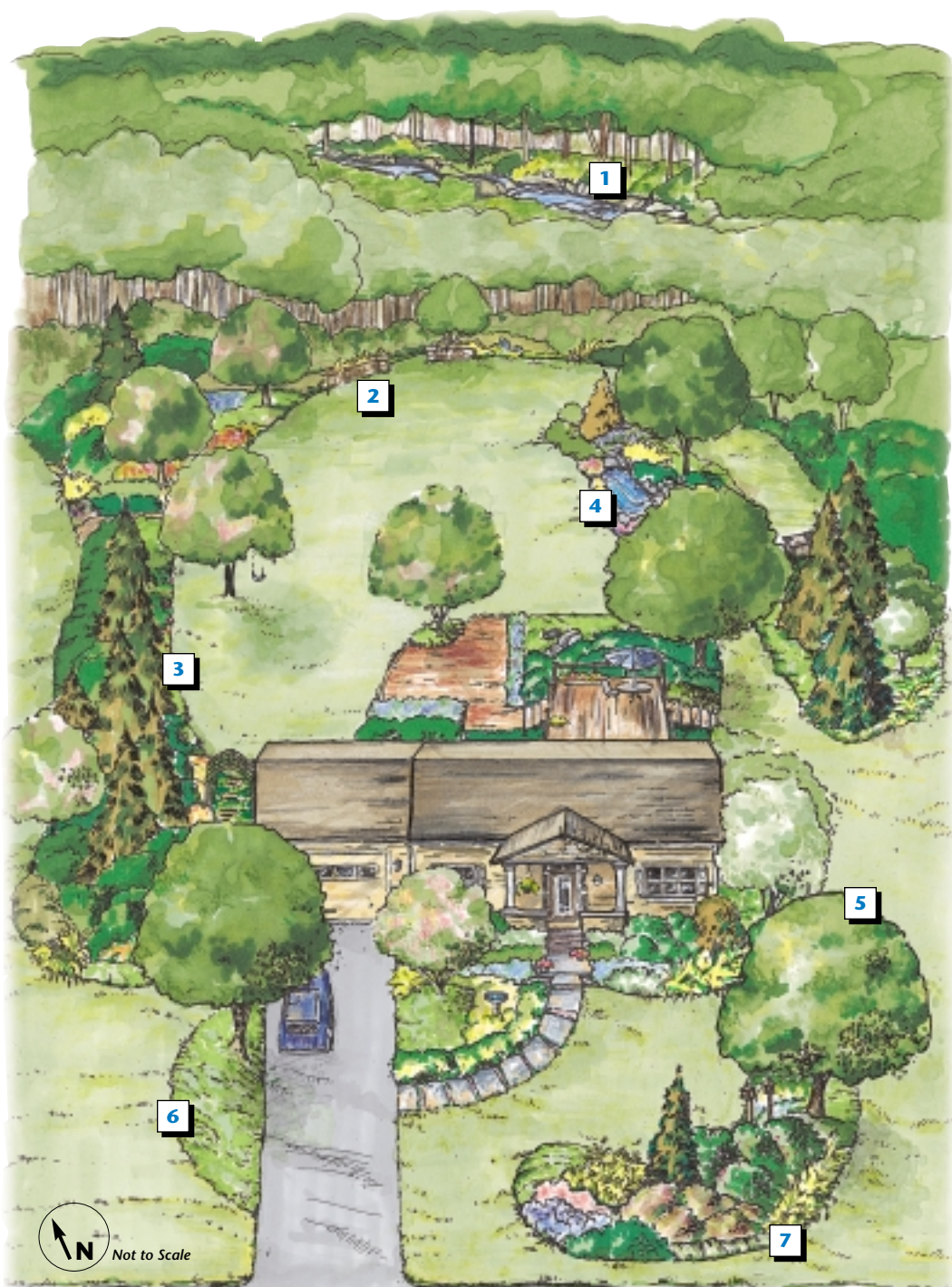




# Homeowners' Guide to Designing Your Property

This guide is designed to help you implement the concepts of BayScaping in your own yard. The enlargements on the inside pages show plant types and quantities for different areas of the property. The back page features a plant list for you to use to install this design.



Many BayScapes principles are illustrated in the features of this yard design.

**1. Streambank Plantings:**

*water-loving trees, shrubs and perennial plants protect streambank from soil erosion.*

**2. Dry Laid Stone Wall:**

*provides habitat for small mammals.*

**3. Buffer Plantings:**

*screen winter winds; create wildlife habitat and corridors.*

**4. Water Garden:**

*provides water for wildlife.*

**5. Trees:**

*provide shade, reduce water runoff and clean the air.*

**6. Groundcovers:**

*reduce lawn and are perfect for sloped and rarely utilized areas.*

**7. Planting Islands:**

*add privacy and habitat, reducing high-maintenance lawns.*

1/4 – 1/2 acre lot



## These planting plans are examples of how to landscape using BayScapes principles.

### BayScapes Principles

Plan for the Long Term • Create Diversity • Use Beneficial Plants • Conserve Water • Practice Conservation Landscaping

## Front Yard

Planting islands feature plantings layered or integrated with a mix of trees, shrubs and groundcovers to reduce lawnmowing, fertilizer, herbicide and pesticide use. These islands also provide year-round beauty and homes for birds and other wildlife. A variety of native trees and shrubs should be used in combination with long-blooming perennials and groundcovers. *Bird feeders* and *bird baths* can be added to attract birds.



#### LEGEND

**LT** = Large Tree  
**ST** = Small Tree  
**ET** = Evergreen Tree  
**LS** = Large Shrub

**SS** = Small Shrub  
**P** = Perennial  
**GC** = Groundcover  
**GR** = Grass

- The numbers indicate a general quantity of plants to be installed.
- Use the spacing chart to determine the exact quantity of plants for your garden area.
- Use the plant list to help you choose your plants.

# Side Yard Planting Screen

Groupings of beneficial plants create a privacy screen while blocking cold winter winds. The evergreen plantings provide nesting habitat. Consider teaming with your neighbors to plant a wider border to increase these benefits and make a corridor for wildlife to move between the properties. **Stepping stones** allow you to walk among the groundcovers. The **arbor** provides a place for climbing vines, which attract bees, butterflies and hummingbirds.

Reduce lawn areas with the use of groundcovers such as moss for shady areas or thyme for sunny areas.

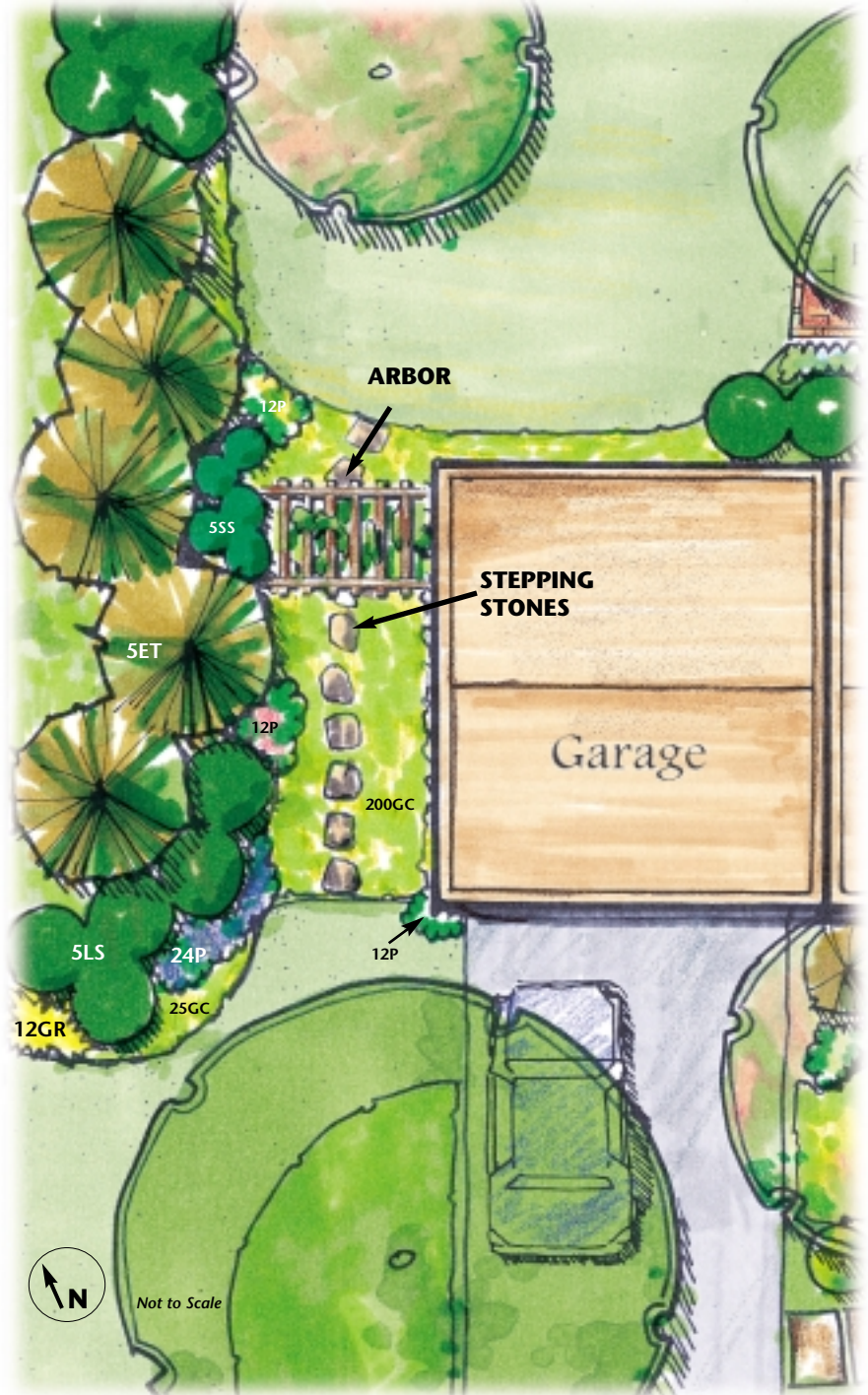
## Tree and Shrub Spacing

When planning for tree and shrub plantings, consider their ultimate spread. Allow that distance between the trunks of the two plants.

## Perennial and Groundcover Spacing

Perennials and groundcovers need to be spaced according to their ultimate size. To determine how many plants you will need, multiply the number of square feet by the number of plants required per square foot using this table. Distance apart is measured from the center of the plant.

Distance Apart	Plants/Sq. Ft.
4"	9.1
6"	2.5
8"	2.25
9"	1.77
10"	1.44
12"	1.00
18"	0.45
24"	0.24
36"	0.11



## LEGEND

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# Back Yard and Water Garden

The back yard features spaces for human enjoyment as well as wildlife habitat:

The ***deck and patio*** provide seating space for enjoyment of the back yard. Plantings include one large tree and a small tree to provide shade at differing heights. Groupings of large and small shrubs, perennials and groundcovers soften the structures.

The ***water garden*** is a visual focal point and a water source for wildlife. Groupings of evergreen and deciduous plants ensure interest in every season.

The **compost bin** allows recycling of kitchen and yard waste (including leaves), creating homemade organic fertilizer. Adding compost to planting beds replenishes nutrients without using synthetic fertilizers. Compost also enriches the soil to better support plants.

## LEGEND

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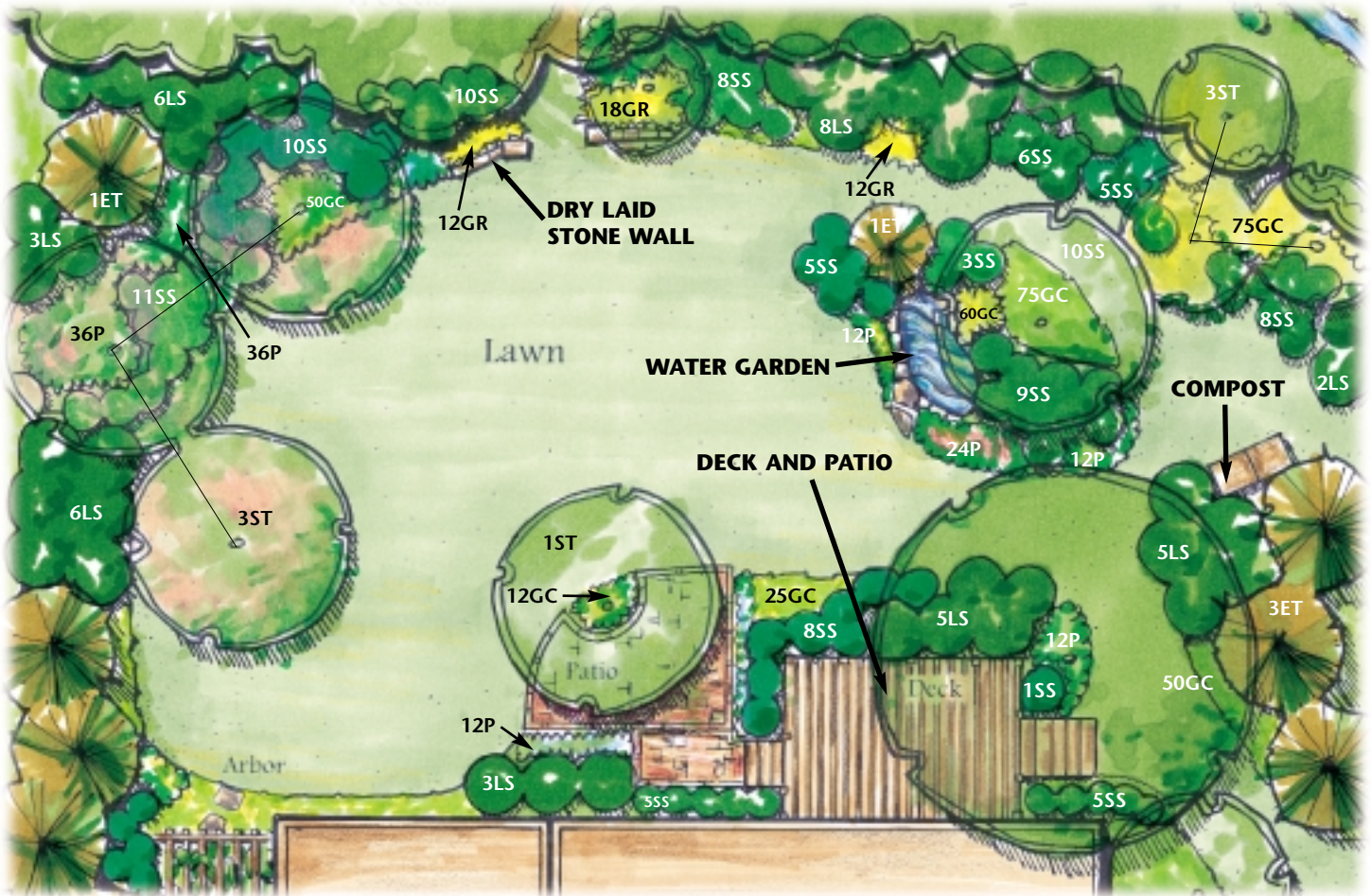
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**GR** = Grass

- *The numbers indicate a general quantity of plants to be installed.*

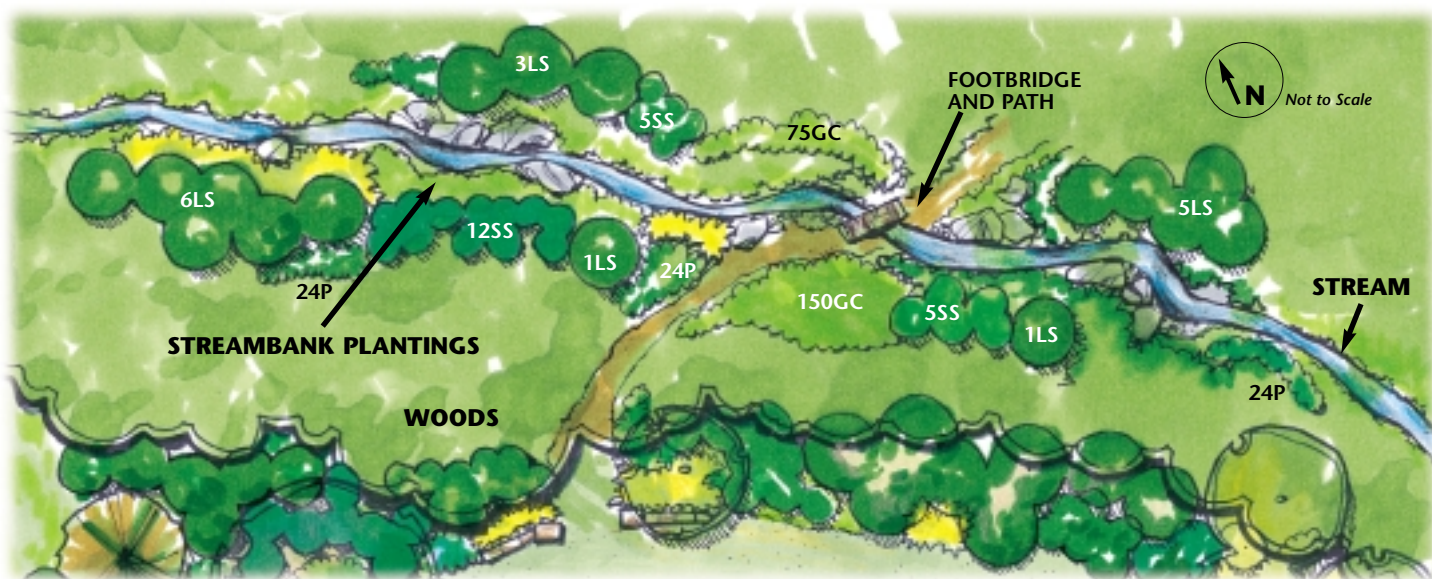
- Use the spacing chart to determine the exact quantity of plants for your garden area.

- Use the plant list to help you choose your plants.



# Stream Buffer Planting

Planting native trees, shrubs and perennials next to streams protects the water from soil erosion and nutrient runoff. Stream buffers protect water quality by absorbing and filtering runoff from lawns and open spaces before it reaches the water. *Streambank or "riparian" plantings* also create aquatic habitat for bugs and fish by providing shade and places to hide.



## LEGEND

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- The numbers indicate a general quantity of plants to be installed.
- Use the spacing chart to determine the exact quantity of plants for your garden area.
- Use the plant list to help you choose your plants.

For more information such as additional Homeowners' Guides, native plant lists, and/or more BayScapes information, visit our website at:

**[www.acb-online.org](http://www.acb-online.org)**

or contact The Alliance for the Chesapeake Bay at

**1.800.662.CRIS**



**BayScaping benefits people and wildlife.**



## Beneficial Plants for BayScaping in the Chesapeake Bay Region

This plant list is a guide to help you install your landscape plan. There are many more native plants that are suitable for BayScaping. Be careful to avoid invasive plants. Consult native plant lists for your region or your local nursery or agricultural extension agent for additional plants which may fit into your landscape.

LARGE TREE	BOTANICAL NAME	REGION	HEIGHT	BLOOM/FRUIT	SUN/SHADE	DRY/WET	VALUE
Red maple	<i>Acer rubrum</i>	all	75' – 100'	red bloom	sun – ps	w – d	very high wildlife, buffer
River birch	<i>Betula nigra</i>	piedmont & coastal	50' – 75'	catkin flower	ps – fs	w – m	wildlife, buffer, ornamental
Red or green ash	<i>Fraxinus pennsylvanica</i>	piedmont & coastal	50' – 75'		sun	m	buffer
Sweet gum	<i>Liquidambar styraciflua</i>	piedmont & coastal	50' – 75'	ornamental capsule	sun	m – w	wildlife, ornamental
Tuliptree	<i>Liriodendron tulipifera</i>	all	75' – 100'	yellow-green bloom	sun	d – m	buffer, ornamental
Black gum	<i>Nyssa sylvatica</i>	all	50' – 75'		sun – ps	d	ornamental, high wildlife
White oak	<i>Quercus alba</i>	all	75' – 100'	acorn fruit	sun	d – m	very high wildlife
SM. TREE/LG. SHRUB	BOTANICAL NAME	REGION	HEIGHT	BLOOM/FRUIT	SUN/SHADE	DRY/WET	VALUE
Shadblow serviceberry	<i>Amelanchier canadensis</i>	all	20' – 30'	deep black, edible fruit	sun – ps	d – m	very high wildlife, buffer
Eastern redbud	<i>Cercis canadensis</i>	mountains & piedmont	20' – 30'	pinkish bloom	sun – fs	d – m	ornamental
Flowering dogwood	<i>Cornus florida</i>	all	10' – 30'	white bloom/scarlet berries	sun – ps	d – m	wildlife, ornamental
Winterberry holly	<i>Ilex verticillata</i>	all	6' – 12'	red-berried fruit	ps	m – w	wildlife, ornamental
Witch hazel	<i>Hamamelis virginiana</i>	all	20' – 35'	yellow bloom-in fall	sun – ps	d	ornamental, borders
Northern bayberry	<i>Myrica pensylvanica</i>	piedmont & coastal	6' – 12'	waxy gray fruit	ps	d – w	high wildlife
Common elderberry	<i>Sambucus canadensis</i>	all	6' – 12'	white bloom/purple fruit	sun – fs	d – w	very high wildlife
Highbush blueberry	<i>Vaccinium corymbosum</i>	all - acid soil	3' – 10'	dark blue fruit	sun – fs	d – m	high wildlife, ornamental
Southern arrowwood	<i>Viburnum dentatum</i>	piedmont & coastal	6' – 12'	bluish-black fruit	sun – fs	m – w	wildlife, buffer, ornamental
EVERGREEN TREE/SHRUB	BOTANICAL NAME	REGION	HEIGHT	BLOOM/FRUIT	SUN/SHADE	DRY/WET	VALUE
American holly	<i>Ilex opaca</i>	coastal	30' – 50'	red berry	sun – ps	m	cover, high wildlife, orn.
Common juniper	<i>Juniperus communis</i>	all	2' – 30'	blue-black berry	sun	d	cover, high wildlife
Eastern red cedar	<i>Juniperus virginiana</i>	piedmont & coastal	50' – 75'	blue-green berry	sun	d	very high wildlife
Eastern white pine	<i>Pinus strobus</i>	mountains & piedmont	75' – 100'	five-needled bundle	sun	d	high wildlife, buffer
SMALL SHRUBS	BOTANICAL NAME	REGION	HEIGHT	BLOOM/FRUIT	SUN/SHADE	DRY/WET	VALUE
Bearberry	<i>Arctostaphylos urva-ursi</i>	mountains & piedmont	1'	red berries	ps	d	ornamental
Fothergilla	<i>Fothergilla gardenii</i>	all	3' – 5'	white bottlebrush flowers	sun – fs	m – w	ornamental
Inkberry holly	<i>Ilex glabra "Shamrock"</i>	all	4' – 6'	black berry	ps	d – w	evergreen, cover
Compact Oregon grapeholly	<i>Mahonia aquifolium "Compacta"</i>	all	2' – 3'	yellow flower, blue berries	ps – fs	m – w	evergreen, ornamental
Pinxterbloom azalea	<i>Rhododendron periclymenoides</i>	mountains - acid soil	6'	pink bloom	ps	m – w	ornamental
PERENNIAL	BOTANICAL NAME	REGION	HEIGHT	BLOOM/FRUIT	SUN/SHADE	DRY/WET	VALUE
Wild columbine	<i>Aquilegia canadensis</i>	all	8" – 24"	red & yellow flowers	sun – fs	d – m	wildlife, ornamental
Swamp milkweed	<i>Asclepias incarnata</i>	all	2' – 5'	pink-red flowers	sun – fs	m – w	wildlife, buffer
Butterfly weed	<i>Asclepias tuberosa</i>	all	1' – 3'	yellow to red flowers	sun	d	wildlife, ornamental
New England aster	<i>Aster novae-angliae</i>	all	3' – 4'	pink to violet flowers	sun	m	wildlife, ornamental
Tickseed	<i>Coreopsis verticillata</i>	all	1'	yellow flowers	fs	d – m	long flowering ornamental
Wild bleeding heart	<i>Dicentra eximia</i>	mountains & piedmont	8' – 12'	pink flowers	ps – fs	m	ornamental
Purple coneflower	<i>Echinacea purpurea</i>	all	2' – 3'	pink flower/seed heads	sun	d	wildlife, ornamental
Mistflower	<i>Eupatorium coelestinum</i>	all	3' – 4'	violet-blue flowers	fs	m – w	wildlife, buffer, ornamental
Joe-pye-weed	<i>Eupatorium fistulosum</i>	all	5' – 10'	pink-purple flowers	sun	m – w	wildlife, buffer, ornamental
Wild geranium	<i>Geranium maculatum</i>	mountains & piedmont	1' – 2'	rose-purple flowers	sun	m	ornamental
Gayfeather	<i>Liatris spicata</i>	all	2'	purple flower spikes	sun	d	ornamental, wildlife
Black-eyed susan	<i>Rudbeckia fulgida</i>	all	2' – 3'	yellow flowers	sun	d	wildlife, buffer, ornamental
Goldenrod	<i>Solidago rugosa</i>	all	2' – 7'	yellow flowers	sun – ps	d – m	wildlife, buffer
New York ironweed	<i>Vernonia noveboracensis</i>	all	Up to 7'	deep purple flowers	sun	m – w	wildlife, buffer, ornamental
GROUNDCOVER	BOTANICAL NAME	REGION	HEIGHT	BLOOM/FRUIT	SUN/SHADE	DRY/WET	VALUE
Green and gold	<i>Chrysogonum virginianum</i>	all	4" – 12"	yellow-green flowers	ps – fs	m	ornamental
Woodland phlox	<i>Phlox divaricata</i>	mountains & piedmont	6" – 18"	blue flowers, semi-evergreen	ps	m	wildlife, ornamental
Creeping phlox	<i>Phlox stolonifera</i>	all	3" – 4"	semi-evergreen	sun – ps	m	ornamental
Sensitive fern	<i>Onoclea sensibilis</i>	all	18" – 24"	dried brown spore-stalks	ps – fs	m – w	ornamental
Foamflower	<i>Tiarella cordifolia</i>	mountains & piedmont	6"	white flower	ps	m – w	ornamental
GRASS	BOTANICAL NAME	REGION	HEIGHT	BLOOM/FRUIT	SUN/SHADE	DRY/WET	VALUE
Switchgrass	<i>Panicum virgatum</i>	all	3' – 5'	seeds	sun	d	wildlife, ornamental
Little bluestem	<i>Schizachyrium scoparium</i>	all	up to 3'	seeds	sun	d	wildlife, ornamental
Indian grass	<i>Sorghastrum nutans</i>	all	5' – 6'	seeds	sun	d – m	wildlife, ornamental

### LEGEND

**VALUE:** Wildlife = provides food and/or shelter  
 Buffers = for streamside or riparian areas  
 Ornamental = attractive, decorative plant

**SUN/SHADE:** sun = sun  
 ps = partial shade  
 fs = full shade

**DRY/WET:** w = moisture  
 m = moderate  
 d = drought tolerant

## APPENDIX D - VEGETATIVE REPLACEMENT STANDARDS

The vegetation replacement standards are a compilation of information from many sources. The following list reflects the major sources of information used to develop the replacement and restoration standards:

**USDA :**

Natural Resources Conservation Service

Forest Service

Virginia Department of Conservation and Recreation

Virginia Department of Forestry

Chesapeake Bay Local Assistance Department

Conversations and emails with members of the Technical Committee.

Maryland Chesapeake Bay Critical Area Commission

Maryland Department of Natural Resources Forest Service

Pennsylvania Releaf

Local governments in Virginia and Maryland

VEGETATION REPLACEMENT RATES		
VEGETATION REMOVED	PREFERRED REPLACEMENT VEGETATION	ACCEPTABLE ALTERNATIVE VEGETATION
1 tree or sapling 1/2"-2 1/2" caliper	1 tree @ equal caliper or greater	<b>Or</b> 2 large shrubs @ 3'-4' <b>Or</b> 10 small shrubs or woody groundcover * @ 15"-18"
1 tree ≥ 2 1/2" caliper	1 tree @ 1 1/2" - 2" caliper, or 1 evergreen tree @ 6' min. ht., per every 4" caliper of tree removed (ex: a 12" cal. tree would require 3 trees to replace it)	<b>Or</b> 75% trees @ 1 1/2" - 2" and 25% large shrubs @ 3'-4' per every 4" caliper of tree removed. (ex: a 16" cal. tree removed would require 3 trees and 1 large shrub) <b>Or</b> 10 small shrubs or woody groundcover @ 15"-18" per 4" caliper of tree removed (ex: a 8" caliper tree removed requires 20 small shrubs .)
1 large shrub	1 large shrub @ 3'-4'	<b>Or</b> 5 small shrubs or woody groundcover @ 15"-18"
* Woody groundcover is considered to be a woody, spreading shrub that remains close to the ground, to 18" high, such as a shore juniper, <i>juniperus conferta</i> . Vines may not be considered "woody groundcover" for the purpose of vegetation replacement.		

# RESTORATION / ESTABLISHMENT TABLE A

## Definitions:

Canopy tree: a tree that reaches 35 feet in height or larger when mature

Understory tree: a tree that matures to a height of 12 feet to 35'

Large shrub: a shrub that reaches 10 feet of height or greater at maturity

Small shrub: a woody plant that can reach up to 10 feet of height at maturity

## ¼ acre or less of buffer

Up to 10,890 square feet or less

For every 400 square-foot unit (20'x20') or fraction thereof plant:

*one (1)* canopy tree @ 1½" - 2" caliper or large evergreen @ 6'

*two (2)* understory trees @ ¾" – 1 ½" caliper or evergreen @ 4'

or *one (1)* understory tree and *two (2)* large shrubs @ 3'-4'

*three (3)* small shrubs or woody groundcover @ 15" – 18"

## Example:

A 100-foot wide lot x 100-foot wide buffer is 10,000 square feet.

Divide by 400 square feet (20'x20' unit) to get:

25 units

<u>Units</u> x	<u>plant/unit</u>	<u>Number of plants</u>
25 units x	1 canopy tree	25 canopy trees
	2 understory trees	50 understory trees
	3 small shrubs	<u>75 small shrubs</u>
		150 plants



# RESTORATION / ESTABLISHMENT TABLE B

## Greater than ¼ acre of buffer

More than 10,890 square feet

- A. Plant at the same rate as for ¼ acre or less.
- B. The waterside 50% of the buffer (from the waterline inland for the first 50 feet):  
For every 400 square-foot unit (20'x20') or fraction thereof plant:

*one* (1) canopy tree @ 1½" - 2" caliper or large evergreen @ 6'  
*two* (2) understory trees @ ¾" - 1 ½" caliper or evergreen @ 4'  
                     or *one* (1) understory tree and *two* (2) large shrubs @ 3'-4'  
*three* (3) small shrubs or woody groundcover @ 15" - 18"

### AND

The landward 50% of buffer (from 50 feet inland to 100 feet inland):

either plant

Bare root seedlings or whips at 1,210 stems per acre<sup>1</sup>, approximately 6'x6' on center  
 (Minimum survival required after two growing seasons: 600 plants,)

or

Container grown seedling tubes at 700 per acre approximately 8' x 8' on center (Minimum survival required after two growing seasons: 490 plants)

- C. If the applicant is willing to enter into a five year maintenance and performance guarantee:  
 100% of buffer planted with:  
 Bare root seedlings or whips at 1,210 per acre, approximately 6'x 6' on center (Minimum survival required after two growing seasons: 600 plants)  
 Or  
 Container grown seedling tubes at 700 per acre approximately 8' x 8' on center (Minimum survival required after two growing seasons: 490 plants).

## 1 acre or more of buffer

With an evaluation from an arborist or forester or other professional, natural regeneration may be an acceptable method of buffer establishment, however, a forestry management plan must be in place prior to any vegetation being removed. A minimum of 35 feet next to the water must be left in forest and protected prior to any vegetation being removed. If over 20 percent of the vegetation must be removed for the health of the woodlot, within the 35 feet closest to the shoreline, vegetation must be reestablished by seedling plantings at the rates above.

<sup>1</sup> Palone, Roxanne S., and Al Todd, *Chesapeake Bay riparian handbook: A guide for establishing and maintaining riparian forest buffers*. May 1977. p. 7-20.



# Sample Landscape / Mitigation Plan for Ches. Bay Waiver / Exception Process

Title (Name and No.), Legend (# plants, type, name), and typical survey features

