Queen Anne's County

Forest Conservation Manual

Amended January 2004

This document is to be used in conjunction with *Subtitle 2, Forest Conservation Act* of the Queen Anne's County Code.

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CHAPTER I -- Introduction

Section 1.1

INTRODUCTION

This Forest Conservation Manual has been developed under the direction of the Maryland Forest Conservation Act to provide the standards and technical guidance needed to implement the Act. This manual will be used as the Technical Manual for the Queen Anne's County Forest Conservation Program and will provide minimum standards for the implementation of the Queen Anne's County Forest Conservation Regulations.

Standards or minimum requirements are presented in the manual in bold type for the sake of clarity.

Technical guidance is also included in the manual to assist in implementing the Act. This information is provided in the form of recommended procedures or specifications. This technical guidance information is presented throughout the manual with discretionary language and in normal type.

Section 1.2

USE OF THE MANUAL

This manual will be most helpful for developers and planners who are looking at specific sites and trying to balance the numerous constraints encountered in development. Ideally, the site-specific forest conservation decisions should be made within the context of a larger vision for county wide forest conservation. In this way, site specific decisions can be made with reference to a comprehensive vision of the most valuable forests.

This manual is organized in accordance with the two major components of the Forest Conservation Regulations: The Forest Stand Delineation and the Forest Conservation Plan. The submittal of these two items is required by anyone making an application for major and minor subdivision, major and minor site plans, grading permit or sediment control plan on a land parcel containing 40,000 square feet or more, unless exempt under Section 18-2-4(b) of the Ordinance. Both plans shall be prepared before any final approvals or permits are issued or any work has begun on the site.

The Forest Stand Delineation is the first submittal requirement. It describes existing forest cover and other environmental features, as defined in the Regulations. Submittal requirements include detailed maps and narratives. Chapter 2 of the manual provides detailed information on submittal requirements and recommended procedures for compiling this information. Within thirty days of receipt of the delineation, the applicant or agent will be notified whether the submittal is complete and correct, or if revisions are necessary.
The second component of the Regulations, the Forest Conservation Plan, is described in Chapter 3 of the manual. The Forest Conservation Plan is a separate submittal requirement that outlines proposed forest retention areas, reforestation and afforestation plans, and forest protection procedures associated with a land use change. It also is comprised of detailed maps and narratives describing the proposed strategies for conserving forests on

site. It should be prepared in conjunction with traditional site planning and the Forest Stand Delineation. Within 45 days of receipt of the Forest Conservation Plan, the applicant or agent will be notified whether the submittal is complete and correct, or whether revisions are necessary.

CHAPTER 2 -- Forest Stand Delineation

Section 2.1

INTRODUCTION

The purpose of the Forest Stand Delineation is to characterize and map the existing forests and conditions of the site. Through a combination of resource mapping and field assessments, a detailed map, or Forest Stand Delineation Map, shall be completed. This information will be used in the Forest Conservation Plan to define retention, reforestation and afforestation areas. As mentioned in Chapter 1, throughout this chapter, requirements are presented in **bold** type and additional guidance is presented in normal type.

Section 2.2

REQUIREMENTS

Who is Affected?

A person making an application for a regulated activity, as defined in Section 18-2-4 of the Ordinance, on areas greater than 40,000 square feet must complete a Forest Stand Delineation (FSD). Exemptions to this requirement are listed in Section 18-2-4(b) of the Ordinance.

Who Can Prepare a Forest Stand Delineation?

A Forest Stand Delineation can be prepared by a licensed Forester, licensed Landscape Architect, or other qualified professional as specified in Section 18-2-6 of the Ordinance. (Refer to Appendix P for a list of qualified professionals).

Submittal Requirements for Simplified Forest Stand Delineations

The applicant shall submit the following:

1. **A Final Forest Stand Delineation Map**
2. **A Site Vicinity Map**
3. **A Narrative of Forest Stand Conditions, placed on the FSD plat**

Contents of Submittal Requirements for *Simplified* Forest Stand Delineations

Procedural Requirements

Simplified Forest Stand Delineations are permitted in accordance with Section 18-2-9(d) of the Ordinance. Areas for which a Simplified Forest Stand Delineation are permitted are not required to provide field sampling points or a forest structure analysis. A Simplified Forest Stand Delineation may also be submitted concurrently with a Forest Conservation Plan.

The submittal package shall include the following information:

1. **Forest Delineation Map: This map shall be prepared at the same scale as the grading, subdivision, or site plan including the following information:**

- **Property boundaries**
- **Topographic information**
- **Perennial and intermittent streams and their buffers**
- **Non-tidal wetlands and their buffers**
- **Soils (indicate if hydric, highly erodible, or prime agricultural)**
- **Current forested areas verified by field inspection (include acreage and type of forest), if applicable**
- **Contiguous forested areas (include approximate acreage) , if applicable**
- **Steep slopes or highly erodible slopes**
- **Critical habitats**
- **100-year floodplains**
- **Adjacent land usage and zoning**
- **Project name**
- **Owner name and address**
- **Name, address, and title of preparer**
- **Signature and seal of preparer**
- **Tax map, Block, Parcel number, Lot number**
- **Deed reference of site**
- **Date of drawing**
- **North arrow**

2. **Site Vicinity Map: This map shall indicate the location of the site within a square mile indicating major roads, land uses, and forest cover at a 1:2,000 scale.**

3. **Narrative:** A written description of forest conditions shall be submitted and shall be placed on the FSD plat. The following information shall be addressed:

- **Stand condition, if applicable**
- **Forest association (deciduous, coniferous, mixed)**
- **Comments on evidence of past management practices**

Other environmental features:

- **Presence or absence of floodplains**
- **Hydric soils**
- **Non-tidal wetlands and their buffers**
- **Streams and their buffers**
- **Critical habitats**
- **Steep slopes or steep erodible soils**
- **Cultural features**

- Historic sites
- Adjacent land uses, current and former (if known)

Submittal Requirements for *Standard* Forest Stand Delineations

The applicant shall submit the following:

1. A Final Forest Stand Delineation Map
2. A Site Vicinity Map
3. Stand Summary Sheets
4. A Narrative of Forest Stand Conditions, placed on the plat

Contents of Submittal Requirements for Standard Forest Stand Delineations

The submittal package shall include the following information:

1.Forest Stand Delineation Map: This map shall be prepared at the same scale as the grading, subdivision, or site plan and shall include the following information:

- Property boundaries
- Topographic information
- Perennial and intermittent streams and stream buffers
- 100-year floodplains
- Non-tidal wetlands and their buffers
- Soils (indicate if hydric, highly erodible, or prime agricultural)
- Current forested areas verified by field inspection (include acreage and type of forest), if applicable
- Contiguous forested areas (include approximate acreage), if applicable
- Forest stand locations
- Steep slopes or highly erodible slopes
- Field sampling points
- Critical habitats
- Adjacent land uses and zoning
- Cultural features
- Historic sites
- Project name
- Owner name and address
- Name, address, and title of preparer
- Signature and seal of preparer
- Tax map, Parcel number, and Lot number
- Deed reference of site
- Date of drawing
- North arrow

2. Site Vicinity Map: This map shall indicate the location of the site within a square mile indicating major roads, land uses, and forest cover at a 1:2,000 scale.

3. Narrative: A written summary of forest stand conditions shall be placed on the plat. The following information shall be addressed:

Stand condition:

- Stand structure (dominant species, understory species)
- Forest association (deciduous, coniferous, mixed)
- Forest structure
- Retention potential
- Comments on evidence of past management

Other environmental features:

- Presence or absence of floodplains
- Hydric soils
- Non-tidal wetlands and their buffers
- Streams and their buffers
- Critical habitats
- Steep slopes or highly erodible soils
- Cultural features
- Historic sites
- Adjacent land uses, current and former (if known)

4. Forest Stand Summary Sheets: Data collected at individual sampling points shall be summarized for each stand (See Appendix D for the recommended form and definitions). The following information shall be included:

- Dominant/Codominant species and forest association
- Size class of dominant/codominant trees
- Total number of tree species
- Number of trees per acre
- Percent of canopy closure
- Basal area in s.f. per acre
- Common understory species and their percentages
- Common woody plant and herbaceous species and their percentages
- Percent downed woody material
- Exotic or invasive species and type
- Forest structure rating (See Appendix D for recommended methods or procedures may be employed with the prior approval of the Department).

(Reference Appendix D for a complete list of requirements and sample worksheet)

Procedural Requirements

The following procedures shall be followed in completing the field sampling portion of the Forest Stand Delineation:

Data Collection:

The following information shall be collected in the field and recorded on Forest Sampling Data Sheets:

Forest Stand Information:

- Tree species (dominant and co-dominant)
- Basal area
- Size class (as defined on data sheet)
- Number of trees
- Number of tree species
- Number of dead trees
- Presence of specimen trees
- Rare, threatened or endangered species
- Forest Structure Analysis (shall be calculated using the field collected information)
- Percent canopy closure
- Percent understory cover
- Percent herbaceous cover
- Percent of forest floor covered by shrubs
- Percent of forest floor covered by herbaceous plants
- Percent forest floor covered by downed woody material
- Exotic or invasive species (presence or absence)
- Forest structure calculation

(Reference Appendix D for a complete list of requirements and sample worksheet)

Sampling Intensity

The sampling intensity for the forest stand information shall be sufficient to adequately characterize the forest stand. Forest Stand information shall be collected using an approved forest sampling procedure. The forest structure analysis shall be calculated at an intensity of one sample point per four acres of forest with a minimum of one sample point per stand.

Sampling Site Location

The sample points shall be randomly chosen and should be drawn on a field map prior to visiting the site. The sample points shall be identified with blue striped flagging in the field.

Sampling Methods

Sampling shall be conducted using a method approved by the Department. The forest structure analysis shall be completed on 1/10 acre plots. Two commonly used methodologies for vegetation sampling are the fixed plot and the variable plot methods (see Avery, 1975). If the applicant or preparer of these documents prefers to use an alternate methodology, that person shall submit a written request to the Department for approval. The request shall include a copy of the description of the sampling methodology (e.g., a chapter of a text book) which verifies that the methodology will provide for the collection of the required data.

A fixed plot sampling method involves the establishment of a tenth of an acre plot (37.23 foot radius) and direct measurement of forest stand information within that fixed plot. A variable plot (or "plotless") sampling method uses a wedge prism or angle gauge to count trees of a certain size. The prism commonly used in Maryland is of basal factor 10.

CHAPTER 3 -- Forest Conservation Plan

Section 3.1

INTRODUCTION

A Forest Conservation Plan provides a blueprint for the retention and protection of forested areas, and reforestation and afforestation in response to the impacts of land use changes. This chapter provides a clear process for developing a Forest Conservation Plan so that the intent of the Act can be met.

Specific guidance is provided on the calculations that determine Forest Conservation requirements (Section 3.2), recommendations for integrating the requirements of the Forest Conservation Act with other site development activities (Section 3.3), forest retention procedures (Section 3.4), forest protection procedures (Section 3.5), and specifications for reforestation and afforestation (Section 3.6).

Who Is Affected?

A Forest Conservation Plan shall be submitted as part of any regulated activity that requires a Forest Stand Delineation.

Who Can Prepare a Forest Conservation Plan?

A Forest Conservation Plan can be prepared by a licensed Forester, licensed Landscape Architect, or other qualified professional as specified in Section 18-2-6 of the Ordinance. (Refer to Appendix P for a list of qualified professionals).

Submittal Requirements

The Forest Conservation Plan shall contain the following elements:

1. **The Approved Forest Stand Delineation.**

2. **A Forest Conservation Worksheet which is used as the basis for determining all forest retention, reforestation and afforestation requirements for the site.**

3. **A Forest Conservation Map drawn at the same scale as the grading, site plan or subdivision plan submitted for approval, clearly indicating the location and acreage of:**

   - **Forest Retention Areas (with priority rating)**
   - **Reforestation Areas**
   - **Afforestation Areas**
   - **Field verified forest edges reflecting critical root zones**
   - **Specimen trees isolated from retained areas and their critical root zones**

- Protective devices
- Limits of disturbance
- Stockpile Areas

4. Anticipated Construction Timetable including the sequence of reforestation, afforestation, maintenance, and protective measures to be employed at the site.

5. Forest Protection Plan that addresses:

- Pre-construction activities
- Specifications of temporary and permanent forest protection measures
- Summary table of proposed protection devices for individual trees
- Stress reduction of specimen trees isolated from the forest retention areas

6. Reforestation Plan and Afforestation Plan, if required, including in narrative form:

- Evaluation of reforestation and afforestation methods
- Plant stock table
- Planting plan which includes:

    1. A summary of site assessment and preparation needed.
    2. Target species for reforestation/afforestation.
    3. A plant materials table which includes information on plant material source, tree species, number of plants and size of plants.

- Signed, binding two year management plan for reforestation and afforestation sites which includes the following:
    1. Watering plans
    2. Fertilizing plans
    3. Control of competing vegetation
    4. Protection from disease, pests, and mechanical injury
    5. Reinforcement planting provisions if survival falls below acceptable levels
    6. Name of company or individual responsible for tree care

7. Any additional supporting documentation or information required by the Department.

For projects which are staged over several years, a forest stand delineation shall be completed at the start of the planning process, and when feasible, a forest conservation plan shall be submitted for the entire project. Notes may be required on the plan or plat to enable appropriate tracking of required afforestation and reforestation.

Section 3.2

THE FOREST CONSERVATION WORKSHEET

The Forest Conservation Worksheet (Version 1.1) serves as the basis for determining forest retention, afforestation, and reforestation requirements on site. In brief, the requirements of the Act are driven by three factors: zoning of the parcel (category), shown in Table 3.2.1, existing forest acreage, and areas of forest to be cleared. To guide the applicant through the computations, the Forest Conservation Worksheet has been developed and is a submittal requirement for both proof of exemption and for any required Forest Conservation Plan.

Required information to complete the Forest Conservation Worksheet

1. **Land use category: The worksheet shall indicate the thresholds required based on the zoning category for the site.**

2. **Total site area: The acreage of the site boundaries as determined by boundary survey to the nearest one-tenth acre.**

3. **Area of site within the 100-year flood plain: The area of the 100-year flood plain as defined by the Federal Emergency Management Agency (FEMA).**

4. **Area remaining in agricultural production or not changing land use.**

5. **Existing forest cover at site: This will be determined from the approved Forest Stand Delineation.**

6. **Forest area proposed for clearing: This will be determined directly from the limits of disturbance defined on the grading or site plan. The worksheet figures shall be modified to reflect additional forest clearing attributed to utility rights of way, roadway grades and rights of way, stormwater and sediment control facilities, and other clearing not shown on the grading plan. Figures for clearing, both above and below threshold levels, shall be required.**

TABLE 3.2.1. ZONING USE TABLE

CONSERVATION THRESHOLD

Zoning District	Threshold Percentage
AG, CS	50%
E, SE, NC-1, NC-2, NC-5	25%
SR, UR, NC-8, NC-15, NC-20, VC, GPRN, CMPD, TC, SMPD, SHVC, GNC, GVC,	20%
SC, UC, SI, LIHS, AD, SIBE	15%
Institutional use in any zoning district	20%

AFFORESTATION THRESHOLD

Land Use	Zoning District	Threshold Percentage
Agriculture and Resource Areas	AG, CS	20%
Medium Density Residential Areas	E, SE, NC-1, NC-2, NC-5	20%
Institutional Development	All Zoning Districts	15%
High Density Residential Areas	SR, UR, NC-8, NC-15, NC-20, GPRN	15%
Mixed Use Areas	VC, CMPD, TC, SMPD, SHVC, GNC, GVC	15%
Commercial and Industrial Use Areas	SC, UC, SI, LIHS, SIBE, AD	15%

QUEEN ANNE'S COUNTY FOREST CONSERVATION WORKSHEET
Version 1.1

Net Tract Area

A. Total Tract Area — A = _____
B. Area within 100-year Floodplain — B = _____
C. Area to Remain in Agricultural Production — C = _____
D. Net Tract Area D = A - B – C — D = _____

Land Use Category (From Table 3.2.1, page 13 in Queen Anne's County Manual)

E. Afforestation Threshold E = D x___% — E = _____
F. Conservation Threshold F = D x___% — F = _____

Existing Forest Cover

G. Existing Forest Cover (excluding floodplain) — G = _____
H. Area of Forest Above Afforestation Threshold — H = _____
   (1) If G ≤E then H=O and I=O, go to L
   (2) If G > E then H = G - E, go to I
I. Area of Forest Above Conservation Threshold — I = _____
   (1) If G≤F then I=O, go to L
   (2) If G>F then I=G- F, go to J

Break Even Point

J. Forest Retention Above Threshold with no Mitigation — J = _____
   (1) If I> 0 then J = (0.2 x I) + F, go to K
   (2) If I = 0, J = 0, go to L
K. Clearing Permitted without Mitigation K = G - J — K = _____

Proposed Forest Clearing

L. Total Area of Forest to be Cleared — L = _____
M. Total Area of Forest to be Retained M = G - L — M = _____

Planting Requirements

N. Reforestation for Clearing Above the Conservation Threshold — N = _____
   (1) If L= K then N = O,P= O,Q= O, R= O, S= O, go to T
   (2) If M > F then N = L x 0.25, P = 0, go to Q
   (3) If M ≤ F then N = I x 0.25, go to P
P. Reforestation for Clearing Below the Conservation Threshold — P = _____
   (1) If G>F and M>F then P= O, Q= O, go to R
   (2) If G>F and M≤F then P= 2.O x (F-M), Q= O, go to R
   (3) If G≤ F then P= 2.O x L,Q= O, go to R
Q. Credit for Retention Above the Conservation Threshold — Q = _____
   (1) If M>F then Q= M- F, go to R
   (2) If M ≤ F then Q = 0, go to R
R. Total Reforestation Required — R = _____
   (1) If Q> N and M> E then R= O, S= O, g to T
   (2) If Q< N and M>E then R = (N+P)-Q, S=O, go to T
   (3) If Q≤ N and M ≤ E then R = N + P, go to S
S. Total Afforestation Required — S = _____
   (1) If G<E and M<E then S = E - G, go to T
   (2) If G < E and M = E then S = 0, go to T
T. Total Reforestation and Afforestation Required T = R + S — T = _____

(Note: Use 0 for all negative numbers that result from the calculations.)

Section 3.3

FOREST CONSERVATION AND SITE PLANNING PROCESSES

INTRODUCTION

The process of land development requires coordinating the requirements of the Forest Conservation Act with other state and local requirements for the subdivision and development of land. This coordination will demand an increased level of awareness and creativity on the part of developers and their consultants. This section provides guidance on planning and site engineering issues. It suggests ways to accommodate site development features while meeting forest conservation goals.

Site planning is a complex interdisciplinary process that should involve a team of consultants. Numerous issues must be considered in the planning process. Decisions about site development must take into account local zoning, subdivision and land development ordinances. In addition, infrastructure concerns (roads, utilities, etc.) must be considered. Another factor is the variety of state and local regulations that address protection of sensitive areas (wetlands and their buffers, steep slopes, waterways, etc.). Forest conservation is another element that must be integrated into the site planning process. The forest conservation consultant must work with the developer, contractor, site planner, engineer, wetland consultant and other specialist on the team to ensure that forest conservation requirements are integrated into plans as they evolve from the conceptual stage to the final plan stage.

Forest conservation should be seen not as a constraint on site planning but as a tool to achieve better community design. The forest stand delineation should be part of a comprehensive site analysis that identifies the areas of a property that are most suitable for development and for preservation. In general, high priority forest areas are likely to coincide with other sensitive areas protected by state and local regulations. Thus, preserving priority forests may also satisfy requirements for preserving wetlands, steep slopes, habitat areas, etc. The initial concept plan should take into account sensitive area and forest stand delineation information. The forest conservation plan should be an integral part of the final plan. Preservation of existing forests and creation of new forests can contribute to site planning and environmental goals such as screening unattractive views, buffering incompatible land uses, and enhancing wildlife habitats.

Although local ordinances and approval processes vary across the state, certain basic elements are common to most site development proposals. The following section outlines some of the site design issues that may impact forest preservation and suggests ways of minimizing potential conflicts between forest conservation goals and other regulations or requirements. Specific topics include:

1. Residential design

2. Erosion and sediment control

3. Wetlands

Residential Design

Creative site planning techniques enable developers to comply with the provisions of the Forest Conservation Act. Two of the most common methods for retaining forests in residential communities are minimizing the area of disturbance and/or creating cluster-type subdivisions. These techniques may also minimize impacts to other environmentally sensitive areas and, in the process, aid in complying with other environmental regulations.

To preserve forests and other sensitive natural environments, clearing and grading around proposed development features should be limited to the minimum extent necessary. Mass grading and clear-cutting will not be permitted. Impervious areas should be minimized and techniques such as shared driveways should be considered.

A residential site design technique that is often used to preserve natural resources is cluster development. In a cluster subdivision, lot sizes are reduced so that the amount of open space is increased. Residential development is concentrated in the areas most suitable for construction and the remainder of the land remains in agricultural production or becomes public or commonly owned open space. Open space land serves two primary purposes: it preserves farmland, sensitive natural environments, or provides area for community recreation use. The location of cluster open space should take into account the results of the Forest Stand Delineation (Chapter 2). High priority areas should be retained and forest cover should be as continuous as possible so that wildlife corridors can be preserved.

Erosion and Sediment Control

The design and construction of erosion and sediment control structures must be closely coordinated with forest conservation planning. Many of the goals of erosion and sediment control plans duplicate those of forest conservation. Protecting retained forests or afforestation and reforestation areas, requires enforcement of defined limits of disturbance and control of sediment from construction sites.

1. Clearing of forests to accommodate the construction of temporary sediment and erosion control devices and/or construction period stormwater management devices should not occur. These devices should be located in areas that are required to be disturbed for permanent development. Staging of development may be needed to accomplish this objective.

2. Forest protection devices should be installed prior to the sediment control devices.

3. Location of sediment control and forest protection devices should be coordinated. Silt fencing used for erosion and sediment control may serve also as forest protection measures if located on the outside of forest retention, afforestation or reforestation zones. Perimeter berms should be located outside of critical root zones. Forest conservation areas need added protection (flagging and signage) as specified in Section(3.5) of this chapter.

4. Untreated runoff should not be directed into forest retention, afforestation or reforestation areas. Retained forests should be protected from drastic changes in

hydrology and excessive sedimentation. However, if existing hydrology permits, retained forests may be appropriate for handling partially treated runoff. The use of existing forests and future afforested areas to serve as additional treatment areas should be considered as part of best management practices for sediment and erosion control.

Wetlands

The protection of wetlands, as specified by state and federal regulations, should have few conflicts with the Forest Conservation Act. The requirements of this act supports similar goals and objectives. The following comments and suggestions are provided:

1. Identify preserved forested wetlands, such as palustrine, or scrub-shrub types (outside of the 100-year flood plain) that qualify as forest retention areas.

2. Report information collected through the wetland delineation (such as hydric or hydric inclusion soils) in the Forest Stand Delineation.

3. Reforest disturbed wetlands or wetland buffers, as they are a high priority. An assessment of the need for state or federal permits to reforest these areas must be made prior to approving any such proposal.

Figure 3.4.1

The Critical Root Zone

Roots are vital to the functioning of any tree. They provide structural support as well as the major mechanism for nutrient and water uptake for use by the tree. Destroying a section of a tree's roots, will ultimately result in a proportional loss to the tree's canopy.

The Critical Root Zone of a tree is the zone in which the majority of a tree's roots lay. Ninety-five percent of the roots of most trees will be found in the upper 12-18" of the soil. The majority of the roots that supply the nutrients and water to the tree are found just below the soil surface. The total amount of a tree's roots are generally proportional to the volume of the tree's canopy. Therefore, if the roots only penetrate a thin layer of soil, then the roots must spread far from the tree, beyond the extension of the canopy.

When delineating forest retention lines in the field, one must consider not only the visible portion of the tree (the trunk and canopy) but the below ground portion as well. On all Forest Conservation maps, isolated specimen trees should be noted with their critical root zones and all forest stands to be saved should be noted by the edges of their critical root zones and not just by the extent of their canopies.

The true size of the critical root zone is determined by the species and size of the tree as well as the conditions of the soil (including texture and moisture level). It is difficult to generalize for all trees but also difficult to field examine the root systems of all of the trees in question.

There are several ways to estimate the size of the critical root zone without examining the roots in the field. The following calculation is suggested but other methods may be accepted if shown to protect the complete root zone.

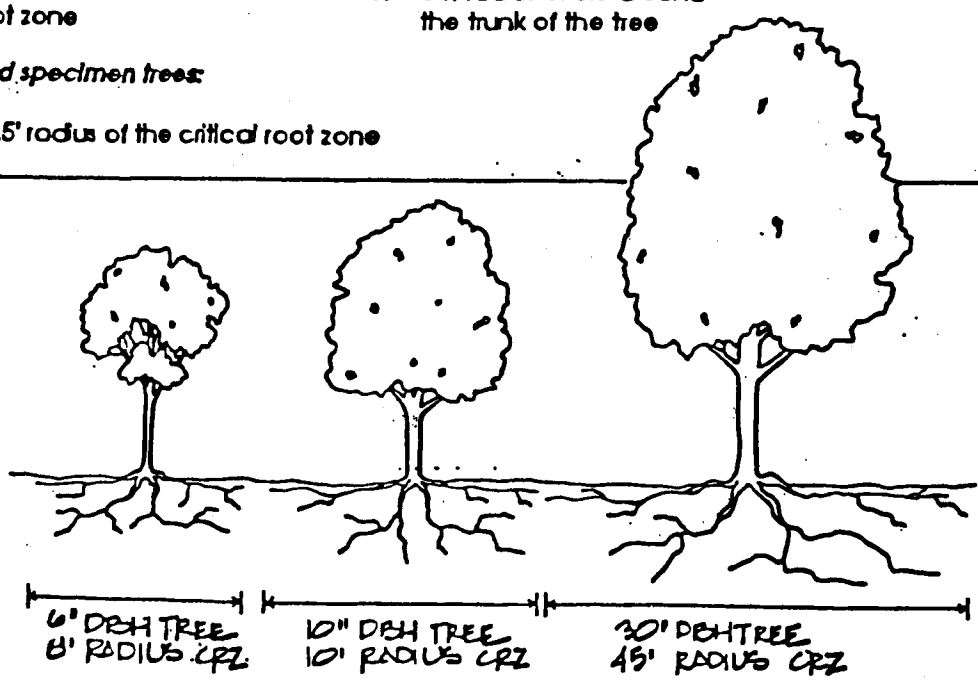
For the edges of large areas, use the greater of the two choices below:

1" DBH of the tree = 1' radius of the critical root zone

or 8 ft radius circle around the trunk of the tree

For isolated specimen trees:

1" DBH = 1.5' radius of the critical root zone



The Critical Root Zone is the area in which most of a tree's roots lay. Retaining this area, along with the tree itself will help to insure a healthy retention area.

Source: MD Department of Natural Resources

Section 3.4

FOREST RETENTION PROCEDURES

Introduction

This section provides a framework for identifying forest areas to be retained. Using the information gathered in the Forest Stand Delineation and forest retention criteria defined in the Act, a final plan for forest retention can be accomplished. This section provides a framework for prioritizing forested areas using specific retention criteria. Once priority areas are mapped and the acreage calculated, this chapter provides additional guidance for the identification of the most important areas to be retained as Forest Retention Areas.

Requirements

Definition of Retention Areas

The Forest Retention Area shall meet the definition of forest. Critical Root Zones of retained areas that are protected shall be counted toward the total Forest Retention Area (Figure 3.4.1). The critical root zones of isolated retained specimen trees (not already within above defined retention areas), shall also be counted toward the total Forest Retention Area. This retention credit shall only apply if 80% of the critical root zone is retained.

Use of Retention Areas

Construction activities may not take place in the retention area. This includes the siting and construction of:

- **Utility lines**
- **Access roads**
- **Staging, storage, stockpile areas, and temporary parking areas**
- **Stormwater management devices**
- **Impervious surfaces**
- **Grading**
- **Berms for the purpose of temporary or permanent sediment and erosion control**

If any of these or other construction activities take place in designated retention areas, these disturbed areas will no longer be credited toward retention and shall be compensated by other retention areas or reforestation and afforestation.

Protection of Retention Areas During Construction

Forest retention areas and specimen trees that are to be protected from construction activities shall be identified at the construction site. Placement of highly visible signage shall be used to protect these areas and must be placed prior to any land clearing or grading. Each sign shall be placed a minimum of 50' apart. These devices shall be maintained throughout the entire construction phase of the project. Attachment of signs or other objects to trees is prohibited and no equipment, machinery, vehicles, materials or excessive pedestrian traffic shall be allowed within protected areas.

As an alternative to devices, a minimum 40 foot wide forested buffer may be used to protect the retention areas. Use of the buffer shall be approved by the Department and may be requested by the Department. No equipment, machinery, vehicles, material or excessive pedestrian traffic shall be allowed within the buffer area. Incidental damage due to construction activity shall not be found in non-compliance unless impact to the retention area also occurs.

Future Protection

The future protection of retention areas, as well as reforestation and afforestation areas, is required by the Act. These areas shall be protected through the use of legal mechanisms described in Section 18-2-19 of the Ordinance. Compatible uses of retention areas may include such activities as unpaved hiking trails or certain silvicultural activities associated with an approved forest management plan.

Submittal Requirements

The applicant shall provide a map at the same scale of the subdivision, site or grading plan submitted for review, with graphic illustration of:

1. Retention areas with priority rating and acreage
2. Field verified edges reflecting critical root zones
3. Specimen trees, isolated from retained areas, and their critical root zones.

Designation of Retention Areas

In the process of determining forest retention areas on site, the criteria listed below shall be used to designate areas of highest importance for retention.

Priority Area 1: High

- Critical habitats of rare, threatened, or endangered species
- Trees, shrubs, or herbaceous plants associated with:

1. Intermittent and perennial streams and their buffers
2. Nontidal wetlands and their buffers
3. Slopes over 25 percent
4. Hydric soils
5. The 100-year floodplain

- Trees, shrubs, or herbaceous plants that are part of a stand that has one or more of the following characteristics:

1. Stands or portions of stands with high forest structural diversity (as defined in Appendix D-Figure D-3)
2. Contiguous forested areas of approximately 100 acres that connect the largest or most vegetated tracts of land within and adjacent to the site.
3. Forested areas which provide a corridor 300 ft. wide or more of primarily native vegetation between two larger forested tracts.
4. Contains trees, shrubs or plants determined to be rare, threatened or endangered under the federal Endangered Species Act of 1973, the Maryland Nongame and Endangered Species Conservation Act, Title 10, Subtitle 2A of the Natural Resources Article, Annotated Code of Maryland or COMAR 08.03.08
5. Is part of a registered historic site
6. Is associated with a registered historic structure

- Individual trees with one or more of the following characteristics:

1. Trees that are part of a historic site or associated with a historic structure.
2. Trees designated as a national, state, or local champion tree.
3. Trees measuring 75 percent or more of the diameter measured at 4.5 feet above the ground (DBH) of the designated state champion tree.

4. Trees with a DBH of 30" or greater.

Priority Area 2: Moderate

- Stands or portions of stands with good structural diversity (see Appendix D-Figure D-3).
- Contiguous forested areas approximately 20 acres or more in size which connect
- The largest or most vegetated tracts of land within and adjacent to the site.
- Forested stream buffers up to a forest corridor width of 50 to 300 feet.

Priority Area 3: Low

- Stands or portions of stands with poor forest structural diversity or areas with none of the characteristics mentioned in priority areas 1 or 2; or
- Approximately 40 percent of land covered with exotic and/or invasive species (See Appendix H)

If there are any changes to the designated retention areas after they have been approved, the amended plans shall be re-approved before construction can proceed on the amended areas.

Designating Forest Retention Areas

The designation of retention areas involves the delineation of the proposed locations of the Forest Retention Areas. Priority 1 areas shall be set aside as forest retention areas unless disturbance is unavoidable and approval is granted by the Department. If the Priority 1 area acreage is below that calculated for the required forest retention acreage, then portions of the land in Priority 2 areas should be included as well. This process continues at least until the minimum amount of forest retention area is identified and set aside for protection and should continue until all forest areas left undisturbed are classified.

1. Elements to consider when deciding between two stands of apparently equal value are as follows:

   a. Neighboring land uses: For example, if there are large roads adjacent to the property, a certain size and character forested buffer may reduce the noises reaching the property and will help to filter air pollutants.

   b. Site-specific climate needs: Forests act as windbreaks and moderate temperature extremes.

c. Susceptibility to disease or pest infestation: There may be diseases or pests noted on the forest stand delineation which are not life threatening. These health concerns, however, may be the deciding factor between two apparently equally valuable stands.

d. Recharge of hydrologic regime: Some wooded areas may border but may not be within a technically defined buffer region of a wetland, stream, or spring. Disturbance of these areas may cause damage to the existing hydrologic regime. In many cases, expansion of these buffers should take precedence over retention of isolated wooded areas of similar size and character.

e. Contiguous forested lands: Even small pieces of forests on site may be connected to areas off site which when combined, are important to retain.

2. If conservation of existing forests is not feasible, then the applicant may propose a reforestation or afforestation plan as directed in Section 3.6 of this manual.

Staking Retention Area Edges in the Field

In the previous sections forest stand characteristics are used to determine which forested areas and specimen trees to retain. The on-site delineation of the retention area will require decisions about specific trees that border the edges of the retention areas. Differences between the conceptual limit of disturbance line on the site plan and the existing field conditions along the line of trees to be retained will require adjustment of the staked line in the field. Adjustments for the protection of individual trees along the forest retention line will require a decision on the survival potential of each tree. There are several different factors that shall be considered during this process.

1. Critical root zones (See Figure 3.4.1)

2. Tree health: decay, pests, disease (see Pirone, 1987, for methods of assessing tree health)

3. Susceptible species: wind throw, sun exposure, soil compaction
(Lee: Virginia pine is susceptible to wind throw, tulip poplar is sensitive to any soil disturbance, see Table 3.4.1)

4. Age: older trees are less resistant to disturbance

If the line of disturbance runs through the critical root zone of any tree, then move the line to accommodate trees with a high probability of survival. Some trees may have too much of the root zone within the disturbance area (above 30%) and should be removed. Others may just have a portion of the root zone within the disturbance area; and should be protected during construction. Once the line is staked or otherwise marked in the field, those trees and their critical root zones shall receive protective devices during construction activity. Specific recommendations for the protection of these trees along the retention line may be found in Section 3.5.

TABLE 3.4.1

COMPACTION TOLERANCE

Highest	**Ulmus spp. (elm), Populus spp. (poplar), Salix spp. (willow), Plantanus occidentalis (sycamore), Quercus palustris (pin oak), and Gleditsia spp. (locust)**
Next	**Betula sp. (birch), Carya spp. (hickory), and Tsuga spp. (hemlock)**
Low	**Acer saccharum (sugar maple), Fagus spp. (beech), cornus spp. (dogwood), Quercus spp. (oak), Liriodendron tulipifera (tulip tree), Pinus spp. (pines), and Picea spp. (spruce)**

Section 3.5

FOREST PROTECTION PROCEDURES

Section 3.5.1.

INTRODUCTION

At this point in the preparation of the Forest Conservation Plan, the applicant should have identified and designated forest retention areas, isolated specimen trees, and determined the siting of all utilities, access roads and limits of disturbances such as grading or stormwater management areas. The mere process of delineating these areas, however, does not guarantee their continued viability of the forested areas beyond the construction phase of the project. The impacts of construction activities to tree health include:

1. Damage to the Critical Root Zone by :

    a. Soil compaction from equipment or storage of construction material or stockpile area
    b. Tearing or removing roots
    c. Desiccation or freezing
    d. Increase in toxins
    e. Changes in soil pH
    f. Flooding

2. Damage to the trunk by:

    a. Sun scald
    b. Disease or insect infestation
    c. Impact from equipment

3. Damage to the crown by:

    a. Broken or damaged limbs
    b. Disease or insect infestations

This section of the manual is intended to guide the applicant through the construction phase of a project, ensuring that construction activities will not adversely affect the forest that have been identified as retention areas or specimen trees. Examples of specifications for protection devices are located in Appendix J.

Section 3.5.2

REQUIREMENTS

Submittal Requirements

The applicant shall provide:

1. A Forest Protection Plan addressing pre-construction activities, when appropriate. This includes:

   a. Stress reduction
   b. Temporary and permanent protection devices
   c. Future protection measures
   d. Protection devices for individual trees

2. An overlay map to be added to the Forest Conservation Map showing:

   a. Placement of stockpile areas and temporary and permanent tree protection devices (See Appendix J)
   b. Construction timetable
   c. Specifications for required devices

CONTENTS OF FOREST PROTECTION PLAN

The above submittal requirement shall address the following issues:

1. Pre-construction activities:

   a. Stress reduction of specimen trees isolated from forest retention areas. The plan shall address each of the items below, noting if a technique is used and for what reason.

      - Root pruning
      - Crown reduction or pruning
      - Watering
      - Fertilizing
      - Mulching

   b. Temporary Protection measures, such as fencing, and signage for retained and reforested or afforested areas (See Appendix J).

   c. Permanent protection devices of disturbed areas within the Critical Root Zone of retained areas (See Appendix J).

2. Future protection measures:

The applicant shall include with the conservation plan, a strategy for protecting all retention, reforestation and afforestation areas for the future. Appendix F describes alternative methods that are suitable to ensure this protection.

Procedural Requirements

1. Planning and design of protection devices for all retained areas, including both forested areas and isolated specimen trees:

a. All retention areas and isolated specimen trees shall be protected by highly visible, well-anchored temporary protection devices.
b. Each sign shall be placed a minimum of 50' apart.
c. All protection devices shall be in place prior to any grading or land clearing.
d. Only approved tree fencing; including blaze orange plastic mesh fencing, snow fencing, super silt fence, chain link, baling wire, or barbed wire shall be permitted for fencing options. Roping, string, flagging tape and other weak materials will not be permitted. (Appendix J offers guidance on suitable fencing materials.)
e. Super-silt fencing shall be used in sensitive areas (e.g. wetlands and streams and/or their buffers).
f. All protection devices shall remain in place until all construction has ceased in the immediate vicinity.
g. Devices shall be maintained throughout construction.
h. Attachment of signs, or any other objects, to trees is prohibited.
i. No equipment, machinery, vehicles, materials or excessive pedestrian traffic shall be allowed within protected areas.

2. Pre-construction meeting

After the boundaries of the retention area have been staked and flagged and before any disturbance has taken place on site, a pre-construction meeting at the construction site shall take place. The developer, contractor or project manager, and appropriate local inspectors shall attend. The purpose of this meeting will be to:

a. Identify the locations of the forest retention areas, specimen trees, limits of construction, employee parking areas, and equipment staging areas on the site plan, subdivision plan, grading plan or sediment control plan;
b. Inspect all flagged boundaries, protection devices, and sediment and erosion control devices on site;
c. Make all necessary adjustments; and
d. Assign responsibilities as appropriate and discuss penalties.

The meeting may also be used to inform all construction personnel of the purpose of the various flagging, protection devices, et cetera; and explain the importance of preserving these retention areas.

3. On-site decisions

Any changes made to the Forest Conservation plan due to on-site conditions shall be made in consultation with a qualified individual.

4. Post-construction phase

a. Corrective Measures if damages were incurred due to negligence:

*Stress reduction
*Removal of trees that pose a safety hazard

b. The following minimum standards shall be observed during the removal of temporary structures:

- No burial of discarded materials will occur on-site within the conservation area.
- No open burning within 100 feet of a wooded area.
- All temporary forest protection structures will be removed after construction.

Penalty for Violation

Following the completion of construction, prior to use, the project inspector shall inspect the entire site. If trees die, then the area encompassing the critical root zone(s) will be considered to be in violation of the conservation plan and appropriate action as outlined in Section 18-2-24 of the Ordinance shall occur. Fees may be assessed accordingly in the minimum sum of $1.00 per square foot of the affected area. Other penalties may apply.

Forest Protection

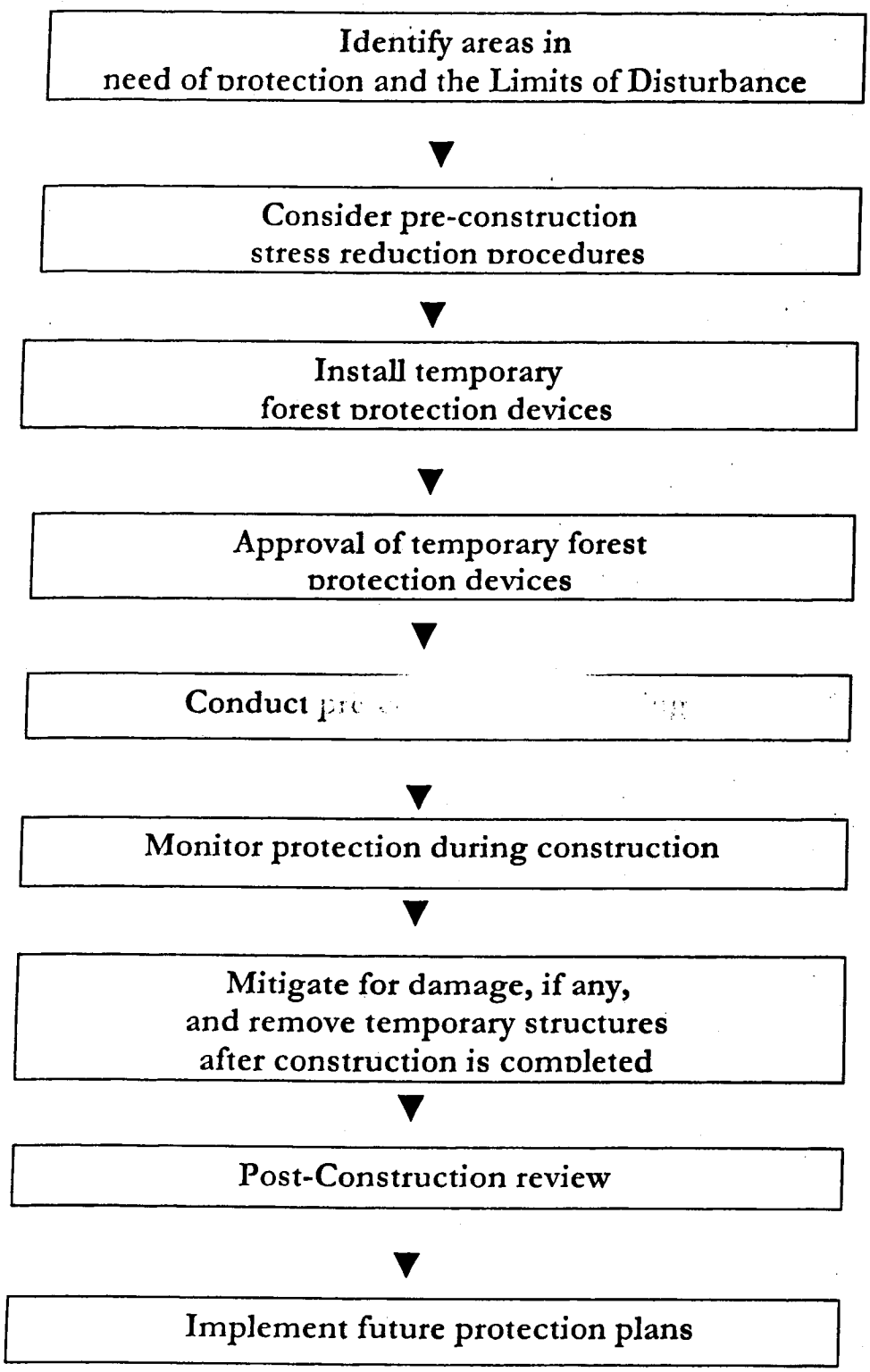
The following is a suggested procedure for the protection of forest retention areas and corresponds to the specifications found in Appendix J of this manual. Figure 3.5.1 outlines the overall process for forest protection.

Pre-Construction Activities

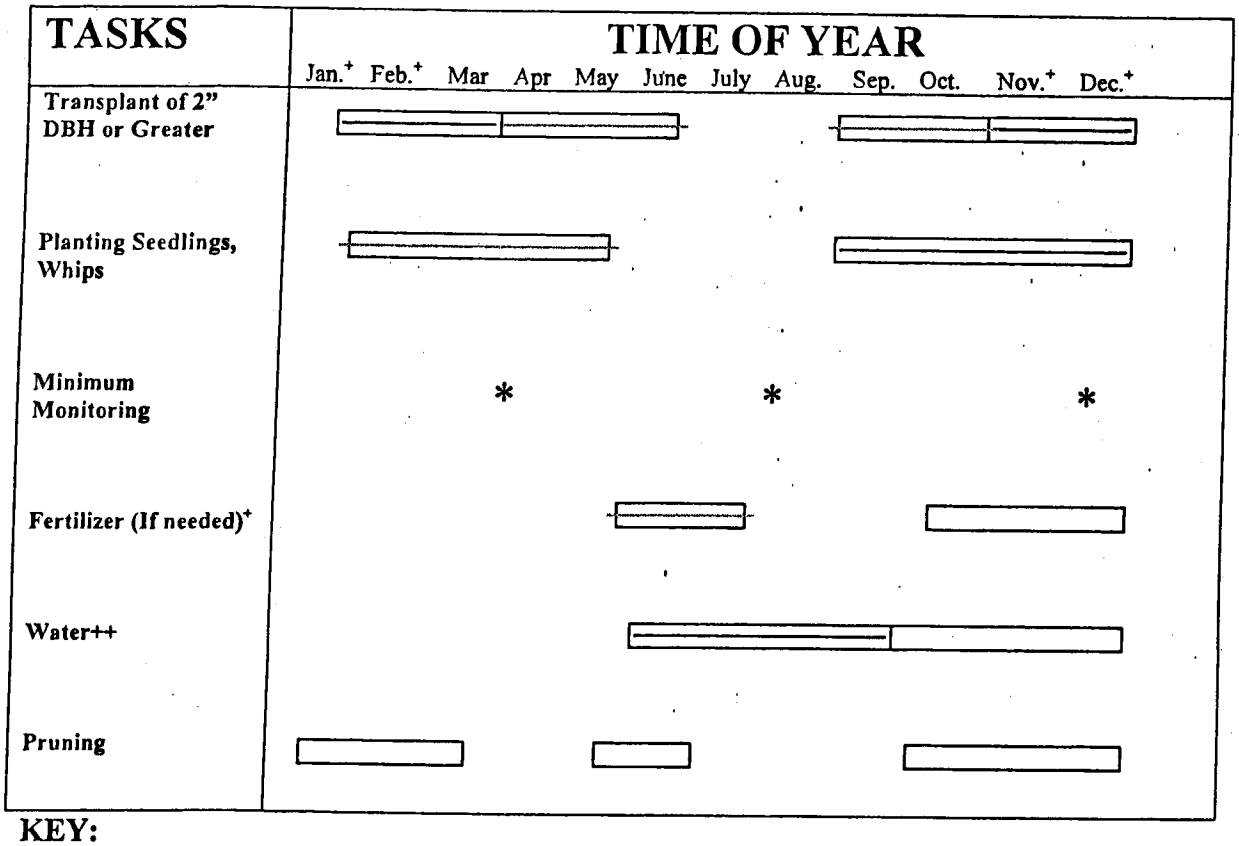
This section applies after the site planning phase is complete and its purpose is to prescribe measures that should be taken on-site prior to any clearing. A development project may be completed in several phases. The measures outlined below should be completed before the start of any phase of a project.

FIGURE 3.5.1

FOREST PROTECTION PROCEDURES



Tree Planting and Maintenance Calendar (Figure 3.5.2)



KEY:

Recommended, Optimal Time of Year

Recommended with Additional Care

Recommended

+ Dependent on Site Conditions

++ Dependent Upon Site Conditions: Weekly Watering is Strongly Recommended From May Through October Unless Weekly Rainfall Equal 1"

Additional Notes:

1. Activities during November through February are dependent on ground conditions.
2. No fall planting of oaks and pines.
3. The planting and care of trees is most successful when coordinated with the local conditions. This calendar summarizes some of the recommended time frames for basic reforestation and stress reduction activities.

This table has been modified from the State Forest Conservation Technical Manual, 3rd Edition, 1997.

Section 3.5.3

Forest Protection: Example Process

Step 1 -- Pre-Construction Phase

Stress Reduction for Specimen Trees Isolated From Forested Retention Areas

Isolated specimen trees that are to be preserved should be examined to determine if stress reduction techniques are needed. The applicant shall address each item below on the conservation plan, if applicable, by noting if a technique is being used and for what reasons.

1. Root Pruning

EVALUATION CRITERIA

a. Will the critical root zone be affected by construction activities such as grade changes, digging for foundations and roads or utility installation?

DESIGN CONSIDERATIONS

a. Prune prior to construction.
b. Prune root with a clean cut, using proper pruning equipment.
c. Exposed roots should be covered immediately with topsoil, peat moss or other suitable material.
d. For trees with a DBH greater than 15" diameter, root pruning may be done up to one year in advance of construction.
e. Monitor for signs of stress and administer water if needed.

2. Crown reduction or pruning

EVALUATION CRITERIA

a. Has the root system been significantly reduced (> 30%) or are there dead, damaged, or diseased limbs?

DESIGN CONSIDERATIONS

a. Prune at the optimal time of year, depending on the type of plant.

*flowering trees--only after flowering and before bud set

*non-flowering trees--in late winter, early spring or mid-summer

b. No more than 1/3 of the crown should be removed at one time using acceptable pruning methods.

c. Monitor for signs of stress

3. **Watering**

EVALUATION CRITERIA

a. Will construction activities alter the hydrology of the site?
b. Has or will root pruning occur?

DESIGN CONSIDERATIONS

a. Water only as necessary.
b. Monitor for signs of stress.

4. **Fertilizing**

EVALUATION CRITERIA

a. Is or will the tree be under stressful conditions?
b. Has or will root pruning occur?

DESIGN CONSIDERATIONS

a. Use low nitrogen and slow release fertilizers.
b. Apply fertilizer in late fall or early spring (see calendar).
c. For small trees (<3" in diameter), broadcast methods may be most appropriate.
d. For larger trees (>3" in diameter), avoid injury while using punch hole method or pressurized injection method.
e. Do not apply fertilizer any closer than 3' from tree trunk for pressurized injection method.
f. Monitor for signs of stress and re-evaluate method being used.

Temporary Forest Protection Devices

Forest retention areas and specimen trees that are to be protected from construction activities shall be identified at the construction site. Placement of highly visible, well anchored devices and highly visible signage (see Figure 3.5.3) shall be used to protect these areas and shall be placed prior to any land clearing or grading. Each sign shall be placed a minimum of 50' apart. These devices shall be maintained throughout the entire construction phase of the project. Attachment of signs or other objects to trees is prohibited and no equipment, machinery, vehicles, materials or excessive pedestrian traffic shall be allowed within protected areas.

DESIGN CONSIDERATIONS

1. Combine protection and sediment and erosion control devices whenever possible.

2. Avoid injuring roots when installing anchoring posts.

3. At a minimum, fencing should be at least 4' high.

4. Fencing should be flagged with highly visible flagging.

5. Fencing should be securely anchored; at a minimum 1/3 of the anchor post should be below ground level.

6. Signs should be posted at all retention areas and specimen trees clearly identifying the area.

The following are representative of the types of devices that may be used:

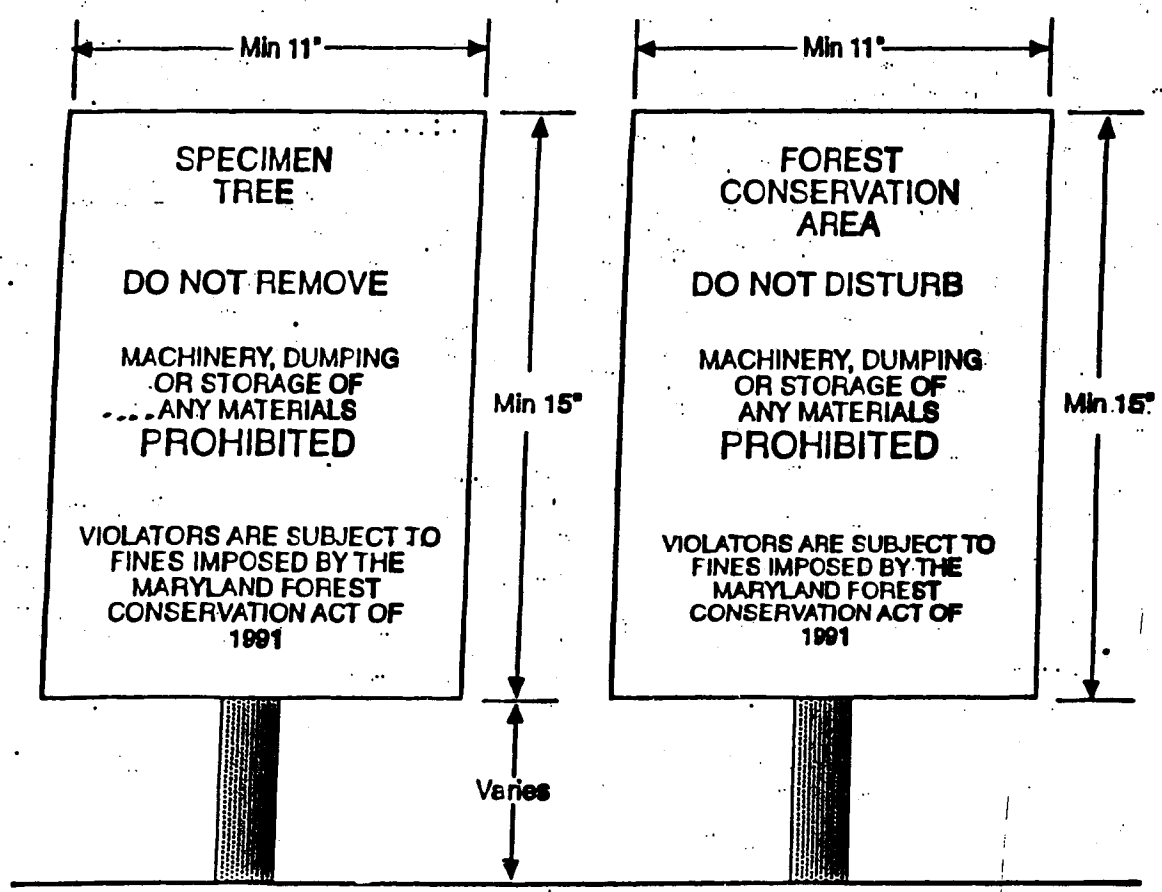
1. For forest protection only (Appendix J)

   a. Blaze orange plastic mesh fencing.
   b. Two to three strand barbed-wire fence with highly visible flags.
   c. Two to three strand wire fencing with highly visible flags/orange streamers.
   d. Snow fencing with highly visible flags on anchor posts.
   e. Super-silt fencing in sensitive areas.
   f. Highly visible signage in areas where construction activity is unlikely to occur.
   g. A combination of any of the above.

2. For combined forest protection and silt fencing

   a. Filter cloth on wire mesh.
   b. Super-silt fencing.
   c. Straw bale dike.
   d. [illegible] dike or swale. Construction of this device will be within the limits of [illegible] the dike and will be maint[illegible] project.

Figure 3.5.3



Notes:
1. Bottom of signs to be higher than top of tree protection fence.
2. Signs to be placed approximately 50' feet apart. Conditions on site affecting visibility may warrant placing signs closer or farther apart.
3. Attachment of signs to trees is prohibited.

Source: Adapted from Forest Conservation Manual, 1991

Construction Signs

Permanent Forest Protection Devices

The following activities should be undertaken, when construction activities will impact the critical root zone of the retained trees as shown on the Forest Conservation Plan. The construction of these devices should take place prior to the grading process whenever possible and their locations should be noted on the forest conservation plan. The devices are to remain in place for the life of the tree. The value of the impacted tree should be determined and compared with the cost of implementing the following.

EVALUATION CRITERIA

Is a significant portion of the critical root zone of a specimen tree or retention edge (>30%) impacted by the construction activity?

DESIGN CONSIDERATIONS (See Appendix J)

1. Install root aeration system as appropriate.
2. Install tree wells as appropriate.
3. Install retaining walls as appropriate.
4. Install raised sidewalks as appropriate.
5. Use reinforced pier and panel wall as appropriate.
6. Apply tunneling practice.

Step 2 -- Construction Phase

Improper or sloppy construction techniques can cause the death of trees immediately or as late as 10 years after construction has been completed. Tree conditions should be monitored during construction and corrective measures should be taken when appropriate.

DESIGN CONSIDERATIONS

1. The following should be monitored:

a.	Soil compaction	aerate and monitor
b.	Root injury	prune and monitor; consider crown reduction
c.	Limb injury	prune and monitor
d.	Flooded conditions	drain and monitor; correct problem
e.	Drought conditions	water and monitor; correct problem
f.	Other stress signs	determine reason, correct, and monitor

2. On-site decisions shall be made in consultation with a qualified individual.

Step 3 -- Post-Construction Activities

CORRECTIVE MEASURES

After construction has been completed, several actions should be taken to increase the survivability of the trees that are retained on the project site. Written authorization for the removal of any trees within the retention area may be required. Each item listed below

Should be addressed on the plan.

1. Stress Reduction: see "stress reduction" under pre-construction activities
2. Repair of tree damages - consider:

    a. Root repair.
    b. Removal of dead limbs: if they pose a safety hazard.
    c. Soil aeration.

3. Removal of dead or dying trees: Applicant shall not remove trees unless they pose a safety hazard (if the height of the tree is greater than or equal to the distance to the nearest building).

Removal of Temporary Structures

After construction has been completed, it is necessary to remove all temporary structures. Temporary structures include temporary roadways, short-term protection devices, and sediment control devices. They cannot be buried within the conservation area. Open burning should not take place within 100 feet of a wooded area. Other items to include are as follows:

1. Remove temporary roads by removing stone or broadcasting mulch; pre-construction elevation should be maintained.
2. Aerate compacted soil.
3. Replant disturbed sites with trees, shrubs and/or herbaceous plants.
4. Retain signs for retention areas or specimen trees.

Review and Approval of Protected Areas

Following the completion of construction and prior to use, the project inspector shall inspect the entire site. If trees in the retention area are found dead or die then the area will be considered to be in violation of the conservation plan and fees will be assessed accordingly, or other penalties as may be imposed.

Future Protection Measures

The forest conservation areas, including the retention, reforestation and afforestation areas, shall be protected long after construction ceases. Appendix F describes methods that are suitable to insure this protection.

FIGURE 3.5.3

FOREST PROTECTION PROCEDURES CHECKLIST

Step 1: Pre-Construction

Address stress reduction of isolated specimen trees
_____Root Pruning
_____Crown reduction or pruning
_____Watering
_____Fertilizing
_____Mulching

Temporary forest protection devices
_____Forest protection fences or
_____Combined sediment control and tree protection fences
_____Forest retention area signs

Permanent forest protection devices
_____Tree wells
_____Root aeration system
_____Retaining walls
_____Signage
_____ Other

Include on site plan:
_____Forest retention areas
_____Isolated specimen trees
_____Employee parking areas
_____Equipment staging areas on site plans

Pre-construction Meeting
_____Discuss penalties
_____Inspect protection devices on site

Step 2: Construction phase

Monitor
_____Soil compaction
_____Root injury
_____Trunk wounds
_____Limb injury
_____Flooded conditions
_____Drought conditions

Step 3: Post-construction

Stress Reduction
_____Root Pruning
_____Crown reduction or pruning
_____Watering
_____Fertilizing
_____Mulching

Repair of tree damages
_____Root repair
_____Removal of dead limbs
_____Soil aeration

_____Removal of dead or dying trees posing an immediate safety hazard
_____Removal of temporary tree structures
_____On-site inspection by local or state project inspector

Future Protection Measures

_____
_____
_____
_____
_____
_____

Section 3.6

REFORESTATION AND AFFORESTATION PROCEDURES

Section 3.6.1

INTRODUCTION

An applicant must demonstrate to the satisfaction of the Department that every reasonable effort has been made to conserve as much forest as possible. Once all retention areas have been identified, the applicant may need to pursue reforestation or afforestation options. Three goals to keep in mind while developing a reforestation or afforestation plan are:

1. The need to integrate native forest associations into developed landscapes.
2. The promotion of diverse, stable forests that are able to provide multiple benefits to the community.
3. The objectives of the local Comprehensive Plan and the site's Forest Management Plan, if applicable.

This section presents a process to assist the applicant in developing reforestation and afforestation plans.

Section 3.6.2

Requirements

WHEN IS REFORESTATION NECESSARY?

1. If an applicant plans to clear existing forest cover above the break-even point, and

2. After is has been shown that "every reasonable effort" has been made to minimize the cutting or clearing of forests.

WHEN IS AFFORESTATION NECESSARY?

Afforestation shall take place:

1. **If there are no trees currently on site or**
2. **If the existing forest cover on site is below the afforestation threshold.**

WHERE SHALL REFORESTATION AND AFFORESTATION OCCUR?

The priority areas for reforestation and afforestation are outlined on Page 40.

SURVIVAL REQUIREMENT

The survival rate for afforestation and reforestation areas shall be a minimum percentage of trees planted (as specified in the stocking table, Table 3.6 on Page 45), at the end of the two-year management agreement.

PENALTY FOR VIOLATION

A site inspection shall take place at the end of the 2-year management agreement. If the survival rate of reforestation and afforestation areas fall below established survival requirements by the end of the two-year management agreement, the remaining amount of the cash bond or other surety may be subject to forfeiture, or other penalties as may be imposed.

SUBMITTAL REQUIREMENTS FOR AFFORESTATION AND REFORESTATION AREAS

The following items shall be submitted as part of the Forest Conservation Plan:

1. Overlay on Forest Conservation Plan Map of reforestation and afforestation areas.
2. Narrative of sequential analysis of reforestation and afforestation methods. (The applicant shall refer to required sequence, on Page 40 and to Appendix K for evaluation criteria.)
3. Planting Plan
4. Signed, binding two-year management agreement

CONTENTS OF PLANTING PLAN

The Planting Plan shall include:

1. Summary of site assessment and preparation needed

2. Target species for reforestation or afforestation

3. Plant materials table including plant material source and:

a. Species
b. Number of plants
c. Size of plants

CONTENTS OF MANAGEMENT AGREEMENT

The Management Agreement shall address:

1. Watering plans*
2. Fertilizing plans*
3. Control of competing vegetation*
4. Protection from disease, pests, and mechanical injury*
5. Reinforcement planting provisions if survival falls below accepted levels

6. Name of company or individual responsible for tree care

*Agreement may indicate little or no action, if appropriate
The Management Agreement must be signed by the property owner and the company or individual responsible for the tree care.

Reforestation and Afforestation -- Example Process

Thus far, the procedures outlined in this section have been required. The following is a suggested procedure for reforestation and afforestation plans. The overall process to be used is outlined in Section 3.6.3.

Section 3.6.3

REFORESTATION AND AFFORESTATION EXAMPLE PROCESS

Step 1 -- Determining Reforestation and Afforestation Acreage

The determination of reforestation and afforestation acreage is based on ~~the~~ land use, existing forest cover, and percentage of the existing forest retained. The Forest Conservation Worksheet (Appendix D) will guide the applicant through these calculations.

Step 2 -- Identifying Priority Reforestation and Afforestation Areas

Certain areas are more sensitive than others to the loss of forest cover. Priority areas established in the Act for reforestation and afforestation are listed below. With reference to the priority retention area map created in Section 3.4, priority reforestation and afforestation areas can be delineated. If an applicant has large areas of open land considered high priority for reforestation or afforestation, and if the development plan allows, the applicant may wish to reforest in excess of required acreage in anticipation of future needs for off-site reforestation.

Priority areas for reforestation and afforestation:

1. **Areas adjacent to intermittent and perennial streams**
2. **Areas that enhance or establish forested corridors**
3. **Areas that establish or enhance forest buffers adjacent to critical habitats, including nontidal wetlands and their buffers**
4. **100-year flood plains**
5. **Areas of steep slopes of 25% or greater including the slopes of ravines or other natural depressions**
6. **Areas adjacent to areas of differing land use; or adjacent to highways or utility rights of way**
7. **Areas adjacent to large tracts of forests**
8. **Areas of hydric soils**

At this point, the applicant should determine proposed areas for reforestation and afforestation.

Step 3 -- Evaluate Reforestation and Afforestation Methods*

The next step is to decide which reforestation or afforestation method to use in planting these areas. The options are, in suggested order of priority with methods to be dictated by site specific concerns:

1. **On-site selective management clearing and supplemental planting.**
2. **On-site transplants or nursery stock that has a caliper greater than 1 ½ inches.**
3. **On-site transplants or nursery stock using seedlings or whips.**

4. For reforestation only, landscaping of areas under an approved landscaping plan which establishes a community dominated by trees and other woody plants that is at least 35 feet wide and covers 2,500 square feet or more of area.
5. Off-site afforestation/reforestation using transplants or nursery stock that is container or tube grown.
6. Off-site afforestation/reforestation using transplants or nursery stock using seedlings or whips.
7. Natural regeneration on-site in limited circumstances.
8. Natural regeneration off-site in limited circumstances.

* A sequence other than the one described may be used for a specific project in limited instances if approved by the Planning Director or in order to take advantage of opportunities to consolidate forest conservation efforts.

The acquisition of an off-site protective easement for existing forested areas not currently protected may be used as a mitigation technique, but the afforestation or reforestation credit granted may not exceed 50% of the area of the forest cover protected.

Selective clearing and supplemental planting means the removal of individual trees, shrubs and/or herbaceous vegetation which is hazardous, exotic, or invasive. Replanting of cleared areas should occur as outlined above. Credit for reforestation requirements shall be received on a 1:1 ratio according to the area cleared and managed for, or interplanted.

The restoration and management of existing woodlands is the most common and effective way to increase forest values. Ecologists, wildlife specialists, and foresters have managed forest resources for decades and are experienced with forest enhancement techniques; therefore, the practice of forest enhancement has a much greater chance of achieving specific design goals than do projects of reforestation or afforestation.

Reforestation and afforestation credit may be received for selective clearing and supplemental planting within retained areas. Analysis of the suitability of a forest stand to receive selective clearing and supplemental planting depends on:

1. The degree of invasive and exotic infestation

2. The structural diversity of the stand

3. The regeneration potential of the stand

Selective clearing and supplemental planting should clearly blend with the long-term management plan for the forest. Destruction of high quality stands shall not occur to advance single issue management objectives.

Transplanted nursery stock is most successful when transplanted in container form. Bare root and ball and burlap stock have significantly greater mortality rates when used in reforestation. Planting plans should use species and sizes suitable to fulfill aesthetic, ecological, and maintenance considerations present on a site-specific basis.

Reforestation in open areas should generally use a mix of sizes and species necessary to create an early serial stage forest with the accelerated potential for complete canopy closure. Planting of understudy or intolerant species is discouraged in open field situations.

Natural regeneration is the preferred method of reforestation only when undisturbed soils can be shown to have a suitable seed band or when open areas are less than one acre in size and are surrounded by high quality native forest associations free from invasive and/or exotic edge conditions. Graded, excavated, and farmed soils are usually not suitable for natural regeneration. In all cases, the regeneration should be monitored for at least five years to insure an adequate probability of the reformation of native forest associations.

Step 4 -- Developing a Planting Plan

The first step in the plan is to assess the conditions of the planting site. Items to consider include past use, future use, soils, hydrology, and sunlight. The second step is to choose an appropriate mix of plant materials for site conditions. The final step is the specification of methods and density of planting.

Site Assessment

PAST AND FUTURE LAND USES

Knowledge of past uses may direct the applicant towards special treatments for and limitations to the reforestation and afforestation sites. For example, past uses that compacted soils may lead to a prescription of intensive soil discing. Soils that have been actively farmed within the past several years may need to be evaluated for pesticide or herbicide contamination.

Consideration of future uses of adjacent land can also direct the reforestation and afforestation plan. High use areas may need larger plant stock to insure survivability. Special attention should be given to design considerations, such as visual diversity, for areas immediately adjacent to human built structures.

SOILS EVALUATION

The quality of the soils is a major determinant of the success of a reforestation or afforestation effort. Every effort should be made to preserve the native soil on site. If fill material is used, it should be uniform with a 12 inch layer of native soils. The best means of evaluating soils is through a laboratory analysis. Analysis is recommended on the following features: nutrient content, organic matter, structure, pH, and cation exchange capacity. (Appendix L provides guidance on recommended corrective measures, when necessary).

An assessment of soil moisture should also be made at this time. Use soil survey information on depth to water table, geotechnical information from soil borings, and knowledge of proposed grade and drainage divide changes to determine likely moisture regimes of the proposed site.

Species Selection

Species native to Maryland are recommended for use. Acclimated stock, suitable for the location, is preferred for hardiness and disease resistance. Multiple species (3 or more) are recommended. However, a Forest Management Plan may call for planting and harvesting of only a single species of tree.

To guide the applicant through the process, two options for selection are suggested:

1. The first is to determine the forest association for the region, based on the most recent data (Grace Brush, 1976, {see Appendix G} Maryland Forest Resource Inventory, 1992) and to plant species found within that association according to the guide below.

2. The second method is to evaluate the adjacent forest stand if relatively undisturbed, or the nearest relatively undisturbed stand, and attempt to replicate the forest community if site conditions remain the same. Again, the mix of species shall be as defined above, following the guide below.

Forests are complex, multi-species, multi-layered systems. In order to retain these distinctive characteristics the following guidelines are recommended:

Seral Stage:	approximately one third pioneer species; two thirds mid or late successional species.
Place in canopy:	60% dominant trees 40% understory trees

Plant Material Selection

1. **All plant materials greater than 1" caliper shall meet or exceed the requirements of standard nurserymen specifications. All plants shall be typical of the species and variety, shall have a normal habit of growth, and shall be first quality, sound, vigorous, well-branched, and with healthy, well furnished root systems. They shall be free of disease, insect pests, and mechanical injuries.**

2. Planting stock less than 1" caliper should meet the following standards.

Seedlings and whips:

hardwoods	1/4" to 1/2" caliper with roots no less than 8" long
conifers	1/8" to 1/4" caliper with roots no less than 8" long and top height of 6" or more

Shrubs: 1/8" or larger caliper with 8" root system

3. Bare root stock, plants should be packaged and handled in the field in such a manner so as to retain moisture in the roots.

Site Stocking

Stocking, as a minimum standard, shall meet the density requirements shown in Table 3.6.

In certain circumstances, any combination of the above mentioned stocking options, dry seeding, pregerminated seeding, tree shelters, and/or natural regeneration may be appropriate ecological restoration strategies or to fulfill the requirements of an approved management plan. They will be evaluated on a case-by-case basis.

TABLE 3.6

SITE STOCKING

Stocking, as a minimum standard, shall meet the following density requirements.

SIZE	NUMBER REQUIRED PER ACRE	APPROXIMATE SPACING Feet on Center*	SURVIVABILITY REQUIREMENT At the end of the second growing season	
Bare Root Seedlings or Whips	700	8 x 8	55%	385
Container Grown Seedling Tubes (Minimum Cavity Width 1.5")	450	10 x 10	65%	290
Container Grown 1, 2, 3, Gallon	350	12 x 12	75%	260
Container Grown 5, 7 Gallon or 1 " Caliper B&B	200	15 x 15	85%	170
Container Grown 15, 25 Gallon or 1.5 - 2" Caliper B&B	100	20 x 20	100%	100

In certain circumstances, any combination of the above mentioned stocking options, dry seeding, pre-germinated seeding, tree shelters, transplants and/or natural regeneration may be appropriate ecological restoration strategies to fulfill the requirements of an approved management plan. They will be evaluated on a case-by-case basis. The mixing of the above mentioned stocking options is encouraged.

***Plant Population Patterns:** This is not to imply that trees or shrubs must be planted in a grid pattern. For various ecological reasons planting in groups such as aggregate distribution may be appropriate. Aggregate massing, drifts, or sweeps are one of the more common vegetation distribution patterns seen in nature. Principle seed bearers are at the central core with dispersal mechanism (seed rain) outwards, often windblown with densities thinning out along the fringes or extremities. Groupings blend through and into other groupings. Another common and observable distribution pattern, even on relatively small sites, is when species may segregate themselves into ecological zones (ecotones) based on a hydrological gradient, soil type or competitive exclusion by abutting vegetation. Clumped populations are very common. At the name suggests, a given individual of a species is grouped closely with others of its species in a clump. Many populations that appear random at first glance, upon careful measurement, are actually clumped. In nature many plants tend to grow in clumped populations. Plants reproduce from seed, and most seeds drop near the parent plants. In addition to reproducing sexually by forming seeds, many species reproduce by underground horizontal stems, which interconnect plants that, above ground, appear as separate individuals. Grid patterns also known as regular populations, though geometrically neat, are uncommon in nature. Plants cannot move as individuals, and even spacing is an improbable chance event. In the known cases of regular plant distribution, evidence exists that each plant is antagonistic toward others of its species. Random populations occur when seeds are dispersed by wind or animals. Many seeds are randomly distributed though many others land near a parent plant. Birds may distribute seeds randomly or in a clumped pattern. For instance, a bird flying over a field drops a seed randomly when it defecates. But a bird sitting on a preferred perch, day after day, may drop many seeds in the same location, forming a clump.

* **Plant Population Patterns:** This is not to imply that trees must be planted in a grid pattern. For various ecological reasons planting in groups such as aggregate distribution may be appropriate. Aggregate massing, drifts or sweeps are one of the more common vegetation distribution patterns seen in nature. Principle seed bearers are at the central core with dispersal mechanism (seed rain) outwards, often windblown with densities thinning out alo the fringes or extremities. Groupings blend through and into other groupings. Another common and observal distribution pattern, even on relatively small sites, is when species may segregate themselves into ecological zones (ecotones) based on a hydrological gradient, soil type or abutting vegetation. The mixing of the above mentioned stocking options is encouraged. In any case, planting should be done with ultimate survivability in mind.

It is customary to plant trees of a single size for one site. In some cases, it may be appropriate to plant a mixture of size stock. The following should be considered:

1. Plant larger stock around the perimeter in order to protect interior smaller stock.
2. Mix stock size when no mechanized equipment is proposed for use on site.
3. Mix size stock when seedlings are thoroughly mulched.
4. Use smaller stock for understory trees and larger stock for overstory in a random plantings.

Larger stock may be more effective than seedlings and whips in areas of high human activity.

Pre-planting Considerations

Planting Site Preparation:

1. Undisturbed sites:

   Disturbance of soils should be limited to the planting field for each plant. A planting field of radius equal t five times the diameter of the root ball is recommended (Moll, 1989).

   In areas of steep slopes or erodible soils, soil disturbance should be limited to the planting field whose radius is equal to 2.5 times the diameter of the root ball.

2. Disturbed areas:

   Soils should be treated by incorporating natural mulch within the top 12 inches, or amendments as determined by a soils analysis. Natural amendments, such as organic mulch or leaf mold compost are preferred. If fill material is used at the planting site, it should be clean fill with 12 inches of native soil. Stockpiling of native top soils must be done in such a way that the height of the pile does not damage the seed bank.

Planting Period:

Depending on the size stock being used, the allowable planting windows differ. Recommended planting windows are shown in Figure 3.5.2.

Plant Material Storage:

It is recommended that planting occur within 24 hours of delivery to the site. Plant materials which are left unplanted for more than 24 hours should be protected from direct sun and weather and kept moist. Bare root stock which are unplanted for more than 24 hours should be heeled in.Nursery stock should not be left unplanted for

more than two weeks. On-site or local transplanted materials should be stored in tree banks if unplanted for more than 24 hours.

On-Site Inspection:

Prior to planting, planting stock should be inspected. Plants not conforming to standard nurseryman specifications for size, form, vigor, roots, trunk wounds, insects, and disease shall be replaced.

Planting Specifications

1. Seedlings and Whips:

Planting small stock, such as seedlings and whips, and balled and burlap stock up to 2" caliper, can be accomplished using manual methods of planting. Equipment ranges from shovels, planting or dibble bars, and mattocks. For larger areas, planting machines are occasionally used, but have the drawback of creating linear, plantation-type forests.

Extreme care should be taken to insure retained moisture of the roots. While planting seedlings and whips, a moist carrying container should be used to further prevent desiccation. For greater protection, seedlings may be planted with tree shelters. Areas planted with seedlings or whips should be mulched after planting.

2. Container Grown Stock:

Successful planting of container grown stock requires careful site preparation and inspection of the plant material root system. Caution is recommended when selecting plants grown in a soils medium differing from that of the planting site. The plant should be removed from the container and the roots gently loosened from the soils. If the roots encircle the root ball, substitution is strongly recommended. J-shaped or kinked root systems should also be noted, and substituted if necessary. Roots may not be trimmed on-site, due to the increased chances of soil borne diseases.

The planting field should be prepared as specified. Native stockpiled soils should be used to backfill planting field. Rake soils evenly over the planting field and cover with two to four inches of mulch.

3. Balled and Burlapped Trees:

Larger tree stock (balled and burlapped stock greater than 2" caliper) is usually planted using tree spades. This is particularly useful when transplanting on-site or with local plant materials. For trees with a six-inch or larger DBH, specialized equipment is recommended.

Balled and burlapped trees must be handled with care while planting. Trees should not be picked up by the trunk or dropped, as both practices will tend to separate the trunk from the root ball. Prior to planting, root balls should be kept moist.

Planting fields should be created. Use watering to settle soil backfilled around trees. Stockpiled native topsoils, if available, should be used to backfill the planting field. Amendments are not recommended in the planting field, as studies have shown that roots will be encouraged to stay within the amended soils. Soils should be raked evenly the planting field and covered with two to four inches of mulch.

Staking of trees is not recommended except in areas of high winds. Staking may be used for trees larger than eight feet in height. Movement is necessary to strengthen the trunk of the planted tree. If stakes are used, they should be

removed after the first growing season. Wrapping is also not recommended due to the increased opportunities for insect infestation and disease.

Post planting Considerations

Soil Stabilization:

For areas of large-scale disturbance, soils must be stabilized using a non-turf-building ground cover or engineering fabric.

Protection Devices:

To prevent damage of planted areas, all reforestation and afforestation sites must be posted with appropriate signs and fenced. (See Figure 3.6.1 and Appendix J). Construction equipment shall be prohibited in these areas.

Step 5 -- Management Agreement for Afforestation and Reforestion Areas

General Design Guidelines

Newly planted trees, whether they are seedlings or 4" caliper transplants, have several basic needs: water and good soil. They also need to be protected from competing vegetation and damaging agents such as pests and diseases. Some of these needs can be met by nature alone; others may require human intervention. The basic maintenance regime should be determined by on-site environmental conditions: structure and nutrient content of soil, and rainfall. Understanding these factors and the specific needs of the species and size of plants used will result in a healthy forested area at the end of the maintenance period.

Watering

How Often?

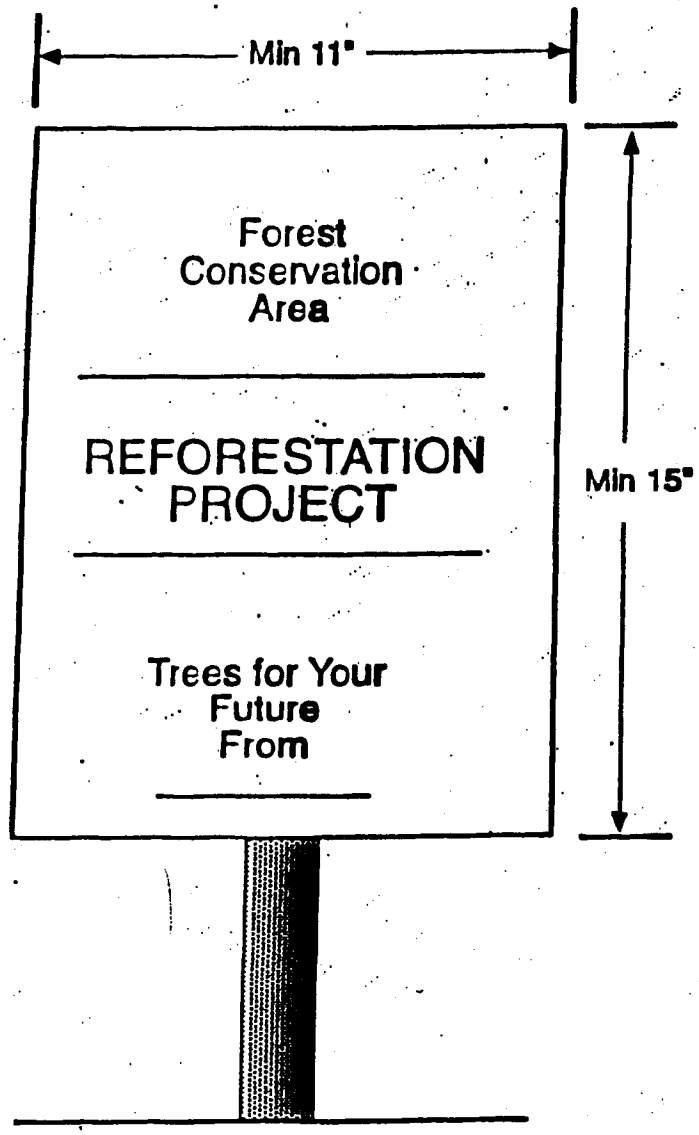
Any watering plan should compensate for recent rainfall patterns. Trees can die from too much water as well as too little. Newly planted trees may need water as much as once a week for the entire growing season. The next two years may require watering only a few times a year, every month during July and August. After that period, trees should only need water in severe droughts. Bare root transplants, as opposed to balled and burlap material, if they were sufficiently watered during planting, may not need water for almost two to four weeks after growth begins.

Soil and Watering

Soil texture influences the downward flow of water. Soils with more clay tend to hold on to the water more and can be watered less often; soils with more sand drain more quickly and need to be watered more often.

If the soil was well prepared before planting then there should not be many drainage problems. If there is restricted downward flow of water, then the soil may have been compacted during construction and not aerated before planting, or there may be a clay hardpan.

Figure 3.6.1



Notes:
1. The signs notify construction workers and future residents of the newly planted material, improving the trees' survival rates.
2. Signs may be adapted by residents for identification of forest retention areas in long term

Source: Adapted from Forest Conservation Manual, 1991

Reforestation and Afforestation Area Signs

How to Water

The best way to water is deeply and slowly using a regular hose, a soaker hose, or drip irrigation. On larger trees start by watering the root ball thoroughly and then expand the watered area to include the whole root zone after t' tree becomes more established. Mulching around the base of newly transplanted trees insulates roots from dry_ too quickly while still providing air movement to the roots.

Fertilizing

What nutrients to apply

Trees depend on three major nutrients, nitrogen, phosphorus, and potassium, and a host of other minor ones (or micronutrients), such as calcium, magnesium and iron. In most soils most of the micronutrients are available in abundance. Of the major nutrients, nitrogen is usually the limiting one. Nothing should be added to the soil without testing it first to determine its needs.

When to fertilize

In general, while soils may be deficient in nitrogen, it is not recommended to fertilize a tree within the first growing season after planting. Too much nitrogen may cause a spurt of canopy growth which the roots cannot support. It is best to wait until after the end of the first growing season, either in the late fall or early spring.

What type of fertilizer

When it is time to fertilize, organic fertilizers are preferred to synthetic fertilizers. Bone meal or seaweed based products are available commercially. Their effectiveness is based on their ability to supply nutrients to the plant as needed while minimizing the risk of excess nutrients entering the forest system and the water supply. Som synthetic fertilizers can mimic this slow-release action and may be appropriate for use.

Control of competing vegetation

In some cases unwanted vegetation growing near newly planted trees can take over the site. The extent to which this problem is controlled depends on the ability of the planted material to withstand the intrusion. Smaller trees need more care, although some seedlings survive among the overgrowth and shade it out when they reach a greater height. As a preventive measure, consider the potential for growth of invasive species while choosing a reforestation or afforestation area. Unfortunately, good sites for reforestation and afforestation are generally good sites for unwanted vegetation as well. (See Appendix H for a list of exotic/invasive plant species).

Mulch is one of the best deterrents to weeds. Spread a two to four inch layer of mulch over the root area of the newly planted trees avoiding direct contact with the trunk, a prime spot for fungal growth. Mulch helps maintain the soil moisture level and may provide a buffer for any equipment, such as mowers, that may be brought through the area. Mulching and manual control of competing vegetation is more compatible with the long term forest health than the use of herbicides.

Protection: pests, diseases, and mechanical injury

An Integrated Pest Management (IPM) program is one of the most effective and safe approaches for maintaining a healthy forest. The basics of IPM include proper species selection for the site, good pruning, mulching and fertilizing practices, regular monitoring, and proper timing of necessary sprays. Good cultural practices will

minimize the amount of spraying. Professional IPM programs have reduced pesticide use by 90%. Some aspects of a full IPM program include:

1. Elimination of some low vegetation before planting. This will help control the rodent population which thrives in brushy environments.

2. Use of tree shelters to protect the trunks of seedlings or whips from animal damage. (The shelters act as mini-greenhouses to speed growth. These trees need more water than those planted without tree shelters.)

3. Mulching around the trees to minimize trunk damage from mowers. Wounds provide an entry way for pests.

4. Pruning dead and diseased branches with a clean cut to prevent spreading of disease.

Sunscald is a problem which thin barked young trees encounter. Tree wrap is commonly used to protect these trees from sunscald but is not recommended due to the increased opportunities for insect infestation and disease. An alternative is to allow small non-competitive branches, commonly pruned, to grow along the sunny side of the trunk to help shade the trunk.

Newly planted trees usually do not have the structural roots to support them during high winds. Stakes and guy wires, appropriate only in locations with high winds, should be used but must be removed after one growing season or they may cause damage to the tree as it grows.

Design Guidance for Special Circumstances

Stream Buffers

Borders of streams and other waterways may have been damaged before reforestation and afforestation and therefore may need more extensive restoration or afforestation work before reforestation can be successful. The following are guidelines for any work within a riparian zone.

1. Check for erosion problems
2. Minimize or eliminate any chemical use
3. Maintain an undisturbed leaf layer and understory
4. Eliminate exotics

Steep Slopes

Planting on steep slopes will stabilize them; however, until the roots become established, there may still be erosion problems. Monitoring the stability of the soil will be important to the survival of the trees.

Reinforcement Planting Provisions

In order to avoid penalties, the applicant has the option to establish reinforcement plantings, on site, after one year, if the possibility exists that the reforestation or afforestation will not meet standards. It is recommended that an inspection take place at the end of year one or before the second growing season to evaluate survival rates (with reference to the survival required at the end of the two year period). This is an opportunity to avoid the penalty for violating survival rate standards. This inspection should take into account the following items to in order to determine survival potential:

* vigor and threat of competing vegetation (i.e. if seedlings are free to grow)
* structure
* growth rate
* crown development
* trunk health

APPENDICES

Appendix A

Glossary of Terms

Appendix A

For purposes of this Article, the following specific terms have the specific meanings indicated.

Afforestation.

"Afforestation" means the:

(i)establishment of a forest on an area from which forest cover has been absent for a long period of time; or

(ii) planting of trees in an open area that is not presently in forest cover; or

(iii) adding additional tree stock to meet required afforestation thresholds; or

(iv) establishment of a forest according to procedures set forth in this manual.

Agricultural activity.

(i) "Agricultural activity" means any recognized commercial farming activity related to the cultivating and harvesting of food or fiber products other than commercial logging and timber harvesting operations.

(ii) "Agricultural activity" includes:

1. plowing, tilling, cropping, seeding, and installation of best management practices;

2. grazing and raising of livestock;

3. aquaculture and silviculture;

4. the management of orchards or nurseries;

5. sod production; and

6. agricultural support

Agricultural transfer.

"Agricultural transfer" means the transfer of land currently involved in agricultural activities in which the purchaser is willing to promise to keep the land in agricultural use for 5 full taxable years after the transfer.

Applicant.

"Applicant" means a person who:

(i) is applying for:

1. subdivision, site plan, or project plan approval; or

2. a grading or sediment control permit; or

(ii) has received approval of a forest stand delineation or forest conservation plan.

Approved forest management plan. (see also "forest management plan")

"Approved forest management plan" means a document:

(i) approved by the Department of Natural Resources forester assigned to the county in which the property is located; and

(ii) that may operate as a protective agreement for forest conservation as described in 5-1607(e) and (f) of the Natural Resources Article, Annotated Code of Maryland.

Building envelope.

"Building envelope" means a portion of a single-family lot that may be disturbed for development and that is not dedicated to agricultural activities.

Caliper.

"Caliper" means the diameter measured two inches above the root collar.

Champion tree.

"Champion tree" means the largest tree of its species within the United States, the State, the County, or a municipal corporation.

Commercial logging or timber harvesting operations.

"Commercial logging or timber harvesting operations" means the cutting and removing of tree stems from a site for commercial purposes, leaving the root mass intact.

Critical habitat area.

"Critical habitat area" means a critical habitat for endangered species and its surrounding protection area. A critical habitat area shall:

(i) be likely to contribute to the long-term survival of the species;

(ii) be likely to be occupied by the species for the foreseeable future; and

(iii) constitute habitat of the species which is considered critical under 4-2A-06 or 10-2A-06 of the Natural Resources Article, Annotated Code of Maryland.

Critical habitat for endangered species.

"Critical habitat for endangered species" means a habitat occupied by an endangered species as determined or listed under 4-2A-04 or 10-2A-04 of the Natural Resources Article, Annotated Code of Maryland.

Declaration of Intent.

"Declaration of Intent" means:

(i) A signed and notarized statement by a landowner or the landowner's agent (when appropriate) certifying that the activity on the landowner's property:

1. Is for certain activities exempted under this Subtitle or Natural Resources Article 5-103 and 5-1601 through 5-1612, Annotated Code of Maryland;

2. Does not circumvent the requirements of this Subtitle or Natural Resources Article 5-103 and 5-1601 through 5-1612, Annotated Code of Maryland; and

3. Does not conflict with the purposes of any other declaration of intent.

Department.

"Department" means the Queen Anne's County Department of Planning and Zoning.

Development project.

(i) "Development project" means the grading or construction activities occurring on a tract of land that is 40,000 square feet or more in size.

(ii) "Development project" includes redevelopment.

Development project completion.

"Development project completion" means, for the purposes of afforestation, reforestation, or payment into the Local Conservation Fund:

(i) designation by the Department that:

1. a development project has been completed; or

2. a particular stage of a staged development project, including a planned unit development has been completed;

(ii) the acceptance by the Department of the streets, utilities, and public services of the project; or

(iii) if a development bond is required, the release of the development bond.

Forest.

(i) "Forest" means a biological community dominated by trees and other woody plants covering a land area of 10,000 square feet (0.23 acres) or more.

(ii) "Forest" includes:

1. areas that have at least 100 trees per acre with at least 50% of those trees having a 2-inch or greater diameter at 4.5 feet above the ground; and

2. areas that are being managed under an approved forest management plan but are not clearcut.

(iii) "Forest" does not include orchards, nurseries or Christmas tree farms.

Forest Conservancy District Board.

"Forest Conservancy District Board" means the forestry board created for each State forestry conservancy district as provided in Title 5, Subtitle 6 of the Natural Resources Article, Annotated Code of Maryland.

Forest conservation.

"Forest conservation" means the retention of existing trees or forest or the creation of new forest or planted areas at the conservation or afforestation levels set by the State or by the Department.

Forest conservation and management agreement.

"Forest conservation and management agreement" means an agreement as provided under 8-211 of the Tax - Property Article, Annotated Code of Maryland and COMAR 08.07.03.

Forest conservation plan (FCP).

"Forest conservation plan" (FCP) means a plan approved by the Department.

Forest Conservation Technical Manual.

"Forest Conservation Technical Manual" means the Queen Anne's County Forest Conservation Technical Manual used to establish standards of performance required in preparing forest stand delineations and forest conservation plans.

Forest cover.

"Forest cover" means an area of a site meeting the definition of forest.

Forest management plan.

"Forest management plan" means a plan that establishes best conservation and management practices to guide a property owner in the assessment of the resource value of the forested property.

Forest mitigation bank

"Forest mitigation bank" means the intentional restoration or creation of forests undertaken expressly for the purpose of providing credits for afforestation or reforestation requirements with enhanced environmental benefits from future activities.

Forest mitigation bank agreement

"Forest mitigation bank agreement" means an agreement entered into by an individual owning a forest mitigation bank and the Department which commits the mitigation banker to certain procedures and requirements when creating and operating the forest mitigation bank.

Forest mitigation bank plan

"Forest mitigation bank plan" means a plan submitted for approval of a forest mitigation bank to the Department by an individual proposing to establish a forest mitigation bank.

Forest stand delineation (FSD).

"Forest stand delineation" (FSD) means the methodology for evaluating the existing vegetation on a site proposed for development, as provided in the Forest Conservation Technical Manual.

Growing season.

"Growing season" means the period of consecutive frost-free days as stated in the current soil survey for the County published by the National Cooperative Soil Survey Program.

Intermittent stream.

"Intermittent stream" means a stream in which surface water is absent during a portion of the year as shown on the most recent 7.5 minute topographic quadrangle maps published by the United States Geological Survey or as confirmed by field verification.

Landscaping plan.

"Landscaping plan" means a plan:

(i) drawn to scale, showing dimensions and details for reforesting an area;

(ii) using native or indigenous plants when appropriate; and

(iii) that is made part of an approved forest conservation plan.

Linear project

"Linear project" means a project whose configuration is elongated with nearly parallel sides and used to transport a utility product or public service not otherwise contained in an application for subdivision or site plan, such as electricity, gas, water, sewer, communications, trains, and vehicles. Linear projects may transverse fee simple properties through defined boundaries or through easement rights.

Local Conservation Fund.

"Local Conservation Fund" means the Queen Anne's County Local Conservation Fund, as provided in 18-2-15 of this subtitle.

Local government agency.

"Local government agency" means a unit in the executive, legislative, or judicial branch of a county or municipal government, including an office or department of public works.

Lot.

"Lot" means a unit of land, the boundaries of which have been established as a result of a deed or previous subdivision of a larger parcel, and which will not be the subject of further subdivision without an approved forest stand delineation and forest conservation plan.

Maintenance agreement.

"Maintenance agreement" means a signed, short-term management agreement associated with afforestation or reforestation plans required under this subtitle and 5-1605 of the Natural Resources Article, Annotated Code of Maryland.

Minor subdivision.

"Minor subdivision" means the division or redivision of land, including the creation of any required easements or rights-of-way, into no more than five lots.

Monoculture.

"Monoculture" means a planting of a single species of trees over one (1) acre in size or greater.

Natural regeneration.

"Natural regeneration" means the natural establishment of trees and other vegetation with at least 400 woody, free-to-grow seedlings per acre, that are capable of reaching a height of at least 20 feet at maturity.

Net tract area.

"Net tract area" means:

(1) Except in agricultural activity areas or linear projects areas, the total area of a site, including both forested and nonforested areas, to the nearest one-tenth acre reduced by that area where forest clearing is restricted by another local ordinance or program;

(2) In agricultural activity areas the portion of the total tract for which land use will be changed or will no longer be used for primarily agricultural activities reduced by that area where forest clearing is restricted by another local ordinance or program;

(3) Net tract can also be interpreted as the portion of the total tract for which land use will ,e changed plus all the forested area within the total tract area which is outside of the boundaries of the newly proposed lot.

(4) For a linear project:

(i) The area of a right-of-way width, new access roads and storage; or

(ii) The limits of disturbance as shown on an application for sediment and erosion control approval or in a capital improvements program project description.

Nontidal wetlands.

(i) "Nontidal wetlands" means an area that is:

1. inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal conditions does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation; and

2. considered a nontidal wetland in accordance with the publication known as the "Federal Manual for Identifying and Delineating Jurisdictional Wetlands", published in 1987 and as may be amended and interpreted by the U.S. Environmental Protection Agency.

(ii) "Nontidal wetlands" do not include tidal wetlands regulated under Title 16 of the Environment Article, Annotated Code of Maryland.

Off-site.

"Off-site" means the area outside the boundaries of a tract of land.

On-site.

"On-site" means the area within the boundaries of a tract of land, including any area classified as a 100-year floodplain.

100-year flood.

"100-year flood" means a flood that has a 1% chance of being equaled or exceeded in any given year. Except for Class III waters (natural trout streams), a body of water with a watershed of less than 400 acres is excluded.

100-year floodplain.

"100-year floodplain" means an area along or adjacent to a stream or body of water, except tidal waters, that is capable of storing or conveying floodwaters during a 100-year frequency storm event or a 100-year flood.

ennial stream.

"Perennial stream" means a stream containing surface water throughout an average rainfall year, as shown on the most recent 7.5 minute topographic quadrangle maps (scale: 1 to 24,000) published by the United States Geological Survey or as confirmed by field verification.

Person.

"Person" includes an individual, or the federal government, the State, a county, municipal corporation, and other political subdivision of the State, or any of their units.

Planned residential development.

"Planned residential development" means either a single-family cluster, multi-family, or manufactured home community residential development that involves the identification and protection of required open space.

Public utility.

"Public utility" means uses or structures for the public purpose of power transmission and distribution (but not power generation or cross-country transmission lines or towers); fuel transmission and distribution (but not manufacturing or storage); water treatment and distribution; sewage collection and treatment; telephone service facilities (but not utility truck terminal facilities); radio and television facilities (not including broadcasting studios); and rail or highway rights-of-way (not including stations or terminals).

Reforestation or reforested.

(i) "Reforestation" or "reforested" means the:

1. creation of a biological community dominated by trees and other woody plants containing at least 100 live trees per acre with at least 50% of those trees having the potential of attaining a 2-inch or greater diameter measured at 4.5 feet above the ground, within 7 years; or

2. establishment of a forest according to procedures set forth in the Forest Conservation Technical Manual.

(ii) "Reforestation" or "reforested" includes the landscaping of areas if the landscaping is part of a reforestation plan approved by the Planning Director.

Regulated activity.

"Regulated activity" means any of the following activities when the activity occurs on a unit of land that is 40,000 square feet or more in size:

(i) subdivision;

(ii) site plan;

(iii) grading; or

(iv) an activity that requires a sediment control permit.

Retention.

"Retention" means the deliberate holding and protecting of existing trees, shrubs, or plants on a site according to established standards as provided in the Forest Conservation Technical Manual.

Root collar.

"Root collar " means the transition zone between stem and root at the ground line of a tree or seedling.

Sediment control permit.

"Sediment control permit" means the authorization of an activity regulated under a sediment control plan as provided in Title 4 of the Environment Article, Annotated Code of Maryland.

Seedling.

"Seedling" means an unbranched woody plant, less than 24 inches in height and having a caliper of less than 1/2 inch, measured at 2 inches above the root collar.

Selective clearing.

"Selective clearing" means the careful and planned removal of trees, shrubs, and plants using specific standards and protection measures under an approved forest conservation plan.

Stream buffer.

"Stream buffer" means all lands lying within 100 feet measured from the normal bank of a perennial stream 50 feet measured from the normal bank of an intermittent stream as shown on the most recent 7.5 minute topographic quadrangle (scale: 1:24,000) maps published by the United States Geological Survey.

Subdivision.

"Subdivision" means any division or redivision of a parcel of land into two or more lots or parcels for the purpose, whether immediate or future, of transfer of ownership, sale, lease, or development.

Timber harvesting.

(i) "Timber harvesting" means a tree cutting operation affecting 1 or more acres of forest or developed woodland within a 1-year interval that disturbs 5,000 square feet or more of forest floor.

(ii) "Timber harvesting" does not include grubbing and clearing of root mass.

Tract. or Total Tract Area.

"Tract" or "Total Tract Area" means a property or unit of land that:

(i) is subject to an application for a grading or sediment control permit, subdivision approval, or project plan approval, or areas subject to this law;

(ii) "Tract" or "Total Tract Area" may be defined as the area of a master plan, planned development, or phased development plan subject to an application for grading or sediment and erosion control plan approval.

Tree.

"Tree" means a large, branched woody plant having one or several self-supporting stems or trunks that reach a height of at least 20 feet at maturity.

Variance.

(i) "Variance" means relief from the provisions of this subtitle or Title 5, Subtitle 16 of the Natural Resources Article, Annotated Code of Maryland.

(ii) "Variance" does not mean a zoning variance.

Watershed.

"Watershed" means all land lying within an area described as a subbasin as provided in the water quality regulations adopted by the State Department of the Environment under COMAR 26.08.02.08.

Whip.

"Whip" means an unbranched woody plant more than 24 inches in height and having a caliper of less than 1 inch.

Woody plant

"Woody plant" means:

(i) a plant with stems and limbs containing lignin, the chief noncarbohydrate constitute of wood; or

(ii) a plant approximately 15 feet in height or smaller, often formed by a number of vertical or semi-upright branches arising close to the ground; or

(iii) a shrub

Appendix B

Forest Conservation Policy Document

POLICY OVERVIEW

It is the policy of Queen Anne's County, Maryland to conserve and protect our forest resource to the maximum possible extent. This shall be accomplished by regulating site planning and construction activities, with the goals of forest retention and the clearing of the minimum amount of forest necessary for development.

In order to insure this policy is carried out, regulations have been produced which serve as development guidelines and minimum standards. Queen Anne's County regulations are modeled after the State's Forest Conservation Act and, as such, meet the intent desired by its drafters, to efficiently protect the forested resources of our County.

These regulations will thus be used to guide our development in a carefully managed way. Identification of sensitive areas on any site prior to plan approval will eliminate unnecessary confusion at the beginning of a project. Through the establishment of long-term protective agreements, the County hopes to alleviate further pressures placed on this invaluable resource. It must be understood that the primary goals of these regulations is to retain the highest quality and highest functional forest habitat in Queen Anne's County. It is also a goal to reclaim areas denigrated by activities which are no longer practiced. The County will encourage the restoration of areas important for water quality, air quality, aesthetics, and habitat values.

In order to see these goals fulfilled, the Queen Anne's County Planning Commission and Queen Anne's County Department of Planning and Zoning will periodically evaluate current practices, techniques and regulations affecting our forest resources. These evaluations may produce specific policy guidelines, guidance papers, (which will be included into this document), or changes to regulatory programs to insure the continued protection and welfare of our resources. Third party interests may also suggest to the Queen Anne's County Planning Commission recommended policies, guidelines or amendments to regulatory programs.

Appendix C

Statement of Exemption

STATEMENT OF EXEMPTION

This [subdivision/site plan] is exempt from the requirements of the Queen Anne's County Forest Conservation Ordinance under Section_____. The owners/developers of the property set forth on this [plat/site plan/grading permit/sediment control plan], their successors and assigns, acknowledge that any future activity, development, or disturbance not exempt from the requirements of the Queen Anne's County Forest Conservation Ordinance, as amended from time to time, shall meet all such requirements prior to final [subdivision/site plan/grading permit/sediment control plan] approval.

Appendix D

Sample Forest Stand Delineation Tables, Worksheets and Figures

Table D-1: Forest Structure Data Sheet

Property: **Prepared By:**

Stand #: **Plot #:** **Date:**

Forest Structure Variable	Sample Point 1	Sample Point 2	Sample Point 3	Sample Point 4	Sample Point 5	% Yes
% Canopy Closure						
Herbaceous Ground Cover						
Downed Woody Debris						
Invasive Plant Cover						
Number of Shrub Species (1/100 acre)						

Forest Structure Sampling Method:

1/10 acre plot---3-5 sampling points

Table D-2: Forest Stand Summary Sheet

Property Name & Location:_____
(Include: Town, Tax Map, Block, Parcel #, and ADC Map #)
Prepared By:_____
Date:_____

Stand Variable	Stand#___Acreage___	Stand#___Acreage___
Dominant species/Codominant species		
Size class of Dominant/Codominant species		
Successional stage		
Number of trees/acre		
Number of tree species/acre		
% Canopy cover		
Basal area in s.f. per acre		
Number of standing dead trees/acre (6" dbh or greater)		
Common understory species/acre		
% of understory cover 3' to 20' tall		
Number of woody plant species 3' to 20' tall		
Common herbaceous species 0' to 3' tall		
%Herbaceous and woody plant cover 0' to 3' tall		
%Downed woody material		
%Exotic or invasive species & type		
Forest structure value		
Comments Sheet__of__		

Table D-3 Forest Sampling Data Worksheet

Property: _____ Prepared By: _____

Stand #: _____ Plot #: _____ Plot Size: _____ Date: _____

Basal Area in Square Feet per Acre:	Size Class of Trees > 20' Height within Sample Plot															
Tree Species	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees > 30" dbh			
Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
Total Number of Trees per Size Class																
Number & Size of Standing Dead Trees																

List of Common Understory Species 3'-20':

Percent of Canopy Closure

C	N	E	S	W	Total

Percent of Understory Cover 3'-20'

C	N	E	S	W	Total

Percent of Herbaceous Cover 0'-3'

C	N	E	S	W	Total

Percent of Invasive Cover per Plot (All Layers):

Plot Successional Stage:

List of Herbaceous Species 0'-3':

List of Major Invasive Species per Plot (All Layers):

Comments

Sheet ___ of ___

Source: DNR

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

Figure D-1 Explanation of Terms

Forest Stand Information

Stand # - Divide the vegetative cover into different stands depending on species groups, size groups, cover types, etc.

Acres - Measure the acreage in each separate stand and open areas. Round off to the nearest 1 /20 acre.

Species - List the four or five most common, dominant and co-dominant species tallied.

Dominant Trees – List the trees with crowns extending above the general level of the crown cover and receiving full sunlight from above and partly from the side. These trees will tend to be larger than the average trees in the stand. Information on dominant species can be used to determine the forest association, which in turn can provide useful information on species recommended for mitigation planting.

Codominant Trees – List the trees with crowns forming the general level of the crown cover and receiving full sunlight from above but little from the sides. These trees will have medium-sized crowns.

Understory Trees – List the trees with crowns entirely below the general level of the canopy receiving little or no sunlight from above or the sides.

Successional Stage-Forests are generally described as early, mid or late successional, each with characteristic growth rates and species composition.

Size Class - Use the following size classes: 2" to 5.9" dbh, 6" to 11.9" dbh, 12" to 19.9" dbh, 20" to 29.9" dbh, and greater than 30" dbh.

Basal Area in square feet per acre - this is a density measurement and should be expressed on a per acre basis for each stand. The total cross sectional area of trees per unit area. A measure of stand density in square feet at 4.5' above the ground. Data can be taken with a prism, or calculated knowing the DBH of all the trees in each plot. When using a prism, total the number of trees determined to be "in" and multiply this number by the prism factor for each sample point.

Number of Trees - Count all trees 2" dbh or greater occurring on the plot.

Number of Tree Species - Count the total number of trees species occurring on the plot.

Number of Dead Trees - Count the total number of dead trees occurring on the plot.

Understory Species - Record the 3 to 5 most commonly occurring understory species on the plot.

Forest Cover Type - Use the Society of American Foresters classification, the Maryland Forest Association Species List and the species tallied on site to determine this.

Figure D-2 Techniques for Forest Structure Data Collection

To measure canopy coverage, herbaceous coverage, dead and downed woody material present and exotic species, sampling may be done in the following way:

1) Construct a sampling tube from a paper towel or toilet paper roll or a length of pvc pipe. Attach wires or string on one end of the tube in the configuration of a cross with four evenly spaced openings (see a below).

2) Select 3-5 random sampling point within each forest stand. To do this, construct a circular sampling plot of 1/10 acre. Take samples from 4 points around the circle and one within the circle (see b below).

3) Walk to each sample point and look through the sampling tube at each sample point.

a) For canopy coverage, record "yes" or "no" for green seen through the tube when pointed up (tube must be held vertically; count only trees 7" DBH and larger.).

b) For herbaceous coverage, record "yes" or "no" for green seen through the tube when pointed down (tube must be held vertically).

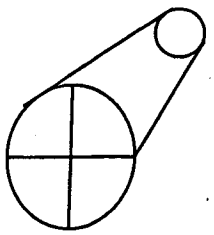
c) For dead and down woody material, record "yes" or "no" for any root wads, logs, downed limbs, or bark seen through the tube (tube must be held vertically).

d) For exotic or invasive species, record "yes" or "no" for any of these species (See Appendix H) seen through the tube (tube must be held vertically).

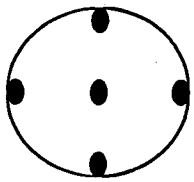
4) Calculate the percentage of sample points at each sample site which were answered by "yes". Use the above information and additional Information provided in the forest stand summary sheet to calculate the forest structure value to be assigned to the site for each Individual parameter.

5) Count number of shrubs found within a 1/100 acre plot. Shrubs can be most easily counted if the central stem can be identified.

a.



b.



(for more information see: James, F.C. and Shugart, H.H. 1970. A Quantitative Method of Habitat Description. Audubon Field Notes. 24: 727-36.)

Figure D-3 Forest Structure Analysis

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3, 2, 1, or 0. Three represents the most valuable structure and zero the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October.

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November- March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70% - 100%	*3*
40% - 69%	*2*
10 % - 39%	*1*
0% - 9 %	*0*

2. Coverage — Number of Understory Shrubs 1/100 acre

6 or more	3
4-5	*2*
2-4	*1*
0-1	*0*

3. Number of Dead Trees/tenth acre plot [1]

3 or more	3
2	*2*
1	*1*
0	*0*

4. Percent of Dead and Downed Woody Material Present

15% - 100%	3
5' - 14"	*2*
0-1	*1*
0	*0*

5. Size Class of Dominant Trees:

Greater than 20"	*3*
7" - 19.9"	*2*
3' - 6.9'	*1*
Less than 3"	*0*

6. Percent of Understory Herbaceous

75% - 100%	3
25%-74%	*2*
596-24%	*1*
0%-4%	*0*

7. Number of Tree Species with a DBH greater than 7"/plot [1]

6 or more	3
4-5	*2*
2-4	*1*
0-1	*0*

[1] Data included in Forest Stand Summary Sheet (See Table D-2).

Appendix E

are Species of Concern to the Maryland Natural Heritage Program

RARE SPECIES OF CONCERN TO THE MARYLAND NATURAL HERITAGE PROGRAM

ANIMALS

Planarians

Phagocata virilis	A planarian
Planaria dactyligera	A planarian
Sphalloplana sp 1	A planarian

Molluscs

Alasmidonta undulata	Triangle floater
Alasmidonta varicosa	Brook floater
Anguispira clarki	Clark's beehive snail
Lampsilis cariosa	Yellow lampmussel

Crustaceans

Ankylocythere tridentata	An entocytherid ostracod
Attheyella spinipes	A harpacticoid copepod
Caecidotea sp 1	An isopod
Caecidotea sp 2	An isopod
Caecidotea sp 3	An isopod
Dactylocythere scotos	An entocytherid ostracod
Diacyclops palustris	A cyclopoid copepod
Eulimnadia francesae	A conchostracan phyllopod
Eulimnadia ventricosa	A conchostracan phyllopod
Stygobromus pizzinii	Pizzini's cave amphipod
Stygobromus sp 5	Crabtree cave amphipod
Stygobromus sp 6	An undescribed amphipod

Spiders

Atypus bicolor	American purse-web spider
Oreonetides sp 1	Snivelys cave spider
Porrhomma cavernicolum	Appalachian cave spider

Insects

Amblyscirtes hegon	Pepper-and-salt skipper
Apamea apamiformis	A noctuid moth
Apamea plutonia	A noctuid moth
Arrhopalites sp 1	Crabtree cave springtail
Capis curvata	A noctuid moth
Catocala marmorata	Marbled underwing
Catocala pretiosa	Precious underwing
Chlorotettix sp 1	A cicadellid leafhopper
Cicindela lepida	Little white tiger beetle
Cicindela patruela	A tiger beetle
Colias interior	Pink-edged sulphur
Cyclophora *nanaria*	A geometrid moth
Cyllopsis gemma	Gemmed satyr
Dasychira atrivenosa	A lymantriid moth
Ectoedemia castaneae	American chestnut nepticulid moth
Ectoedemia*phleophaga	Phleophagan chestnut nepticulid moth
Elaphria georgei	A noctuid moth

Erynnis persius	Persius duskywing
Euchloe Olympia	Olympia marble
Euphyes pilatka	Saw-grass skipper
Hadena ectypa	A noctuid moth
Hemileuca maia ssp 4	Woodland buckmoth
Hesperia attalus	Dotted skipper
Hesperia sassacus	Indian skipper
Hoperius planatus	A hydrophylid beetle
Hydrochara occulta	A hydrophylid beetle
Hydrochus sp 1	Seth forest water scavenger beetle
Isoparce cupressi	cypress sphinx moth
Laccophilus schwarzi	Schwarz' diving beetle
Limotettix sp 1	Eastern sedge barrens planthopper
Lucanus elephas	Giant stag beetle
Meropleon titan	A noctuid moth
Mitoura hesseli	Hessel's hairstreak
Nicrophorus americanus	American burying beetle
Papaipema duovata	A noctuid moth
Papaipema marginidens	A noctuid moth
Papaipema polymniae	Polymnia stalk borer
Papilio cresphontes	Giant swallowtail
Papilio palamedes	Palamedes swallowtail
Potamanthus walkeri	Walker's.tusked sprawler
Satyrium acadica	Acadian hairstreak
Satyrium kings	King's hairstreak
Schinia parmeliana	A noctuid moth
Scymnus gordoni	A coccinellid beetle
Sperchopsis tessellatus	A hydrophylid beetle
Speyeria diana	Diana
Sphinx franckii	Franck's sphinx
Stylurus notatus	Elusive clubtail dragonfly
Synanthedon castaneae	chestnut clearwing moth
Tachopteryx thoreyi	Thorey's grayback damselfly
Xestia bollii	A noctuid moth

Fishes

Acantharchus pomotis	Mud sunfish
Acipenser oxyrhynchus	Atlantic sturgeon
Centrarchus macropterus	Flier
Clinostomus elongatus	Redside dace
Enneacanthus chaetodon	Blackbanded sunfish
Fundulus luciae	Spotfin killifish
Noturus flavus	Stonecat
Percina caprodes	Xogperch

Amphibians

Plethodon wehrlei	Wehrle's salamander
Pseudacris brachyphona	Mountain chorus frog
Rana virgatipes	Carpenter frog

Reptiles	
Apalone Spubufern	Mantern Spiny softshell
Graptemys geographica	Map turtle
Pituophis melanoleucus	Northern pine snake
Birds (breeding only)	
Accipiter striatus	Sharp-shinned hawk
Aegolius acadicus	Northern saw-whet owl
Ammodramus henslowii	Henslow's sparrow
Asio flammeus	Short-eared owl
Asio otus	Long-eared owl
Botaurus lentiginosus	American bittern
Catharus ustulatus	Swainson's thrush
Circus cyaneus	Northern harrier
Cistothorus platensis	Sedge wren
Dendroica coronata	Yellow-rumped warbler
Egretta caerulea	Little blue heron
Empidonax alnorum	Alder flycatcher
Gallinula chloropus	Common moorhen
Ixobrychus exilis	Least bittern
Junco hyemalis	Dark-eyed junco
Laterallus jamaicensis	Black rail
Limnothlypis swainsonii	Swainson's warbler
Lophodytes cucullatus	Hooded merganser
Podilymbus podiceps	Pied-billed grebe
Porzana carolina	Sora
Regulus satrapa	Golden-crowned kinglet
Sitta canadensis	Red-breasted nuthatch
Sphyrapicus varius	Yellow-bellied sapsucker
Sterna antillarum	Least tern
Sterna sandvicensis	Sandwich tern
Troglodytes troglodytes	winter wren
Vermivora ruficapilla	Nashville warbler
Mammals	
Condylura cristata parva	Southeastern star-nosed mole
Erethizon dorsatum	Porcupine
Mustela nivalis	Least weasel
Myotis leibii	Eastern small-footed bat
Neotoma floridana magister	Eastern woodrat
Sorex dispar	Long-tailed shrew
Sorex hoyi winnemana	Southern pygmy shrew
Sorex longirostris	Southeastern shrew
Spilogale putorius	Eastern spotted skunk
Sylvilagus transitionalis	New england cottontail
Ursus americanus	Black bear

PLANTS

Abies balsamea	Balsam fir
Agalinis decemloba	
Agalinis linifolia	
Agalinis Skinnerian	

Alnus maritima	Seaside alder
Alopecurus aequalis	short-awned foxtail
Alopecurus carolinianus	Carolina foxtail
Ammannia coccinea	
Ammannia latifolia	Koehne's ammannia,
Ampelopsis arborea	Pepper-vine
Ampelopsis cordata	
Amsohia tabernaemontana	Blue dogbane
Anemone riparia	Large white anemone
Arabia glabra	Tower mustard
Arabia hirsuta	Hairy rockcress
Aristida curtissii	Curtiss' three-awn
Aristida tuberculosa	Sea-beach three-awn
Aster nemoralis	Bog aster
Aster praealtus	Willow aster
Aster sagittifolius	Arrow-leaved aster
Azolla caroliniana	Mosquito fern
Bacopa monnieri	
Betula populifolia	Gray birch
Blephilia hirsuta	Hairy woodmint
Bouteloua curtipendula	Side-oats grama
Calystegia spithamaea	Low bindweed
Campanula rotundifolia	Harebell
Cardamine pratensis	Cuckooflower
Carex arenaria	Sand sedge
Carex brevior	
Carex cephaloidea	Thin-leaved sedge
Carex echinata	Little prickly sedge
Carex emoryi	Emory's sedge
Carex meadii	Mead's sedge
Carex projecta	Necklace sedge
Carex retrorsa	
Carex richardsonii	Richardson's sedge
Carex rostrata	Beaked sedge
Carex rugosperma	
Carex tonsa	Shaved sedge
Carex trichocarpa	Hairy-fruited sedge
Carex typhina	Cat-tail sedge
Celtis laevigata	Sugarberry
Centrosema virginianum	Spurred butterfly-pea
Chaerophyllum tainturieri	
Chamaesyce vermiculata	Hairy spurge
Chenopodium leptophyllum	Narrow-leaved goosefoot
Cimicifuga americana	American bugbane
Clintonia alleghaniensis	Harned's swamp clintonia
Corydalis aurea	Golden corydalis
Croton capitatus	Hogwort
Croton monanthogynus	Prairie-tea
Cuscuta indecora	
Cyperus houghtonii	
Cyperus refractus	Reflexed cyperus
Cyperus retrofractus	Rough cyperus
Cystopteris tennesseensis	Tennessee bladder-farm
Desmodium viridiflor	

Dioscorea hirticaulis	Wild yam
Eleocharis flavescens	Pale spikerush
Eleocharis geniculatla	Capitate spikerush
Eleocharis tortilis	Twisted spikerush
Epilobium leptophyllum	Linear-leaved willowherb
Eragrostis hirsuta	
Erianthus alopecuroides	Woolly beardgrass
Erigeron pulchellus var brauntiae	Lucy Braun's robin plantain
Eriocaulon compressum	Flattened pipewort
Eriocaulon decangulare	Tan-angled pipawort
Euphorbia zinniiflora	Flowering spurge
Fimbristylis puberula	Hairy fimbristylis
Galax aphylla	Galax
Galium palustre	Marsh bedstraw
Gymnocladus dioicus	Kentucky coffee-tree
Helianthus hirsutus	Hirsute sunflower
Houstonia tenuifolia	Slender-leaved bluets
Juncus articulatus	Jointed rush
Juncus brevicaudatus	Narrow-panicled rush
Juncus polycephalus	
Liatris spicata	Spiked blazing-star
Limonium nashii	Nash's sea lavender
Ludwigia brevipes	creeping ludwigia
Ludwigia decurrens	
Lycopodium inundatum	Bog clubmoss
Lycopodium sabinifolium	Ground-fir
Manfreda virginica	False aloe
Matteuccia struthiopteris	Ostrich fern
Muhlenbergia glabriflora	
Muhlenbergia glomerata	
Myriophyllum heterophyllum	Broadleaf water - milfoil
Nemophila aphylla	
Nymphaea tuberosa	Tuberous white water lily
Oldenlandia uniflora	clustered bluets
Panicum aciculare	Bristling panicgrass
Panicum aculeatum	Tall rough panicgrass
Panicum angustifolium	Narrow-leaved panicgrass
Panicum *commonsianum*	Commons' panicgrass
Panicum laxiflorum	
Panicum leucothrix	Roughish panicgrass
Panicum tuckermanii	Tuckerman's panicgrass
Panicum yadkinense	
Passiflora incarnata	Purple passionflower
Pilea fontana	Coolwort
Poa alsodes	Grove meadow-grass
Poa languida	Weak speargrass
Poa palustris	Fowl bluegrass
Polygonum amphibium	Water smartweed
Polygonum careyi	Carey's knotweed
Polygonum glaucum	Seaside kriotweed
Polygonum opelousanum	Opelousas smartweed
Polygonum setaceum	Bristly smartweed
Populus balsamifera	Balsam poplar

Potamogeton illinoensis	Illinois pondweed
Potamogeton natans	Floating pondweed
Potamogeton perfoliatus	Clasping-leaved pondweed
Potamogeton pusillus	Slender pondweed
Potamogeton spirillus	spiral pondweed
Potentilla arguta	Tall cinquefoil
Prunus pumila	Eastern dwarf cherry
Psoralea psoralioides	
Pycnanthemum virginianum	Virginia mountain-mint
Quercds laurifolia	Laurel-leaved oak
Quercus macrocarpa	Mossy-cup oak
Quercus shumardii	Shumard's red oak
Ranunculus laxicaulis	
Rhododendron calendulaceum	Flame azalea
Rhododendron canescens	
Ribes glandulosum	Skunk currant
Ribes hirtellum	Low wild gooseberry
Rosa setigera	prairie rose
Rumex hastatulus	Engelmann's dock
Sagittaria longirostra	Long-beaked arrowhead
Salix discolor	Pussy willow
Salix tristis	Dwarf prairie willow
Scirpus cylindricus	Salt-marsh bulrush
Sirpus fluviatilis	RiVer bulrush
Scirpus verecundus	
Scleria reticularis	Reticulated nutrush
Scleria triglomerata	Tall nutrush
Scutellaria galericulata	Common skullcap
Sesuvium maritimum	sea- purslane
Sibara virginica	Virginia cress
Smilax ecirrhata	Upright smilax
Solidago stricta	Wandlike goldenrod
Spiranthes laciniata	Lace-lip ladys' tresses
Spiranthes praecox	Grass-leaved ladys' tresses
Sporobolus asper	Long-leaved rushgrass
Stachys clingmanii	Clingmnan's s hedge-nettle
Stachys cordata	Nuttaall's hedge-nettle
Stachys hyssopifolia	Hyssop-leaved hedge-nettle
Stachys latidens	
Streptopus amplexifolius	White mandarin
Stylophorum diphyllum	
Symplocos tinctoria	Sweetleaf
Thalictrum dasycarpum	Purple meadowrue
Thalictrum macrostylum	
Thalictrum subrotundum	
Thelypteris phegopteris	Northern beech fern
Tillandsia usneoides	Spanish moss
Tofieldia glutinosa	False asphodel
Triadenum tubulosum	
Trichostema setaceum	Narrow-leaved bluecurls
Triglochin maritimum	Seaside arrow-grass
Utricularia cornuta	Horned bladderwort
Uvularia grandiflora	Large-flowered bellwort

Verbesina virginica	
Vernonia gigantea	Giant ironweed
Viburnum lentago	Nannyberry
Viola appalachiensis	Appalachian blue violet
Viola incognita	Large-leaved white violet
Viola septentrionalis	Northern blue violet
Vitis cinerea	Graybark
Vitis rupestris	Sand grape
Wolffia papulifera	
Wolffia punctata	Water-meal
Xyris difformis	Variable yelloweyed - grass
Zephyranthes atamasca	Atamasco lily

Appendix F

Protective Agreements, 2-Year Maintenance Agreements, Conservation Easements, Declarations of Intent, Forest Stewardship Plans, Forest Management Plans, & Timber arvest Plans

Protective Agreements
for
Forest Conservation Areas

Deed restrictions are a means of protecting or restricting the use of certain land areas. The restrictions are binding and are recorded with the land records for that property. For the purposes of this Act, any areas set aside for preservation shall be protected by deed restrictions. These areas include but are not limited to:

1.Trees, shrubs and plants located in sensitive areas including 100-year floodplains, intermittent and perennial streams and their buffers, nontidal wetlands and their buffers, steep slopes and critical habitats.

2.Contiguous forest that connects the largest undeveloped or most vegetated tracts of land within and adjacent to the site.

3.Trees, shrubs or plants identified on the list of rare, threatened and endangered species.

4.Trees that are part of a historic site or associated with a historic structure, or trees designated by the Department or local authority as a national, state or local champion trees.

5.Trees having a diameter measured at 4.5 feet above ground of:
a. 30 inches or more; **or**

b. 75% or more of the diameter, measured at 4.5 feet above ground, of the current state champion tree of that species.

6.Existing or established forested buffers adjacent to intermittent and perennial streams and their buffers.

7.Existing or established forested buffers adjacent to critical habitat.

8.All land retained on site as forest whether it was forested, afforested, or reforested.

The restrictions shall limit the uses of forest to those activities that are consistent with forest conservation, such as recreational activities, forest management, and wildlife management. Covenants and conservation easements are the primary method used to accomplish this. Covenants are deed restrictions that tell what may and may not occur on the property. Covenants may include statements that allow for the removal of dead or dying trees, limit clearing of the forest understory, provide for removal of noxious plants or weeds, allow for the development of passive recreational uses such as hiking or nature study, allow forest and wildlife management activities to take place, or prevent the dumping of trash or other material within the protected areas.

Conservation easements are another protective device for land. The easement is usually held by a

non-profit organization such as the Maryland Environmental Trust or the Chesapeake Bay Foundation. These easements may be negotiated to allow the owner certain uses of the property while prohibiting future development.

Forest management practices are allowed within all land retained on site as forest whether it is forested, afforested or reforested, and that is not included in items 1 through 7 above. The property owner may place forest in the Forest Conservation and Management Program or under a forest management plan. In either case, a forest management plan written by a professional forester, licensed by the State of Maryland, shall be required prior to commencement of any forest practice. The forest management plan shall conform to the format shown here. Reforestation shall be required when a final regeneration harvest is complete or if determined to be necessary due to the lack of adequate natural regeneration.

For information concerning the development of a forest management plan, please contact your local forestry office.

PERPETUAL PROTECTIVE AGREEMENT
DEED OF FOREST CONSERVATION EASEMENT
QUEEN ANNE'S COUNTY, MARYLAND

THIS DEED OF FOREST CONSERVATION EASEMENT is made this_____day of _____, 20____, by and between_____

_____

hereinafter called the "Grantor(s)", and COUNTY COMMISSIONERS OF QUEEN ANNE'S COUNTY, MARYLAND, a body politic and corporate of the State of Maryland, hereinafter called the "County" or "Grantee".

RECITALS

WHEREAS, Grantor(s) are the owners of a certain parcel of land situate in the_____ Election District of Queen Anne's County, Maryland which was conveyed to Grantor(s) by _____by deed dated_____ and recorded among the Land Records of Queen Anne's County, Maryland, in Liber ___, Folio ____ et seq.; and

WHEREAS, Grantor(s) have elected to engage in a regulated activity, as defined by the Queen Anne's County Forest Conservation Act (Chapter 18, Subtitle 2, Forest Conservation Act, Queen Anne's County), on said property, and have applied to the Queen Anne's County Department of Planning and Zoning for approval of the regulated activity, and which approval has been given and;

WHEREAS, as a condition of the aforesaid approval, Grantor(s) have submitted and the County has approved Final Forest Conservation Plan (Plan #) (the "Plan"), which sets forth the requirements for forest retention, reforestation or afforestation in an area located on the afore said property and designated on the approved final subdivision plat, site development plan, or grading permit, as the forest conservation area, and more particularly described on Exhibit A, attached hereto and made a part hereof. Said Plan is incorporated into and made a part of this Deed of Easement by reference; and

WHEREAS, the Final Forest Conservation Plan, and the Queen Anne's County Forest Conservation Act require the establishment of a forest conservation easement in, on, over and through the forest conservation area, to ensure the permanent protection, management and inspection of said area.

GRANT AND AGREEMENTS

NOW, THEREFORE, for and in consideration of the foregoing; the covenants and promises contained herein and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

1. Grantor(s) do hereby grant and convey unto County Commissioners of Queen Anne's County, Maryland, a body politic and corporate of the State of Maryland, its successors and assigns, a forest conservation, management and access easement, of the nature and character and to the extent hereinafter set forth, in, on, over, through and across the aforesaid forest conservation area (as described in Exhibit A). Grantor(s) further establish, create and declare the restrictions herein set forth in favor of and for the benefit of the County, its successors and assigns.

2. Except as specifically provided in Paragraph 3 (C) and 4 herein, Grantor(s) covenant with the County to refrain from destroying, damaging or removing anything of nature which grows there now, or hereafter without approval of the County as to manner, form, extent and any other aspects of the removal whatsoever, it being the express intention of the parties hereto that Grantor(s) shall comply with the final forest conservation plan approved under the Queen Anne's County Forest Conservation Act and that the easement area shall be preserved in a manner which protects the forest thereon, existing or to be established.

3. Grantor(s) hereby relinquish the right to use or develop the forest conservation area for any purpose whatsoever, except for the following uses:

A. Planting, maintenance and protection of the forest conservation area in accordance with the terms and conditions of the Plan and the Forest Planting and Maintenance Agreement;

B. Passive recreational activities which are consistent with and do not interfere with forest conservation and management or cause harm to forest management resources, including walking, hiking, and bird watching;

C. Forest conservation and management practices, including harvesting of trees pursuant to § 18:2-19 of the Queen Anne's County Forest Conservation Ordinance and in accordance with a written agreement with the State Department of Natural Resources; provided suitable provisions are made for the replacement of harvested trees.

4. Grantor(s) may engage in limited clearing of the forest understory, such as may be necessary to allow a walking or hiking trail for foot traffic only; and may allow the removal of dead or dying trees, and noxious plants or weeds.

5. All rights reserved by or not prohibited to Grantor(s) shall be exercised so as to prevent or minimize damage to the forest and trees, streams and water quality, plant and wildlife habitats, and the natural topographic character of the easement area.

6. The County, or its duly authorized representatives, shall have the right, at reasonable hours, to enter the forest conservation area for the sole purpose of inspecting the forest conservation area to determine whether the Grantor(s) are complying with the terms, covenants, conditions, limitations and restrictions herein contained.

7. No failure on the part of the County to enforce and covenant or provision hereof shall discharge or invalidate such covenant or any other covenant, condition, or provision hereof or affect the right of the County to enforce the same in the event of a subsequent breach or default.

8. Upon any breach of the terms of this Deed of Easement the County may exercise any or all of the remedies provided in Chapter 18, Public Local Laws of Queen Anne's County including, but not limited to the institution of an action in equity to enjoin, by temporary or permanent injunction, such breach; to require the restoration of the forest to its condition prior to such breach, and such other legal action as may be necessary to ensure compliance with this Deed of Easement and the covenants, conditions, limitations and restrictions herein contained. If Grantor is found to have breached any of its obligations under this Deed of Easement, Grantor shall reimburse the County for any costs or expenses incurred, including consultant's fees, court costs, reasonable attorney's fees, and any administrative and overhead costs.

9. Interpretation of this Agreement shall be the sole province of County, and County may issue interpretations hereof upon request of Grantor(s), or at County's discretion.

10. This Deed of Easement does not grant the public, in general, any right of access or any right to the use of the easement area, or any other portion of the property. This easement extends only to those areas designated as the forest conservation area and necessary access thereto.

11. The Grantor(s) further covenant and agree that the easements, rights of way, covenants and agreements contained herein shall run with the forest conservation area and all portions thereof and shall bind the Grantor(s) and their heirs, personal representatives, successors and assigns and shall bind all present and subsequent owners of the property identified herein.

12. Grantor(s) agree to make specific reference to this Deed of Easement in a separate paragraph of any subsequent sales contract, mortgage, deed, lease or other legal instrument by which any interest in the forest conservation area is conveyed.

13. This Deed of Easement shall be binding upon the personal representatives, heirs, successors and assigns of the parties hereto.

14. The undersigned lienholders, join herein for the purpose of subordinating any lien that they or any of them may have in the property described in Exhibit A to the effect of this Deed of Forest Conservation Easement and do further warrant and represent that they, to the best of their knowledge, belief and understanding are the only lienholders who have liens upon such property.

5. Grantor(s) hereby warrants and covenants that the lienholders whose signatures follow are the only lienholders having any lien or encumbrance upon the property described in Exhibit A.

TO HAVE AND TO HOLD the said easement unto County Commissioners of Queen Anne's County, Maryland, a body politic and corporate of the State of Maryland, its successors and assigns, forever, for the uses and purposes herein before described.

AND the said Grantor(s) covenant that they have not done nor suffered to be done anything to encumber the property, easement, and or rights hereby conveyed and that they will execute such other and further assurances of the same as may be necessary and requisite.

AS WITNESS our hands and seals the day and year first above written.

WITNESS: GRANTOR(S):

_____ _____(Seal)

_____ _____(Seal)

STATE OF MARYLAND_____COUNTY, TO WIT:

I HEREBY CERTIFY that on this_____day of_____

20_____before me, the subscriber, a Notary Public, in and for the state and county aforesaid, personally appeared_____, Grantor(s) who executed the afore going instrument in my presence and acknowledged the[illegible]as his or her deed and act, and further made oath in due form of law that the matters and fa[illegible]in are true and correct to the best of his/her knowledge, information and belief.

AS WITNESS my hand and Notarial Seal.

_____
Notary Public
My Commission Expires:

WITNESS:

LIENHOLDER(S)

_____ _____(Seal)

_____ _____(Seal)

STATE OF MARYLAND, _____ COUNTY, TO WIT:

I HEREBY CERTIFY that on this _____ day of _____, 20_____before me, the subscriber, a Notary Public, in and for the state and county aforesaid, personally appeared _____, Lienholder(s) who, known to me or satisfactorily proven to be the person(s) whose name(s) is subscribed to the foregoing instrument, who acknowledged that he/she is the _____of _____, a corporation organized and existing under the law of _____, that he/she has been duly authorized to execute, and executed such instrument on its behalf for the purposes therein set forth, and that the same is its act and deed.

AS WITNESS my hand and Notarial Seal.

_____
Notary Public
My Commission Expires:

Approved as to legal sufficiency.

_____ _____
Attorney Date
Queen Anne's County
Planning Commission

Exhibit **A**

Forest Conservation Area

The Forest Conservation Area shall be all that tract or parcel lying and being in the _____Election District of Queen Anne's County and State of Maryland, and being more particularly described as that area designated _____consisting of a total of _____acres more or less, which includes those portions of land shown as _____on a plat entitled "_____", prepared by _____dated _____and intended to be recorded among the Land Records of Queen Anne's County, Maryland in Plat Liber S.M/., No.__, folio____.

Example Deed and Recorded Plat Restriction Language

All existing forest retained as specified in the approved Forest Conservation Plan, FCP#_____, shall be within the Forest Protection Area and under the jurisdiction of the Maryland Forest Conservation Program and COMAR, Title 8, Subtitle 19. Activities are to be consistent with forest conservation under Natural Resources Article, Section 5-1601--5-1612 and Title 18, Subtitle 2, Forest Conservation Act, Queen Anne's County. There shall be no clearing or removal of forest unless said activity is specified in an approved Forest Management Plan which is in accordance with COMAR, Title 8, Subtitle 19, Chapter 5, Section 2B and Title 18, Subtitle 2, Sections 18-2-16 and 18-2-19 through 18-2-23, Forest Conservation Act, Queen Anne's County. . Any clearing, grading or construction within 50' of the forest edge shall require protective fencing in accordance with the standards and specifications of the state or locally adopted Forest Conservation manual and the approved Forest Conservation Plan, FCP # _____. All long-term forest protection signs shall remain in place in perpetuity.

FCA #_____(1)_____

2-Year Maintenance Agreement

For The

_____(2)_____subdivision

on the lands of____(3)_____

Tax Map __(4)___ Block__(5)__ Parcel__(6)___ Lot_(7)____

On this day of_____(8)_____

___(9)_____(applicant), the owner of the above-referenced real property in Queen Anne's County, Maryland, hereby declares and affirms his/her intention to maintain and monitor the ____(10)___ acre_____(11)_____ area which is depicted on Forest Conservation Plan #_____(12)_____.

The applicant agrees to provide, plant, maintain, and monitor the approved _____(13)_____ area planting(s) and to preserve the forest conservation area, as required by the Queen Anne's County Forest Conservation Act, in a manner which ensures the protection and satisfactory establishment of the planted material, and to provide for replacement plantings in the event that survival rates fall below the required threshold. The _____(14)_____ area(s) will be planted as soon as possible and must be planted within one (1) year or within two (2) growing seasons of the subdivision approval (whichever is greater), as noted on the approved FCP.

The applicant agrees to monitor and maintain the _____(15)_____ area(s) on bi-weekly intervals, commencing immediately following completion of the planting(s). Monitoring and maintenance of the _____(16)_____area (s) will be conducted between _____(17)_____ and _____(18)_____and will continue for a period of no less than two(2) years beginning on the completion date of the _____(19)_____ planting(s).

Maintenance of the _____(20)_____ area(s) planting(s) includes: watering plantings on a as-needed basis to supplement precipitation events and ensure normal growth rates; applying fertilizer on an as-needed basis; manual/mechanical control of competing vegetation; protecting the plating(s) from diseases, pests, and mechanical injury; and reinforcement planting provisions if survival falls below acceptable levels. Maintenance also includes ensuring that all specified _____(21)_____ area protection signs are in place and visible throughout the duration of the maintenance and monitoring period.

The applicant agrees to notify the Queen Anne's County Department of Planning and Zoning in writing in advance of the date of the actual planting of the _____(22)_____ area(s).

The applicant agrees to contact the Queen Anne's County Department of Planning and Zoning at the end of the first growing season to arrange for an inspection of the _____(23)_____ planting(s). Following the inspection, and when it has been determined that the planting(s) has/have been installed and maintained as agreed, 85% of the planting security may be released to the applicant.

The applicant agrees to contact the Queen Anne's County Department of Planning and Zoning at the end of the second growing season to arrange for a final inspection of the _____(24)_____ planting(s). Following the inspection, and when it has been determined that the required survivorship requirement has been met, the balance of the planting security shall be released to the applicant.

The Queen Anne's County Department of Planning and Zoning is hereby designated as a third party beneficiary of this agreement, and may enter onto the _____(25)_____ area(s) to inspect the plantings as necessary.

_____(26)_____ _____(27)_____

Signature(s) of Applicant(s)

Date_____(28)_____

State Of Maryland
County Of Queen Anne's

On this_(29)____day of_____(30)_____, 20__(31)___, before me, the undersigned officer, personally appeared

(32)_____

__(33)_____

Known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he/she executed the same for the purposes therein contained. In witness whereof I hereunto set my hand and official seal.

_____(34)_____
Notary Public

The applicant should prepare their own, unique 2-Year Maintenance Agreement. The above 2-Year Maintenance Agreement serves only as an example.

1. Forest Conservation Agreement number (this number will be provided by the Planning Office).
2. Type of subdivision (e.g. sliding-scale, large lot, cluster, noncontiguous, etc.) or site plan.
3. Owner's name of property being developed.
4. Tax Map number of property (this information is available through the Planning Office).
5. Grid or block number the parcel is located in (this information is available through the Planning Office).
6. Parcel number of property being developed.
7. Lot number, if applicable.
8. Date that agreement is being prepared.
9. Applicant's full name. This is the person responsible for adhering to the 2-Year Maintenance Agreement. This is almost always the owner of the property. If more than 1 party will be responsible, please provide all applicable names.
10. Acreage of the afforestation/reforestation area.
11. Afforestation, Reforestation or both Afforestation and Reforestation.
12. Forest Conservation Plan number (this number will be provided by the Planning Office).
13. Afforestation, Reforestation or both Afforestation and Reforestation.
14. Afforestation, Reforestation or both Afforestation and Reforestation.
15. Afforestation, Reforestation or both Afforestation and Reforestation.
16. Afforestation, Reforestation or both Afforestation and Reforestation.
17. Beginning date (month and day) the area under the agreement will begin to be monitored for each growing season.
18. Ending date (month and day) the area under the agreement will stop being monitored for each growing season.
19. Afforestation, Reforestation or both Afforestation and Reforestation.
20. Afforestation, Reforestation or both Afforestation and Reforestation.
21. Afforestation, Reforestation or both Afforestation and Reforestation.
22. Afforestation, Reforestation or both Afforestation and Reforestation.
23. Afforestation, Reforestation or both Afforestation and Reforestation.
24. Afforestation, Reforestation or both Afforestation and Reforestation.
25. Afforestation, Reforestation or both Afforestation and Reforestation.
26. Signature of applicant.
27. Signature of second applicant, if necessary.
28. Date Maintenance Agreement is signed.
29. Calendar day.
30. Month.
31. Year.
32. PRINTED full name of applicant (one name per space).
33. PRINTED full name of applicant #2, if necessary.
34. Signature line for the Notary Public.

Conservation Easements

Any land which demonstrates a definite conservation purpose can be protected by an easement. This includes forestland, farmland, wetlands, meadows, endangered species habitat, beaches, scenic areas, natural areas, wild and scenic rivers, historic sites, and any other type of land which is basically undeveloped. An easement is an effective way for property owners to control the future appearance and character of their land. There are no negative impacts on neighboring property values. Easements can be handled without assistance or regulation from the local government.

The major benefits of easements are:

1.Permanent protection of open space, farmland, forestland and historic sites.

2.Flexible easement provisions tailored to the needs of the owner.

3.Long-term monitoring with future owners.

4.Federal and state income tax benefits.

5.Lower estate and inheritance taxes due to the reduced development potential of the property.

6.Fifteen-year property tax credit on the unimproved portions of the property.

Easements are generally perpetual. The landowner who gives an easement gives up the right to develop the land, both now and in the future. The terms of the easement therefore apply to all present and future owners of the land. Easements are executed in the form of a deed and are recorded with the land records of the county.

The easement allows for additions and modifications to existing structures, construction of accessory and farm structures, logging in accordance with accepted forestry practices, and normal agricultural practices. The easement prohibits commercial, industrial and residential development, the dumping of waste materials, the erection of billboards, and excavation, and dredging and mining activities, with some exemptions.

Because the easement restricts the economic and development uses of the property, the fair market value of the land is often reduced. If the terms of the easement are breached, restoration of the property to its prior condition as required.

Forestry Declaration of Intent

Directions on Following Page Correspond to Numbered Blanks
Sketch Map of Proposed Exempt Area Must be Submitted

DNR Use
File #

(1) County_____ (2) Map_____ (3) Assessment #_____

(4) Watershed_____ (5) Subwatershed _____

(6) Grid_____, _____ (7) Parcel_____ (8) Lot_____ (9) Liber_____ (10) Folio____

(11) Area Exempted_____ (12) Name(s)_____

_____

(13) Phone_____ (14) Address_____

I (we), (15)_____the Owner(s) of the real property located at (16)_____ as described as (17)_____ Hereby declare my (our) intention to continue and/or place into forestry use the above property, in accordance with the provisions of the (18)_____(jurisdiction) Forest Conservation Program and COMAR 08.19.01.04, for a period of at least five (5) consecutive full taxable years following this date.

This declaration grants an exemption for commercial forestry activities under the (19)_____(jurisdiction) Forest Conservation Program. If the land does not remain in commercial forestry use, the Owner(s) must notify the (20)_____(jurisdiction). If the Owner(s) makes application for an activity regulated under the Forest Conservation Program, clears more than 40,000 square feet of forest, or violates the requirements of a previous Forest Conservation Plan on all or part of the lot within the five (5) year period, the (21)_____(jurisdiction) may require the Owner(s) to meet the forest conservation threshold established in the Forest Conservation Program and COMAR 08.19.03, and may also assess a noncompliance fee for forested areas cut in violation of this exemption.

I (we) declare, under the penalties of law, that this declaration, including any accompanying forms and statements, has been examined by me (us) and the information contained herein, to the best of my (our) knowledge, information, and belief, is true, correct and complete.

Signature(s) (22)_____ Date_____

(22) _____Date_____

Directions for *Forestry Declaration of Intent*: Attach a sketch map (same map you use for obtaining a sediment and erosion control permit) which represents the area to be exempt .

1) County/Tax District - The County/tax jurisdiction in which the property in question is located.
2) Map-Refers to the Tax Map where the property in question is located.
3) Assessment #- Tax assessment number from the assessor's office.
4) Watershed - Major drainage basin in which property is located. May be obtained from DNR map.
5) Subwatershed - Minor drainage basin in which property is located. May be obtained from DNR map.

6 - 8)Grid, Parcel#, Lot #-Taken from the Tax Map. It is the legal description of where the property in question is located.

9-10) Liber/Folio #-Book and page number of deed reference for property in question.

11) Area Exempted - Square feet or acres this exemption is to apply.

12) Name - The owner(s) of the property in question.

13) Phone – The number at which the owner(s) may be reached, including area code.

14) Address -Current mailing address of owner(s).

15) Name(s) of current owner(s).

16) Street address of Property in question.

17) Map, Parcel, Lot, Liber, Folio - legal description of property.

18-21) Jurisdiction of the Forest Conservation Program under which the property in question is located.

22) Signature(s) of present owner(s) and date.

---

23) Authority- Name of agency responsible for accepting Declaration (Send copy of this declaration to DNR).

24) Date-Date action was taken.

Office Use Only

23)Authority: _____

24) Date: _____

Maryland Department of Natural Resources
Forest Service
Forest Conservation Program
Tawes State Office Building, E-1
580 Taylor Avenue
Annapolis, MD. 21401

Real Estate Transfer Declaration of Intent

Directions on Following Page Correspond to Numbered Blanks
Sketch Map of Proposed Exempt Area Must be Submitted

DNR Use
File #_____

(1) County_____ (2) Map_____ (3) Assessment #_____

(4) Watershed_____ (5) Subwatershed _____

(6) Grid_____, _____ (7) Parcel_____ (8) Lot_____ (9) Liber_____ (10) Folio____

(11) Area Exempted_____ (12) Name(s)_____

_____

(13) Phone_____ (14) Address_____

I (we), (15)_____the Owner(s) of the real property located at (16)_____ as described as (17)_____ Hereby declare my (our) intention to invoke the real estate transfer exemption for the above property, in accordance with the provisions of the (18)_____(jurisdiction) Forest Conservation Program and COMAR 08.19.01.04, for a period of at least five (5) consecutive full taxable years following this date.

This declaration grants an exemption for commercial forestry activities under the (19)_____(jurisdiction) Forest Conservation Program, for a real estate transfer to provide security, leasehold or other legal or equitable interest, including a transfer of title, of a portion of a lot or parcel and this transfer does not involve a change in land use, or new development, or redevelopment with associated land disturbing activities. If the Owner(s) makes application for an activity regulated under the Forest Conservation Program, clears more than 40,000 square feet of forest, or violates the requirements of a previous Forest Conservation Plan on all or part of the lot within the five (5) year period, the (20)_____(jurisdiction) may require the Owner(s) to meet the forest conservation threshold established in the Forest Conservation Program and COMAR 08.19.03, and may also assess a noncompliance fee for forested areas cut in violation of this exemption.

I (we) declare, under the penalties of law, that this declaration, including any accompanying forms and statements, has been examined by me (us) and the information contained herein, to the best of my (our) knowledge, information, and belief, is true, correct and complete.

Signature(s) (21)_____ Date_____

(22) _____Date_____

Directions for *Real Estate Transfer Declaration of Intent*: Attach a sketch map (preferably a plat map) which represents the area to be exempt and a letter providing a narrative description of the transaction .

1) County/Tax District - The County/tax jurisdiction in which the property in question is located.
2) Map-Refers to the Tax Map where the property in question is located.
3) Assessment #- Tax assessment number from the assessor's office.
4) Watershed - Major drainage basin in which property is located. May be obtained from DNR map.
5) Subwatershed - Minor drainage basin in which property is located. May be obtained from DNR map.

6 - 8)Grid, Parcel#, Lot #-Taken from the Tax Map. It is the legal description of where the property in question is located.

9-10) Liber/Folio #-Book and page number of deed reference for property in question.

11) Area Exempted - Square feet or acres this exemption is to apply.

12) Name - The owner(s) of the property in question.

13) Phone – The number at which the owner(s) may be reached, including area code.

14) Address -Current mailing address of owner(s).

15) Name(s) of current owner(s).

16) Street address of Property in question.

17) Map, Parcel, Lot, Liber, Folio - legal description of property.

18-20) Jurisdiction of the Forest Conservation Program under which the property in question is located.

21-22) Signature(s) of present owner(s) and date.

---

23) Authority- Name of agency responsible for accepting Declaration (Send copy of this declaration to DNR).

24) Date-Date action was taken.

Office Use Only

23)Authority:_____

24) Date:_____

Maryland Department of Natural Resources
Forest Service
Forest Conservation Program
Tawes State Office Building, E-1
580 Taylor Avenue
Annapolis, MD. 21401

Agricultural Declaration of Intent

Directions on Following Page Correspond to Numbered Blanks
Sketch Map of Proposed Exempt Area Must be Submitted

DNR Use
File #

(1) County_____ (2) Map_____ (3) Assessment #_____

(4) Watershed_____ (5) Subwatershed _____

(6) Grid_____, _____ (7) Parcel_____ (8) Lot_____ (9) Liber_____ (10) Folio____

(11) Area Exempted_____ (12) Forested Area to be Cleared_____

(13) Name(s)_____

_____

(14) Phone_____ (15) Address_____

I (we), (16)_____the Owner(s) of the real property located at (17)_____ as described as (18)_____ Hereby declare my (our) intention to continue and/or place into agricultural use the above property, in accordance with the provisions of the (19)_____(jurisdiction) Forest Conservation Program and COMAR 08.19.01.04, for a period of at least five (5) consecutive full taxable years following this date.

This declaration grants an exemption for agricultural activities under the (20)_____(jurisdiction) Forest Conservation Program. If the land does not remain in agricultural use, the Owner(s) must notify the (21)_____(jurisdiction). If the Owner(s) makes application for an activity regulated under the Forest Conservation Program, clears more than 40,000 square feet of forest, or violates the requirements of a previous Forest Conservation Plan on all or part of the lot within the five (5) year period, the (22)_____(jurisdiction) may require the Owner(s) to meet the forest conservation threshold established in the Forest Conservation Program and COMAR 08.19.03, and may also assess a noncompliance fee for forested areas cut in violation of this exemption.

I (we) declare, under the penalties of law, that this declaration, including any accompanying forms and statements, has been examined by me (us) and the information contained herein, to the best of my (our) knowledge, information, and belief, is true, correct and complete.

Signature(s) (23)_____ Date_____

(24) _____Date_____

Directions for *Agricultural Declaration of Intent*: Attach a sketch map (preferably a plat map) which represents the area to be exempt and a letter providing a narrative description of the transaction .

1) County/Tax District - The County/tax jurisdiction in which the property in question is located.
2) Map-Refers to the Tax Map where the property in question is located.
3) Assessment #- Tax assessment number from the assessor's office.
4) Watershed - Major drainage basin in which property is located. May be obtained from DNR map.
5) Subwatershed - Minor drainage basin in which property is located. May be obtained from DNR map.

6 - 8)Grid, Parcel#, Lot #-Taken from the Tax Map. It is the legal description of where the property in question is located.

9-10) Liber/Folio #-Book and page number of deed reference for property in question.

11) Area Exempted - Square feet or acres this exemption is to apply.

12) Forested Area Cleared-Provide acreage or square footage of forest to be cleared.

13) Name - The owner(s) of the property in question.

14) Phone-The number at which the owner(s) may be reached, including area code.

15) Address -Current mailing address of owner(s).

16) Name(s) of current owner(s).

17) Street address of Property in question.

18) Map, Parcel, Lot, Liber, Folio - legal description of property.

19-21) Jurisdiction of the Forest Conservation Program under which the property in question is located.

22-23) Signature(s) of present owner(s) and date.

---

24) Authority- Name of agency responsible for accepting Declaration (Send copy of this declaration to DNR).

25) Date-Date action was taken.

Office Use Only

24)Authority: _____

25) Date: _____

Maryland Department of Natural Resources
Forest Service
Forest Conservation Program
Tawes State Office Building, E-1
580 Taylor Avenue
Annapolis, MD. 21401

Intrafamily Transfer Declaration of Intent
Subtitle 2-Forest Conservation Act
(Exemption 18-2-4-(b)(11))

Directions on back correspond to Numbered Blanks
All requirements of Subtitle 1 must also be met

Current Property Owners Name_____
Current Property Owners Full Address_____
Current Property Owners Phone Number_____
Tax Map No._____ Block No._____ Parcel No. _____ Lot No._____
Acreage of Current Lot_____ Acreage of Proposed Lot _____Zoning of Property_____
Amount Of Forest Cover on Proposed Lot_____Amount of Proposed Clearing_____
Intended Use of Land_____
Future Property Owners Name_____
Future Property Owners Address_____
Future Property Owners Phone Number_____
Relationship of Future Property Owner to Current Property Owner_____

I (we)_____the current owner(s) of the real property located at_____as described as _____ do hereby declare my (our) intent to enter into an activity required for the purpose of constructing a dwelling for the use and occupation by_____, whose relationship to myself (ourselves) may be best described as_____. I (we) do not intend t cut, clear or grade more than 40,000 square feet of forest and I (we) understand that all requirements of Subtitle1, *Land Use and Development*, must be met prior to receiving an exemption from Subtitle 2, *Forest Conservation Act*. I (we) understand that this Declaration of Intent is for a period of no less than 5 years. I (we) understand that any violation, (including further subdivision or other regulated activity), of this Declaration of Intent may result in the loss of the exemption.

I(we)_____, the future property owners of the real property located at _____as described as_____do hereby declare my (our) intent to enter into an activity for the purpose of construction a dwelling for myself (ourselves). Our relationship to the current owner may be best described as_____.
I (we) do not intend to cut, clear or grade more than 40,000 square feet of forest and I (we) understand that this Declaration of Intent is for a period of no less than 5 years. I (we) understand that any violation of this Declaration of Intent, (including further subdivision, transfer of the property to a non-family member, or other regulated activity) may result in the loss of the exemption. I (we) understand that if a transfer to a new owner(s) who is not a family member occurs within a 5 year period, we or the new owner(s) may be required to meet the conservation thresholds as outlined in Subtitle 2, *Forest Conservation Act*.

This declaration grants an exemption for intrafamily transfer activities under the Queen Anne's County Forest Conservation program, Subtitle 2, *Forest Conservation Act*. If the land transfers ownership within 5 years, the owner(s) must notify the Queen Anne's County Department of

Directions for *Agricultural Declaration of Intent*: Attach a sketch map (preferably a plat map) which represents the area to be exempt and a letter providing a narrative description of the transaction.

1) County/Tax District - The County/tax jurisdiction in which the property in question is located.
2) Map-Refers to the Tax Map where the property in question is located.
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5) Subwatershed - Minor drainage basin in which property is located. May be obtained from DNR map.

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9-10) Liber/Folio #-Book and page number of deed reference for property in question.

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12) Forested Area Cleared-Provide acreage or square footage of forest to be cleared.

13) Name - The owner(s) of the property in question.

14) Phone-The number at which the owner(s) may be reached, including area code.

15) Address -Current mailing address of owner(s).

16) Name(s) of current owner(s).

17) Street address of Property in question.

18) Map, Parcel, Lot, Liber, Folio - legal description of property.

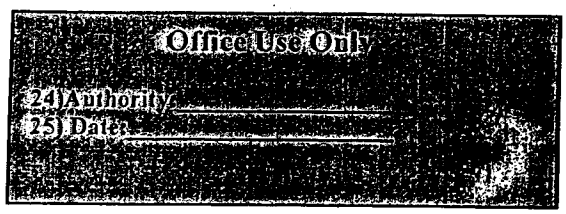
19-21) Jurisdiction of the Forest Conservation Program under which the property in question is located.

-23) Signature(s) of present owner(s) and date.

---

24) Authority- Name of agency responsible for accepting Declaration (Send copy of this declaration to DNR).

25) Date-Date action was taken.



Maryland Department of Natural Resources
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Forest Conservation Program
Tawes State Office Building, E-1
580 Taylor Avenue
Annapolis, MD. 21401

Intrafamily Transfer Declaration of Intent
Subtitle 2-Forest Conservation Act
(Exemption 18-2-4-(b)(11))

Directions on back correspond to Numbered Blanks
All requirements of Subtitle 1 must also be met

Current Property Owners Name_____
Current Property Owners Full Address_____
Current Property Owners Phone Number_____
Tax Map No._____ Block No._____ Parcel No._____ Lot No._____
Acreage of Current Lot_____ Acreage of Proposed Lot_____Zoning of Property_____
Amount Of Forest Cover on Proposed Lot_____Amount of Proposed Clearing_____
Intended Use of Land_____
Future Property Owners Name_____
Future Property Owners Address_____
Future Property Owners Phone Number_____
Relationship of Future Property Owner to Current Property Owner_____

I (we)_____the current owner(s) of the real property located at_____as described as _____ do hereby declare my (our) intent to enter into an activity required for the purpose of constructing a dwelling for the use and occupation by_____, whose relationship to myself (ourselves) may be best described as_____. I (we) do not intend to cut, clear or grade more than 40,000 square feet of forest and I (we) understand that all requirements of Subtitle1, *Land Use and Development*, must be met prior to receiving an exemption from Subtitle 2, *Forest Conservation Act.* I (we) understand that this Declaration of Intent is for a period of no less than 5 years. I (we) understand that any violation, (including further subdivision or other regulated activity), of this Declaration of Intent may result in the loss of the exemption.

I(we)_____, the future property owners of the real property located at _____as described as_____do hereby declare my (our) intent to enter into an activity for the purpose of construction a dwelling for myself (ourselves). Our relationship to the current owner may be best described as_____.
I (we) do not intend to cut, clear or grade more than 40,000 square feet of forest and I (we) understand that this Declaration of Intent is for a period of no less than 5 years. I (we) understand that any violation of this Declaration of Intent, (including further subdivision, transfer of the property to a non-family member, or other regulated activity) may result in the loss of the exemption. I (we) understand that if a transfer to a new owner(s) who is not a family member occurs within a 5 year period, we or the new owner(s) may be required to meet the conservation thresholds as outlined in Subtitle 2, *Forest Conservation Act.*

This declaration grants an exemption for intrafamily transfer activities under the Queen Anne's County Forest Conservation program, Subtitle 2, *Forest Conservation Act.* If the land transfers ownership within 5 years, the owner(s) must notify the Queen Anne's County Department of

Planning and Zoning. If the owner(s) make application for an activity regulated under the Forest Conservation Program and intends to cut, clear, or grade more than 40,000 square feet of forest on all or part of the lot within a five (5) year period, the owner(s) may be required to meet the Forest Conservation thresholds outlined in Subtitle 2, *Forest Conservation Act* and may be assessed a noncompliance fine for forested areas cut in violation of this exemption.

I (we) understand, under the penalties of law, that this declaration, including any accompanying forms and statements, has been examined by us and the information contained herein, to the best of our knowledge, information, and belief, is true, correct and complete.

Signature(s) of Current Property Owner(s)_____

Date_____

Signature(s) of Future Property Owner(s)_____

Date_____

State Of _____
County Of_____

On this_____day of_____, 20_____, before me, the undersigned officer, personally appeared

_____

And

_____

Known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he/she executed the same for the purposes therein contained. In witness whereof I hereunto set my hand and official seal.

_____
Notary Public

State Of _____
County Of_____

On this_____day of_____, 20_____, before me, the undersigned officer, personally appeared

_____

And

_____

Known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he/she executed the same for the purposes therein contained. In witness whereof I hereunto set my hand and official seal.

_____
Notary Public

Intrafamily Transfer Declaration of Intent
Subtitle 2-Forest Conservation Act
(Exemption 18-2-4-(b)(11))

Directions on back correspond to Numbered Blanks
All requirements of Subtitle 1 must also be met

Current Property Owners Name_____(1)_____
Current Property Owners Full Address_(2)_____
Current Property Owners Phone Number___(3)_____
Tax Map No._(4)____ Block No._(5)____ Parcel No. __(6)_____ Lot No.____(7)___
Acreage of Current Lot__(8)_Acreage of Proposed Lot__(9)____Zoning of Property__(10)_
Amount Of Forest Cover on Proposed Lot __(11)___Amount of Proposed Clearing__(12)____
Intended Use of Land_____(13)_____
Future Property Owners Name___(14)_____
Future Property Owners Address__(15)_____
Future Property Owners Phone Number__(16)_____
Relationship of Future Property Owner to Current Property Owner___(17)_____

I (we)_____(18)_____the current owner(s) of the real property located at_____(19)_____as described as _____(20)_____ do hereby declare my (our) intent to enter into an activity required for the purpose of constructing a dwelling for the and occupation by_____(21)_____, whose relationship to myself (ourselves) may be best described as_____(22)_____. I (we) do not intend to cut, clear or grade more than 40,000 square feet of forest and I (we) understand that all requirements of Subtitle1, *Land Use and Development*, must be met prior to receiving an exemption from Subtitle 2, *Forest Conservation Act.* I (we) understand that this Declaration of Intent is for a period of no less than 5 years. I (we) understand that any violation, (including further subdivision or other regulated activity), of this Declaration of Intent may result in the loss of the exemption.

I(we)_____(23)_____, the future property owners of the real property located at ____(24)_____as described as_____(25)_____do hereby declare my (our) intent to enter into an activity for the purpose of construction a dwelling for myself (ourselves). Our relationship to the current owner may be best described as_____(26)_____. (we) do not intend to cut, clear or grade more than 40,000 square feet of forest and I (we) understand that this Declaration of Intent is for a period of no less than 5 years. I (we) understand that any violation of this Declaration of Intent , (including further subdivision, transfer of the property to a non-family member, or other regulated activity)may result in the loss of the exemption. I (we) understand that if a transfer to a new owner(s) who is not a family member occurs within a 5 year period, we or the new owner(s) may be required to meet the conservation thresholds as outlined in Subtitle 2, *Forest Conservation Act.*

This declaration grants an exemption for intrafamily transfer activities under the Queen Anne's County Forest Conservation program, Subtitle 2, *Forest Conservation Act*. If the land transfers ownership within 5 years, the owner(s) must notify the Queen Anne's County Department of Planning and Zoning. If the owner(s) make application for an activity regulated under the Forest Conservation Program and intends to cut, clear, or grade more than 40,000 square feet of forest on all or part of the lot within a five (5) year period, the owner(s) may be required to meet the Forest Conservation thresholds outlined in Subtitle 2, *Forest Conservation Act* and may be assessed a noncompliance fine for forested areas cut in violation of this exemption.

I (we) understand, under the penalties of law, that this declaration, including any accompanying forms and statements, has been examined by us and the information contained herein, to the best of our knowledge, information, and belief, is true, correct and complete.

Signature(s) of Current Property Owner(s)_____(27)_____

Date_____(28)_____

Signature(s) of Future Property Owner(s)_____(29)_____

Date_____(30)_____

State Of Maryland
County Of Queen Anne's

On this_(31)____day of____(32)_____, 20__(33)___, before me, the undersigned officer, personally appeared

(34)_____

And

___(35)_____

Known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he/she executed the same for the purposes therein contained. In witness whereof I hereunto set my hand and official seal.

_____(36)_____
Notary Public

State Of Maryland
County Of Queen Anne's

On this__(37)____day of___(38)_____, 20__(39)___, before me, the undersigned officer, personally appeared

(40)_____

And

_(41)_____

Known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he/she executed the same for the purposes therein contained. In witness whereof I hereunto set my hand and official seal.

____(42)_____
Notary Public

Please print or type clearly, unless otherwise instructed.
Use only blue or black ink

1. All listed owners contained within the deed for the property on which the activity is to occur
2. Current mailing addresses for all listed owners in #1
3. All phone numbers, with area codes, for all owners in #1
4. Queen Anne's County Tax Map Number of the property (this information should be provided by your agent or the Tax Assessment Office (410-758-5030))
5. Block Number (this information should be provided by your agent or the Tax Assessment Office (410-758-5030))
6. Parcel Number (this information should be provided by your agent or the Tax Assessment Office (410-758-5030))
7. Lot number (this information should be provided by your agent)
8. Size of original lot, in acres, rounded to the nearest 10th
9. Size of newly created lot, in acres, rounded to the nearest 10th
10. Zoning district (this information should be provided by your agent or the Tax Assessment Office (410-758-5030))
11. Amount of forest, in acres, on newly created lot (lot on which activity is to occur)
12. Amount of forest clearing proposed, in acres, if applicable
13. Residential, agricultural, etc.
14. List all future property owners names of lot on which activity is to occur
15. List current address of all future property owners, and future address, if known
16. List current phone number, including area codes, of all future property owners
17. List the future property owner's relationship to the current owner (Child, grandchild, step-child, brother, sister, step-brother, step-sister, aunt, uncle, niece, nephew, parent, step-parent, grand-parent)
18. List all listed owners contained within the deed for the property on which the activity is to occur
19. Complete address of property in question (not necessarily the same as the mailing address)
20. Tax Map Number, Block Number, Parcel Number, Lot Number, Liber, Folio reference of the property in question.
21. Name of future property owners
22. Relationship of future property owner to current property owner
23. All future property owner names
24. Complete address of property on which activity is to occur (not necessarily the same as the mailing address)
25. Tax Map Number, Block Number, Parcel Number, and Lot Number of property on which activity is to occur and its Liber, Folio reference, if known.
26. Relationship of future property owner to current property owner
27. Please WRITE complete name of all current property owners (1 name per space)
28. Provide complete date of when document is being signed by current property owners
29. Please WRITE complete name of all future property owners (1 name per space)
30. Provide complete date of when document is being signed by future property owners
31. Calendar day
32. Month
33. Year
34. & 35. Please WRITE complete name of all current property owners (1 name per space)

36. Signature line for the Notary Public
37. Calendar day
38. Month
39. Year
40. & 41. Please WRITE complete name of all property owners (1 name per space)
42. Signature line for the Notary Public

OFFICIAL USE ONLY
DO NOT WRITE IN THIS BOX

AUTHORIZATION:_____
DATE:_____

Forest Stewardship Plan Format

This format is meant to serve as a guideline only. The applicant should expect additional comments/requirements, as necessary.

Instructions

Stewardship Plan Format – the format for all stewardship plans prepared by all Forest Service personnel will be as follows:

A. Title Page – the title page shall include the following:

1. Landowner name and address
2. Location of property (include MD Grid)
3. County
4. Acres (Breakout woodland, agricultural fields, idle fields and marsh)
5. Author(s)
6. Date
7. Forester's Stamp – lower right corner
8. Stewardship Sticker – upper right corner

B. Maps

The maps shall conform to the following:

1. Appropriate scale
2. Appropriate detail of adjacent property
3. Standard orientation of North arrow to top of page, or as close as possible
4. Acres match what is on title page (to tenths of acres)
5. No color
6. Vegetation map is mandatory
7. Soils, wetlands or other maps if necessary

C. Standard Description and Recommendation Overview

This section is optional for properties with three or less stands. If there are more than three stands, this table is a useful reference tool for comparing stands. On properties with three or less stands, the information on the Stand Recommendation pages should be sufficient.

D. Stand Description and Rec

Each stand shall have a separate p[illegible] which describes the composition of the stand and the recommendations for i[illegible]

1. Stand Number
2. Area (Acres)
3. Dominant Overstory Species
4. Dominant Understory Species
5. Development Stage
6. Age (if even, give age)
7. Stocking/Basal Area
8. Site Growth Potential
9. Soil Type

Recommendations should be in narrative form and as specific as possible.
For example, if a thinning is recommended, the basal area to remain should be spelled out.

E. Additional Comments

This section shall be used to supply any additional comments that have not been included in the "Overview" or the "Standard Recommendations" sections. Practices or activities that encompass the entire property such as monitoring for insects and disease, boundary line maintenance, fire control, broad wildlife recommendations, etc., should be included in this section.

F. Practice Schedule

This section shall give the suggested schedule (by month and year) for practice implementation. The schedule should not include administrative activities such as applying for the FCMA program or inspections for FCMA or Tree Farm certification. An asterisk shall be placed next to a practice that is cost-sharable.

G. Appendix

This section shall include any appropriate management inserts as identified on the "Insert Checklist." Any other miscellaneous informational material shall be included in this section.

Forest Conservation and Management Program

A Forest Conservation and Management Agreement (FCMA) is a binding contract between a landowner and the Maryland Department of Natural Resources which provides for the freezing of the assessment of forested areas if the property is managed according to sound forest conservation principles. A forest resource management plan, written by a professional forester licensed by the State of Maryland, is required and must be approved by the Department. A tax savings results from the freezing of the property taxes at an agricultural rate at the time the contract is let.

Any owner of 5 or more contiguous acres of forest land may enter the Forest Conservation and Management Program. Open land that was recently planted to forest tree seedlings can be included. Land that is used to grow Christmas trees if they will be cut at harvest may also be included. The agreement does not apply to the assessment on house sites, other structures, crop land, mining sites and other non-forested open space.

Forest management is often considered the art and science of matching the owner's objectives with biological requirements of the forest. Good forest management results in a healthy forest which will produce quality timber, increase income of the owner, reduce soil erosion and flooding, and provide open space for recreation and aesthetic enjoyment. Tree species, soils, topography, tree age, property location and other factors will have to be evaluated as well as the owners desires and the requirements of the law. The plan must contain a detailed schedule of practices to be accomplished and their completion date.

The contract must cover a minimum of 15 years. A memorandum of the contract and any subsequent changes are recorded at the county courthouse. The contract can be renewed indefinitely if forest conservation practices are approved and are accomplished. The contract can be assigned and transferred to a new owner of the property if the buyer agrees to assume the obligation of the agreement. The property will be re-assessed if the agreement ends, the agreement is terminated or the property changes hands. A nominal administrative fee is charged to the owner upon entering the program, when changes to the agreement must be made and for each five year inspection.

A Forest Conservation and Management Agreement is not the same as a Long-Term Protective Agreement. However, a FCMA can be placed, under certain circumstances, on land also protected under a Long-Term Protective Agreement.

Preparation of Forest Management Plans

Forest Management Plans and Timber Harvest Plans shall be prepared by professional foresters, licensed by the State of Maryland. Please contact the Maryland Department of Natural Resources-Forest Service for complete information.

Queen Anne's County:
State Office Building
120 Broadway Ave.
Room 207
Centreville, Md. 21617
(410-819-4120)

FOREST MANAGEMENT PLAN

for

(Landowner's Name)

(Address)

(Property Location)

(Maryland Grid Coordinates)

In

_____County

On

_____Acres

Prepared By:

_____

_____

Date

A. Landowner's Objectives

B. Soil Types: List the primary soil types on the property with a general narrative of their capabilities and productivity.

C. Topography: A brief description of the aspect and slopes, and the limitations it (they) might impose on the proposed management.

D. Forest Stand Delineation: This section is to be used by the forester to describe the results of forest data collection. This section shall also include all relevant data about the site collected through any previous field inventories and/or environmental reviews.

E. Management Recommendations:

1. Forestland

2. Open Land

3. Wetlands

F. Management Practice Schedule

G. Map shall include the following features:

1. North arrow

2. Acreage

3. Scale

4. Date of preparation

5. Critical habitat areas

6. Stream buffers

7. Locality or distinguishing landmarks

8. Specimen trees

9. Public and private roads

10. Property boundaries

11. Slopes greater than 25%

12. Perennial and Intermittent streams

13. Non-tidal wetlands

Sample Forest Management Objectives

1. Provide passive recreation opportunities (such as nature trails, nature observation, photography, etc.).
2. Provide for wildlife habitat.
3. Protect habitat for endangered or special plant/wildlife communities.
4. Improve hunting opportunities.
5. Provide for income through timber resource development and harvesting.
6. Provide firewood and timber products for the landowners use.

Timber Harvest Plan

(sample cover sheet)

Landowner:

Address:

Phone Number:

County:

Location:

Stand:

Acres:

Description:

Timber Harvest Plan

- Landowner:
- Acreage:
- Owner's Management Goal(s):
- Dominant Tree Species In Stand:
- Dominant Understory Species In Stand:
- Dominant Soil Series:
- Slope Range:
- Type of Harvest (Clearcut, Shelterwood, Deferred Rotation, Seedtree, Thinning, Selection, etc.)
- Current Basal Area: Post Harvest Basal Area:
- DBH of Dominant Timber Size Class:
- Proposed Site Preparation Method (if necessary):
- Proposed Regeneration Method and Desired Stocking:
- Other Laws and Ordinances that May Apply to the Harvest Site (Seed Tree, FCMA, Forest Conservation Act, Sediment Control, etc.)
- A Sediment and Erosion Control Plan for Forest Harvest Operations has been/will be (circle one) prepared for submittal to the county Soil Conservation District for its review and approval. All work will be done in compliance with the approved plan.
- Describe measures that will be taken to provide for wildlife corridors and continuity of habitat.

Critical Habitat and Protection Areas

Note if harvesting is to occur in or adjacent to any of the following (yes or no):

A. 50 foot buffer along perennial or intermittent streams
B. Non-tidal wetlands or their buffers
C. Habitat for threatened and endangered species, and their protection areas
D. Natural Heritage Areas

For each positive response to C or D, include an attachment with the following information:

1. Delineation of the critical habitat and protection area within the stand.

2. How the harvest will be modified to conform with the critical habitat protection requirements in the local program.

3. Attach the appropriate survey information and/or Natural Heritage Program recommendations.

Appendix G

Maryland Forest Association Species List

Key to Codes

Form: Describes plant type:

T= tree S=shrub V=vine

Seral Stage: Indicates most common position in succession occupied by the species:

P=pioneer ES=early seral C=climax

Moisture Regime: Refers to the amount of moisture required by a plant for optimal growth.

D=dry M=moist W=wet

Sun Exposure: The amount of sun required by the species for optimum or adequate development.

F= full sun P= partial shade S= full shade

A= all (full sun, partial shade, full shade)

Sources

Darr, Lonnie. 1990. A Technical Manual for Woodland Conservation with Development In Prince George's County. MNCPPC, Upper Marlboro, MD.

Henderson, Carrol L. 1981. Landscaping For Wildlife. Minnesota Department of Natural Resources, St. Paul, MN.

Maryland Forest Associations Species List (Brush et al., 1977)

Forest Associations	Associated Species	Form	Seral Stage	Moisture Regime	Sun Exposure
Tamarack					
	hemlock	T	C	M-W	A
	red spruce	T	C	M-W	F-P
	tamarack	T	C	D-M-W	F-P
Hemlock-Birch					
	red maple	T	P-ES	M-W	P-S
	northern red oak	T	ES	M	F
	witch hazel	S	ES	M-W	P-S
	black cherry	T	P-ES	M	F-P
	sugar maple	T	C	M	F
	white oak	T	C	D-M	A
	beech	T	C	M	A
	Ironwood	T	P	M	A
	mapleleaf viburnum	S	P	M-D	F-P
	shagbark hickory	T	C	D-M	F-P
	white ash	T	P-ES	M-W	A
	striped maple	T	P-ES	MW	P-S
	hemlock	T	C	M-W	A
	black birch	T	ES-C	M-W	F-P
Chestnut Oak-Bear Oak					
	white oak		C	D-M	A
	northern red oak		ES	M	F
	early low blueberry		P	D	F-P
	red maple		P-ES	M-W	P-S
	black oak	T	C	D-M	F-P
	sassasfras	T	P	D-M	F-P
	grape	V	P-ES	D-M-W	S
	tall deerberry	S	P	D	F-P
	flowering d	T	C	M	A
	pignut hic	T	C	D-M	A
	black gun	T	ES	M-W	F
	black ch	T	P-ES	M	F-P
	black l st	T	P	D-M	F
	hawthorn	S	ES-C	D-M-W	F-P
	white pine	T	P-ES	M	F-P
	mockernut hickory	T	C	D-M	F
	greenbriers	V	P-ES	D-M-W	A

Forest Associations	Associated Species	Form	Seral Stage	Moisture Regime	Sun Exposure
Chestnut Oak-Bear Oak (cont.)					
	service berries	S	ES-C	W-M	A
	mapleleaf viburnum	S	P	M-D	F-P
	sweet pignut hickory	T	ES-C	D-M	P-S
	Virginia pine	T	P	D-M	F
	witch hazel	S	ES	M-W	P-S
	chestnut oak	T	C	D-M	*F-P*
	bear oak	T	C	D-M	F-P
Sugar Maple Basswood					
	northern red oak	T	ES	M	F
	black cherry	T	P-ES	M	*F-P*
	red maple	T	P-ES	M-W	P-S
	white oak	T	C	D-M	A
	white ash	T	P-ES	M-W	A
	flowering dogwood	T	C	M	A
	Virginia creeper	V	ES-C	M-D	A
	witch hazel	S	ES	M-W	P-S
	black locust	T	P	D-M	F
	greenbriers	V	P-ES	D-M-W	A
	grape	V	P-ES	D-M-W	S
	hop hornbeam	T	P	M	A
	poison pignut hickory	T	P -ES	D-M	P-S
	black birch	T	ES-C	M-W	A
	serviceberries	S	P-ES	W-M	F-P
	sassafras	T	P	D-M	A
	mockernut hickory	T	C	D-M	F-P
	sweet pignut hickory	T	ES-C	D-M	F
	hawthorn	S	ES-C	D-M-W	P-S
	brambles	V	P-ES	D-M	*F-P*
	sugar maple	T	C	M	F-P
	basswood	T	ES	M	F
Chestnut Oak					F-P
	red maple	T	P-ES	M-W	P-S
	white oak	T	C	D-M	A
	sassafras	T	P	D-M	F-P

For Associations	Associated Species	Form	Seral Stage	Moisture Regime	Sun Exposure
Chestnut Oak (cont.)					
	northern red oak	T	ES	M	F
	black cherry	T	P-ES	M	F-P
	black gum	T	ES	M-W	F
	black oak	T	C	D-M	F-P
	early low blueberry	S	P	D	F-P
	pignut hickory	T	C	D-M	A
	flowering dogwood	T	C	M	A
	American chestnut	T	C	D	P-S
	mockernut hickory	T	C	D-M	F
	Virgnia Creeper	V	ES-C	M-D	A
	grape	V	P-ES	D-M-W	S
	chestnut oak	T	C	D-M	F-P
	tall deerberry	S	P	D	F-P
	brambles	V	P-ES	D-M	F-P
	mapleleaf viburnum	S	P	M-D	F-P
	greenbriers	V	P-ES	D-M-W	F-P
	scarlet oak	T	ES	D	F-P
	white ash	T	P-ES	M-W	A
	witch hazel	S	ES	M-W	P-S
Tulip Poplar					
	red maple	T	P-ES	M-W	P-S
	flowering dogwood	T	C	M	A
	Virginia creeper	V	ES-C	M-D	A
	black gum	T	ES	M-W	F
	white oak	T	C	D-M	A
	sassafras	T	P	D-M	F-P
	black cherry	T	P-ES	M	F-P
	grape	V	P-ES	D-M-W	S
	mockernut hickory	T	C	D-M	F
	southern arrowwood	S	P	M-W	F-P
	pignut hickory	T	C	D-M	A
	black oak	T	C	D-M	F-P
	poison ivy	V	P-ES	D-M	P-S
	greenbriers	V	P-ES	D-M-W	A
	beech	T	C	M	A
	spicebush	S	P	M-W	A
	northern red oak	T	ES	M	F

Forest Associations	Associated Species	Form	Seral Stage	Moisture Regime	Sun Exposure
Tulip Poplar (cont.)					
	mapleleaf viburnurn	S	P	M-D	F-P
	early low blueberry	S	P	D	F-P
	choke cherry	S	P	M-D	A
	brambles	V	P-ES	D-M	F-P
	tulip poplar	T	ES	M	F-P
Sycamore-Green Ash-Box Elder-Silver Maple					
	red maple	T	P-ES	M-W	P-S
	Virginia creeper	V	ES-C	M-D	A
	white oak	T	C	D-M	A
	flowering dogwood	T	C	M	A
	grape	V	P-ES	D-M-W	S
	black cherry	T	P-ES	M	F-P
	northern red oak	T	ES	M	F
	spicebush	S	P	M-W	A
	tulip poplar	T	ES	M	F-P
	black gum	T	ES	M-W	F
	sassafras	T	P	D-M	F-P
	white ash	T	P-ES	M-W	A
	mockernut hickory	T	C	D-M	F
	poison Ivy	V	P-ES	D-M	P-S
	southern arrowwood	S	P	M-W	F-P
	black oak	T	C	D-M	F-P
	pignut hickory	T	C	D-M	A
	brambles	V	P-ES	D-M	F-P
	greenbriers	V	P-ES	D-M-V	A
	Ironwood	T	P	M	A
	green ash	T	P-ES	M-W	F
	sycamore	T	P-C	M-W	F-P
	box elder	T	P	M-W	F-P
	silver maple	T	ES	M-W	F-P

Forest Associations	Associated Species	Form	Seral Stage	Moisture Regime	Sun Exposure
Shingle Oak					
	black oak	T	C	D-M	F-P
	black cherry	T	P-ES	M	F-P
	white oak	T	C	D-M	A
	flowering dogwood	T	C	M	A
	grape	V	P-ES	D-M-W	S
	poison Ivy	V	P-ES	D-M	P-S
	red maple	T	P-ES	M-W	P-S
	sassafras	T	P	D-M	F-P
	black gum	T	ES	M-W	F
	shagbark hickory	T	C	D-M	F-P
	greenbriers	V	P-ES	D-M-W	A
	Virginia creeper	V	ES-C	M-D	A
	white ash	T	P-ES	M-W	A
	chestnut oak	T	C	D-M	F-P
	dwarf juniper	S	P-ES	D-M	F-P
	early low blueberry	S	P	D	F-P
	nannyberry	S	ES	M	A
	northern red oak	T	ES	M	F
	redbud	T	P	M	F-P
	spicebush	S	P	M-W	A
	tullp poplar	T	ES	M	F-P
	Virginia pine	T	P	D-M	F
	shingle oak	T	ES-C	D-M	P-5
Chestnut Oak-Post Oak -Blackjack Oak					
	red maple	T	P-ES	M-W	P-S
	black gum	T	ES	M-W	F
	white oak	T	C	D-M	A
	sassafras	T	P	D-M	F-P
	greenbriers	V	P-ES	D-M-W	A
	American holly	T	C	M-W	A
	Virginia pine	T	P	D-M	F
	black oak	T	C	D-M	F-P
	beech	T	C	M	A
	early low blueberry	S	P	D	F-P
	flowering dogwood	T	C	M	A
	sweet gum	T	P	M-W	F-P

Forest Associations	Associated Species	Form	Seral Stage	Moisture Regime	Sun Exposure
Chestnut Oak-Post Oak -Blackjack Oak					
	scarlet oak	T	ES	D	*F-P*
	mockemut hickory	T	C	D-M	*F*
	Virginia creeper	V	ES-C	M-D	A
	black cherry	T	P-ES	M	*F-P*
	sweet pignut hickory	T	ES-C	D-M	P-S
	dwarf huckleberry	S	ES	M	A
	mountain laurel	S	C	D-W	P-S
	southern arrowwood	S	P	M-W	*F-P*
	tall deerberry	S	P	D	F-P
	chestnut oak	T	C	D-M	F-P
	post oak	T	ES	D-M	F
	blackjack oak	T	ES-C	D	A
Bald Cypress					
	red maple	T	P-ES	M-W	P-S
	sweet gum	T	P	M-W	F-P
	green ash	T	P-ES	M-W	F
	greenbriers	V	P-ES	D-M-W	A
	coast pepperbush	S	P	M-W	F
	poison Ivy	V	P-ES	D-M	P-S
	Virginia creeper	V	ES-C	M-D	A
	black gum	T	ES	M-W	F
	southern arrowwood	S	P	M-W	F-P
	American holly	T	C	M-W	A
	common winterberry holly	S	P	M-W	A
	flowering dogwood	T	C	M	A
	grape	V	P-ES	D-M-W	S
	sweetbay magnolia	T	ES	M-W	F
	common highbush blueberry	S	*S*	*P*	*F-P*
	elderberry	S	P	M	A
	rose	S	P	D-M	F
	spicebush	S	P	M-W	A
	wax myrtle	S	P-ES	M-W	A
	bald cypress	T	ES-C	W	A

Forest Associations	Associated Species	Form	Seral State	Moisture Regime	Sun Exposure
River Birch Sycamore					
	red maple	T	P-ES	M-W	P-S
	poison ivy	V	P-ES	D-M	P-S
	Virginia creeper	V	ES-C	M-D	A
	greenbriers	V	P-ES	D-M-W	A
	sweet gum	T	P	M-W	F-P
	southern arrowwood	S	P	M-W	F-P
	tulip poplar	T	ES	M	F-P
	spicebush	S	P	M-W	A
	black gum	T	ES	M-W	F
	grape	V	P-ES	D-M-V	S
	Ironwood	T	P	M	A
	American holly	T	C	M-W	A
	flowering dogwood	T	C	M	A
	black cherry	T	P-ES	M	F-P
	green ash	T	P-ES	M-W	F
	white oak	T	C	D-M	A
	brambles	V	P-ES	D-M	F-P
	elderberry	S	P	M	A
	slippery elm	T	ES	M-W	F
	sassafras	T	P	D-M	F-P
	sycamore	T	P-C	M-W	F-P
	river birch	T	ES-C	M-W	F-P
Basket Oak Loblolly Pine					
	red maple	T	P-ES	M-W	P-S
	sweet gum	T	P	M-W	F-P
	American holly	T	C	M-W	A
	black gum	T	ES	M-W	F
	greenbriers	V	P-ES	D-M-W	A
	white oak	T	C	D-M	A
	coast pepperbush	S	P	M-W	F
	common highbush blueberry	S	S	P	F-P
	willow oak	T	ES	M-W	F
	beech	T	C	M	A
	sassafras	T	P	D-M	F-P

Forest Associations	Associated Species	Form	Seral Stage	Moisture Regime	Sun Exposure
Basket Oak Loblolly Pine (cont.)					
	black oak	T	C	D-M	F-P
	southern arrowwood	S	P	M-W	F-P
	scarlet oak	T	ES	D	F-P
	black highbush blueberry	S	P	M	F-P
	poison Ivy	V	P-ES	D-M	P-S
	sweetbay magnolia	T	ES	M-W	F
	Virginia creeper	V	ES-C	M-D	A
	basket oak	T	ES-C	M	A
	loblolly pine	T	P-ES	D-W	F
Basket Oak					
	sweet gum	T	P	M-W	F-P
	black gum	T	ES	M-W	F
	white oak	T	C	D-M	A
	greenbriers	V	P-ES	D-M-V	A
	red maple	T	P-ES	M-W	P-S
	sassafras	T	P	D-M	F-P
	willow oak	T	ES	M-W	F
	southern arrow wood	S	P	M-W	F-P
	tulip poplar	T	ES	M	F-P
	American holly	T	C	M-W	A
	black oak	T	C	D-M	F-P
	serviceberries	S	P	W-M	A
	black highbush blueberry	S	P	M	F-P
	Virginia creeper	V	ES-C	M-D	A
	coast pepperbush	S	P	M-W	F
	common highbush blueberry	S	P	M	F-P
	flowering dogwood	T	C	M	A
	red cedar	T	P	D-M	F-P
	scarlet oak	T	ES	D	F-P
	Virginia pine	T	P	D-M	F
	black cherry	T	P-ES	M	F-P
	grape	V	P-ES	D-M-W	S
	basket oak	T	ES-C	M	A

Forest AssociationsSpecies	Associated Form	Stage	Seral Regime	Moisture Exposure	Sun
Willow Oak-Loblolly Pine					
	red maple	T	P-ES	M-W	P-S
	sweet gum	T	P	M-W	F-P
	black gum	T	ES	M-W	F
	American holly	T	C	M-W	A
	greenbriers	V	P-ES	D-M-V	A
	white oak	T	C	D-M	A
	Virginia creeper	V	ES-C	M-D	A
	sassafras	T	P	D-M	F-P
	poison ivy	V	P-ES	D-M	A
	common highbush blueberry	S	P	M	F-P
	flowering dogwood		T	C	M A
	black oak	T	C	D-M	F-P
	dwarf huckleberry	S	ES	M	A
	tulip poplar	T	ES	M	F-P
	coast pepperbush		S	P	M-W F
	black cherry	T	P-ES	M	F-P
	Virginia pine	T	P	D-M	F
	grape	V	P-ES	D-M-W	S
	beech	T	C	M	A
	scarlet oak	T	ES	D	F-P
	southern arrowwood		S	P	M-WF-P
	mockernut hickory		T	C	D-M F
	loblolly pine	T	P-ES	D-W	F
	willow oak	T	ES	M-W	F
Loblolly Pine					
	wax myrtle	S	P-ES	M-W	A
	loblolly pine	T	P-ES	D-W	F

Plant Species Listed Alphabetically by Common Name

Associated Species	Scientific Name
American Chestnut	*Castanea dentata*
American Holly	*Ilex opaca*
Bald Cypress	*Taxodium distichum*
Basket Oak	*Quercus Michauxii*
Basswood	*Mid americana*
Bear Oak	*Quercus ilcifolia*
Beech	*Fagus grondifolia,*
Black Birch	*Betula lenta*
Black Cherry	*Prunus serotina*
Black Gum	*Nyssa sylvatica*
Black Highbush Blueberry	*Vaccinium atrococcum*
Blackjack Oak	*Quercus marilandica*
Black Locust	*Robinia Pseudo Accia*
Black Oak	*Quercus velutina*
Box Elder	*Acer Negundo*
Brambles	*Rubus spp.*
Chestnut Oak	*Quercus Prinus*
Choke Cherry	*Prunus virginiana*
Coast Pepperbush	*Clethra alnifolia*
Common Highbush Blueberry	*Vaccinium corymbosum*
Common Winterberry Holly	Ilex *verticillata*
Coast Pepperbush	*Clethra alnifolia*
Dwarf Juniper	*Juniperus communis*
Dwarf Huckleberry	*Gaylussacia dumosa*
Early Low Blueberry	*Vaccinium vacillans*
Elderberry	*Sambucus canadensis*
Grape	*VMS sp.*
Greenbrier	*Simlax SP.*
Flowering Dogwood	*Cornus florida*
Hawthorn	*Crataegus sp.*
Hemlock	*Tsuga canadensis*
Hop Hornbeam	*Ostrya virginiana*
Ironwood	*Carpinus carolliniana*
Loblolly Pine	*Pinus Taeda*
Mapleleaf Viburnum	*Viburnum acerifolium*
Mockernut Hickory	*Carya tomentosa*
Mountain Laurel	*Kalmia latifolia*
Nannyberry	*Viburnum Lentago*
Northern Red Oak	*Quercus rubra*

Plant Species Listed Alphabetically by Common Name

Associated Species	Scientific Name
Pignut Hickory	*Carya glabra*
Poison Ivy	*Rhus radicans*
Redbud	*Cercls canadensis*
Red Cedar	*Juniperus virginlana*
Red Maple	*Acer rubrum*
Red Spruce	*Picea rubens*
River Birch	*Betula nigra*
Rose	*Rosa sp.*
Sassasfras	*Sassafras albidum*
Scarlet Oak	*Quercus coccInea*
Serviceberries	*Amelanchier spp.*
Shagbark Hickory	*Carya ovata*
Shingle Oak	*Quercus Imbricaria*
Southern Arrowwood	*Viburnum dentatum*
Spicebush	*Lindera Benzoin*
Silver Maple	*Acer saccharinum*
Slippery Elm	*Ulmus rubra*
Striped Maple	*Acer pennsylvanicum*
Sugar Maple	*Acer saccharum*
Sweetbay Magnolia	*Magnolia virginlana*
Sweet Gum	*Liquidambar Styraciflua*
Sweet Pignut Hickory	*Carya ovalis*
Sycamore	*Platanus occldentalis*
Tall Deerberry	*Vaccinium stamineum*
Tamarack	*Larix sp.*
Tulip Popular	*Liriodendron Tulipifera*
Virginia Creeper	*Parthenocissus quinquefolia*
Virginia Pine	*Pinus virginiana*
Wax Myrtle	*Myrica cerifera*
White Ash	*Fraxinus americana*
White Oak	*Quercus alba*
White Pine	*Pinus strobus*
Willow Oak	*Quercus Phellos*
Witch Hazel	*Hamamelis virginiana*

Appendix H

Exotic and Invasive Species

Invasive/Exotic Plants

Exotic plants are those plant species not native to the area in which they are found growing. Exotic plants are either foreign to the United States as a whole or are native in parts of the United States but are now distributed outside of their natural realm because of transport by man or through the breakdown of natural barriers to dispersal.

Most exotic plants do not pose a serious threat to existing natural vegetation. Invasive exotics are considered pests however because of their ability to change the structure and make-up of natural communities as well as their propensity to displace native species. Invasive exotics lack the predators, competitors, diseases and parasites that would control their populations in their natural environment. The presence of such plants indicates site disturbance at some time and can indicate the ability to degrade the existing natural community of plants and trees. Many exotics have the ability to retard healthy forest growth, as they are often able to grow in low light conditions and are easily established and readily dispersed.

Exotic or Invasive Plants

These species may displace native vegetation and disrupt forest ecosystems

HERBACEOUS PLANTS

Common Name	Scientific Name	Common Name	Scientific Name
Garlic Mustard[1]	Alliara officinalis[1]	Day-lily	Hemerocallis fulva
a grass	Arthraxon hispidus	Purple Loosestrife	Lythrum Alatum
Musk (nodding) thistle	Carduus nutans	Moneywort	Lysimachia nummularia
Plumeless thistle	Carduus acanthoides		Myoston aquaticum
Spotted knapweed	Centuria maculosa	Wild Reed	Phragmites australis
Bull thistle	Cirium vulgare	Japanese Knotweed[1]	Polygonum[1]
Canada thistle	Cirsium arvense	Asian tearthumb	Polygonum perfoliatum
Crown vetch[2]	Coronilla varia[2]	Russian thistle	Salsola iberica
Beefsteak Mint	Eulalia vimineus	Johnson grass	Sorgum halepense
Tall Fescue, K31 Fescue[2]	Festuca elatior (F. arundinacea[2])	Cocklebur	Xanthium spp.
a grass[1]	Microstegium vimineum[1] (Eulalia viminea)	Sericea Lespedeza[2]	Lespedeza cuneata[2]
Common Reed[1]	Phragmites australis [1] (P. communis)		
Lesser Celandine[1]	Ranunculus ficaria[1]		
Mile-a-minute Vine[1], Devil's Tearthumb[1]	Polygonum perfoliatum[1]		

VINES

Porcelain Berry[1]	Ampeleopsis brevipendunculata[1]
Oriental Bittersweet[1]	Celastrus orbiculatus
Climbing Eyonymus, Wintercreeper	Eunymus fortunei
English Ivy[2]	Hedera helix[2]
Japanese Honeysuckle[1]	Lonicera japonica[1]
Kudzu[2]	Pueraria lobata[2]
Periwinkle	Vinca minor
Wisteria[2]	Wisteria floribunda, W. sinensis[2]
Cinnamon Vine[1]	Dioscorea batatas[1]

SHRUBS

Japanese Barberry	Berberis thunbergii	Common [illegible]rn	Rhamnus Cathartica
Russian Olive	Eleagnus angustifolium	Eur[illegible]thorn	Rhamnus frangula
Autumn Olive	Eleagnus umbellate	[illegible]Rose[1]	Rosa multiflora[1]
Winged Euonymus,	Euonymus alatus[1]	[illegible]ry-raspberry	Rubus illecebrosus
Winged Wahoo[1]		[illegible]onberry	
Privet	Ligustrum sp.	[illegible]meberry	Rubus phoenicolasius
Bush Honeysuckles,[1]			
Including:	Lonicera sp.	Japanese Spiraea[1]	Spiraea japonica[1]
Belle Honeysuckle	Lonicera x bella	Coralberry	Symphoricarpos orbiculatus
Amur Honeysuckle	Lonicera maackii		
Morrow's Honeysuckle	Lonicera morrowii		
Tartarian Honeysuckle	Lonicera tatarica		
Bamboo-running varieites[2]	Phyllostachys spp., Pseudosasa japonica[2]		

TREES

Norway Maple[1]	Acer platanoides[1]
Tree of Heaven	Ailanthus altissima
Catalpa	catalpa sp.
Russain Olive	Eleagnus angustifolia
White Mulberry	Morus alba
Empress Tree	Aulownia tomentosa
White Spruce	Picea glauca
Sweet Cherry, Bird Cherry	Prunus avium

[1]The most serious threats to natural forests because they are both damaging and strongly invasive.

[2] Not as readily established, but once established, very persistent and damaging.

(This ranking is from the Maryland Natural Heritage Program (July 21, 1994).)

Information partially taken from the State Forest Conservation manual Appendix E: invasive Plants That Threaten or Degrade Forest In Maryland, 2nd Edition, July 1995.

Appendix I

Forest Borders for Wildlife

Forest Borders for Wildlife

A border established along the edge of a forest will create a more diverse habitat for wildlife. Many wildlife species thrive in the edge, or zone, where two different habitat types join. A forest border can provide two edges, one between the open area and the border, and the other between the border and the forest.

Naturally occurring forest edges contain a variety of small trees, shrubs and herbaceous vegetation that require full sunlight to grow. This diversity of plants offers wildlife many sources of food and shelter. A human-created edge can be as effective as a naturally occurring edge in creating wildlife habitat and protecting the trees in the forest. There are two methods which can be used to create an edge.

1. Forest border plantings to create an edge.
2. Selective cutting to thin the forest and allow the understory to develop.

The planted border should be at least 25 feet wide and should provide a gradual change from the open area to the forest. Small trees should be planted adjacent to the forest. Then shrubs should be planted next to the small trees. Finally, herbaceous vegetation should be planted next to the shrubs. This border will soften the forest edge and make it more attractive for wildlife.

Many species of trees, shrubs and vines can be used. Flowering dogwood, crabapple, serviceberry, American holly and apple trees are some small trees well adapted for use in borders. Trees should be planted 10 to 12 feet away from the forest edge. Blackberry, viburnums, blueberry, sumac, elderberry and bayberry are some of the shrub species that can planted. Shrubs should be planted beyond the planted trees. For vines; grape, Virginia creeper, trumpet vine and morning glory do well. Herbaceous vegetation may include grasses, legumes and wildflowers. Vines and herbaceous vegetation should be planted in the zone between the shrubs and the open area.

Selective cutting can thin the forest and open the tree canopy to allow sunlight to reach the forest floor. This will allow a more diverse layer of vegetation to grow in the forest. As a general rule, trees which produce nuts or berries, such as oak, hickory, cherry, dogwood, holly or walnut, should be retained. The trees within 30 feet of the edge should be thinned. Any dead trees should be felled to reduce to possibility of property damage. Dead trees beyond the 30-foot limit should be left standing.

Vines and shrubs growing naturally in the forest should be left untouched. The branches from trees that are cut can be piled to create nesting and cover areas for the wildlife. As the piles decay, other vegetation will grow and provide the necessary shelter. The best time to selectively cut to create the border is in the late fall or winter when the trees are dormant.

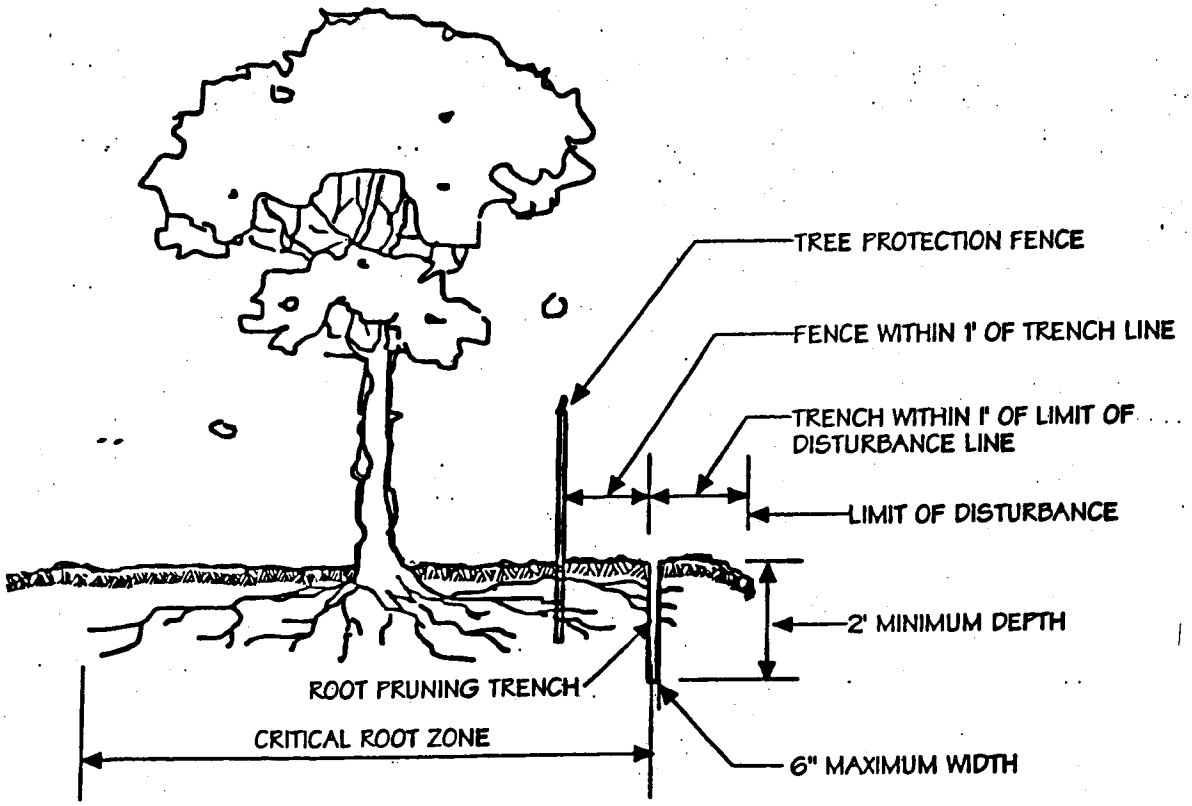
The border will require periodic maintenance. In planted borders, the shrub and herbaceous vegetation must be mowed every 2 to 4 years in mid-July to reduce density and prevent larger trees from taking over. In selectively cut areas, thinnings may be required every 10 years to maintain an open canopy.

On development sites where some of the forests are being cleared and some retained, borders would be a valuable asset to the community and to the wildlife. Creating borders can count toward the afforestation mitigation. A forest management plan will be requires if selective cutting is the chosen method. Planted borders would require a landscaping plan.

Appendix J

Forest Protection Specifications

Figure J-1



Notes:
1. Retention Areas to be established as part of the forest conservation plan review process.
2. Boundaries of Retention Areas to be staked, flagged and/or fenced prior to trenching.
3. Exact location of trench should be identified.
4. Trench should be immediately backfilled with soil removed or organic soil.
5. Roots should be cleanly cut using vibratory knife or other acceptable equipment.

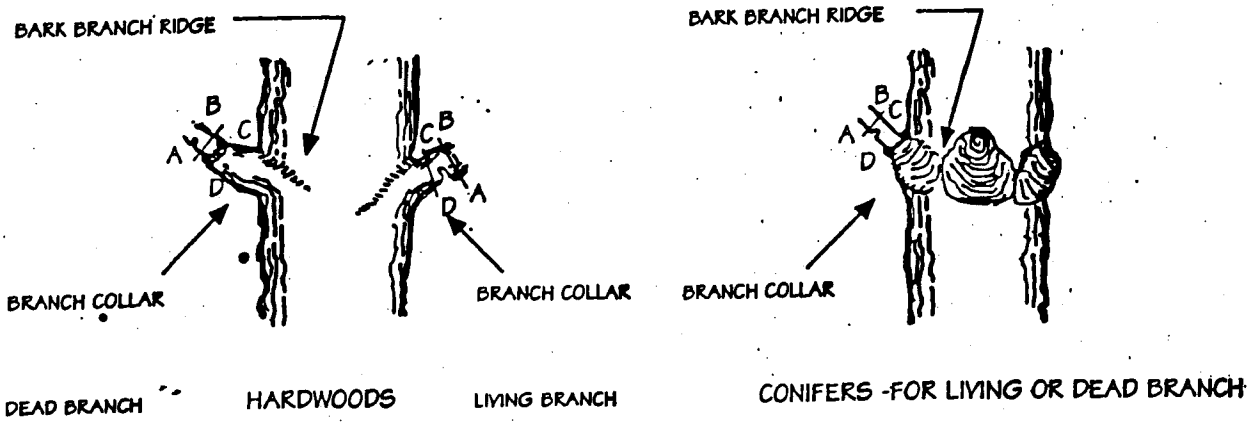
Source: Adapted from Steve Clark & Associates/ACRT, Inc. and Forest Conservation Manual, 1991

Root Pruning

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

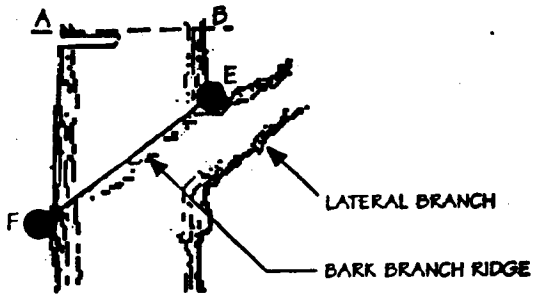
Figure J-2

Pruning a Branch



Notes:
1. Remove branch weight by undercutting at A and remove limb by cutting through at AB.
2. Remove stub at CD (line between branch bark ridge and outer edge of branch collar).
3. If D is difficult to find on hardwoods, angle of CD to trunk should be the reflective angle of the bark branch ridge to the trunk.
4. Only prune at specified times.
5. Remove no more than 30% of crown at one time.

Pruning a Leader to Reduce Size



Notes:
1. Remove top weight by undercutting at A and remove limb by cutting through AB.
2. Remove stub at EF parallel to the bark branch ridge.
3. Only prune at specified times.
4. No more than 30% of crown to be removed at one time.
5. Diameter of lateral branch should be no less than 30% of the diameter of the leader.

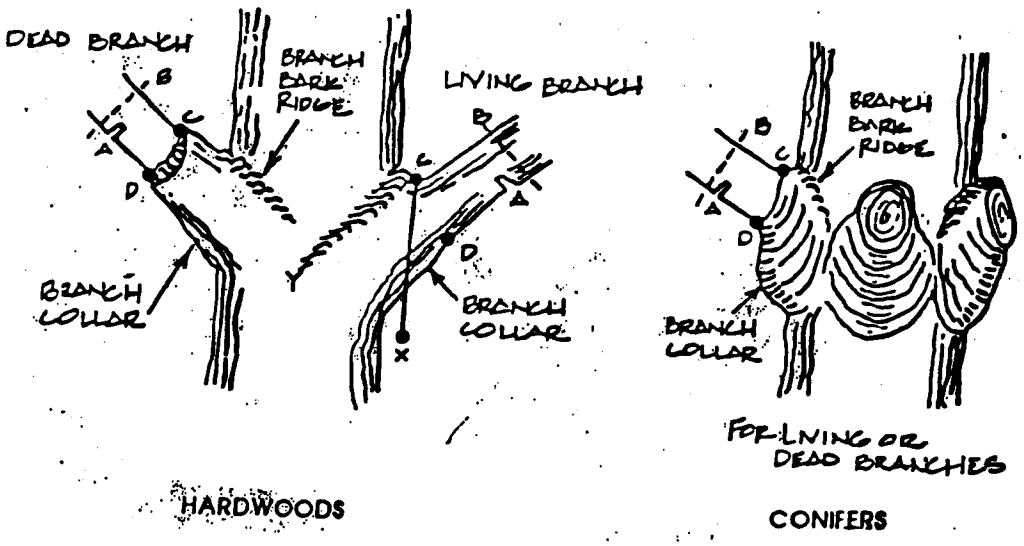
Source: Fairfax County, Virginia:Vegetation Preservation & Planting, January 1986

Tree Pruning

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

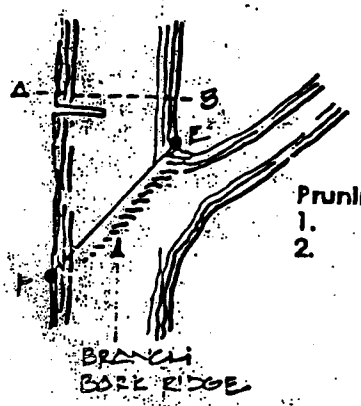
Figure J-3

Crown Reduction



Pruning a Branch

1. Remove branch weight by undercutting at A and remove limb by cutting through at B.
2. Remove stub at CD (line between branch bark ridge and outer edge of branch collar).
3. If D is difficult to find on hardwoods, drop vertical from C (line CX). Angle XCY=XCD.



Pruning a Leader or To Reduce Size

1. Remove top weight by cutting at A&E.
2. Remove stub at EF parallel to the Branch Bark Ridge.

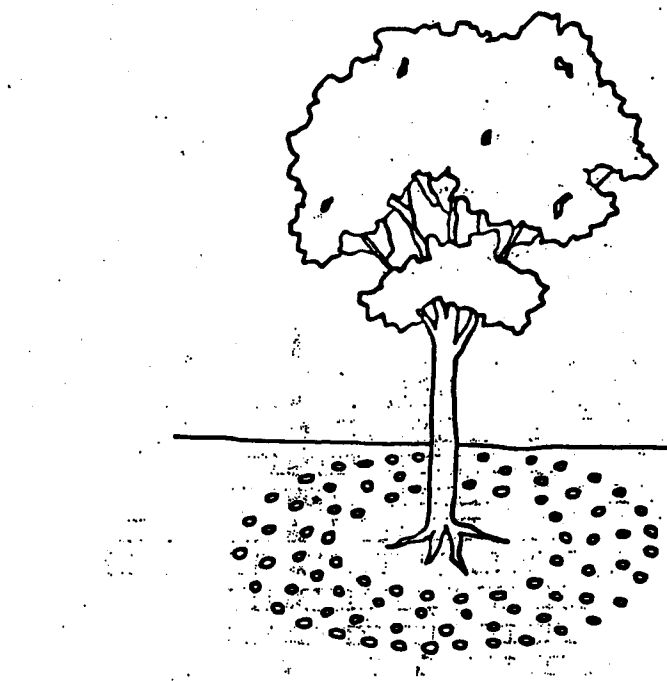
Source: Fairfax County, Virginia
Vegetation Preservation & Planting

Notes:

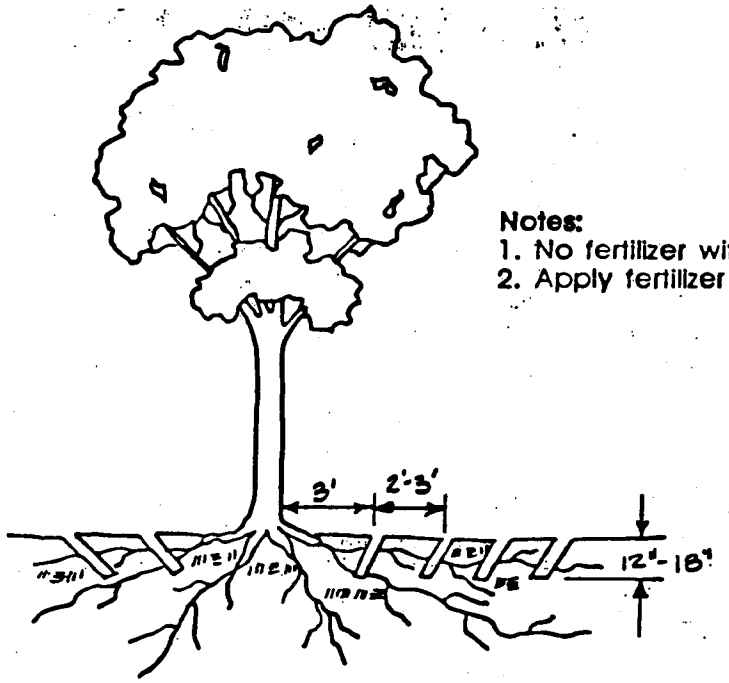
1. Only prune at specified times
2. No more than 30% of crown to be removed at one time.

Figure J-4

Application of Fertilizers by Injection



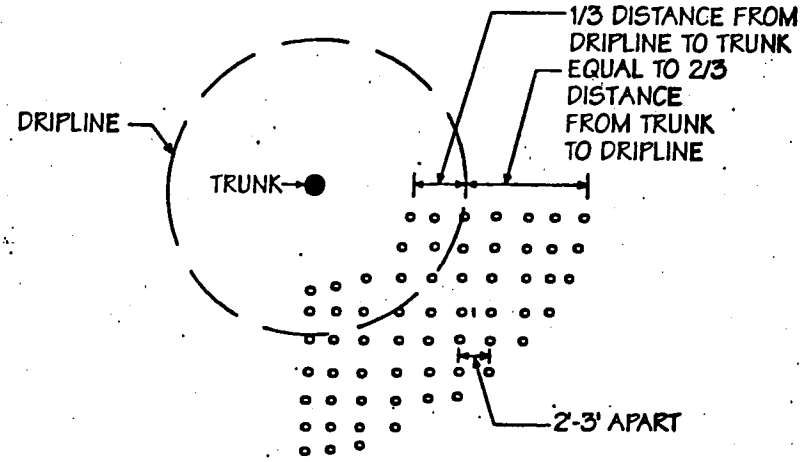
Source: Pirone, 1978



Notes:
1. No fertilizer within 3 feet of trunk
2. Apply fertilizer to entire critical root zone

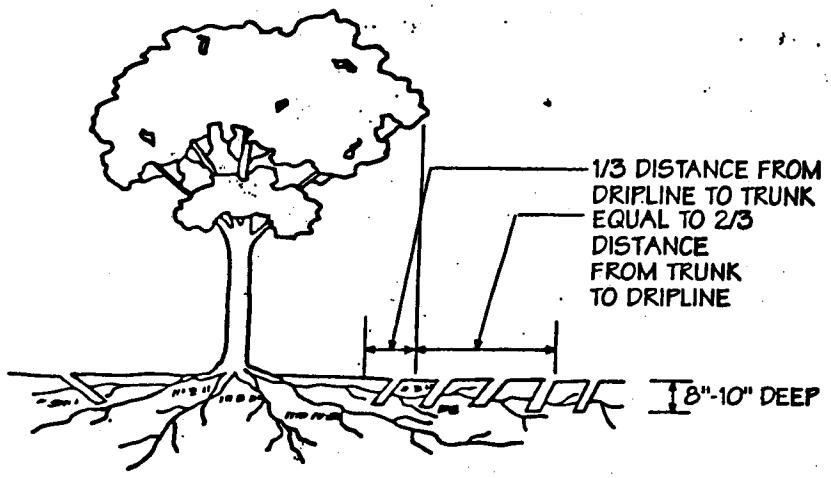
Figure J-5

Vertical Mulching or Fertilizing



Notes:
1. Auger holes 8"-10" deep, 2'-3' apart, 1"-3" wide.
2. Leave soil on ground.
3. Apply fertilizer 1/3 distance in from dripline to trunk.
4. Fertilize with 50/50 compost and pine fines.

Application of Fertilizer by Injection



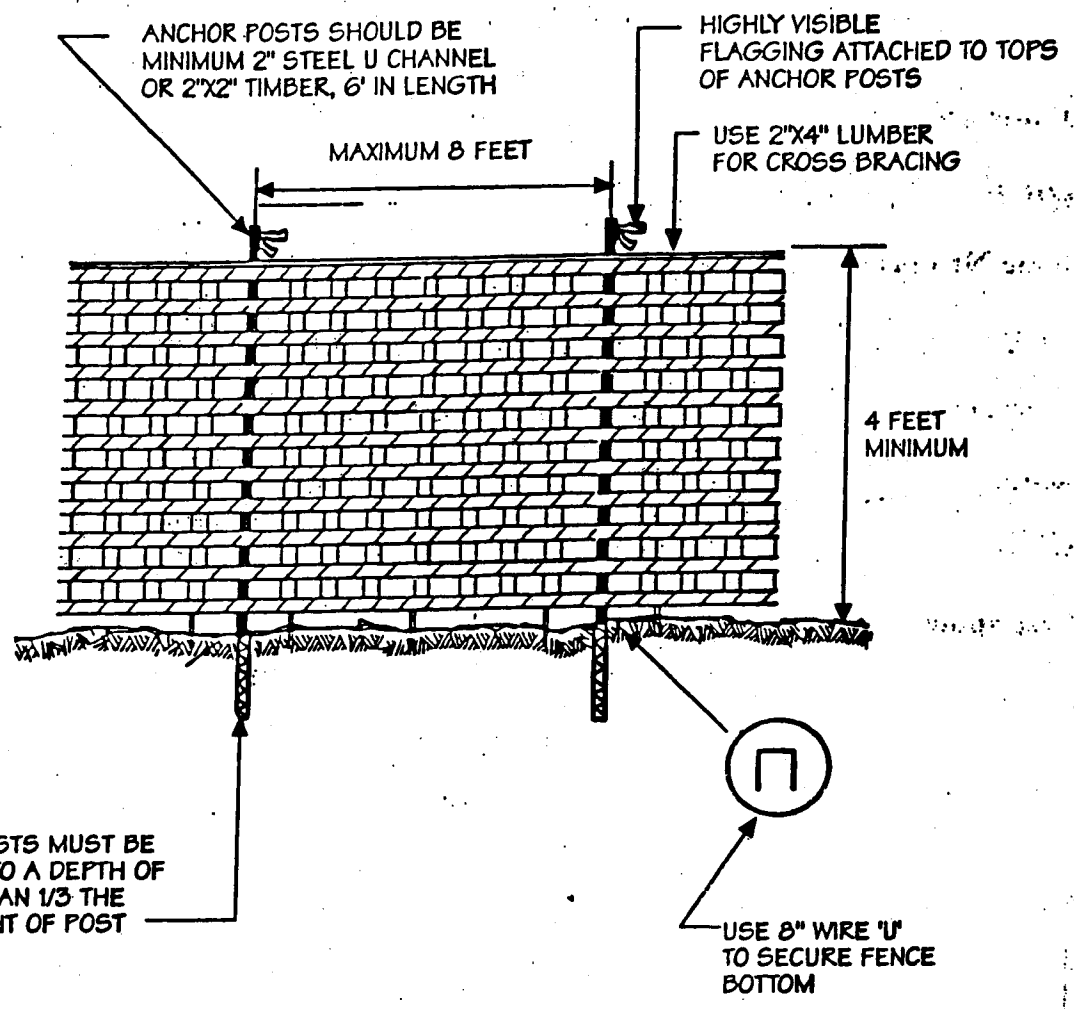
Notes:
1. Injection holes to be 8"-10" deep, 2'-3' apart.
2. Auger holes, do not poke. Leave soil on ground.
3. Apply fertilizer 1/3 distance in from dripline to trunk and extend 2/3 out from dripline.

Source: UMCP

Application of Fertilizers

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

Figure J-6



Notes:

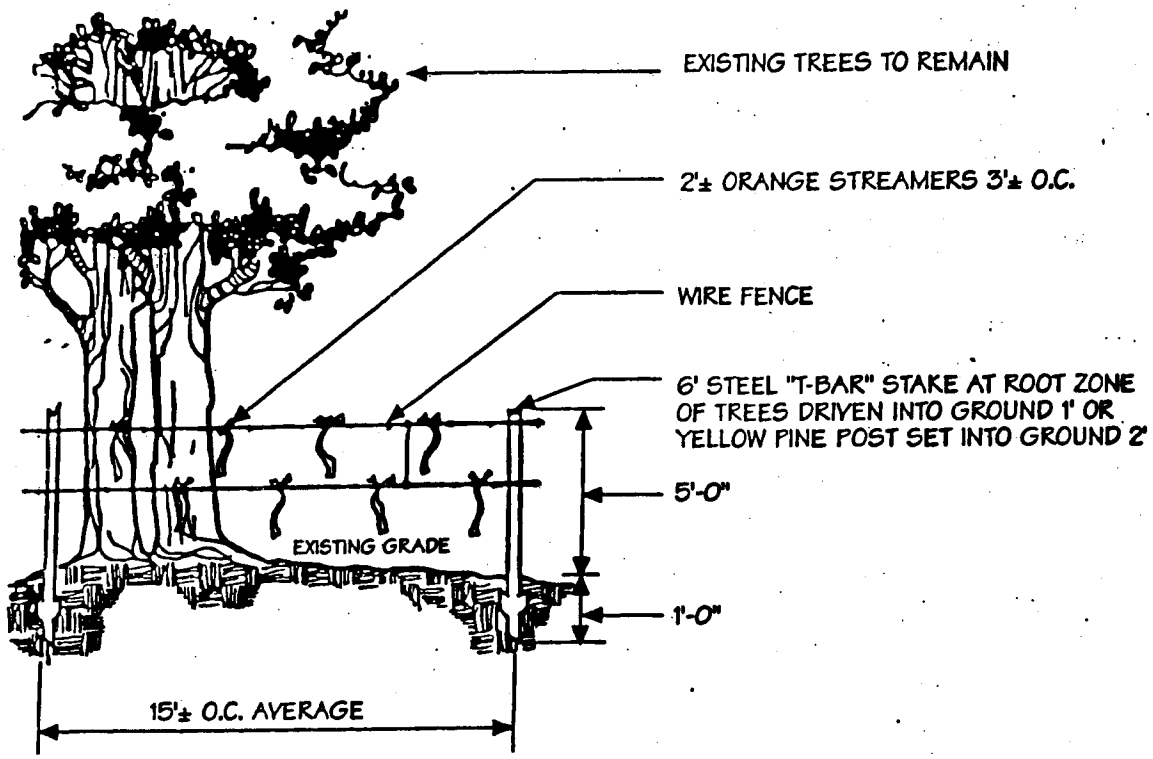
1. Blaze orange or blue plastic mesh fence for forest protection device, only.
2. Boundaries of Retention Area will be established as part of the forest conservation plan review process.
3. Boundaries of Retention Area should be staked and flagged prior to installing device.
4. Avoid damage to critical root zone. Do not damage or sever large roots when installing posts.
5. Protection signs are required, See Figure C-4.
6. Device should be maintained throughout construction.

Source: Adapted from Prince George's County, Maryland: Woodland Conservation Manual and Forest Conservation Manual, 1991

Plastic Mesh Tree Protection Fence

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

Figure J-7



Notes:
1. Wire fence for forest protection device only.
2. Boundaries of Retention Area will be established as part of the forest conservation plan review process.
3. Boundaries of Retention Area should be staked and flagged prior to installing device.
4. Avoid root damage when placing anchor posts.
5. Wire should be securely attached to posts.
6. Device should be properly maintained throughout construction.
7. Protection signs are also required, see Figure C-4.
8. Locate fence outside the Critical Root Zone.

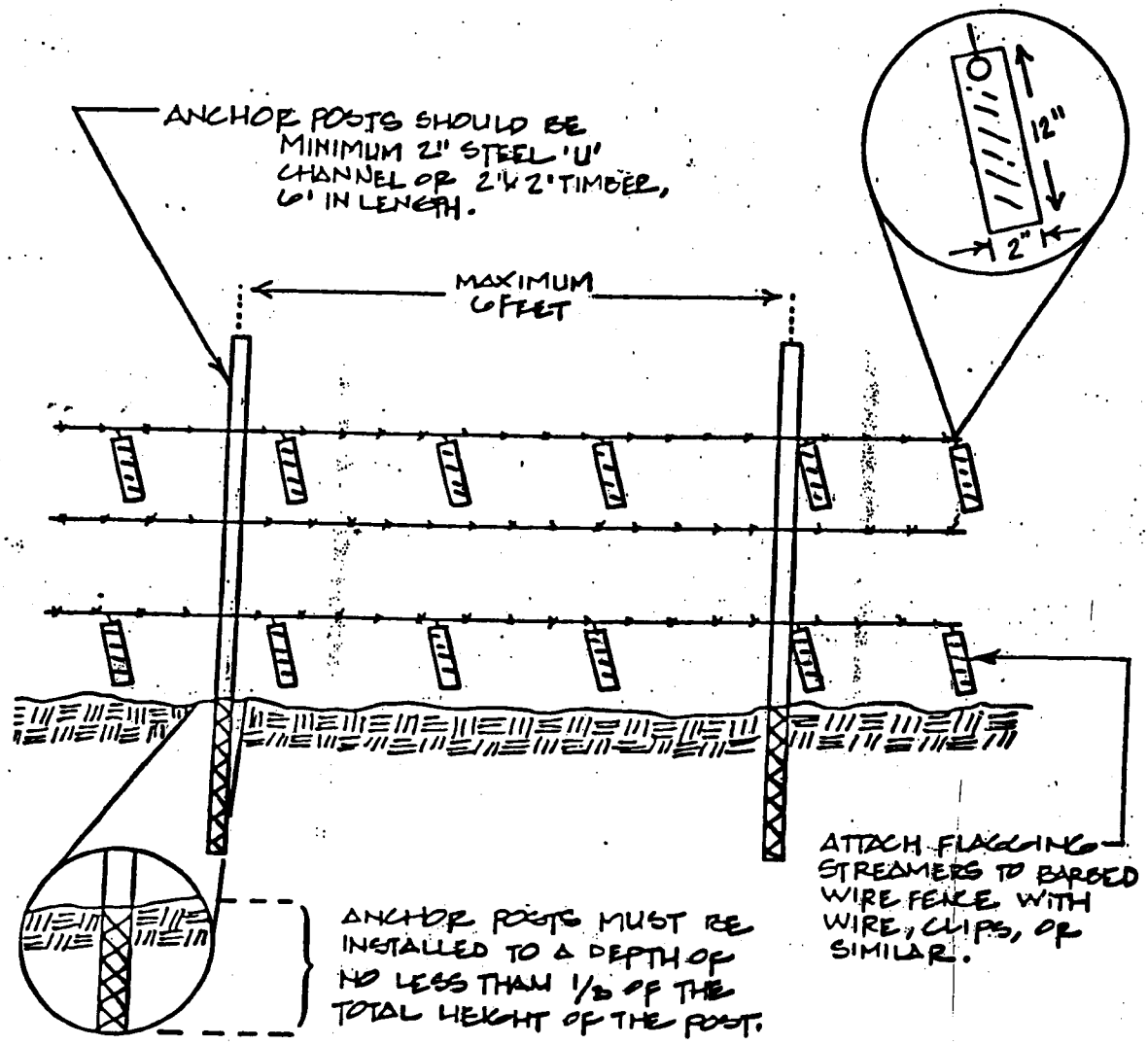
Source: Adapted from Steve Clark & Associates/ACRT, Inc. and Prince George's County, Maryland Woodland Conservation

Wire Tree Protection Fence

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

Figure J-8

Three Strand Barbed Wire

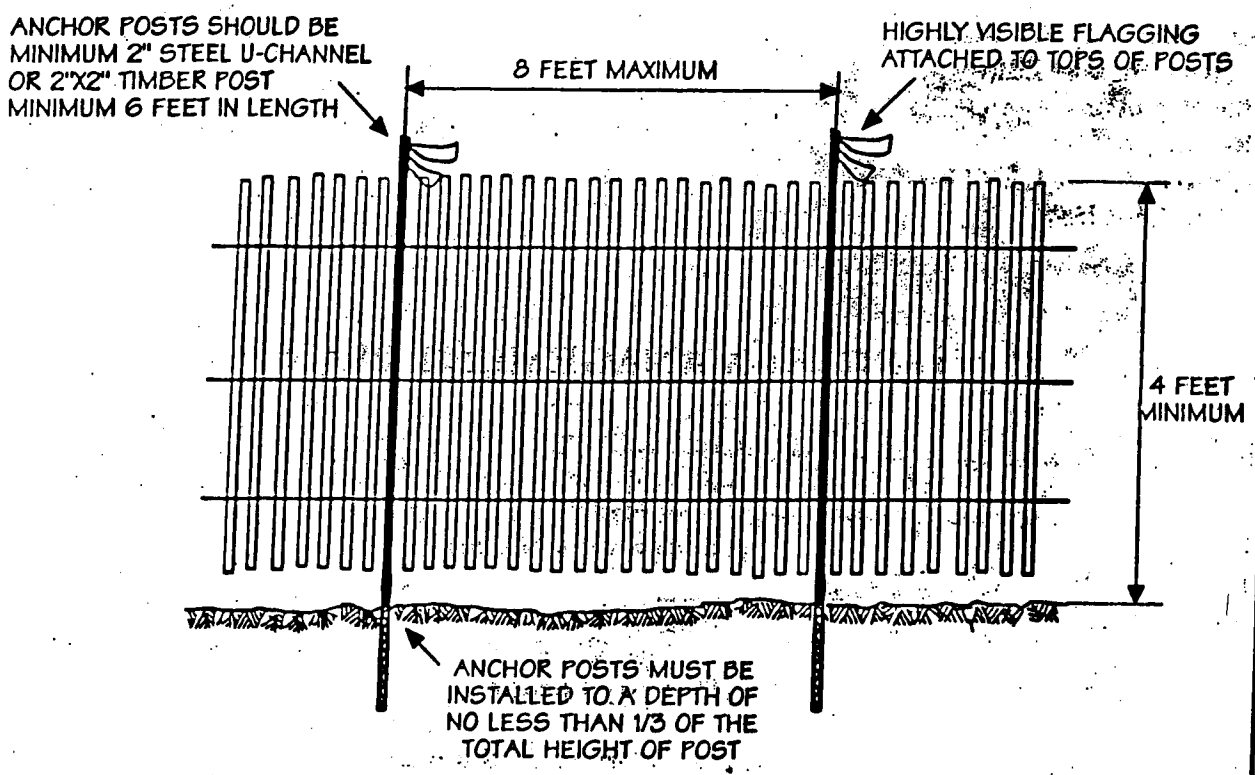


Notes

1. -- Forest protection device only
2. Retention Area will be set as part of the review process.
3. Boundaries of Retention Area should be staked and flagged prior to installing device.
4. Avoid root damage when placing anchor posts.
5. Barbed wire should be securely attached to posts.
6. Device should be properly maintained during construction.
7. Protective signage is also recommended.

Source: Prince George's County, Maryland: Woodland Conservation Manual

Figure J-9



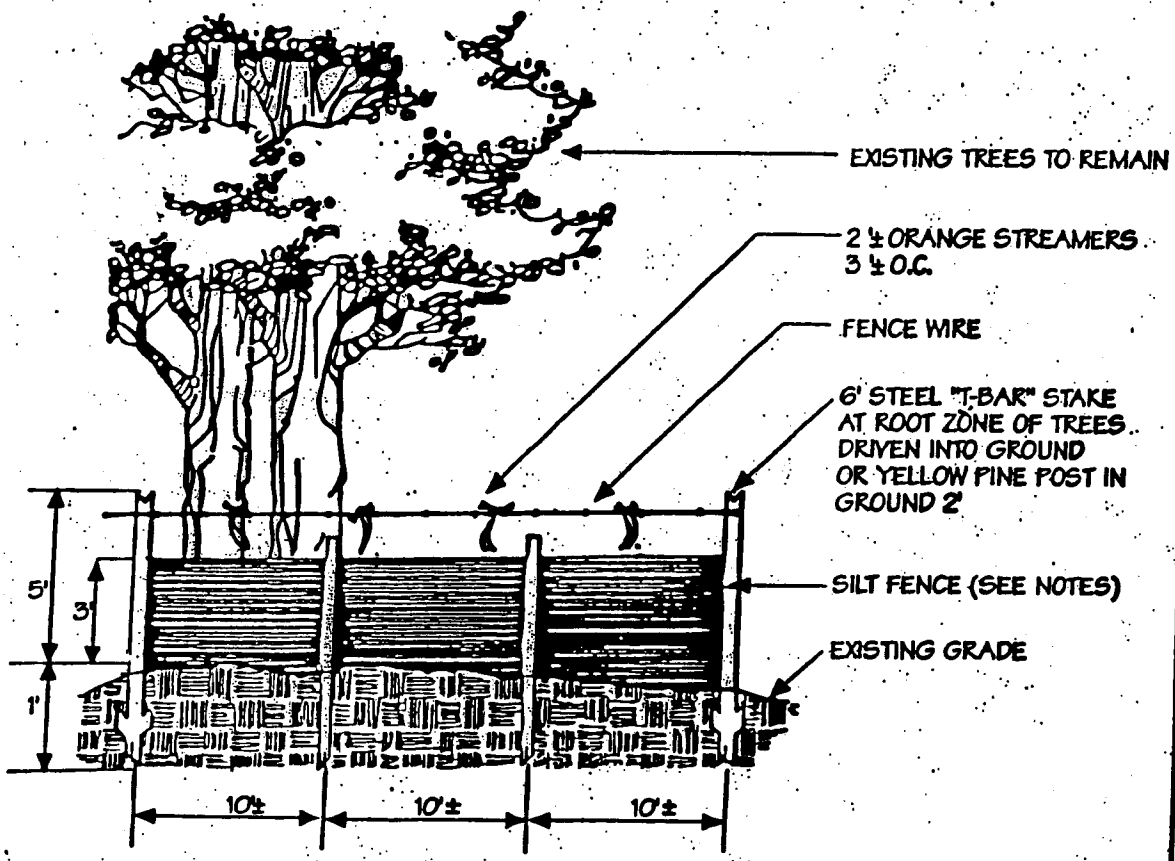
Notes:

1. Snow fence for forest protection device only.
2. Boundaries of Retention Area will be established as part of the forest conservation plan review process.
3. Boundaries of Retention Area should be staked and flagged prior to installing device.
4. Avoid root damage when placing anchor posts.
5. Snow fence should be securely attached to posts.
6. Device should be properly maintained throughout construction.
7. Protection signs are also required, see Figure C-4.
8. Locate fence outside the Critical Root Zone.

Source: Adapted from Prince George's County, Maryland: Woodland Conservation Manual

Snow Fence

Figure J-10



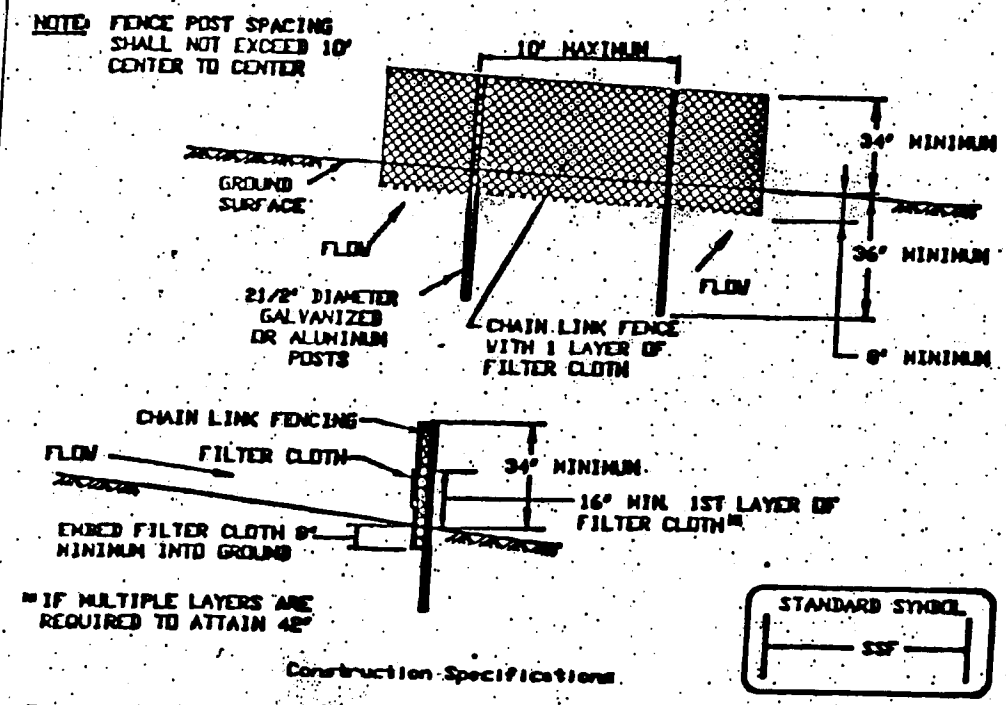
Notes:
1. Silt fence to be heeled into the soil.
2. Wire, snow fence, etc. for tree protection only.
3. Boundaries of Retention Area will be established as part of the forest conservation plan review process.
4. Boundaries of Retention Area should be staked and flagged prior to installing device.
5. Avoid root damage when placing anchor posts.
6. Device should be properly maintained throughout construction.
7. Protection signs are also required, see Figure C-4.
8. Locate fence outside the Critical Root Zone.

Source: Adapted from Steve Clark & Associates/ACRT, Inc.

Silt Fence and Tree Protection

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

- SUPER SILT FENCE



Construction Specifications

1. Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 6' fence shall be used, substituting 42" fabric and 6' length posts.

2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence.

3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.

4. Filter cloth shall be embedded a minimum of 8" into the ground.

5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.

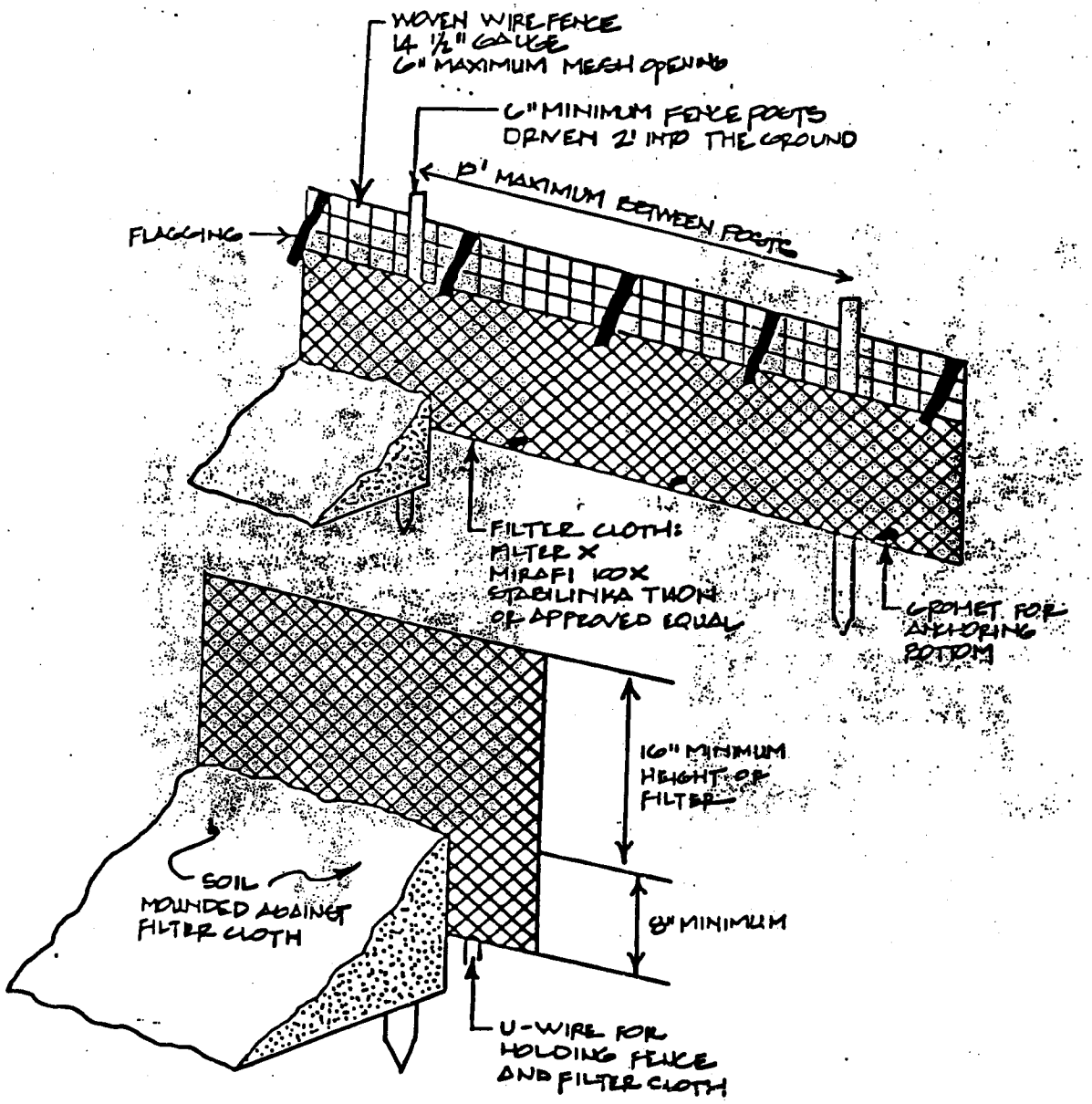
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height.

7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Tests MSMT 509
Tensile Modulus	20 lbs/in (min.)	Tests MSMT 509
Flow Rate	0.3 gal/ft²/minute (max.)	Tests MSMT 322
Filtering Efficiency	75% (min.)	Tests MSMT 322

Figure J-11

Filter Cloth on Wire Mesh



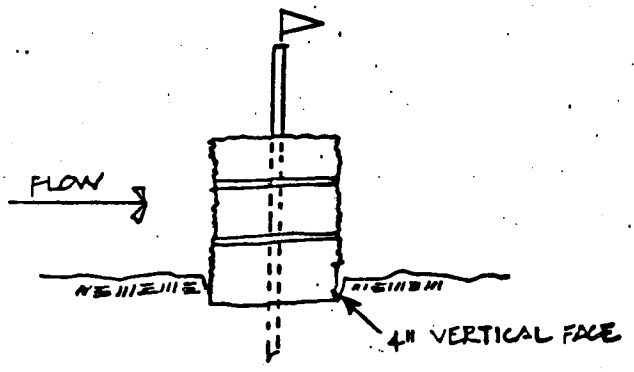
Source: Prince George's County, Maryland: Woodland Conservation Manual

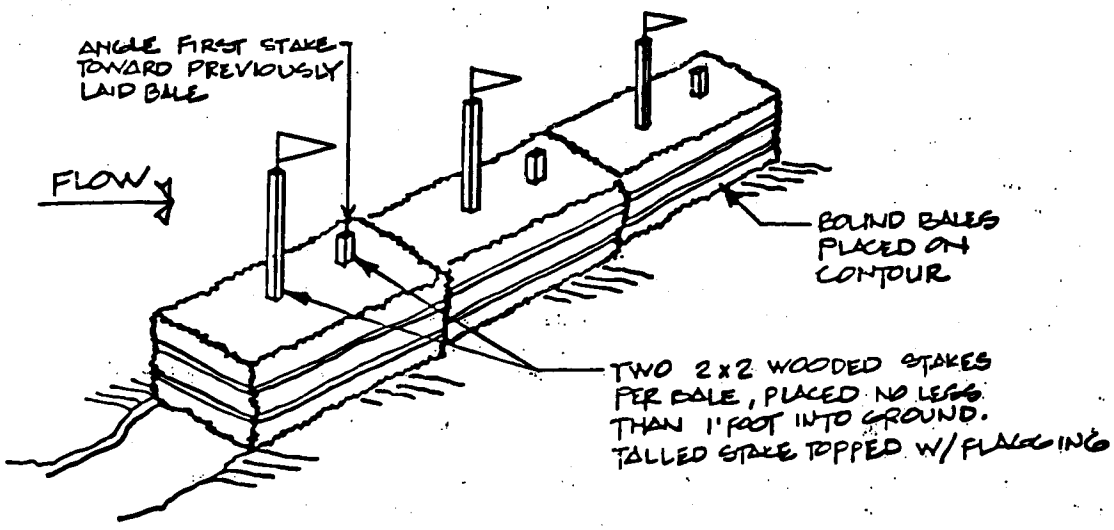
Notes:

1. Combination sediment control and protective device
2. Retention area will be set as part of the review process
3. Boundaries of Retention Area should be staked prior to installing protective device.
4. Root damage should be avoided
5. Mound soil only within the limits of disturbance
6. Protective signage is also recommended
7. All standard maintenance for sediment control devices apply to these details

Figure J-12

Staked Straw Bale Dike



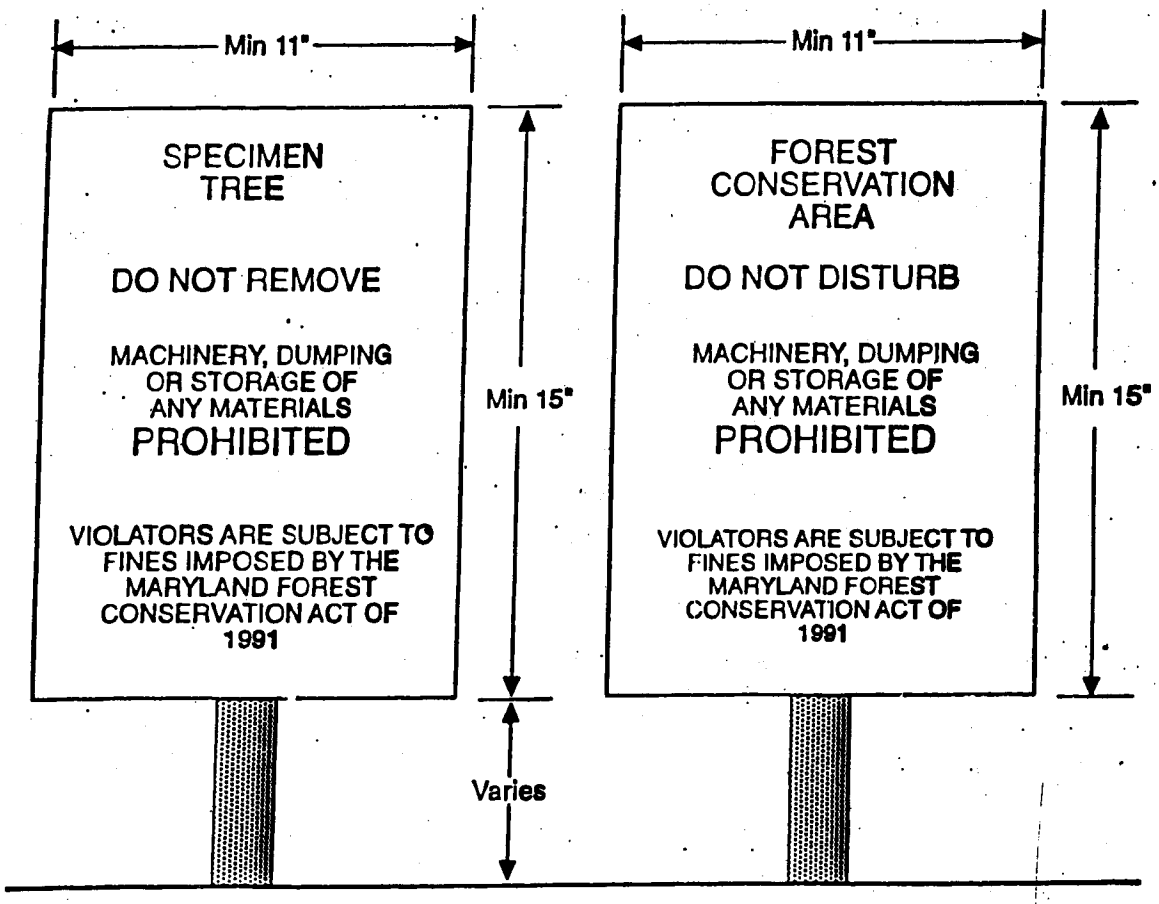


Source: Prince George's County, Maryland: Woodland Conservation Manual

Notes:

1. Combination sediment control and protective device
2. Retention area will be set as part of the review process
3. Boundaries of Retention Area should be staked prior to installing protective device
4. Root damage should be avoided
5. This device should only be placed within the limit of disturbance
6. Protective signage is also recommended
7. All standard maintenance for sediment control devices apply to these details

Figure J-13



Notes:

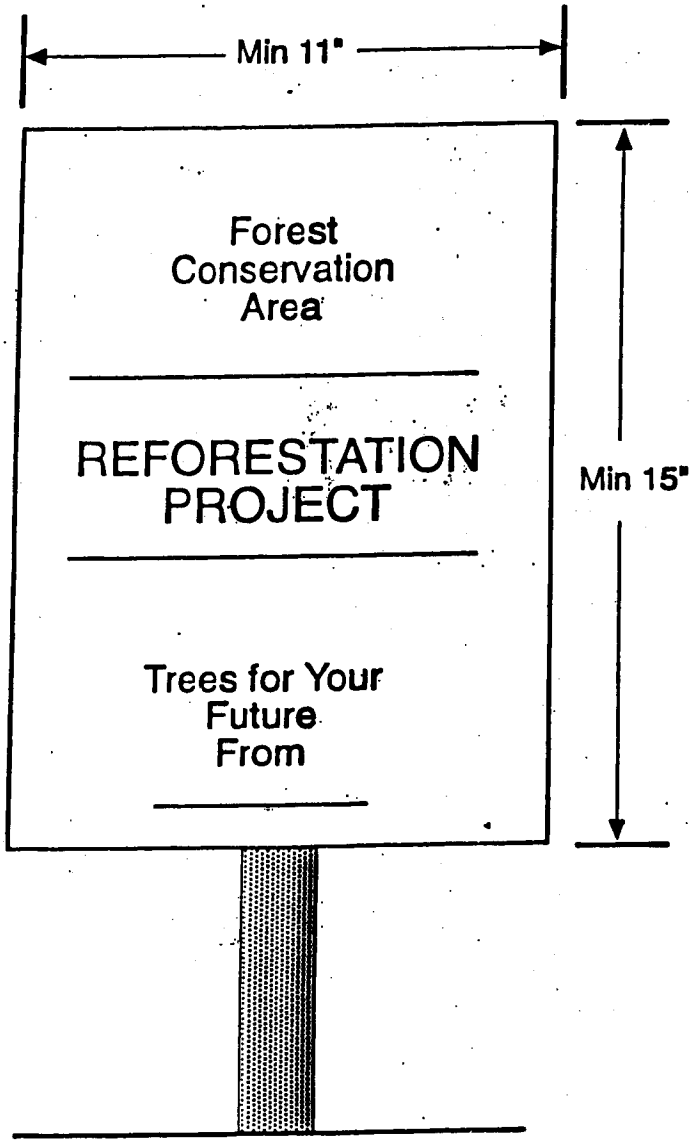
1. Bottom of signs to be higher than top of tree protection fence.
2. Signs to be placed approximately 50' feet apart. Conditions on site affecting visibility may warrant placing signs closer or farther apart.
3. Attachment of signs to trees is prohibited.

Source: Adapted from Forest Conservation Manual, 1991

Construction Signs

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

Figure J-14

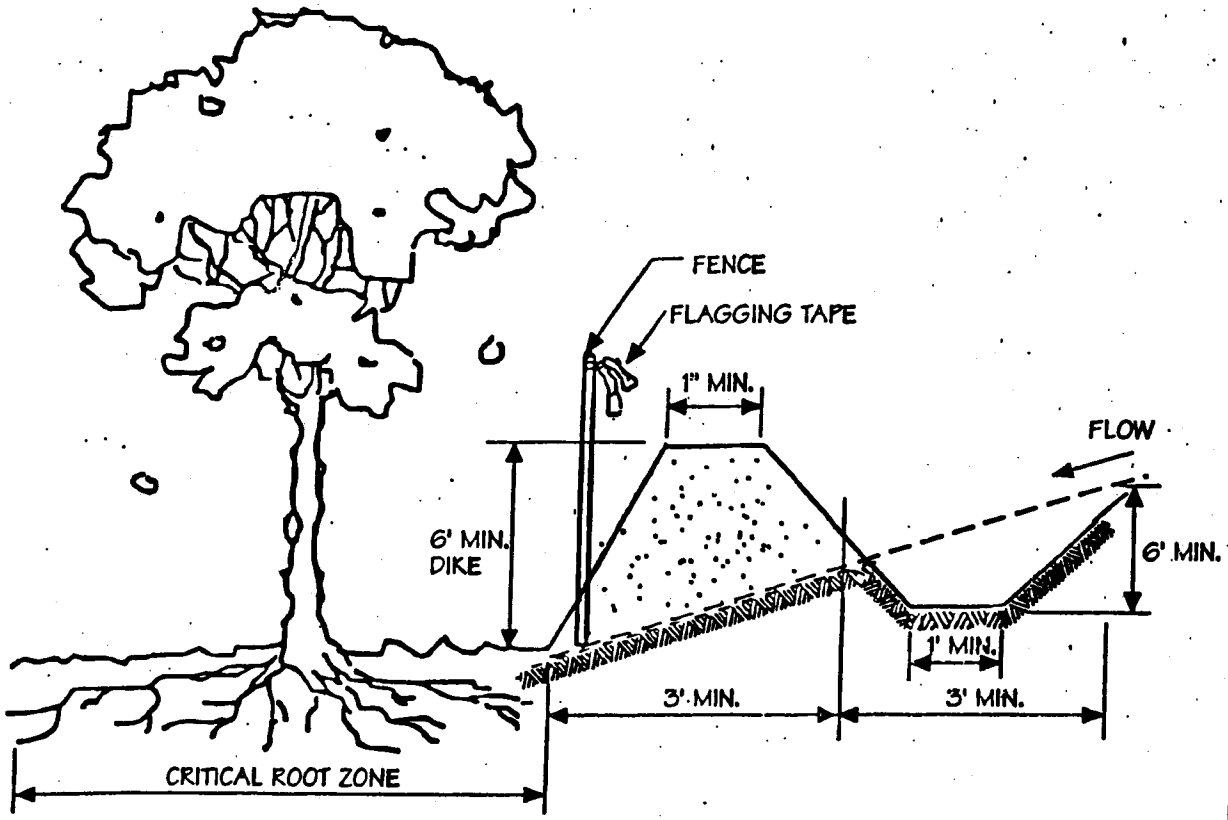


Notes:
1. The signs notify construction workers and future residents of the newly planted material, improving the trees' survival rates.
2. Signs may be adapted by residents for identification of forest retention areas in long term

Source: Adapted from Forest Conservation Manual, 1991

Reforestation and Afforestation Area Signs

Figure J-15



Notes:

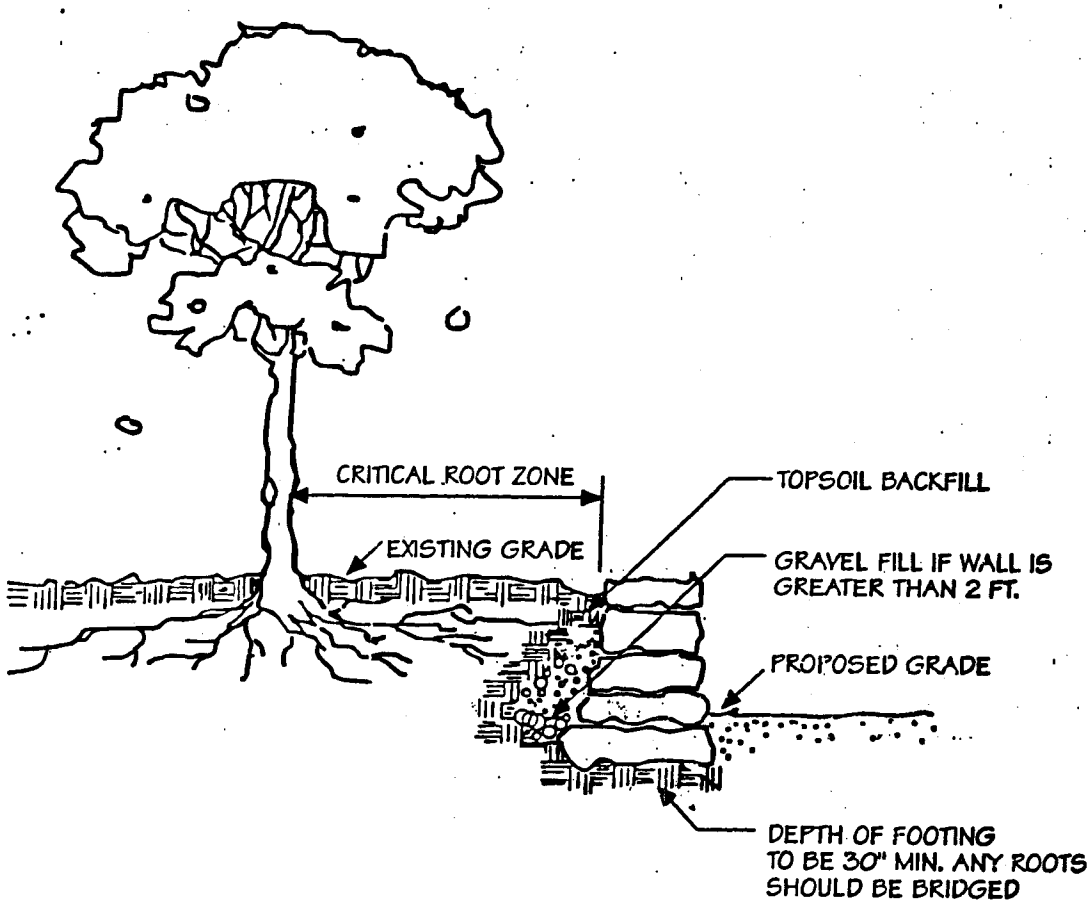
1. Combine sediment control and forest protection device.
2. Boundaries of Retention Area will be established as part of the forest conservation plan review process.
3. Boundaries of Retention Area should be staked prior to installing protection device.
4. Root damage should be avoided.
5. Toe of slope should be outside the Critical Root Zone.
6. Equipment is prohibited within Critical Root Zone of Retention Area; place dike accordingly.
7. All standard maintenance for earth dikes and swales apply to these details.
8. All standard reclamation practices for earth dikes and swales shall apply to these details.

Source: Adapted from Prince George's County, Maryland: Woodland Conservation Manual

Earth Dike and Swale Combination Device

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

Figure J-16



Notes:
1. Wall should be constructed outside the Critical Root Zone.
2. Use extreme care to protect existing roots while constructing retaining wall, including anchoring system, if required.
3. If tree roots must be disturbed, prune roots per Figure C-1.

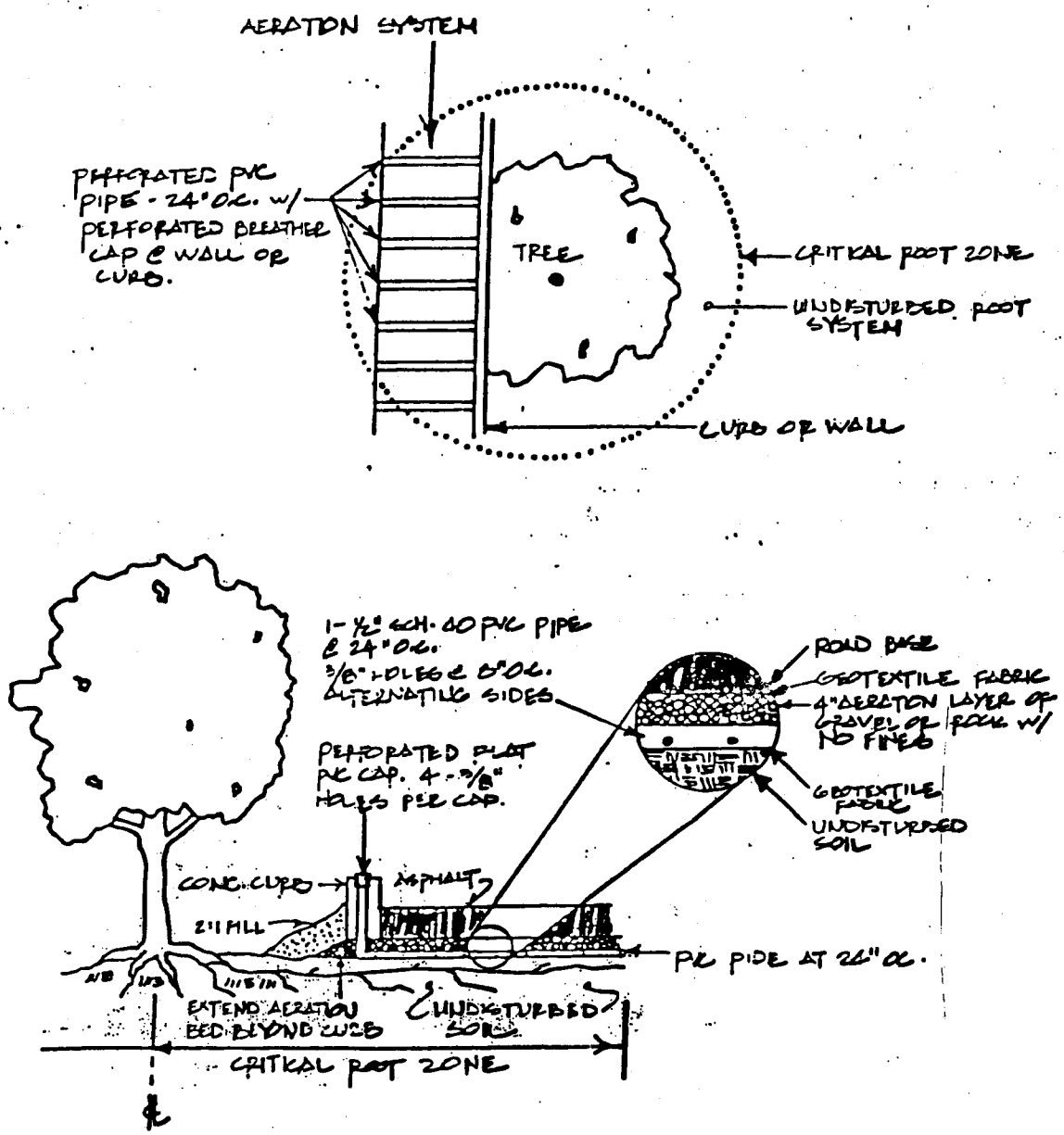
Source: Adapted from Fairfax County, Virginia: Vegetation Preservation & Planting, January 1986

Retaining Walls

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

Figure J-17

Aeration System



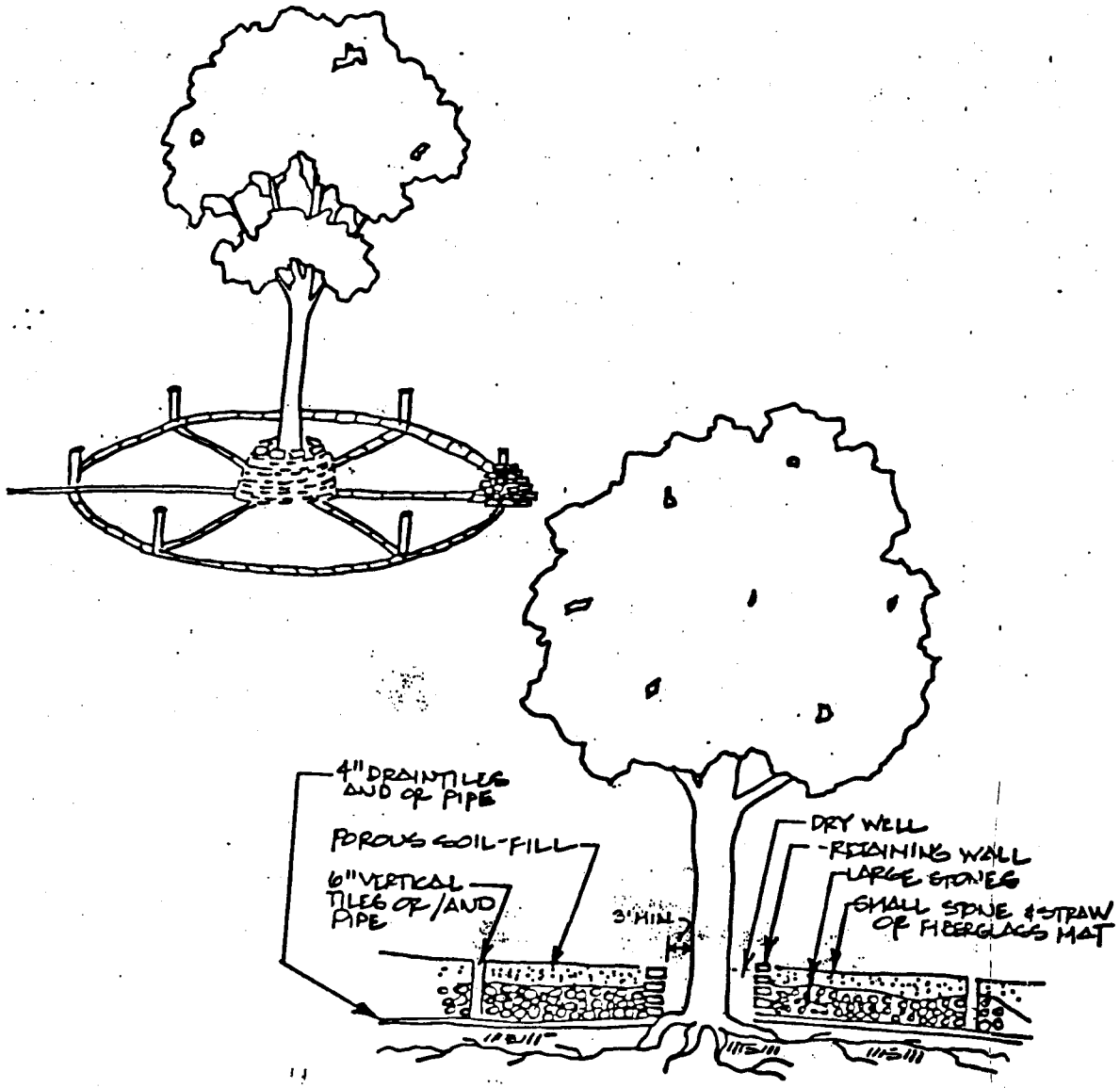
Notes:

1. Bed preparation should not exceed two inches.
2. Vertical pipe should be capped with a perforated cap with 4-3/8 inch holes per cap.
3. Gravel or rock should contain no fines.
4. Can also be used when critical root zone is covered by fill instead of asphalt.

Source: Steve Clark & Associates

Figure J-18

Tree Well

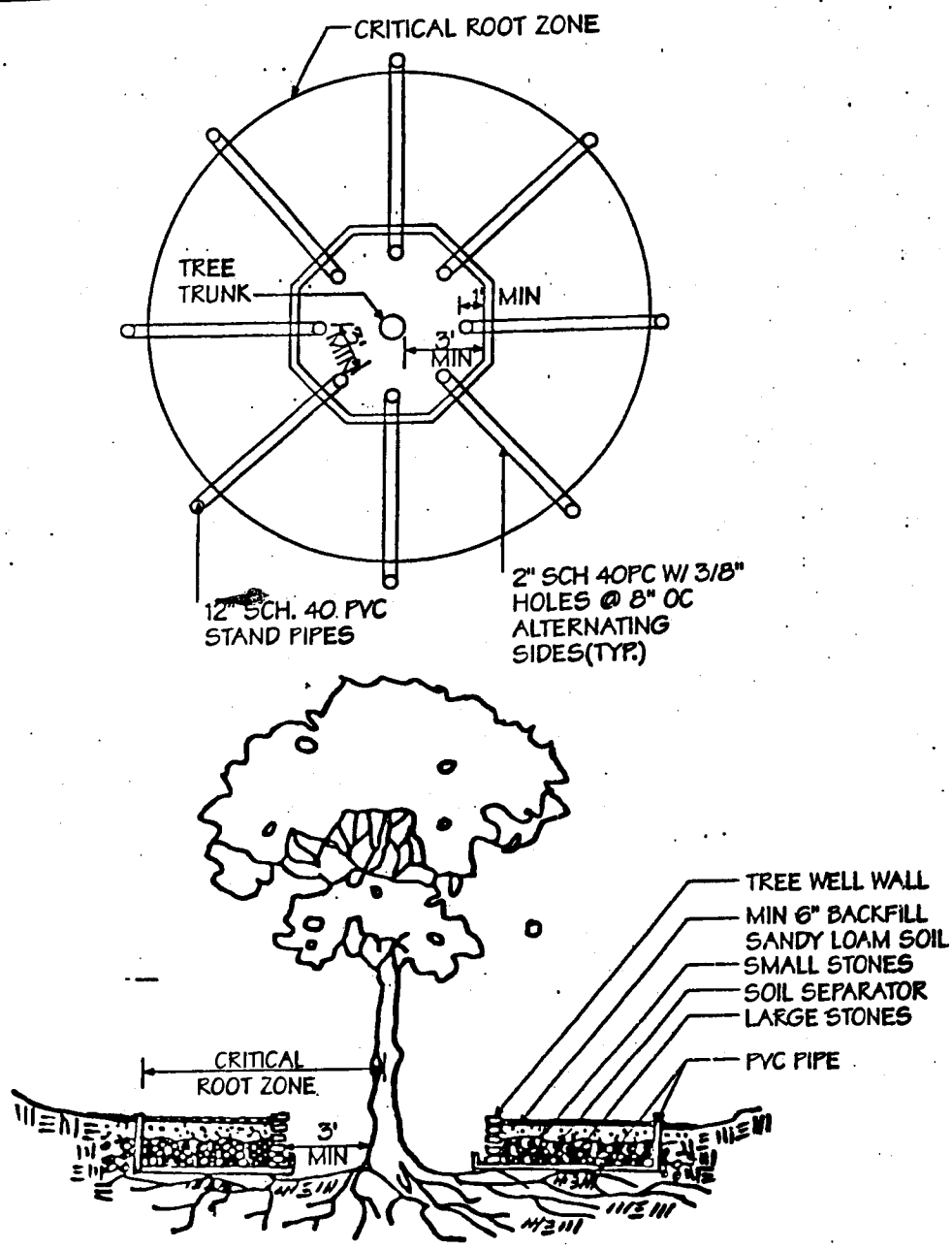


Notes:

1. Well wall should be no closer than 3 feet from tree trunk or more for smaller trees.
2. Drainage pipe layout should extend beyond the critical root zone
3. Vertical pipes shall be capped with a perforated flat cap with 4-3/8 inch holes per cap
4. Radiating spokes should be on 3 foot centers at the well wall

Source: Fairfax County, Virginia: Vegetation Preservation & Planting

Figure J-19



Notes:
1. Well wall should be no closer than 3 feet from tree trunk.
2. Drainage pipe layout should extend beyond the Critical Root Zone.
3. Vertical pipes should be capped with a perforated flat cap with 4-3/8 inch holes per cap.
4. Radiating spokes should be on 3 foot centers at the well wall.

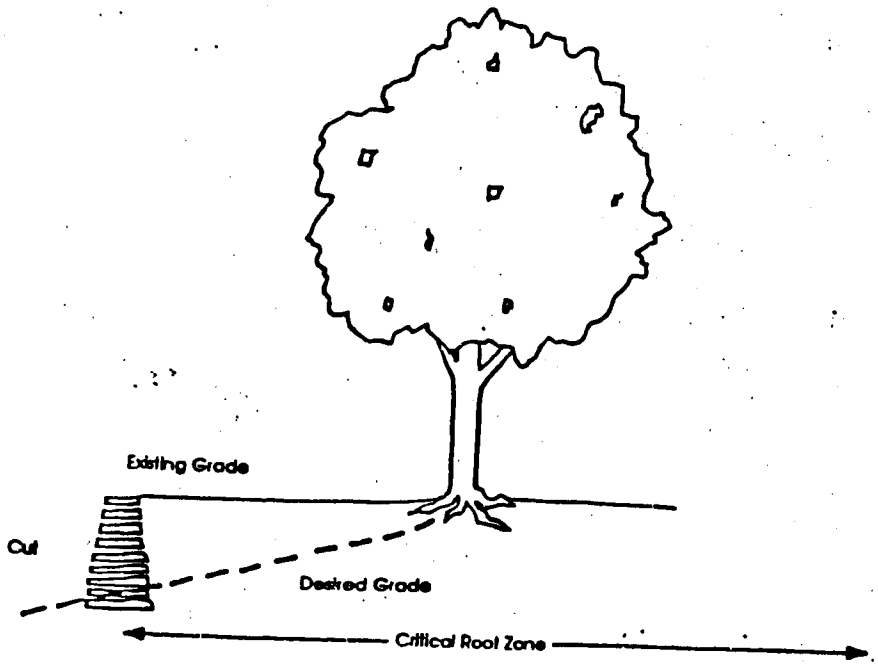
Source: UMCP

Tree Well and Aeration System

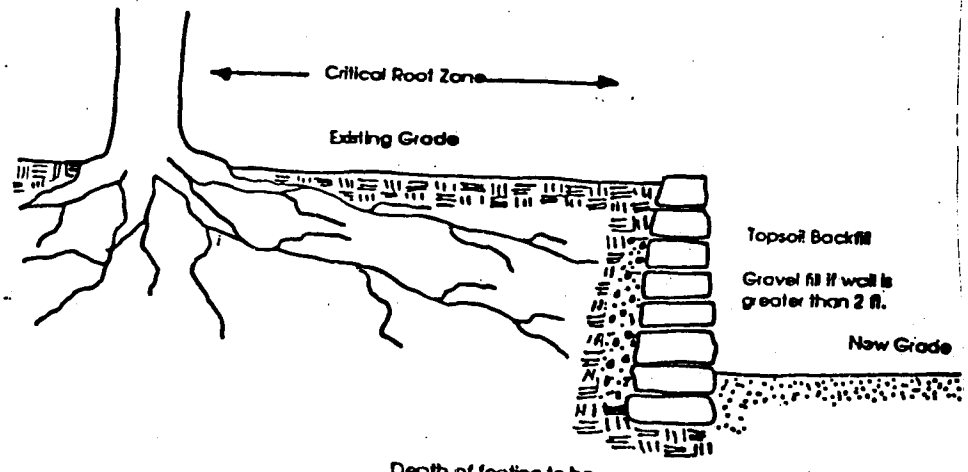
Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

Figure J-20

Retaining Walls



Source: Fulton County, Georgia
Tree Preservation Ordinance



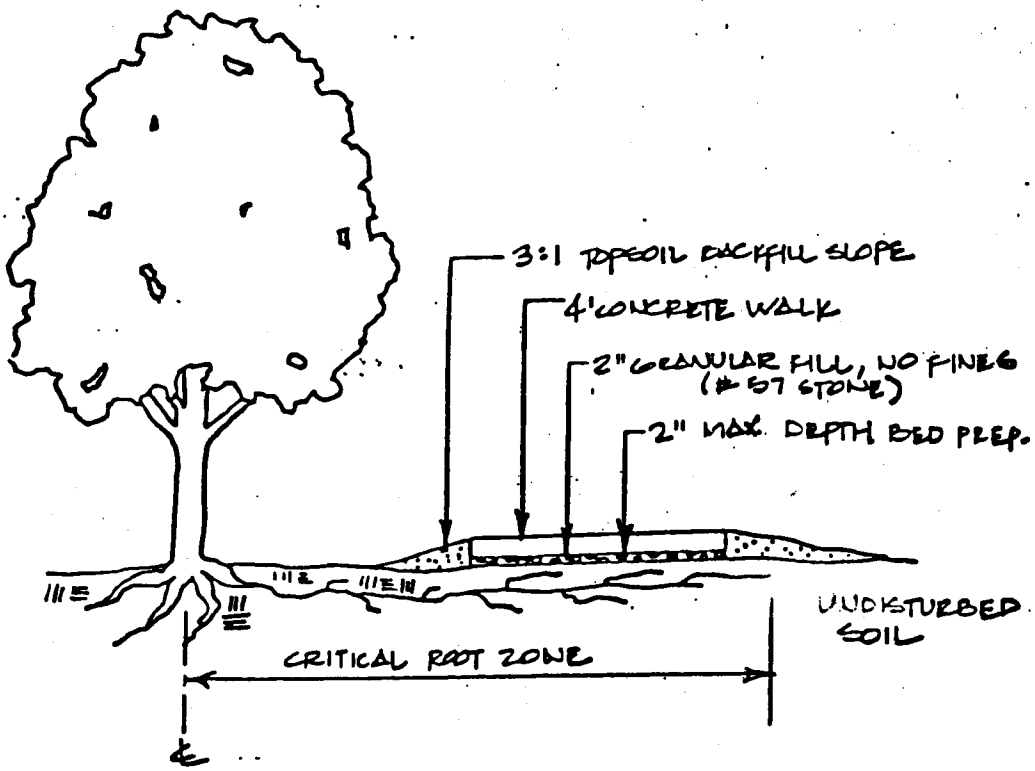
Depth of footing to be
30" minimum--any roots shall be bridged

Source: Fairfax County, Virginia
Vegetation Preservation & Planting

Note:
1. Wall should be constructed outside the critical root zone.

Figure J-21

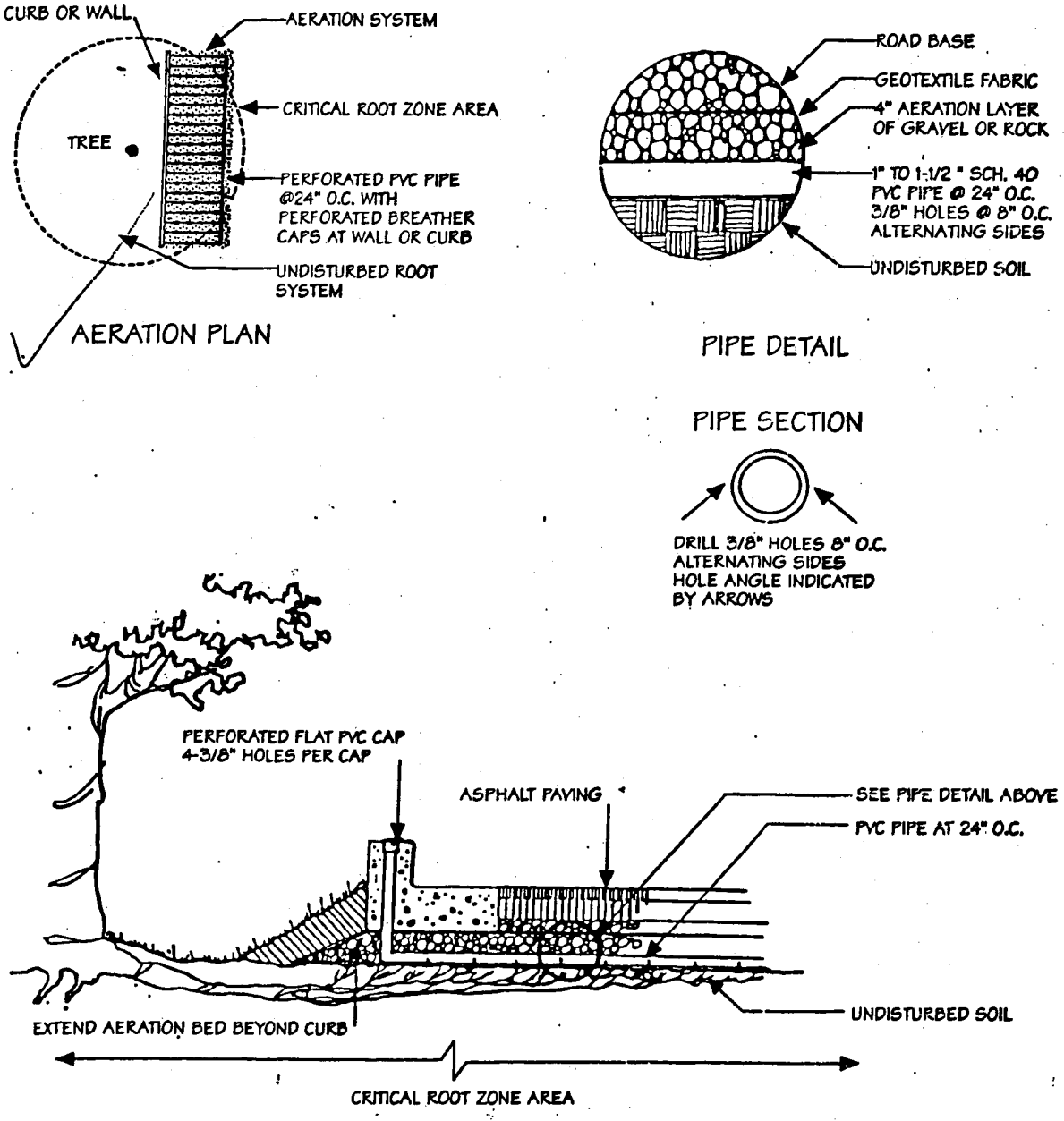
Raised Sidewalk



Notes:
1. Bed preparation should not exceed 2 inches
2. Granular fill should contain no fines
3. Minimize width of sidewalk; should be no wider than 4 feet

Source: City of Gaithersburg, Maryland: City Tree Manual

Figure J-22



Notes:

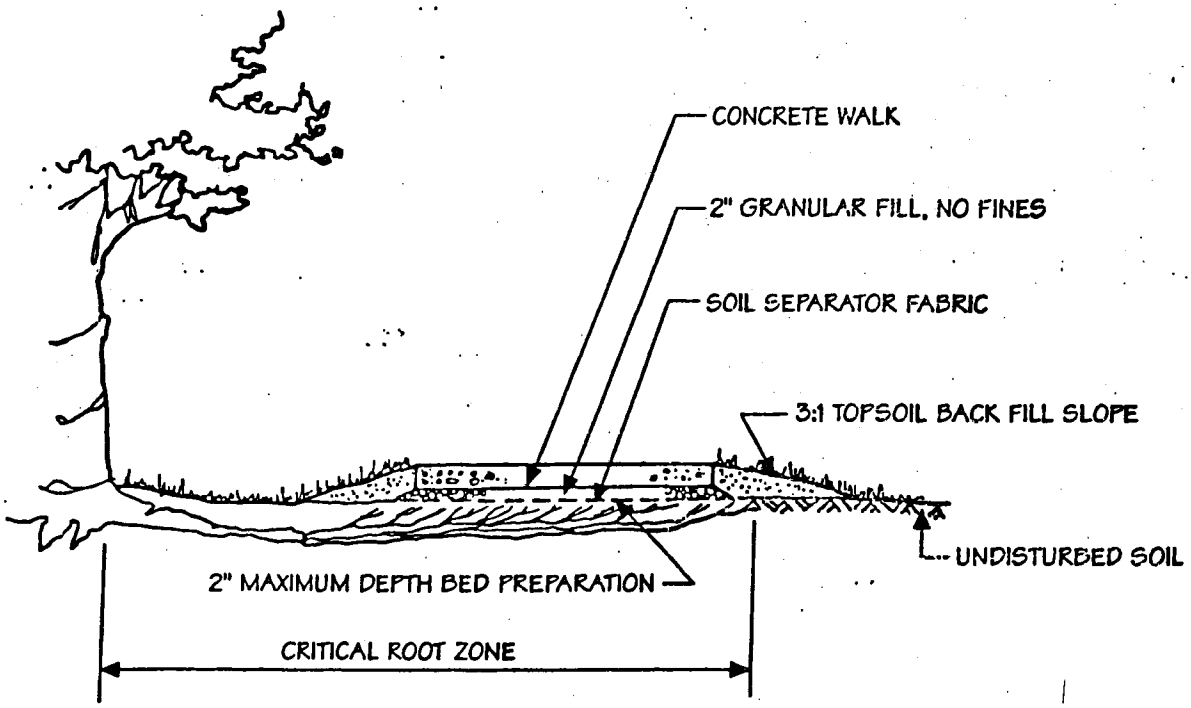
1. Bed preparation should not exceed 2 inches.
2. Vertical pipe should be capped with a perforated cap with 4-3/8 inch holes per cap.
3. Gravel or rock should contain no fines.
4. Can also be used when critical root zone is covered by fill instead of asphalt.

Source: Adapted from Steve Clark & Associates/ACRT, Inc.

Aeration for Paving above Critical Root Zone

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

Figure J-23



Notes:
1. Bed preparation should not exceed 2 inches
2. Granular fill should contain no fines
3. Minimize width of sidewalk as allowed by code.
4. Take extreme care of existing trees' critical root zone during construction.

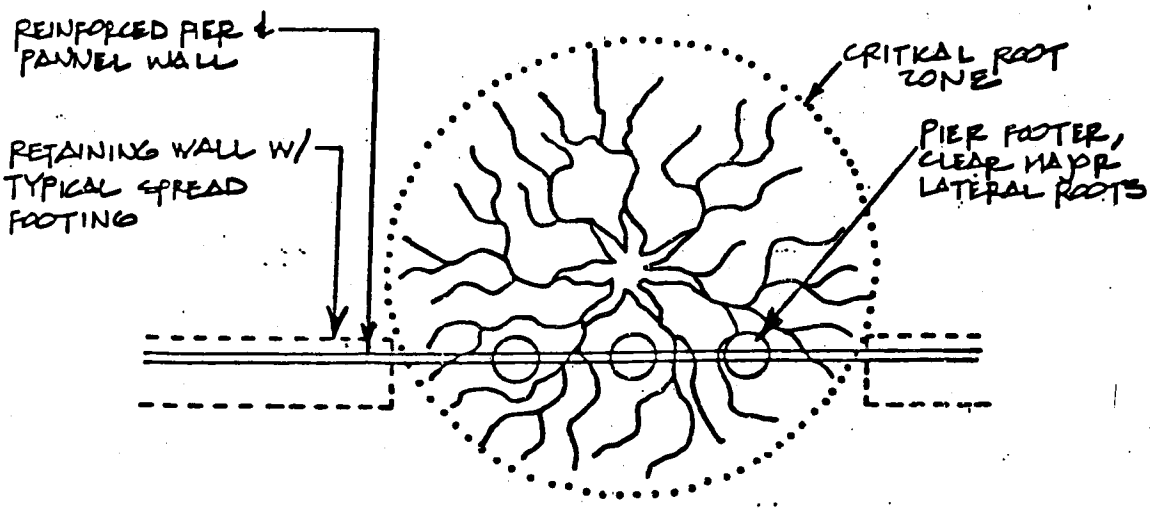
Source: Adapted from Steve Clark & Associates/ACRT, Inc.

Sidewalk above Critical Root Zone

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

Figure J-24

Reinforced Pier and Panel Wall

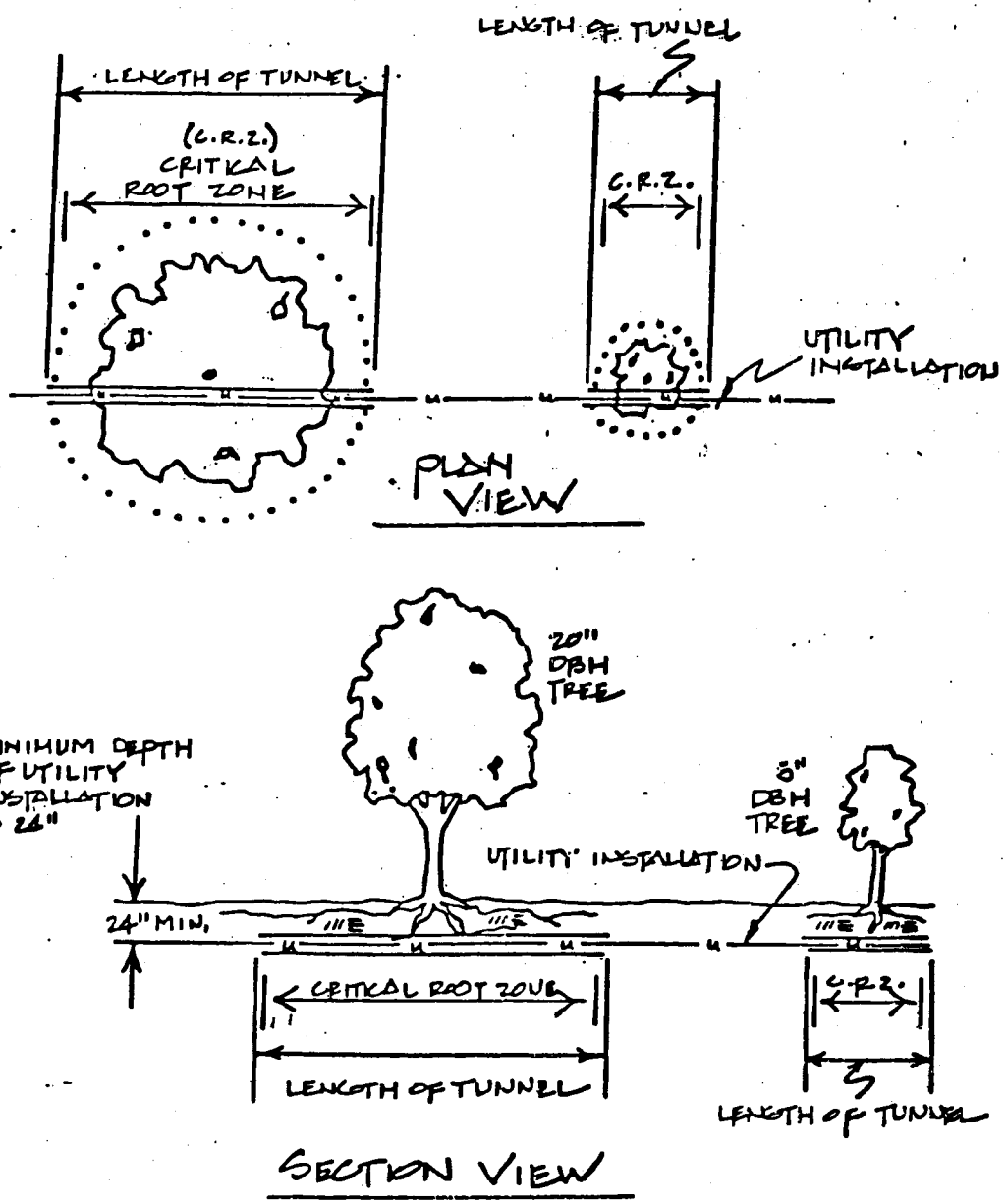


Notes:
1. Area of disturbance should be minimized
2. Care should be taken to avoid major lateral roots
3. Roots should be cleanly cut using a vibratory knife or other similar equipment

Source: Steve Clark & Associates

Figure J-25

Tunnelling



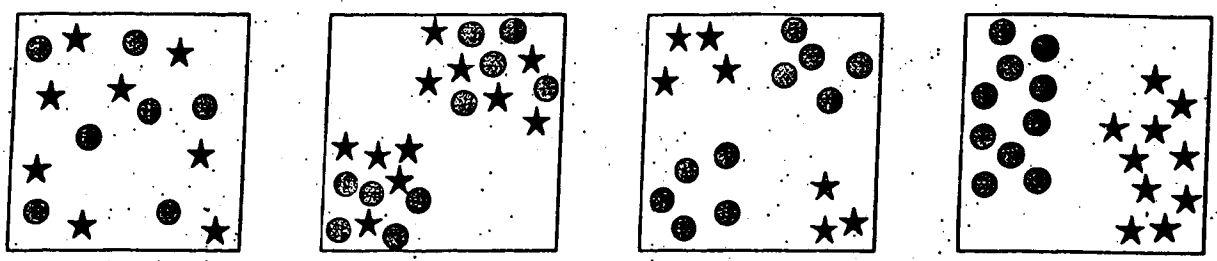
Notes:

1. Tunnel under critical root zone
2. Tunnel should be 24 inches deep at a minimum
3. When tunneling, aim for the trunk of the tree
4. When trenching, tunnel through the critical root zone

Adapted from: Fairfax County, Virginia: Vegetation Preservation & Planting

Figure J-26

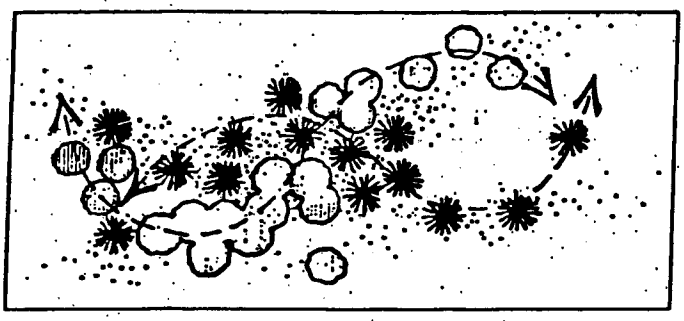
Typical Forest Tree Distribution Patterns



Note:
Naturally occurring populations of trees tend to be found in informal groupings. A cluster of trees is really a mosaic of different species groups. The objective of an afforestation/reforestation plan is to select the appropriate species and distribution pattern for a chose site that mimic natural patterns.

Source: Prince Georges County Woodland Conservation Manual.

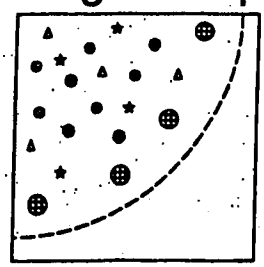
Aggregate Distribution Drift



Note:
When used, plant cluster type groupings that taper or feather out along the edges. Clusters often appear as elongated or tear drop shapes.

Source: EQR, Inc.

Mixing Transplant Stock



- Locate larger trees (B&B or container grown) or transplant stock at the perimeter of reforestation/afforestation plantings of whips, seedling grown stock.
- Protective Fencing
- Smaller Stock

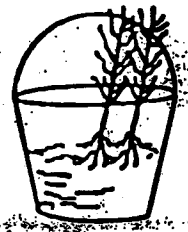
Source: Adapted from Forest Conservation Manual, 1991

Planting Distribution Patterns

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

Figure J-27

Handling Seedlings in the Field



Correct
IN BUCKET WITH SUFFICIENT WATER TO COVER ROOTS

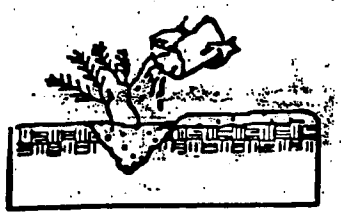
Incorrect
IN HAND:
ROOTS DRY OUT

Note:
1. Bare root seedlings and whip stock should be heeled-in when left unplanted for more than 24 hours.

Seedlings and Whips

1. DIG V-SHAPED TRENCH IN MOIST SHADY PLACE

2. BREAK BUNDLES AND SPREAD OUT EVENLY

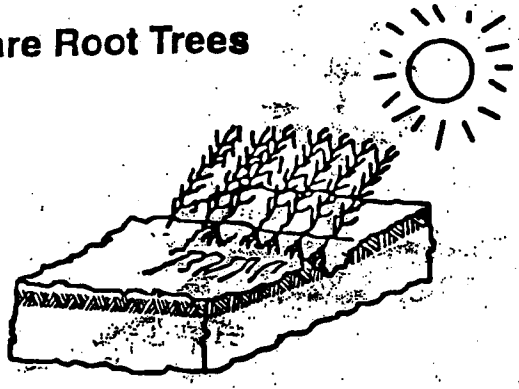


3. FILL IN LOSE SOIL AND WATER WELL

4. COMPLETE FILLING IN SOIL AND FIRM WITH FEET

Note:
1. Bare root seedlings and whip stock should be heeled-in when left unplanted for more than 24 hours.

Bare Root Trees



Place trees in an east-west trench with the tops of the trees pointing toward the afternoon sun. Moist soil should be worked around the roots to cover them and minimize air pockets. Pointing the tree tops toward the afternoon sun exposes the least surface to the sun so the buds will be less likely to begin growth.

Note:
1. Bare root trees should be banked-in when they must be left unplanted for longer than a few days and shaded after

Source: Adapted from Forest Conservation Manual, 1991

Handling Bare Root Stock

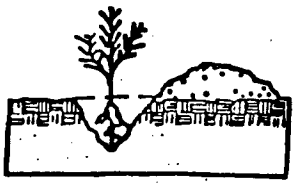
Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

Figure J-28

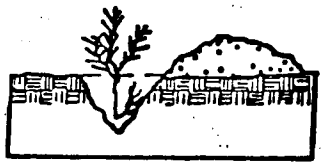
Seedling and Whip Planting

Note:
1. Mulching newly planted seedlings helps the soil retain moisture and protects the seedling from compaction and stem injuries.

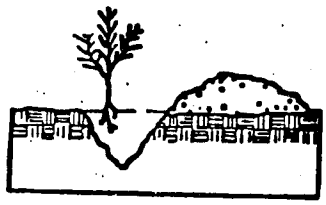
Correct and Incorrect Planting Depth



Correct
AT SAME DEPTH OR 1/2 DEEPER THAN SEEDLING WAS GROWN IN NURSERY

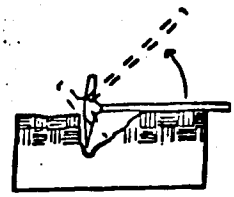


Incorrect
TOO DEEP AND ROOT BENT

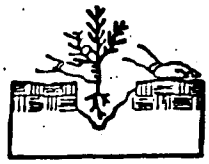


Incorrect
TOO SHALLOW AND ROOTS EXPOSED

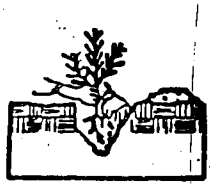
Mattock Planting



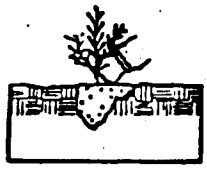
1. Insert mattock; lift handle and pull



2. Place seedling along straight side at correct depth.



3. Fill in and pack soil to bottom of roots.



5. Firm around seedling with feet.

4. Finish filling in soil and firm with heel.

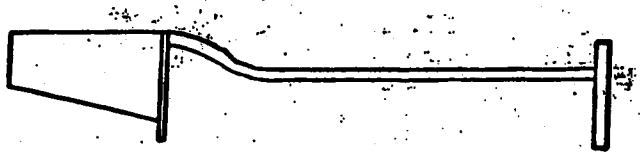
Source: Adapted from Forest Conservation Manual, 1991

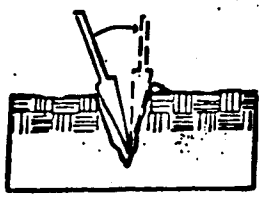
Seedling and Whip Planting Techniques

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

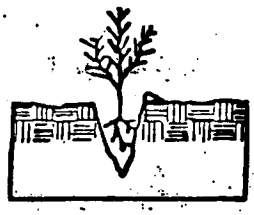
Figure J-29

Planting With Dibble Bar

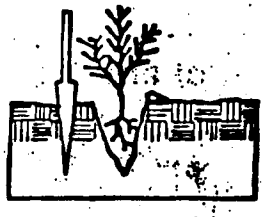




1. INSERT DIBBLE AT ANGLE SHOWN ABOVE AND PUSH FORWARD TO UPRIGHT POSITION



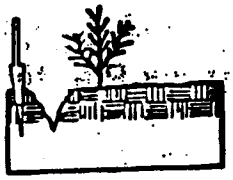
2. REMOVE DIBBLE AND PLACE SEEDLING AT CORRECT DEPTH



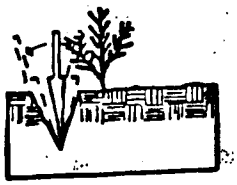
3. INSERT DIBBLE 2 INCHES TOWARD PLANTER FROM SEEDLING

4. PULL HANDLE OF DIBBLE TOWARD PLANTER FIRMING SOIL AT BOTTOM OF ROOTS

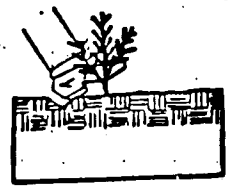
5. PUSH HANDLE OF DIBBLE FORWARD FROM PLANTER FIRMING SOIL AT TOP OF ROOTS.



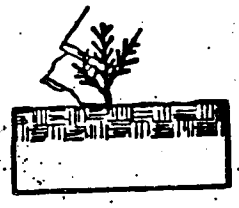
6. INSERT DIBBLE 2 INCHES FROM SEEDLING



7. PULL FORWARD THEN PULL BACKWARD FILLING HOLE



8. FILL LAST HOLE BY STAMPING WITH HEEL



9. FIRM SOIL AROUND SEEDLING WITH FEET

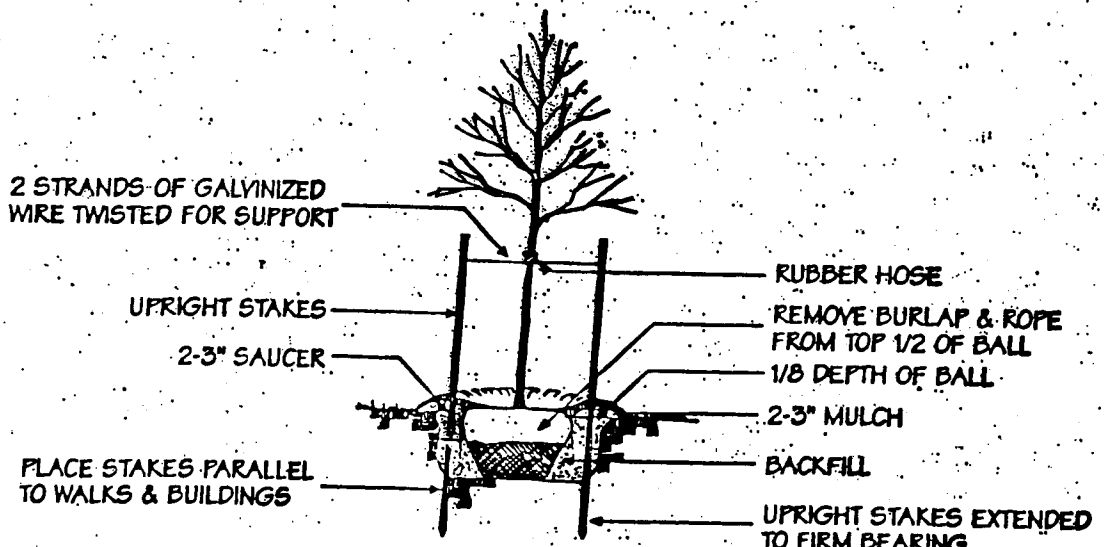
Source: Adapted from Duryea & Dougherty, Forest Regeneration Manual, Kluwer Academic Publishers, Boston, 1991 and Forest Conservation Manual, 1991.

Seedling Planting Techniques

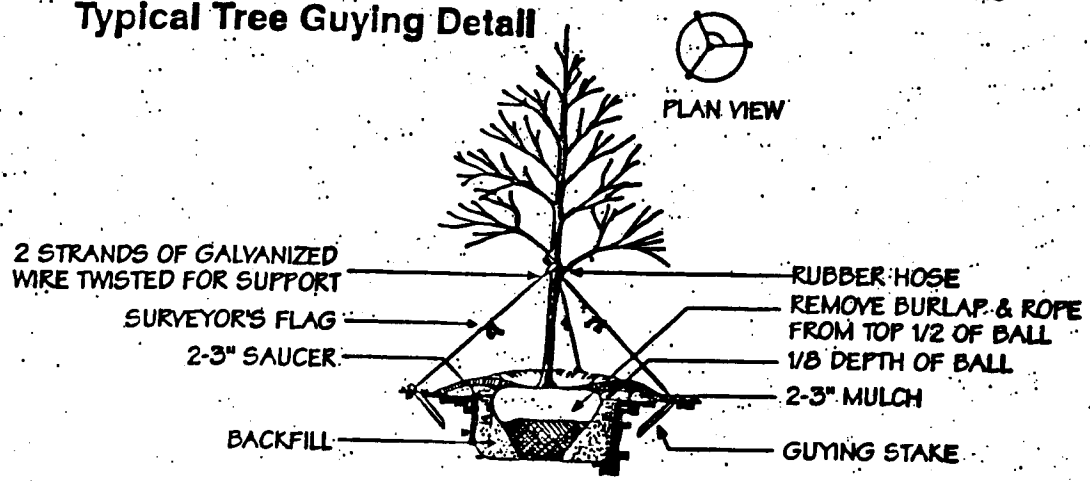
Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

Typical Upright Staking Detail

Figure J-30



Typical Tree Guying Detail



Tree Size Height	Tree Size Caliper	Stake	#	Wire or Cable	Hose
6-10'	1" to 1-1/2"	5-6' upright	2	14 guage wire	1/2"
10-12'	2" to 2-1/2"	7-8' upright	2	14 guage wire	1/2"
12-14'	2-1/2" to 3"	2" guy	3	12 guage wire	1/2"
14-16'	3-4"	2" guy	3	12 guage wire	3/4"

Source: Adapted from Forest Conservation Manual, 1991

Tree Staking and Guying Specifications

Taken from the State Forest Conservation Manual, 2nd Edition, 1995.

Appendix K

Sequential Reforestation Methods Evaluation Criteria

Sequential Tree Planting Methods Evaluation Criteria

Selective Clearing and Supplemental Planting

Depending on the extent of the disturbance, the residual forest may need specialized treatments to enable it to withstand the changes imposed on it. Selective clearing and supplemental planting is a method of restabilizing these altered forest stands.

Description: The management of residual tracts of forest through selective thinning and/or supplemental plantings in an effort to stabilize and enhance the smaller forest tract created during development.

Evaluation Criteria:[1]

* Does the stand include dominant trees that are taller than the smallest lateral dimension of the stand?

* Is the acreage of the stand less than 1 /2 acre?

* Has there been significant grade changes or soil compaction adjacent to sensitive species (such as tulip poplar) (See Table 3.4.1)

* Does the stand include a strong regenerative population that would respond to release? (see Stand Summary Sheet data)

Design Guidance:

Trees whose height is greater than the width of the narrowest lateral dimension of the stand should be removed if a healthy understory exists.

Tulip poplars or other grade sensitive species may need to be removed if subjected to significant grade changes within their critical root zone.

If sun-sensitive species are abundant on stand margin, supplemental planting of tolerant plant materials is recommended, or these species may be removed.

[1]If the responses to any of the evaluation criteria is affirmative, then this may be an appropriate use of selective clearing.

In priority sensitive areas the functions of a Forest retention Area can be greatly enhanced by additional planting. This may include additional planting to create structural diversity, increase the total density up to optimum stocking levels, or to retard surface runoff.

If species prone to wind-throw (ex. Virginia pine, *Pinus virginiana*) are within 1 tree height of structures, these species may be removed.

Snags 6-8 feet in length may be left for the benefit of wildlife, with consideration of safety.

If the average cover of invasive/exotic species in the Retention area exceeds 50% (as identified in the Forest Stand Delineation), elimination of invasive/exotics is appropriate with the replacement of an appropriately selected non-invasive species of equivalent size and strata.

Requirements:

Applicant must show selective clearing is the best alternative for the site.

Selective clearing objectives must be clearly defined in the reforestation plan. Selective clearing is not acceptable for purely aesthetic reasons.

Specific trees targeted in the selective clearing must be noted on plans.

Selective clearing must be done in such a manner that remaining trees and understory are not disturbed in the process.

Stumps should not be removed under any circumstance.

Selectively cleared areas must be planted with supplemental plant materials.

Stocking levels shall be determined by approved forestry methods.

All clearing and planting activities shall be monitored under a minimum 2-year maintenance and monitoring agreement.

Transplant of Local Plant Materials

The use of transplanted materials is generally encouraged due to the hardiness and adaptability of local plant materials to local conditions. The risks associated with this practice are related to the methods used for transplanting, storing and planting transplanted materials.

Description: The use of on-site or locally obtained[2] plant materials which are transplanted for use on-site.

Evaluation Criteria:

* Is the material to be transplanted amenable to disturbance? (See Table K-1).

* Is the plant material suited for planting site (sunlight, soils, moisture regime)?

Design Guidance:

Climax species in general, are less tolerant than pioneer or early successional species (See Table K-1).

Larger trees (>6' dbh) need specialized care and equipment.

Investigative root diggings are recommended for larger trees.

Best times for transfer is late fall (after leaf fall)/early winter.

Transplants are not recommended in spring after the buds start to grow.

Soft rooted species not recommended for transplant with frozen root ball. (See Table K-2)

Open grown trees grown in heavy or clay soils are preferred for transplant. Their rooting patterns are typically denser than forest grown trees.

Requirements:

Transplant of local materials must be shown to be the best alternative for the site. Soils must be prepared in a field pit fashion, with proper amendments.

Root balls must meet or exceed standard nurserymen specifications.

Species stocking requirements described in Section 3.6 must be met.

If tree banks are used, the location, treatment and schedule for banking and transplant must be described.

Nursery Stock

The use of nursery stock is also an option for reforestation. Of primary concern is the hardiness of the nursery stock for the climate and conditions of the planting site. For this reason, there is a preference for the preservation of local genetic stock.

Description: The use of plant material transported from local (within a 100 mile radius) nurseries for reforestation or afforestation.

Evaluation Criteria:

* Species must be adapted to conditions of planting site.

Requirements:

Species native to Maryland shall be used unless shown to be unavailable. Local native genetic stock are recommended for better survivability.

Stock must meet standard nurserymen specifications.

Landscaping

Landscaping can be counted towards certain reforestation requirements. This method may be most appropriate for high use areas adjacent to structures or as visual barriers to adjacent land uses.

Description: The planting of a mixture of trees or shrubs with a primary intent of creating an aesthetic vegetated area adjacent to structures.

Evaluation Criteria:

* Is the site 2500 square feet or greater in size with a minimum width of 35 feet?

* Is the area adjacent to human structures?

Design Guidance:

These areas may be appropriate adjacent to park-like settings, picnic areas or playgrounds.

Native plant materials or cultivars of native plants are recommended.

Requirements:

For every 2500 sq. ft. of area, there must be no less than 7 major shade trees, and 20 shrubs.

The planting plan shall include a canopy, understory and ground cover or shrub layer.

All planting activities shall be monitored under a minimum 2-year maintenance and monitoring agreement.

Natural Regeneration

Under natural conditions, the lands of this region have remarkable abilities to regenerate forests. When humans attempt to encourage or recreate this phenomena, the results are much less impressive. The problems lie in the numerous variables which effect the success of this process and the number of unknowns.

Description: The preparation and management of cleared areas to allow for the regeneration of forests through natural recruitment by seed bank, standing seed crop or asexual sprouting.

Evaluation Criteria:

*Does the site have suitable regenerative source and distribution mechanism for a stable population of target species?

* Are the physical conditions (soils, sunlight, moisture, and cover) and suitable for encouraging natural regeneration or suitable plant growth?

Design Guidance:

Best used in low visibility, low use areas.

Treatment is extremely species and site specific. Therefore, the plan must be prepared by professional Forester.

Management and monitoring of these areas should be intensive for these areas.

Broadcast seeding of appropriate tree species may be beneficial.

Requirements:

Plan must describe in detail how the above factors will be addressed and detailed information on the method of regeneration and the target forest association being designed.

Construction equipment must be prohibited from this area, through signage, fencing and plan delineation.

If using soil seed bank for regeneration, the original seed bed, or other local suitable seed source must not be disturbed.

Soils must be stabilized with an appropriate cover material (non-turf building).

Any adjoining forest must contain 20% or less cover of invasive/exotic species.

Table K-1: General Transplant Tolerance

High Transplant Tolerance	Low Transplant Tolerance
Malus spp. (apple)	*Carya spp.* (hickory)
Fraxinus spp. (ash)	*Juglans spp.* (walnut)
Ulmus spp. (elm)	*Juglans cinerea* (butternut)
Celtis occidentalis (hackberry)	*Sassafras albidum* (sassafrass)
Tlia spp.(linden)	*Myssa sylvatica* (tupelo)
Plantanus occidentalis (sycamore)	*Quercus alba* (white oak)
Populus spp. (poplar)	
Salix spp. (willow)	
Gleditsia hiacanthos (honey locust)	
Quercus palustris (pin oak)	

Table K-2: Transplanting Tolerance -- Frozen Root Ball

High Transplant Tolerance	Low Transplant Tolerance
Malus spp. (apple)	*Betula spp.* (birch)
Ulmus spp. (elm)	*Cornus spp.* (dogwood)
Gleditsia triacanthos (honey locust)	*Tsuga spp.* (hemlock)
Tlia spp.(linden)	*Mognolia spp.* (magnolia)
Acer spp. (maple)	*Quuercus spp.* (oak)
Pinus resinosa (red pine)	*Liquidambar* (sweet gum)
Pinus strobus (white pine)	*Liriodendron tulipifera* (tulip tree)
Pinus sylvestris (Scotch pine)	

Appendix L

Soil Treatment Guidance

SOIL TREATMENT GUIDANCE

PROBLEMATIC RANGE[1]

Soil Characteristics	Low	Medium	High	Corrective Measures for Consideration
Chemical				
PH[3]				
Acid Soils	>7-6	<6.0	<4.0	Add lime, select low-pH-adapted species
Alkaline Soils	7-<7.5	>7.5	>8.5	Add OM, sulfur, and acidifying fertilizers, select high pH-adapted species
Cation Exchange Capacity[3] (CEO)	>10	>5	<3	Add OM and soil amendments with high CEC; fertilize regularly
Fertility	Variable			Test N, P, and K levels and micro-nutrients commonly deficient or toxic; add OM and encourag micro-organism growth; adjust the pH; use low demand, adapted plants; if deficient, DO NOT over water; leach if toxic levels occur.
Chemically Polluted[2] Soils	Numerous Chemicals & Concentrations			Identify the polluting chemicals; detoxify; leach, remove or abandon site; train personnel to prevent; stockpile construction materials and chemicals off site; avoid spilling pollutants; monitor storage tanks for leaks; repair immediately.

1. Approximate determinations, subject to site parameters and subjective judgment.
2. Adapted from: USDA Forest Service, Urban and Community Forestry, p. 181-184, 1990.
3. Requires determination in a soil testing laboratory.

PROBLEMATIC RANGE[1]

Soil Characteristics	Low	Medium	High	Corrective Measures for Consideration
Physical				
SOIL TEXTURES				
Sand	<50%	>75%	>90%	Add OM, irrigate frequently
Clay, Kaolinitic[2]	<25%	>50%	>65%	Add OM, DO NOT over-irrigate, reduce traffic and compaction
Clay, Expandable[2]	None	Any	>10%	Reclaim with gypsum and leaching, DO NOT plant perennials until reclaimed
Clay & Silt	<30%	>50%	>75%	Add OM, irrigate correctly, deep till, aerate and reduce compaction and traffic
STRUCTURE		Variable		eliminate compaction, traffic, add OM; manage beneficial micro-organisms and root growth; reduce sodium concentrations; DO NOT over rototill, especially at high RPMs
Bulk Density[1], Mg/m^3 Clay	<1.1	<1.4	>1.5	Add OM; deep till
Loam	<1.2	>1.5	>1.7	Same as above
Soil Crusting		Variable		DO NOT leave bare soil; add OM and mulch; grow groundcovers; eliminate droplet size of irrigation spray
Aeration Porosity[2], %large	>5	<2	<1	Add OM; deep till, eliminate traffic and pore volume compaction; increase earthworm population
Soil Permeability, Infiltration and Percolation Rates, in/hr.	>0.50	<0.25	<0.20	Add OM; deep till, aerate; use mulches, adjust irrigation rates accordingly
Debris and Litter		Variable		Remove from soil surface and profile where possible.

PROBLEMATIC RANGE'

Soil Characteristics	Low	Medium	High	Corrective Measures for Consideration
Depth to Bedrock	>10'	<4'	<2'	Add top soil
Seasonal Water Depth	>10'	<4'	<2'	Remove source, improve surface drainage, Install subsoil drains, select trees Tolerant of short-term standing water
Apparent Water Table Depth	>10'	<6'	<4'	Same as Above
Restrictive Horizons	>10'	<6'	<4'	Deep till to break up; or same as above; or both
Impermeable Layers	>10'	<6'	<4'	Deep till to break up; or same as above; or both
Disturbed and Mixed Horizons And Profiles		Variable		Add OM and mix well; DO NOT bring subsoil to the surface
Curs, Remaining Top Soil Depth	>4'	<2'	<1'	Replace top soil (blend into top of subsoil), DO NC remove topsoil to subsoil
Fill Soil		Variable		Match new texture and structure with and blend int existing soil; a deep, uniform till is best
Wet, Putrid Soils	Brown	Tan	Gray, Black	Remove source of stagnant water; install surface and subsoil drainage, then incorporate coarse OM
Soil Structure, massive, Platy		Present vs. Absent		Provide drainage, incorporate coarse OM, deep till

Appendix M

Planting Plan and Inspection Form

PLANTING PLAN (EXAMPLE)

SITE NAME: _____

COUNTY: _____ DATE: _____

PREPARED BY: _____

PHONE #: _____

CONTACT PERSON: _____

PHONE #: _____

SITE LOCATION: _____

_____

ACREAGE OF PLANTING: _____

SITE ASSESSMENT: _____

_____

TYPE OF SITE PREPARATION NEEDED: _____

_____

SPECIES	#SEEDLINGS W/TREE SHELTERS	#SEEDLINGS W/O TREE SHELETRS	B&B	*SOURCE
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

(1) Provide a map of the planting site with this form indicating planting pattern.
(2) Include planting specifications.

PLANTING INSPECTION FORM (EXAMPLE)

SITE NAME: _____

COUNTY: _____ INSPECTION DATE: _____

INSPECTED BY: _____

PHONE #: _____

SITE LOCATION: _____

_____

ACREAGE OF PLANTING: _____ % SURVIVAL: _____

IS REINFORCEMENT PLANTING NEEDED? YES_____ NO_____

CAUSE OF MORTALITY: _____

_____

_____

_____

COMMENTS: _____

_____

_____

_____

_____

Appendix N

Maryland State Champion Trees

Trees are one of the most outstanding features in our landscape. Almost everyone likes trees for one reason or another, including aesthetics, financial and sentimental reasons. Trees also provide a wealth of environmental benefits including their use of carbon dioxide and subsequent release of oxygen, protection from the elements and buffering capabilities as they filter harmful sediments and nutrients before they reach our sensitive waterways. No matter what their size, trees play an important role in our environment.

In order to ensure fair comparisons for champion trees, certain measuring procedures are used. To qualify as a tree champion, the tree must have a single stem or trunk for at least 4.5 feet above ground level and have a total height of at least 15 feet. In multiple stemmed trees, only the largest stem should be measured.

The following information is required when nominating a "Big Tree":

- ***Species*** – common name and scientific name (if known)
- ***Location*** - county, town or road name
- ***Circumference*** - the girth, in inches, of the trunk at 4.5 feet above the ground
- ***Height*** - total perpendicular height of the tree, in feet
- ***Crown Spread*** - the average of two measurements of the crown spread taken at right angles to each other, in feet
- ***Condition*** - the general condition and health of the tree

The formula is:

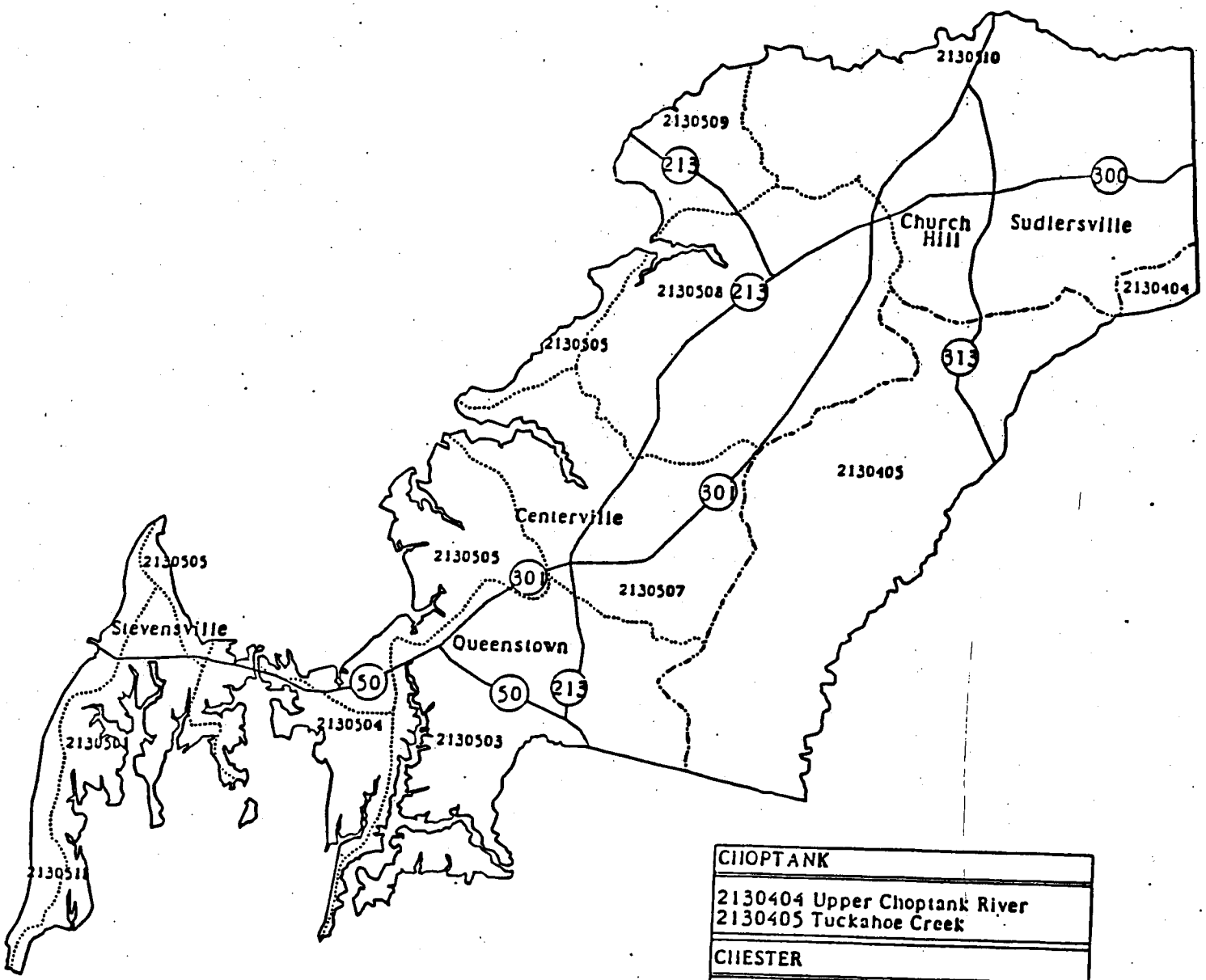
Total Points = Circumference (inches) + Height (feet) + 25% of the Average Crown Spread (feet)

The list is constantly changing as the search continues for the largest and most historic of trees. The "Big Tree Listing" is now updated on a semi-annual basis. For the most up to date list, please contact the Maryland Department of Natural Resources, Forestry Division or refer to www.dnr.state.md.us/forests/trees/bigtree.html.

Appendix O

Queen Anne's County Watershed and Subwatershed Boundaries

Queen Annes County



CHOPTANK
2130404 Upper Choptank River
2130405 Tuckahoe Creek
CHESTER
2130501 Eastern Bay
2130503 Wye River
2130504 Kent Narrows-Prospect Bay
2130505 Lower Chester River
2130507 Corsica River
2130508 Southeast Creek
2130509 Middle Chester River
2130510 Upper Chester River
2130511 Kent Island Bay

Roads

Watershed boundaries

Subwatershed boundaries

Produced by:

Forest Service,
Maryland Department of Natural Resources

with the assistance of

Image Processing & Remote Sensing Center
Salisbury State University

Appendix P

Qualified Professionals

FOREST CONSERVATION ACT

QUALIFIED PROFESSIONALS

As of AUGUST, 2003

According to COMAR 08.19.06.01, all licensed landscape architects, all licensed foresters and the following professionals are qualified to prepare Forest Stand Delineations and Forest Conservation Plans.

AGEE, ANNE ELIZABETH
ALBRECHT, TERENCE W.
ALESHIRE, KRISTIN B
ALLEN, BENJAMIN L.
ALLEN, LORI ANN
ALLEN, THOMAS P.
ALMQUIST, BENJAMIN E.
AMRHEIN, PAUL
ANDERSEN-FINELLI, SUSAN
ANDERSON, RICHARD B
ANDREWS, JOHN W.
ARMIGER, STEPHEN B
ASCHENBAUCH, ERNST F.
ATHANAS, LOUIS C.
BACHTEL, RANDY L.
BAKER, MICHAEL S
BANKS, RODNEY L
BARE, CHARLES E.
BARMOY, DOUGLAS A.
BARNHART, STEPHEN C.
BASSETT, KATHLEEN E.
BATCHER, MATT
BAZIS, JOSHUA
BAUMGARDNER, STEVEN J
BAUTZ, DONALD J. JR
BENEFIEL, GREGORY C.
BENENATI, FRANK
BENTON, B. JAMES
BERGMANN, CAROLE F.
BERNSTEIN, BRIAN
BIBA, FRANK
BICKEL, DAVID
BILLINGSLEY, PAUL F.
BOLTON, RAYMOND GORE
BOLTON, TODD
BONTZ, SHELLEY
BORSI, ALICIA
BOSTIAN, WILLIAM J.
BOYLAND, ELIZABETH J.
BRADNER, SAMUEL J.
BRADY, NORMAN
BRIDGELAND, WILLIAM T.
BROCKWAY, BENJAMIN F.
BROOKS, STEPHAN B.
BROWN, ARLENE T.
BROWN, BRIAN
BROWN, ROBIN C.
BRUNORI, CARLO R
BUBCZYK, FRANK
BURCHICK, MARK
CADIEUX, CHAD
CADWALLADER, ROBERT
CALISTI, MARISA
CALLAHAN, SEAN
CANFIELD, HAROLD
CANOLES, JOHN P.
CARROLL, RAYMOND E.
CARY, ELISE POLYDOROFF
CHAPMAN, JONATHAN W
CHRISAFIS, JOHN A.
CLEAR, KRISTIN
COBLE, LESTER W. JR
COLIANNI, ANGELO
CONLON, CATHERINE A.
CONNER, JON S
COOK, JAMES H.
COOKSEY, GLENN
CORNMAN, PATRICIA
COX, BRIAN
CROWDER, CLIFFORD D
DALTON, CHRISTOPHER S
DAMERON, KRIS B
DANIEL, CHRISTOPHER T
DASH, LOUIS JAMES JR
DASKIEVIGE, FRANK
DAUS, GERALD R
DAVIS, SEAN D
DE ROIA, DEIDRE
DEACON ANDERS, JEANNETTE
DEMCHIK, STEPHANIE J
DENNIS, PAUL A
DI MISA, JOSEPH
DILLON, JEFFREY M
DIRCKS, MARY A
DISNEY, STEVEN L
DOWNARD, RALPH B. JR
DRESS, EDWARD G. JR
DUFF, JENNIFER L
DUNN, WARREN K
EDSALL, DOUGLAS D
EDWARDS, GLENN D
EHRHART, MATTHEW J
ENGEL, STEVE
ERICSON, TOD
ESTES, MICHAEL R
FABRYCKI, VICTOR
FARR, PATRICIA M
FERGUSON, KAREN L
FINCH, KIM I
FOSTER, JOHN W. S. III
FRERE, PHYLLIS E
FRYE, JUSTIN
FULLER, STEVEN
FULTON, VIRGINIA L
FUSTER, MARCO
GABBERT, STEPHEN D
GALUSKY, L PETER JR.
GAMBA, JOHN E
GATTON, RONALD D
GEMMILL, ELDON R
GERRED, FRANK J
GIBSON, RODERICK TODD
GIESING, PHILIP
GIGLIOTTI, JOHN J
GILBERT, MICHAEL A
GILLIS, JENNIFER C
GOCHNAUER, BRADLEY J
GOLDSTEIN, CECELIA
GORMAN, JAMES P
GOVE, C SCOTT III
GREEN, MICHAEL F
GUTSHALL, MARK
GUPTA, MRIDULA
HADAWAY, ERIC C
HAIBACH, MARK
HALL, BENTON H
HANSON, LOUISE I
HARDIN, DAVID L
HARMEYER, WILLIAM C
HARRIOTT, STEVEN P
HAUSE, BRIAN
HAY, TOM
HAZEN, USA C
HECKERT, WILLIAM B
HEDGE, KEVIN
HEDGER, MATTHEW
HEERBRANDT, PAUL F
HEISS, STEVEN D
HESS, GREGORY SCOTT
HIEBLER, JOANNA
HITESHEW, WILLIAM D
HOBNER, JOHN H
HOLLINS, MICHAEL S
HONECZY, MARIAN
HOWE, EDWIN S
HOWELL, GINGER PAGE
HUMPHRIES, EDYTHE DR
HUPPMAN, L REED
HUSTEAD, VERNON
IMBIEROWICZ, TAMI J
INGRUM, R. PORTER
IRRE, JAMES E
JONES, GARTH S
JONES, ROBERT R
JUBA, MARC
KAGAN, TOBIAS
KALLAN, PAUL
KAUSE, KATIE K
KEANE, DAVID
KEARNEY, VIRGINIA F
KEEFER, JAMES M
KELLERMAN, TIMOTHY J
KELLEY, BETTY L
KELLY, BYRNE H
KELLY, KEITH
KELLY, KEVIN
KERR, CHERYL ANNE
KIBBY, RICHARD
KIMBLE, JOYCE
KIMMONS, JOHN H
KISHTER, SALLY
KISHTER, MARY JO
KLEBASKO, MICHAEL J
KLEIN, VALARIE
KOLLAR, STANLEY A. JR.
KOPECK, DOUGLAS
KORTRIGHT III, PETER
KRELL, CHRISTINE
KRISTA-MAENHARDT, TANYA
KRONENBERG, ROBERT A
KROPP, MATTHEW
KROUT, SHAWN
KULIS, MICHAEL S
LA BARE, DENNIS J
LANGE, LEYLA
LASZEWSKI, VIRGINIA
LATHAM, ANTHONY
LAUNAY, EDWARD M
LESKINEN, HENRY L
LINDLEY, BRIAN
LITTLE, ROBIN K
LUTHER, VICKI L
LYKENS, DAVID V
MADER, STEVEN E
MANKOWSKI, MARTIN T

MARKEY, JACK B
MARTIN, CAROL W
MATTHEWS, NANCY L
MAY, HOLLY L
MAYNARD, KELLY
McAVOY, WILLIAM A
McCAMY, CARTER
McCARTHY, KEVIN
McCOY, MICHAEL
McDONOUGH, SEAN
McKEE, DAVID W. JR.
McKENNA, MARY
MEAD, GORDON B
MEINERT, JOSEPH M
MELIA, DIANE S
MEYERS, ANTHONY G
MIDGLEY, ELIZABETH HUNT
MILLER, GERALD LEE
MILLER, JOSEPH N
MITCHELL, KRIS T
MORGERETH, EDWARD JR.
MORRIS, JAMES B
MORRIS, TIMOTHY
MORRISON, JOSEPH F
MORSBERGER, STEVEN A
MOZAL, GEORGE SCHMIDT
MRUGAL, SUSAN L
MUDD, JOHN F
MUELLER, LYNN MELVIN
MUSSER, DOUGLAS
MUSTAFA, MARWAN FARIS
NACE, JULIE S
NAUMANN, ROBERT
NELSON, KATHERINE
NIELSEN, CHARLOTTE C
NIEMAN, JEFFREY TODD
NOBILE, THOMAS D
NOLDE, SUSAN
NOLL, WAYNE C
NORMAN, PHILIP C
NORTON, MICHAEL
OHLIGER, PAIGE
OTT, STEPHEN
OUTEN, JANICE B
OWENS, MARY R
PAIS, RICHARD
PALMER, ADDISON H
PANZARELLA, THOMAS
PARK, WILLIAM R. JR
PARKER, ANDREW C
PARKER, MICHAEL
PARSONS, KEVIN
PAYNE RYAN, MICHELLE D
PECORA, ANDREW JAY
PENTZ, NANCY S
PETRAKIS, MICHAEL
PFINGSTEN, RICHARD P
PHILIBERT, JOSHUA
PIERCE, ROBERT J
PILSON, JEFFREY L
PIPPIN, JAMES B
POMPA, CHRISTINA R
POWELL, ROCKY O
PRZYBOCKI, MICHAEL F
PURNELL SR, GREGORY
QUATTROCCI, DOM A
RAU, DOUGLAS
REDINGER, KENNETH W
REDMAN, DONNELL
REED, GALE J
REED, JASON
REEDER, ELIZABETH
REESE, JAN
REID, JAMES ARTHUR JR.
RENN, MICHAWL EDWARD
REPPERT, PAMELA
RICE, RICHARD E
RICHERSON, PATRICIA
RIVERA, MICHAEL
ROBBINS, SHON L
ROBERTSON, JEFFREY A
ROEMER, JOHN C. IV
ROOD, MARSHALL
ROTH, JULIE ANGELA
ROWE, PAMELA
RUBIN, RONALD
RUSSO, JOHN G
SARATE, GABRIELLE V
SAVERCOOL, DDANIEL
SCHAUMBURG, PEGGY
SCHNEIDER, CHUCK
SCHULER, MEGAN
SCHWARM, RODNEY D
SCHWARTZ, CRAIG J
SCHWARTZ, JEFFREY H
SCHWEITZER, THOMAS
SCOZZARI, NANCY E
SEE, ERIC E
SEELEY, ROBERT B
SEELINGER, MARC
SHAFFER, GLENN E
SHAW, SUSAN
SHIRE, PHILLIP J.
SIBISK, WILLIAM A
SIEVERS, JOHN D
SLATER, JAMES E. JR
SMITH, LENWOOD E II
SMITH, MATTHEW V
SMITH, STEPHANIE F
SNYDER, MARY ELIZABETH
SOBBOTT, RICHARD
SOBRACK, JIM D
SODERBERG, ROBERT W
SPALDING, KELLY A
SPARKS III, GEORGE
SPEAKMAN, THOMAS W
STACHOVIAK, WILLIAM V
STEERE, EDWARD M
STERN, ALVIN
STEWART, MARGARET
STEWART, STEVEN L
STICH, THOMAS J
STIMMEL, GREGORY S
STOTLER, SHANNON
STRAUGHAN, EILEEN K
STUM, EUGENE S
SUNLEY, JENNIFER
SYPHARD, ROBERT S
TAYLOR, CLAUDE SWANSON
THOMAS, HOLLY
THOMAS, MILDRED A
THOMAS, STEVEN A.
THOMPSON, MICHAEL W
TILMES, MATTHEW A
TOMLINSON, WM W JR
TRACH, JOHN
TRUMBAUER, MIKE
TUCKER, MARTIN D
TURGEON, JOHN G
TURNER, RICH
TURNOCK, MEGAN
TWUPACK, WILLIAM S
ULM, IRENE M
VALENTINE, TERRANCE
VAN NESS, KEITH D JR
VAN SWERINGEN, ANNE E
VEDRAL, LAURA A
VIENNEAU, KEVIN D
WAGESTER, KENNETH E
WAGNER, CLARK M
WALLIS, KENNETH R III
WARD, GUY CAMERON
WARHOLIC, GEORGE JR
WEARMOUTH, ANN
WEINKAM, BETSY
WEINKAM, CHUCK
WETMORE, DOUGLAS G
WHEELER, JEFFREY S
WHITEHEAD, JAMES
WHITMAN, STACEY N
WHITT, ROXANA
WIGGAN, KAREN H.
WILDMAN, RONALD
WILSON, BECKY
WILSON, RONALD
WINTER, BETH
WOLFE, THOMAS E
WOLINSKI, JEFFREY A
WOOD, DIANA F
ZIMAR, DONALD E

Appendix Q

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