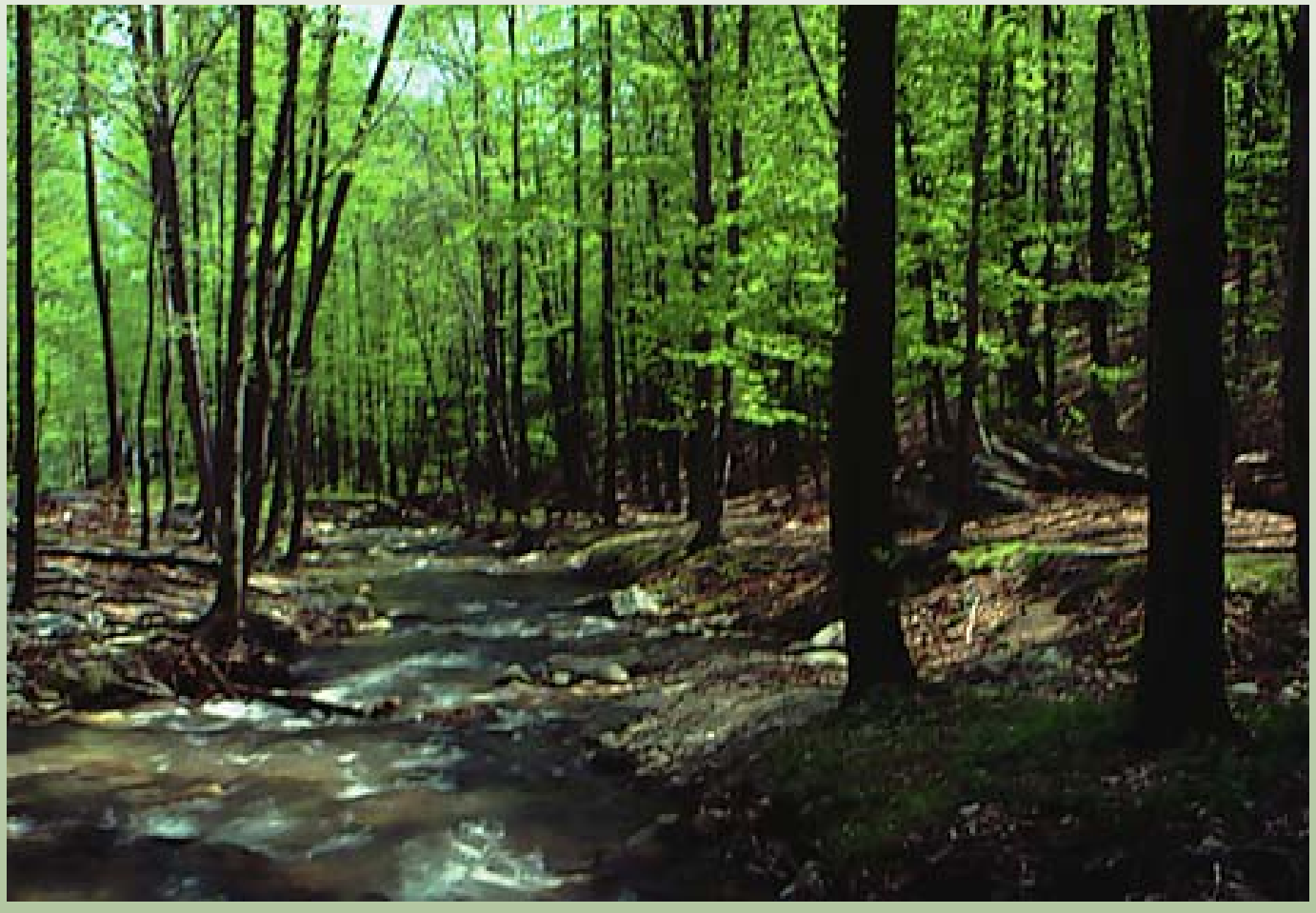
A Citizen's Guide to the

Forest Conservation Act in Maryland



A Citizen's Guide to the Forest Conservation Act in Maryland

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This guide was written and designed by Christopher Delfs under the direction of Senior Planner George Maurer. It draws its information about the Forest Conservation Act primarily from the third edition of the State Forest Conservation Technical Manual, published by the Maryland Department of Natural Resources. Cover photo by Dick Weigand.

This guide is a supplement to the Chesapeake Bay Foundation publication "Influencing Development in Your Community: A Citizen's Guide for Maryland." Other supplements that provide more detail on specific conservation programs in Maryland include:

- "A Citizen's Guide to the Critical Area Program in Maryland"
- "A Citizen's Guide to Protecting Wetlands in Maryland"

These publications are available online from the Chesapeake Bay Foundation at www.savethebay.cbf.org.

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How to Use This Guide

This guide aims to make the Maryland Forest Conservation Act more accessible and useful for citizens who want to protect forests in their communities.

Most of the information presented in this guide comes directly from the third edition of the *State Forest Conservation Technical Manual (*1997). As the name implies, the manual is written for trained individuals who implement the specific requirements of the Forest Conservation Act. The following pages distill the technical information contained in the manual to its most vital components. We hope to foster understanding and point out places where citizens can make a difference in the development process.

This guide is a supplement to another CBF publication called *Influencing Development in Your Community*, which provides an overview of the development process, and offers suggestions on how citizens can affect development projects. This document occasionally refers readers to *Influencing Development in Your Community*, when more context (outside the Forest Conservation Act) is necessary.

Orange stars throughout this guide (like the one shown at left) signal helpful advice for citizen action.

I. Introduction

Source: National Oceanic and Atmospheric Administration

As population in the Chesapeake grows and development increases, more and more forest land is vanishing from the Maryland landscape. In the process, we are not only losing areas that contribute to the beauty and character of the state but resources that provide economic products and safeguard the quality of our air, water, and soil.

Maryland's Forest Conservation Act (FCA) strives to conserve forest cover on development sites by establishing rules that minimize the loss of existing forests and, in some cases, replenish forest that has been lost to development activities in the past.

By reviewing development plans for their compliance with the FCA and by monitoring forest protection during construction, citizens can help ensure forests are protected as fully as possible.

This guide will seek to answer three main questions:

1. What is the Forest Conservation Act?
2. How does it affect the development process?
3. How can citizens use the Act to protect forest land?

Legal Basics

The Maryland Forest Conservation Act (FCA) was enacted by the state legislature in 1991. It provides a set of minimum standards that developers must follow when designing a new project that affects forest land. County and municipal governments are responsible for making sure these standards are met, but may choose to implement even more stringent criteria. If there is no local agency in place to review development plans, the Maryland Department of Natural Resources will serve this function.

Simply put, the FCA calls for a minimum amount of forest cover on development sites. How much forest must exist on a particular piece of land is based upon the site's zoning. More information on forest cover requirements is provided on page 17.

The provisions of the Forest Conservation Act of 1991 may be found in the Annotated code of Maryland (Natural Resources Article, Title 5, Subtitle 16) and the Code of Maryland Regulations (COMAR Title 08, Subtitle 19, Forest Conservation).

Who must comply with Forest Conservation Act requirements?

Any party applying to the local authority for public or private subdivision, project plan, grading permit, or sediment control permit on a unit of land 40,000 square feet or greater (nearly an acre).

Commercial logging is exempt from FCA requirements. However, landowners must file a Declaration of Intent, which states that they will not develop a site after logging at least five years. This provision is intended to discourage developers from logging first in order to avoid FCA regulations.

Definitions

Subdivision: a parcel of land that is split into smaller plots for individual use. A housing development is an example of a subdivision

Grading: clearing vegetation and moving earth to alter the original slope of the land, typically for construction purposes

Sediment and erosion control: techniques employed to stop additional water run-off and erosion caused by development

Two Main Components

The Forest Conservation Act consists of two main components: the Forest Stand Delineation (FSD) and the Forest Conservation Plan (FCP).

Any time a developer chooses a new site (containing 40,000 square feet or more) for some type of construction, he or she must submit these two items for review by local officials.

1. Forest Stand Delineation

The FSD is an inventory of forest cover and other environmental features on site. Through resource mapping and written description, this process determines the most desirable areas for forest conservation. Forest characteristics that are usually documented include forest stands, canopy closure, dominant species, size class, and number of trees per acre.

2. Forest Conservation Plan

The FCP provides specific plans for retaining and protecting existing forested areas and plans for new tree plantings and their maintenance to ensure survival during subdivision and construction. It gives special attention to "priority" forested areas as identified by the FSD. Priority areas are forest lands located on sensitive environmental areas such as stream buffers or steep slopes.

Definitions

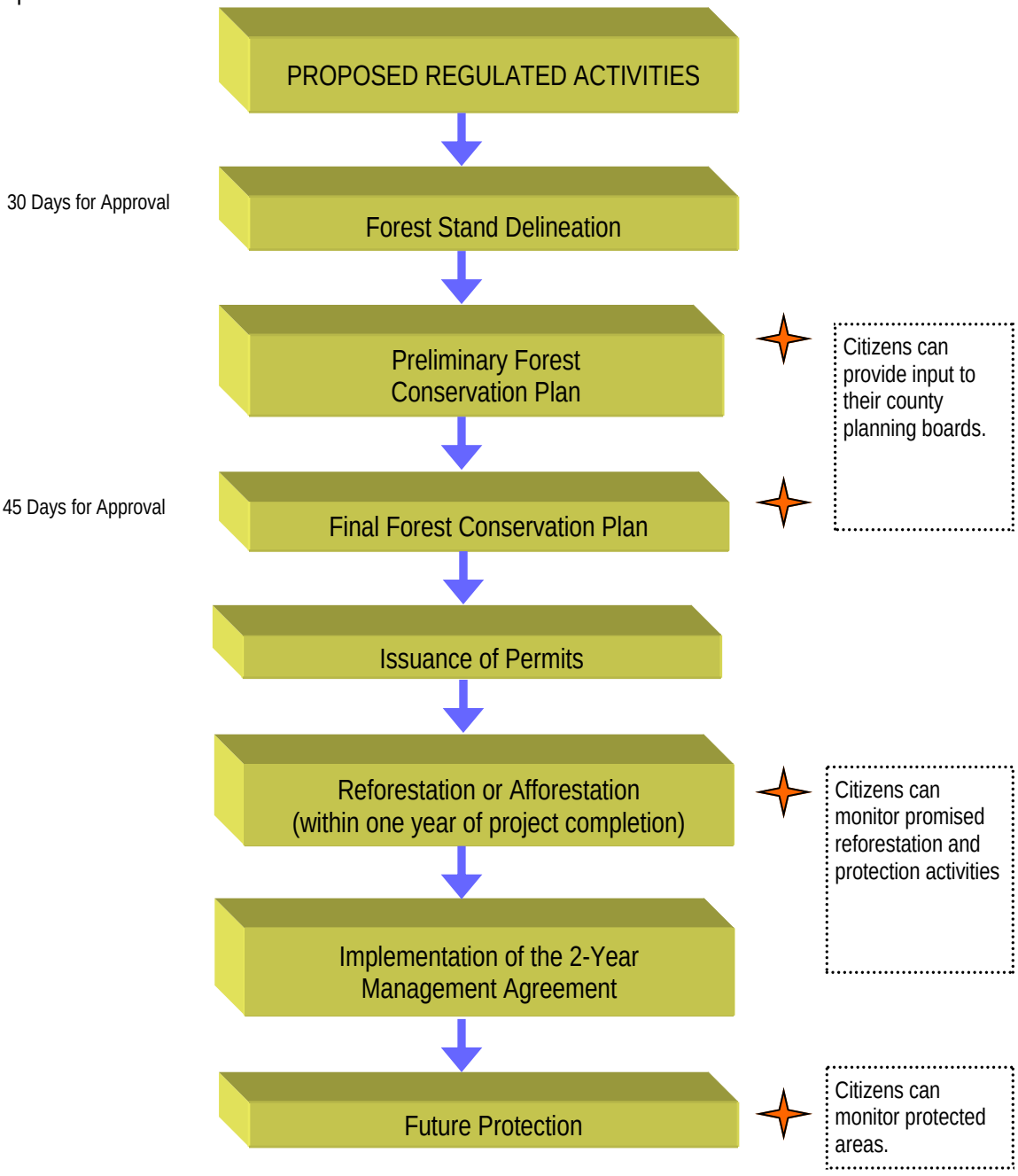
Forest Stand - a grouping of trees with similar characteristics (such as species, age, or condition) that can be distinguished from adjacent groups.

Size class - a category of trees determined by Diameter at Breast Height — the diameter of the trunk measured at 4.5 feet off the ground .

Canopy Closure - the percentage of overhead cover formed by branches and foliage at the tops of adjacent trees.

Meeting FCA Requirements

This figure depicts the steps for carrying out the requirements of the Forest Conservation Act. The guide will refer back to this diagram as we talk more about the specifics of these stages and when citizens can influence development decisions on forest conservation. Remember that the star symbols on this framework and throughout the guide indicate appropriate times for citizen input or action.



II. Forest Stand Delineation

The Forest Stand Delineation (FSD) provides a detailed picture of existing forest cover on a particular site. But what exactly does a FSD consist of?

Every FSD will include some or all of the following elements:

1. Environmental Features Map
2. Forest Stand Map
3. Forest Stand Analysis
4. Forest Delineation Map

Three different levels of an FSD exist. Which one is submitted depends upon how much disturbance a project will cause.

- If no forest exists on a site or if no forests will be cut, a developer may submit a ***simplified FSD.***
- If no priority areas are disturbed and no reforestation is necessary, a developer may submit an ***intermediate FSD.***
- If priority areas are disturbed or trees must be replanted after cutting, a developer must submit a ***full FSD.***

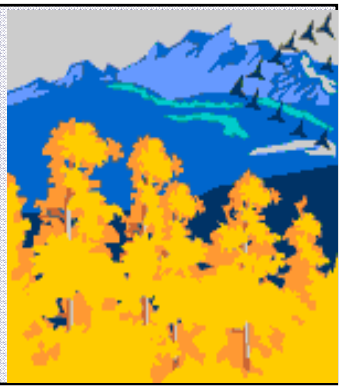
Of the major components mentioned above, a simplified FSD only requires an Environmental Features Map and a Forest Delineation Map. The intermediate and full FSDs require all four components, although the Forest Stand Analysis for the intermediate FSD is a less complex assessment.

Who can prepare a Forest Stand Delineation?

Only a Maryland licensed Forester, Landscape Architect, or other qualified professional (all referred to in this report as "qualified professional") can perform the necessary forest studies and provide documentation to county officials.

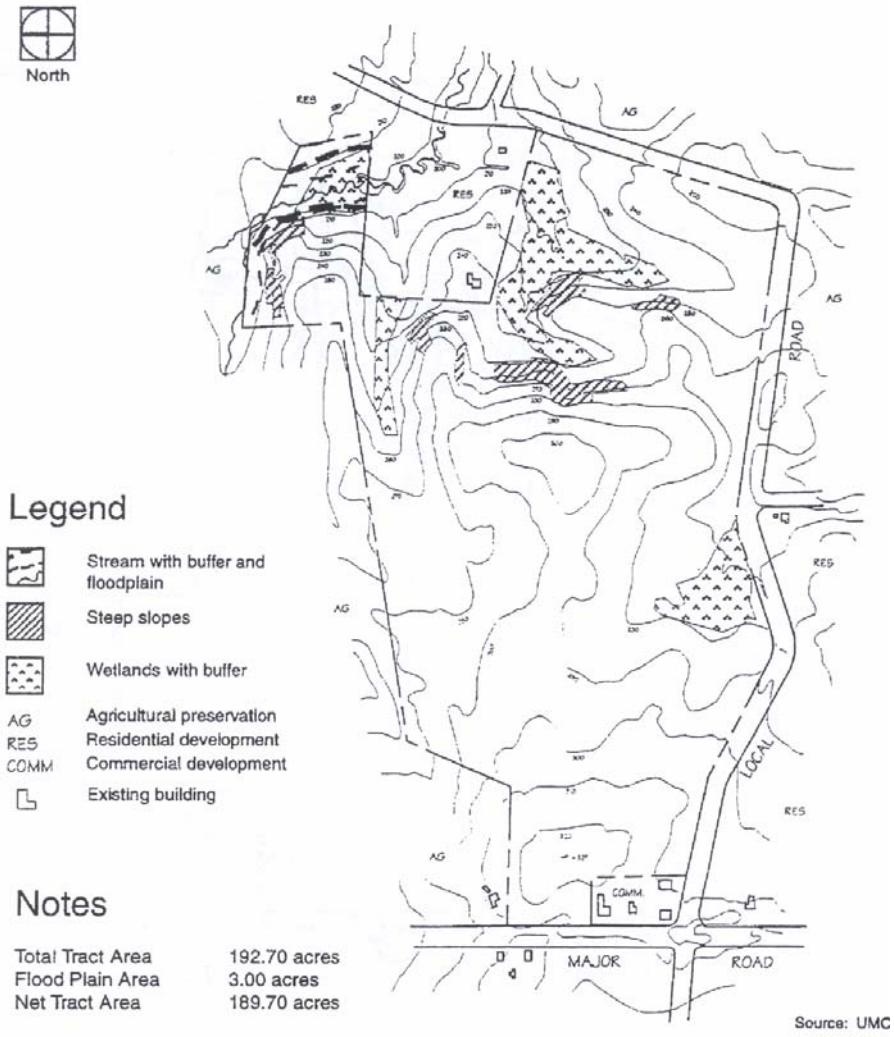
Food for Thought:

Field analysis of potential development sites and associated forest land should follow an objective process. However, it is important to remember that a contractor *hires* an individual or firm to perform the FSD. Therefore, this party may favor the developer's goals, rather than erring on the side of conservation. For this reason, it is always good to keep your eyes open for mistakes or misrepresentations by a developer or their consultants.



Environmental Features Map

The Environmental Features Map (EFM) identifies important environmental features and their locations. It is a critical part of the Forest Stand Delineation. The qualified professional first composes a preliminary "rough draft" through examination of aerial photography and existing data. The map is later finalized after a survey is completed on site. An example is shown at right.

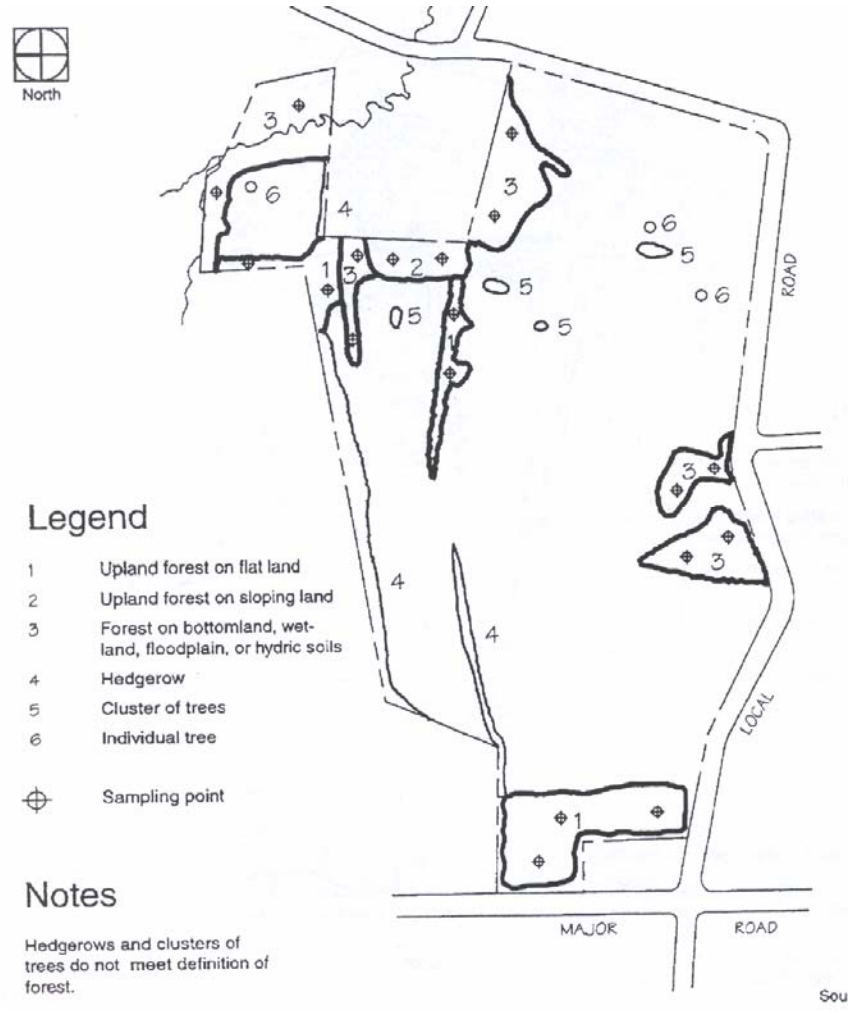


Source: Maryland State Forest Conservation Technical Manual

While many "features" may be presented on the EFM, the most important components to identify include floodplains, wetlands, stream buffers, critical habitats, and soils sensitive to erosion (such as steep slopes). These characteristics are extremely important to consider when evaluating the suitability of a site for development. Disruption in these areas will cause the most severe impacts to a forest ecosystem, so pay close attention to these environmental features.

Forest Stand Map (FSM)

The Forest Stand Map (FSM) displays the locations and types of forest stands on the proposed site, as well as base features such as property boundaries, significant trees, topographic information (elevation of the terrain), and perennial and intermittent streams. As you can observe in the map shown to the right, sampling points show where the person preparing the FSD has verified background information through actual field study.



Source: Maryland State Forest Conservation Technical Manual

Forest Stand Analysis

Source: www.eccl.co.uk

Once preliminary maps have been obtained, qualified professionals go out into the field to verify the information that has been collected. Data, including the number of tree species, percentage of canopy cover, size class, etc. are gathered to improve the accuracy of the FSD. Naturally, if a site has no tree cover, then a map and written analysis are not needed.

Analyzing field data provides those preparing the FSD with a better understanding of the site under review. It enables them to make the preliminary maps more precise and begin an evaluation of what forest land should be retained. In preparing the Forest Stand Analysis, professionals must summarize their findings, provide a written comparison of stands, and compose a narrative including descriptions of stand composition, structure, and condition.

In addition to reporting on forest stands, the Forest Stand Analysis also includes record of important trees called "specimen" or "monarch" trees. These hold a special protected status by virtue of their age and size.

Source: National Oceanic and Atmospheric Administration

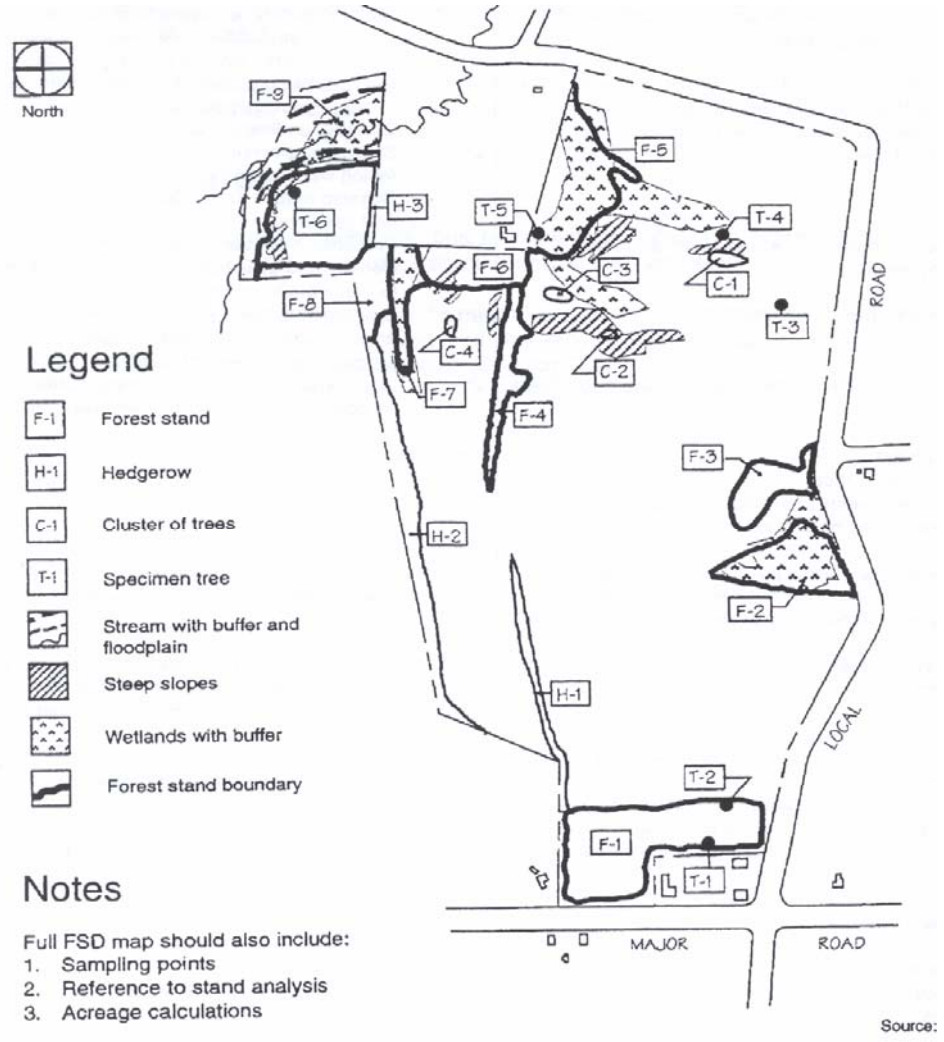
Definitions

Specimen Tree: trees having a diameter measured at 4.5 above the ground of 30 inches or more, or trees having 75% or more of the diameter of the current state champion tree.

Champion Tree: the largest tree of its species within the United States, the state, county, or municipality as determined by the Maryland Department of Natural Resources

Forest Stand Delineation Map

The Forest Stand Delineation Map merges the Environmental Features Map and the Forest Stand Map. The FSD map should clearly depict areas where forest stands and where "priority" environmental features overlap. As we can see in the model below, for instance, stands are situated in sensitive natural features like wetlands. This map will serve as the foundation for making decisions for the Forest Conservation Plan.



Source: Maryland State Forest Conservation Technical Manual

Preparing the FSD is a highly technical process, performed entirely by a professional. It is therefore difficult for citizens to exert any influence during this stage. However, if you know that a site is being considered for development, you can carry out a basic survey of your own (see p.34 "Conducting a Site Analysis" in *Influencing Development in Your Community*) so you are already familiar with the site when the Conservation Plan is presented.

III. Forest Conservation

What is a "Forest Conservation Plan"?

The Forest Conservation Plan (FCP) identifies the amount and location of forest to be conserved and of areas to be planted with trees.

More specifically, it mandates a certain level of forest retention based upon site characteristics, a forest protection strategy to be employed during and after construction activities, and reforestation in most cases where trees have been cleared.

Source: National Oceanic and Atmospheric Administration

Who May Prepare a Forest Conservation Plan?

The same people who conduct the Forest Stand Delineation: a Maryland licensed Forester, a Maryland licensed Landscape Architect, or another qualified professional whose name shall appear on the final submission.

What are the Main Elements of an FCP?

1. Priority Areas Map
2. Forest Conservation Worksheet
   (forest retention, reforestation, and afforestation calculations)
3. Forest Conservation Plan Map
4. Long-term Forest Protection Plan
5. Planting Plan

Mapping Priority Areas

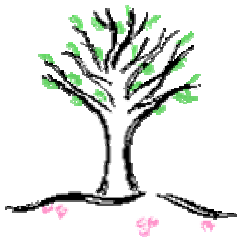
To create a Forest Conservation Plan, qualified professionals must determine *where* to preserve forest within the site. This step requires the identification of priority areas — areas that have the highest ecological value. The completed Forest Stand Delineation graphically presents this information about the site under consideration. By using the FSD as a main reference, foresters can see where priority areas are located.

The following land-types are deemed priority areas for forest protection and restoration:

- 100-year floodplains
- Intermittent and perennial streams and their buffers
- Steep slopes (greater than 25 percent grade)
- Critical habitats for endangered species
- Non-tidal wetlands
- Contiguous forest that connects the largest undeveloped or most vegetated tracts of land within and adjacent to the site
- Coastal bays and their buffers

The following forest stands or individual trees are also deemed as priority items for retention:

- Forest stands identified as priority areas by local or county authorities
- Trees, plants, and shrubs listed on the State or Federal lists of rare, threatened, or endangered species
- Trees associated with a historic site or structure
- Champion trees
- Specimen trees

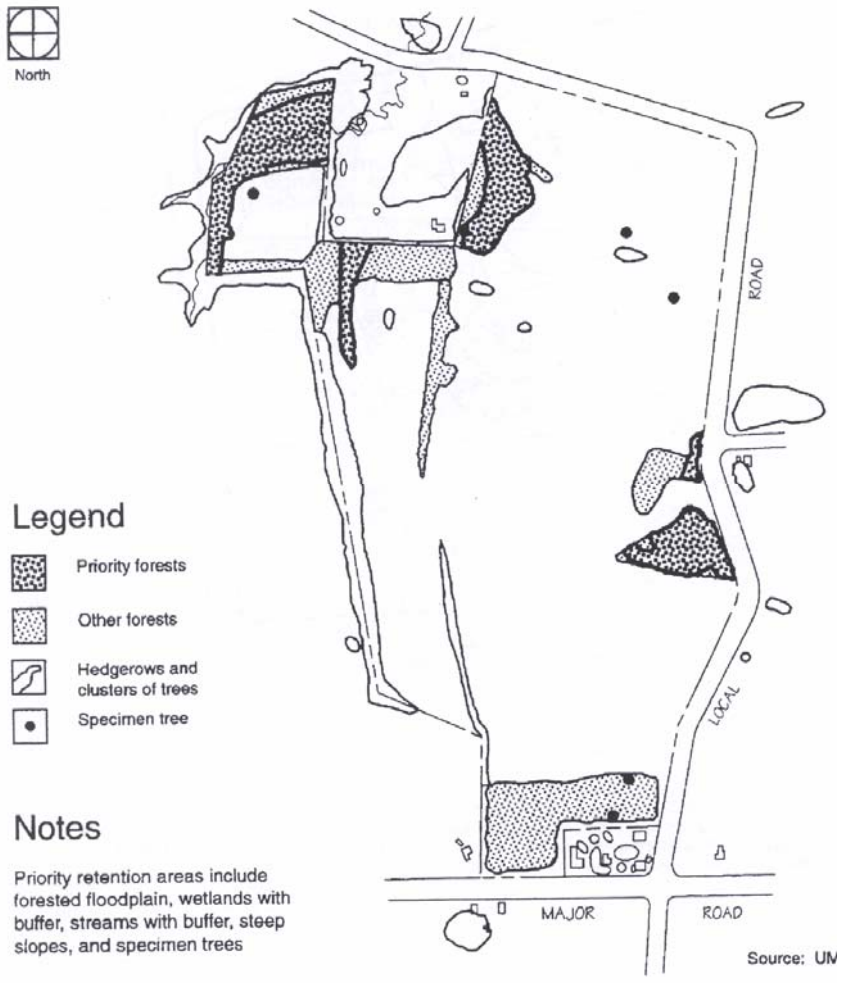


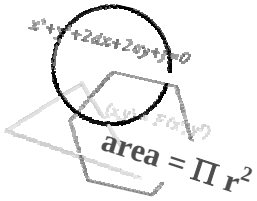
Definition

Stream Buffer: all lands lying within 50 feet of any stream, measured from the top of the bank

Mapping Priority Areas

A map format (like the one presented to the right) fosters understanding of where environmentally sensitive areas are located and permits a quick visual comparison between the amount of land covered by priority areas and the overall size of the site. Acreage of priority areas are calculated and presented in a tabular form as well in order to gain more precise measures of their total land area.

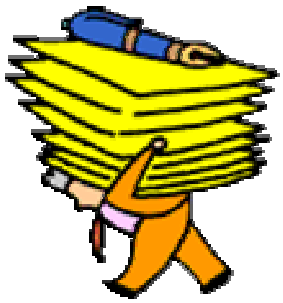




Source: Maryland State Forest Conservation Technical Manual

Conservation Worksheet

Determining Retention and Planting Acreage



The Forest Conservation Act establishes minimum standards for the *amount* of forest which must exist on a site at the completion of a development project. This minimum amount of forest cover is called a threshold, which varies according to land-use category.

The Forest Conservation Worksheet is used to calculate *how many* acres of forest must be present on a development site after construction has occurred. The appropriate number of acres might be reached by leaving forest untouched, reforestation, afforestation, or some combination of these techniques. In sum, the worksheet organizes site forest data and provides formulas so that those preparing the Forest Conservation Plan can determine if and how developers must compensate for clearing forests.

Two types of thresholds exist for each land-use category: Conservation Thresholds and Afforestation Thresholds. Thresholds are expressed as a percentage of the Net Tract Area, and are displayed in the text box on the following page. The threshold system is designed to provide incentives to developers for forest conservation while permitting some flexibility for clearance.

Definitions

Afforestation: the conversion of bare or cultivated land into forest.

Reforestation: the restoration (replanting) of a forest that had been reduced by fire or cutting

Afforestation Threshold: the target level of forest cover on a parcel of land with few or no trees. (Developers must plant up to the threshold level, even if no trees have been cut).

Conservation Threshold: a benchmark percentage of the Net Tract Area by which replanting acreage is calculated. (Developers are required to abide by the rules of this threshold only if trees have been cut). Note: The Conservation Threshold is better explained through examples, which are shown in the following pages.

Net Tract Area: the total area of a site, including both forested and non-forested areas, to the nearest one-tenth acre, reduced by that area where forest clearing is prohibited by another local ordinance or program.

Conservation Worksheet

The box below presents the conservation thresholds and afforestation thresholds for the six land-use types established by the Forest Conservation Act. Also included are descriptions of each of the categories. Percentages below apply to the Net Tract Area of a site.

Land-Use Thresholds

Land Use Type	Conservation Threshold	Afforestation Threshold
Agricultural and Resources Areas	50%	20%
Medium Density Residential Areas	25%	20%
Institutional Development Areas	20%	15%
High Density Residential Areas	20%	15%
Mixed Use and Planned Unit Development Areas	15%	15%
Commercial and Industrial Use Areas	15%	15%

Agricultural and Resource Areas – undeveloped areas zoned for densities of less than or equal to one dwelling unit per five acres.

Medium Density Residential Areas – areas zoned for densities greater than one dwelling unit per five acres and less than or equal to one dwelling unit per acre, including both existing and planned development and their associated infrastructure, such as roads, utilities, and water and sewer service.

Institutional Development Areas – schools, colleges, universities, military installations, transportation facilities, utility and sewer projects, government offices and facilities, golf courses, recreation areas, parks, and cemeteries.

High Density Residential Areas – areas zoned for densitites greater than one dwelling unit per acre, including both existing and planned development and their associated infrastructure, such as roads, utilities, and water and sewer service.

Mixed Use Development Areas – single, relatively high density development projects, usually commercial in nature, which include two or more types of uses.

Planned Unit Development Areas – developments comprising a combination of land uses or varying intensities of the same land use in accordance with an integrated plan that provides flexibility in land use design approved by the local jurisdiction with at least 20% of the land permanently dedicated to open space.

Commercial and Industrial Use Areas – manufacturing operations, office complexes, shopping centers, and other similar uses and their associated storage areas, yards, and parking areas.

Source: Maryland State Forest Conservation Technical Manual

Conservation Worksheet

Reforestation Requirements

1. In order to avoid reforestation requirements, a developer must retain at least 20% of the forest acreage **above** the Conservation Threshold. This is referred to as the **Break-Even Point**.

2. Forest Area cleared above the Conservation Threshold must be replaced by planting 1/4 acre per acre cleared on the site.

3. Forest area cleared below the Conservation Threshold must be replaced by planting two acres for each acre cleared.

Conservation Worksheet

Determining the Conservation Threshold and Break-Even Point

The best way to understand the Worksheet and the associated calculations is to look at a couple of examples.

Example A. Woodland Farms Subdivision

Site Information

Land Use Category:	Medium Density Residential
Net Tract Area:	100 acres
Forested Area:	70 acres
Area of Forest to be Cleared:	30 acres

Calculations

Conservation Threshold: 25% x 100 acres = 25 acres

Forest Acres Above Conservation Threshold:
70 acres forest – 25 acres (Conservation Threshold) = 45 acres

Break-Even Point:
(20% of acres above Conservation Threshold)
45 acres x 20% = 9 acres
25 acres (Conservation Threshold) + 9 acres (break-even rule) = 34 acres

Conclusion

A total of 34 acres of the original 70 acres of forest land must be retained by the developer in order to avoid a reforestation requirement for forest clearing. Since the developer plans to clear 30 acres, 40 acres will remain and he will not have to reforest the site.

Conservation Worksheet

Example B. Bluebird Hill Subdivision

Site Information

Land Use Category:	Medium Density Residential
Net Tract Area:	100 acres
Forested Area:	15 acres
Afforestation Threshold:	20% = 20 acres
Area of Forest to be Cleared:	5 acres

Calculations

Afforestation Requirement:
100 acres x 20% = 20 acres must be forested
20 acres (required) – 15 acres (existing) = 5 acres must be afforested

Reforestation Requirement:
Area Cleared Below Afforestation Threshold:
5 acres x 2 (factor for forest replanting below Conservation Threshold) = 10 acres

Total planting requirements:	5 acres Afforestation
	10 acres Reforestation
	_____
	15 acres

Conclusion

In this example, a 100-acre area tract has only 15 acres of forest cover prior to development. This means that the developer must meet the afforestation threshold by planting five acres of new trees. Yet he must also reforest because he has chosen to cut down five acres. Following the same formula as when clearing below the conservation threshold, the developer must multiply the acreage cleared by two, thereby reforesting 10 additional acres.

Conservation Worksheet

To the right is an example Forest Conservation Worksheet for a 189.7-acre medium density residential project with 34.35 acres of existing forest and 3.45 acres proposed to be cleared.

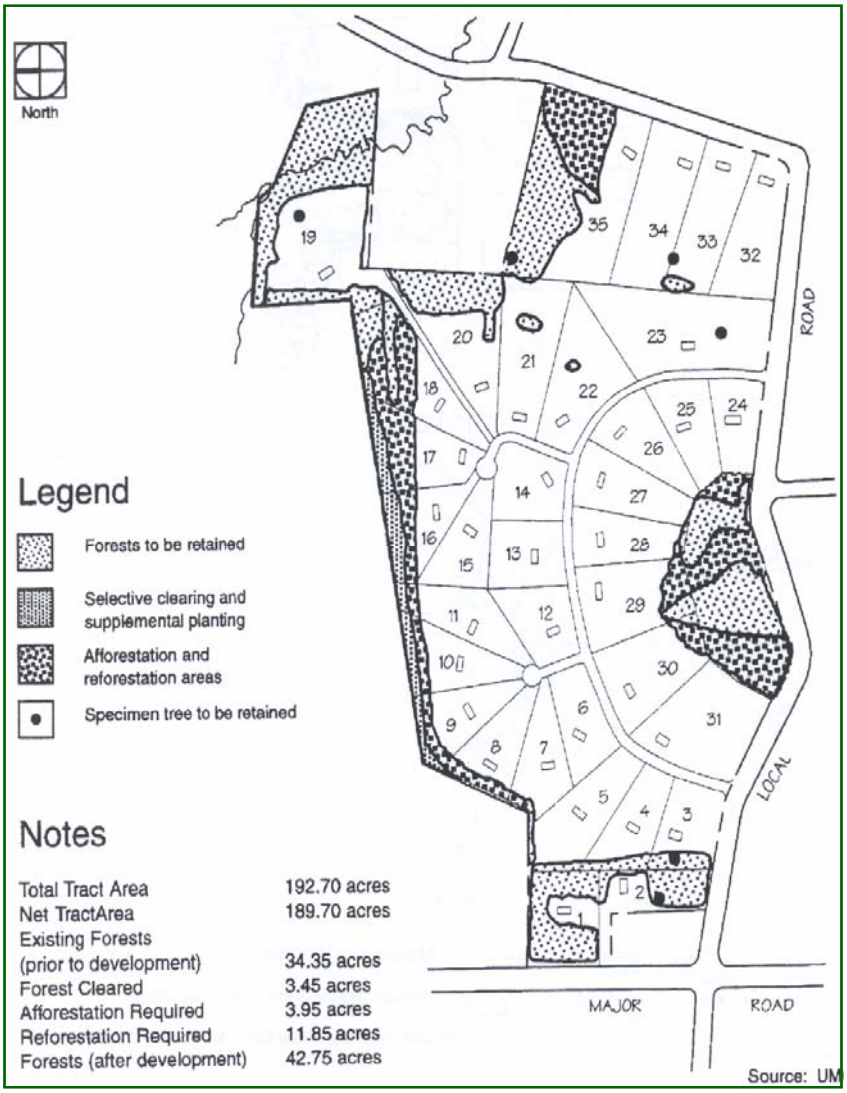
Note: Use 0 for all negative numbers that result from the calculations.	
Net Tract Area	
A. *Total Tract Area*	A= *189.70*
B. *Deductions* (Critical Area, area restricted by local ordinance or program)	B= *0.00*
C. *Net Tract Area* Net Tract Area = Total Tract (A) - Deductions (B)	C= *189.70*
Land Use Category: *Medium Density Residential*	
D. *Afforestation Threshold* (Net Tract Area [C] x ____%)	D= 37.94
E. *Conservation Threshold* (Net Tract Area [C] x ____%)	E= 47.43
Existing Forest Cover	
F. *Existing Forest Cover within the Net Tract Area*	F= 34.35
G. *Area of Forest Above Conservation Threshold* If the Existing Forest Cover (F) is greater than the Conservation Threshold (E), then G = F – E; otherwise G = 0.	G= *0.00*
Breakeven Point	
H. *Breakeven Point* (Amount of forest that must be retained so that no mitigation is required) (1) If the Area of Forest Above Conservation Threshold (G) is greater than 0, then H = (0.2 x the Area of Forest Above Conservation Threshold (G)) + the Conservation Threshold (E); (2) If the Area of Forest Above Conservation Threshold (G) is equal to 0, then H= Existing Forest Cover (F)	H= 34.35
I. *Forest Clearing Permitted Without Mitigation* I = Existing Forest Cover (F) – Breakeven point (H)	I= *0.00*
Proposed Forest Clearing	
J. *Total Area of Forest to be Cleared*	J= 3.45
K. *Total Area of Forest to be Retained* K = Existing Forest Cover (F) – Forest to be Cleared (J)	K= 30.90
Planting Requirements	
If the Total Area of Forest to be Retained (K) is at or above the Breakeven Point (H), no planting is required, and no further calculations are necessary (L=0, M=0, N=0, P=0, Q=0, R=0). Otherwise, calculate the planting requirement(s) as follows:	
L. *Reforestation for Clearing Above the Conservation Threshold* (1) If the Total Area of Forest to be Retained (K) is greater than the Conservation Threshold (E), then L = the Area of Forest to be Cleared (J) x 0.25; (2) If the Forest to be Retained (K) is less than or equal to the Conservation Threshold (E), then L = Area of Forest Above Conservation Threshold (G) x 0.25	L= *0.00*
M. *Reforestation for Clearing Below the Conservation Threshold* (1) If Existing Forest Cover (F) is greater than the Conservation Threshold (E) and the Forest to be Retained (K) is less than or equal to the Conservation Threshold (E), then M = 2.0 x (Conservation Threshold (E) – Forest to be Retained (K)) (2) If Existing Forest Cover (F) is less than or equal to the Conservation Threshold (E), then M = 2.0 x Forest to be Cleared (J)	M= *6.90*
N. *Credit for Retention Above the Conservation Threshold* If the area of Forest to be Retained (K) is greater than the Conservation Threshold (E), then N = K – E; Otherwise N=0	N= *0.00*
P. *Total Reforestation Required* P = L + M – N	P= *6.90*
Q. *Total Afforestation Required* If Existing Forest Cover (F) is less than the Afforestation Threshold (D), then Q = Afforestation Threshold (D) – Existing Forest Cover (F)	Q= 3.59
R. *Total Planting Requirement* R = P + Q	R= 10.49

Source: Maryland State Forest Conservation Technical Manual

Forest Conservation Plan Map

The Forest Conservation Plan (FCP) Map represents a comprehensive vision of the development site including how the developer plans to alter the land, and what areas of the forest he will clear, maintain, or enhance. Also displayed on the map are priority areas and individual specimen trees that have been selected for protection.

When creating the FCP Map, the qualified professional makes his or her official decisions about which forest land to preserve. He or she must synthesize findings from the Forest Stand Delineation about *where* priority forest should be retained and from the Conservation Worksheet about *how much* forest should be retained (and/or reforested). These decisions are then outlined in graphic form on the Forest Conservation Plan Map.



Source: Maryland State Forest Conservation Technical Manual

This map, along with supporting data and narrative, will be submitted to reviewing authorities. At this time citizens can comment on the plan. Pay special attention to whether priority areas are fully retained.

Visit: www.mdp.state.md.us/info/localplan/counties.html to find out how to contact your county planning department.

Refer to Section III, Part 2, "Organizing for Change" in *Influencing Development in Your Community* for suggestions on how to make your voice heard.

Ideally, forest retention areas, or portions of them, should be set aside as protected common open space, forming a network of adjacent forestlands or corridors, and not located on individual lots. Otherwise, homeowners might clear protected trees on their private land (knowingly or unknowingly) despite their special status.

Long-Term Protection Measures

After priority retention areas have been identified and staked, it is not enough to simply say these sensitive places are to be avoided during construction. Because construction activities are often intrusive to the forest system, the Forest Conservation Act requires that contractors incorporate protection strategies into their Forest Conservation Plans

Pre-construction activities, temporary protection measures, and permanent protection measures should all be considered.

Root pruning and fertilizing are examples of pre-construction activities. These measures aim to increase the wellbeing of trees and prepare them for higher stress. Prior to beginning construction, temporary devices such as fences or sediment controls are installed and remain throughout the construction phase. Some devices, like retaining walls and root aeration systems may stay for good. For example, if part of a root system is collapsed by a built road, permanent aeration may be necessary for the tree to remain healthy.

Once forest land has been assigned as a retention area, it is to be placed under *permanent* protection through a conservation easement.

A conservation easement is a legally-binding agreement in which the landowner foregoes the right to develop the land while retaining full ownership.

Long-Term Protection Measures

The following checklist includes a host of protection procedures. With knowledge of the forest protection measures a developer is expected to carry out as part of an approved FCP, citizens can serve as watchdogs of construction activities. Perhaps the most visible aspect is protection along a forest edge. Be aware of this border and watch that contractors respect the protection boundaries. Refer to *Influencing Development in Your Community* to obtain more information about "Monitoring and Enforcement of Development Projects."

Forest and Tree Protection Checklist

Step 1: Pre-Construction Phase

Stress Reduction, if needed
__ Root pruning
__ Crown reduction or pruning
__ Watering
__ Fertilizing
__ Mulching

Temporary Forest Protection Devices
__ Forest protection fences or
__ Combined sediment control and tree protection
__ Forest Retention Area signs

Permanent Forest Protection Devices
__ Tree wells
__ Root aeration system
__ Retaining walls

Include On Site Plan
__ Forest Retention Areas
__ Isolated specimen trees
__ Employee parking areas
__ Equipment staging areas

Pre-Construction Meeting
__ Discuss penalties
__ Inspect installed protection devices

Step 2: Construction Phase

Monitor
__ Soil compaction
__ Root Injury
__ Trunk wounds
__ Limb injury
__ Flooded conditions
__ Drought conditions

Step 3: Post-Construction Phase

Stress Reduction
__ Root pruning
__ Crown reduction or pruning
__ Watering
__ Fertilizing
__ Mulching

Repair of Tree Damage
__ Root repair
__ Repair of dead limbs
__ Soil aeration

Other
__ Removal of dead or dying trees posing an immediate safety hazard
__ Removal of temporary tree protection structures
__ On-site inspection by approving authority
__ Amended FCP, if needed

Source: Maryland State Forest Conservation Technical Manual

Planting Plan

As explained earlier, the Forest Conservation Worksheet helps developers determine how much land must be reforested or afforested after construction. If a developer is required to plant new trees, then he or she must submit a Planting Plan, including a two-year Maintenance Agreement.

Source: USDA NRCS

When reforestation or afforestation is required, a developer must typically plant new trees onsite. If the applicant demonstrates that this cannot reasonably be done, he or she may plant the same acreage of trees offsite at an agreed location. If it is overly burdensome for an applicant to plant trees either onsite or offsite, there is a final alternative. The developer may pay a fee-in-lieu of planting to the Forest Conservation Fund of the approving authority, which covers the cost for local governments to plant trees offsite.

The Planting Plan proposes what kinds of trees to plant and the methods of planting, based upon a site assessment. Generally, developers should use species native to Maryland and genetic stock within a 100-mile radius that are acclimated to this area and resistant to local disease. A minimum of five different species is the norm for reforestation on a single site.

The Maintenance Agreement outlines the care-taking responsibilities of a developer once construction has been completed. The developer must monitor new stands that have been planted and keep protection devices in working order for a period of at least two years. Tasks that must be delegated include watering, fertilizing, battling disease, controlling competing vegetation, and replacing trees if too many die after reforestation.

Planting Plan

A Planting Plan is required as part of a developer's Forest Conservation Plan any time trees are cleared and must be replaced, or when new trees must be planted on a site to meet an afforestation requirement.

Every Planting Plan includes:

- A description of needed site preparation
- A list of tree species, size, and spacing for planting
- A binding two-year Maintenance Agreement describing maintenance plans for survival of tree plantings

When and Where Should Forests Be Planted?

Forests must be planted within one year or two growing seasons after a development project is completed.

Re-planting or new planting should establish or improve forests in the same areas that are priorities for forest retention:

- 50-foot stream buffers
- Buffers adjacent to critical habitat
- Buffers between differing land-uses and adjacent to highways and utility rights-of-way
- 100-year floodplains
- Corridors up to 300 feet wide
- Steeply sloping ground and highly erodible soils
- Areas adjacent to existing large forest tracts

A Planting Plan is part of the Forest Conservation Plan, which is available at the County or Municipal Planning Office. If you discover that a developer is not following the objectives in the Planting Plan, you should notify authorities in the Planning Office. If additional follow-up is needed, you may also contact the Maryland Department of Natural Resources. Refer to pages 54-55 in *Influencing Development in Your Community* for more direction with respect to documenting violations and notifying the proper authorities.

Problems that you might witness related to the planting plan are failing to plant enough trees, planting in the wrong locations, and planting the wrong types of species.

Planting Plan

What Kind of Trees Should be Planted?

Transplanted or nursery stock greater than 1.5 inches DBH (diameter at breast height, that is, trunk diameter 4.5 feet from the ground) is the preferred planting material when sites are managed and monitored carefully.

Other planting materials are also permitted under certain conditions and with certain restrictions.

Whip and Seedling Stock should be used when sites will not be carefully monitored. Whips or seedlings must be planted at a minimum density of 700 plants per acre, and at least 55 percent of these plants must remain at the end of the 2-year management period.

Source: National Oceanic and Atmospheric Administration

Landscaping is permitted if the site is 2,500 square feet or larger and at least 35 feet wide and if certain criteria are fulfilled. In sum, developers or landowners must identify long-term management measures to ensure survival; the landscaped forest must include canopy, understory, and ground cover; and the landscape proposal must be approved by the proper authority.

Natural Regeneration only suffices as a reforestation or afforestation technique when 75 percent of the proposed planting area is located within 50 feet of adjoining forest, and the adjoining forest may not be covered by more than 20 percent cover of invasive exotic species. Supplemental planting must ensure a density of 400 seedlings per acre.

IV. Influencing Development Plans to Protect Forests

This section provides guidance for effectively exercising your rights as a citizen to influence development projects for the protection of forests.

The Maryland Forest Conservation Act outlines where development should be restricted (priority areas) and establishes targets for forest cover. By taking the actions described below, you can help ensure that developers meet or exceed the standards of the Forest Conservation Act.

There are two fundamental ways to influence the development process to protect forests:

1) First, you can apply pressure during the development planning stages. The earlier a community begins to make its voice heard, the better chance it has of meeting with success. Keep in mind that the window of opportunity to provide your input on forest conservation is limited and potentially quite short. Local authorities have a *maximum* of 45 days to approve a developer's Forest Conservation Plan. It is imperative that you maintain frequent contact with the planning coordinator assigned to the development project in question to become aware of this approval deadline and other project deadlines and milestones.

   You might ask that the coordinator call you as soon as the Forest Conservation Plan has been submitted, or you might call as often as once a week. Keep on the lookout for public hearings held by the Planning Board. If one is not scheduled, you should press for one. Organize your friends and colleagues and hone your position.

2) Second, once a project has been approved, you can monitor development activities. In the Forest Conservation Plan, a developer must demonstrate which forests will be retained, how they will be protected during construction, what planting methods they will use, and how they will maintain new plantings. Examine the Forest Conservation Plan, keeping in mind the explanations presented in this guide, and make sure that developers stick to their plans. You can make sure that words and drawings are translated into responsible action.

Speak Out in Favor of Forest Conservation

Join with Others in Your Community to Support Forest Conservation

Refer to *Influencing Development in Your Community* for guidance with regards to providing effective input and organizing your community — see Section III, Part 2, "Organizing for Change."

How can citizens influence development plans to offer greater protection for forests?

Offer alternative design ideas:

Even if a developer is complying with the regulations of the Forest Conservation Act, you and members of your community may still be dissatisfied with the development project. Remember that the Forest Conservation Act establishes *minimum* forest cover standards. You might feel that a greater amount of forest should be protected. An effective way to do that is to offer alternative ideas and good arguments that show saving more trees is possible.

Some of these alternative ideas are explored in the pages ahead:

- Clustering Development
- Reducing Parking Coverage
- Narrowing Street Widths and Rights-of-Way

Lobby your county executives and/or commissioner:

In general, it is also important to let local elected officials know that you support strong forest protection measures. You can communicate with them most effectively by gathering details about a project's compliance with Forest Conservation requirements, citing a project's shortcomings, and offering constructive recommendations. With this information in hand, you can also assess whether you believe regulations need to be strengthened, and lobby for stronger regulations.

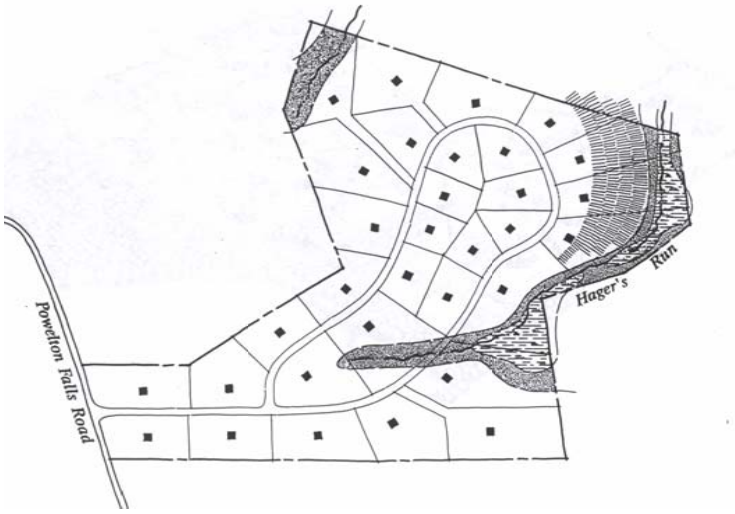
Encouraging more efficient land-use planning before development occurs is key to saving our forests. Convincing public officials to institute policies such as urban revitalization (known as infill) and strong agricultural zoning conserves forest land that would otherwise be cleared for development. More detailed explanations of anti-sprawl development patterns are located in *Influencing Development in Your Community*.

Clustering Development

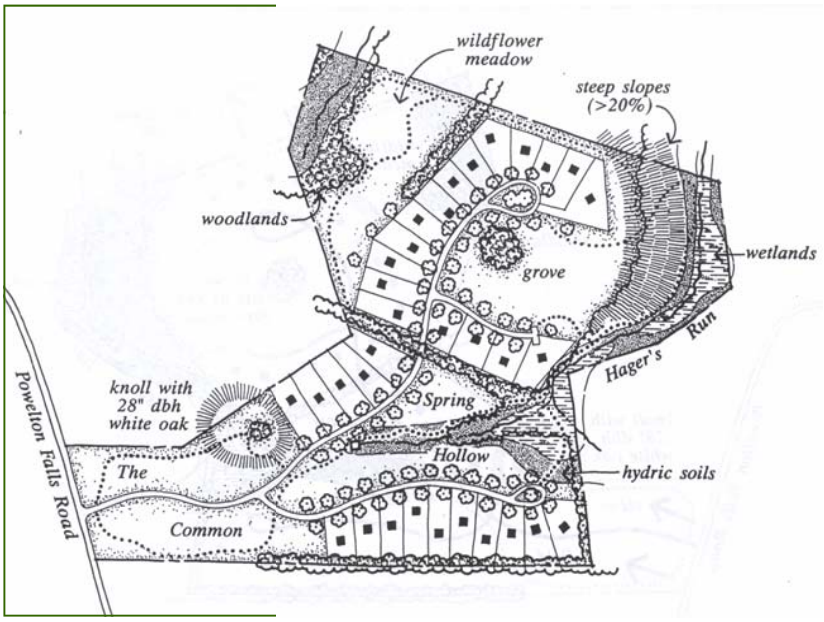
Clustering is defined as a form of development where the buildings in a project are grouped together into compact arrangements, or clusters, while other portions of the site are preserved as permanent open space.

Typically, a parcel of land zoned for residential development is divided in cookie-cutter fashion into as many equal lots as that parcel can hold (see figure at right). As a result, much of the entire site may be cleared of forest. The cluster subdivision, otherwise known as *open-space subdivisions* (shown below) can preserve ecological areas and other features on the development site, and improve the character of the neighborhood. Rather than settling for cookie-cutter development across an entire tract of land, it is possible to create a community with land set aside for woodlands, meadows, farmland, and historical sites.

Lots Not Clustered



Lots Clustered



Source: Randall G. Arendt, Conservation Design for Subdivisions: A Practical Guide to Creating Open Space Networks, Island Press, 1996.

Clustering Development

Below is a comparison of conventional subdivision design versus clustered subdivision design. Our subject is a place called Remlik Hall Farm, located near the hamlet of Remlik in Middlesex, Virginia, approximately 70 miles southeast of Fredericksburg. As this example will demonstrate, clustering development promotes the conservation of undeveloped land and reduces construction costs.

The first plan depicts a layout of residential lots typical of conventional sub-divisions. It contains a total of 84 lots: 19 one-acre lots, 58 two– to four-acre lots, and seven lots 5– to 15-acres in size. This sprawling development pattern consumes 287 acres, leaving only 41% of the site undeveloped.

Conventional Subdivision Plan

Adapted from Dodson and Associates and Land Ethics by Keith Stichler.

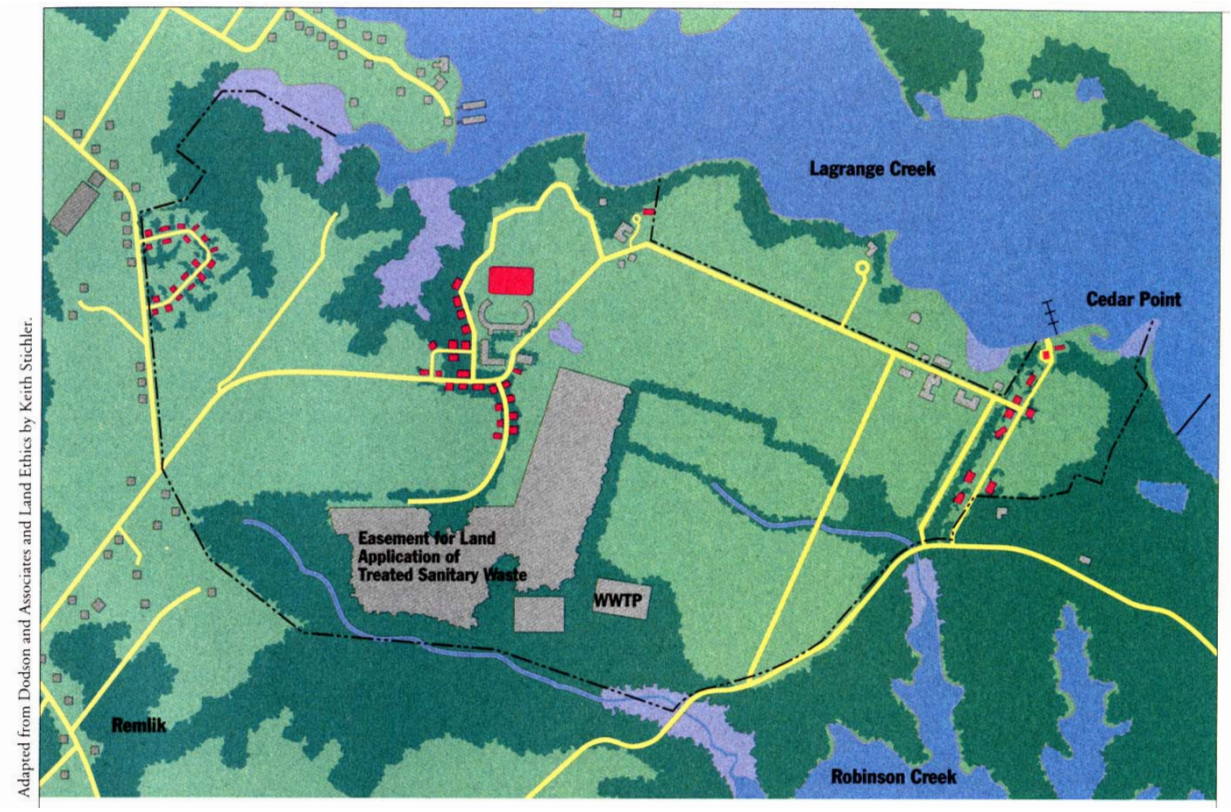
Source: A Better Way to Grow by George Maurer, Chesapeake Bay Foundation

Clustering Development

The second plan below depicts the cluster subdivision alternative for Remlik Hall, which contains 52 lots in three clusters. The two westernmost clusters contain a total of 44 lots with a minimum of 7,500-square feet, or slightly less than one-sixth of an acre. The third cluster of homes are designed as high-end residences that occupy lots of approximately one-acre each.

The cluster plan preserves rural character, field and shoreline vistas, and large acreages of forest and workable farmland for the enjoyment of all residents. In contrast to the conventional development plan, it consumes only 69 acres, leaving 86% of the site in forest and farmland.

Cluster Subdivision Plan



Source: A Better Way to Grow by George Maurer, Chesapeake Bay Foundation

Clustering Development

The table below compares the Remlik Farm Conventional Development Plan and Cluster Development Plan.

Total Site Area = 490.15 acres	Existing Conditions	Conventional	Cluster
Total Developed Land	38.41 acres (7.8%)	287.41 acres (58.6%)	69.41 acres (14.2%)
Roads and Driveways	8.89 acres	19.72 acres	11.75 acres
Undeveloped Land	451.74 acres (92.2%)	202.74 acres (41.4%)	420.64 acres (85.8%)
Total Costs (Engineering, Road Construction, and Sewage and Water)	___	$1,229,030	$594,550

Source: A Better Way to Grow by George Maurer, Chesapeake Bay Foundation

In addition to saving money on infrastructure costs and preserving more undeveloped land, cluster / open space development offers a host of other advantages over conventional development.

Developers of cluster subdivisions normally meet with an easier and less costly review process because they have fewer environmental regulations to satisfy. Further, studies have found that homes in open-space subdivisions yield higher sales prices and appreciate faster than homes in conventional subdivisions. Finally, local governments do not face as much demand for public space such as parklands and playing field since these are often incorporated into cluster neighborhoods.

As mentioned earlier, cluster development saves more forest cover on site. As a result, these additional forests act as enhanced buffers for other sensitive areas such as wetlands and steep slopes. They reduce run-off and erosion, and also provide habitat areas and ecological corridors for local wildlife.

Last but not least, cluster development permits more areas for recreation and the compact arrangement of homes fosters enhanced community interaction.

Reducing Parking Coverage

There are various ways to reduce parking coverage on both residential and commercial sites in order to minimize forest clearing.

Source: A Better Way to Grow, Chesapeake Bay Foundation

1. Build parking structures that condense the amount of land needed for parking space and relieve development pressure on forest land. Parking structures include multiple-floor parking garages and "tuck-under" parking—a design which locates some spaces beneath a building's first floor.
2. Encourage car-sharing arrangements, which can significantly reduce or even avoid the construction of new spaces. Pay-per use car services have been active in Europe for some time and are beginning to catch on in some American cities. Studies have shown that each shared vehicle replaces between four and eight privately owned automobiles. With fewer cars on the road, fewer parking spaces are needed to accommodate them.
3. Decrease parking fees for people who carpool; provide proper bicycle storage and lanes for those who travel by bike; and offer transit subsidies to those who elect to take public transportation. All of these strategies strive to discourage driving and reduce the demand for parking space.
4. Reduce the number of spaces required per home, office, or store. The standard number of spaces required by a local government may be excessive, and may not reflect the availability of transportation alternatives or commuter trip reduction programs. See the table below for variations in zoning standards amongst different cities.

Jurisdiction	HOME: Minimum # of Spaces per Unit	OFFICE: Minimum # of Spaces per 1,000 Square Feet of Floor Space	RETAIL: Minimum # of Spaces per 1,000 Square Feet of Floor Space
Arlington County, VA	1.0	4.0 on first floor; 2.8 on additional floors	4.0
City of Oakland, CA	Varies by location between 0-2.0	Varies by location between 0-1.66	Varies by location between 0-5.0
City of Portland, OR	1.0	2.0	2.0
City of Vancouver, WA	1.0	2.5	2.86 up to 1,500 GSF; 5.0 beyond 1,500 GSF

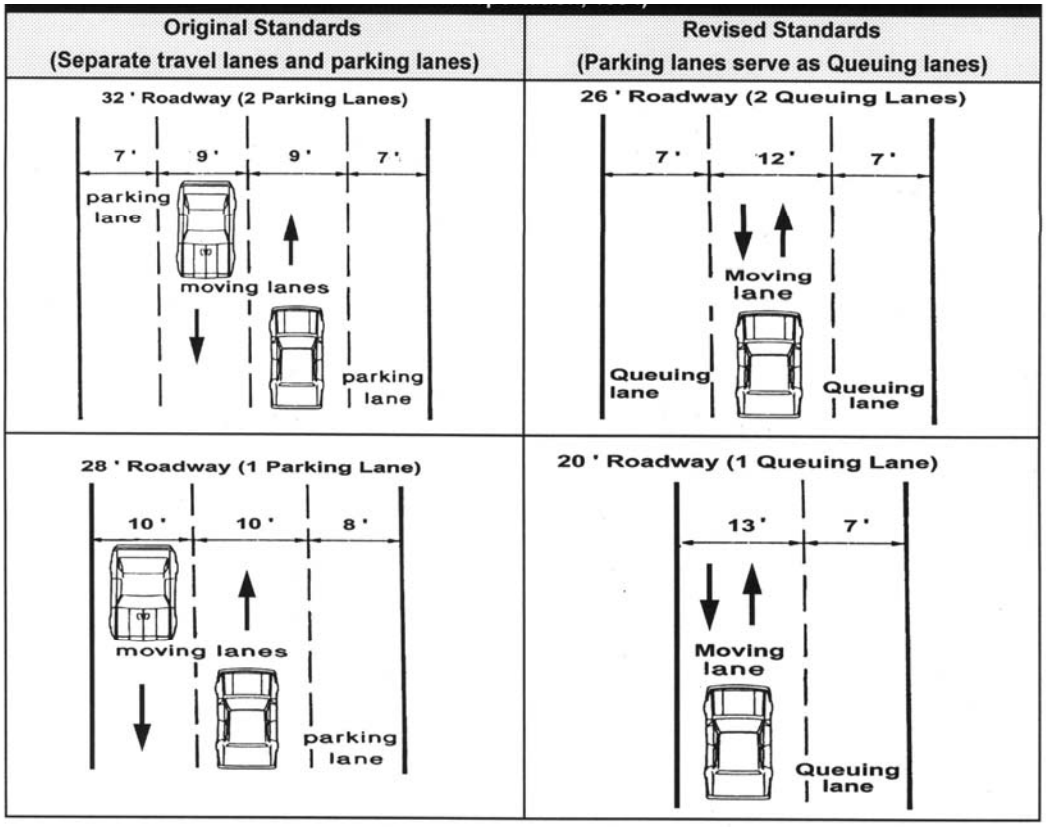
Source: Building Healthier Neighborhoods with Metrorail: Rethinking Parking Policies, Chesapeake Bay Foundation

Narrowing Street Widths

This practice involves promoting the use of narrower streets to reduce the amount of impervious cover created by new residential development, and in turn, to minimize the amount of forest cleared for road construction.

Currently, many communities require wide residential streets that are 32, 36 and even 40 feet wide. These wide streets provide two parking lanes and two moving lanes, but provide much more parking than is actually necessary. In many residential settings, streets can be as narrow as 22 to 26 feet wide without sacrificing emergency access, on-street parking or vehicular and pedestrian safety. Even narrower access streets or shared driveways can be used when only a handful of homes are served.

Many communities require wide residential streets as a standard element of their local road and zoning standards. In this case, citizens will have to work for revisions to current local road standards by lobbying local elected officials and speaking with their Planning and Zoning Office.



Source: http://www.stormwatercenter.net

V. Information Resources

County Government Contacts:

The following Maryland Department of Planning website provides a profile of planning activities for each county in Maryland as well as a link to the planning department of each county with phone numbers and addresses.

www.mdp.state .md.us/info/local/plan/counties.html

Or see your local telephone directory for the telephone number of your city or county's department of planning.

State Government Contacts:

Forest Service
Maryland Department of Natural Resources
580 Taylor Avenue
Annapolis, MD 21401
410-260-8531
www.dnr.state.md.us/forests/

The Forest Service's mission is to conserve and enhance the quality, quantity, productivity and biological diversity of the forest and tree resources of Maryland. It also strives to provide leadership and technical and financial support to inform, involve and empower citizens, local governments and private organizations to take action necessary to accomplish these goals.

If a county or municipality is not fully implementing or enforcing the Forest Conservation Act, citizens should contact this agency.

Organizations and Websites

These websites present information related to forest conservation and better site design. For websites regarding development, land use, and smart growth, refer to the "Resources" section of *Influencing Development in Your Community*.

American Forests www.americanforests.org
Specializes in planting trees for environmental restoration and communicates strategies in urban forestry

Community and Environmental Defense Services www.ceds.org
Legal consulting group for citizens on issues of land development.

ESDPD www.chesapeakebay.net/data/esdp/mtp1.cfm
This database contains an overview of Environmentally Sustainable Design Practices and titles of various publications about this subject.

Forest Stewardship Council www.fscus.org
The FSC promotes responsible forest management globally by certifying forest products that meet the most rigorous standards in the world.

Green Home Building www.greenhomebuilding.com/saveforests
This site contains a wide range of information on sustainable architecture and natural building.

Green Space Design www.greenspacedesign.org
Provides information on preserving open space while allowing for growth.

MD Environmental Design Program www.dnr.state.md.us/ed/index.html
Provides local governments and interested citizens with the information and on-site technical assistance they need to identify, implement, and evaluate actions to enhance and restore natural resources in and around developed environments.

National Arbor Day Foundation www.arborday.org
Sponsors and manages tree planting and forest conservation programs.

Scenic America www.scenic.org/trees
Dedicated to preserving and enhancing the scenic character of America's communities and countryside, including forested landscape.

Sierra Club www.sierraclub.org
Addresses a host of issues associated with resource conservation. Site contains pages discussing forest protection and sprawl issues.

Trust for Public Land www.trustforpublicland.org
Works with landowners, governments, and community groups to leave open space in neighborhoods and to preserve historic landmarks.

Books and Other Publications

Below we list a selected group of publications that might be useful for citizens working to conserve forest and influence development in their communities. In most cases, publisher information and abstracts can be viewed on the following website: *http://www.chesapeakebay.net/data/esdp/mtp1.cfm*

Here, for space reasons, we relay only titles and authors.

Assorted Readings

Arendt, Randall. *Conservation Design for Subdivisions*.

Arendt, Randall. *Creating Open Space Networks*.

Arendt, Randall. *Growing Greener: Putting Conservation into Local Plans and Ordinances*.

Brown, Whitney E., et. al. *Better Site Design: A Handbook for Changing Development Rules in Your Community*.

Chellman, Chester E. *Traditional Neighborhood Development: Street Design Guidelines*.

Cooksey, Richard A. and Albert H. Todd. *Conserving the Forests of the Chesapeake: The Status, Trends, and Importance for the Bay's Sustainable Future.*

Duerksen, Chris. *Tree Conservation Ordinances: Land Use Regulations Go Green*.

Gray, Gerald J., Maia J. Enzer, and Jonathan Kusel (Editors). *Understanding Community-Based Forest Ecosystem Management.*

Greenfeld, Jennifer, et al. *Forest Conservation Manual: Guidance for the Conservation of Maryland's Forests During Land Use Changes*, Under the 1991 Forest Conservation Act (First Edition, 1991).

Hall, Kenneth B. and Gerald A. Porterfield. *Community by Design: New Urbanism for Suburbs and Small Communities.*

Howell, Ginger Page and Tod Ericson. *State Forest Conservation Technical Manual* (Third Edition, 1997).

Maurer, George. A Better Way to Grow. *Chesapeake Bay Foundation*, 1998.

Petit, Jack, Debra L. Bassert, and Cheryl Kollin. *Building Greener Neighborhoods*.

Phillips, Leonard E. Jr. *Urban Trees: A Guide for Selection, Maintenance, and Master Planning*.

CHESAPEAKE BAY FOUNDATION

Save the Bay

Founded in 1967, the Chesapeake Bay Foundation is the largest nonprofit conservation organization working solely to Save the Bay. CBF's mission is to restore and sustain the Chesapeake Bay's ecosystem by substantially improving the water quality and productivity of the watershed, with respect to water clarity, resilience of the system, and diversity and abundance of living resources, and to maintain a high quality of life for the people of the Chesapeake Bay region.

The Chesapeake Bay Foundation is a charitable, tax-exempt organization under Section 501(c)(3) of the Internal Revenue Code.

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