Landscaping for Water Quality
Concepts and Garden Designs for Homeowners, Adapted for Maryland

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Cover photo courtesy of Jim Brueck  http://www.nativelakescapes.com/
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Landscaping For Water Quality in Maryland--An Overview

The purpose of this document is to provide Maryland homeowners information they can use to enhance water quality when landscaping their property.

Residents of Maryland enjoy a unique environment. Whether east or west of the Appalachian Mountains, every Maryland property is part of a watershed, the area of land that drains into a larger body of water. If you live west of the Appalachian Mountains your property is in the Mississippi River watershed. If you live east of the Appalachians your property is part of the Chesapeake Bay watershed.

The Bay, a national treasure, supports “3,600 species of plant and animal life, including more than 300 fish species and 2,700 plant types...Formed about 12,000 years ago as glaciers melted and flooded the Susquehanna River valley, the Chesapeake Bay is North America’s largest estuary and the world's third largest.” (Chesapeake Bay Foundation data [http://www.cbf.org/page.aspx?pid=433](http://www.cbf.org/page.aspx?pid=433)). This document will focus primarily on the Chesapeake Bay watershed.

Water is an important resource for our health, economy, and ecosystem. Landscaping practices can impact the quality of our water systems. Traditionally, a lush green carpet of turf grass has been the ultimate goal. We sow a tight field of grass that is difficult to coax into growing. Then we fertilize it, spray it with pesticides and water it. Just when the turf is at its best we cut off the top third. This process is expensive, time-consuming and costly to the environment. Creating a landscape that doesn’t require fertilizing, watering or mowing is easier on the homeowner and benefits the ecosystem.

Landscaping for water quality invites nature back into our lives and yards.

Grasses, sedges and wildflowers are attractive and require no fertilizer and less water than turf to thrive. A common misconception about emulating nature in our gardens is that they look unkempt and weedy. In reality you can create a finely sculptured, manicured look or that English country cottage look.

Following the basic concepts here, you will get to know your property so that you can create a design specifically for you.

- The first section will give an overview of the “why” and “what” of landscaping for water quality.
- The second section, *Designing and Installing Your Garden*, concentrates on the “how”.
- The third section, *Sample Garden Designs and Plant Lists* gets specific about what plants to use and where to find them.
Why Landscape For Water Quality?

- **To Capture Rainwater**

Precipitation is a valuable resource. Consider that in a 1” rainstorm 13,000 gallons of water fall on a typical 1/2 acre residential lot. Normally about 2/3 of this amount (8,500 gallons) runs down the storm drain (Schueler, 1994). By designing gardens to capture this water you retain a treasure for your own use.

Even if your home is located on a curb and gutter system, rainwater eventually drains to a lake or stream. If you capture large amounts of water on your property, you will help to prevent overloading of storm drains and possible downstream flooding.

- **To Stabilize Soil**

Soil erosion from stream banks, construction sites and sloped yards is significant, costly and disastrous. Your physical property is literally washing down the drain. The resulting siltation chokes aquatic habitat and pollutes drinking water.

The roots of turf grass are too shallow to restrict soil loss from flowing water. Maintaining buffer zones of water-quality garden vegetation with deep roots can abate the force of water that sweeps the topsoil off your property.

- **To Increase Water Infiltration**

Appropriate landscaping slows the flow of water. Reducing water speed allows storm water to sink into the soil. This process is called infiltration. Pervious or permeable products, rather than traditional concrete, asphalt and other impermeable materials also allow water to go directly into the soil. Unfortunately, infiltration is nearly eliminated as development overtakes natural areas.
• To Increase Water Filtration Rates

Our water on earth cleanses itself by filtering through the soil. This process allows contaminants, such as fertilizer, pet waste, pesticides and oils to be separated from water. Landscaping increases filtration because plant roots absorb many of the chemicals found in water.

• To Provide Wildlife Habitat

Providing “natural” shelter and food for wildlife by using native plants improves habitat. A diversity of plants encourages a variety of wildlife and provides attractive landscaping at the same time. Native plants are the best choice because they are the exact plants which our native wildlife needs to survive. The plants are naturally adapted to our environment and are more disease resistant than non-natives. They require no chemicals, less water than turf and are low maintenance.

Because wildlife provides natural pest management you can greatly reduce or eliminate the use of pesticides. It should be noted that pesticides pose a threat to beneficial wildlife.

• To Improve Air Quality

Trees and shrubs are natural air filters which trap large amounts of dust and particulate matter. They consume carbon dioxide and release oxygen. This process cleanses the air and cools the temperature of the air and water. Cooler water temperatures are needed for fish habitat.

• To Save Money Time and Effort

Reduced use of water, fertilizer, herbicides and pesticides can save the homeowner an average of $500 per year (U.S. EPA) and can offer freedom from weekly mowing.

• To Create Improved Recreational Opportunities

Today we realize that the loss of clean streams, ponds and lakes has all but eliminated opportunities for our children to catch frogs, trap planaria, study crawfish, etc. Our polluted ponds and lakes have frequent fish kills and pond scum which prevent us from using them for paddling, fishing and relaxing.
To Enhance Property Values

Landscaping enhancement is a proven method of increasing the value of your property. Using landscaping that is specifically designed for water quality results in this same value increase. Incorporating ornamental pervious paving stones for a driveway or patio adds to the value even more.

The use of plant buffers will prevent sediments and pollution from entering the water. The landscaping will add value to your property (aesthetic garden, clean odor-free water); cost less (reduce fertilizer, pesticides and watering) and improve the quality of our water for wildlife and our recreation.

A Water-Quality Plan

Water-quality landscaping is more than plantings. It is an overall plan to improve absorption, infiltration and filtration. Here are some practices that should be included in a Water-Quality Plan:

- Remove turf grass whenever possible.
- Plant borders around edges of property to keep water where it falls.
- Modify terrain to redirect water using swales (slight depressions), berms (slight ridges), terraces, rain gardens or other methods.
- Test soil every three years.
- Eliminate or reduce fertilizer.
- Change impervious surfaces to pervious where possible.

For more information refer to Permeable Pavement Fact Sheet at: https://extension.umd.edu/sites/default/files/_docs/programs/master-gardeners/Howardcounty/Baywise/PermeablePavingHowardCountyMasterGardeners10_5_11%20Final.pdf
Section 2
Designing and Installing Your Garden

Now that you have a basic understanding of the merit of planting with water quality in mind, planning and designing your new landscape is the next step. This section is designed to help you plan a simple, yet effective, water-quality garden or to incorporate the concepts into an already existing garden area. Here you will find the steps for design and basic installation of gardens in your landscape to improve water quality and reduce the amount of water leaving your property. You can add beauty and value to your landscape, minimize topsoil loss and lower the cost of maintenance, all while capturing valuable rainwater.

Waterfront Views

If your property adjoins a body of water and the value of your property is dependent on a waterfront view you can take steps to preserve views while also improving water quality. These steps include:

- Creating a window to frame the view by planting low growing plants in the center and taller plants at the sides.
- Removing lower limbs of existing trees to reveal the view.
- Using curved pathways and planting beds to add dimension to the view,

It can be fun to design your own water-quality garden. The style of garden is up to you. Remember that the more formal the style of the garden the more maintenance is required.

Planning Your Garden

Make a rough drawing of your yard using the graph paper at the end of this document. Take a walk around your property to view it from several angles when making your drawing to make sure you haven’t missed anything. On the drawing show:

- The measurements
- Your house, decks, driveways, paths, etc.
- Trees and existing landscaping
- Areas of sun and shade
- Moisture
- Soil types—Refer to Appendix E for information about identifying your soil type
- Terrain—direction water flows; where it pools
- Existing views you want to preserve

Now look at your drawing and consider the following questions:

- Is there turf area that can be eliminated or reduced?
- Are there existing perennials or trees that you want to use?
- Is there an existing garden into which you can incorporate the concepts?
- Are there existing plants or trees that you wish to remove?
- Have you had your soil tested in the last three years? See Appendix C for more information.
- Have all downspouts been directed to gardens?
- Are there any impervious areas that can be changed to permeable materials?
Evaluating Your Property

The first step is to look at your property using the drawing you have made and considering the categories below. This will simplify the process when choosing your plants. Below is a chart that will allow you to evaluate areas of your property. Under Chosen Area place a check if it needs attention. Under Value select a number from 1-10, with 10 being the most in need of attention and 1 being the least. When you finish you will have a number of projects which can be listed from the most important to the least. Check off growing conditions (light, soil moisture and soil pH) for each area needing work.

**Suitable Areas to Consider**

<table>
<thead>
<tr>
<th>Areas to Consider</th>
<th>Chosen Area</th>
<th>Value</th>
<th>Full sun (6+ hrs sun)</th>
<th>Partial sun (3-6 hrs)</th>
<th>Shade (/than 3 hrs sun)</th>
<th>Soil Wet</th>
<th>Soil Moist</th>
<th>Soil Dry</th>
<th>Soil pH</th>
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<tr>
<td>Eroding bank</td>
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<td>Gently sloping yard dumping all rain water into storm drain</td>
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<td>Gently sloping yard dumping all rain water into lake or stream</td>
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<td>Steep slope that needs planting</td>
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<td>Area that is too dry</td>
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<td>Lawn mowed to edge of water</td>
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<td>Area where water should be redirected</td>
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<td>Area where you want a berm</td>
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<td>Area where you want a swale</td>
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<td>Area where landscaping rock(s) can break water flow</td>
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<td>Area of lawn to eliminate</td>
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Simple Ways to Modify Your Existing Landscape

- Cultivated garden beds can be transformed, at least minimally, into simple water-quality gardens by incorporating slight depressions into the beds.

- Create small depressions 3-4 inches wide and deep and two to three feet from the trunks of the trees so that it resembles a moat around existing trees. The trees will use rain water more effectively. You can make depressions in the turf grass by either lifting the turf and removing 2 – 3 inches of the subsoil or by mulching around the base of the tree and forming the depression in the mulch.

- If there is a large bermed area containing many trees, a depression following the outline of the edge of the berm will keep the water in the area. Adding bright perennials in and on the outer edge of this depression will complete the transformation.

- If you want to retain turf grass, consider altering the topography by adding berms and swales. These mild undulations in the turf are placed at planned angles, channeling the water run-off to desired areas such as rain gardens.

- Consider planting a groundcover that will help manage water runoff.

Make a new drawing showing the changes you wish to make by installing water-quality gardens, berms, swales and pervious surfaces.

Even a very slight slope can have areas that wash out during rain. Adding plants and strategically placed rocks to help stabilize the slope can be a beautiful solution. A steep slope will require more careful planning. You may wish to incorporate a terrace design in conjunction with plants to help stabilize the slope.

The following drawings give examples of the before and after showing overhead as well as street view perspectives.

Overhead view...

Street view....
Plant Selection

The garden should have both a lowland, or wet zone and an upland, or dry zone. Selection of water-tolerant plants for the wet zone is essential. The dry zone should surround the wet zone to help buffer, trap nutrients, retard erosion and stabilize the slopes. The dry zone can be planted with plants adapted to moderate and dry areas.

Although many will call any area where there is a garden planted in a depression a rain-garden, a true rain-garden is more than this. Rain gardens are special water-quality gardens that are expressly designed for areas where water habitually pools or where rainwater is deliberately channeled. These gardens may require soil replacement and more complicated preparation than the simple gardens discussed here. For more information about Rain Gardens see Appendix B.

Guidelines for Plant Selection

- Select appropriate plants for your soil and light conditions.
- Select plants that will optimize on-site infiltration, filtration and absorption.
- Select a mixture of plant species to provide diversity, increase survival rates and add aesthetic qualities year-round.
  - Choose at least three plant species that will work for each area of the garden to keep color alive and maintenance down.
  - Avoid single species beds since they are more work and vulnerable to pest infestation
- Include grasses, sedges and ferns.
  - These plants add movement and sound, color, texture and interest in the winter.
  - They knit the garden into a pleasing composition and serve as a support structure for some of the wildflowers.
  - Most importantly they enhance your garden’s infiltration rate because of the deep roots.
- Include groundcovers which are low growing and low maintenance plants. Although groundcovers offer less than optimum water-quality benefits, they can make a large impact over time. See Appendix G for a short recommended list of groundcovers. Groundcovers are useful in locations where:
  - Shorter plants are needed to preserve a view of the water (the “window” mentioned under Waterfront Views on Page 7).
  - There is a steep incline and soil needs to be held in place.
  - Grass will not grow, such as under trees and bushes.
- Use a blend of plant heights and types (trees, shrubs, perennials) Variation will add interest year round and will help to trap water as it enters the garden.
- Use seedling plants instead of seeds since they are easier to establish.
- Resist the urge to feed your garden. Adding unneeded fertilizer will only encourage weed growth.
- Select plants according to your plant hardiness zone. See Appendix D for more information.

Installing Your Garden

Preparation

Garden preparation is similar to preparing for any type of garden. The better the soil preparation is, the better the final result will be.
Before you begin any digging, it is important to make sure there are no underground utilities in the areas affected. “Miss Utility” is a free service that will flag where any underground cables, lines or pipes are. Please call at least three full working days before you dig. The toll-free number is 1-800-257-7777 or use this web site: [http://www.missutility.net/homeowners/](http://www.missutility.net/homeowners/).

- Remove any existing sod from the area you’ve chosen to plant. Turn it upside down and use it to build a berm on the downhill side of the planting bed.
- Gently contour your garden, making sure it has a depression of at least 4-5 inches deep in the center area. Variation and undulation can add to the beauty of your garden. To minimize erosion, keep slopes gentle.
- No matter what your soil type, you will need to till the subsoil layer. This will help plants establish and take root. After they are mature, they will do well, even in adverse soil conditions.
- If your soil is rich in clay, you may wish to amend it to help the plants establish. To do so, till weed-free compost into the top 6"-8" of the bed prior to adding the topsoil. See Appendix F for more information about soil amendment.
- Add a 5-6" thick layer of topsoil over your prepared garden.

**Planting**

- **When to plant**
  - A garden can be planted any time during the growing season, spring through fall. Take note that frequent watering will be necessary if you plant during the heat of summer.
- **Filtration rate**
  - Although this step is not required, it is good to know what the filtration rate is before you plant. To test this, dig a hole 18”-24” deep and fill it with water. If the water has not drained in an hour you may want to amend your topsoil by adding weed-free compost to the top 4”-5”. Be sure to let the garden dry out before planting.
- **Mulching**
  - Mulch around all the new seedlings with fibrous shredded wood chips. This mulch layer should be about 3 inches thick. It helps to retain moisture and discourage weeds. The preferred mulch is a coarse, fibrous shredded wood chip mulch. After the garden is established, varying the wood type from year to year is a good practice to guard against algae or mold growth on the mulch.

**Maintenance**

Maintenance of these gardens is minimal once they are established. The plants suggested are hardy in our region and require little work after they are established.

- Nurture the plants for the first few weeks. Regular watering, weeding and maintaining 3 inches of mulch around them are all it takes.
- Soak the plants once a week after the first few weeks either through rainfall or by sprinkling. Do not add fertilizer to these gardens. They don’t need it!
- Except for shrubs, cut the plants back to about 6 inches tall and remove any dead foliage before the next growing season. While you can do this in the fall you may want to wait until spring as the plants will add interest to your landscape all winter long.
- Add or replace the mulch, which acts as weed control, especially if it begins to cake and not allow water through it.
- Split clumps of growth after several years if you wish. Create new gardens with the divisions!
- Neat edges help create a look of care for the natural garden.
Before utilizing this third section, it is suggested that you read about the concepts in the first section and plan your design using one or more of the ideas in the second section, *Designing and Installing Your Garden*. The following are sample garden designs to give you a jump-start using the concepts of *Landscaping for Water Quality*. All plants in the layouts are native plants intended to attract pollinators. Some provide food, some are host plants for larvae and some provide shelter.

These are examples only. Keep in mind the attributes of your property when considering what plants to choose for your unique gardens. Vary the shapes of the gardens to fit your individual needs. The drawing you made of your property earlier will help you decide on garden type, size and shape.

To determine how many plants your garden will need calculate your square footage and then figure on one to two plants for every square foot. This will give you an estimate from which to work. Because individual plant requirements differ, ask your nursery for spacing and planting specifics.

**Riparian Buffer Layouts**

In the first two examples, riparian layouts, the lowland (wet zone) plants are placed closest to the water’s edge, while the drier plants are planted farther away from the water’s edge. (Riparian refers to the land found at the edges of a river or lake.) It is essential that contaminated water runoff is prevented from entering the water bodies. A riparian garden is a beautiful option to meet that need.

The first layout functions as a water body buffer zone and utilizes taller species, up to six feet in height. The tall foliage is useful as a privacy screen as well as providing excellent butterfly, bird and other wildlife habitat. The various plant varieties will migrate into each other over time.

The second layout is another buffer zone example that utilizes shorter species of plants. The roots encourage filtration and the dense foliage acts as an effective barrier to storm water runoff. It is suggested that you make your buffer at least 10-12 feet wide. As a rule of thumb, the steeper the slope the wider your buffer zone should be. On a very steep slope, the entire slope should be used as a buffer zone.

**Riparian Garden Layout 1-Sun**
Riparian Garden Layout 1-Sun (continued)
1. Switchgrass (*Panicum virgatum*)
2. Cardinal Flower (*Lobelia cardinalis*) and Northern Blue Flag (*Iris versicolor*)
3. Tussock Sedge (*Carex stricta*)
4. Dense Blazing Star (*Liatris spicata*)
5. Little Blue Stem (*Schizachyrium scoparium*)
6. Tall White Beardtongue (*Penstemon digitalis*) and Orange Coneflower (*Rudbeckia fulgida*)
7. Lobed Tickseed (*Coreopsis auriculata*)

Riparian Layout 2-Sun

1. Tussock Sedge (*Carex stricta*)
2. Beebalm (*Monarda didyma*)
3. Great Blue Lobelia (*Lobelia siphilitica*)
4. Turtlehead (*Chelone glabra*)
5. Blue-eyed Grass (*Sisyrinchium angustifolium*)
6. Threadleaf Tickseed (*Coreopsis verticillata*)
7. Lyre leafed Sage (*Salvia lyrata*)

Other Sample Layouts
In the next seven design examples, the lowland (wet zone) plants are placed in the center of the garden design. The ground gradually slopes from the upland (dry zone) areas on the outer edges down to the center. Storm water runoff is encouraged to enter and stay in the garden where it will be filtered and absorbed into the ground.

Prairie Garden Layout

Prairie gardens offer extensive water-quality benefits to any landscape. Deep roots encourage water infiltration, water storage and soil stabilization, while interesting foliage provides windbreaks. This style of garden is very natural looking and is a low maintenance garden choice. As the name “prairie” implies, this garden does best in full or partial sun. These plants also tolerate drought conditions well, reducing or eliminating the need for “sprinkling”, even during a dry spell.
1. Switch Grass (*Panicum virgatum*)
2. Oxeye Sunflower (*Heliopsis helianthoides*)
3. Orange coneflower (*Rudbeckia fulgida*)
4. Little Bluestem (*Schizachyrium scoparium*)
5. Blazing Star (*Liatris spicata*)
6. Purple Coneflower (*Echinacea purpurea*)*
7. American Beautyberry (*Callicarpa americana*)
8. Blue Flag Iris (*Iris versicolor*)
   (* denotes not native in Maryland)

**Sunny Garden Layout**

This garden is for sunny areas – places receiving more than six hours of direct sunlight per day. The plants used encourage water infiltration while providing vibrant colors. There are numerous species of sun loving plants that can have a positive impact on water quality. If the nursery near you does not carry a specific plant in your plan, substitute a similar one.
Sunny Garden Layout (continued)
1. Bee Balm (*Monarda fistulosa* )
2. Blue-Eyed Grass (*Sisyrinchium angustifolium* )
3. Oxeye Sunflower (*Heliopsis helianthoides* )
4. Blue False Indigo (*Baptisia australis* )
5. Appalachian Sedge (*Carex appalachica* )
6. Orange Coneflower (*Rudbeckia fulgida* )
7. Butterfly weed (*Asclepias tuberosa* )
8. Hollow-stemmed Joe-Pye Weed (*Eupatorium fistulosum* )

**Butterfly Garden Layout**

Designed for a fairly steep slope, the plants in this garden not only provide water-quality benefits, but are also attractive to butterflies and birds. The plants were selected to provide a long colorful blooming season with fragrant blossoms. Wildflowers are a great choice when your goal is to ensure water quality and storm water management.

**Butterfly Garden Layout**

1. Late Lowbush Blueberry (*Vaccinium angustifolium*)
2. Butterfly Weed (*Asclepias tuberosa*)
3. Smooth Aster (*Aster laevis*)
4. Swamp Milkweed (*Asclepias incarnate*)
5. Orange coneflower (*Rudbeckia fulgida*)
6. Blazing Star (*Liatris spicata*)
7. Joe Pye Weed (*Eupatorium maculatum*)
8. Blue-stemmed Goldenrod (*Solidago caesia*)
9. New York Ironweed (*Vernonia noveboracensis*)
10. Mist Flower (*Eupatorium coelestinum*)
Sunny Border Garden Layout

This garden is designed as a running border at the edge of your property or wherever you wish to have a colorful border. The flowers and seeds are attractive to birds and butterflies while providing an interesting mix of foliage and textures. The lowland (wet zone) is planted with Blue Flag Iris, which does very well in shallow water, interspersed with Golden Alexander for variety. You may wish to add a third species in the lowland area to add diversity.

1. Blue Flag Iris (*Iris versicolor*) & Golden Alexander (*Zizia aurea*)
2. Blue-Eyed Grass (*Sisyrinchium angustifolium*)
3. White Coneflower (*Echinacea purpurea alba*)*
4. Purple Love Grass (*Eragrostis spectabilis*)
5. Wild blue indigo (*Baptisia australis*)
6. Threadleaf Coreopsis (*Coreopsis verticillata*)
7. Hairy Beard Tongue (*Penstemon hirsutus*)
8. Pennsylvania Sedge (*Carex pensylvanica*)
9. New York Ironweed (*Vernonia noveboracensis*)

* denotes not native in Maryland

Shady Garden Layout

This garden is for shady or partly shaded areas – places receiving less than six hours of direct sunlight per day. The blooming season is long, giving three-season color. Shade plants help hold moisture in the soil, which is beneficial to the trees providing the shade.
Shady Garden Layout (continued)
1. Pennsylvania sedge (Carex pennsylvanica)
2. Solomon’s Seal (Polygonatum biflorum)
3. Crested Iris (Iris cristata)
4. Dog laurel (Leucoathose fontanesiana)
5. Great Blue Lobelia (Lobelia siphilitica) mixed with Bottlebrush Grass (Elymus hystrix)
6. Blue stemmed goldenrod (Solidago caesia)
7. Ostrich Fern (Mateuccia pennsylvanica)
8. Wild Ginger (Asarum canadense)
9. White Wood Aster (Aster divaricatus)

Inviting Shrub Garden

Plants for this garden are mostly shrubs and were selected to provide water uptake and storage. Spring and summer bloom attracts butterflies and other insects.

![Shrub Garden Diagram]

1. Sweet Pepperbush (*Clethra alnifolia*)
2. Dwarf Fothergilla (*Fothergilla gardenia*)
3. Virginia Sweetspire (*Itea virginiana*)
4. Lowbush Blueberry (*Vaccinium angustifolium*)
5. Tussock Sedge (*Carex stricta*)
6. Buttonbush (*Cephalanthus occidentalis*)
Low Maintenance Deer Resistant Layout

The design below is one example of many from the excellent Low Impact Development. Although it was designed as a rain garden it can also be used in a simple water-quality garden. See the web site for other designs: http://www.lowimpactdevelopment.org/raingarden_design/templates.htm. Do keep in mind that deer resistant does not mean deer proof and resistance varies with location.

The next four designs were planned as rain gardens but can also be used as simple water-quality gardens.

The water is still captured in the center as in the designs beginning on Page 14, but there is also a rock outflow included on the downhill side in these four designs in case of overflow.
### SUN (*First Choice)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Latin Name</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. *Tussock sedge</td>
<td>Carex stricta</td>
<td>1-3.5’ clumping grass</td>
</tr>
<tr>
<td>Little Bluestem</td>
<td>Schizachyrium scoparium</td>
<td>1-5.4 clumping grass</td>
</tr>
<tr>
<td>2. *Orange Coneflower</td>
<td>Rudbecki fulgida “Goldstrum”</td>
<td>1.5-3.5’ yellow flowers July-Oct.</td>
</tr>
<tr>
<td>Coreopsis</td>
<td>Coreopsis verticillata</td>
<td>0.5-3.5’ yellow flowers July-Sept.</td>
</tr>
<tr>
<td>Gayfeather</td>
<td>Liatris spicata</td>
<td>1-6’ rose-purple flowers July-Aug</td>
</tr>
<tr>
<td>4. *American Beautyberry</td>
<td>Callicarpa Americana</td>
<td>6’ lavender flowers June-Aug</td>
</tr>
<tr>
<td>Black Chokeberry</td>
<td>Photinia melanocarpa</td>
<td>lavender berries Sept.-March</td>
</tr>
</tbody>
</table>

### SEMI-SHADE (*First Choice)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Latin Name</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. *Soft rush</td>
<td>Juncus effuses</td>
<td>3’ grass</td>
</tr>
<tr>
<td>Tufted hairgrass</td>
<td>Deschampsia cespitosa</td>
<td>18” purple-tinged panicles June-Aug.</td>
</tr>
<tr>
<td>2. *Coral bells</td>
<td>Huechera Americana</td>
<td>1-2’ nice foliage, tiny flowers on spikes April-June</td>
</tr>
<tr>
<td>False spirea</td>
<td>Astilbe</td>
<td>1-3’ plume-like flowers June-July</td>
</tr>
<tr>
<td>3. *Cinnamon fern</td>
<td>Osmunda cinnamomea</td>
<td>2-5’ fronds,brown spike seed heads fall</td>
</tr>
<tr>
<td>Sensitive fern</td>
<td>Onoclea sensibilis</td>
<td>1-3.5 ‘ fronds</td>
</tr>
<tr>
<td>4. *Silky dogwood</td>
<td>Cornus ammomum</td>
<td>6-12’ white flowers spring</td>
</tr>
<tr>
<td>Black chokeberry</td>
<td>Photinia melanocarpa</td>
<td>3-6’ white flowers April-May</td>
</tr>
<tr>
<td></td>
<td></td>
<td>black berries Sept.-Nov.</td>
</tr>
</tbody>
</table>
RainGarden Template for Columbia Association by Howard County MD Master Gardeners July 2011-- # 2

### SUN (*First Choice)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Latin Name</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. *Tussock Sedge</td>
<td>Carex stricta</td>
<td>1-3.5’ clumping grass</td>
</tr>
<tr>
<td>Switch grass</td>
<td>Panicum virgatum</td>
<td>3-6’ clumping grass</td>
</tr>
<tr>
<td>2. *Gayfeather</td>
<td>Liatris spicata</td>
<td>1-6’ lavender spikes July-August</td>
</tr>
<tr>
<td>Purple Coneflower</td>
<td>Echinacea purpurea</td>
<td>2-3’ lavender flowers July-Septem</td>
</tr>
<tr>
<td>3. *White Turtlehead</td>
<td>Chelone glabra</td>
<td>1.5-6’ white blooms July-October</td>
</tr>
<tr>
<td>Common Boneset</td>
<td>Eupatorium perfoliatum</td>
<td>1-5’ white blooms July-September</td>
</tr>
<tr>
<td>4. *Coreopsis</td>
<td>Coreopsis verticillata</td>
<td>0.5-3.5’ yellow blooms June-October</td>
</tr>
<tr>
<td>Orange coneflower</td>
<td>Rudbeckia fulgida ‘Goldstrum’</td>
<td>1.5-3.5’ yellow blooms June-October</td>
</tr>
<tr>
<td>5. *American Beautyberry</td>
<td>Callicarpa Americana</td>
<td>6’ lavender flowers June-August</td>
</tr>
<tr>
<td>Sweet pepper bush</td>
<td>Clethra alnifolia</td>
<td>lavender berries September-March</td>
</tr>
</tbody>
</table>

### SEMI-SHADE (*First choice)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Latin Name</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. *Soft Rush</td>
<td>Juncus effuses</td>
<td>3’ grass</td>
</tr>
<tr>
<td>Switch Grass</td>
<td>Panicum virgatum</td>
<td>3-6’ clumping grass</td>
</tr>
<tr>
<td>2. *Cinnamon Fern</td>
<td>Osmunda cinnamomea</td>
<td>2-5’ fronds brown spike seed heads in fall</td>
</tr>
<tr>
<td>Royal Fern</td>
<td>Osmunda regalis</td>
<td>1.5-6’ fronds</td>
</tr>
<tr>
<td>False Spirea</td>
<td>Heuchera Americana</td>
<td>1-2.5’ nice foliage, tiny flowers April-June</td>
</tr>
<tr>
<td>3. *Coral Bells</td>
<td>Astilbe</td>
<td>Plume-like flowers June-July</td>
</tr>
<tr>
<td>Mist flower</td>
<td>Salvia lyrata</td>
<td>1-2’ violet flowers April-June</td>
</tr>
<tr>
<td>4. *Lyre-leaf sage</td>
<td>Eupatorium coelestinum</td>
<td>1-3.5 purple flowers July-August</td>
</tr>
<tr>
<td>Pink azalea</td>
<td>Hydrangea quercifolia</td>
<td>6-8’ white cone-shaped flower clusters in spring</td>
</tr>
<tr>
<td>5. *Oak-leaf hydrangea</td>
<td>Rhododendron periclymenoides</td>
<td>3-10’ white/pink blooms April-May, orange/scarlet fall foliage.</td>
</tr>
</tbody>
</table>
### SUN (*First choice) 300 sq ft (x) = number of plants in area on 12” centers

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Latin Name</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.* Switch grass</td>
<td>Panicum virgatum</td>
<td>3-6’ clumping grass</td>
</tr>
<tr>
<td>Broom Sedge</td>
<td>Andropogon virginicus</td>
<td>1-3’ red brown plumes July-August</td>
</tr>
<tr>
<td>2.* Purple Coneflower</td>
<td>Echinacea purpurea</td>
<td>2-3’ lavender flowers July-September</td>
</tr>
<tr>
<td>Beebalm</td>
<td>Monard didyma</td>
<td>2-5’ red flowers July-September</td>
</tr>
<tr>
<td>3.* Black Eyed Susan</td>
<td>Rudbeckia hirta</td>
<td>1.5-3.5’ yellow flowers July-October</td>
</tr>
<tr>
<td>Coreopsis</td>
<td>Coreopsis verticillata</td>
<td>0.5-3.5’ yellow flowers June-October</td>
</tr>
<tr>
<td>4.* Lyre-leaf Sage</td>
<td>Salvia lyrata</td>
<td>1-2’ violet flowers April-June</td>
</tr>
<tr>
<td>Blue Flag</td>
<td>Iris vericolor</td>
<td>3’ blue flowers May-June</td>
</tr>
<tr>
<td>5.* Red Osier Dogwood</td>
<td>Cornus sericea</td>
<td>6-8’ white flowers in spring, small red twigs</td>
</tr>
<tr>
<td>American Beautyberry</td>
<td>Callicarpa americana</td>
<td>6’ lavender flowers June-August</td>
</tr>
<tr>
<td></td>
<td></td>
<td>lavender berries September-March</td>
</tr>
</tbody>
</table>

### SEMI-SHADE (*First choice)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Latin Name</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.* Tussock Sedge</td>
<td>Carex stricta</td>
<td>1’-3.5 clumping grass</td>
</tr>
<tr>
<td>Switch grass</td>
<td>Panicum virgatum</td>
<td>3-6’ clumping grass</td>
</tr>
<tr>
<td>2.* Sheep Laurel</td>
<td>Kalmia angustifolia</td>
<td>2-3’ white/pink blooms May-June evergreen</td>
</tr>
<tr>
<td>Mist flower</td>
<td>Eupatorium coelestinum</td>
<td>2-3’ blue to violet flowers late summer</td>
</tr>
<tr>
<td>3.* Cinnamon Fern</td>
<td>Osmunda cinnamomea</td>
<td>2-5’ fronds, brown spike seedheads in fall</td>
</tr>
<tr>
<td>Royal Fern</td>
<td>Osmunda regalis</td>
<td>1.5-6’ fronds</td>
</tr>
<tr>
<td>4.* False spirea</td>
<td>Astilbe</td>
<td>1-2.5 plume-like flowers June-July</td>
</tr>
<tr>
<td>Coral bells</td>
<td>Heuchera americana</td>
<td>1.2-5’ good foliage, tiny flowers on spikes April-June</td>
</tr>
<tr>
<td>5. Oak-leaf Hydrangea</td>
<td>Hydrangea quercifolia</td>
<td>6-8’ white cone-shaped flower clusters in spring</td>
</tr>
<tr>
<td>Pink Azalea</td>
<td>Rhododendro periclymenoides</td>
<td>6-8’ white/pink blooms April-May, orange-scarlet fall foliage</td>
</tr>
</tbody>
</table>
### SUN (*First Choice) centers

<table>
<thead>
<tr>
<th>Common name</th>
<th>Latin Name</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.*Tussock Sedge</td>
<td>Carex stricta</td>
<td>1-3.5’ clumping grass</td>
</tr>
<tr>
<td>Little Bluestem</td>
<td>Schizachyrium scoparium</td>
<td>1.5-4’ grass</td>
</tr>
<tr>
<td>2.*Winterberry</td>
<td>Ilex verticilla</td>
<td>6-12” white blooms May-July; red berries</td>
</tr>
<tr>
<td>Red Osier Dogwood</td>
<td>Cornus stolonifera</td>
<td>September-March. Must plant one male to fertilize female plants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7-9’ white blooms in spring; red twigs in fall</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Common name</th>
<th>Latin Name</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.*Soft Rush</td>
<td>Juncus effuses</td>
<td>3’ grass</td>
</tr>
<tr>
<td>Switch Grass</td>
<td>Panicum virgatum</td>
<td>3-6’ clumping grass</td>
</tr>
<tr>
<td>2*Oak Leaf Hydrangea</td>
<td>Hydrangea quercifolia</td>
<td>6-9’ white cone-shaped flowers in spring</td>
</tr>
<tr>
<td>Silky Dogwood</td>
<td>Cornus amomum</td>
<td>6-12’ white flowers in spring; orange/scarlet fall foliage</td>
</tr>
</tbody>
</table>

250 sq ft  (x) x=number of plants on 12”
Other Resources for Water-quality Garden Designs

- Low Impact Development.org  
  [http://www.lowimpactdevelopment.org/raingarden_design/index.htm](http://www.lowimpactdevelopment.org/raingarden_design/index.htm)
  This site is an excellent resource for many garden designs. They are specifically for either Piedmont, Mountain or Coastal regions and include both sun and shade gardens. Although designed as rain gardens they may also be used as simple water-quality gardens.

- Bay Scapes Homeowners’ Guide to Designing Your Property  

- Portland Maine Water District-Environmental Landscaping for Water Quality  
  This web site has three generic plans specifically for lakefronts.

- Illinois Wildflower Preservation and Propagation Committee  
  [http://thewppc.org/resources.html](http://thewppc.org/resources.html)
  (Yard Plans Home Page)
  Maryland and Illinois have many of the same wildflowers. You can check plants in the designs against the Maryland plants lists below (Page 24).

What Plants do I use for MY Garden?

It is entirely a personal choice which specific plants you choose. In the lists we recommend there are a variety of plants from which to choose. The plants listed are by no means the complete list of plants you can consider. You will see that the majority of the species listed are native to Maryland, defined here as: “Plants that were found in this region prior to European settlement.”

Native species are well suited to the local quirks of nature, and many provide the functions needed for a successful water-quality garden. Use of native species also provides food and habitat for native animals. Some will argue that the use of genetically pure native species is the preferred choice. However, it can also be argued that many species of plants that are not native to Maryland also provide excellent water-quality benefits.

It is as important to look for the specific functions of a plant as it is to choose a plant simply because it is native to Maryland. Plants to choose are those that have deep root systems, have the ability to filter or absorb pollutants, need little or no fertilization, and are nearly maintenance free. For more information about deep root systems see Appendix H.

Be flexible when choosing your plants. You will probably design your landscape with a few specific plants in mind, but when you go to the nursery to buy them, you may have to substitute. Work with the nursery to reach a solution that will give you the effect you desire. **A note of caution:** ask questions at your nursery to ensure that your choices are not invasive species that could spread beyond your garden and cause environmental damage. **Even some of the nurseries that are listed below still sell invasive species, such as English ivy.** For further information about invasive plants see Appendix A

The plants in the lists below are divided into several categories. Each species will have specific characteristics listed, and in addition, short comments to help you make your decisions. This listing is in no way comprehensive. There are many other species that are suitable for water-quality gardens that were not included in this list. You can consult your local native plant nursery for more native suggestions, discuss your needs with your nursery or explore the resource list suggested at the end of this document. **A quick note about the categories:**
Plant Names  Because there is no standardization of common names of plants, look for the plant tags at the time of purchase. The tags will list the scientific name and the plant characteristics. This is helpful in both securing the exact plant you seek as well identifying good substitutions if necessary.

Plant Height  Influences such as water availability, sun exposure and proximity to other plants can affect plant height. In addition, you can physically limit plant height through pruning. You can use many shrubs as trees if desired.

Exposure  The lists will give information about needed sunlight/shade.

Plant Lists

Below are links to the plant lists we recommend for Maryland.

  Lists many plants and cites the size, moisture needs, sun needs and other details for each.

- **Native Plants for Wildlife Habitat and Conservation Landscaping-Maryland**—National Park Service
  See note also under Native Plant Center below.

- **Plant Lists for Maryland Regions**—National Park Service; abbreviated plant lists arranged by Maryland physiographic regions (Piedmont, Coastal, Mountain*)
  Available at [http://www.nps.gov/plants/pubs/nativesmd/lists.htm](http://www.nps.gov/plants/pubs/nativesmd/lists.htm)

- Native Plant Center --Alliance for the Chesapeake Bay with U.S.Fish and Wildlife Service
  [http://www.nativeplantcenter.net/](http://www.nativeplantcenter.net/)
  This site has converted *Native Plants for Wildlife Habitat and Conservation Landscaping-Maryland* into a searchable database.

- **Plant Lists for Maryland Regions**—National Park Service; abbreviated plant lists arranged by Maryland physiographic regions (Piedmont, Coastal, Mountain*)
  Available at [http://www.nps.gov/plants/pubs/nativesmd/lists.htm](http://www.nps.gov/plants/pubs/nativesmd/lists.htm)

- **Rain Gardens Across Maryland-Worcester County Maryland**
  [http://www.co.worcester.md.us/drp/natres/Rain_Gardens_Across_MD.pdf](http://www.co.worcester.md.us/drp/natres/Rain_Gardens_Across_MD.pdf)
  Plants listed in this publication may be used in water-quality gardens and are not necessarily limited to rain gardens.
The best plan is to request your plant by its scientific name. This list contains nurseries which carry natives only and nurseries which carry cultivars and natives. Some of the nurseries carry only a few native plants. The list also gives you sources to find names of native plants, pictures and descriptions of conditions preferred by the plant. Buying with the knowledge of the scientific name and the preferred conditions for the plant is the most successful way to buy native plants.

A note of caution: ask questions at your nursery to ensure that your choices are not invasive species that could spread beyond your garden and cause environmental damage. Even some of the nurseries that are listed below still sell invasive species, such as English ivy. For further information about invasive plants see Plant Invaders of Mid-Atlantic Natural Areas, a list of invasive plants and native alternatives. http://www.nps.gov/plants/alien/pubs/midatlantic/toc.htm

### NURSERIES


  Wholesale nursery that has retail spring and fall open houses. See web site for dates, times and address.


- **Chesapeake Natives**, [http://www.chesapeakenatives.org/Chesapeake_Natives/HOME.html](http://www.chesapeakenatives.org/Chesapeake_Natives/HOME.html) Location as of May 2012: Pope Farm Nursery 7400 Airpark Drive, Derwood MD 20855. Contact: Sarah, 301-655-9236 or sarah.fulton@comast.net

  Environmental Concern, P.O. Box P, 201 Boundary Lane, St. Michael's, Md. 21663; [http://www.wetland.org](http://www.wetland.org)

  Has native plant sale in the spring. Check web site for dates.

- **Herring Run Nursery**; 410-254-1577 ext.104; atraut@herringrun.org

  Check web site for annual open houses/retail sales [http://www.bluewaterbaltimore.org/herring-run-nursery/](http://www.bluewaterbaltimore.org/herring-run-nursery/)

- **Go Native Tree Farm**; 2310 Chestnut View Drive, Lancaster, Pa. 17603; 717-399-0195; [http://www.gonativetrees.com](http://www.gonativetrees.com)


  Wholesale nursery specializing in native plants of the Eastern Piedmont. Retail sales by appointment.


- **Lazy S Farm**, Gordonsville, Va.; also has rare natives; excellent quality; online sales only. [http://www.lazyssfarm.com/Plants/Special%20Lists/native_plants.htm](http://www.lazyssfarm.com/Plants/Special%20Lists/native_plants.htm)

- **Maryland Native Plant Society**  [http://mdflora.org/publications/nurseries.html](http://mdflora.org/publications/nurseries.html)

  List of native plant sources, some of which are duplicated on this list.


- **New Moon Nursery**; [http://www.newmoonnursery.com](http://www.newmoonnursery.com)

  Good quality; large orders of plugs.

- **North Creek Nurseries** 388 North Creek Rd. Landenberg, PA 19350 877-326-7584; [http://www.northcreeknurseries.com/](http://www.northcreeknurseries.com/)

  Wholesale nursery--good quality, large orders of plugs.


- **Sun Nurseries**, 14790 Bushy Park Road, Woodbine, Md. 21797; [http://www.sunnurseries.com](http://www.sunnurseries.com)

- **Toadshade Wildflower Farm**, 53 Everittstown Rd. Frenchtown, NJ 08825;908-996-7500; [http://www.toadshade.com](http://www.toadshade.com)
U.S. Fish and Wildlife Service  
List of Native Plant Nurseries in the Chesapeake Bay Watershed (some duplicated on this list)
http://www.fws.gov/chesapeakebay/BayScapes/bsresources/bs-nurseries.html

Wakefield Valley Nursery, 1690 Wakefield Valley Road, New Windsor, Md. 21776; 410-635-2169;
http://www.wakefieldvalleynursery.com

For a regularly updated list of nurseries please see also:

OTHER SOURCES
Adkins Arboretum, 12610 Eveland Rd., Ridgely, Md 21660; 410-634-2847; http://www.adkinsarboretum.org
Has an annual native plant sale. See web site for dates,


Black Hill Regional Park (Montgomery County) 20926 Lake Ridge Drive Boyds, MD 20841  Friends of the Black Hill Park has a native plant sale in late April.  See web site for dates  http://www.blackhillnature.org

Howard County MD has a stream buffer restoration program called Stream ReLeaf for Howard County residents. http://www.howardcountymd.gov/Departments.aspx?id=6442455851


The National Arboretum ; Usually has a native plant sale with many vendors attending at the end of March, held in conjunction with the Lahr Symposium.  http://www.usna.usda.gov/Education/events.html

NATIVE PLANT WEBSITES
Maryland Native Plant Society;  http://www.mdflora.org

Home and Garden Information Center, University of Maryland;  http://www.hgie.umd.edu
http://www.hgie.umd.edu/_media/documents/NativePlantsofMD.pdf

Chesapeake Bay Program;  http://www.chesapeakebay.net

Chesapeake Bay Trust;  http://www.cbtrust.org/site/c.miJPKXPCJnH/b.5457711/k.8609/Native_Plants.htm

Fairfax County Virginia, Green Spring Gardens;  http://www.greenspring.org

Grow Native--Missouri Dept. of Conservation ;  http://grownative.org/plants/main.asp
Many Missouri native wildflowers are also native to Maryland.  Compare to U.S. Fish and Wildlife Service list below to determine which are native to Maryland; good for additional cultural information and pictures.  Nice features are: suggested companion plants, seedling identification for some plants, and interactive landscape plans.

Illinois Wildflowers;  http://www.illinoiswildflowers.info/index.htm
Many Illinois native wildflowers are also native to Maryland.  Compare to U.S. Fish and Wildlife Service list below to determine which are native to Maryland; good for additional cultural information and pictures.

Lady Bird Johnson Wildflower Center, University of Texas at Austin  http://www.wildflower.org/
This site has a searchable database with advanced options (including state) for all United States native plants.
Native Plant Center, Alliance for the Chesapeake Bay and U.S. Fish and Wildlife Service; [http://www.nativeplantcenter.net/](http://www.nativeplantcenter.net/)
This site has *Native Plants for Wildlife Habitat and Conservation Landscaping-Maryland* (listed below) as a searchable database.

*Plant Lists for Maryland Regions*—National Park Service; abbreviated plant lists arranged by Maryland physiographic regions (Piedmont, Coastal, Mountain*)
Available at [http://www.nps.gov/plants/pubs/nativesmd/lists.htm](http://www.nps.gov/plants/pubs/nativesmd/lists.htm)
* For explanation of Maryland physiographic regions: [http://www.nps.gov/plants/pubs/nativesmd/info](http://www.nps.gov/plants/pubs/nativesmd/info)

U.S. Fish and Wildlife Service; 410-573-4500; [http://www.chesapeakebay.fws.gov](http://www.chesapeakebay.fws.gov)

Virginia Native Plant Society; [http://www.vnps.org](http://www.vnps.org) Check web site for annual native plant sale.

**Appendix A—Invasive Species**
Invasive species crowd out native species and would be harmful to your garden. *Plant Invaders of Mid-Atlantic Natural Areas* at [http://www.nps.gov/plants/alien/pubs/midatlantic/toc.htm](http://www.nps.gov/plants/alien/pubs/midatlantic/toc.htm) is a list of invasive plants. This publication also includes information about native alternatives to invasive species.

**Appendix B—Rain Gardens**
Creating a rain garden begins by excavating at least a few feet from the area, to create a large swale. A bed of pea gravel to help store water is covered by a sandy loam (soil augmented with sand) to encourage infiltration. A final layer of topsoil completes the preparation. Small swales are created throughout the yard to channel water to the rain-garden. An excellent resource for planning and installing a rain garden is *Rain Gardens Across Maryland* available at [http://www.rainscaping.org/_cclLib/attachments/pages/Rain+Gardens+Across+MD_screen.pdf](http://www.rainscaping.org/_cclLib/attachments/pages/Rain+Gardens+Across+MD_screen.pdf)
For further information you may also contact HGIC at 1-800-342-2507 or at [http://www.hgic.umd.edu](http://www.hgic.umd.edu)

**Appendix C—Soil Testing**
For a list of soil test laboratories and further information on soil testing use the following University of Maryland Home and Garden Information Center bulletin at:
The scope of this document is not broad enough to give details here, but you can discuss your specific soil concerns with your local county MD Extension office, or call the University of Maryland Extension Home and Garden Information center (HGIC) at 1-800-342-2507 or [http://www.hgic.umd.edu](http://www.hgic.umd.edu)

**Appendix D—Plant Hardiness**
“Plant Hardiness Zones” divide the United States into 11 planting zones based on a 10 degree Fahrenheit difference in the average annual minimum temperatures. There are also different climates and frost dates within planting zones in a region due to the topography, lakes and rivers, gullies or hills. The plants included in the suggested plant lists previously given are hardy for most of the state of Maryland (zones 6 and 7).

If you are uncertain about the suitability of a plant for your locale, check with a local nursery or contact HGIC at 1-800-342-2507 or [http://www.hgic.umd.edu..umd.edu](http://www.hgic.umd.edu..umd.edu) A USDA interactive web site will give hardiness zones based on zip code. This tool is posted at [http://planthardiness.ars.usda.gov/PHZMWeb/](http://planthardiness.ars.usda.gov/PHZMWeb/)

**Appendix E—Soil Types**
Knowing what type of soils are present on your property help you to select the correct plants species, as well as properly design your water-quality garden. Collect a handful of soil and moisten it. Make a small ball in your hand and create a ribbon of soil by pushing part of it between your thumb and forefinger. Measure the length of the ribbon that stands up above your thumb and forefinger without falling apart to determine what type of soil you have.
<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Ribbon Length</th>
<th>Type of Garden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand</td>
<td>0“-1/2”</td>
<td>Use existing soil</td>
</tr>
<tr>
<td>Sandy loam</td>
<td>½”=1”</td>
<td>Use existing soil</td>
</tr>
<tr>
<td>Clay loam</td>
<td>1”-1 ½”</td>
<td>Use existing soil</td>
</tr>
<tr>
<td>Clay</td>
<td>1.5”</td>
<td>Use gravel base or underdrain</td>
</tr>
</tbody>
</table>

**Appendix F—Soil Amendment**
Local landfills may have compost and mulch available to their constituents. Check with your county. LeafGro is a product produced by the Maryland Department of Environmental Services. It is a good soil amendment produced from composted leaves and grass clippings. [http://www.menv.com/leafgro.shtml](http://www.menv.com/leafgro.shtml)

**Appendix G—Suggested Groundcovers**
A short list of groundcovers to consider include: Wild Ginger (Asarum), Mayapple (Podophylluyym), evergreen ferns, Leucothoe (a low growing shrub) and Wintergreen (Gaultheria procumbens). For other examples of groundcovers refer to plant lists on Page 24.

**Appendix H—Root Depth Charts**
The two web sites below graphically illustrate root depth of several native plants compared to turf grass. Not all the examples are plants native to Maryland however several are, such as Black Eyed Susan (*Rudbeckia hirta*), Ninebark (*Physocarpus opulifolius*), Little Bluestem (*Schizachyrium scoparium*), Big Bluestem (*Andropogon geradii*) and Switchgrass (*Panicum virgatum*). [http://www.marc.org/environment/water/pdfs/~/know_your_roots.pdf](http://www.marc.org/environment/water/pdfs/~/know_your_roots.pdf) (See page three of document for chart)  [ftp://ftp-fc.sc.egov.usda.gov/IL/techres/npg/NPGpp5-6-11x17.pdf](ftp://ftp-fc.sc.egov.usda.gov/IL/techres/npg/NPGpp5-6-11x17.pdf) (This page takes several seconds to load)

**Publication Credits**

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