



# Policy *and* Guidelines for Community Tree Planting Projects

Baltimore County, MD



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*Urban Baltimore County today includes many remnants of its native high-quality oak forests, as in this area at Oakleigh Elementary School in Ridgeleigh.*

# Thank You!

Baltimore County appreciates the assistance of citizens and organizations in helping to restore our environment, including the planting of trees. Due to the limited space on County-owned properties, County obligations for reforestation (MD Forest Conservation Act and Chesapeake Bay Critical Area Act), and experience with some previous planting projects, the Policy and Guidelines for community tree planting projects have been adopted.

## **I. Policy for Planting Trees and Reforestation on Baltimore County-owned Land**

1. Baltimore County generally needs to reserve opportunities for planting trees on County-owned land in order to meet its obligations for reforestation. The County is especially likely to reserve planting sites of one acre and larger.
2. Tree planting by citizen organizations will be considered under the following criteria:
  - The Department of Environmental Protection & Sustainability (EPS) has reviewed a citizen tree planting proposal and determined that the project would not preempt a planting opportunity needed by the County for reforestation because of its size, cost-effectiveness, or other reason,
  - EPS has reviewed and approved the project for site preparation, planting design (species selection and distribution, and tree size and density), planting methods and tree protection, and assurances for maintenance (including watering) for at least 3 years, and
  - EPS has coordinated with appropriate County agencies including the Baltimore County Public Schools, the Community College of Baltimore County, the Department of Recreation & Parks, the Office of Property Management, and the Dept. of Public Works regarding potential conflicts with planned construction, utilities, maintenance, or other site conditions. The Baltimore County Public Schools (BCPS) requires notification, and approval must be received, prior to beginning any project covered by this policy. Contact the BCPS Dept. of Physical Facilities at 410-887-6300.

The primary purpose for establishing the Policy is to assure that the County can address its obligations for reforestation and that tree planting projects on all land owned by Baltimore County are successful. The following Goals, Process, and Planting Guidelines are designed to assist community groups that wish to propose tree planting and maintenance plans that are in compliance with this Policy.

## II. Goals for Tree Planting and Reforestation

Planting projects by citizen organizations and public agencies can take the form of reforestation (urban and rural), including riparian buffers, and single tree plantings wherein larger trees are maintained in more park-like settings or within 60 feet of buildings.

The County has conducted extensive reforestation projects, conferred with forest professionals, and conducted thorough research into the ecological literature regarding forest ecology. The results of these activities is the realization that reforestation and tree planting must be more strategic given the continuing loss of forest and urban tree cover and the difficulty of re-establishing desirable vegetative cover.

Through the Policy and Guidelines for planting trees on land owned by Baltimore County, the following goals are sought:

- Planting projects are designed, installed, and maintained for long-term success and tree health, including the development of tree crowns.
- Native tree species are planted in all circumstances except for a limited number of urban-adapted species that may be considered near buildings or in road rights-of-way.
- To the extent possible, the native oak-dominated canopy of Baltimore County is favored for restoration.
- To the extent possible, reforestation and single tree planting projects are designed and maintained so as to provide significant ecosystem services and to qualify for environmental restoration credits.



*Widely-spaced native oaks with full, healthy crowns at the Community College of Baltimore County, Catonsville campus. Trees with great biomass provide optimal stormwater control and habitat benefits.*

### III. Challenges and Choices

The vegetative cover of Baltimore County has been altered greatly from the time of human settlement. Impacts to the forested landscape include conversion of forest to non-forest land cover, increasing fragmentation and parcelization of forests, loss of habitat, and increased water and air pollution. With these transformations, the challenges for restoring tree and forest cover have grown.

Today, forests and trees are documented as providing the greatest benefits for addressing climate change (*MD Climate Action Plan, 2008*) and water quality, including restoration of the Chesapeake Bay (*State of Chesapeake Forests, 2006*). While planting trees is beneficial, Baltimore County agencies choose to approach community tree planting so as to provide the greatest benefits possible, using our native forest ecosystems as a reference condition. For these reasons, tree planting and reforestation on County-owned land should:

1. Utilize tree species with documented historical ranges in the Maryland Piedmont and Coastal Plain physiographic provinces. Tree planting and reforestation are not exercises in horticultural landscaping wherein any species that can grow in Baltimore County are to be selected.
2. Favor tree species that provide greater ecosystem benefits to the extent possible and where space exists. Tree planting and reforestation should favor larger native canopy species over smaller ornamental species.
3. Minimize the creation of edge habitat. With less than 20% of forest cover in Baltimore County defined as interior forest, tree planting and reforestation should prioritize establishing and adding to mature forest canopy. Additional edge habitat is not needed.
4. Expand existing forest remnants wherever possible. Tree planting and reforestation in urban and rural areas should continue the pattern and species dominance of adjacent mature treed areas. The existing oak-dominated forest community should be the context for species diversity, and the planting should be designed “from the top-down” by placing and spacing canopy dominants and co-dominants first.
5. Avoid using early successional tree species, which tend to be invasive and can dominate a site for decades in a transitional stage by spreading through the site, competing with later stage species, and preventing the development of a biologically and structurally diverse forest ecosystem.

## IV. The Planting Continuum

A project's design, installation, and maintenance depend on its purpose and its setting. These factors in turn influence how the planted trees will function. Tree size class, tree spacing, installation materials, and maintenance requirements for each planting project may vary depending on the degree to which the project is a reforestation or single tree planting. Examples of projects at the limits of this planting continuum are provided below:



### Urban & Rural Reforestations and Buffers



- **Purpose/Function:** ecosystem services (forest habitat, water quality)
- **Design:** potted seedlings to 3-gallon containerized stock, spaced 15-25 feet
- **Technique:** single-staked aerated tree shelters, or double-staked 6'x20" deer fence rolls; no mulch
- **Maintenance:** seasonal mow, vine and invasives suppression as needed, stake and shelter upkeep for 3+ yrs
- **3-Year Survival Expectation:** 75%+

### Landscape-Style Single Tree Plantings in High Visibility Areas



- **Purpose/Function:** stormwater uptake, shade, air quality, aesthetics
- **Design:** 6-foot tall minimum, 1.5-2" caliper containerized or ball-and-burlap stock spaced  $\geq 35$  feet apart
- **Technique:** double-staked black mesh bark protectors, mower guards, mulch rings
- **Maintenance:** seasonal mowing and watering, mulching, pruning, and stake/shelter upkeep for 3+ yrs
- **3-Year Survival Expectation:** 100%

## **V. Process for Planning and Implementing a Community Planting Project**

The process that we require all groups to follow is intended to facilitate the achievement of the aforementioned goals by sharing the expertise of forest ecosystem and urban forest specialists, encouraging proper planting plan design, and holding community groups accountable for the long-term success of their projects.

The process includes six steps and should be started at least one planting season prior to the intended tree planting event:

- 1. Site Identification**
- 2. Site Assessment**
- 3. Planting Plan Development**
- 4. Planting Plan Submittal to Baltimore County EPS**
- 5. Planting**
- 6. Project Maintenance**

### **Step 1: Site Identification**

When choosing a planting site, consider your budget, site access by a vehicle, the current site use, and your planting objective. It is also important that you have access to water or that you will be able to transport water to the site, especially if the site is in an urban setting.

Once you have chosen your site on Baltimore County land, contact the Department of Environmental Protection and Sustainability with the site location and your planting intention (410-887-4010, [bigtrees@baltimorecountymd.gov](mailto:bigtrees@baltimorecountymd.gov)).

EPS will first determine if the site is needed for reforestation by the County. If not, EPS will contact the appropriate agency and ensure that the site is eligible for planting. Upon request, Baltimore County EPS will also generate an aerial map of your planting site using our GIS databases, which can be mailed or emailed to you for use in assessing your planting site and developing a planting plan.

If the planting site is on BCPS property, you must also fill out a Special Project Request form (SPR). The SPR can be obtained by contacting the school's principal. The process should be started at least one month prior to your intended planting date, and the planting may not proceed until the SPR process is complete.

**Proceed to the next step only after you have approval from EPS.** Underground utilities, future site plans, or particular site uses might preclude or limit the area of land available for planting.

## **Step 2: Site Assessment**

Identifying characteristics of the planting site will enable you to select appropriate tree species. Consider the following:

### **Geography and Topography**

*What is the size and shape of the planting area, and the extent of the slopes, grades, uplands, bottomlands, and ridges? Are there streams or wetlands on site?*

Importance: Tree species have different moisture and light requirements.

### **Soils**

*What is the soil type – clay loam, sandy? How well does the soil drain? Is the soil compacted?*

Importance: Tree species have different tolerances for soil types and degrees of permeability.

### **Natural Surroundings**

*What is the existing vegetation?*

Importance: Grasses, weeds, wildflowers, trees, and shrubs offer clues about the soil quality and habitat characteristics of the site.

### **Infrastructure**

*What buildings exist on or near your planting site?*

Importance: Canopy trees should be planted no closer than 30' from buildings to avoid leaves clogging gutters and branches interfering with doors and windows. Shade cast from buildings or structures (especially on the north side) may also affect your tree species selection.

*Are there obvious utilities, manhole covers, sewer caps, electric boxes, sidewalks, or storm drains to avoid?*

Importance: Canopy trees should be planted no closer than 10' from sidewalks or utilities. Tree roots and infrastructure conflicts are costly problems.



### **Step 3: Planting Plan Development**

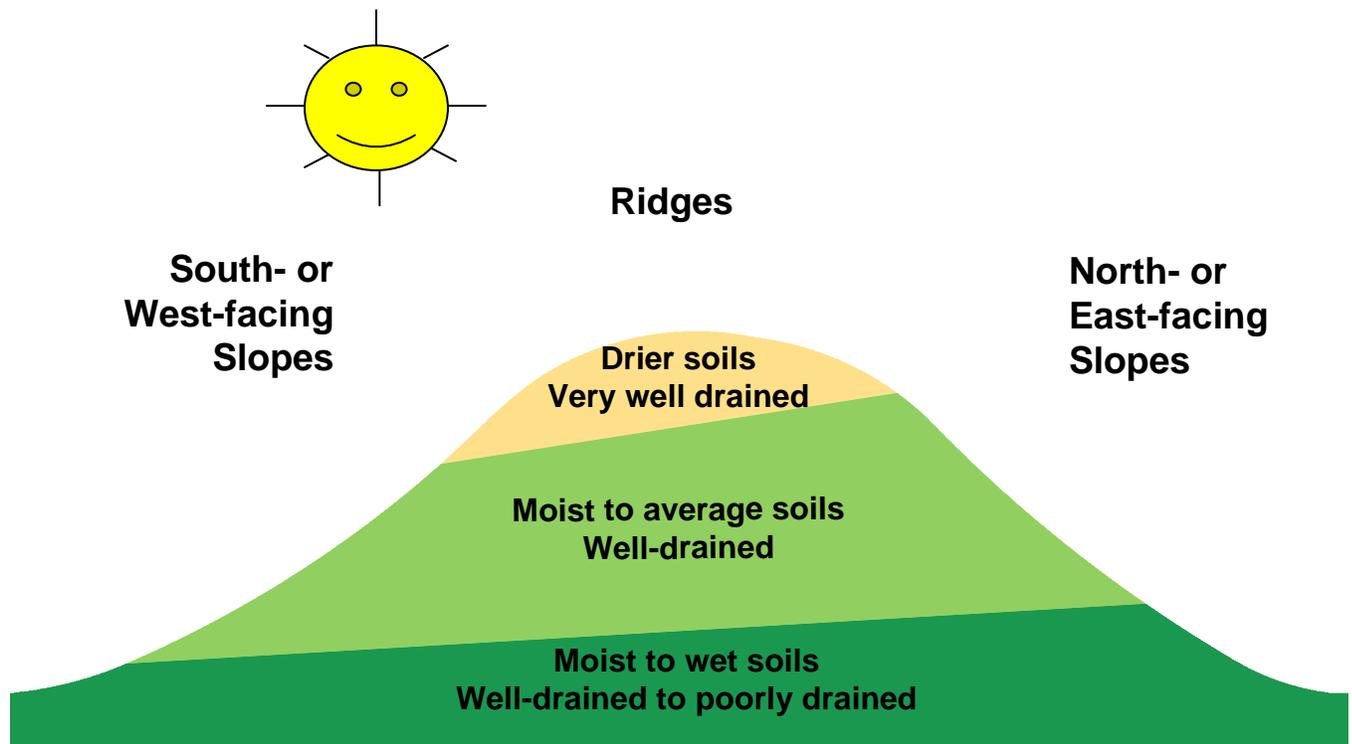
In developing your planting plan, you will use the information obtained from the site assessment to determine what tree species to plant and where to place them. The information in this section will help you to make these choices, but if you need additional assistance, please contact EPS (see p. 25). Staff at EPS are experienced in designing, planting, monitoring, and maintaining a wide range of rural and urban tree planting projects.

The three main tasks in developing a planting plan are:

- 1. Choosing tree species** that suit the moisture and light conditions of the planting site,
- 2. Spacing and arranging the tree species** to achieve the project's objective, while – to the extent possible – mimicking natural forest stand distribution, and
- 3. Assembling a map and a narrative cover sheet** to submit to EPS.

#### **Tree Species Selection**

The following generalized landscape profile depicts the relationship between topography, exposure, and soil moisture.



Soils on level ground, including lawns and fields, may have areas of very dry to wet soils.

### **Step 3: Planting Plan Development** (continued)

#### **Tree Species Selection – The Importance of Oaks**

**When selecting tree species for your planting plan, prioritize oaks.** Oak trees are “keystone species” in the eastern forests. For thousands of years, oaks have been critically important to the sustainability of forest ecosystem functions and high quality wildlife habitats. Today, oak species still dominate the fragmented forests surrounding the densely populated towns and cities of the Chesapeake Bay watershed.

The benefits of oak dominance include:

- The acorn crop, a critical source of high-energy food for 96 species of mammals and birds, especially in the winter when food is scarce.
- Spring oak foliage, the preferred food of >530 species of moth caterpillars that are a substantial food source for the hatchlings of >150 species of perching birds, including residents and neo-tropical migrants.
- Fall oak foliage, which decomposes very slowly compared to that of maples, ashes, tuliptree, and others. Slow decomposition means that the oak leaves remain intact on the forest floor as thick mats of leaf mold, or in streams as leaf packs, for more than a year. The benefits of this persistent biomass include the slowing of surface water movement on the ground and higher ground water recharge. Nitrates and nutrients also leak more slowly from the foliage, yielding more efficient nutrient recycling and reduced nutrient loading of waterways and wetlands.
- Slow decomposition also yields greatly increased intervals of available food for aquatic macroinvertebrates. Leaf shredders and leaf scrapers that are food for many of our native trout and other fishes in streams feed on leaves that have been colonized by bacteria well after other leaf packs have disintegrated.

Typically, several oak species and a few additional canopy co-dominants provide desirable diversity for our forest ecosystems. Recommended tree species and their attributes are presented on pages 10-11. Canopy species should represent at least 80% of the project trees, with 50% or more oaks.



## Step 3: Planting Plan Development - Tree Species Selection (con't)

**Canopy Species** – should comprise 80% or more of the project's trees, and 50% of the trees should be oak species. Asterisks (\*) indicate species recognized as tolerant of all or most urban conditions (soil compaction, salt, heat/drought). Such species are well-suited to street plantings or urban landscapes.

Common Name / Species	Crown Form	Mature Height (ft.)	Mature Crown Spread (ft.)	Growth Rate	Shade Tolerance	Soil Moisture	Root Pattern
<b>Oak, Black</b> <i>Quercus velutina</i>	irregular	60 - 80	50-60	slow	intolerant	moist to dry	deep taproot
<b>Oak, Chestnut</b> <i>Quercus prinus</i>	globular	60 - 70	same	medium	intolerant	average/ dry	shallow fibrous and deep coarse laterals
<b>Oak, Northern Red</b> <i>Quercus rubra</i>	ovoid	75 - 100	55 - 75	medium	tolerant	moist/ average	deep laterals
<b>Oak, Pin*</b> <i>Quercus palustris</i>	pyramidal	50 - 75	30 - 50	medium/ fast	intolerant	wet/ average	shallow fibrous laterals
<b>Oak, Scarlet</b> <i>Quercus coccinea</i>	globular	50 - 75+	40 - 50	medium/ fast	intolerant	average/ dry	deep tap/shallow laterals
<b>Oak, Swamp White*</b> <i>Quercus bicolor</i>	globular	50 - 60	same	medium	intermediate	wet/ average	shallow fibrous laterals
<b>Oak, White</b> <i>Quercus alba</i>	globular	75 - 100	up to 120	slow	intermediate	moist/ average	deep taproot/laterals
<b>Oak, Willow*</b> <i>Quercus phellos</i>	rounded	60 - 80+	30 - 40	medium/ fast	intolerant	wet/ average	medium taproot
<b>Hickory, Pignut</b> <i>Carya glabra</i>	irregular/ obovoid	75 - 100	35 - 50	slow	intermediate	average	deep taproot
<b>Hickory, Mockernut</b> <i>Carya tomentosa</i>	irregular/ obovoid	75 - 100	35 - 50	slow	intolerant	average	strong, deep taproot
<b>Hickory, Shagbark</b> <i>Carya ovata</i>	irregular ovoid/ obovoid	75 - 100	35 - 50	slow	intermediate	wet to porous/ droughty	deep taproot
<b>Birch, River*</b> <i>Betula nigra</i>	columnar	40 - 70	same	fast	intolerant	wet/ average	shallow fibrous spreading
<b>Birch, Sweet</b> <i>Betula lenta</i>	ovoid	50-75	35-50	slow	intermediate	moist	deep laterals
<b>Hackberry</b> <i>Celtis occidentalis</i>	globular	75 - 100	same	medium/ fast	intermediate	wet/dry	deep, coarse laterals
<b>Maple, Red*</b> <i>Acer rubrum</i>	ovoid/ globular	40 - 60	30 - 45	medium/ fast	very tolerant	wet/ average	very shallow fibrous
<b>Sycamore*</b> <i>Platanus occidentalis</i>	open/ globular	75 - 100	up to 120	very fast	intermediate	wet/ average	shallow fibrous
<b>Pine, Pitch</b> <i>Pinus rigida</i>	irregular/ globular	50 - 75	50 - 75	fast	intolerant	average	short taproot
<b>Pine, White</b> <i>Pinus strobus</i>	conical/ irregular ovoid	75 - 100	50 - 75	medium	intermediate	moist/ average	weak taproot, deep coarse laterals
<b>Cedar, Eastern Red</b> <i>Juniperus virginiana</i>	conical/ columnar	50 - 75	35 - 50	slow	intolerant	moist/ average	taproot
<b>Gum, Black</b> <i>Nyssa sylvatica</i>	broadly conical	50 - 75	35 - 50	slow	intolerant	wet/ average	taproot

**Midstory and Understory Species** – limit to maximum of 20% of trees planted.

Common Name / Species	Crown Form	Mature Height (ft.)	Mature Crown Spread (ft.)	Growth Rate	Shade Tolerance	Soil Moisture	Root Pattern
<b>American Plum</b> <i>Prunus americana</i>	globular	20-35	20-35	fast	intolerant	dry	shallow fibrous
<b>Fringetree</b> <i>Chionanthus virginicus</i>	columnar/ obovoid	20 - 35	10 - 20+	slow	very tolerant	moist/ average	deep, coarse laterals
<b>Pawpaw</b> <i>Asimina triloba</i>	irregular	20-35	20-35	slow	tolerant	moist	deep laterals
<b>Redbud, Eastern</b> <i>Cercis canadensis</i>	globular	20 - 35	same or wider	slow	tolerant	average/ dry	shallow to deep fibrous
<b>Serviceberry, Downy</b> <i>Amelanchier arborea</i>	globular	15 - 25+	variable	medium	very tolerant	moist/ average	shallow fibrous
<b>Serviceberry, Shadblow</b> <i>Amelanchier canadensis</i>	globular obovoid	35 - 50	35 - 50	medium	very tolerant	moist/ average	shallow fibrous/ spreading
<b>Hornbeam, American</b> <i>Carpinus caroliniana</i>	obovoid/ globular	35 - 50	35 - 50	slow	very tolerant	moist/ average	deep coarse lateral spreading
<b>Magnolia, Sweetbay</b> <i>Magnolia virginiana</i>	irregular/ obovoid	12 - 20	12 - 20	medium	tolerant	wet/ moist	deep coarse laterals
<b>Holly, American</b> <i>Ilex opaca</i>	pyramidal	15 - 30	10 - 20	medium	tolerant	wet/ moist	deep coarse laterals

### **Step 3: Planting Plan Development** (continued)

**Landscape & Street Trees** (*in addition to oaks and maples on pg. 10*) – *not to be used in reforestation projects*

Common Name / Species	Crown Form	Mature Height (ft.)	Mature Crown Spread (ft.)	Growth Rate	Shade Tolerance	Soil Moisture	Root Pattern
<b>Elm, cultivars *</b> <i>Ulmus americana</i>	globular	75-100	same or wider	medium	intermediate	moist/dry	shallow/deep laterals
<b>Hawthorn, Washington*</b> <i>Crataegus phaenopyrum</i>	ovoid/ globular	20-35	15-25	slow	intolerant	moist/ average	taproot
<b>Katsura*</b> <i>Cercidiphyllum japonicum</i>	upright/ spreading	40 - 60	20 - 30	medium/ fast	intermediate	moist/ average	shallow lats, some at grade
<b>Linden, Little Leaf*</b> <i>Tilia cordata</i>	globular	60 - 70+	30 - 50+	medium	intolerant	moist/ average	deep, coarse laterals
<b>Maple, Sugar</b> <i>Acer saccharum</i>	ovoid/ globular	75-100	50-75	medium/ slow	very tolerant	moist/ average	shallow to moderate, deep
<b>Plane, London*</b> <i>Platanus x acerifolia</i>	open/ globular	75 - 100	65 - 80+	medium	intolerant	moist/ average	shallow fibrous
<b>Serviceberry, Apple</b> <i>A. x grandiflora</i>	globular	15-25+	variable	medium	tolerant	moist/ average	shallow fibrous
<b>Zelkova*</b> <i>Zelkova serrata</i>	upright	50 - 80	same	medium	intolerant	moist/ average	deep laterals

The trees in these three tables are preferable for canopy, mid-story, and landscape situations, respectively. Other species may be suitable for particular purposes or in particular landscape settings, and these will be evaluated on a case-by-case basis.

#### **Sources:**

Dirr, Michael A. 1983. Manual of Woody Landscape Plants.

Hightshoe, Gary .1988. Native Trees, Shrubs, and Vines for Urban and Rural America.

USDA Silvics of North America, Vol.2

### **Tree Spacing and Arrangement**

Once you have selected trees that are suitable for the moisture and light conditions present at your site, you must decide how they should be spaced and arranged. To the extent possible, **planting plans should mimic the natural distribution of stands of like species typically found in the County’s maturing deciduous forests.**

#### Spacing

In order to promote the growth of tree crowns, support long-term tree health, and emulate the patterns of a mature forest, canopy trees should be spaced no less than 25 feet apart in a reforestation. Fifteen to twenty-foot spacing is appropriate between midstory and understory species. In no circumstances should trees be planted closer than 15 feet apart.

Canopy trees planted as landscape specimens in areas of high public use/visibility should be placed 30-35 feet apart in order to maximize crown spread, biomass, and aesthetic appeal. Midstory and understory landscape specimens should be spaced no closer than 20 feet.

### **Step 3: Planting Plan Development** (continued)

#### Arrangement (Reforestation)

On flat land, arrange the trees in a planting design that gives **adequate space for the trees with the widest mature crowns**. For example, in the diagram on p. 13, White oaks – which have expansive crowns, slow growth rates, and little tolerance to shade – are spaced more widely from adjacent trees. This arrangement helps the White oaks successfully compete for a position in the canopy as the stand grows. The same spacing is appropriate for Sycamores.

Next, **interplant the other narrower canopy trees, arranging them in clusters of identical species to mimic natural stand development**. On slopes, follow a similar pattern but consider the position and aspect of the slope to match the species' moisture and light requirements.

Certain trees, such as the Eastern Redbud, flower more profusely in the light along forest edges. Consider these attributes when arranging the trees in your planting plan. **Avoid surrounding sun-loving edge species with shade-casting canopy dominants.**

Finally, it may be practical to arrange the trees in rows for ease of seasonal mowing and maintenance, especially for reforestation projects.



*The reforestation at County Home Park includes a Pin oak-dominated stand, shown here 14 years after planting. The adjacent site is lawn and the reforested area is mowed seasonally to maintain a meadow-like condition. At about 15-foot spacing, the young tree canopies could be more widely spaced for continued development of tree crowns.*

### Step 3: Planting Plan Development (continued)

#### Reforestation Tree Spacing and Arrangement Example

The example to the right shows a reforestation area of approximately 1 acre. Midstory red maples are located among canopy dominant and co-dominant oaks and hickories. Canopy species are spaced 25 feet apart along rows, midstory species are spaced 15 feet along rows, and rows are spaced 15 feet apart for ease of seasonal “meadow mowing.”

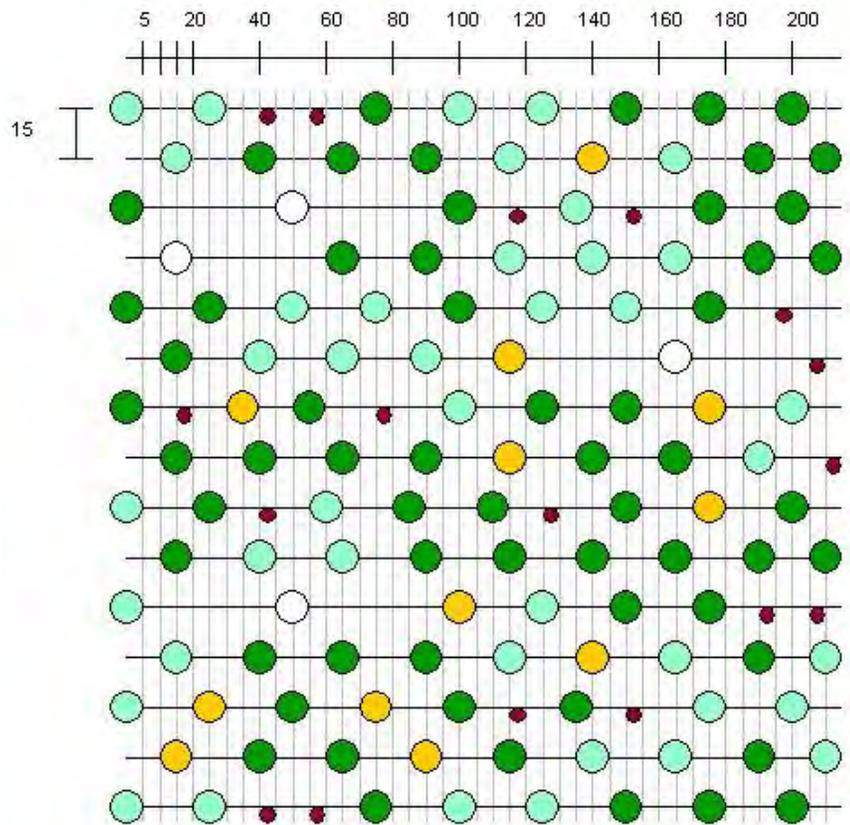
Red and Pin oaks are arranged in clusters, with White oak and Pignut hickory trees distributed throughout the area.

-  4 White Oak
-  61 Northern Red Oak
-  41 Pin Oak
-  12 Pignut Hickory
-  17 Red Maple

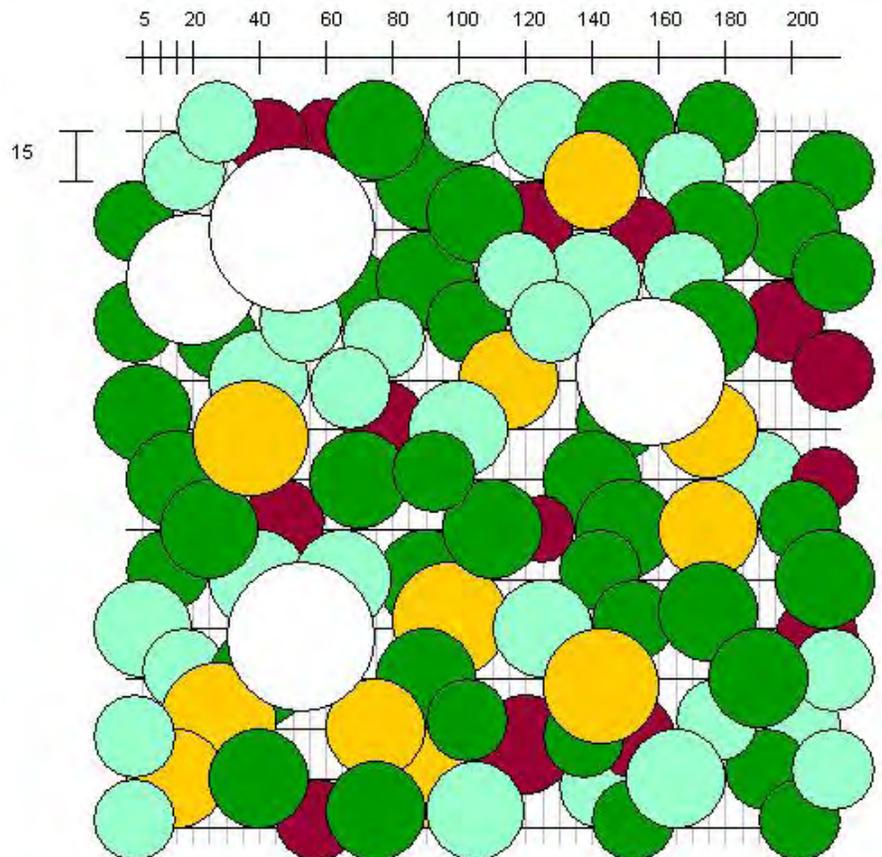
135 total trees  
 126 large canopy trees (93%)  
 106 Oak trees (79%)  
 17 midcanopy trees (13%)

The example to the right is a projection of the stand development at 25 years. It takes into account some natural tree mortality. The overall survival is at least 100 trees per acre.

**One-Acre Planting – Year 1**



**One-Acre Planting – Year 25**



### **Step 3: Planting Plan Development** (continued)

#### **Arrangement (Urban/Landscape)**

There are some settings for which reforestation planting designs are less appropriate. When planting in close proximity to buildings (within ~100'), in urban parks, along sidewalks, or in conspicuously manicured or landscaped locations, for example, different principles of design apply.

**Landscape-style planting plans should favor line, repetition, balance, and simplicity.** Lines, whether straight or curved, offer great visual appeal. In many cases, the straight edge of a building or the curve of a path have created this line for you, and a successful planting plan need only compliment it.

Repetition creates unity in a landscape. Rows or partial rows of identical species present a very easy visual message. Too much repetition, however, can appear monotonous; consider using a few different species for a landscape-style planting plan with 12+ trees.

Balance is achieved through symmetry and grouping. Odd-numbered groupings (trees in 3's or 5's) make a bold statement and convey a strong sense of mass.

**Above all, embrace simplicity. The most elegant landscapes are those that let the beauty of the trees speak for themselves.**



*The dramatic 9/11 Memorial at Ground Zero includes 412 hardy Swamp White Oak trees that convey a sense of strength, perseverance, and peace.*



*A row of four Red Maples follows the gentle curve of a building at New Town High School.*

### Step 3: Planting Plan Development (continued)

#### Arrangement (Street Trees)

The planting of trees within public road rights-of-way is governed by the Maryland Roadside Tree Law. Pursuant to the law, all planting of street trees must be reviewed and approved by EPS and the Baltimore County Department of Public Works.

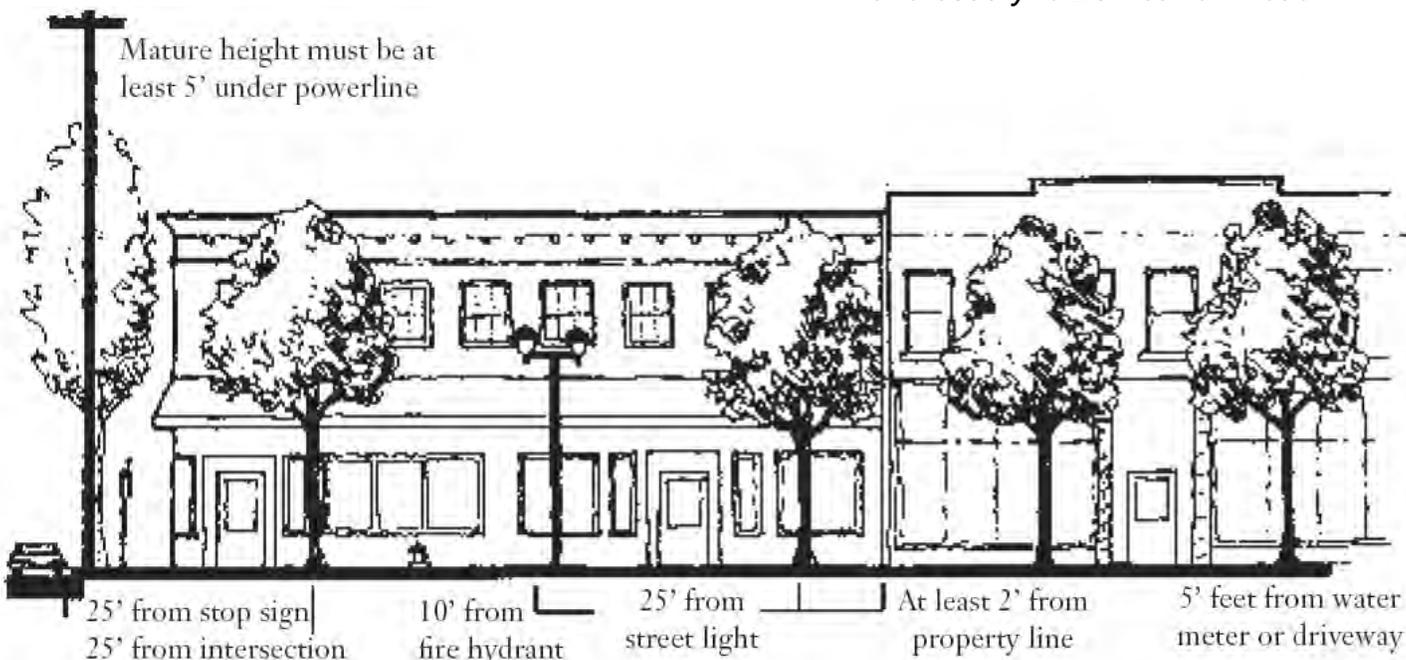
Street tree planting plans should conform to the guidelines for landscape-style single tree plantings (see p. 5), and should utilize species that are highly tolerant of urban conditions (see p. 10-11). Experience has shown that trees planted within 4' of sidewalks pose great risk to the long-term integrity of the infrastructure. In most cases, **trees can grow larger and healthier when set back from the walkway in private yards**, where their roots are less restricted.

If the trees cannot to be placed in yards, **they should preferably be planted in strips or medians that are at least 8' wide and 8' long** to allow for adequate root growth. Smaller areas will be considered if the trees are planted with a root barrier.

For the purposes of safety and visibility, street trees should be planted at least 25' from intersections, 25' from road signs, 10' from fire hydrants, 40' from overhead lines, and 15' from underground utilities. These guidelines may vary marginally based on tree species.



*With the consent of the homeowner, street trees should be set back from the street in yards whenever possible to allow for maximum crown development, root growth and long-term tree health. Above, mature oaks add shade, color, and beauty to Dumbarton Road in*



in

### Step 3: Planting Plan Development (continued)

## Aerial Map and Planting Narrative Form Preparation

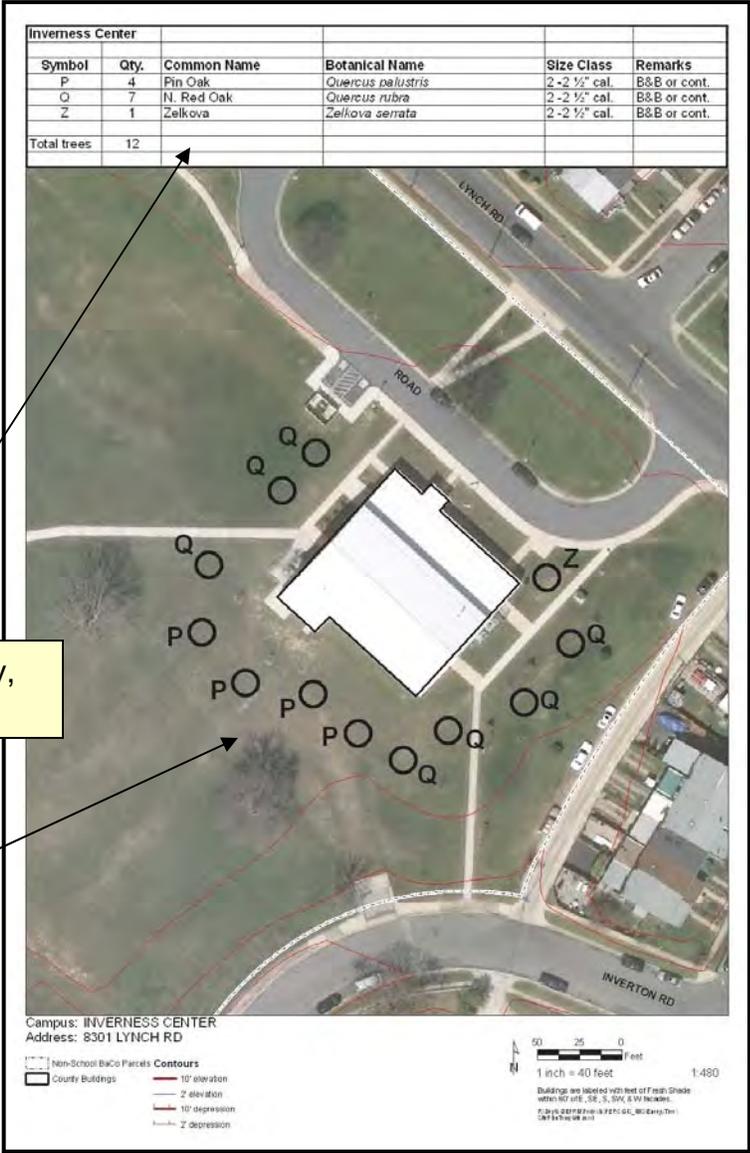
The planting plan that you submit to Baltimore County EPS must contain:

1. An **aerial map** or clear scale drawing of the planting site that indicates the intended placement of the trees. You can locate aerial maps that provide contour lines and imagery at <http://myneighborhood.baltimorecountymd.gov>.

- For plantings of half an acre or less, label individual trees according to species
- For plantings greater than half an acre, indicate the general distribution of species
- In all cases, include on the map a summary table with the total quantity and size class of each tree species

Summary table provides species key, tree sizes, and tree quantities.

Proposed trees represented with circles and labeled according to species.



2. A **planting narrative form** that includes the site location, site description, tree selection and arrangement rationale, maintenance plan, contact information, and anticipated volunteer involvement.

The cover sheet form and example planting plan submissions are on the following pages.

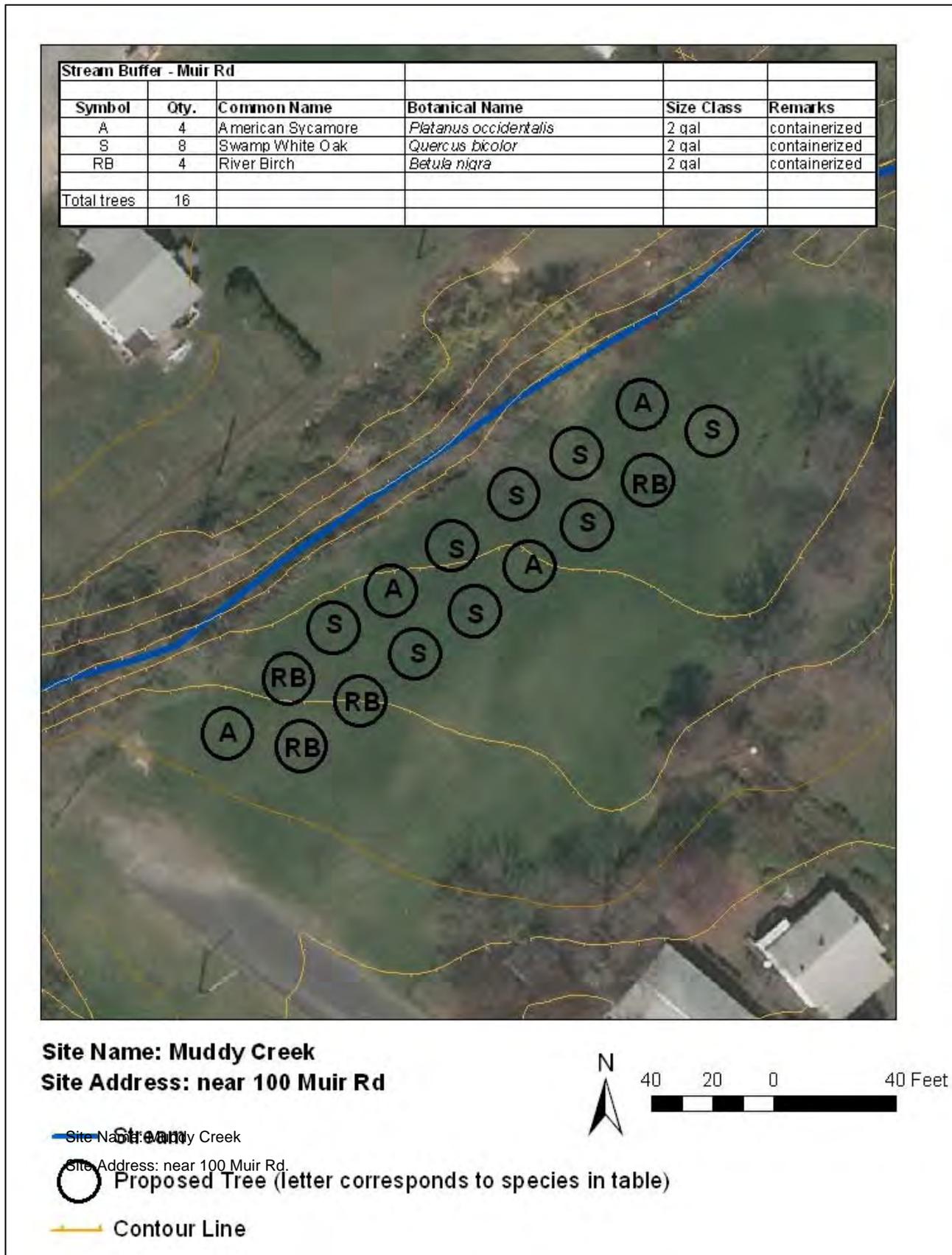
### Step 3: Planting Plan Development (continued)

#### Planting Narrative Form (example information in blue)

Baltimore County EPS	
Community Tree Planting Narrative Form	
Name of Group/Organization: <b>Muddy Creek Alliance</b>	
Date: <b>7/30/2012</b>	Intended Planting Date: <b>10/15/2012</b>
Name of Primary Contact: <b>Nita Shovel</b>	
Phone #: <b>410-555-0123</b>	
Email: <b>n_shovel@tree.net</b>	
Planting Purpose: <b>Install a 60'-wide buffer along 200' of Muddy Creek in order to filter pollutants and control erosion.</b>	
Site Location: <b>near 100 Muir Rd.</b>	
Site Description: <b>60'-wide swath of land between a 4'-wide creek and a hedgerow. The site is not compact, stays quite moist, contains tall grasses, and slopes gently to the northeast. Along the other side of the stream lie Willow, Mulberry, Sycamore, White Oak, and River Birch.</b>	
List of Proposed Tree Species (Quantity, Species, Size): <b>4 American Sycamore, 2 gallon containerized</b> <b>8 Swamp White Oak, 2 gallon containerized</b> <b>River Birch, 2 gallon containerized</b>	
List of Additional Supplies: <b>16 - 1x1" wooden stakes</b> <b>16 Miracle Tube tree shelters</b>	
Tree Selection and Arrangement Rationale: <b>All of the selected trees prefer moist soils. They are arranged, for the most part, in alternate rows for ease of maintenance, with species placed loosely in groups as they might occur naturally.</b>	
General Inspection and 3-Year Maintenance Plan: <b>The site will be checked once each month, with general maintenance scheduled for once each season. Anticipated maintenance tasks include invasive vine removal, shelter and stake upkeep, watering during periods of drought, and pruning of dead branches</b>	
Volunteer Involvement: <b>(effort anticipated for planting and 3 years of maintenance)</b> <b>Expecting to have 20-30 volunteers on planting day and a dedicated group of 5 volunteers to oversee monthly check-ups and seasonal maintenance.</b>	

### Step 3: Planting Plan Development (continued)

#### Aerial Map (example)



#### **Step 4: Planting Plan Submittal**

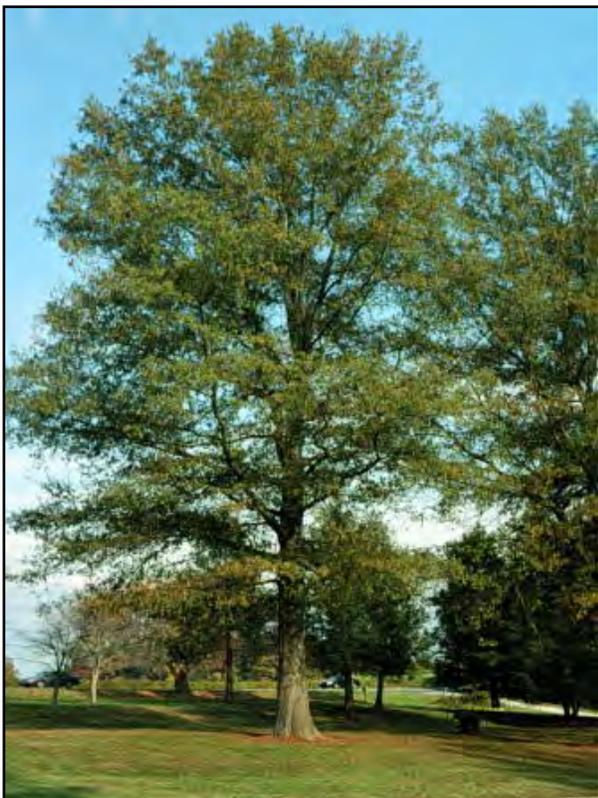
Once you have prepared your planting plan, submit the Planting Narrative Form and the aerial map to the Baltimore County Department of Environmental Protection and Sustainability.

Address: 111 West Chesapeake Avenue, Room 319  
Towson, MD 21204

EPS Fax: 410-887-4804

You may also scan and email the plan to:  
[BigTrees@baltimorecountymd.gov](mailto:BigTrees@baltimorecountymd.gov).

**The planting plan should be submitted preferably 3 months – *and no less than 1 month* – prior to the scheduled planting.**



Canopy species: Willow Oak



Understory species: E. Redbud

## Step 5: Tree Planting

After your planting plan has been approved, place your order for trees and any associated installation materials. Although planting techniques and materials needed will differ somewhat depending on the nature of the planting project, the following principles apply to all installations:

- Holes should be dug to be 2x wider than the size of the container or root ball but no deeper than the depth of the root mass.
- Each tree should be placed with its root collar just slightly above grade so that it will not be covered with soil as it settles after watering.
- For best growth and long-term survival, it is recommended that each tree should receive an application of transplant inoculant added to the backfill soil. The inoculant includes a moisture retaining gel and essential microorganisms that typically are missing from lawns and early-successional fields.

### Reforestation Plantings

For potted seedlings, protect each tree from deer browse and wind damage with a 4-6 foot ventilated tree shelter, secured to a wooden stake with two cable ties.

- Taller and wider diameter shelters (18-24", for example) can also be made from 6-foot tall deer fencing secured to two stakes with two to three cable ties (example at right).
- In urban reforestations, mulch rings are optional and may protect the trees from mowing damage.



### Landscape-Style Single Tree Plantings

When applicable, cut burlap away from the top third of the root ball and remove any cords or pins. The remaining burlap may be left intact.

- Water the planting hole thoroughly and let it drain before planting the tree and backfilling with soil. Exclude grass clumps and rocks from the backfill.
- Protect each tree with a mower guard inside a rigid black mesh bark protector. Stabilize each tree with a flexible strap attached to two sturdy wooden stakes.
- Gently tamp the backfill soil and apply a 2 – 3" deep mulch ring around the tree. Do not pile up mulch around the trunk.



## **Step 6: Tree/Forest Maintenance**

Maintenance is the critical yet often-neglected step in ensuring the long-term survival of a community planting project. Many disturbances can interfere with the success of plantings: deer browse, weather, noxious vines, insect pests, diseases, vole damage, etc. In the first year after planting, inspecting sites regularly (seasonal site visits) can help you identify and solve problems before they overwhelm a planting project.

Under the new policy, **projects must be inspected and maintained for a period of three years after planting.** Annual Maintenance Reports must be submitted to Baltimore County EPS each year, summarizing issues and maintenance tasks completed at each project site. The Maintenance Report Form is located at the end of this section on p. 23 and is available on the Baltimore County website:

<http://www.baltimorecountymd.gov/Agencies/environment/forestsandtrees/plantingguide.html>.

Failure to perform maintenance or submit a report will result in an unfavorable consideration of future planting proposals.

Maintenance requirements vary according to the purpose and function of the project (see p. 5) and are described in detail below.

### Watering

**Reforestation plantings, and urban and rural stream buffers that are planted with smaller 2-3 gallon containerized stock, require watering only during periods of intense heat or drought.** 5-10 gallons per tree (depending on the tree size) once a week is appropriate under these conditions.

**Single tree plantings with 1"-caliper or larger trees require watering throughout the spring and summer growing seasons for each of the three years post-planting.** Transplanted trees have a great water demand and require 10 gallons per week (during the growing season) for every inch of tree diameter. A 2"-caliper tree, for example, requires 20 gallons of water each week. Watering should be more frequent during periods of intense heat or drought. For these sites, Baltimore County recommends using 20-gallon slow-release water bags.

### Mulching

Mulch should be topped once a year in the spring for each of the three years of required maintenance.

## **Step 6: Tree/Forest Maintenance** (continued)

### Tree Shelters, Bark Protectors, and Stake Reinforcement

Tree shelters, bark protectors and stakes in all settings are subject to disturbance from deer, high winds, mowers, and vandals. **With each site inspection, be prepared to readjust fallen, leaning, or bent bark protectors and to re-hammer stakes.**

### Weeding

Weed mulch rings during the spring and summer growing seasons.

### Vine Removal

Vines, especially Oriental Bittersweet and Japanese Honeysuckle, can present problems at reforestation and buffer sites and should be cleared away from trees and bark protectors. If vines or other plants present overwhelming problems, refer to the following section on “Invasive Plant and Pest Control.”

### Invasive Plant and Pest Control

Reforestation plantings may become overrun with invasive plants or may exhibit significant decline due to vole damage or insect infestation. Especially in rural areas, voles prefer to inhabit warm, grassy tree shelters and chew young saplings. Other unwelcome guests, such as Canada thistle, Bamboo, Multiflora rose, Bradford pear, Mile-a-minute, and Oriental bittersweet, can quickly overwhelm a planting project.

If you notice issues developing at your site, notify the Baltimore County Department of Environmental Protection and Sustainability immediately (see p. 25). **Baltimore County’s reforestation crew is certified in pesticide application (includes herbicide and rodenticide) and will handle invasive plant or vole infestations** using best practices. Plantings on school grounds may only be treated in the summer.

For a thorough illustrated list of invasive species in the area, see the National Park Service manual, “Plant Invaders of Mid-Atlantic Natural Areas” (<http://www.nps.gov/plants/alien/pubs/midatlantic/>).

## **Step 6: Tree/Forest Maintenance** (continued)

### Pruning

**Pruning should be limited to:**

- **the removal of dead, dying, or severely diseased branches**
- **branches growing toward or across the tree's center, and**
- **sprouts forming at the base of the trunk.**

It is best to prune deciduous trees in the winter, when the majority of nutrients are stored in the roots and sap flow is reduced (though dead branches may be removed at any time).

### Mowing

Seasonal mowing is required for sites that are not regularly maintained by County grounds crews. **Mowing is extremely important for suppressing invasive and undesirable pioneer species, and it eliminates sheltering material for voles.** Because most invasives thrive in full sunlight, they are suppressed naturally once the trees grow large enough to generate substantial patches of shade. Over time, mowing frequency is decreased and becomes unnecessary as tree crowns develop deeper shade.

## **Step 6: Tree/Forest Maintenance** (continued)

### Quality Assurance

The tree survival goals for reforestation sites and single-tree planting sites are 75 and 100%, respectively (see p. 5). **If at any point the survival count falls below those numbers within the three year maintenance period, we expect the group to perform a tree replacement in order to re-attain or exceed the necessary quantity of healthy trees.**

Under the federally mandated Watershed Implementation Plans (WIP), tree plantings must cross these percent survival thresholds – which must be assessed every three years – in order to continue to qualify for credit toward the County’s tree planting obligation.

If the threshold is not met at the end of the three year maintenance period, Baltimore County EPS will work with your group or organization to develop a strategy for bringing your project up to acceptable standards.

Replacements are a typical part of most planting projects. For this reason, it is important to factor them into your budget. **Be prepared to replace about one quarter of the trees that you initially plant over the course of your three-year maintenance period.** By planning for a worst-case scenario, you ensure that you are equipped with the resources you need to establish a successful and long-lived tree planting.

For example, if your goal is to expand a forest edge with a planting of 50 trees, budget enough money to purchase at least 63 trees (1.25 x 50). Though you will only plant 50 trees initially, it is likely that you will need additional resources to purchase more trees and materials for infill over the course of the next three years.

By planting on Baltimore County property, you consent to unannounced inspections of your planting site. It is your responsibility to be pro-active in the upkeep of your project. If you notice severe problems or unexpectedly poor tree survival and need help, staff at Baltimore County EPS are more than willing to work with you to ensure your project’s success. After all, we share the same goals: restoring forests, restoring habitat, revitalizing communities, and promoting the health of our watersheds and the Chesapeake Bay.

# Baltimore County EPS

## Annual Project Maintenance Report Form\*

<b>Site Name:</b>	<b>Number of Trees Planted:</b>	<b>Acres Planted:</b>		
<b>Date of Planting:</b>	<b>Date of Inspection:</b>			
<b>Number / Percentage of Living Trees:</b>				
<b>Number / Percentage of Dead Trees:</b>				
<b>Condition of Surviving Trees:</b>				
<b>Evidence of Pest and/or Animal Damage</b> (please list different types):				
<b>List of Invasive Species</b> (list each identified species and place a check mark under the adjectives that best describe the species' frequency and extent):				
<b>Species:</b>	<b>Common</b>	<b>Occasional</b>	<b>Localized</b>	<b>Widespread</b>
<b>Maintenance Measures Taken Since Previous Inspection</b>				
<b>Specific Comments and Concerns:</b>				
<b>Inspector Name:</b>	<b>Signature:</b>	<b>Date:</b>		

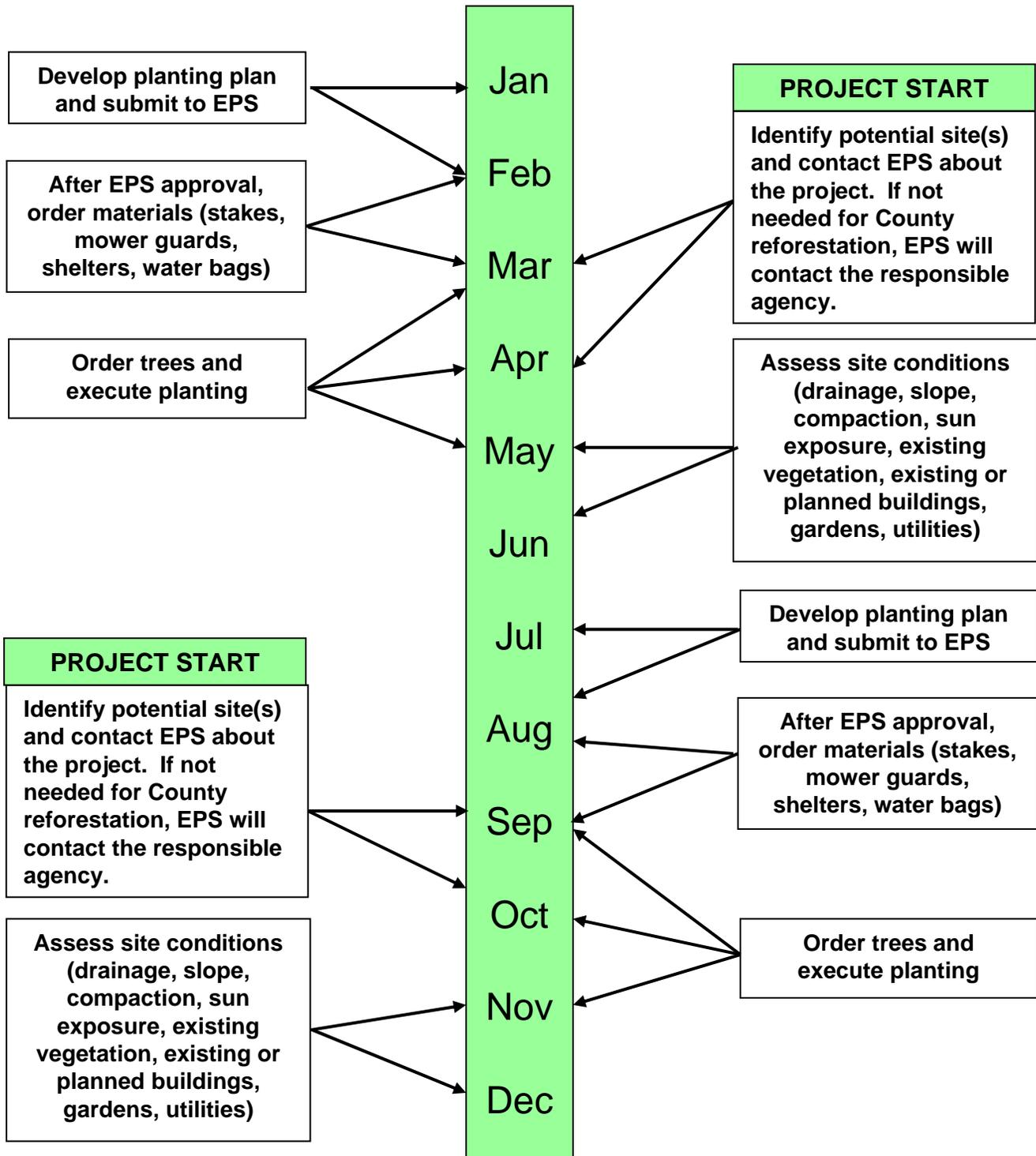
\*Project maintenance must be performed *throughout* the year. Report forms must be completed and submitted *once* a year, on the first, second, and third anniversaries of the tree planting.

## VI. Recommended Project Timelines

It may take longer to plan, develop, and execute a planting project than you might think. As a general rule, start the site identification process several months before your intended planting date. Make sure that your planting plan (Planting Narrative Form and aerial map) are submitted to Baltimore County EPS at least one month prior to your scheduled planting.

### FOR SPRING PLANTINGS

### FOR FALL PLANTINGS



## VII. Contact Information

Contact the Department of Environmental Protection and Sustainability with questions and comments regarding community planting projects.

Planting plans and maintenance reports may be sent to the address, email, or fax below.

Address: Dept. of Environmental Protection & Sustainability  
111 West Chesapeake Avenue, Room 319  
Towson, MD 21204

Email: [BigTrees@baltimorecountymd.gov](mailto:BigTrees@baltimorecountymd.gov)

Phone: 410-887-3776

Fax: 410-887-4804

Website: <http://www.baltimorecountymd.gov/Agencies/environment>









