill in on their own. Or it can be quite expensive, requiring permits, engineers, and labor for site modifications such as grading, terracing, erosion correction, or coir log (coconut fiber) installation for erosion prevention. Each buffer is unique to the specific site, and many different factors can influence the final price. They include:

- Permits cost time and money and are usually necessary if the buffer is above a certain size; requires tree removal; includes a bulkhead, riprap, or pier; or is in a protected area (Resource Protection Area [RPA] or Chesapeake Bay Preservation Area [CBPA]). Check local jurisdictions and regulations.
- Design costs to blend the buffer with the surrounding landscape style or to address site-specific conditions.
- Fresh or brackish water changes the plant selection. Salt-tolerant plants require very specific planting locations and are often harder to find or more expensive.
- Length and width of the buffer; larger could mean more plants or maintenance.

- Labor for slope modifications like grading, terracing, coir log installation, and planting.
- Plant species and numbers of plants.
- Maintenance like mowing and managing invasive species.

Many homeowners like to install their own buffers, which significantly reduces the cost. Using plants that are propagated out of the surrounding landscape or that are purchased at local gardening organization sales can also help reduce overall costs. Numerous resources are available (see Resources section), including design guides, plant lists, places to see different buffers, and, in some areas, Virginia Cooperative Extension or other groups that offer buffer classes or workshops.

Maintenance

Once established, buffers are considered lowmaintenance parts of the landscape. Maintenance is done on an as-needed basis and includes:

- Plant in fall when plants are dormant so they will establish healthy roots over the winter for quick spring growth.
- Water plants when they are first planted if possible and in any long dry periods during establishment (usually once a week for the first six weeks).
- Remove weeds around newly planted plants to prevent competition and remove any invasive or undesirable species (see state or local lists).
- If it is a meadow-style buffer, mow at 6 to 12 inches high once a year in February or March to prevent tree seedlings and to maintain a dense plant cover.
- Periodically check for erosion, especially on slopes and at the water's edge, and correct the problem quickly.

Resources

- Chesapeake Bay Foundation, "Forested Buffers: The Key to Clean Streams" – www.cbf.org/documentlibrary/federal-affairs/Buffers-fact-sheet-stroud-0bb8.pdf
- Chesapeake Bay Program, "How-To's and Tips" www. chesapeakebay.net/action/howtotips

- Chesapeake Conservation Landscaping Council, "The Eight Elements of Conservation Landscaping" – www.ChesapeakeLandscape.org
- Chesapeake Stormwater Network, "Homeowner BMP Guide" – http://chesapeakestormwater.net/2013/04/ homeowner-bmp-guide/
- Lynnhaven River NOW, "Lynnhaven River Buffer Restoration" – www.lynnhavenrivernow.org/pdf/ buffers.pdf
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Glossary

Aquifer – A natural underground storage area for water.

BMP (best management practice) – An action or device meant to manage runoff.

Buffer – An area of vegetation next to the water's edge that protects water quality by slowing runoff, filtering pollutants and sediment, providing infiltration, and stabilizing shorelines. Buffers also add plant diversity to the landscape and provide wildlife with food, habitat, and movement corridors.

Erosion – The loss of soil on property, often due to water flow.

Evergreen – A plant that keeps leaves throughout the year.

Grass swale – A graded, linear, shallow, open channel covered with grass; used to slow down, spread out, and filter stormwater.

Herbaceous – Plants that have no woody stems and generally die back and are dormant over the winter.

Impervious surface – A surface that does not allow water to flow through it.

Infiltration – The process by which water enters the soil or other materials.

Living shoreline – A protected and stabilized shoreline that is made of natural materials such as plants, sand, or rock.

Permeable pavement – Pavement with a top layer that allows water to infiltrate due to spaces in the paving material or spaces between the pavers.

Pervious surface – A surface that allows water to flow through it.

Pollutants– Materials that have a negative impact on human or environmental health.

Rain barrel – A small collection tank installed at the end of a downspout to collect and temporarily store rainwater runoff from a roof for later use.

Rain garden – A planted shallow depression that temporarily holds runoff from impervious areas until it evaporates, is absorbed by plants, or infiltrates into the ground.

Rooftop redirection (disconnection) – A stormwater management practice that moves the runoff collected from rooftops through gutters and downspouts into the landscape where it can spread out, slow down, and infiltrate instead of moving the runoff directly into a storm drain system.

Runoff – Water that runs off impervious surfaces during rain events, often associated with urban areas. Runoff can also occur from pervious surfaces if the precipitation rate is greater than the infiltration rate. Also called "stormwater."

Sediment – Soil, rock, or biological material particles formed by weathering, decomposition, and erosion.

Stormwater – Water that runs off impervious surfaces during rain events, often associated with urban areas. Also called "runoff."

Stormwater pond – A pond that is used to temporarily hold and treat water pollution; used in residential developments to manage runoff from roads, driveways, and roofs.

Wetlands – Areas where water covers the soil or is present either at or near the surface of the soil all year or for varying periods of time during the year. Also referred to as "marshes," "bogs," or "swamps."

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9/2011



Restoration & Landscaping FOR CONSERVATION,



VIRGINIA RIPARIAN BUFFER ZONES

WHAT ARE NATIVES?

interdependent relationships. Our native fauna depend on thousands to millions of years and have formed complex and and provide food and shelter for native animal species. throughout their range without known human involvement. Native plants co-evolved with native animals over many They form the primary component of the living landscape Native species evolved within specific regions and dispersed native flora to provide food and cover.

Many animals require specific plants for their survival.

BENEFITS OF NATIVE PLANTS

benefits as well species. It may provide a few unexpected the likelihood of introducing new invasive cultivated landscapes and minimizes reduces the expense of maintaining Using native species in landscaping

Fewer inputs mean time and money saved for the gardener. Native plants often require less water, fertilizer and and maintaining water quality in nearby rivers and streams. pesticide, thus adding fewer chemicals to the landscape

for you to find peace and quiet after a busy day. can become an outdoor classroom for children, or a place habitats. The natural habitat you create with native plants these animals as they journey between summer and winter such as birds and butterflies, and provide sanctuaries for Native plants increase the presence of desirable wildlife,

mind the deserts of the Southwest. characterize the Pacific Northwest. Saguaro cacti call to strongly associated with the Deep South. Redwood trees character. For example, live oak and magnolia trees are Native plants evoke a strong sense of place and regional

BUYING AND GROWING NATIVE PLANTS

propagated natives. offering an ever-widening selection of vigorous, nursery centers. Because of this increased demand, retailers are native plants and requesting them at their local garden More gardeners today are discovering the benefits of

conditions in the area to be planted. to select plants with growth requirements that best match their adaptation to local conditions. However, it is important next step is choosing appropriate plants for a project. One of the greatest benefits of designing with native plants is Once you've found a good vendor for native plants, the

these categories. plants grow well under a variety of conditions. Many of the moisture requirements for each species, noting that some use the list in this brochure to learn which plants grow in If you're planning a project using native plant species, recommended species are well-suited to more than one of your region of Virginia. Next, study the minimum light and

associations, spatial groupings and habitat conditions wildlife management area to learn about common plant region. Visit a nearby park, natural area preserve, forest or and specific wildlife value of the plants that grow in your on local natural history for color, shape, height, bloom times For more information, refer to field guides and publications

places

experience in native plants. design, consult a landscape or garden design specialist with For specific recommendations and advice about project

WHAT ARE NON-NATIVE PLANTS?

Over time, many plants and animals have expanded their Sometimes referred to as "exotic," "alien," or "nonpathway, enabling many species to move into new locations species along when they moved into new regions or traded began cultivating plants, they brought beneficial and favored ranges slowly and without human assistance. As people intentionally or accidentally, into a new region by humans. indigenous," non-native plants are species introduced, with people in distant lands. Humans thus became a new

WHAT ARE INVASIVE PLANTS?

cultivation. Of the 3,500 plant species in Virginia, more than currently lists more than 100 of these species as invasive. 800 have been introduced since the founding of Jamestown and become established in the United States outside these introduced species, fewer than 3,000 have naturalized Some were introduced accidentally, for example, in ship to society as agricultural crops and landscape ornamentals introduced intentionally, and many provide great benefits the United States since the time of Columbus. Most were than 30,000 species of plants have been introduced to Invasive plants are introduced species that cause health, ballast, in packing material and as seed contaminants. Of economic or ecological damage in their new range. More The Virginia Department of Conservation and Recreation

\$120 billion in annual economic losses, including costs to manage their effects. Annual costs and damages arising In the United States, invasive species cause an estimated from invasive plants alone are estimated at \$34 billion.

NATIVE PLANTS VS. INVASIVE PLANTS

grows very rapidly and overtops forest canopy, thus eliminating virtually all other species. shading other plant species from the sunlight necessary for dependent on them. For example, kudzu (Pueraria montana) them to disrupt native plant communities and the wildlife (Phragmites australis ssp. australis), invades and dominates their survival. A tall invasive wetland grass, common reed Invasive plants have competitive advantages that allow marshes, reducing native plant diversity and sometimes

become far reaching. Habitats with a high occurrence of of the diet of many birds, the effects on the food web Invasive species can marginalize or even cause the loss of invasive plants become insects disappear. And since insects are an essential part native species. With their natural host plants gone, many

a kind of "green far fewer native green and healthy found in such species of plants desert." Although adically altered and animals are n appearance,



Nirzinia Riparian Buffer Zones

Riparian forest buffers are areas of trees, shrubs and other vegetation found next to stream channels and other waterways. The removal of these buffers has contributed to ecological problems in our waterways and the Chesapeake Bay. Problems include sedimentation, nutrient and toxic chemical pollution, and reduction of fish habitat.

Riparian forest buffers are natural communities such as bottomland hardwood forest, coastal scrub and upland oakhickory-pine forests. They support a variety of plants and animals, particularly plants that are adapted to periodic flooding or saturated soils. Because of the presence of moving water, more materials are deposited in, and pass through, riparian forests than any other wetland ecosystem.

Riparian forest buffers provide important ecosystem services.

- Vegetation, leaf litter and porous soil slow the flow of water. This helps control the rate and volume of water in streams and rivers, greatly influencing flood levels.
- Leaf litter filters sediment from upland runoff, as well as phosphorus, nitrogen and other nutrients that may be bonded to sediment particles. Leaf litter intercepts and stores these polluting nutrients before they can cloud waterways.
- Leaf litter captures and converts pesticides to nontoxic compounds by various chemical and microbial activities within the forest buffer. This protects fish and amphibians, which are threatened by pesticide pollution.
- Soils store water, and plants in the forest buffer take up that water and release it into the atmosphere.

Scientific Name	Common Name		Us	es		R	egio	on	L	igh	t	Мо	isture	Rip	paria	an Z	one
		W	н	C	D	M	Ρ	C	S	Р	F	L	мн	1	2	3	4
Herbs											_						
Amsonia tabernaemontana	blue star		•				•	•	•	•			•••			•	•
Arisaema triphyllum	Jack-in-the-pulpit wild ginger		:			•	:	:	:				•			•	:
Asclepias incarnata	swamp milkweed	•	٠	٠		٠	٠	٠		٠	•		•	•	٠		
Bidens cernua+	nodding beggar-ticks	•	٠	٠		٠	٠	٠		٠	٠	•	••	•	٠		
Boltonia asteroides*	aster-like boltonia		٠					٠			•		•	•	٠	٠	
Caltha palustris	marsh marigold		•	•		•		•		•	•	-	•			•	
Chalono glabra	partridge pea			:		•	:	•			•	•	•				•
Chrysogonum virginianum	areen and gold					•	•		•				•		Ť.	÷	
Conoclinium coelestinum	blue mistflower	•	•	•		٠	•	•		•	•		•			•	•
Coreopsis tripteris	tall coreopsis		٠	٠		٠	٠	٠		٠	٠		•		٠	•	٠
Delphinium tricorne	dwarf larkspur		٠			٠	٠		٠	٠	_		•				٠
Dicentra cucullaria	Dutchman's breeches		•			•	•		•				•				•
Equisetum hyemale	horsetail		·			•	•	•	•		•		•••				
Eupatoriadelphus fistulosus	Joe-pve weed	•	•	•		٠	•	•		•	•				•	•	•
Eupatorium perfoliatum	common boneset			٠		٠	٠	٠		٠	•		••	•	٠	٠	
Helenium autumnale	sneezeweed	•	٠	٠		٠	٠	٠		٠	٠		•	•	٠	٠	
Helianthus decapetalus	ten-petaled sunflower	•	٠	٠		٠	٠	٠		٠	•		•			٠	٠
Helianthus divaricatus	woodland sunflower	•	•	•		٠	•	•		•		•					•
Hibiscus moscheutos	Virginia blue flog	•	•	•		•	•	•			•		•	•	•		
Kosteletskva virginica	seeshore mallow		·				Ť			•							
Lilium superbum	Turk's cap lily		•			٠	•	•		•	•		• •			•	•
Lobelia cardinalis	cardinal flower	•	٠	٠		٠	٠	٠		٠	•		•	•	٠	٠	
Lobelia siphilitica	great blue lobelia	•	٠	٠		٠	٠	٠	٠	٠			•			٠	٠
Maianthemum racemosum	false Solomon's seal		٠	٠		٠	٠	٠	•	٠			•			٠	٠
Mertensia virginica	Virginia bluebells		•	•		•	•		•	•			••			•	•
Monarda diduma	monkeyflower boo balm		:	:		•	•	•			•		. •	•	•	:	
Nymphaea odorata	American water lilv	•				•	•						•			÷	÷
Oenothera fruticosa	sundrops	•	•	•		٠	•	•			•						•
Packera aurea+	golden ragwort	•		٠		٠	٠	٠	•	٠			• •		٠	٠	
Peltandra virginica	arrow arum	•	٠	٠			٠	٠		٠	٠		٠	٠	٠		
Phlox divaricata	woodland phlox		٠	٠		٠	•			•		•	•			٠	٠
Phlox paniculata	summer phlox		•	•		•	•	•		•	•		•			•	•
Polemonium rentans	lacob's ladder			•													
Pontederia cordata	nickerel weed	•	•	•			•	•			•		•	•			
Rhexia virginica	Virginia meadow-beauty	•		٠		٠	٠	٠			•		•	Г		•	
Rudbeckia laciniata	cut-leaved coneflower	•	٠	٠		٠	٠	٠		٠	•		•			٠	٠
Sagittaria latifolia	broadleaf arrowhead	٠	٠	٠		٠	٠	٠			٠		•	٠	٠		
Saururus cernuus	lizard's tail		•	•		•	•	•		•	•		•	•	•		
Solidago rugosa+ Symphystrichum poyas anglias	Now England actor	•					•	•								:	•
Symphyotrichum novi-belgii	New York aster	•	•	•		-		•		•	•		•	•	•		
Verbena hastata	blue vervain	•		٠		٠	٠			٠	•		• •		٠	٠	
Vernonia noveboracensis	New York ironweed	•	٠	٠		٠	٠	٠		٠	٠		•		٠	٠	٠
Viola cucullata	marsh blue violet	•	٠	٠		٠	٠	٠		٠	•		•			٠	
Viola pubescens	yellow violet	•	•	•		٠	•		•	•			•				•
Zephyrantnes atamasco	Atamasco IIIy			•				•		•	•		••			•	•
Ferns & Fern Allies																	
Athyrium asplenioides	Southern ladyfern		٠	•		٠	•	٠	•				• •			•	٠
Botrychium virginianum	rattlesnake fern		•			•	•	•	•	•		•	•				•
Osmunda cinnemomee	cinnamon fern		:	:		•	:	:		•	•					:	•
Osmunda regalis	roval fern		•	•		•	•	•		•			• •		•	•	
Polystichum acrostichoides	Christmas fern		•	•		٠	•	٠	•				•	Г			•
Thelypteris palustris	marsh fern		٠			٠	٠	٠		٠	•		••	•	٠	٠	
Woodwardia virginica+	Virginia chain fern		٠	•				•	•	•	٠		•••	٠	•		
Grasses, Sedges & I	Rushes																
Agrostis perennans	autumn bentgrass			•		٠	•	•	•	•	•	•	• •		•	•	
Andropogon gerardii	big bluestem	•	٠	٠	٠	٠	٠			٠	•	•	•		٠	٠	
Andropogon glomeratus	bushy bluestem		•	•		٠	٠	•		٠	٠		• •			٠	
Arundinaria gigantea	wild cane	•		•		٠			•	•	•		• •		٠	•	٠
Arunginaria tecta	switch cane			:			:	•	•	:	•		•••		:	:	
Carex Jurida	sallow sedge		•											•			
Carex stricta	tussock sedge	•		٠		•	٠	•		٠	•		• •	•	•	•	
Chasmanthium latifolium+	river oats, spanglegrass		٠	٠		٠	٠	٠	•	٠	٠		•		٠	٠	٠
Dichanthelium clandestinum	deer-tongue	•		٠	٠	٠	٠	٠		٠	•	•	• •		٠	٠	
Dichanthelium commutatum	variable panicgrass	•	•	•		٠	•	•	•	•		•	•				•
Dulichium arundinaceum	dwart bamboo	•		•	•	•	•	•		•	•		•	•	٠	•	
Elymus nystrix	Virginia wild rve		•	•							•	•	•				
Lighted virginious	· · · · · · · · · · · · · · · · · · ·	1000		-	_	1000		-	1000			100 C	_			-	-

- The canopy created by riparian forests provides shade and controls water temperature, which is essential for instream organisms and the invertebrate food sources on which they depend. Instream, leaf litter and woody debris create food and habitat vital to the aquatic food web.
- Riparian forests provide food and habitat for a variety of terrestrial wildlife species and serve as safe corridors for movement between habitats. Habitat conversion and fragmentation have reduced wildlife habitat and limited the ability of animals to move between existing habitats.
- Riparian forest buffers offer recreation to fishermen, hunters, birders, hikers, canoeists and picnickers. People enjoy these areas in many different ways because of the diversity of life and scenic beauty they provide.

Drier upland forests adjacent to waterways provide many of the same ecosystem values. These ecological functions combine to make riparian forest buffers critical to ecological and human health. Recognizing this, staff at the Chesapeake Bay Program has set a goal to replant riparian buffers along 70 percent of stream miles in the bay watershed.

RIPARIAN VEGETATION ZONES

Riparian forest buffers consist of four vegetation zones. Zone 1, the emergent vegetation zone, is permanently to semipermanently flooded and often dominated by grasses, sedges, rushes and other herbaceous plants. Zone 2, the riverside thicket, may be seasonally to temporarily flooded and is often characterized by emergent aquatic species, shrubs and a few tree species. Zone 3, the saturated forest, has soils that are saturated to poorly drained. Zone 4, the well-drained forest, is also known as upland forest and has dry soil. Zones 3 and 4 are dominated by trees but also contain shrub and herb layers in the understory.

Recommended Uses

- W = Wildlife H = Horticulture & landscaping
- C = Conservation & restoration
- D = Domestic livestock forage

Region

- M = Mountain
- P = Piedmont
 C = Coastal Plain
- Minimum 11-1-1

Minimum Light Requirements S = Shade

- P = Partial sun
- $\mathbf{F} = Full sun$

Moisture Requirements

- L = Low moisture
- M = Moderate moisture H = High moisture

Riparian Buffer Zones

- 1 = Emergent
- 2 = Riverside thicket
- **3** = Saturated forest**4** = Well-drained forest
- vven-uramed torest

Some species are marked with the following footnote symbols:

- May be aggressive in a garden setting
- * Due to the rarity and sensitivity of habitat in Virginia, these species are recommended for horticultural use only. Planting these species in natural areas could be detrimental to the survival of native populations.

Scientific Name	Common Name	w	Us H	es C D	R	egia P	on C	Lig S F	ht F	Mo	oisti M	ure H	Rip 1	aria 2	n Zo 3	one 4
Juncus canadensis	Canada rush	•				•	•		•		•	•	•	•	•	
Juncus effusus	soft rush	•		•	•	٠	٠		•		•	•	•	•	•	
eersia orvzoides	rice cutorass	•		•	•	•	•		•		•	•	•	•	•	
Panicum virgatum	switch grass	•	•	•	•	•	•		•	•	•	•	•	•	•	
Saccharum giganteum	giant nlumegrass	•	•	•		•	•				•	•	•		•	
Scirnus cynerinus	woolgrass hulrush															
Sparganium amoricanum	Amorican bur rood															
Tringgamum destylaides	American bur-reeu												÷.			
Tripsaculli dactyloides	yallia ylass		•											•	•	
Typna latirolla	broad-leaved cattall	•		•	•	•	•		•		•	•	•			
Zizania aquatica	wild rice	•	•	•			•		•			•	•			
Vines																
Rignopia caproplata	orossvino								_							
Digitorila capreolata	crossvine											•		•	•	
Celastrus scandens	climbing bittersweet	•	•		•	•	•	• •	•	_	•	_				•
Clematis virginiana	virgin's bower		•		•	•	•	•	•		•			•	•	•
Parthenocissus quinquefolia	Virginia creeper	•	•	•	•	•	•		•		•		_	•	•	•
Shruhs & Small Tree	15															
Alexe a secondate	handaldar															
Alnus serrulata	nazel alder	•	•	•	•	•	•	• •	•			•	•	•	•	
Aronia arbutifolia	red chokeberry		•	•	•	•	•	• •			•	•		•	•	•
Aronia melanocarpa	black chokeberry		٠	•	•	٠	٠		•	•	٠	٠		٠	٠	٠
Baccharis halimifolia	high tide bush		٠	•			•		•	•	•	•		•	•	
Callicarpa americana	American beautyberry	•	٠				•	• •		L	•				•	٠
Cephalanthus occidentalis	buttonbush		٠	•	•	٠	•		•			•	•	•		
Clethra alnifolia	sweet pepper-hush	•	•		1		•	• •		Г	•	•			•	
Cornus amomum	silky dogwood	•		•				•						•		
Euhotore racomoca	fattarhuch				1.		-									
	unid hudrongoo				1		-							÷		
nyurangea arborescens	wild nydrangea		•		•	•	•	• •			•					•
llex decidua	deciduous holly	•	•	•		•	•	• •			•	_		•	•	•
llex verticillata	winterberry	٠	٠	•	•	٠	٠		•		•	٠		•	•	٠
ltea virginica	Virginia willow	•	٠	•			•	• •	,			•		•	•	
Leucothoe axillaris	coastal dog-hobble		•				•	•			•			•	•	
Lindera benzoin	spicebush	•	•		•	•		•		T	•				•	•
Myrica cerifera	Southern wax myrtle			•				• •					•			
Bhododendron viscosum	swamn azalea						1			1			•			1
Public allochoniansis	Alloghany blackborn	-			1.		-				÷	÷	ć.			
Coliv oprigos	allow willow	•					ų.			1					1	
Salix sericea	SIIKY WIIIOW		•	•		•	•		•		•	_		•	•	
Sambucus canadensis	common elderberry	•	•	•	•	•	•		•		•	•		•	•	•
Spiraea alba	narrow-leaved meadowsweet	٠	٠	•	•				•		٠			٠	•	
Spiraea latifolia	broad-leaved meadowsweet	•	•	•	•				•		•			•	•	٠
Vaccinium corymbosum	highbush blueberry	٠	٠	•	•	٠	•	• •	•	•	٠	•		•	•	٠
Viburnum dentatum	Southern arrow-wood viburnum	•	•	•		•	•		•		•			•	•	
Viburnum prunifolium	black-haw viburnum	•	•		•	•				1	•				•	•
Madian Tasas					÷.,								-		-	
Medium Trees																
Amelanchier arborea	downy serviceberry	•	٠	•	•	•	•		•		•					•
Amelanchier canadensis	Canada serviceberry	•	•	•		•			•		•	•		•	•	
Amelanchier laevis	smooth serviceherry	•								•						
Acimina triloha	DOW DOW									Ľ.						÷
Corpus alternifelie	plaw pdw						-								•	-
contras alternitolia	alternate-lear dogwood	•	•	•		•	_	• •		•	•	_				•
Grataegus viridis	green nawthorn	•	•	•	•	•	٠		•		•	•			•	•
Morus rubra	red mulberry	•	٠	•	•	٠	٠	• •			٠				٠	٠
Ostrya virginiana	Eastern hop-hornbeam		٠		•	٠	٠	• •	1		•					٠
Persea borbonia	redbay		٠	•			•	• •			•	•			•	
Rhus glabra	smooth sumac	•	٠	•	•	•	•		•	•	•				•	•
Salix nigra	black willow				•	•				T	•	•	•	•	•	
				_	1											
Large Trees							1							1	1	Γ.
Acer rubrum	red maple		٠	•	•	•	•		•	Ľ	•	•	•	•	•	•
Betula lenta	sweet birch	٠	٠	•	•	٠			•		•				•	٠
Betula nigra	river birch	•	•		•	•	•		•	1	•	•		•	•	
Diospyros virginiana	persimmon	•		•				•	•						•	
Fravinus americana	white ash						1									
Fravinus unionealla	groop ach		÷	•												É
luglono pigro	yreen dSII block webeut		•			•	1							-		-
Jugians nigra	DIACK WAINUT	•		•		•	•		•		•	_		•	•	•
Liquidambar styraciflua	sweetgum		•	•	•	•	•	• •	•		•	•		•	•	٠
Liriodendron tulipifera	tulip poplar	•	٠	•	•	•	٠		•	1	•				•	•
Nyssa aquatica	water tupelo	•	٠	•			٠		•			•	•			
Nyssa sylvatica	black gum	•	٠	•	•	٠	٠		•		•			•	•	٠
Oxydendrum arboreum	sourwood		٠		•	٠	٠				•				•	•
Pinus taeda	loblolly pine	•	•	•		•	•		•	•	•	•		•	•	•
Platanus occidentalis	sycamore			•		•	•		•		•	•		•	•	•
Quercus hicolor	swamp white oak	•						• •		1						
Quercus Jaurifolio	swamp laural cok					÷										
Quereus laurilolla	swamp laurer oak													-		1
		•			1	•	•	•	•	1		•		•	•	•
	swamp chestilut oak									1000	1					-
Quercus nigra	water oak	٠		•			٠	• •	•	•	•			•	•	•
Quercus nigra Quercus palustris	water oak pin oak	•	•	:		•	•	•••		•	•	•		•	•	•
Quercus nigra Quercus palustris Quercus phellos	water oak pin oak willow oak	•	•	•	•	•	•	•••	•	•	•	•		•	•	•

Virginia Invasive Plant Species List



The Virginia Invasive Plant Species List comprises species that are established - or may become established - in Virginia, cause economic and ecological harm, and present ongoing management issues.

The list is for educational purposes only and has no regulatory authority.

To be included on the list, there must be demonstrable evidence that a species poses a threat to Virginia's forests, native grasslands, wetlands or waterways.

The Virginia Department of Conservation and Recreation's Invasive Species Assessment Protocol, approved by the Virginia Invasive Species Working Group, May 2015, was used to conduct a risk assessment for each listed species. Species were ranked as exhibiting high, medium or low levels of invasiveness based on their threat to natural communities and native species.

Ailanthua altianima	Common Name
Allaninus anissima	Corlia Musterd
Allana peliolala	
Anemanunera prinoxeroides	Anigator-weed
Amperopsis previpedunculata	Porcelain-berry
	Japanese Sand Sedge
	Uriental Bittersweet
Centaurea stoebe ssp. micranthos	Spotted Knapweed
Cirsium arvense	Canada Thistle
Dioscorea polystachya	Cinnamon Vine
Elaeagnus umbellata	Autumn Olive
Euonymus alatus	Winged Euonymus
Ficaria verna	Lesser Celandine
Hydrilla verticillata	Hydrilla
Iris pseudacorus	Yellow Flag
Lespedeza cuneata	Chinese Lespedeza
Ligustrum sinense	Chinese Privet
Lonicera japonica	Japanese Honeysucki
Lonicera maackii	Amur Honeysuckle
Lonicera morrowii	Morrow's Honeysuckie
Lythrum salicaria	Purple Loosestrife
Microstegium vimineum	Japanese Stiltgrass
Murdannia keisak	Marsh Dewflower
Myriophyllum aquaticum	Parrot Feather
Myriophyllum spicatum	Eurasian Water-milfoi
Persicaria perfoliata	Mile-a-minute
Phragmites australis ssp. australis	Common Reed
Pueraria montana var. lobata	Kudzu
Reynoutria japonica	Japanese Knotweed
Rosa multiflora	Multiflora Rose
Rubus phoenicolasius	Wineberry
Sorghum halepense	Johnson Grass
Urtica dioica	European Stinging Net
Acer platanoides	Norway Maple
Agrostis capillaris	Colonial Bent-grass
Akebia quinata	Five-leaf Akebia
Albizia julibrissin	Mimosa
Arthraxon hispidus var. hispidus	Joint Head Grass
Berberis thunbergii	Japanese Barberry
Cirsium vulgare	Bull Thistle
Dipsacus fullonum	Wild Teasel
Egeria densa	Brazilian Waterweed
Euonymus fortunei	Winter Creeper
Glechoma hederacea	Gill-over-the-ground
Hedera helix	English Ivy

ommon Name	Virginia Invasiveness Rank	Mountain	Piedmont	Coastal
ee-of-heaven	High	•	•	•
arlic Mustard	Hiah	•	•	•
lligator-weed	High			•
orcelain-berry	High		•	•
apanese Sand Sedge	High			•
riental Bittersweet	High	•	•	•
potted Knapweed	High	•	•	•
anada Thistle	High	•	•	•
innamon Vine	High	•	•	•
utumn Olive	High	•	•	•
inged Euonymus	High	•	•	
esser Celandine	High		•	•
ydrilla	High	•	•	•
ellow Flag	High	•	•	•
hinese Lespedeza	High	•	•	•
hinese Privet	High	•	•	•
apanese Honeysuckle	High	•	•	•
mur Honeysuckle	High	•	•	•
lorrow's Honeysuckle	High	•	•	
urple Loosestrife	High	•	•	•
apanese Stiltgrass	High	•	•	•
larsh Dewflower	High	•	•	•
arrot Feather	High	•	•	•
urasian Water-milfoil	High	•	•	•
lile-a-minute	High	•	•	•
ommon Reed	High	•	•	•
udzu	High	•	•	•
apanese Knotweed	High	•	•	•
lultiflora Rose	High	•	•	•
lineberry	High	•	•	•
ohnson Grass	High	•	•	•
uropean Stinging Nettle	High	•	•	•
orway Maple	Medium	•	•	•
olonial Bent-grass	Medium	•	•	•
ive-leaf Akebia	Medium		•	•
limosa	Medium	•	•	•
bint Head Grass	Medium	•	•	•
apanese Barberry	Medium	•	•	•
ull Thistle	Medium	•	•	•
ild Teasel	Medium	•	•	•
razilian Waterweed	Medium	•	•	•
inter Creeper	Medium	•	•	•
ill-over-the-ground	Medium	•	•	•
nglish lvy	Medium		•	•

REGION

Invasiveness rank is higher for species that:

Alter ecosystem processes, such as succession, hydrology or fire regime.

So

- Are capable of invading undisturbed natural communities.
- Cause substantial impacts on rare or vulnerable species or natural communities or high-quality examples of more common communities.
- Are found widely distributed and • generally abundant where present.
- Disperse readily to new areas.
- Are difficult to control.

Early detection species

The list includes a subcategory of invasive plants that are considered early detection species. These are species not yet established or, if established, are not yet widespread in Virginia but known to be highly invasive in habitats similar to those found here. If discovered in Virginia, these species need to be quickly mapped, photographed and reported to DCR. The management goal for early detection species is eradication, as preventing the establishment and spread of newly arrived species will save valuable natural and economic resources.

INFORMATION

For more information, or to report early detection species, contact Stewardship Biologist Kevin Heffernan with the Virginia Department of Conservation and Recreation at 804-786-9112 or kevin.heffernan@dcr.virginia.gov

Photo credits:

Tree-of-heaven, Chuck Bargeron, University of Georgia, Bugwood.org. Phragmites, Jil M. Swearingen, USDI National Park Service, Bugwood.org. Wavyleaf grass, Kerrie L. Kyde, Maryland Department of Natural Resources, Bugwood.org.

Citation:

Heffernan, K., E. Engle, C. Richardson. 2014. Virginia Invasive Plant Species List. Virginia Department of Conservation and Recreation, Division of Natural Heritage. Natural Heritage Technical Document 14-11. Richmond.



Scientific Name	Common Name	Virginia Invasiveness Rank	Mount	Piedm	Coasta
Holcus lanatus	Common Velvet Grass	Medium	•	•	•
Humulus japonicus	Japanese Hops	Medium	•	•	•
Ligustrum obtusifolium var. obtusifolium	Border Privet	Medium	•	•	•
Lonicera tatarica	Tartarian Honeysuckle	Medium	•	•	
Lysimachia nummularia	Moneywort	Medium	•	•	•
Miscanthus sinensis	Chinese Silvergrass	Medium	•	•	•
Najas minor	Brittle Naiad	Medium	•	•	•
Paulownia tomentosa	Royal Paulowina	Medium	•	•	•
Persicaria longiseta	Long-bristled Smartweed	Medium	•	•	•
Phyllostachys aurea	Golden Bamboo	Medium	•	•	•
Poa compressa	Flat-stemmed Bluegrass	Medium	•	•	•
Poa trivialis	Rough Bluegrass	Medium	•	•	•
Pyrus calleryana	Callery Pear	Medium	•	•	•
Rhodotypos scandens	Jetbead	Medium	•	•	•
Rumex acetosella	Sheep sorrel	Medium	•	•	•
Spiraea japonica	Japanese Spiraea	Medium	•	•	
Stellaria media	Common Chickweed	Medium	•	•	•
Veronica hederifolia	Ivy-leaved Speedwell	Medium	•	•	•
Viburnum dilatatum	Linden arrow-wood	Medium		•	
Wisteria sinensis	Chinese Wisteria	Medium	•	•	•
Commelina communis	Asiatic Dayflower	Low	•	•	•
Elaeagnus pungens	Thorny Olive	Low	•	•	•
Lespedeza bicolor	Shrubby Bushclover	Low	•	•	•
Lonicera fragrantissima	Winter Honeysuckle	Low	•	•	•
Melia azedarach	Chinaberry	Low		•	•
Morus alba	White Mulberry	Low	•	•	•
Perilla frutescens	Beefsteak Plant	Low	•	•	•
Phleum pratense	Timothy	Low	•	•	•
Populus alba	Silver Poplar	Low	•	•	•
Rumex crispus ssp. crispus	Curly Dock	Low	•	•	•
Securigera varia	Crown-vetch	Low	•	•	•
Trapa natans	European Water Chestnut	Low			•
Ulmus pumila	Siberian Elm	Low	•	•	
Vinca major	Greater Periwinkle	Low	•	•	•
Vinca minor	Periwinkle	Low	•	•	•
Wisteria floribunda	Japanese Wisteria	Low		•	•
EARLY DETECTION SPE	ECIES - not yet widely e	stablished	in Viı	ginia	
Aldrovanda vesiculosa	Waterwheel	High			•
Eichhornia crassipes	Water Hyacinth	High			•
Imperata cylindrica	Cogon Grass	High			•
Ludwigia grandiflora ssp. hexapetala	Large Flower Primrose Willow	High	•	•	•
Oplismenus hirtellus ssp. undulatifolius	Wavyleaf Grass	High	•	•	
Vitex rotundifolia	Beach Vitex	High			•
Heracleum mantegazzianum	Giant Hogweed	Medium	•	•	
Ipomoea aquatica	Water Spinach	Medium	•	•	•
Salvinia molesta	Giant Salvinia	Medium	•	•	•
Solanum viarum	Tropical Soda Apple	Medium		•	•

REGION

Montclair Property Owners Association Annual Dock and Shoreline Improvement Permit

Staff Initials & Date Received

Annual Dock and Shoreline Improvement Permits are required for all docks on Lake Montclair and any shoreline improvements between the property boundary lines of lot eligible for a dock and Lake's water surface (*including, but not limited to: stairways, steps, walkways, landings, fences, boat racks, irrigation systems, etc.*), regardless of whether or not a dock exists. This permit constitutes a license agreement between MPOA and the homeowner and is intended to be temporary in nature. -MPOA may terminate or modify the license hereby granted at any time in the event of any violation of this permit or in the event the Board of Directors, in its sole discretion, determines it necessary or in the best interest of the Association to do so.

Dock and Shoreline Improvement Permits must be renewed annually between October 1st and 31st each year. All applicable improvements (e.g. a dock, a set of stairs, an irrigation system, etc.) must be listed on the renewal permit when submitted to MPOA.

The initial application and annual renewal fee is \$5. There will be a \$200 late fee assessed unless the owner provides proof by November 10th that general liability insurance coverage (see below) was in effect as of November 1st of that year.

All dock and shoreline improvement owners are required to sign up for FSRConnect and provide a current phone number and e-mail address for emergency notifications regarding Lake Montclair.

Owners of docks and shoreline improvements described herein are required to provide MPOA with proof of valid general liability insurance coverage of no less than one million dollars (\$1,000,000) and must list the MPOA as a certificate holder or as additional insured when available through the insurance carrier. Owners with insurance carriers providing the necessary coverage but unable to have MPOA listed as a certificate holder or additional insured will be required to provide MPOA a copy of a letter signed by the insurance provider addressed to the owner indicating that coverage is in place for a current annual period and that the insurance provider will provide MPOA with a notice of any change to or cancellation or renewal of the policy. Property owners will obtain all applicable county permits and will accept liability for any damages that may occur to sewer lines, other utilities, or other MPOA property. Dock and shoreline improvement owners are responsible for obtaining a survey of the property abutting the Common Area before submitting plans to the Covenants Committee for approval. Owners are solely responsible for the safety and structural integrity of docks and shoreline improvements covered by this permit.

Type of Application (circle one):	Renewal	New	Dock Plaque # (or N/A)	
NAME:				
ADDRESS:		E-MAIL	(Required):	
PHONE (H):	(W):		(Cell):	
SIZE OF DOCK AND/OR DESCRIPTION	ON OF SHORELIN	E IMPROVEM	ENTS (List all):	
INSURANCE CARRIER:				
INSURANCE POLICY #:		DATE	EFFECTIVE:	
	Incor	mplete Applic	ations will be returned	

In consideration for MPOA's approval, the owner hereby waives, releases, acquits, and discharges the Association of and from any and all liability for any claim, cause of action or dispute arising out of or relating to the dock or shoreline improvements, including but not limited to personal and property damage, and the raising or lowering of the water level in Lake Montclair, and further agrees to indemnify and hold the Association harmless for all losses or damages, incurred by the Association in connection with any such claim, cause of action or dispute, whether brought or asserted by the owner or by any other individual or entity, including but not limited to attorney's fees and costs.

All use of the licensed area shall be in strict compliance with the covenants and restrictions set forth in the Association's Declaration and Bylaws and all Association Rules and Regulations, as the same may be amended from time to time.

Owner acknowledges and agrees that the Association may terminate or modify the license hereby granted at any time in the event of any violation of this Permit or in the event the Board of Directors, in its sole discretion, determines it necessary or in the best interest of the Association to do so. In the event of termination of this Permit, the owner shall promptly remove all docks and/or shoreline improvements and restore the area to its condition prior to the modifications contemplated by this Permit.

I attest that any and all electrical devices and equipment used/installed for the purpose of charging boat batteries, powering lights, irrigation systems or other items in, on or around shoreline improvements are in good working order, safe, and do not present a hazard to life or property.

Print Name (Owner):

Signature (Owner):

For Offi	ice Use Only		
	MPOA Board President, Tracy Hansen (Initial)	Date Reviewed	
	MPOA Acting General Manager, Susan Manch (Initial)	Date Reviewed	-