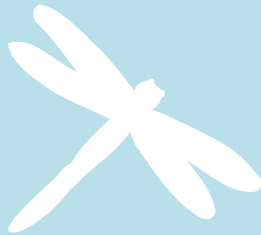


# Ecoscaping Back to the Future . . .

## *Restoring Chesapeake Landscapes*

Native Plant Rain Gardens and Xeriscapes  
Examples From the Chesapeake Ecology Center  
by Zora Lathan and Thistle A. Cone





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Acknowledgements

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## IV. Conservation Landscaping Nuts and Bolts— General Guidelines

*The supreme accomplishment is to blur the line between work and play.*  
—Arnold Toynbee, British Historian

*Gardening is an educational process that lasts a lifetime. Its diploma consists of a green thumb, a happy heart and a permanently enlarged soul. If you're ready for an advanced degree, Mother Nature is anxious to teach. Her class is always in session.* —Author Unknown

### **WHERE TO BEGIN?**

“Plan your work, then work your plan” is a familiar saying and good advice that bears repeating, especially to gardeners. Alexander Pope wrote, “All gardening is landscape painting.” Before you begin your masterpiece, reduce it to paper. When developing your design, consider such matters as site conditions, your own tastes, your impacts on the landscape, and how to improve same. It's been said, “Thoughtful preparation will pay more dividends than a wheelbarrow full of fertilizer.” So remember, plan your work, then work your plants.

### **OBTAINING AND CREATING A SITE MAP**

When starting on your home landscape or community project, it is important to first obtain or create a map of the site as it currently exists so that you will know what you have to work with. This will enable you to plan appropriately and to minimize unnecessary work, expense, and other problems. You can use a copy of a tax map, a topographic map of the area, or survey of the property; or you can create your own site map by taking measurements of the area. Transfer the measurements onto a piece of graph paper to produce a scale base map. The scale of landscape maps and drawings are usually 1/4 inch equals one foot, 1/8 inch equals one foot, or 1/16 inch equals one foot.

Then add to your scale base map permanent features that exist on the site, such as buildings, accessory structures, walkways, lights, water sources, utility right-of-ways (sewer, septic, water, etc.), and existing beneficial plants. Remember to consistently use the same symbols throughout the drawing; for example, use one symbol per type of plant. Feel free to make up symbols or copy ones you have seen on plans (there are no set standards). Add a reference key to indicate what the symbols stand for.

A good way to unleash your creative energy and not worry about your drawing ability or unnecessarily redrawing your scale base map is to create an overlay map, which can be created on tracing paper placed over the

Nature to be commanded, must be obeyed.  
—Francis Bacon,  
philosopher  
(1561-1626)

base map. Scale overlay maps are good for creative experimentation as well as indicating, for example, drainage problem areas or existing microclimates. Areas of shade, surface depressions with moist soil, wind tunnels or slopes can form a microclimate worth noting on your map.

## ***GATHERING INPUT***

With maps of your site in hand, gather input from observation and discussion with family members, school or group members, and others sharing the landscape. Take time to walk through the landscape several times to study it and recognize the possibilities for the site. Give yourself time and enjoy the creative process.

### ***Site considerations:***

- Climate
- Topography
- Soil type (moist, wet, dry, loam, clay, sand, acid, or alkaline).
- Light conditions for planting areas (full sun, or full to partial shade).
- Water sources, including access to water for newly installed plants.
- Existing vegetation and animals, including insects.
- Past land use (e.g., debris may have been landfilled in an area).
- Human-made structures (buildings, decks, patios, sidewalks, fences, utility rights-of-way, etc.).
- Traffic patterns of people in vehicles and on foot, including sports and play areas; traffic patterns of wildlife.

### ***Some of the questions you may consider are:***

What are the practical uses of the site? What about service areas, for example, garbage cans, work space, clotheslines, and storage? Is recreation space for people as well as pets needed? Will portions of the current landscape be retained? What species of wildlife do you want to attract to the landscape? Will there be a vegetable garden? How will maintenance be handled? Are there local ordinances to consider?

Now is also a good time to take a soil sample of the areas to be planted. A soil test kit can be obtained from your local county extension office (check the blue pages of your telephone directory), or from garden supply centers. Knowing the soil characteristics of the designated planting areas is important to select appropriate plants for the site.

Remember, the evaluation process will be ongoing, just as a garden is a growing, living thing and is never complete. As well, nature may decide— independent of your ideas—to edit your landscape. With these considerations in mind, sketch out your desired results. Modify your plans and ideas as needed.

In the naturalistic garden, the site is king. It determines both the form and content of the garden. Topography determines the shape and even the placement of walks and paths, the lines of massed shrubs or trees, the form of beds of herbaceous plants. —Hal Bruce, curator of plants at Winterthur

**Green-and-Gold**  
(*Chrysogonum virginianum*)



## DEVELOPING A GARDEN DESIGN

*I have never had so many good ideas day after day as when I work in the garden.* –John Erskine

Conservation landscape design is the arrangement of plants, water features, stone, accessory features, and the working with or creating of contours in a landscape to enhance it for our use, enjoyment, wildlife needs, and the overall health of the environment. A good design will unify the landscape as a whole.

...if the planting of site-appropriate native woodland species on the perimeters of suburban properties became commonplace, a series of continuous woodland corridors would be created, connecting existing isolated fragments of native forest badly in need of ecological interaction. The positive ecological impact of this would be quite significant, while the aesthetic advantages of suburban landscape in visual harmony with our native American forest would be easily apparent. Additional privacy would be a bonus. –Larry Weaner, landscape architect

A good starting place in developing your design is to take or collect photographs of the natural areas that inspire you. Use these for ideas to change your traditional landscape into one that is more environmentally friendly. Photos can provide helpful design ideas for your project. Also, it is very instructive to take before, intermediate, and after photos of your landscape project.

After gathering input, you are ready to begin designing your garden. There is more than one approach to landscape design; however, imitating nature's designs—arrangements, patterns, colors, and textures found in nature—can provide the best results. The following guidelines will facilitate the design process.

### *Basic principles of design to keep in mind:*

- You may find it helpful to begin with the shape of your design. Consider a variety of curvilinear forms. For example, create a sun-shaped area for a raised xeriscape (drought tolerant) planting bed. Work with or create contours in the landscape, for example, swales for rain gardens. For a naturalistic garden effect, remember that nature tends to design in curves, rather than straight lines.
- Consider emphasizing natural features in your yard, such as existing trees, swales, and depressions, to create a rain garden or a pond, or dry areas to create a xeriscape garden.
- Place plants in appropriate growing conditions. Vegetation will grow and thrive if you plant the right plant in the right place. For example, a plant that requires dry soil and sun won't thrive in a wet, shady location, and vice versa. Know the site conditions and research the plants you wish to use.
- Research your plants to become familiar with their mature size; leaf structure; bloom color, shape, time of year, and duration; wildlife benefits; and look throughout the season, such as whether selected plants are evergreen or not.
- Plant in drifts (massing of like plants). For example, drifts of the same plant strategically located within a meadow (which is a varied mixture of native grasses and wildflowers) can create dramatic effects.
- Consider the needs of wildlife—water, food, shelter, and space—the ingredients necessary in the landscape to support and attract wildlife. A

wide variety of plants in the landscape will attract the most species by providing these necessary elements. The spatial arrangement of food, water and cover is important, both to attract wildlife and to decrease competition among species. When planning your habitat garden, connect planting beds to create wildlife corridors where possible. Corridors provide areas in which wildlife can safely travel to meet their needs.

- Consider layering your plant arrangements. For example, create a gradual transition from grasses and wildflowers to shrubs to under-story trees to canopy trees for a more natural look and greater wildlife benefits. Varied layers provide a range of light, temperature, food, nesting, and hiding areas for wildlife.
- Plan your garden with seasonal changes in mind. For example, in addition to spring-blooming plants, consider four-season gardening by adding summer- and fall-blooming plants, as well as plants that have winter interest.
- Even a small garden can benefit from adding a path. Paths help direct traffic, facilitate maintenance of the garden, and can enhance the design and use of the garden. Consider the traffic flow through the property. You can direct people where you want them to go, or not go, by your path placement; but also take notice of the paths people naturally create. It generally works better to go with the flow. Various types of mulch make a good surface for paths; and don't forget to control weeds by adding an underlying layer of weed-blocker fabric, newspaper, or cardboard.

## CREATE A GARDEN PLAN

Take your site map—keeping the principles of design in mind—and sketch in the location of plants, paths, and other elements for the entire site. This will also help you phase in the project in stages if you can't accomplish it all at once. Use either tracing paper and pencil, or grease pencil and clear plastic. Place the tracing paper or plastic over the base map. Begin by designating the human elements to include from your input-gathering exercise, such as recreation areas or a vegetable garden; then begin defining shapes, placing trees, shrubs, and herbaceous perennials, stone, and special features. Sketch possible natural elements you wish to enhance, such as a swale for a rain garden. As you add plants to your sketch, remember to use consistent symbols and make a reference chart for the symbols.

## SITE PREPARATION

Site preparation varies widely depending on circumstances. It can be quick and simple, especially if you have the help of heavy machinery such as a bobcat, or it can sometimes take more time and effort than planting the garden. Before you dig in any area, it is critically important that you call Miss Utility (1-800-257-7777, from 7 AM to 5 PM unless it is an emergency, in MD, DE, and DC) no less than (and preferably more than) two business days ahead to locate any underground service lines or utilities that may be located where you intend to plant. Miss Utility will make all of the arrangements with utility, cable, and phone companies to mark designated

Paths lead us to the center, converging, reestablishing the familiar. Paths lead us away, far from the familiar, into adventure, into change. A good path is irresistible.

—Mary McCoy

Foxglove Beardtongue  
(*Penstemon digitalis*)



areas with different colored paint (which will last through a few rainfalls) to indicate whatever utilities may happen to be in the planting area. Their automated phone system is easy to use and explains the color coding. If you don't see any markings after making arrangements with Miss Utility, you should double check with them to be sure there are no lines in the designated planting areas. Planting where lines are located is not prohibited, but you are required to dig by hand in these areas. Use caution; you don't want to accidentally dig up your phone line, and there may be restrictions to activities in rights-of-way.

In some cases, you will need to clear the area of turf and debris. Check the soil for obstructions such as asphalt, large rocks, or problematic soil texture (e.g., heavy clay or excessive compaction). Turf grass can be removed by hand, with a sod cutter or bobcat, or it will need to be covered for a few months until it is fully dead. If your planting date is a few months away, a convenient way to eliminate turf is to smother it by covering it with either cardboard or layers of newspaper. Add a 3- to 4-inch layer of wood chips or shredded pine mulch on top of either paper product to help hold it in place and create a planting bed (be sure to completely cover all of the grass). In approximately four or more months the vegetation will have died and the cardboard or newspaper will be decomposed enough to easily plant through it.

Babylon died because  
its soil died.  
—*The Nashville  
Tennessean*

## **SOIL**

Soil is made up of sand, silt, clay (which are large, medium, and very small rock particles, respectively), and organic matter, in varying proportions. If there is too much clay or silt, the soil tends to become compacted, making it difficult for air, water and roots to penetrate; while too much sand compromises the soil's ability to retain water and nutrients. Good, workable garden soil consists of airy crumbs in which particles of sand, silt, and clay are held together by decayed organic matter. The organic matter is the decomposed remains of once living things that now provide nutrients for growing plants, as well as improve the structure and texture of the soil.

Soils vary in "pH" rating (the acidity or alkalinity of soil), fertility, and drainage. A pH of 7.0 is neutral. Below 7.0 is acid, and above 7.0 is alkaline. Generally, it is best to install a garden suitable to the conditions you already have. However, plant selection may be limited if your site has very sandy soil, heavy clay, compacted soil, or extreme soil pH (below 5.5 or above 6.8). In these cases, you may want to seek expert advice. Determine the kind of soil you are working with by testing the soil where you plan to install your garden. Do a physical examination of the soil texture and density. Dig down about 6 inches to where the roots will be growing, and pick up a chunk of soil and squeeze it in your hand. If it sticks together and can be squeezed into a long ribbon, it may be heavy with clay which may need to be amended with compost. Classic garden soil has a relatively even mix-

ture of sand, silt, and clay, with a bit less of the clay than the other two. Fortunately, many native plants are able to survive in a range of soil textures. Figure out what type of soil you have, and try to match it with the plants that will do well there.

Soil is often damaged through compaction and excessive use of fertilizers. A well drained soil—generally defined as soil that can absorb 1/2 inch of water or more per hour—creates a good environment for native plants to develop deep roots and take advantage of deep water and nutrients. In the long run this makes for healthy, steady growth. You can test your soil’s infiltration rate by digging a hole 1 foot wide and 1 foot deep; next, pour a bucket of water into it and see how long it takes to soak in. If 1/2 inch or more of water absorbs within an hour, drainage should be adequate. If it takes much longer than that, you may need to amend the soil to improve infiltration.

If needed, the addition of the proper soil amendment can either help soil drain faster or slower. Well composted organic material is an ideal amendment that can improve soil containing too much sand or clay. Compost improves soil texture and fertility by supplying organic matter. It provides a source of slow release nutrients for plants which encourages healthy, balanced growth, thereby reducing disease and pests as well as pruning maintenance. Composting also makes great use of excess yard waste. (See the section on Composting below and Chapter X, “Resources,” for more sources of information on composting.)

Tilling is often unnecessary and can stir up dormant weed seeds. However, if amending the soil is necessary to effectively enhance soil properties, thoroughly blend either compost, topsoil, sand, or combinations of two or three amendments into the planting bed to improve drainage and promote even growth. In the case of rain gardens, if your soil is sandy, simply mix in compost to prepare for planting. If your soil is clay, you may need to remove and replace it with a recommended mixture of 50-60% sand, 20-30% topsoil, and 20-30% compost. (Hint: Don’t worry about exact ratios. Proportions may vary based on the heaviness of the clay).

Amend the soil only if necessary. If you are landscaping with native plants, this step may not be necessary. Remember, native plants are adapted to local soil conditions (provided the local soil has not been significantly degraded or changed). Many native plants prefer not to have soil that is too rich.

Once planted, the garden should be dressed with a layer of composted mulch such as shredded or chipped pine to a 2- to 3-inch depth.

At the CEC, we have installed several large native plant gardens throughout the ten acres, and amended the soil in only one garden—the SRA Rock ‘N Rain Garden.

We have conducted several soil tests on the grounds of the Chesapeake Ecology Center, and have averaged a pH of 5 or 6. A great deal of top soil was apparently added to the grounds in the 1950s. A foot deep (or more) layer lies over the land-filled remains of a small African-American housing community that once existed on the 10-acre site. While the top layer of soil is loamy, loose and well-drained, it appears that in some areas there exists a hard clay layer, and rubble (some of which is of historical significance) below the topsoil layer.



## CHOOSING AND PURCHASING PLANTS

To develop a feasible garden design it is important to select the appropriate plants for the conditions of your site. Take time to research which plants are native to your area and will be appropriate for your site conditions. You may want to check online to find nurseries that sell native plants (see Chapter X, "Resources," for native plant suppliers near you), and then take your plan to a nursery to seek their advice. It helps to have some flexibility in your plan since certain species may not be readily available.

Select plants with consideration to: their mature size and shape; leaf appearance; whether they are evergreen or deciduous; bloom structure, color, time of year, and length; seasonal interest; wildlife value; and features such as erosion control and other restoration landscaping values (some of which are covered in the following two chapters). When installing landscapes, common mistakes include planting young trees and shrubs, which will eventually become large, too close to the house or other structures, and planting trees, shrubs, and herbaceous perennials too close together. Consider the mature height of selected plants and how their size will affect your view. Some prairie perennials can grow ten feet tall, which may or may not be a feature you want to include.

The jargon of any profession can be provoking to anyone who feels excluded by it. A botanical description is so packed with trade terms of Greek and Latin derivation that most gardeners feel repulsed. Yet the jargon is an essential shorthand to prevent it [from] becoming impossibly long-winded.

–Hugh Johnson,  
*Hugh Johnson's  
Gardening Companion*

### *A word about those pesky Latin plant names*

Gardeners not trained in biology are often thrown off by the "scientific" Latin names for plants. They are, however, very useful for figuring out exactly what plant you are talking about. Think of them as a "first name" and a "last name," which correspond to the genus and species. Using them allows you to discuss a particular plant with a nursery, another gardener, or someone from another part of the world, with certainty that you are talking about the same plant.

However, names change: "Taxonomists seem to love to mess with plant names. Now that plants can be identified right down to their chromosomes, many have turned out to be something other than they [were] thought to be. Just when you get proud of yourself for remembering the name of sweet autumn clematis, *Clematis paniculata*; it gets changed to *C. maximowicziana*, and there is word that this plant may get another name change." –Ken Druse, *The Collector's Garden*

Often the species name is descriptive of the plant in some way, and sometimes the Latin or Greek root gives you a clue in remembering the name. The species name may describe the plant's color, shape, growth habit, or even a place name like *americana* or *canadensis*. For example, *Acer rubrum*, is red maple. The maples belong to the genus *Acer*; and this species is *rubrum*, Latin for red. Sugar maple is *Acer saccharum*, with *saccharum* from the Greek word for sugar.

## *Here is some advice on four areas of plant buying:*

### **1) HOW MANY PLANTS TO BUY:**

Most perennials are planted 1- to 3-feet on center. Determine the number of plants needed by first measuring the areas where each type of plant will be installed. Use the following formula for guidelines on how many plants to buy. Consider adding 10% to account for some attrition, or start by spacing plants slightly closer together for appearance. You can thin most perennials later, however, large shrubs and trees are not as easy to move.

**Use this simple formula to calculate the number of plants needed for your design:**

A = Area to be planted (total square feet)

D = Distance plants are spaced apart in feet

N = Number of plants needed

**Distance plants are to be spaced apart guidelines:**

- For perennials, use D = 2 feet (use 1.5 feet for slow spreaders, 3 feet for faster spreaders)
- For shrubs, use D = 5- to 7-feet (based on mature size)
- For a mixture of trees and shrubs, use D = 10 feet for a naturalistic planting
- For ornamental trees, use D = crown spread

**Formula:**  $A \div D^2 = N$

For example: If you decide to plant an entire 100 square foot area with perennials that are spaced 2 feet apart, then you will need 25 plants, or  $100 \text{ feet} \div 4 \text{ (2 feet squared)} = 25$ .

### **2) WHAT COMMON CATALOG SYMBOLS MEAN:**

Not all nurseries use the same symbols for plant needs. Be sure to check the catalog. Many use symbols like those below quoted from *Native Plants for Wildlife Habitat and Conservation Landscaping: Chesapeake Bay Watershed*, by Britt E. Slattery, Kathryn Reshetiloff, and Susan M. Zwicker, published by the US Fish and Wildlife Service, Chesapeake Bay Field Office.

**LIGHT:** The amount of sunlight a plant requires is defined as: 1) Full sun (Su), the site is in direct sunlight for at least six hours a day during the growing season; 2) Partial shade (PS), the site receives approximately three to six hours of direct sunlight; and 3) Shade (Sh), the site receives less than three hours of direct sunlight or filtered light.

**MOISTURE:** The amount of soil moisture a plant requires is defined as: (1) Wet (W), areas where the soil is saturated for much of the growing season, except in droughts. Many of the plants designated for wet areas tolerate specific ranges of water depths. Consult a wetland plant specialist or

How fair is a garden  
amid the toils and  
passions of existence.  
–Sir Benjamin Disraeli,  
British Prime Minister,  
novelist

American Holly  
(*Ilex opaca*)



reference book; (2) Moist (M), areas where the soil is damp, and may be occasionally saturated (“average soil” has been included in this category); and (3) Dry (D), areas where water does not remain after a rain. The latter areas may be in full sun or in a windy location, on a steep slope, or have sandy soil. Plants in this category are drought tolerant and appropriate for a xeriscape garden (see Chapter VI).

### 3) *WHAT SIZE PLANTS TO BUY:*

The following information is contributed by Dr. Sara Tangren, Chesapeake Natives:

Short of Aphrodite, there is nothing lovelier on this planet than a flower, nor more essential than a plant. The true matrix of human life is the greensward covering mother earth. Without green plants we would neither breathe nor eat. On the undersurface of every leaf a million movable lips are engaged in devouring carbon dioxide and expelling oxygen. All together, 25 million square miles of leaf surface are daily engaged in this miracle of photosynthesis, producing oxygen and food for man and beast.

—Peter Tompkins and Christopher Bird, *The Secret Life Of Plants*

“Herbaceous plants are sold in gallon pots (the most expensive), quart pots, as bare root pieces, as seedling plugs, or as seeds (the least expensive). Gallon pots don’t really contain a gallon of soil. They are about 7.5 inches in diameter. Similarly, quart pots contain a bit less than a quart of soil and are about 4 inches wide and are square. Potted plants are ideal for projects where instant visual impact is required. Bare root plants are simply divisions of dormant mature plants. They are called “bare” because they have been removed from the soil. Bare root plants are available from many wholesale nurseries. Depending on which nursery you buy them from, they may come packed in plastic bags, packed in peat moss (a non-renewable resource made by mining living peat bogs), or packed in flats and covered with soil.

“Although bare root plants are affordable, plants packed in plastic bags must be kept out of the sun at all times, and preferably refrigerated until planting. If they are kept too long they will mold and die. “Flats” are 11 inch by 20 inch black plastic rectangles shaped much like a large sheet cake pan. Bare root plants packed in soil inside of flats can be treated much like potted plants, and if kept in the shade and kept moist they will last for weeks or even a few months. Bare root plants should only be used for projects being planted during the dormant season, roughly Thanksgiving to tax day.

“Seedling plugs usually come in sets planted into a molded black plastic tray that looks something like an 11 inch x 20 inch ice cube tray. The number in a tray will depend on the type of tray but typically vary from as few as 48 to as many as 288. Seedling plugs can also be treated like potted plants, but because the “pots” are so tiny (from less than 1/4 inch diameter to 2 inch diameter) they dry out quickly. Most species of seedling will die if allowed to dry out. Seedling plugs may need to be watered daily. Seedling plugs are an especially good buy for species that grow quickly and flower in the first year. They are ideal for colonizing large areas where potted plants would make a project too expensive, or for stabilizing soils where seed would take too long. Ideally seedlings are not planted in the heat of summer unless irrigation is available.

“Seed is the most economical way to plant large areas like wildflower meadows and stormwater management pond banks. Native seed does best if planted in the fall. It is imperative that the ground be well prepared and free of weed seed, or the native seedlings will be difficult to find and care for. Typically, preparation for sowing involves a year of spraying with Round Up or Plateau prior to the planting date. Native seed is sold in packets, ounces, and pounds.”

To plant a garden is to believe in tomorrow.  
—Anonymous

While planting from seed is the most economical way to establish a garden, a low-cost way to obtain plant stock is to buy seedling plugs, which can be purchased from various sources for \$1 each. Bare root herbaceous perennials can be obtained from a number of sources for about \$2.50 each. Quart size potted plants are also economical, costing about \$5 each. (Prices vary; these are average prices as of 2005.) You will pay significantly more for large, mature potted plants, although you will have greater instant impact. (See Chapter X for a list of nurseries.)

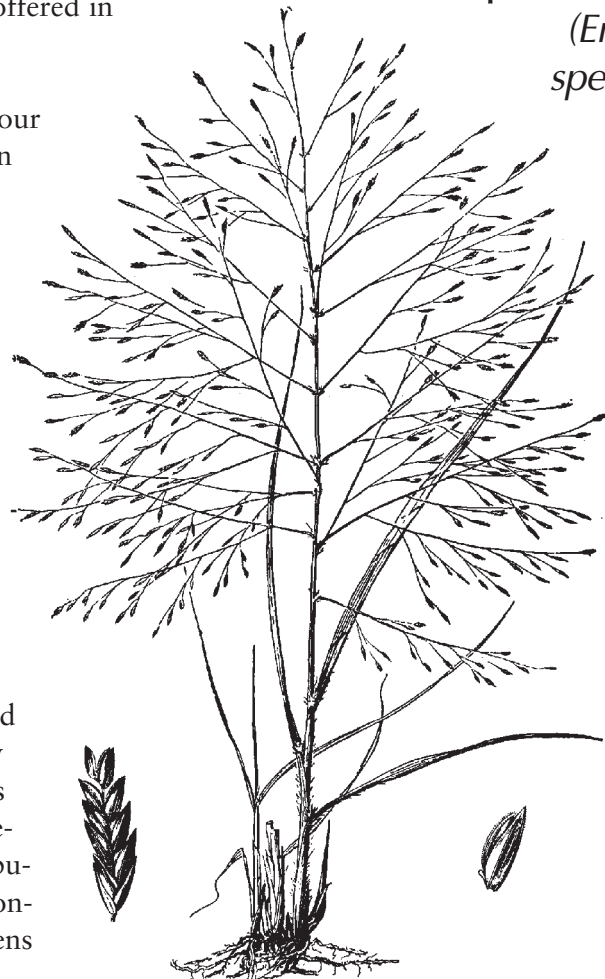
#### 4) GENERAL CONSIDERATIONS ON PLANT BUYING:

Although some nurseries are beginning to carry a wider variety of native plants, many species are not available from traditional plant nurseries. However, as the demand grows, so does the number of native plant nurseries, as well as native plants species offered in traditional nurseries.

Timing can be a factor in obtaining plants for your garden. It is not possible for suppliers to keep an extensive inventory of native plants and seeds on hand. It is not economically practical for them to grow plants for which they do not have a ready market (however, demand and availability is steadily growing). Be sure to plan ahead, and pre-order plants, especially if you have a large project or require certain species. Remember, if you are good at planning, and your schedule allows, you can grow plants from seed.

Although nurseries may offer “native” plants, many times they are actually cultivars of native plants. Cultivars are varieties which arise in cultivation, not in nature, and they are cultivated to reproduce a particular set of traits. They may not bloom, set seed, or grow in the same way as the true native plants; so they may not be as useful to wildlife. Furthermore, if they are very popular, they may displace the naturally-occurring non-cultivated species by being over-planted in gardens and might spread to the wild. This reduces the

Purple Lovegrass  
(*Eragrostis spectabilis*)



genetic diversity in a region. Less genetic diversity also makes a population more at risk for being wiped out by diseases. Ask for true native “species” plants, not cultivars, at your local nurseries. If they notice a demand, they will be more likely to stock them.

If possible, purchase plants propagated from native plants which originated near where you plan to plant them to preserve local genes from those plants and improve your chances of success with a genetic type adapted to your local climate and soils.

Tip: Adding small flags next to seedlings or small bare root plants can help with four things: indicate that a garden is in progress to reduce damaging foot traffic in the garden bed; help to identify weeds from seedlings when weeds begin to appear in the garden; help to quickly identify seedlings for the purpose of watering them; and you can also write on the flags with a waterproof marker to identify plants. Two and a half inch by three inch plastic flags, attached to a thin metal stakes are made in a variety of colors and can be purchased at hardware and farm supply stores.

Additionally, when planting your garden, a color can be assigned to each type of plant. Then color coded flags can be placed in the planting bed to indicate where plants are to be placed.

## ***PLANTING HERBACEOUS PERENNIALS***

*No occupation is so delightful to me as the culture of the earth, no culture comparable to that of the garden...But though an old man, I am but a young gardener. –Thomas Jefferson*

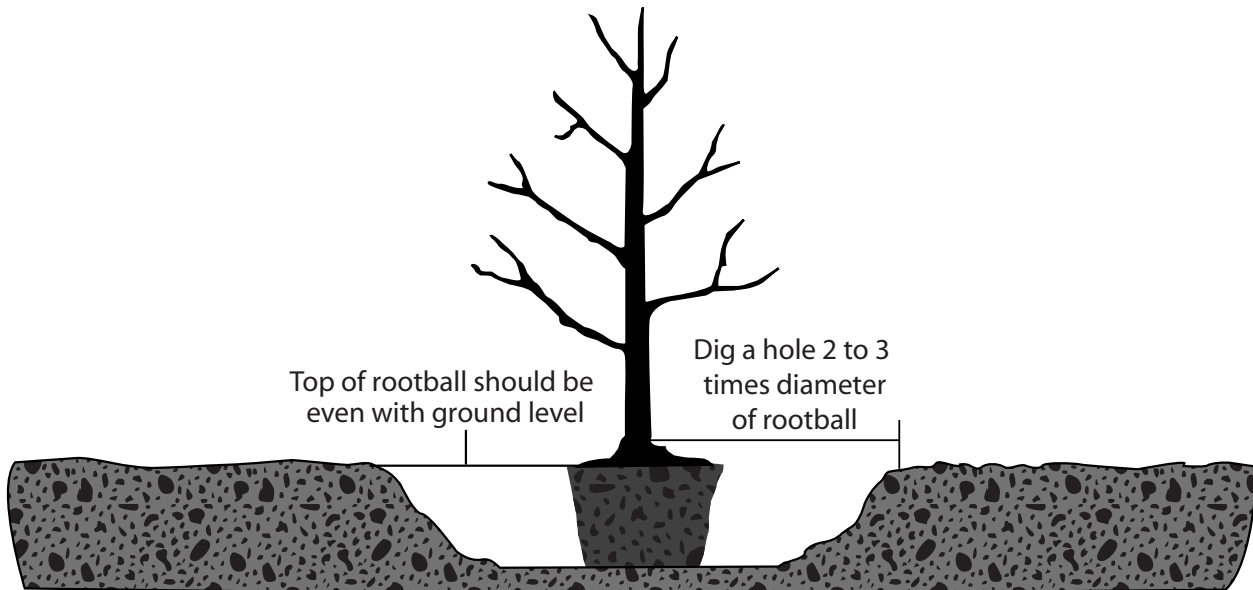
Enjoy the process, and work in phases if this makes your project more manageable. Develop a planting plan that works best for you.

It is also good to remember that the best planting times are usually fall and spring. If you plant in early spring or late fall, some potted plants may be dormant. Do not mistakenly throw these dormant plants away. They are still alive in their pots, and will green up in the spring. You can plant any-time spring through fall. However, if you plant in the summer, you will need to do more watering.

When removing a plant from a pot, don’t pull it out by its stem or you may damage it. Loosen the root ball, then slide the plant out of the pot. If you find the pot “root bound” or tightly wrapped inside with many roots, it is actually helpful to cut through the base of matted roots with a trowel to separate them before planting. Loosen the root ball with your hand or a trowel, and place the plant in the soil at the same level it was growing in the pot. Firmly press or tamp the ground around the plant with your hands or feet to remove air pockets. Once the plants are installed, add a top dressing of mulch. (See Mulch section below), and give them a good watering to get them growing in their new home.

Plant seedlings 1- to 2-feet on center. Small seedlings, will not look like much for several months, but if you plant in the spring, you will start to see more definition by the fall (and vice versa), and a year later, they will be noticeably more mature. In fact, one foot on center might be too close, but some may not survive, and you can always transplant plants from crowded areas as they mature.

A technique for achieving curvaceous edges is to use a garden hose or heavy rope to help lay out your garden areas. Marking paint and stone can also be used. Before you plant your garden, you may want to use Roundup two or three times to kill weeds, with a couple of weeks in between each application to allow for growth of new weeds.



## ***PLANTING CONTAINER AND “BALLED AND BURLAPPED” (B&B) TREES***

*(Reprinted with permission from the Department of Natural Resources’ Tree-mendous Maryland Program)*

- If a tree is planted correctly, it will grow twice as fast and live at least twice as long as one that is incorrectly planted. Tree roots need moisture, air, nutrients, and a lot of space to grow. The roots of most trees spread through the top 12 inches of soil, (where the moisture, air, and nutrients are) but over a wide area around the trunk.
- Select a site with enough room for roots and branches to reach full size. Avoid overhead and underground utilities.
- Dig a hole as deep as the rootball and 2 to 3 times its diameter. The rootball should be even with the ground level and no deeper.
- Always handle your tree by the ball, not by the trunk or branches.
- Help prevent root girdling by vertically cutting any roots that show tendencies to circle the root ball.
- Backfill the hole, tamping the soil firmly as you go, to remove air pockets. Be sure tree is planted straight.
- Stake the tree only if it is unable to stand up to high wind, or in danger of vandalism or heavy traffic.
- Spread a 2- to 3-inch layer of mulch on entire area, but not within 3 inches of tree trunk.
- Water - Water - Water.

The best time to plant a tree was twenty years ago. The second best time is now.

–Anonymous

## ***ADDING MULCH***

Why mulch? Adding organic matter, such as shredded leaf mulch, improves soil structure; it also conserves moisture, blocks light that many weed seeds need to germinate, lessens erosion, and is an attractive top-dressing for your planting bed. As a rule-of-thumb, apply mulch to a depth

of 2- to 3-inches in planting beds. The depth of mulch to apply will depend upon the type of material used. Be sure to not to bury seedlings or dormant plants, and keep it a few inches from the trunks of trees and shrubs. Commonly used organic mulches include: chipped or shredded wood mulch, such as pine or cypress; pine needles; and shredded leaves. Inorganic mulches include: gravel and other types of stone, and a new product on the market called Treadspread which is made from recycled tires. (Treadspread may be useful in certain instances, like paths; but there is some concern about the leaching of zinc in acid conditions, which can harm plants.) Note: Do not use regular sheet plastic underneath mulch to reduce weed growth. It prevents water from soaking into the soil and prevents the soil from breathing. Use paper, cardboard, or a permeable plastic such as weed-blocker.

### American Cranberry (*Vaccinium macrocarpon*)



Often, wood chips and finer shredded mulch can be obtained at no cost from municipal and county facilities. But there are two issues to consider before using chipped or shredded wood. First, avoid the use of freshly chipped wood, unless it is for a pathway where you don't want plants to grow. Fresh wood chips will remove the nitrogen plants need from the soil as they decompose. Wood chips should be composted for six or more months before being used in planting beds. Second, hardwood is rich in the mineral manganese. Some experts believe that years of mulching with hardwood mulch will cause toxic accumulation of manganese in the soil, which can sicken and ultimately kill your plants, and that pine mulch or shredded leaves, for example, should be used instead.

Avoid using dyed mulch, which has been shown to have several problems. In natural settings, dyed mulch is out of character and there are other problems as well. Unlike composted chipped or shredded mulches, dyed mulch tends to be made from ground up waste wood, like pallets and shipping crates. It has the same problems for plants as using newly chipped wood. As it decomposes, it will draw nitrogen from the soil. Furthermore, some dyed mulch is made from construction debris, containing chemicals such as asbestos or lead paint.<sup>17</sup>

Remember to keep mulch 3 or more inches away from the base of shrubs and trees and avoid the use of too much mulch. A 2- to 3-inch depth is enough. Excessive mulching too close to the trunks of trees creates unhealthy conditions where soil microbes, insects, and even larger creatures like mice or voles can access the tree bark and damage it. It can also cause girdling roots to form around the base of the tree that could strangle it.

#### ***To determine the amount of mulch needed:***

- 1 cubic yard = 27 cubic feet (9 bags of 3-cubic feet each or 13.5 bags of 2-cubic feet each).
- A cubic yard of mulch will cover approximately 100 square feet 3 inches deep. A 10 x 20 (200 square feet) garden will require 2 cubic yards of mulch.

Anaerobic (without oxygen) composting can work too, if you don't turn or aerate your compost; but it works more slowly and can also generate odors.

There are varieties of bins from which to choose. Some bins can be ordered or purchased from local garden supply retailers, or homeowners can construct their own from cedar, other wood, or recycled wooden pallets. There are also special in-ground bins which are animal resistant and are good for food waste. Another option is a simple compost pile. Even if you don't mix organic material in certain ratios, and don't turn or add water to the pile, it will eventually break down into a rich soil amendment.

## GARDEN MAINTENANCE

*Sweet flowers are slow and weeds make haste.* –William Shakespeare

*Weeds stand at the forefront of evolution; no doubt they are evolving in my garden at this very moment, their billions of offspring self-selecting for new tactics to outwit my efforts and capitalize on any opening in my garden. Weeds are nature's ambulance chasers, carpetbaggers, and confidence men. Virtually every crop in general cultivation has its weed impostor, a kind of botanical Doppelganger that has evolved to mimic the appearance as well as the growth rate of the cultivated crop and so ensure its survival.* –Michael Pollan

If you (like so many of us) are concerned about staying in shape, consider doing a little bending and stooping. After all, you can burn a lot of calories and stretch practically every muscle in your body by getting down and dirty in the garden and eliminating weeds by hand.

*For though we may be the earth's gardeners, we are also its weeds. And we won't get anywhere until we come to terms with this crucial ambiguity about our role—that we are at once the problem and the only possible solution to the problem.* –Michael Pollan

The definition of “weed” is usually just “a plant out of place.” If you have to contend with a population of weeds or invasive plants, there are several options. The best weeding method for the health of the environment is to remove or pull weeds by hand. Many weeds will bounce back if you don't remove the entire root, so bring along a trowel. Weeding is easier in moist soil after it rains. Other natural techniques are spraying full strength vinegar on young leaves (works well on a hot day), and pouring boiling water over weeds. Mulch and weed-blocker can help reduce this task on pathways and between plants.

If hand removal of weeds is not possible, one may resort to the least-damaging herbicide possible. In some cases it is necessary to use an herbicide containing the active ingredient glyphosate, such as the brand Roundup. This still has minor effects in the soil, but it has been shown to break down fairly quickly in warm weather. It will kill many types of organisms in an aquatic ecosystem and should not be used near surface or groundwater. (An alternative to Roundup for areas near water is the brand called Rodeo. Check with an expert before applying herbicides near water.) Read the directions and carefully mix glyphosate just before use. It should be applied on a dry, calm day to avoid spreading to plants you want to



## VIII. Alien Invaders and Commonly Used Native Shrubs and Trees



### *Alien Invaders: America's Most Un-wanted*

Here is a sampling of a “most un-wanted” list of various plants you might encounter in creating conservation landscapes. There are many references and authorities on agricultural weeds, but fewer on the types of plants to avoid if you are gardening and landscaping. Here is a selection of those to particularly avoid or eradicate if possible. Your state agricultural extension service can advise you further on the latest invasive species to look out for.

#### *Weeds to take special care to eradicate if possible (very invasive)*

Tree of Heaven (*Ailanthus altissima*)  
Mile-A-Minute Weed (*Polygonum perfoliatum*)  
Multiflora Rose (*Rosa multiflora*)  
Kudzu (*Pueraria montana v. lobata*)  
Garlic Mustard (*Alliaria petiolata*)  
Common Reed (*Phragmites australis*)

#### *Plants not to plant because they are “alien invaders”*

English Ivy (*Hedera helix*)  
Periwinkle (*Vinca major and minor*)  
Bamboos (*Bambusa, Phyllostachys and Pseudosassa species*)  
Common Daylily (*Hemerocallis fulva*)  
Autumn Olive (*Elaeagnus umbellata*)  
Privets (*Lingustrum obtusifolium, L. sinense, L. Vulgare, L. japonicum*)  
Winged Burning Bush (*Euonymus alata*)  
Butterfly Bush (*Buddleja-several species*)  
Purple Loosestrife (*Lythrum salicaria*)

#### *Trees not to plant since they are “alien invaders”*

Bradford Pear (*Pyrus calleryana “Bradford”*)  
Norway Maple (*Acer platanoides*)  
Princess Tree (*Paulownia tomentosa*)

### *Commonly Used Native Shrubs and Trees*<sup>21</sup>

There are many excellent sources for detailed information on native plants, many of which are listed in Chapter X “Resources.” Several commonly used herbaceous native plant species are listed in Chapters V and VI. Although the plants listed in these chapters are for rain gardens and xeriscapes, respectively, most will also work well in average conditions. As well, there are many versatile plants that can tolerate dry to moist and sun to shade conditions. The herbaceous plants listed in the preceding chapters

are only a sampling of possible species from which you can choose, as is the following list of shrubs and trees.

When planning your garden or landscape, try to include shrubs and trees in the design. They are the backbone of many landscape designs, and they provide many attributes such as erosion control, air and water purification, water absorption, and wildlife habitat. They are also pleasing to the eye and form the basis of multi-tiered plantings. We have included detailed information on the characteristics and wildlife benefits of several commonly used native shrubs, small trees, and large trees. They are arranged alphabetically by Latin name, within each of the size categories. Several entries in these lists are from the website of the Maryland Department of Natural Resources Tree-mendous Maryland program.

## Shrubs

### Sweetpepperbush (*Clethra alnifolia*)



### Shadbush or Serviceberry (*Amelanchier canadensis*)

Height: 6'-20', Spread: 10'. Erect stems, often clumped. Blends well on the edge of woodland or shrub border with evergreen background. Important berry producer during the early summer months. Fruit eaten by bluebirds, cardinals, and tanagers. Foliage is used by browsers.

### Buttonbush (*Cephalanthus occidentalis*)

Height: 6' to 12', Spread: same. Adaptable to many soil types except dry. Full sun to shade. Needs sun to flower. Tolerates flooding to 36 inches. Tolerates drought. Found in marshes, swamps, and forested wetlands; stream, lake, and pond edges.<sup>22</sup> Seeds eaten by small birds and ducks.<sup>23</sup>

### Sweet Pepperbush or Summersweet (*Clethra alnifolia*)

Height: 3'-8', Spread: 4'-6'. Oval, round topped, erect, dense leafy shrub. Transplant into moist, organic soils. Full sun or shade. Excellent for summer flower, shrub border. Good plant for wet areas and heavy shade. Limited wildlife value.

### Sweetfern (*Comptonia peregrina*)

Height: 3'. Erect plant with fern-like leaves. Found on hillsides, cliffs, woods openings, sand flats and barrens, fields, dunes. Fragrant, fixes nitrogen, and leaves may persist into winter. Thrives in most dry soils. Sun to partial shade. Has value to songbirds and small mammals.<sup>24</sup>

### Silky Dogwood (*Cornus amomum*)

Height: 6'-10', Spread: 8'. Rounded multi-stemmed shrub. Wet or dry soil. Prefers sun but tolerates partial shade. Reddish purple young growth, and brownish-purple older growth. Fast-growing shrub, flat-topped heads of white flowers, blue fruit ripening to black. Purple to red fall foliage. Plants can spread by layering or cuttings. Will grow on sloped banks and provide effective erosion control in 3 to 5 years. Provides food and cover for a variety of birds and mammals. Nesting sites for gray catbirds and American goldfinches.<sup>25</sup>

**Inkberry (*Ilex glabra*)**

Height: 6'-8', Spread: 8'-10'. Upright multibranched, rounded shrub. Prefers moist, acid soils. Excellent for foundations, hedges, mass plantings and as accent plant. Berries used by a wide variety of wildlife.

**Inkberry  
(*Ilex glabra*)**

**Winterberry (*Ilex verticillata*)**

Height: 6'-10', Spread: same. Oval, rounded, deciduous shrub holly. Tends to form multistemmed clumps. Does well in light and heavy soils. Prefers moist, organic soils. Excellent for mass plantings and shrub borders. Red fruit is beautiful in winter. A male plant is necessary for fertilization. Used extensively by many songbirds, particularly thrushes, mockingbirds, robins, bluebirds, and thrashers.



**Virginia Sweetspire (*Itea virginica*)**

Height: 3'-5', Spread: 6'-8'. Erect shrub with clustered branches. Prefers moist, fertile soils. Full sun or shade. Suited for wet areas. Excellent fall color. Fruit capsules are used by some songbirds.

**Spicebush (*Lindera benzoin*)**

Height: 6'-12', Spread: same. Rounded shrub with pleasant fragrance. Prefers moist soil and found in river bottomlands, northern slopes, and woodland stream banks. Full sun or part shade. Interesting yellow flower in early spring. Brilliant yellow fall foliage and scarlet berries in winter. Dioecious and spreads by suckers. Berries are food for many birds.

**Bayberry (*Morella pensylvanica*) or (*Myrica pensylvanica*)**

Height: 5'-10', Spread: same. Fragrant leaves. Suckers to form small colonies. Full sun to part shade. Fresh and brackish marshes, swamps, sand flats, and dunes. Tolerates salinity to 20 ppt. Females produce waxy berries which persist into winter. High wildlife value.<sup>26</sup>

**Wax Myrtle (*Morella cerifera*)**

Height: 5'-12', Spread: same. Evergreen, upright, rounded, dense shrub. Adaptable to many soil conditions, including poor and wet soils. Full sun to 1/2 shade. Excellent for mass borders. Combines well with broadleaf evergreens. Berry wax is used for candles. Fruit is eaten by a variety of birds in small quantities including tree swallows and myrtle warblers.

**Red Chokeberry (*Photinia pyrifolia*) or (*Aronia arbutifolia*)**

Height: 6'-10', Spread: 3'-5'. Upright, multistemmed shrub, somewhat open and rounded. Adaptable to many soil types. Full sun to half shade. Used in border and mass plantings. Fruit eaten by grouse, chickadees and other songbirds.

**Black Chokeberry (*Photinia melanocarpa*) or (*Aronia melanocarpa*)**

Height: 3'-5', Spread: same.<sup>27</sup> Tolerates some shade. Prefers moist sites but will grow on drier sites as well. Fruit readily eaten by birds and other wildlife.<sup>28</sup>

**Northern Spicebush  
(*Lindera benzoin*)**



**Swamp Azalea (*Rhododendron viscosum*)**

Height: 6.5'-10'. Attractive, spreading, loose-branched habit. Prefers wet conditions. Sun or partial shade and is found in wet woods and stream-banks. Soil pH of 4-6. Susceptible to disease and insects. Some wildlife value to waterfowl and small mammals.<sup>30</sup>

**Pasture Rose (*Rosa carolina*)**

Height: 0.5'-3', Spread: same. Small, bush-like shrub with thorns and pale pink flowers. Dry fields, open woods, rocky banks, shale barrens. Full sun or part shade. Edible fruit is a berry-like rose hip. High wildlife value.<sup>31</sup>

**Lowbush Blueberry (*Vaccinium angustifolium*)**

Height: 1'-2', Spread: same. Small, bush-like shrub with edible berries. Makes a nice ground layer. Likes dry soil in dry woods, barrens, rock out-croppings. Prefers soil pH of 4-6. Full sun to partial shade. High wildlife value.<sup>32</sup>

**Highbush Blueberry (*Vaccinium corymbosum*)**

Height: 6'-12', Spread: 8'-12'. Upright, multistemmed shrub with spreading branches. Requires moist, well-drained soils. Prefers soil pH 4-6.5.<sup>33</sup> Full sun or light shade. Blends well into shrub borders. Used heavily by grouse, scarlet tanager, bluebirds, thrushes and other songbirds.

**American Cranberry (*Vaccinium macrocarpon*)**

Height: 0.5 to 1', Spread: forms mats. Low-growing mat which can spread indefinitely. Edible cranberries. Found in sphagnum bogs and cool, swampy areas. Likes soil pH of 4-6. Sun to partial shade. Wildlife eat berries.

**Arrowwood Viburnum (*Viburnum dentatum*)**

Height: 6'-8', Spread: 6'-15'. Multistemmed, dense, rounded shrub. Adaptable to most soil conditions, but prefers well drained. Suckers freely. Good in hedges and mass plantings. Used by grouse, brown thrasher, cedar waxwing, squirrels and deer.

**Nannyberry (*Viburnum lentago*)**

Height: 15'-18', Spread: 6'-10'. Shrub or small tree with open habit. Adapts to a wide range of soil conditions. Sun or partial shade. Use as naturalized plant in shrub borders, as background or screen plant. See Arrowwood Viburnum for wildlife value.

**Blackhaw Viburnum (*Viburnum prunifolium*)**

Height: 12'-15, Spread: 8'-12'. Round-headed tree or multistemmed shrub. Adaptable to many soil types. Sun or shade. Interesting as small specimen tree, or massing, shrub border or groupings. See Arrowwood Viburnum for wildlife value.

## ***Small Trees***

**Pawpaw (*Asimina triloba*)**

Height: 20'-35', Spread: same. Pyramidal shaped small tree, which can

**Early Lowbush  
Blueberry  
(*Vaccinium pallidum*)**



sucker into a patch of trees. Prefers moist soils in river valleys, bottomlands, understory of woods in the coastal plain. Full sun preferred. Songbirds and small mammals eat the yellow fruit which appears in August to September.<sup>34</sup>

**Eastern Redbud (*Cercis canadensis*)**

Height: 20'-30', Spread: 25'-30'. Small tree with rounded crown, pink to purplish flowers in April. Likes moist, well drained soils. Full sun to light shade. Good as specimen tree or in shrub border. Limited wildlife value.

**White Fringetree (*Chionanthus virginicus*)**

Height: 12'-20', Spread: same. Open habit, often wider than high. Prefers moist, fertile soils and full sun. Excellent specimen tree or in groups, borders or near large buildings. Limited wildlife value.

**Flowering Dogwood (*Cornus florida*)**

Height: 20', Spread: 15'-20'. Small tree with flat topped crown. Place in well drained soil. Full sun to partial shade. Has character in all four seasons. Excellent as specimen tree or used on the corner of a house or in a woodland group setting. Fruit is an important food source for songbirds including evening grosbeaks, cardinals, robins and cedar waxwings.

**Common Witchhazel (*Hamamelis virginiana*)**

Height: 20-30', Spread: 20'-25'. Small tree or multistemmed shrub with yellow flowers in winter. Prefers moist soils in full sun or partial shade. Excellent for foundations, hedges, mass plantings and as an accent plant. Limited wildlife value.

**American Holly (*Ilex opaca*)**

Height: 15'-30', Spread: 18'-25'. Dense, pyramidal in youth, opening up with age. Plant in moist, well drained soil. Full sun or partial shade. Use one male for every three females. Use as specimen plant or in groupings. Many cultivars. Used extensively by many songbirds including thrushes, mockingbirds, catbirds, bluebirds and thrashers. Foliage provides cover for songbirds and mammals.

**Sweetbay Magnolia (*Magnolia virginiana*)**

Height: 12'-30', Spread: same. Multistemmed, small, semi-evergreen tree with fragrant, whitish flowers May-July. Likes wet, acid soils (pH 5-6.5) in forested wetlands, seeps, stream and pond edges, sandy woods. Tolerates sun or shade, occasional flooding and some salt.<sup>35</sup> Used as specimen tree. Wildlife value is low. Seeds are eaten by some mammals and birds. Foliage is used by several birds for nest building.

**Sassafras (*Sassafras albidum*)**

Height: 35'-50', Spread: same. Variable leafed tree with famous "mitten-shaped" and other leaves. Historically used for tea and medicinal purposes, though the tea now thought to be carcinogenic. Likes moist, open woods. Full sun to partial shade. High wildlife value.<sup>36</sup>

**PawPaw  
(*Asimina triloba*)**



**White Fringetree  
(*Chionanthus virginicus*)**



