Appendix A

Landscaping Guidance for Stormwater BMPs

Introduction

Landscaping is a critical element to improve both the function and appearance of stormwater best management practices (BMPs). This Appendix provides landscaping criteria and plant selection guidance for effective stormwater BMPs. It is organized as follows:

The first section, A.1, outlines general guidance that should be considered when landscaping any stormwater practice. Section A.2 then presents more specific guidance on landscaping criteria and plant selection for individual BMP designs. These include:

- Stormwater ponds and wetlands
- Infiltration and sand filter practices
- Bioretention
- Open Channels
- Filter Strips and Buffers

In Section A.3, key factors in selecting plant material for stormwater landscaping are reviewed, including hardiness zones, physiographic regions, hydrologic zones, and cultural factors. Section A.4 contains a detailed plant list of native woody and herbaceous species that can be used when preparing a stormwater planting plan.

Native Species

This manual encourages the use of native plants in stormwater management facilities. Native plants are defined as those species which evolved naturally to live in this region. Practically speaking, this refers to those species which lived in Maryland before Europeans explored and settled in America. Many introduced species were weeds brought in by accident; others were intentionally introduced and cultivated for use as medicinal herbs, spices, dyes, fiber plants, and ornamentals.

Introduced species can often escape cultivation and begin reproducing in the wild. This is significant ecologically because many introduced species out-compete indigenous species and begin to replace them in the wild. Some introduced species like kudzu, phragmites, and dandelions are invasive, have few predators, and can take over naturally occurring species at an alarming rate. By planting native species in stormwater management facilities, we can protect Maryland's natural heritage and provide a legacy for future generations.

Native species also have distinct genetic advantages over non-native species for planting in Maryland. Because they have evolved to live here naturally, indigenous plants are best suited for our local climate. This translates into greater survivorship when planted and less replacement and maintenance during the life of a stormwater management facility. Both of these attributes provide cost savings for the facility owner.

Finally, people often plant exotic species for their ornamental value. While it is important to have aesthetic stormwater management facilities for public acceptance and the maintenance of property value, it is not necessary to introduce foreign species for this purpose. Many native species are aesthetically pleasing and can be used as ornamentals. For example, the following species are part of Maryland's natural heritage and provide high aesthetic value throughout the year: rhododendron, pink azalea, red maple, pin oak, sycamore, flowering dogwood, mountain laurel, willow, hemlock, white pine, bald cypress, atlantic cedar, american holly, black-eyed susan, sunflower, lobelia, pickerel weed, marsh hibiscus, and yellow pond lily. When selecting ornamentals for stormwater management facilities, planting preference should be given to native ornamentals. Please refer to the plant list in Section A.4 for a comprehensive list of native species available for stormwater management facility planting.

A.1 General Landscaping Guidance for All Stormwater BMPs

- Trees, shrubs, and/or any type of woody vegetation are not allowed on the embankment.
- Plant trees and shrubs at least 15 feet away from the toe of slope of a dam.
- Trees or shrubs known to have long taproots should not be within the vicinity of the earth dam or subsurface drainage facilities.
- Plant trees and shrubs at least 25 feet away from perforated pipes.
- Plant trees and shrubs at least 25 feet away from a principal spillway structures.
- Provide 15 foot clearance from a non-clogging, low flow orifice.
- Herbaceous embankment plantings should be limited to 10 inches in height.
- Use erosion control mats and fabrics in channels to reduce the potential for erosion.
- Stabilize all emergency spillways with plant material that can withstand strong flows. Root material should be fibrous and substantial but lacking a taproot.
- Sod channels that are not stabilized with erosion control mats.
- Divert flows temporarily from seeded areas until stabilized.
- Check water tolerances of existing plant materials prior to inundation of area.
- Stabilize aquatic and safety benches with emergent wetland plants and wet seed mixes.
- Do not block maintenance access to structures with trees or shrubs.
- To reduce thermal warming, shade inflow and outflow channels as well as southern exposures of ponds.
- Avoid plantings that will require routine or intensive chemical applications (i.e. turf area).
- Have soil tested to determine if there is a need for amendments.
- Native plant species should be specified over exotic or foreign species because they are well adapted to local on-site soil conditions and require little or no additional amendments.
- Decrease the areas where turf is used. Use low maintenance ground cover to absorb run-off.

- Plant stream and water buffers with trees, shrubs, ornamental grasses, and herbaceous materials where possible, to stabilize banks and provide shade.
- Maintain and frame desirable views. Be careful not to block views at entrances, exits, or difficult road curves. Screen unattractive views into the site. Aesthetics and visual characteristics should be a prime consideration.
- Use plants to prohibit pedestrian access to pools or steeper slopes.
- The designer should carefully consider the long-term vegetation management strategy for the BMP, keeping in mind the "maintenance" legacy for the future owners. Provide a planting surface that can withstand the compaction of vehicles using maintenance access roads. Make sure the facility maintenance agreement includes requirements to ensure vegetation cover in perpetuity.
- If a BMP is likely to receive excessive amounts of deicing salt, salt tolerant plants should be used.
- Provide signage for:
  - Stormwater Management Areas to help educate the public.
  - Wildflower areas, when possible, to designate limits of mowing.
- Avoid the overuse of any plant materials.
- Preserve existing natural vegetation when possible.

It is necessary to test the soil in which you are about to plant in order to determine the following:

- pH; whether acid, neutral, or alkaline
- major soil nutrients; Nitrogen, Phosphorus, Potassium
- minerals; such as chelated iron, lime

Have soil samples analyzed by experienced and qualified individuals, such as those at the Agricultural Extension Office, who will explain in writing the results, what they mean, as well as what soil amendments would be required. Certain soil conditions, such as marine clays, can present serious constraints to the growth of plant materials and may require the guidance of qualified professionals. When poor soils can not be amended, seed mixes and plant material must be selected to establish ground cover as quickly as possible.

Areas that recently have been involved in construction can become compacted so that plant roots cannot penetrate the soil. Also seeds will lie on the surface of compacted soils and are often washed away or eaten by birds. For planting success, soils should be loosened to a depth of three to five inches. Hard soils may require disking to a deeper depth. The soil should be loosened regardless of the ground cover. This will improve seed contact with the soil, increase germination rates, and allow the roots to penetrate the soil. For areas to be sodded, disking is necessary so that the roots can penetrate the soil. Providing good growing conditions can prevent poor vegetative cover. This saves money because vegetation will not need to be replanted.

Whenever possible, topsoil should be spread to a depth of four to eight inches and lightly compacted to minimum thickness of four inches. This provides organic matter and important nutrients for the plant material. The use of topsoil allows vegetation to become established faster and roots to penetrate deeper. This ensures quicker and more complete stabilization, making it less likely that the plants will wash out during a heavy storm.

If topsoil has been stockpiled in deep mounds for a long period of time, it is necessary to test the soil for pH as well as microbial activity. If the microbial activity has been destroyed, it is necessary to inoculate the soil after application.

Remember that newly installed plant material requires water in order to recover from the shock of being transplanted. Be sure that some source of water is provided, especially during dry periods. This will reduce plant loss and provide the new plant materials with a chance to establish root growth.

A.2 Specific Landscaping Criteria for BMP Groups

A.2.1 Ponds and Wetlands

For planting within a stormwater management facility, it is necessary to determine what hydrologic zones will be created. Hydrologic zones describe the degree to which an area is inundated by water. Plants have differing tolerances to inundation and the six zones described in this section will dictate which plants will survive where. Every facility does not necessarily exhibit all of these zones.

Table A.1 Hydrologic Zones

Zone #	Zone Description	Hydrologic Conditions
Zone 1	Deep Water Pool	1-6 foot deep permanent pool
Zone 2	Shallow Water Bench (low marsh)	6 inches to 1 foot deep
Zone 3	Shoreline Fringe (high marsh)	Regularly inundated
Zone 4	Riparian Fringe	Periodically inundated
Zone 5	Floodplain Terrace	Infrequently inundated
Zone 6	Upland Slopes	Seldom or never inundated

Zone 1: Deep Water Area ***(1 to 6 feet)***

Ponds and wetlands both have deep pool areas that comprise Zone 1. These pools range from one to six feet in depth, and are best colonized by submergent plants, if at all. This pondscaping zone has not been routinely planted for several reasons. First, the availability of plant materials that can survive and grow in this zone is limited, and it is also feared that plants could clog the stormwater facility outlet structure. In many cases, these plants will gradually become established through natural recolonization (e.g., transport of plant fragments from other ponds by waterfowl). If submerged plant material becomes more commercially available and clogging concerns are addressed, this area can be planted. The function of the planting is to reduce sedimentation and improve oxidation while creating a greater aquatic habitat.

- Plant material must be able to withstand constant inundation of water of one foot or greater in depth.
- Plants may be submerged partially or entirely.
- Plants should be able to enhance pollutant uptake.
- Plants may provide food and cover for waterfowl, desirable insects, and other aquatic life.

Some suggested emergent or submergent species include, but are not limited to lotus, wild celery, and redhead grass.

Zone 2: Shallow Water Bench/Low Marsh ***(6 inches to 1 foot)***

Zone 2 includes all areas that are inundated below the normal pool to a depth of one foot, and is the primary area where emergent plants will grow in stormwater wetlands. Zone 2 also coincides with the aquatic bench found in stormwater ponds. This zone offers ideal conditions for the growth of many emergent wetland species. These areas may be located at the edge of the pond or on low mounds of earth located below the surface of the water within the pond. When planted, Zone 2 can be an important habitat for many aquatic and nonaquatic animals, creating a diverse food chain. This food chain includes predators, allowing a natural regulation of mosquito populations, thereby reducing the need for insecticide applications.

- Plant material must be able to withstand constant inundation of water to depths between six inches and one foot deep.
- Plants will be partially submerged.
- Plants should be able to enhance pollutant uptake.
- Plants may provide food and cover for waterfowl, desirable insects and other aquatic life.

Plants will stabilize the bottom of the pond, as well as the edge of the pond, absorbing wave impacts and reducing erosion, when water level fluctuates. In addition to slowing water velocities and increasing sediment deposition rates, plants can also reduce resuspension of sediments caused

by the wind. Plants can also soften the engineered contours of the pond, and can conceal drawdowns during dry weather.

Some suggested species for Zone 2 include lobelia, bayberry, many asters, turtlehead, pond cypress, iris, and blue flag. It is important to recognize that a plant typically found in wetlands may be cultivated in nonwetland conditions. Hence the importance of obtaining plant stock which is cultivated in similar hydrologic and soil conditions as those present in the stormwater management facility. A plant typically found in wetlands, but cultivated in nonwetland conditions, may not survive if installed in wetland conditions. A nonwetland plant cultivated in wetland conditions should thrive when introduced to wetland conditions.

Table A.2 Common Emergent Wetland Plant Species Used for Stormwater Wetlands and on Aquatic Benches of Stormwater Ponds

Common Name	Scientific Name	Inundation Tolerance
Arrow Arum	*Peltandra virginica*	up to 12 inches
Arrowhead/Duck Potato	*Saggitaria latifolia*	up to 12 inches
Broomsedge	*Andropogon virginicus*	up to 3 inches
Broad Water Weed	*Elodea canadensis*	at least 12 inches
Bushy Beardgrass	*Andropogon glomeratus*	up to 12 inches
Common Three-square	*Scirpus pungens*	up to 6 inches
Marsh Hibiscus	*Hibiscus moscheutos*	up to 3 inches
Spatterdock	*Nuphar luteum*	up to 3 inches
Rice Cutgrass	*Leersia oryzoides*	up to 3 inches
Sedges	*Carex spp.*	up to 3 inches
Soft Rush	*Juncus effusus*	up to 3 inches
Switchgrass	*Panicum virgatum*	up to 3 inches
Note 1: Inundation tolerance is maximum inches below the normal pool; most plants prefer shallower depths than the maximum indicated.		
Note 2: for additional plant options, consult the stormwater planting list at the end of this appendix. Other good sources include the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control (MDE, 1994), Design of Stormwater Wetland Systems (Schueler, 1992) and Planting Guide for the Northeastern United States (Environmental Concern, 1993).		

Zone 3: Shoreline Fringe/High Marsh *(regularly inundated)*

Zone 3 encompasses the shoreline of a pond or wetland, and extends vertically about one foot in elevation from the normal pool. This zone includes the safety bench of a pond, and may also be periodically inundated if storm events are subject to extended detention. This zone occurs in a wet pond or shallow marsh and can be the most difficult to establish since plants must be able to withstand inundation of water during storms, when wind might blow water into the area, or the occasional drought during the summer. In order to stabilize the soil in this zone, Zone 3 must have a vigorous cover.

- Plants should stabilize the shoreline to minimize erosion caused by wave and wind action or water fluctuation.
- Plant material must be able to withstand occasional inundation of water. Plants will be partially submerged at this time.
- Plant material should, whenever possible, shade the shoreline, especially the southern exposure. This will help to reduce water temperature.
- Plants should enhance pollutant uptake.
- Plants may provide food and cover for waterfowl, songbirds, and wildlife. Large plants could also be selected and located to control overpopulation of waterfowl.
- Plants should be located to reduce human access where there are potential hazards, but should not block the maintenance access.
- Plants should have very low maintenance requirements, because they may be difficult or impossible to reach.
- Plants should be resistant to disease and other problems which require chemical applications (since chemical application is not advised in stormwater ponds).
- Native plants are preferred because they are low maintenance and disease resistant.

Many of the emergent wetlands plants outline in Table A.2 also thrive in Zone 3. Some other species that do well include bentgrass, foxtail, panic grass, and hawthorn. If shading is needed along the shoreline, the following tree species are suggested— river birch, ash, willow, red maple and willow oak.

Zone 4: Riparian Fringe *(periodically inundated)*

Zone 4 extends from one to four feet in elevation above the normal pool. Plants in this zone are subject to periodic inundation after storms, and may experience saturated or partly saturated soil. Nearly all of the temporary ED area is included within this zone.

- Plants must be able to withstand periodic inundation of water after storms, as well as occasional drought during the warm summer months.
- Plants should stabilize the ground from erosion caused by run-off.

- Plants should shade the low flow channel to reduce pool warming whenever possible.
- Plants should enhance pollutant uptake.
- Plant material should have very low maintenance, since they may be difficult or impossible to access.
- Plants may provide food and cover for waterfowl, songbirds and wildlife. Plants may also be selected and located to control overpopulation of waterfowl.
- Plants should be located to reduce pedestrian access to the deeper pools.
- Native plants are preferred because they are low maintenance and disease resistant.

Some frequently used plant species in Zone 4 include coneflower, violets, primrose, milkwort, nannyberry, lespedeza, lilies, flatsedge, hollies, horsythia, lovegrass, hawthorn, spiraea, birch, and sugar maple.

Zone 5: Floodplain Terrace ***(infrequently inundated)***

Zone 5 is periodically inundated by floodwaters that quickly recede in a day or less. Operationally, Zone 5 extends from the maximum two year or Cp_v water surface elevation up to the 10 or 100 year maximum water surface elevation. Key landscaping objectives for Zone 5 are to stabilize the steep slopes characteristic of this zone and establish low maintenance natural vegetation.

- Plant material should be able to withstand occasional but brief inundation during storms. In between storms, typical moisture conditions may be moist, slightly wet, or even swing entirely to drought conditions during the dry weather periods.
- Plants should stabilize the basin slopes from erosion.
- Ground cover should be very low maintenance, since they may be difficult to access on steep slopes or if frequency of mowing is limited. A dense tree cover may help reduce maintenance and discourage resident geese.
- Plants may provide food and cover for waterfowl, songbirds, and wildlife.
- Placement of plant material in Zone 5 is often critical, as it often creates a visual focal point and provides structure and shade for a greater variety of plants.

Some commonly planted species in Zone 5 include solomon's seal, nannyberry, many fescues, many viburnums, cherries, chestnut oak, post oak, and phlox.

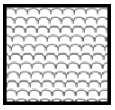
Zone 6: Upland Slopes/Pond Buffer ***(seldom or never inundated)***

The last zone extends above the maximum 100 year water surface elevation, and often includes the outer buffer of a pond or wetland. Unlike other zones, this upland area may have sidewalks, bike paths, retaining walls, and maintenance access roads. Care should be taken to locate plants so they will not overgrow these routes or create hiding places that might make the area unsafe.

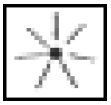
- Plant selections should be made based on soil condition, light, and function within the landscape because little or no water inundation will occur.
- Ground covers should require infrequent mowing to reduce the cost of maintaining this landscape.
- Placement of plants in Zone 6 is important since they are often used to create a visual focal point, frame a desirable view, screen undesirable views, serve as a buffer, or provide shade to allow a greater variety of plant materials. Particular attention should be paid to seasonal color and texture of these plantings.

Some frequently used plant species in Zone 6 include eastern cottonwood, american yew, linden, bald cypress, magnolia, and mountain ash.

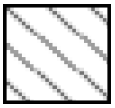
Figure A.1 Hydrologic Zones Around Stormwater Facilities – Legend



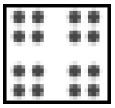
12”-36” depth below normal pool elevation
Water Lily, Deep Water Duck Potato, Sago Pond Plant, Wild Celery, Redhead Grass



0”-12” depth below normal pool elevation
Blue Flag Iris, Duck Potato, Flowering Bulrush, Softrush, Sedges, Lobelia, Pond Cypress, various asters

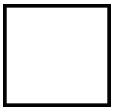


0” to 12” elevation above normal pool elevation
New England Aster, Marsh Aster, Marsh Marigold (Appalachian Plateau), Tussock Sedge, Spotted Joe Pye Weed, Forget Me Nots, Inkberry, Purple Osier Dogwood, Pin Oak, River Birch, Sycamore, Swamp White Oak (Coastal Plain), Weeping Willow, Dawn Redwood



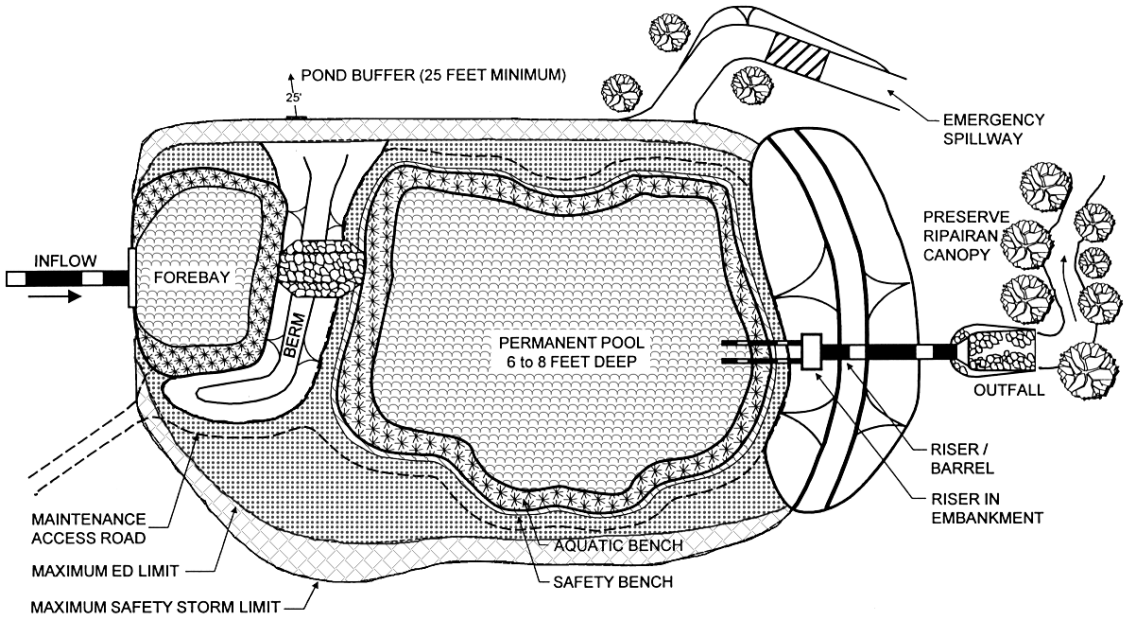
1’ to 4’ elevation above normal pool elevation
Purple Cone Flower, Birds Foot Trefoil, Slender Rush, Deer Tongue Grass, Lespedeza, Switch Grass, Serviceberry, Gray Birch, Hackberry, Sweet Pepper Bush (Coastal Plain, Gray stem Dogwood, Red Osier Dogwood, Green Ash,

Qp_2 or Cp_v to Qp_{10} or Q_f water surface elevation
(Many Wildflowers and native grasses) American Holly, Witch Hazel, Ninebark, Red Oak, American Elderberry, American Hemlock, Lowbush Blueberry, Maple Leaf Viburnum, Nannyberry, Blackhaw Viburnum

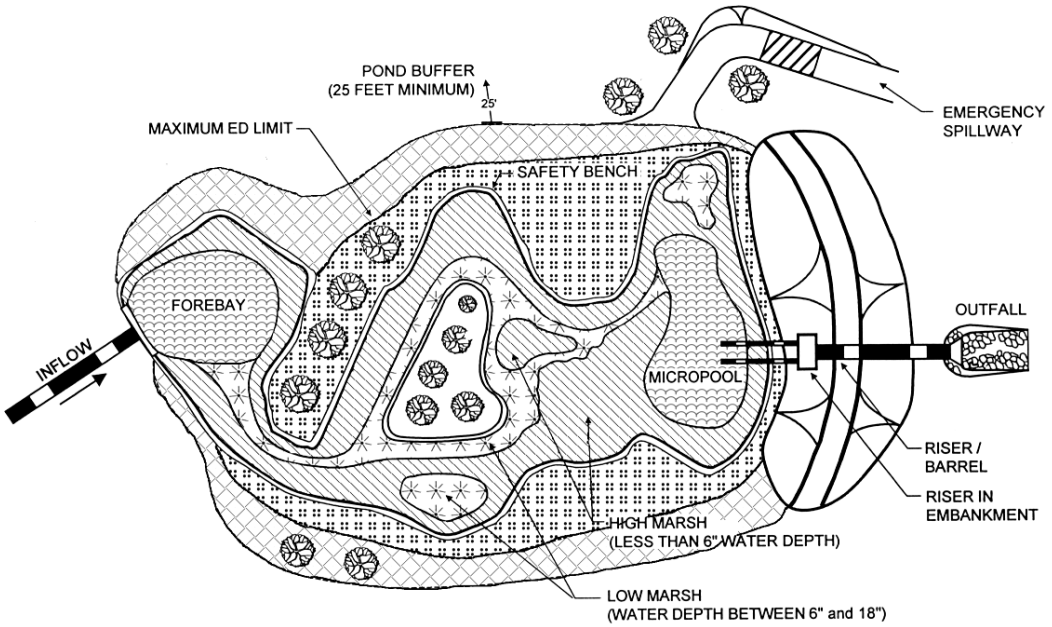


Q_f water surface elevation and above (Floodplain)
Mostly ornamentals as long as soils drains well. Many natives. All species must be able to tolerate flood plain conditions. Hackberry, Pitch Pine, Sheep Fescue, Wildflowers, many Native Grasses.

Figure A.2 Hydrologic Zones Around Stormwater Facilities



WET ED POND (P-3)



ED SHALLOW WETLAND (W-2)

Figure A.3 Section of Typical Stormwater Management Detention Pond

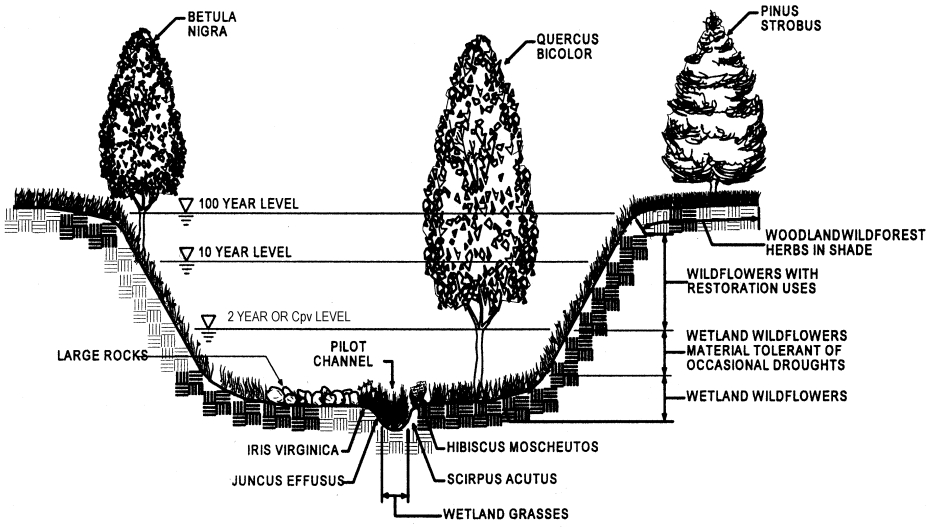
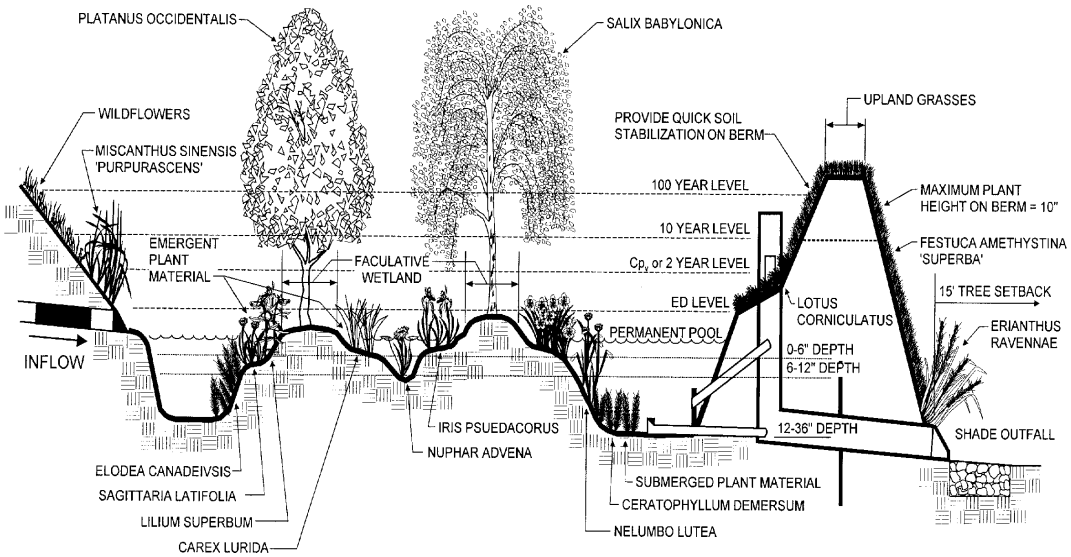


Figure A.4 Section of Typical Shallow Extended Detention Wetland System



A.2.2 Infiltration and Filter Systems

Infiltration and filter systems either take advantage of existing permeable soils or create a permeable medium such as sand for WQ_v and Re_v. In some instances where permeability is great, these facilities may be used for Q_p as well. The most common systems include infiltration trenches, infiltration basins, sand filters, and organic filters.

When properly planted, vegetation will thrive and enhance the functioning of these systems. For example, pre-treatment buffers will trap sediments that often are bound with phosphorous and metals. Vegetation planted in the facility will aid in nutrient uptake and water storage. Additionally, plant roots will provide arteries for stormwater to permeate soil for groundwater recharge. Finally, successful plantings provide aesthetic value and wildlife habitat making these facilities more desirable to the public.

Design Constraints:

- Planting buffer strips of at least 20 feet will cause sediments to settle out before reaching the facility, thereby reducing the possibility of clogging.
- Determine areas that will be saturated with water and water table depth so that appropriate plants may be selected (hydrology will be similar to bioretention facilities, see figure A.5 and Table A.4 for planting material guidance).
- Plants known to send down deep taproots should be avoided in systems where filter fabric is used as part of facility design.
- Test soil conditions to determine if soil amendments are necessary.
- Plants shall be located so that access is possible for structure maintenance.
- Stabilize heavy flow areas with erosion control mats or sod.
- Temporarily divert flows from seeded areas until vegetation is established.
- See Table A.5 for additional design considerations.

A.2.3 Bioretention

Soil Bed Characteristics

The characteristics of the soil for the bioretention facility are perhaps as important as the facility location, size, and treatment volume. The soil must be permeable enough to allow runoff to filter through the media, while having characteristics suitable to promote and sustain a robust vegetative cover crop. In addition, much of the nutrient pollutant uptake (nitrogen and phosphorus) is accomplished through absorption and microbial activity within the soil profile. Therefore, soils must balance their chemical and physical properties to support biotic communities above and below ground.

The planting soil should be a sandy loam, loamy sand, loam (USDA), or a loam/sand mix (should contain a minimum 35 to 60% sand, by volume). The clay content for these soils should be less than 25% by volume [Environmental Quality Resources (EQR), 1996; Engineering Technology Inc. and Biohabitats, Inc. (ETAB), 1993]. Soils should fall within the SM, ML, SC classifications or the Unified Soil Classification System (USCS). A permeability of at least 1.0 feet per day (0.5"/hr) is required (a conservative value of 0.5 feet per day is used for design). The soil should be free of stones, stumps, roots, or other woody material over 1" in diameter. Brush or seeds from noxious weeds (e.g., Johnson Grass, Mugwort, Nutsedge, and Canada Thistle or other noxious weeds as specified under COMAR 15.08.01.05.) should not be present in the soils. Placement of the planting soil should be in 12" to 18" lifts that are loosely compacted (tamped lightly with a backhoe bucket or traversed by dozer tracks). The specific characteristics are presented in Table A.3.

Table A.3 Planting Soil Characteristics
(Adapted from EQR, 1996; ETAB, 1993)

Parameter	Value
pH range	5.2 to 7.00
Organic matter	1.5 to 4.0% (by weight)
Magnesium	35 lbs. per acre, minimum
Phosphorus (phosphate - P_2O_5)	75 lbs. per acre, minimum
Potassium (potash - K_2O)	85 lbs. per acre, minimum
Soluble salts	500 ppm
Clay	10 to 25%
Silt	30 to 55%
Sand	35 to 60%

Mulch Layer

The mulch layer plays an important role in the performance of the bioretention system. The mulch layer helps maintain soil moisture and avoids surface sealing which reduces permeability. Mulch helps prevent erosion, and provides a microenvironment suitable for soil biota at the mulch/soil interface. It also serves as a pretreatment layer, trapping the finer sediments which remain suspended after the primary pretreatment.

The mulch layer should be standard landscape style, single or double shredded hardwood mulch or chips. The mulch layer should be well aged (stockpiled or stored for at least 12 months), uniform in color, and free of other materials, such as weed seeds, soil, roots, etc. The mulch should be applied to a maximum depth of three inches. Grass clippings should not be used as a mulch material.

Planting Guidance

Plant material selection should be based on the goal of simulating a terrestrial forested community of native species. Bioretention simulates an upland-species ecosystem. The community should be dominated by trees, but have a distinct community of understory trees, shrubs and herbaceous materials. By creating a diverse, dense plant cover, a bioretention facility will be able to treat stormwater runoff and withstand urban stresses from insects, disease, drought, temperature, wind, and exposure.

The proper selection and installation of plant materials is key to a successful system. There are essentially three zones within a bioretention facility (Figure A.5). The lowest elevation supports plant species adapted to standing and fluctuating water levels. The middle elevation supports plants that like drier soil conditions, but can still tolerate occasional inundation by water. The outer edge is the highest elevation and generally supports plants adapted to dryer conditions. A sample of appropriate plant materials for bioretention facilities are included in Table A.4. The layout of plant material should be flexible, but should follow the general principals described in Table A.5. The objective is to have a system which resembles a random and natural plant layout, while maintaining optimal conditions for plant establishment and growth. For a more extensive bioretention plan, consult ETA&B, 1993 or Claytor and Schueler, 1997.

Figure A.5 Planting Zones for a Bioretention Facilities

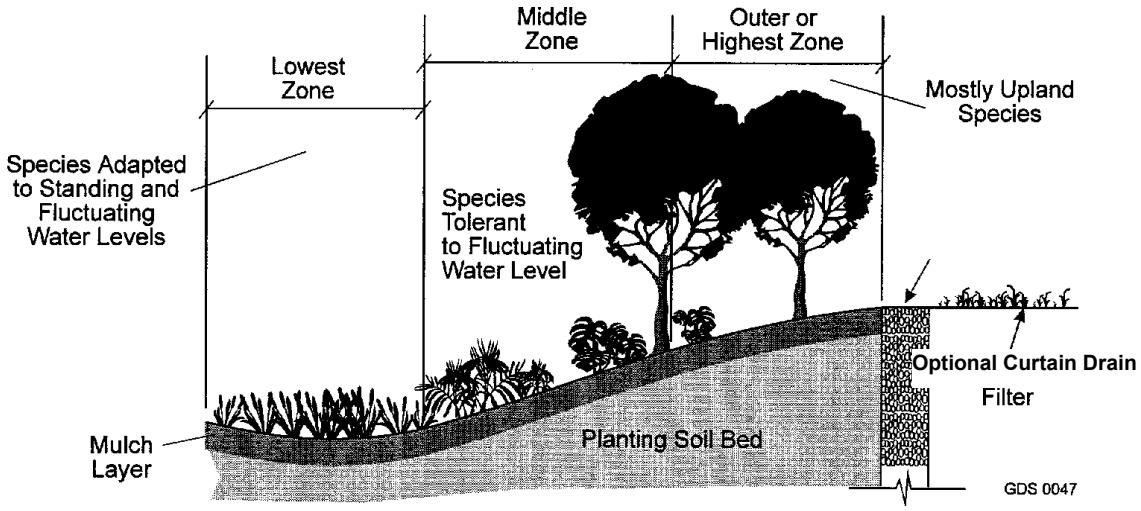


Table A.4 Commonly Used Species for Bioretention Areas

Trees	Shrubs	Herbaceous Species
Acer rubrum Red Maple	*Aesculus pariviflora* Bottlebrush Buckeye	*Andropogon virginicus* Broomsedge
Betula nigra River Birch	*Cephalanthus occidentalis* Buttonbush	*Eupatorium perpurea* Joe Pye Weed
Juniperus virginiana Eastern Red Cedar	*Hamemelis virginiana* Witch Hazel	*Scirpus pungens* Three Square Bulrush
Chionanthus virginicus Fringe-tree	*Vaccinium corymbosum* Highbush Blueberry	*Iris versicolor* Blue Flag
Nyssa sylvatica Black Gum	*Ilex glabra* Inkberry	*Lobelia cardinalis* Cardinal Flower
Diospyros virginiana Persimmon	*Ilex verticillata* Winterberry	*Panicum virgatum* Switchgrass
Platanus occidentalis Sycamore	*Viburnum dentatum* Arrowwood	*Dichanthelium scoparium* Broom Panic Grass
Quercus palustris Pin Oak	*Lindera benzoin* Spicebush	*Rudbeckia laciniata* Tall Coneflower
Quercus phellos Willow Oak	*Myrica pennsylvanica* Bayberry	*Scirpus cyperinus* Woolgrass
Salix nigra Black willow		*Vernonia noveboracensis* New York Ironweed
Note 1: For more options on plant selection for bioretention, consult Bioretention Manual (ETAB, 1993) or the Design of Stormwater Filtering Systems (Claytor and Schueler, 1997).		

Table A.5 Planting Plan Design Considerations

- Native plant species should be specified over exotic or foreign species.
- Appropriate vegetation should be selected based on the zone of hydric tolerance.
- Species layout should generally be random and natural.
- A canopy should be established with an understory of shrubs and herbaceous materials.
- Woody vegetation should not be specified in the vicinity of inflow locations.
- Trees should be planted primarily along the perimeter of the bioretention area.
- Stressors (e.g., wind, sun, exposure, insect and disease infestation, and drought) should be considered when laying out the planting plan.
- Noxious weeds shall not be specified or used.
- Aesthetics and visual characteristics should be a prime consideration.
- Traffic and safety issues must be considered.
- Existing and proposed utilities must be identified and considered.

Plant Material Guidance

Plant materials should conform to the American Association of Nurserymen's publication, the American Standard Nursery Stock. The planting plan shall include a sequence of construction; a description of the contractor's responsibilities; a planting schedule and installation specifications; initial maintenance requirements; and a warranty period stipulating requirements for plant survival. Table A.6 presents some typical issues for planting specifications.

Table A.6 Planting Specification Issues

Specification Element	Elements
Sequence of Construction	Describe site preparation activities, soil amendments, etc.; address erosion and sediment control procedures; specify step-by-step procedure for plant installation through site clean-up.
Contractor's Responsibilities	Specify the contractor's responsibilities, such as watering, care of plant material during transport, timeliness of installation, repairs due to vandalism, etc.
Planting Schedule and Specifications	Specify the plants to be installed, the type of materials (e.g., balled and burlap, bare root, containerized); time of year of installations, sequence of installation of types of plants; fertilization, stabilization seeding, if required; watering and general care.
Maintenance	Specify inspection periods; mulching frequency (annual mulching is most common); removal and replacement of dead and diseased vegetation; treatment of diseased trees; watering schedule after initial installation (once per day for 14 days is common); repair and replacement of staking and wires.
Warranty	Specify the warranty period, the required survival rate, and expected condition of plant species at the end of the warranty period.

A.2.4 Open Channels

Consult Table A.7 for grass species that perform well in the stressful environment of an open channel. For more detailed information, please consult the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control. If a BMP is likely to receive excessive amounts of deicing salt, salt tolerant plants should be used.

A.2.5 Filter Strips and Stream Buffer

For design and plant selection of filter strips and stream buffers, please consult the USDA Natural Resources Conservation Service Maryland Conservation Practice Standard No. 391 “Riparian Stream Buffers.”

Table A.7 Common Grass Species for Open Channels

Common Name	Scientific Name	Notes
Big Bluestem	*Andropogon gerardii*	Warm, not for Wet Swale
Creeping Bentgrass	*Agrostis palustris*	Cool,
Red Fescue	*Festuca rubra*	Cool, not for Wet Swale
Reed Canary grass	*Phalaris arundinacea*	Cool, Wet Swale
Redtop	*Agrostis alba*	Cool,
Smooth Brome	*Bromus inermis*	Cool, not for Wet Swale
Switch grass	*Panicum virgatum*	Warm

Note 1: These grasses are sod-forming and can withstand frequent inundation, and are thus ideal for the swale or grass channel environment. Most are salt-tolerant, as well. Cool refers to cool season grasses that do well in the western part of the State, Warm refers to warm season grasses that work well in the eastern part of the State (see Table A.8).

Note 2: Where possible, one or more of these grasses should be in the seed mixes. For a more thorough listing of seed mixes, consult the 1994 Maryland Standard and Specifications for Soil Erosion and Sediment Control (MDE, 1994) or the MD NRCS Code 391 Riparian Forest Buffer Standard, Table 2 (Zone 3).

A.3 Plant Selection for Stormwater Facilities

A.3.1 Hardiness Zones

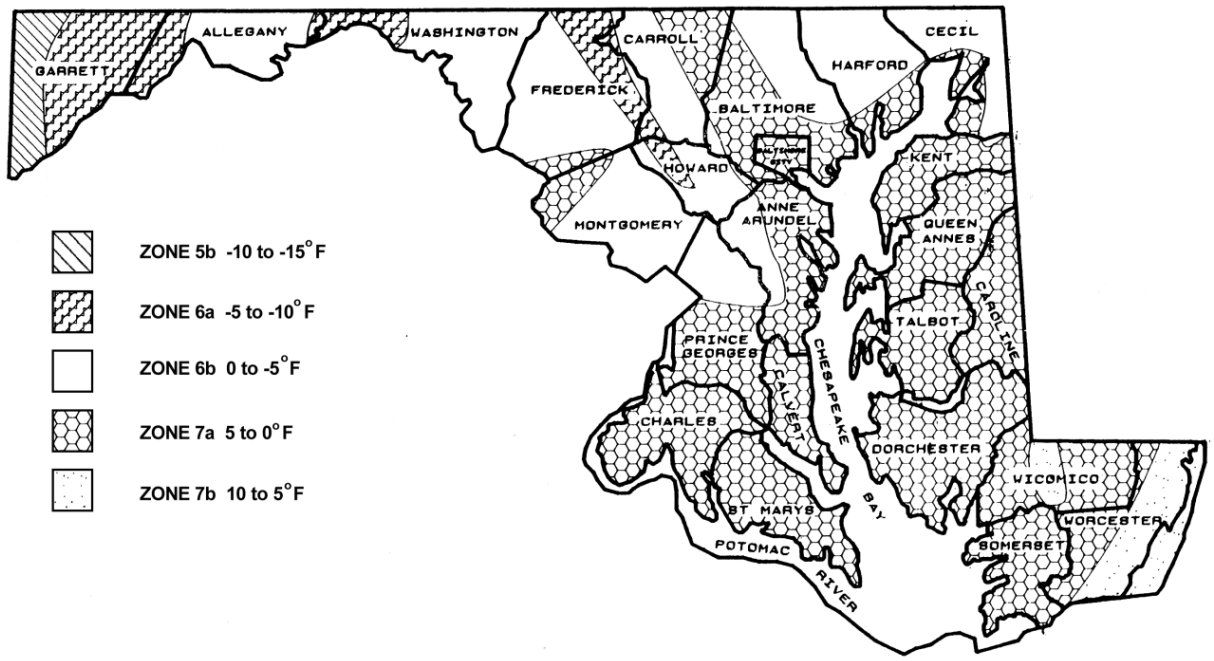
Hardiness zones are based on historical annual minimum temperatures recorded in an area. A BMPs location in relation to plant hardiness zones is important to consider first because plants differ in their ability to withstand very cold winters. This does not imply that plants are not affected by summer temperatures. Given that Maryland summers can be very hot, heat tolerance is also a characteristic that should be considered in plant selection.

Table A.8 Average Annual Minimum Temperature

Zone		USDA Minimum Temperature (°F)
Temperate Zone 1		below -50°
Temperate Zone 2		-50° to -40°
Temperate Zone 3		-40° to -30°
Temperate Zone 4		-30° to -20°
Temperate Zone 5	a	-20° to -15°
	b	-15° to -10°
Temperate Zone 6	a	-10° to -5°
	b	-5° to 0°
Temperate Zone 7	a	0° to 5°
	b	5° to 10°
Temperate Zone 8		10° to 20°

It is best to recommend plants known to thrive in specific hardiness zones. The plant list included at the end of this appendix identifies the hardiness zones for each species listed as a general planting guide. It should be noted, however, that certain site factors can create microclimates or environmental conditions which permit the growth of plants not listed as hardy for that zone. By investigating numerous references and based on personal experience, a designer should be able to confidently recommend plants that will survive in microclimates.

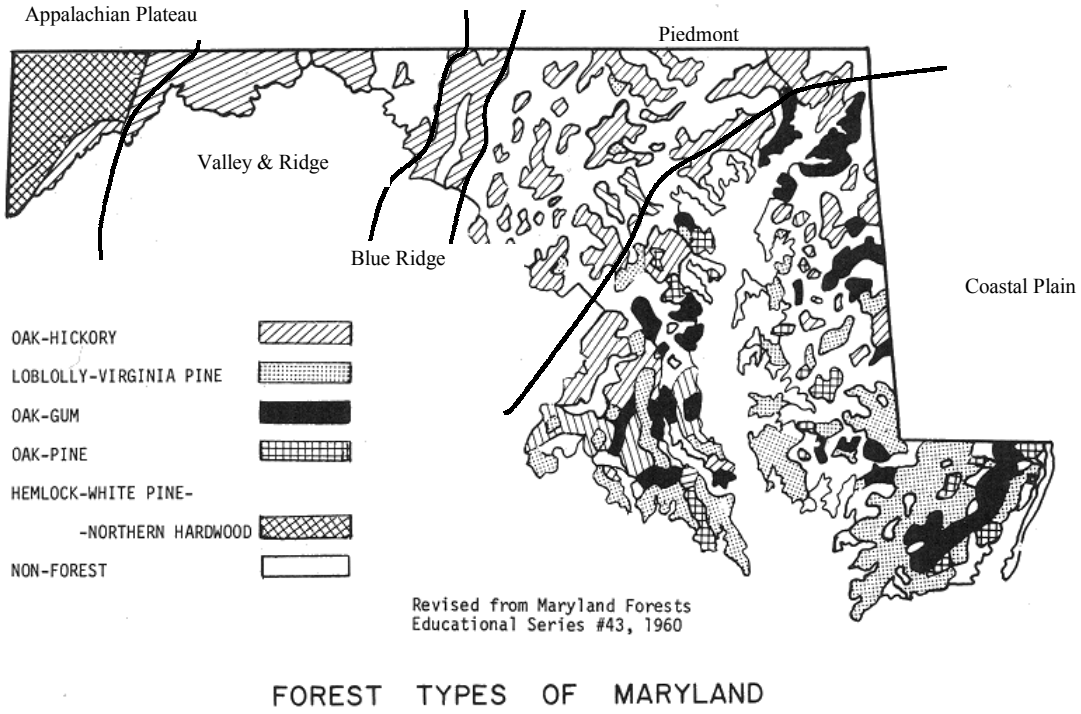
Figure A.6 USDA Plant Hardiness Zones in Maryland



A.3.2 Physiographic Provinces

There are five physiographic provinces in Maryland that describe distinct geographic regions in the State with similar physical and environmental conditions (Figure A.7). These physiographic provinces include, from west to east, the Appalachian Plateau, Valley and Ridge, Blue Ridge, Piedmont, and Coastal Plain. Each physiographic region is defined by unique geological strata, soil type, drainage patterns, moisture content, temperature and degree of slope which often dictate the predominant vegetation. Because the predominant vegetation has evolved to live in these specific conditions, a successful stormwater management facility planting design can be achieved through mimicking these natural associations. The five physiographic regions are described below with associated vegetation listed as general planting guidance. For more detailed information and plant listings please refer to *Woody Plants of Maryland* (Brown and Brown, 1992).

Figure A.7 Physiographic Provinces and Forest Types of Maryland



Appalachian Plateau Province

The Appalachian Plateau Province is where Maryland's highest elevations occur with Backbone Mountain being the greatest at 3,360 feet above sea level. In the higher elevations of the Appalachian Plateau, the climate becomes similar to that of the northern states and Canada. Slopes in the Appalachian Plateau are often steep and deeply carved by winding streams. This province has mountainous soils composed of clay and clay loams. The predominant forest types in this province are the Northern Hardwood and Oak-Hickory.

Common Species of the Appalachian Plateau Province	
Tree Species	**Understory**
eastern hemlock, white pine, mountain pine, pitch pine, red spruce, sugar maple, white basswood, american basswood, beech, yellow birch, sweet birch, cucumber tree, tulip tree, white oak, chestnut oak, scarlet oak, red oak, white ash, black walnut, and white walnut	hydrangea, flowering dogwood, pink azaleas, greenbriers, witch hazel, iron wood, hazelnut, blueberries, huckleberries, dewberries, dockmackie, deerberry, great laurel, hobble bush, mountain maple, striped maple, red-berried elder, bush honeysuckle, canadian yew, mountain holly, red raspberry, allegheny menziesia, and dwarf cornel

Within the Appalachian Plateau are bog and swamp areas which support unique vegetation. For stormwater management facilities that will remain wet year-round, many species found in these bog and swamp areas will likely do well. Around the edges of these bogs, red spruce, white pine, hemlock, black gum, red maple, large and small toothed aspen, and pussy willow are common. Interior bog species include tamarack or larch, alders, swamp rose, winter berry, wild raisin, arrowwood, mountain holly, great laurel, smooth service berry, high bush blueberry, swamp dewberries, and cranberries.

Valley and Ridge, Blue Ridge, and Piedmont Provinces

The Valley and Ridge Province is where parallel ridges and valleys of the Appalachian Mountains create an alternating pattern. This province has mountainous soils composed of clay and clay loams, as well as sandy or stony loams. Often, the soils are shallow, and shale barrens may be found. The climate is dry. Most of the precipitation from the west is blocked by the Allegheny Mountain range, and precipitation from the east is blocked by the Blue Ridge Mountains.

The Blue Ridge Province is on the eastern edge of the Appalachian Mountains. This province has mountainous soils composed of sandy or stony loams. The climate is similar to that in the Piedmont Province, but somewhat cooler and moister.

The Piedmont Province is an area of rolling uplands with elevations ranging from 100 to 500 feet above sea level. Soils of the Piedmont are derived from granite rock and consist of loams and clays with rock fragments and gravel. The climate is moderate throughout this central Maryland province.

Common Species of the Valley and Ridge, Blue Ridge. and Piedmont Provinces	
Tree Species	**Understory**
hickory, chestnut oak, scarlet oak, scrub oak, white oak, red oak, black oak, scrub pine, pitch pine, short leaf pine, white pine, hemlocks, beech, black jack oak, shingle oak, fringe tree, and chinquapin	Sweet fern, flowering dogwood, black haw, chinquapin, sassafras, redbud, mountain laurel, blueberry, fringe tree, pink azalea, hydrangea, spicebush, and maple-leaved arrowwood

In the Hagerstown region of the Ridge and Valley Province, limestone outcrops produce alkaline soils which are conducive to red cedar communities. Other common species include oaks, black locust, redbud, fragrant sumac, hop hornbeam, hackberry, and slippery elm. Between Cumberland and Flintstone a series of shale barrens occur. These areas have a low water holding capacity and surfaces can get hot on sunny days. Common species associated with the shale barrens include scrub pine, scrub oak, post oak, yellow oak, fragrant sumac, dwarf sumac, single-flowered hawthorn, dwarf hackberry, New Jersey tea, Allegheny plum and pasture rose.

Coastal Plain Province

The Coastal Plain Province is recognized by flat or gently rolling topography and elevations rising from sea level to about 100 feet. Coastal Plain marshes and swampy tidal flats surround the Chesapeake Bay. Sands, sandy loams, and silt loams make up the soils of the Coastal Plain. The climate is mild and sometimes rainy, similar to that found further south.

Common Species of the Coastal Plain Province	
Forest Species	**Understory**
loblolly pine, virginia pine, pitch pine, pond pine, sweet gum, willow oak, water oak, basket oak, pin oak, post oak, spanish oak, black cottonwood, pale hickory, bitternut hickory, sweet bay, american holly, beech, tulip tree, and river birch	blueberry, huckleberry, greenbier, sand blackberry, beach plum, beach heather, bay berry, sweet pepper bush, azalea, maleberry, stagger bush, fetter bush, inkberry, and alder

Because of low topographic relief and proximity to sea level, extensive swamp areas are common to the Coastal Plain Province. Most notable are the cypress swamps found on both the Eastern and Western Shores. As with the bogs of the Appalachian Province, species common to Coastal Plain swamps will grow well in wet stormwater management facilities because of the similar hydrology. In addition to bald cypress, other common species to these swamps are southern white cedar, black gum, red maple, and swamp bay. Common understory include evergreen laurel-leaved greenbrier, red-berried greenbrier, red choke berry, swamp haw, smooth winterberry, virginia willow, bay berry, inkberry, and swamp rose.

Floodplain Regions in Maryland

Floodplains occur across Maryland's physiographic provinces as low-lying areas adjacent to streams and rivers. Floodplain plant communities are similar across most of the State because of common soil characteristics governed by occasional flooding and high groundwater. Because stormwater management facilities are often located in floodplains, plant associations in these areas can provide valuable information for successful BMP plantings.

Common Species of Floodplain Regions	
Forest Species	**Understory**
river birch, willows, silver maple, sweet gum, sycamore, box elder, green ash, american elm, swamp white oak, bur oak, honeylocust, and hackberry	shrub willows, ninebark, silkey cornel, buttonbush, spicebush, black alder, winterberry, black elderberry, and alders

A.3.3 Hydrologic Zones

For planting within a stormwater management facility, it is necessary to determine what hydrologic zones will be created. Hydrologic zones describe the degree to which an area is inundated by water. Plants have differing tolerances to inundation and as an aid to landscape designers, these tolerance levels have been divided into six zones and corresponding plant species have been identified.

Section A.4 includes a native plant list with appropriate hydrologic zones designated for each species. The hydrologic zones which are bracketed [ ] are where the plants tend to occur. There may be other zones listed outside of these brackets. The plants may occur in these zones, but are not typically found in them. Just as plants may, on occasion, be found outside of their hardiness zone, they may also be found outside of their hydrologic zone. They tend to grow where they can compete and survive. Additionally, hydrologic conditions in a stormwater management facility may fluctuate in unpredictable ways; thus the use of plants capable of tolerating wide varieties of hydrologic conditions greatly increases a successful planting. Conversely, plants suited for specific hydrologic conditions may perish when hydrologic conditions fluctuate, expose the soil, and increase the chance for erosion.

Table A.9 Hydrologic Zones

Zone #	Zone Description	Hydrologic Conditions
Zone 1	Deep Water Pool	1-6 foot deep permanent pool
Zone 2	Shallow Water Bench (low marsh)	6 inches to 1 foot deep
Zone 3	Shoreline Fringe (high marsh)	Regularly inundated
Zone 4	Riparian Fringe	Periodically inundated
Zone 5	Floodplain Terrace	Infrequently inundated
Zone 6	Upland Slopes	Seldom or never inundated

A.3.4 Other Considerations in Stormwater BMP Landscaping

Use or Function

In selecting plants, consider their desired function in the landscape. Is the plant needed as ground cover, soil stabilizer, or a source of shade? Will the plant be placed to frame a view, create focus, or provide an accent? Does the location require that you provide seasonal interest to neighboring properties? Does the adjacent use provide conflicts or potential problems and require a barrier, screen, or buffer? Nearly every plant and plant location should be provided to serve some function in addition to any aesthetic appeal.

Plant Characteristics

Certain plant characteristics are so obvious, they may actually be overlooked in the plant selection. These are:

- Size
- Shape

For example, tree limbs, after several years, can grow into power lines. A wide growing shrub may block an important line of sight to oncoming vehicular traffic. A small tree, when full grown, could block the view from a second story window. Consider how these characteristics can work for you or against you, today and in the future.

Other plant characteristics must be considered to determine how the plant provides seasonal interest and whether the plant will fit with the landscape today and through the seasons and years to come. Some of these characteristics are:

- Color
- Texture
- Seasonal Interest (e.g., flowers, fruit, leaves, stems/bark)
- Growth Rate

If shade is required in large amounts, quickly, a sycamore might be chosen over an oak. In urban or suburban settings, a plant's seasonal interest may be of greater importance. Residents living next to a stormwater system may desire that the facility be appealing or interesting to look at throughout the year. For example, willows are usually the first trees to grow leaves signaling the coming of spring. Pink and white dogwoods bloom in mid-spring to early summer, while witch hazel has a yellow bloom every fall which can be contrasted with the red fall foliage of a sugar maple. Careful attention to the design and planting of a facility can result in greater public acceptance and increased property value.

Availability and Cost

Often overlooked in plant selection is the availability from wholesalers and the cost of the plant material. There are many plants listed in landscape books that are not readily available from local nurseries. Without knowledge of what is available, time spent researching and finding the one plant that meets all the needs will be wasted. It may require shipping, therefore, making it more costly than the budget may allow. Some planting requirements may require a special effort to find the specific plant that fulfills the needs of the site and the function of the plant in the landscape.

In some cases, it may be cost effective to investigate nursery suppliers for the availability of wetland seed mixtures. Specifications of the seed mix shall include wetland seed types and the relative proportion of each species. Some suppliers provide seed mixtures suitable for specific wetland, upland, or riparian habitat conditions. This option may best be employed in small stormwater facilities such as pocket wetlands and open swales, or to complement woody vegetation plantings in larger facilities.

A.4 Stormwater Plant List

The pages at the end of this appendix present a list of herbaceous, tree and shrub plants native to Maryland and suitable for planting in stormwater management facilities. The list is intended as a guide for general planting purposes and planning considerations. Knowledgeable landscape designers and nursery suppliers may provide additional information for considering specific conditions for successful plant establishment and accounting for the variable nature of stormwater hydrology.

The planting list is in alphabetical order according to the common name, with the scientific name also provided. Life forms indicate whether a plant species is an “annual,” “perennial,” “grass,” “fern,” “shrub,” or “tree”.

Each plant species has a corresponding hydrologic zone provided to indicate the most suitable planting location for successful establishment. While the most common zones for planting are listed in parenthesis, the listing of additional zones indicates that a plant may survive over a broad range of hydrologic conditions.

The wetland indicator status (from Region 1, Reed, 1988) has been included to show “the estimated probability of a species occurring in wetlands versus nonwetlands” (Reed, 1988). Reed defines the indicator categories as follows:

> Obligate wetland (OBL): Plants, which nearly always (more than 99% of the time) occur in wetlands under natural conditions.

Facultative Wetland (FACW): Plants, which usually occur in wetlands (from 67 to 99% of the time), but occasionally found in non wetlands.

Facultative (FAC): Plants, which are equally likely to occur in wetlands and non wetlands and are found in wetlands from 34 to 66% of the time.

Facultative Upland (FACU): Plants, which usually occur in non wetlands (from 67 to 99% of the time), but occasionally found in wetlands (from 1 to 33% of the time).

Upland (UPL): Plants, which almost always (more than 99% of the time) under natural conditions occur in non wetlands.

A given indicator status shown with a "+" or a "-" means that the species is more (+) or less (-) often found in wetlands than other plants with the same indicator status without the "+" or "-" designation.

Since the wetland indicator status alone does not provide an indication of the depth or duration of flooding that a plant will tolerate, the "Inundation Tolerance" section is designed to provide further guidance. Where a plant species is capable of surviving in standing water, a "yes" is designated in this column. Additional information is provided for depth of inundation for aquatic vegetation and tolerance for seasonal inundation or saturated soil conditions. Because individual plants often have unique life requirements difficult to convey in a general listing, it will be necessary to research specific information on the plant species proposed in order to ensure successful plant establishment.

Pollution tolerance and salt tolerance information are indicated to identify plantings that would be most appropriate in pollution hot spots.

Hardiness zones are provided for the U.S.D.A. hardiness zones. The herbaceous plant list identifies the range of zones the plant may survive in, while the tree and shrub list shows the coldest zone where the plant may naturally occur.

Table A.4.1 Stormwater Plant List - Woody Vegetation

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
ALDER,BROOK-SIDE	*Alnus serrulata*	Tree	[1,2],3	OBL	0-3"	☐	☐	
ALDER,SEASIDE	*Alnus maritima*	Tree	[1,2],3	OBL	YES	☐	☐	
ALDER,SPECKLED	*Alnus rugosa*	Tree	1[2,3]	FACW+	YES	☐	☐	2
ARROW-WOOD	*Viburnum dentatum*	Shrub	[3,4],5	FAC	SEASONAL	☐	☑	2
ASH,BLACK	*Fraxinus nigra*	Tree	[2,3],4	FACW	SATURATED	☐	☐	2
ASH,GREEN	*Fraxinus pennsylvanica*	Tree	[2,3],4	FACW	SEASONAL	☐	☑	2
ASH,WHITE	*Fraxinus americana*	Tree	[4,5],6	FACU	NO	☐	☐	3
ASPEN,BIG-TOOTH	*Populus grandidentata*	Tree	[4,5,6]	FACU	NO	☐	☐	3
ASPEN,QUAKING	*Populus tremuloides*	Tree	[4,5],6	FACU	YES	☐	☐	1
AZALEA,DWARF	*Rhododendron atlanticum*	Shrub	[2,3,4],5	FAC,FAC+	YES	☐	☐	
AZALEA,EARLY	*Rhododendron prinophyllum*	Shrub	[2,3,4],5	FAC,FAC+	YES	☐	☐	3
AZALEA,HOARY	*Rhododendron canescens*	Shrub	[2,3],4	FACW	YES	☐	☐	
AZALEA,PINK	*Rhododendron periclymenoides*	Shrub	2,[3,4],5	FAC	SEASONAL	☐	☐	3
AZALEA,SMOOTH	*Rhododendron arborescens*	Shrub	[3,4],5	FAC	YES	☐	☐	4
AZALEA,SWAMP	*Rhododendron viscosum*	Shrub	[1,2,3],4	FACW+,OBL	SEASONAL	☐	☐	3
BASSWOOD,AMERICAN	*Tilia americana*	Tree	3,[4,5],6	FACU	NO	☐	☐	2
BAYBERRY,NORTHERN	*Myrica pennsylvanica*	Shrub	[3,4],5	FAC	SEASONAL	☐	☑	2
BAYBERRY,SOUTHERN	*Myrica cerifera*	Shrub	[2,3,4],5	FAC,FAC+	REG.INUNDA	☐	☐	
BEECH,AMERICAN	*Fagus grandifolia*	Tree	[4,5],6	FACU	NO	☐	☐	3
BIRCH,GRAY	*Betula populifolia*	Tree	[3,4],5	FAC	SEASONAL	☐	☐	5
BIRCH,RIVER	*Betula nigra*	Tree	[2,3],4	FACW	SEASONAL	☐	☐	4
BIRCH,YELLOW	*Betula alleghaniensis*	Tree	[3,4],5	FAC	YES	☐	☐	3
BLACK GUM, SWAMP TUPELO	*Nyssa sylvatica*	Tree	1,[2,3]	FACW+	SEASONAL	☐	☐	4

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
BLACK-HAW	*Viburnum prunifolium*	Shrub	[3,4,5],6	FACU,FACU+	YES	☐	☐	3
BLACK-HAW,RUSTY	*Viburnum rufidulum*	Shrub	3,[4,5,6]	UPL,FACU	NO	☐	☐	5
BLADDERNUT, AMERICAN	*Staphylea trifolia*	Shrub-Tree	[3,4],5	FAC	YES	☐	☐	3
BLUEBERRY,BOG	*Vaccinium uliginosum*	Shrub	2,3,4,5,6	FACU+,FACW+	YES	☐	☐	
BLUEBERRY,CREEPING	*Vaccinium crassifolium*	Shrub	[2,3,4],5	FAC,FAC+	YES	☐	☐	
BLUEBERRY,HIGHBUSH	*Vaccinium atrococcum*	Shrub	[2,3]	FACW	SEASONAL	☐	☐	3
BLUEBERRY,LOWBUSH	*Vaccinium angustifolium*	Shrub	3,[4,5,6]	FACU-,FACU	NO	☐	☐	2
BLUEBERRY,VELVET-LEAF	*Vaccinium myrtilloides*	Shrub	1,2,[3,4,5],	FACU,FACW-	YES	☐	☐	2
BOX-ELDER	*Acer negundo*	Tree	2,[3,4]	FAC+	SEASONAL	☐	☐	2
BUCKTHORN,CAROLINA	*Rhamnus caroliniana*	Shrub	2,[3,4,5,6]	FACU-,FAC	YES	☐	☐	5-6
BUCKTHORN,LANCE-LEAF	*Rhamnus lanceolata*	Shrub	6	NI	NO	☐	☐	5
BUFFALO-BERRY,CANADA	*Shepherdia canadensis*	Shrub	6	NI	NO	☐	☑	
BURNING-BUSH,EASTERN	*Euonymus atropurpureus*	Shrub	[2,3,4,5],6	FACU,FAC+	YES	☐	☐	4
BUTTERNUT	*Juglans cinerea*	Tree	[3,4,5,6]	FACU-,FACU+	YES	☐	☐	3
BUTTONBUSH,COMMON	*Cephalanthus occidentalis*	Shrub	[1,2],3	OBL	0-3'	☐	☐	
CEDAR,ATLANTIC WHITE	*Chamaecyparis thyoides*	Tree	[1,2],3	OBL	SATURATE	☐	☐	3
CEDAR,EASTERN RED	*Juniperus virginiana*	Shrub	4,5,6	FACU	NO	☑	☐	2
CEDAR,NORTHERN WHITE	*Thuja occidentalis*	Tree	[2,3],4	FACW	SEASONAL	☐	☐	2
CHERRY,BLACK	*Prunus serotina*	Tree	[4,5],6	FACU	NO	☐	☐	3
CHERRY,CHOKE	*Prunus virginiana*	Tree	4,5,6	FACU	YES	☐	☐	5,6
CHERRY,FIRE	*Prunus pensylvanica*	Tree	4,5,6	FACU	NO	☐	☐	2
COTTON-WOOD,EASTERN	*Populus deltoides*	Tree	[3,4],5	FAC	SEASONAL	☑	☑	2
COTTON-WOOD,SWAMP	*Populus heterophylla*	Tree	[2,3]	FACW+	YES	☐	☐	
CRANBERRY,MOUNTAIN	*Vaccinium vitis-idaea*	Shrub	2,[3,4],5	FAC	YES	☐	☐	2
CRANBERRY,SMALL	*Vaccinium oxycoccos*	Shrub	[1,2],3	OBL	YES	☐	☐	2

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
CRANBERRY,SOUTHERN MOUNTAIN	*Vaccinium erythrocarpum*	Shrub	2,[3,4],5	FAC	YES	☐	☐	5
CYPRESS,BALD	*Taxodium distichum*	Tree	[1,2],3	OBL	SATURATED	☐	☐	4
DANGLE-BERRY	*Gaylussacia frondosa*	Shrub	2,[3,4],5	FAC	YES	☐	☐	
DEERBERRY	*Vaccinium stamineum*	Shrub	[3,4,5,6]	FACU-,FACU+	YES	☐	☐	5
DOG-HOBBLE,COASTAL	*Leucothoe axillaris*	Shrub	[1,2,3,4],5	FACW,FACW+	YES	☐	☐	6
DOG-HOBBLE,RED-TWIG	*Leucothoe recurva*	Shrub	3,[4,5],6	FACU	NO	☐	☐	5
DOGWOOD, GRAY	*Cornus racemosa*	Shrub	2[3,4]	FAC+	SEASONAL	☐	☐	
DOGWOOD,FLOWERING	*Cornus florida*	Shrub-Tree	4,5,6	FACU-	NO	☐	☐	4
DOGWOOD,ROUGH-LEAF	*Cornus asperifolia*	Shrub	1,2,[3,4,5]	FAC-,FACW-	YES	☐	☐	
DOGWOOD,ROUGH-LEAF	*Cornus drummondii*	Shrub	2,[3,4],5	FAC	YES	☐	☐	4
DOGWOOD,SILKY	*Cornus amomum*	Shrub	[2,3],4	FACW	SEASONAL	☐	☐	5
ELDER,EUROPEAN RED	*Sambucus racemosa*	Shrub	[3,4,5],6	FACU,FACU+	YES	☐	☐	4
ELM,SLIPPERY	*Ulmus rubra*	Tree	[3,4],5	FAC	YES	☐	☐	3
FALSE-WILLOW,EASTERN	*Baccharis halimifolia*	Shrub	1,[2,3,4],5	FAC,FACW	0-6"	☐	☐	
FARKLEBERRY	*Vaccinium arboreum*	Shrub	3,[4,5],6	FACU	NO	☐	☐	7
FETTER-BUSH	*Leucothoe racemosa*	Shrub	1,[2,3,4],5	FACW	SEASONAL	☐	☐	5
FETTER-BUSH	*Lyonia lucida*	Shrub	1,[2,3,4],5	FACW	YES	☐	☐	
GERMANDER,AMERICAN	*Teucrium canadense*	Shrub	1,[2,3,4],5	FAC+,FACW	YES	☐	☐	
GROUNDSEL TREE	*Baccheris halimifolia*	Shrub	[2,3]4	FACW		☐	☐	
GUM,SWEET	*Liquidambar styraciflua*	Tree	[3,4],5	FAC	YES	☐	☐	4
HACKBERRY,COMMON	*Celtis occidentalis*	Shrub-Tree	4,5,6	FACU	SEASONAL	☑	☐	5
HAWTHORN,BEAUTIFUL	*Crataegus pulcherrima*	Tree	2,[3,4],5	FAC	YES	☐	☐	4
HAWTHORN,COCKSPUR	*Crataegus crus-galli*	Tree	2,[3,4,5],6	FACU,FAC	YES	☑	☐	4
HAWTHORN,DOWNY	*Crataegus mollis*	Tree	1,2,[3,4,5],	FACU,FACW-	YES	☐	☐	4
HAWTHORN,GREEN	*Crataegus viridis*	Tree	1,[2,3,4],5	FAC,FACW	YES	☐	☐	4

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
HAWTHORN,LITTLE-HIP	*Crataegus spathulata*	Tree	1,[2,3,4],5	FAC,FACW	YES	☐	☐	4
HAWTHORN,PARSLEY	*Crataegus marshallii*	Tree	[1,2,3,4],5,	FACU+,FACW	YES	☐	☐	4
HAWTHORN,WASHINGTON	*Crataegus phaenopyrum*	Tree	2,[3,4,5]	FAC-,FAC	YES	☐	☐	4
HAZEL-NUT,AMERICAN	*Corylus americana*	Shrub	3,[4,5,6]	UPL,FACU	NO	☐	☐	4
HAZEL-NUT,BEAKED	*Corylus cornuta*	Shrub	3,[4,5,6]	UPL,FACU	NO	☐	☐	4
HEATHER	*Calluna vulgaris*	Shrub	2,[3,4],5	FAC	YES	☐	☐	4
HEMLOCK,EASTERN	*Tsuga canadensis*	Tree	4,5,6	FACU	NO	☐	☐	3
HICKORY,BIG SHELLBARK	*Carya laciniosa*	Tree	1,[2,3,4],5	FAC,FACW	YES	☐	☐	5
HICKORY,BITTER-NUT	*Carya cordiformis*	Tree	4,5,6	FACU+	NO	☐	☐	4
HICKORY,PECAN	*Carya illinoensis*	Tree	1,[2,3,4,5],	FACU,FACW	YES	☐	☐	5
HICKORY,RED	*Carya ovalis*	Tree	3,[4,5,6]	UPL,FACU	NO	☐	☐	4
HICKORY,SHAG-BARK	*Carya ovata*	Tree	[3,4,5,6]	FACU-,FACU+	YES	☐	☐	4
HICKORY,SWEET PIGNUT	*Carya glabra*	Tree	3,[4,5,6]	FACU-,FACU	NO	☐	☐	4
HOLLY, WINTERBERRY	*Ilex laevigata*	Shrub	[1,2],3	OBL	YES	☐	☐	4
HOLLY,AMERICAN	*Ilex opaca*	Shrub	4,5,6	FACU	LIMITED	☑	☐	5
HOLLY,BAY-GALL	*Ilex coriacea*	Shrub	1,[2,3,4],5	FACW	YES	☐	☐	
HOLLY,DECIDUOUS	*Ilex decidua*	Shrub	1,[2,3,4,5]	FACW-,FACW	SEASONAL	☐	☐	
HOLLY,GEORGIA	*Ilex longipes*	Shrub	1,[2,3,4],5	FAC,FACW	YES	☐	☐	
HOLLY,SARVIS	*Ilex amelanchier*	Shrub	[1,2],3	OBL	YES	☐	☐	
HOP-HORNBEAM,EASTERN	*Ostrya virginiana*	Shrub-Tree	[3,4,5,6]	FACU-,FACU+	YES	☐	☐	4
HORNBEAM,AMERICAN	*Carpinus caroliniana*	Tree	[3,4],5	FAC	SOME	☐	☐	2
HUCKLEBERRY,BLACK	*Gaylussacia baccata*	Shrub	3,[4,5],6	FACU	NO	☐	☐	2
HUCKLEBERRY,DWARF	*Gaylussacia dumosa*	Shrub	2,[3,4],5	FAC	YES	☐	☐	2
HYDRANGEA,PANICLE	*Hydrangea paniculata*	Shrub	2,[3,4],5	FAC	YES	☐	☐	4
HYDRANGEA,WILD	*Hydrangea arborescens*	Shrub	3,[4,5,6]	UPL,FACU	NO	☐	☐	4

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
INK-BERRY	*Ilex glabra*	Shrub	[2,3],4	FACW-	SEASONAL	☐	☐	3
LAUREL,MOUNTAIN	*Kalmia latifolia*	Shrub	4,5,6	FACU	NO	☐	☐	4
LOCUST,BLACK	*Robinia pseudoacacia*	Tree	4,5,6	FACU	YES	☐	☑	5
MAGNOLIA,UMBRELLA	*Magnolia tripetala*	Tree	2,[3,4,5],6	FACU,FAC	YES	☐	☐	4
MALEBERRY	*Lyonia ligustrina*	Shrub	1,[2,3,4],5	FACW	YES	☐	☐	3
MAPLE,MOUNTAIN	*Acer spicatum*	Tree	4,5,6	FACU	NO	☐	☐	2
MAPLE,RED	*Acer rubrum*	Tree	[3,4],5	FAC	SEASONAL	☐	☐	3
MAPLE,SILVER	*Acer saccharinum*	Tree	[2,3],4	FACW	SEASONAL	☐	☐	3
MAPLE,STRIPED	*Acer pensylvanicum*	Shrub-Tree	3,[4,5,6]	FACU-,FACU	NO	☐	☐	3
MARSH ELDER	*Iva frutescens*	Shrub	1[2,3]	FACW+		☐	☑	
MEADOW-SWEET,BROAD-LEAF	*Spiraea latifolia*	Shrub	[2,3,4]	FAC+,FACW	YES	☐	☐	2
MEADOW-SWEET,NARROW-LEAF	*Spiraea alba*	Shrub	[1,2,3,4],5	FACW,FACW+	YES	☐	☐	4
MEADOW-SWEET,VIRGINIA	*Spiraea virginiana*	Shrub	1,[2,3,4,5],	FACU,FACW	YES	☐	☐	5
MEADOW-SWEET,WILLOW-LEAF	*Spiraea salicifolia*	Shrub	1,[2,3]	FACW+	YES	☐	☐	4
NANNYBERRY	*Viburnum lentago*	Shrub	[3,4],5	FAC	SEASONAL	☐	☐	2
NINEBARK,EASTERN	*Physocarpus opulifolius*	Shrub	[2,3],4	FACW-	YES	☐	☐	2
OAK, PIN	*Quercus palustris*	Tree	[2,3],4	FACW	SEASONAL	☑	☐	4
OAK, SCARLET	*Quercus coccinea*	Tree	6		NO	☐	☐	
OAK,BUR	*Quercus macrocarpa*	Tree	3,[4,5],6	FAC-	YES	☑	☐	2
OAK,CHERRY-BARK	*Quercus falcata var. pagodafolia*	Tree	1,[2,3,4],5	FAC+,FACW	YES	☐	☐	5-6
OAK,CHESTNUT	*Quercus prinus*	Tree	4,5,6	FACU	NO	☐	☐	5,6
OAK,CHINKAPIN	*Quercus muhlenbergii*	Tree	[3,4],5	FAC	YES	☐	☐	5
OAK,LAUREL	*Quercus laurifolia*	Tree	1,[2,3,4,5]	FACW-,FACW	YES	☐	☐	
OAK,LIVE	*Quercus virginiana*	Tree	4,5,6	FACU	YES	☐	☑	7
OAK,OVERCUP	*Quercus lyrata*	Tree	[1,2],3	OBL	YES	☐	☐	5

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
OAK,POST	*Quercus stellata*	Tree	3,[4,5,6]	UPL,FACU	NO	☐	☐	5
OAK,RED	*Quercus rubra*	Tree	6		NO	☑	☐	
OAK,SHINGLE	*Quercus imbricaria*	Tree	[3,4],5	FAC	YES	☑	☐	5
OAK,SHUMARD	*Quercus shumardii*	Tree	2,[3,4]	FAC+	YES	☐	☐	5
OAK,SWAMP CHESTNUT	*Quercus michauxii*	Tree	1,[2,3,4,5]	FACW-,FACW	YES	☐	☐	
OAK,SWAMP WHITE	*Quercus bicolor*	Tree	1,[2,3]	FACW+	SEASONAL	☐	☐	3
OAK,WATER	*Quercus nigra*	Tree	[3,4],5	FAC	SEASONAL	☐	☐	6
OAK,WHITE	*Quercus alba*	Tree	[4,5,6]	FACU	YES	☐	☐	4
OAK,WILLOW	*Quercus phellos*	Tree	2,[3,4]	FAC+	SEASONAL	☐	☐	5
PEPPER-BUSH,SWEET	*Clethra alnifolia*	Shrub	2,[3,4]	FAC+	SEASONAL	☐	☑	3
PINE,EASTERN WHITE	*Pinus strobus*	Tree	4,5,6	FACU	NO	☑	☑	3
PINE,JERSEY	*Pinus viginiana*	Tree	6		NO	☐	☑	
PINE,LOBLOLLY	*Pinus taeda*	Tree	3,[4,5],6	FAC-	SEASONAL	☐	☐	
PINE,PITCH	*Pinus rigida*	Tree	4,5,6	FACU	SEASONAL	☐	☑	4
PINE,POND	*Pinus serotina*	Tree	[1,2],3	OBL	YES	☐	☐	
REDBUD,EASTERN	*Cercis canadensis*	Shrub-Tree	3,[4,5,6]	UPL,FACU	NO	☐	☐	4
RHODODENDRON	*Rhododendron canadense*	Shrub	1,[2,3,4],5	FACW	YES	☐	☐	2
RHODODENDRON,ROSEBAY	*Rhododendron maximum*	Shrub	[3,4],5	FAC	YES	☐	☐	3
ROSEMARY,BOG	*Andromeda polifolia*	Shrub	[1,2],3	OBL	YES	☐	☐	
SAND-MYRTLE	*Leiophyllum buxifolium*	Shrub	3,4,[5,6]	FACU-	NO	☐	☐	
SASSAFRAS	*Sassafras albidum*	Tree	3,[4,5,6]	FACU-,FACU	NO	☐	☐	4
SERVICE-BERRY,DOWNY	*Amelanchier arborea*	Shrub-Tree	2,[3,4,5],6	FAC-	YES	☐	☐	
SHEEP-LAUREL	*Kalmia angustifolia*	Shrub	3,[4,5],6	FAC	YES	☐	☐	2
SILVER-BERRY,AMERICAN	*Elaeagnus commutata*	Shrub	[6]	UPL	NO	☐	☐	
SNOWBELL,BIG-LEAF	*Styrax grandifolia*	Shrub	3,[4,5,6]	FACU-,FACU	NO	☐	☐	5

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
SPICEBUSH,NORTHERN	*Lindera benzoin*	Shrub	[2,3],4	FACW-	SEASONAL	☐	☐	3-5
STAGGER-BUSH,PIEDMONT	*Lyonia mariana*	Shrub	2,[3,4,5,6]	FACU-,FAC	YES	☐	☐	5
STEEPLE-BUSH	*Spiraea tomentosa*	Shrub	1,[2,3,4],5	FACW	YES	☐	☐	4
STRAWBERRY-BUSH,AMERICAN	*Euonymus americanus*	Shrub	1,[2,3,4,5],	FACU,FACW	YES	☐	☐	5
SUGAR-BERRY	*Celtis laevigata*	Shrub	1,[2,3,4,5,6	UPL,FACW	YES	☐	☐	
SWEETSHRUB	*Calycanthus fertilis*	Shrub	[3,4,5],6	FACU,FACU+	YES	☐	☐	5
SYCAMORE,AMERICAN	*Platanus occidentalis*	Tree	[2,3],4	FACW-	SATURATED	☐	☐	
TEABERRY	*Gaultheria procumbens*	Shrub	3,[4,5],6	FACU	NO	☐	☐	3
TREE,TULIP	*Liriodendron tulipifera*	Tree	2,[3,4,5],6	FACU,FAC	YES	☐	☐	4
VIBURNUM,MAPLE-LEAF	*Viburnum acerifolium*	Shrub	3,[4,5,6]	UPL,FACU	NO	☐	☐	3
VIBURNUM,POSSUM-HAW	*Viburnum nudum*	Shrub	[1,2],3	OBL	YES	☐	☐	6
WILLOW,BLACK	*Salix nigra*	Tree	[2,3]	FACW+	SEASONAL	☐	☐	3
WILLOW,HEART-LEAF	*Salix cordata*	Shrub	1,[2,3,4],5	FAC,FACW	YES	☐	☐	3
WILLOW,SILKY	*Salix sericea*	Shrub	[1,2],3	OBL	YES	☐	☐	3
WILLOW,TALL PRAIRIE	*Salix humilis*	Shrub	3,[4,5],6	FACU	NO	☐	☐	3
WILLOW,VIRGINIA	*Itea virginica*	Shrub	[1,2],3	OBL	0-6"	☐	☐	5
WINTERBERRY,COMMON	*Ilex verticillata*	Shrub	1,[2,3]	FACW+	SEASONAL	☐	☐	3
WITCH-ALDER,DWARF	*Fothergilla gardenii*	Shrub	1,[2,3,4],5	FACW	YES	☐	☐	
WITCH-HAZEL, AMERICAN	*Hamamelis virginiana*	Shrub-Tree	3,[4,5],6	FAC-	NO	☑	☐	4
WITCH-HAZEL,AMERICAN	*Hamamelis virginiana*	Shrub-Tree	2,3,[4,5],6	FACU,FAC-	NO	☑	☐	4
WITHE-ROD	*Viburnum cassinoides*	Shrub	1,[2,3,4],5	FACW	YES	☐	☐	3
YAUPON	*Ilex vomitoria*	Shrub	3,[4,5],6	FAC-	YES	☐	☑	
YEW,AMERICAN	*Taxus canadensis*	Shrub	2,[3,4,5],6	FACU,FAC	YES	☐	☐	2

Appendix A.4.2 Stormwater Plant List - Herbaceous Vegetation

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
ARROW-GRASS,MARSH	*Triglochin palustre*	Grass	[1,2],3	OBL	YES	☐	☐	
ARROW-HEAD,BROAD-LEAF	*Sagittaria latifolia*	Perennial	[1,2],3	OBL	0-2'	☐	☐	
ARROW-HEAD,COASTAL	*Sagittaria falcata*	Perennial	[1,2],3	OBL	YES	☐	☐	
ARROW-HEAD,GRASS-LEAF	*Sagittaria graminea*	Perennial	[1,2],3	OBL	0-1'	☐	☐	
ARROW-HEAD,NORTHERN	*Sagittaria cuneata*	Perennial	[1,2],3	OBL	YES	☐	☐	
ARROW-HEAD,SHORT-BEAK	*Sagittaria brevirostra*	Perennial	[1,2],3	OBL	YES	☐	☐	
ARROW-HEAD,WAPATO DUCK POTATO	*Sagittaria latifolia*	Perennial	[1,2],3	OBL	0-2'	☐	☐	3-8
ASTER,ANNUAL SALTMARSH	*Aster subulatus*	Annual	[1,2],4	OBL	YES	☐	☑	
ASTER,BOG	*Aster nemoralis*	Perennial	[2,3],4	FACW+	YES	☐	☐	
ASTER,BUSH	*Aster dumosus*	Perennial	[3,4],5	FAC	NO	☐	☐	
ASTER,CALICO	*Aster lateriflorus*	Perennial	[2,3,4]	FACW-	SEASONAL	☐	☐	
ASTER,CROOKED-STEM	*Aster prenanthoides*	Perennial	[3,4],5	FAC	NO	☐	☐	
ASTER,FLAT-TOP WHITE	*Aster umbellatus*	Perennial	[2,3],4	FACW	YES	☐	☐	
ASTER,NEW ENGLAND	*Aster novae-angliae*	Perennial	[2,3],4	FACW	YES	☐	☐	
ASTER,NEW YORK	*Aster novi-belgii*	Perennial	[2,3],4	FACW+	YES	☐	☐	
ASTER,ONTARIO	*Aster ontarionis*	Perennial	[3,4],5	FAC	NO	☐	☐	
ASTER,PANICLED	*Aster simplex*	Perennial	[2,3],4	FACW	YES	☐	☐	
ASTER,PERENNIAL SALTMARSH	*Aster tenuifolius*	Perennial	1,[2,3]	OBL	YES	☐	☑	
ASTER,SMALL WHITE	*Aster vimineus*	Perennial	[3,4,5]	FAC	NO	☐	☐	
ASTER,SWAMP	*Aster puniceus*	Perennial	1,[2,3]	OBL	YES	☐	☐	

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
ASTER,TRADESCANT	*Aster tradescanti*	Perennial	[2,3],4	FACW	YES	☐	☐	
ASTER,WHITE HEATH	*Aster ericoides*	Perennial	3,[4,5,6]	FACU	NO	☐	☐	
ASTER,WILLOW-LEAF	*Aster praealtus*	Perennial	[2,3],4	FACW	YES	☐	☐	
BABY-BLUE-EYES,SMALL-FLOWER	*Nemophila aphylla*	Annual	[2,3],4	FACW	YES	☐	☐	
BEACHGRASS,AMERICAN	*Ammophila breviligulata*	Grass	4,[5,6]	FACU-	NO	☐	☐	
BEAKRUSH,FASCICULATE	*Rhynchospora fascicularis*	Grass	[1,2],3	OBL	YES	☐	☐	
BEAKRUSH,GRAY'S	*Rhynchospora grayi*	Grass	2,3,4,5,6	FAC	NO	☐	☐	
BEAKRUSH,PINELAND	*Rhynchospora perplexa*	Grass	[2,3],4	FACW+	YES	☐	☐	
BEAKRUSH,TALL	*Rhynchospora macrostachya*	Grass	[1,2],3	OBL	YES	☐	☐	
BEARDTONGUE	*Penstemon digitalis*	Perennial	3,4,5	FAC	NO	☐	☐	3-8
BEARDTONGUE,LONG-SEPAL	*Penstemon calycosus*	Perennial	[4,5,6]	UPL,FACU	NO	☐	☐	
BEARDTONGUE,LOWLAND	*Penstemon alluviorum*	Perennial	[2,3,4]	FACW	YES	☐	☐	
BEEBALM	*Monarda didyma*	Perennial	3,4,5	FAC+	SATURATED	☐	☐	4-8
BENTGRASS,BROWN	*Agrostis canina*	Grass	[4,5,6]	FACU	NO	☐	☐	
BENTGRASS,PERENNIAL	*Agrostis perennans*	Grass	[4,5],6	FACU	YES	☐	☐	
BENTGRASS,SPREADING	*Agrostis stolonifera*	Grass	[2,3],4	FACW	YES	☐	☐	
BENTGRASS,WINTER	*Agrostis hyemalis*	Grass	[3,4],5	FAC	NO	☐	☐	
BERGAMOT,WILD	*Monarda fistulosa*	Perennial	[4,5,6]	UPL	NO	☐	☐	
BLACK-EYED SUSAN	*Rudbeckia hirta (yellow)*	Perennial	4,5,6	FACU-	NO	☐	☐	3-7
BLADDERWORT,COMMON	*Utricularia macrorhiza*	Perennial	[1,2],3	OBL	YES	☐	☐	
BLOODROOT	*Sanguinaria canadensis*	Perennial	4,[5,6]	UPL,FACU-	NO	☐	☐	
BLUEBELLS,VIRGINIA	*Mertensia virginica*	Perennial	[2,3],4	FACW	YES	☐	☐	

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
BLUE-EYE-GRASS	*Sisyrinchium capillare*	Grass	[2,3]4	FACW+	YES	☐	☐	
BLUEFLAG,SOUTHERN	*Iris shrevei*	Perennial	1,[2],3	OBL	YES	☐	☐	
BLUEFLAG,VIRGINIA	*Iris virginica*	Perennial	1,[2],3	OBL	YES	☐	☐	
BLUEGRASS,BOG	*Poa paludigena*	Grass	[2,3],4	FACW+	YES	☐	☐	
BLUEGRASS,GROVE	*Poa alsodes*	Grass	2,[3,4],5	FACW-	SEASONAL	☐	☐	
BLUEGRASS,LOW	*Poa alpigena*	Grass	2,[3,4],5	FACW-	SEASONAL	☐	☐	
BLUESTEM,BIG	*Andropogon gerardii*	Grass	[4,5],6	FAC	NO	☐	☐	
BLUESTEM,BUSHY	*Andropogon glomeratus*	Grass	[2,3],4	FACW+	YES	☐	☐	
BROOM-SEDGE	*Andropogon virginicus*	Grass	[4,5],6	FACU	NO	☐	☐	
BULRUSH, HARDSTEMMED	*Scirpus acutus*	Perennial	[1,2],3	OBL	0-3'	☐	☐	8
BULRUSH, SOFTSTEM	*Scirpus validus*	Perennial	[1,2,],3	OBL	0-1'	☐	☐	8
BULRUSH,ALKALI	*Scirpus robustus*	Grass	1,[2],3	OBL	SALT, EDGE	☐	☑	
BULRUSH,CLINTON'S	*Scirpus clintonii*	Grass	[4,5,6]	FACU	NO	☐	☐	
BULRUSH,OLNEY'S	*Scirpus americanus*	Grass	[1,2],3	OBL	0-6"	☐	☐	
BULRUSH,RIVER	*Scirpus fluviatilis*	Grass	[1,2],3	OBL	0-1'	☐	☐	
BULRUSH,SPREADING	*Scirpus divaricatus*	Grass	[1,2],3	OBL	YES	☐	☐	
BULRUSH,THREE-SQUARE	*Scirpus pungens*	Grass	[2,3],4	FACW+	0-6"	☐	☐	
BURREED,AMERICAN	*Sparganium americanum*	Grass	[1,2],3	OBL	0-1'	☐	☐	
BURREED,GIANT	*Sparganium eurycarpum*	Grass	[1,2],3	OBL	YES	☐	☐	
BUSHCLOVER,NARROW-LEAF	*Lespedeza angustifolia*	Groundcover	4,5,6	FACU	NO	☐	☐	
BUTTER-CUP,ALLEGHENY MOUNTAIN	*Ranunculus allegheniensis*	Perennial	[3,4],5	FAC	NO	☐	☐	
BUTTER-CUP,POND	*Ranunculus subrigidus*	Perennial	[1,2],3	OBL	YES	☐	☐	

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
BUTTER-CUP,SEASIDE	*Ranunculus cymbalaria*	Perennial	[1,2],3	OBL	YES	☐	☐	
CAMPION, SNOWY	*Silene nivea*	Perennial	[3,4],5	FAC	NO	☐	☐	4-8
CARDINAL FLOWER	*Lobelia cardinalis*	Perennial	1,[2,3],4	FACW+	YES	☐	☐	2-8
CHICORY	*Cichorium intybus*	Perennial	5,6	UPL	NO	☐	☐	3-8
CLUB,GOLDEN	*Orontium aquaticum*	Perennial	[1,2],3	OBL	YES	☐	☐	
COLTSFOOT,SWEET	*Petasites palmatus*	Perennial	1,[2,3],4	FACW+	YES	☐	☐	
COLUMBINE,WILD	*Aquilegia canadensis*	Perennial	[3,4],5	FAC	NO	☐	☐	
CONEFLOWER,CUT-LEAF	*Rudbeckia laciniata*	Perennial	[2,3],4	FACW	YES	☐	☐	
CONEFLOWER,ORANGE	*Rudbeckia fulgida*	Perennial	[3,4],5	FAC	NO	☐	☐	
CONEFLOWER,SWEET	*Rudbeckia subtomentosa*	Perennial	[3,4],5	FAC	NO	☐	☐	
CORDGRASS,BIG	*Spartina cynosuroides*	Grass	[1,2],3	OBL	SALT, EDGE	☐	☑	
CORDGRASS,PRAIRIE	*Spartina pectinata*	Grass	[1,2],3	OBL	SALT, EDGE	☐	☑	
CORDGRASS,SALTMARSH	*Spartina alterniflora*	Grass	[1,2],3	OBL	SALT, EDGE	☐	☑	
CORDGRASS,SALTMEADOW	*Spartina patens*	Grass	1,[2,3],4	FACW+	SALT, EDGE	☐	☑	
CORNFLOWER	*Centaurea cyanus*	Perennial	5,6	UPL	NO	☐	☐	
CUTGRASS,RICE	*Leersia oryzoides*	Grass	[1,2],3	OBL	0-6"	☐	☐	
DAISY, OXEYE	*Chrysanthemum levcanthemu*	Perennial	5,6	UPL	NO	☐	☐	
DRAGON-HEAD,FALSE	*Physostegia virginiana*	Perennial	2,[3,4],5	FAC+	SATURATED	☐	☐	
DRAGON-HEAD,PURPLE	*Physostegia purpurea*	Perennial	[2,3],4	FACW	YES	☐	☐	
DRAGON-HEAD,SLENDER	*Physostegia intermedia*	Perennial	[2,[3,4]	FACW-	SEASONAL	☐	☐	
DRAGON-HEAD,SLENDER-LEAF	*Physostegia leptophylla*	Perennial	[1,2],3	OBL	YES	☐	☐	
DROPSEED,SEASHORE	*Sporobolus virginicus*	Grass	1,[2,3],4	FACW+	YES	☐	☐	

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
DUCKWEED	*Lemna trinervis*	Perennial	[1,2],3	OBL	Fre Float	☐	☐	
DUCKWEED,LEAST	*Lemna minima*	Perennial	[1,2],3	OBL	Free Float	☐	☐	
DUCKWEED,LESSER	*Lemna minor*	Perennial	[1,2],3	OBL	Free Float	☐	☐	
DUCKWEED,MINUTE	*Lemna perpusilla*	Perennial	[1,2],3	OBL	Free Float	☐	☐	
DUCKWEED,PALE	*Lemna valdiviana*	Perennial	[1,2],3	OBL	Free Float	☐	☐	
DWARF PLAINS COREOPSIS	*Coreopsis tinctoria (dwarf)*	Annual	3,[4,5],6	FAC-	NO	☐	☐	
EELGRASS	*Zostera marina*	Perennial	[1,2],3	OBL	2-6'	☐	☑	3-8
FALSE-HELLEBORE,AMERICAN	*Veratrum viride*	Perennial	[2,3,4]	FACW+	YES	☐	☐	
FALSE-SOLOMON'S-SEAL,FEATHER	*Smilacina racemosa*	Perennial	[4,5],6	FACU-	NO	☐	☐	
FERN,CINNAMON	*Osmunda cinnamomea*	Fern	[2,3],4	FACW	SATURATE	☐	☐	
FERN,NEW YORK	*Thelypteris noveboracensis*	Fern	[3,4],5	FAC	SATURATE	☐	☐	
FERN,ROYAL	*Osmunda regalis*	Fern	[1,2],3	OBL	SATURATE	☐	☐	
FERN,SENSITIVE	*Onoclea sensibilis*	Fern	[2,3],4	FACW	SATURATE	☐	☐	
FESCUE,MEADOW	*Festuca pratensis*	Grass	[3,4,5,6]	FACU-	NO	☐	☐	
FESCUE,NODDING	*Festuca obtusa*	Grass	[4,5],6	FACU	NO	☐	☐	
FESCUE,RED	*Festuca rubra*	Groundcover	[4,5]	FACU	NO	☐	☐	
FLATSEDGE,MARSH	*Cyperus pseudovegetus*	Grass	[2,3],4	FACW	YES	☐	☐	
FLATSEDGE,POORLAND	*Cyperus compressus*	Grass	[3,4],5	FAC+	SATURATE	☐	☐	
FLATSEDGE,RUSTY	*Cyperus odoratus*	Grass	[2,3],4	FACW	YES	☐	☐	
FLATSEDGE,SHORT-LEAF	*Cyperus brevifolius*	Grass	[1,2],3	OBL	YES	☐	☐	
FLATSEDGE,SLENDER	*Cyperus filicinus*	Grass	2,[3,4,5,6]	UPL,FAC	YES	☐	☐	
FLAX, VIRGINIA	*Linum virginianum*	Perennial	5,6	FACU	NO	☐	☐	1-8

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
FLOATING-HEART,YELLOW	*Nymphoides peltata*	Perennial	[1,2],3	OBL	YES	☐	☐	
FORGET-ME-NOT,FIELD	*Myosotis arvensis*	Perennial	[3,4,5,6]	UPL	NO	☐	☐	
FOUR-O'CLOCK,HEART-LEAF	*Mirabilis nyctaginea*	Perennial	[4,5,6]	FACU	NO	☐	☐	
FOXTAIL,MEADOW	*Alopecurus geniculatus*	Grass	[1,2],3	OBL	YES	☐	☐	
FOXTAIL,MEADOW	*Alopecurus pratensis*	Grass	[2,3],4	FACW	YES	☐	☐	
FOXTAIL,MOUSE	*Alopecurus myosuroides*	Grass	[2,3],4	FACW	YES	☐	☐	
FOXTAIL,SHORT-AWN	*Alopecurus aequalis*	Grass	[1,2],3	OBL	YES	☐	☐	
FOXTAIL,TUFTED	*Alopecurus carolinianus*	Grass	[2,3],4	FACW	YES	☐	☐	
GLASSWORT,VIRGINIA	*Salicornia virginica*	Perennial	[1,2],3	OBL	SALT,EDGE	☐	☐	
GOLDEN-ROD	*Solidago austrina*	Perennial	[1,2],3	OBL	YES	☐	☐	
GOLDEN-ROD,COAST	*Solidago spathulata*	Perennial	4,[5,6]	FACU-	NO	☐	☐	
GOLDEN-ROD,SEASIDE	*Solidago sempervirens*	Perennial	[2,3],4	FACW	YES	☐	☐	
GOLDEN-ROD,STIFF	*Solidago rigida*	Perennial	1,2,3	OBL	NO	☐	☐	
GRASS,BROOM PANIC	*Dichanthelium scoparium*	Grass	[2,3],4	FACW	YES	☐	☐	
GRASS,CANADA MANNA	*Glyceria canadensis*	Grass	[1,2],3	OBL	0-1'	☐	☐	
GRASS,EASTERN MANNA	*Glyceria septentrionalis*	Grass	[1,2],3	OBL	0-1'	☐	☐	
GRASS,FOWL MANNA	*Glyceria striata*	Grass	[1,2],3	OBL	SEASONAL	☐	☐	
GRASS,PANIC	*Dichanthelium acuminatum*	Grass	[2,3],4	FAC	NO	☐	☐	
GRASS,PANIC	*Panicum longifolium*	Grass	[1,2],3	OBL	YES	☐	☐	
GRASS,ROUGH BARNYARD	*Echinochloa muricata*	Grass	[2,3],4	FACW+	YES	☐	☐	
GRASS,SALTMARSH ALKALI	*Puccinellia fasciculata*	Grass	[1,2],3	OBL	YES	☐	☐	
GRASS,SALTMEADOW	*Spartina caespitosa*	Grass	[1,2],3	OBL	YES	☐	☐	

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
HORNWORT,COMMON	*Ceratophyllum demersum*	Perennial	[1,2],3	OBL	1-5'	☐	☐	
HORSETAIL,ROUGH	*Equisetum hyemale*	Grass	[2,3],4	FACW	YES	☐	☐	
INDIAN-TOBACCO	*Lobelia inflata*	Perennial	[4,5,6]	FACU	NO	☐	☐	
IRIS, BLUE WATER	*Iris versicolor*	Perennial	[1,2],3	OBL	0-6"	☐	☐	2-7
IRIS,BEACH-HEAD	*Iris hookeri*	Perennial	4,[5,6]	FACU-	NO	☐	☐	
IRIS,BEACH-HEAD	*Iris setosa*	Perennial	[3,4],5	FAC	NO	☐	☐	
IRIS,COPPER	*Iris fulva*	Perennial	[1,2],3	OBL	YES	☐	☐	
IRIS,LAMANCE	*Iris brevicaulis*	Perennial	[1,2],3	OBL	YES	☐	☐	
JACK-IN-THE-PULPIT,SWAMP	*Arisaema triphyllum*	Perennial	[2,3],4	FACW	SEASONAL	☐	☐	
JACOB'S LADDER	*Polemonium reptans*	Perennial	[4,5],6	FACU	NO	☐	☐	3-8
JACOB'S-LADDER,BOG	*Polemonium van-bruntiae*	Perennial	[3,4],5	FAC+	SATURATED	☐	☐	
LILY,CANADA	*Lilium canadense*	Perennial	2,[3,4]	FAC+	YES	☐	☐	
LILY,CAROLINA	*Lilium michauxii*	Perennial	[3,4,5]	FAC	NO	☐	☐	
LILY,GRAY'S	*Lilium grayi*	Perennial	3,[4,5],6	FACU	NO	☐	☐	
LILY,SOUTHERN RED	*Lilium catesbaei*	Perennial	[2,3,4]	FACW	YES	☐	☐	
LILY,TURK'S-CAP	*Lilium superbum*	Perennial	[2,3,4]	FACW+	YES	☐	☐	
LIZARDS TAIL	*Saururus cemuus*	Perennial	2,3,4	OBL	0-1'	☐	☐	2-8
LOBELIA,BOYKIN'S	*Lobelia boykinii*	Perennial	[1,2],3	OBL	YES	☐	☐	
LOBELIA,BROOK	*Lobelia kalmii*	Perennial	[1,2],3	OBL	YES	☐	☐	
LOBELIA,DOWNY	*Lobelia puberula*	Perennial	[2,3,4]	FACW-	SEASONAL	☐	☐	
LOBELIA,ELONGATED	*Lobelia elongata*	Perennial	[1,2],3	OBL	YES	☐	☐	
LOBELIA,GEORGIA	*Lobelia georgiana*	Perennial	[2,3,4]	FACW	YES	☐	☐	

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
LOBELIA,GREAT BLUE	*Lobelia siphilitica*	Perennial	[2,3],4	FACW+	YES	☐	☐	
LOBELIA,NUTTALL'S	*Lobelia nuttallii*	Perennial	[2,3,4]	FACW	YES	☐	☐	
LOBELIA,PALE-SPIKE	*Lobelia spicata*	Perennial	[3,4,5]	FAC-	NO	☐	☐	
LOBELIA,SOUTHERN	*Lobelia amoena*	Perennial	[1,2],3	OBL	YES	☐	☐	
LOBELIA,WATER	*Lobelia dortmanna*	Perennial	[1,2],3	OBL	YES	☐	☐	
LOTUS,AMERICAN	*Nelumbo lutea*	Perennial	[1,2],3	OBL	1-5'	☐	☐	
LOTUS,SACRED	*Nelumbo nucifera*	Perennial	[1,2],3	OBL	1-5'	☐	☐	
LOVEGRASS,MEADOW	*Eragrostis refracta*	Grass	[2,3,]4	FACW	YES	☐	☐	
LOVEGRASS,PURPLE	*Eragrostis pectinacea*	Grass	[4,5],6	FAC	NO	☐	☐	
MALLOW,VIRGINIA SEASHORE	*Kosteletzkya virginica*	Perennial	[1,2],3	OBL	SALT, EDGE	☐	☑	
MARSH MARIGOLD	*Caltha palustris*	Perennial	3,4	OBL	6"SATURATE	☐	☐	3-8
MARSH SMARTWEED	*Polygonum hydropiperoides*	Perennial	2,3	OBL	0-1'	☐	☐	2-8
MARSH SMARTWEED	*Polygonum puntatum*	Perennial	2,3	OBL	SATURATE	☐	☐	2-8
MARSH-MALLOW,COMMON	*Althaea officinalis*	Perennial	[1,2,3]	FACW+	YES	☐	☐	
MEADOW-RUE,PIEDMONT	*Thalictrum macrostylum*	Perennial	[2,3,4]	FACW	YES	☐	☐	
MILKWORT,MARYLAND	*Polygala mariana*	Annual	[2,3,4]	FACW	YES	☐	☐	
MONKEY-FLOWER	*Mimulus ringens*	Perennial	[1,2],3	OBL	YES	☐	☐	3-8
MONKEY-FLOWER,COMMON LARGE	*Mimulus guttatus*	Annual	[1,2],3	OBL	YES	☐	☐	
MOUNTAIN-MINT,NARROW-LEAF	*Pycnanthemum flexuosum*	Perennial	[2,3,4]	FACW	YES	☐	☐	
MUHLY,MARSH	*Muhlenbergia glomerata*	Grass	[2,3],4	FACW	YES	☐	☐	
NIMBLE-WILL	*Muhlenbergia schreberi*	Grass	[3,4,5]	FAC	NO	☐	☐	
NUTRUSH	*Scleria flaccida*	Grass	[2,3],4	FACW	YES	☐	☐	

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
PANSY,FIELD	*Viola bicolor*	Annual	[4,5,6]	FACU	NO	☐	☐	
PARTRIDGE-BERRY	*Mitchella repens*	Groundcover	[4,5],6	FACU	NO	☐	☐	
PENNSYLVANIA SMARTWEED	*Polygonum pensylvanicum*	Annual	[2,3]	FACW	0-6"	☐	☐	2-8
PENNY-WORT,MANY-FLOWER	*Hydrocotyle umbellata*	Perennial	[1,2],3	OBL	0-1'	☐	☐	
PHLOX,FALL	*Phlox paniculata*	Perennial	[4,5],6	FACU	NO	☐	☐	
PHLOX,MEADOW	*Phlox maculata*	Perennial	[2,3,4]	FACW	YES	☐	☐	
PHLOX,WOODLAND	*Phlox divaricata*	Perennial	[4,5,6]	FACU	NO	☐	☐	
PICKERELWEED	*Pontederia cordata*	Perennial	2,3	OBL	0-1'	☐	☐	2-8
PLANTAIN,SEASIDE	*Plantago maritima*	Perennial	1,2,3,4	FACW	YES	☐	☐	
PLUMEGRASS,SUGARCANE	*Erianthus giganteus*	Grass	[2,3]	FACW+	YES	☐	☐	
PONDWEED,CLASPING-LEAF	*Potamogeton perfoliatus*	Perennial	[1,2],3	OBL	1' MIN-6'	☐	☐	
PONDWEED,LONG-LEAF	*Potamogeton nodosus*	Perennial	[1,2]	OBL	1' MIN-6'	☐	☐	
PONDWEED,SAGO	*Potamogeton pectinatus*	Perennial	[1,2]	OBL	1' MIN-24'	☐	☐	
PRIMROSE,BIRDSEYE	*Primula laurentiana*	Perennial	[4],5	FAC	NO	☐	☐	
REED, MEADOWGRASS	*Glyceria maxima*	Grass	[1,2],3	OBL	YES	☐	☐	
REEDGRASS,BLUE-JOINT	*Calamagrostis canadensis*	Grass	[1,2],3	FACW+	6"SATURATE	☐	☐	
ROCKCRESS,ALPINE	*Arabis alpina*	Perennial	[3,4,5]	FAC+	SATURATE	☐	☐	
ROSE-GENTIAN,NARROW-LEAF	*Sabatia brachiata*	Annual	[4,5,6]	FACU	NO	☐	☐	
RUSH,ARCTIC	*Juncus arcticus*	Grass	[1,2],3	OBL	YES	☐	☐	
RUSH,GRASS-LEAF	*Juncus marginatus*	Grass	[2,3],4	FACW	YES	☐	☐	
RUSH,NARROW-PANICLE	*Juncus brevicaudatus*	Grass	[1,2],3	OBL	YES	☐	☐	
RUSH,NEEDLEGRASS	*Juncus roemeranus*	Grass	[1,2],3	OBL	SALT, EDGE	☐	☑	

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
RUSH,SALTMEADOW	*Juncus gerardii*	Grass	[2,3],4	FACW+	YES	☐	☐	
RUSH,SLIM-POD	*Juncus diffusissimus*	Grass	[2,3],4	FACW	YES	☐	☐	
RUSH,SOFT	*Juncus effusus*	Grass	[2,3],4	FACW+	0-1'	☐	☐	4-8
RUSH,TURNFLOWER	*Juncus biflorus*	Grass	[2,3],4	FACW	YES	☐	☐	
RYEGRASS,PERENNIAL	*Lolium perenne*	Groundcover	[4,5,6]	FACU-	NO	☐	☐	
SALTGRASS,SEASHORE	*Distichlis spicata*	Grass	[2,3,]4	FACW+	SALT, EDGE	☐	☑	
SAWGRASS,SMOOTH	*Cladium mariscoides*	Grass	[1,2],3	OBL	YES	☐	☐	
SAXIFRAGE,SWAMP	*Saxifraga pensylvanica*	Perennial	[1,2],3	OBL	YES	☐	☐	
SAXIFRAGE,VIRGINIA	*Saxifraga virginiensis*	Perennial	[4,5]	FAC-	NO	☐	☐	
SEA-LAVENDER,CAROLINA	*Limonium carolinianum*	Perennial	[1,2],3	OBL	YES	☐	☐	
SEA-LAVENDER,NORTHERN	*Limonium nashii*	Perennial	[1,2],3	OBL	YES	☐	☐	
SEA-OATS	*Uniola paniculata*	Grass	[4,5,6]	FACU-	NO	☐	☐	
SEDGE,BEARDED	*Carex comosa*	Grass	[1,2],3	OBL	6"SATURATE	☐	☐	
SEDGE,BENT	*Carex styloflexa*	Grass	2,[3,4]	FACW-	YES	☐	☐	7-8
SEDGE,CAT-TAIL	*Carex typhina*	Grass	[2,3],4	FACW+	YES	☐	☐	5-8
SEDGE,CRESTED	*Carex cristatella*	Grass	[1,2],3,4	FACW	YES	☐	☐	
SEDGE,FESCUE	*Carex festucacea*	Grass	[3,4,5]	FAC	NO	☐	☐	4-6
SEDGE,FOX	*Carex vulpinoidea*	Grass	[1,2],3	OBL	SAT. 0-6"	☐	☐	
SEDGE,FRINGED	*Carex crinita*	Grass	[1,2],3	OBL	YES	☐	☐	
SEDGE,GRACEFUL	*Carex gracillima*	Grass	[4,5],6	FACU	NO	☐	☐	7
SEDGE,HOARY	*Carex canescens*	Grass	[1,2],3	OBL	YES	☐	☐	
SEDGE,INLAND	*Carex interior*	Grass	1,[2,3]	OBL	YES	☐	☐	5-8

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
SEDGE,LAKEBANK	*Carex lacustris*	Grass	[1,2],3	OBL	SAT. 0-2'	☐	☐	
SEDGE,LOOSE-FLOWERED	*Carex laxiflora*	Grass	[4,5,6]	FACU	NO	☐	☐	5-8
SEDGE,RETRORSE	*Carex retrorsa*	Grass	[2,3],4	FACW+	SAT. 0-6"	☐	☐	
SEDGE,SHALLOW	*Carex lurida*	Grass	[1,2],3	OBL	YES	☐	☐	5-8
SEDGE,SWAN'S	*Carex swanii*	Grass	[4,5,6]	FACU	NO	☐	☐	5-8
SEDGE,UPTIGHT	*Carex stricta*	Grass	[1,2],3	OBL	SAT.0-6"	☐	☐	
SEDGE,WOOLY	*Carex lanuginosa*	Grass	[1,2],3	OBL	SAT.0-6"	☐	☐	
SEDGE,YELLOW-FRUIT	*Carex annectens*	Grass	[2,3,]4	FACW+	YES	☐	☐	
SEEDBOX	*Ludwigia x lacustris*	Annual	[1,2],3	OBL	YES	☐	☐	
SENNA,MARYLAND	*Cassia marilandica*	Groundcover	3,[4,5]	FAC+	SATURATED	☐	☐	
SKULLCAP	*Scutellaria churchilliana*	Perennial	[2,3],4	FACW	YES	☐	☐	
SOLOMON'S-SEAL,GREAT	*Polygonatum commutatum*	Perennial	[4,5,6]	FACU	NO	☐	☐	
SOLOMON'S-SEAL,SMALL	*Polygonatum biflorum*	Perennial	[4,5,6]	FACU	NO	☐	☐	
SPIKERUSH,BLUNT	*Eleocharis obtusa*	Grass	[1,2],3	OBL	0-6"	☐	☐	
SPIKERUSH,CREEPING	*Eleocharis palustris*	Grass	[1,2],3	OBL	SEASONAL	☐	☐	
SPIKERUSH,ENGELMANN'S	*Eleocharis engelmannii*	Grass	[2,3],4	FACW+	YES	☐	☐	
SPIKERUSH,SQUARE-STEM	*Eleocharis quadrangulata*	Grass	[1,2],3	OBL	0-1'	☐	☐	
SPRING BLUE EYE, MARY	*Collinsia verna*	Perennial	4,5,6	FAC-	NO	☐	☐	1-8
ST. JOHN'S-WORT,MARSH	*Triadenum fraseri*	Perennial	[1,2],3	OBL	YES	☐	☐	
STARWORT,MARSH	*Stellaria palustris*	Perennial	[5],6	FACU	NO	☐	☐	
STONECROP,ROCK	*Sedum pulchellum*	Perennial	[4,5,6]	FACU	NO	☐	☐	
STONECROP,ROSEROOT	*Sedum rosea*	Perennial	3,4,5,6	FACU	NO	☐	☐	

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
SWAMP MILKWEED	*Asclepias incarnata*	Perennial	2,3	OBL	SATURATED	☐	☐	3-8
SWAMP ROSE MALLOW	*Hibiscus moscheutos*	Perennial	2,3	OBL	0-3"	☐	☐	4-8
SWAMP SMARTWEED	*Polygonum coccineum*	Perennial	2,3,4	OBL	0-3'	☐	☐	2-8
SWAMP-LOOSESTRIFE,HAIRY	*Decodon verticillatus*	Perennial	[1,2],3	OBL	YES	☐	☐	
SWITCHGRASS	*Panicum virgatum*	Grass	2,[3,4],5	FAC	SEASONAL	☐	☐	
TREFOIL, BIRD'S-FOOT	*Lotus corniculatus*	Perennial	4,5,6	FACU-	NO	☐	☐	2-8
TURTLEHEAD,RED	*Chelone obliqua*	Perennial	[1,2],3	OBL	YES	☐	☐	
TURTLEHEAD,WHITE	*Chelone glabra*	Perennial	[1,2],3	OBL	YES	☐	☐	
VALERIAN,EDIBLE	*Valeriana edulis*	Perennial	[1,2],3	OBL	YES	☐	☐	
VERVAIN,BLUE	*Verbena hastata*	Perennial	2,3,4	FACW+	YES	☐	☐	
VIOLET,APPALACHIAN BLUE	*Viola appalachiensis*	Perennial	[4,5],6	FACU	NO	☐	☐	
VIOLET,COASTAL	*Viola brittoniana*	Perennial	[3,4],5	FAC	NO	☐	☐	
VIOLET,COMMON BLUE	*Viola papilionacea*	Perennial	[3,4,5]	FAC	NO	☐	☐	
VIRGINIA WILD RYE	*Elymus virginicus*	Grass	2,[3,4]	FACW-	YES	☐	☐	
WATER SMARTWEED	*Polygonum amphibium*	Perennial	2,3	OBL	6"-Sat	☐	☐	2-8
WATER-CRESS,TRUE	*Nasturtium officinale*	Annual	[1,2],3	OBL	2"-1'	☐	☐	
WATER-LILY,PYGMY	*Nymphaea tetragona*	Perennial	[1,2],3	OBL	1-3'	☐	☐	
WATER-LILY,WHITE	*Nymphaea odorata*	Perennial	[1,2],3	OBL	1-3'	☐	☐	
WATER-LILY,WHITE	*Nymphaea tuberosa*	Perennial	[1,2],3	OBL	1-3'	☐	☐	
WATER-LILY,YELLOW/ SPATTERDOCK	*Nuphar advena/luteum*	Perennial	[1,2],3	OBL	1-3'	☐	☐	
WHORLED COREOPSIS	*Coreopsis verticillata*	Perennial	[2,3],4	FACW	YES	☐	☐	3-8
WIDGEON-GRASS	*Ruppia maritima*	Grass	[1,2],3	OBL	1' MIN	☐	☑	

COMMON	SCIENTIFIC	FORM	ZONE	INDICATOR	TOLERANCE			HARDINESS
					INUNDATION	POLLUTION	SALT	
WILD-LILY-OF-THE-VALLEY	*Maianthemum canadense*	Perennial	[4,5],6	FAC-	NO	☐	☐	
WITCHGRASS,HELLER'S	*Dichanthelium oligosanthes*	Grass	[4,5,6]	FACU	NO	☐	☐	
WITCHGRASS,NEEDLE-LEAF	*Dichanthelium aciculare*	Grass	[4,5,6]	FACU	NO	☐	☐	
WOOD-REEDGRASS,SLENDER	*Cinna latifolia*	Grass	[2,3,4]	FACW	YES	☐	☐	
WOODRUSH,COMMON	*Luzula multiflora*	Grass	[4,5,6]	FACU	NO	☐	☐	
WOOL-GRASS	*Scirpus cyperinus*	Grass	[2,3],4	FACW+	SEASONAL	☐	☐	

Section A.5 References

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