

Baltimore County Forest Conservation Technical Manual



Department of Environmental Protection and Sustainability
ENVIRONMENTAL IMPACT REVIEW | REVISED APRIL 2024



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I. INTRODUCTION

A. Baltimore County Forest Conservation Program Policy

The Maryland Forest Conservation Act was passed in 1991. In 1993, Baltimore County began implementing its local Forest Conservation program through Article 33 Title 6 of the Baltimore County Code, as well as supporting policies such as those outlined in this technical manual. This Forest Conservation Program supports the retention and enhancement of important forest and woodland resources through regulation of land development, including reforestation and afforestation where disturbance of forests is permitted. In Baltimore County, the implementation and enforcement of the Forest Conservation Act is the responsibility of the Department of Environmental Protection and Sustainability (DEPS or the Department). The Forest Conservation Act does not apply to land within the Chesapeake Bay Critical Area.

B. Forest Resources of Baltimore County

Forests and woodlands represent a significant percentage of land cover in Baltimore County and are key to maintaining good water and air quality as well as valuable wildlife habitat. At the inception of the Baltimore County Forest Conservation program in 1993, forests or some form of tree cover equaled 36.2% of land in Baltimore County. Since then, County forest cover has risen to 42.4% as of 2018, according to the most current Chesapeake Bay Program land data. Figure 1 shows the geographical distribution of forests and woodlands within Baltimore County based on 2018 aerial photography. Figure 2 shows the changes in forest cover in Baltimore County over the past century. Inside the Urban Rural Demarcation Line (URDL), 2018 forest cover is 9.4%, and outside the URDL 2018 forest cover is 33.0%.

Historic land conversion has had a detrimental impact on the quality and quantity of forest resources. As with most of the State of Maryland, there are no virgin forest stands within Baltimore County due to heavy logging and agricultural conversion in the 1800s. The largest and most mature blocks of forest are located on publicly owned land along the Gunpowder and Patapsco Rivers and Loch Raven, Prettyboy, and Liberty Reservoirs.

Land conversion coupled with urbanization has further fragmented the County's forests. Tree cover within the urbanized and development-zoned areas is less than in the rural portion of the County and makes up only 14% of total forest cover. Forest loss and fragmentation has significant impact on wildlife habitat and other functions of forest systems.

Wildlife corridors are another concern when considering the geographical distribution of forests. Due to fragmentation, large tracts of contiguous forest are sparse. However, through continued reforestation there is potential for connecting large tracts to form a functional network of wildlife corridors.

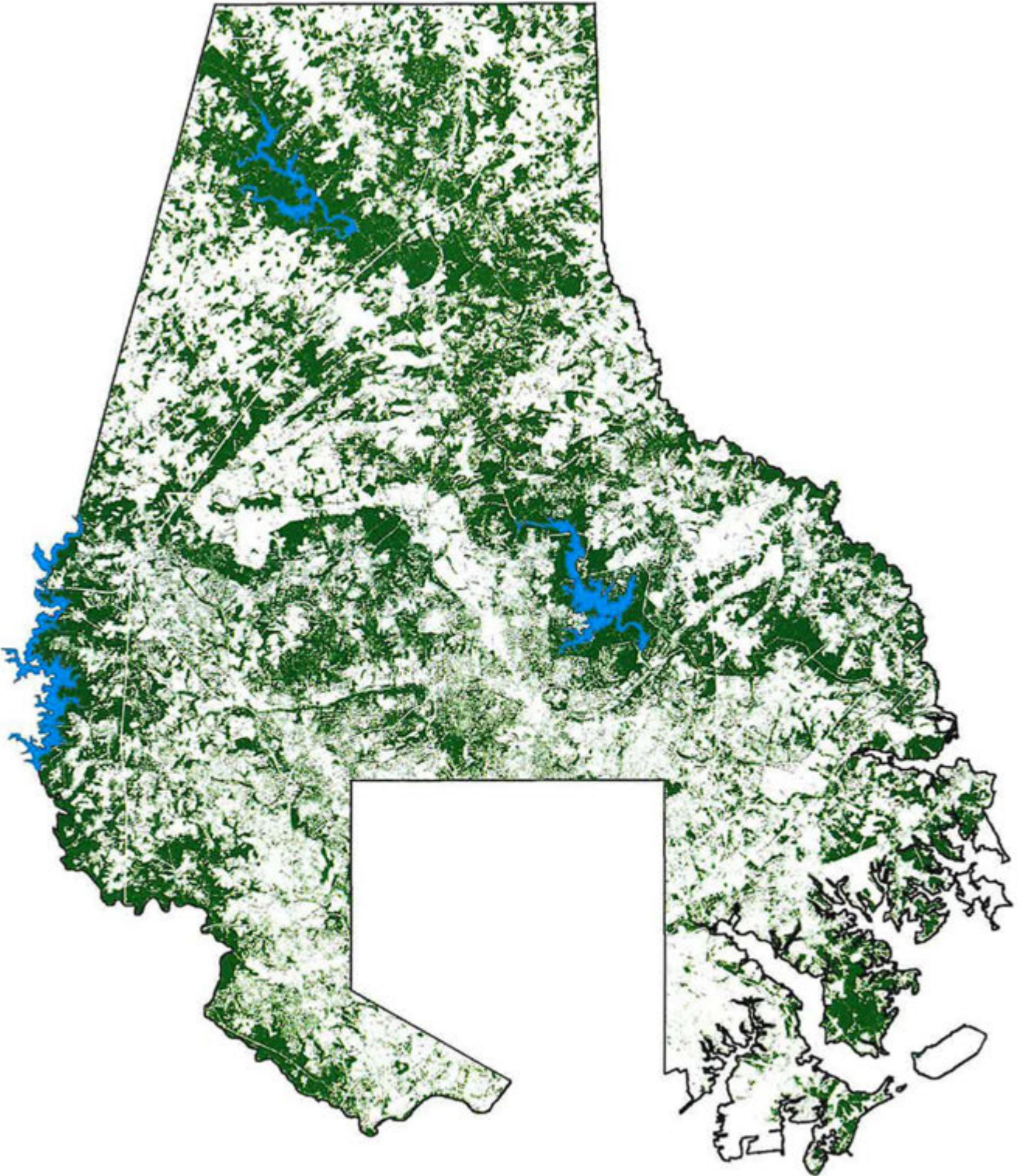


Figure 1: 2018 Forest Cover in Baltimore County
Source: Chesapeake Bay Program 1-meter resolution land cover data

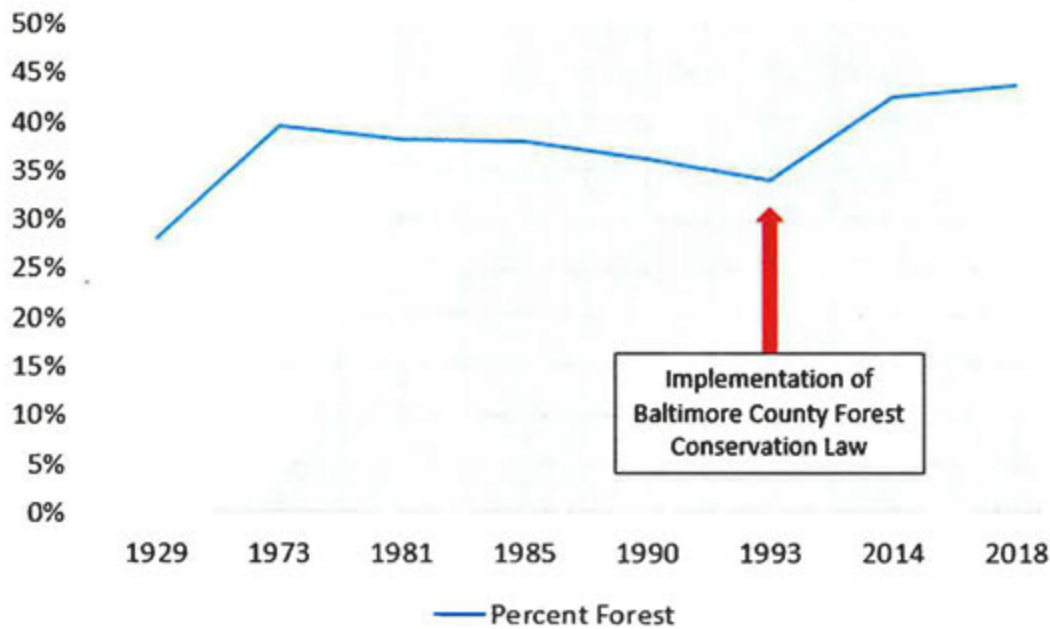


Figure 2: Forest cover in Baltimore County over time

C. Use of the Forest Conservation Manual

This manual was created to assist landowners, industry professionals, and Baltimore County regulatory agencies achieve compliance with the requirements of the State of Maryland Forest Conservation Act of 1991 (Natural Resources Article, Sections 5-1601 through 5-1613, Annotated Code of Maryland) and the Baltimore County regulations for forest conservation (Baltimore County Code, Sections 33-6-101 through 33-6-122). It provides guidelines for the site-specific assessments of the functions and environmental values of individual forested areas within the context of the County's comprehensive forest management goals.

This manual includes all required elements of the State Forest Conservation Manual but has been customized for Baltimore County. Modifications of the two major State-required components, the Forest Stand Delineation and the Forest Conservation Plan, have been made to adapt the manual to the needs and goals of forest conservation in Baltimore County while satisfying the intent and requirements of the State Act. Changes include:

1. The Forest Stand Delineation procedure has been modified to better characterize forest stands and compare their ecological value in order to prioritize their retention;

2. The forest protection components of the Forest Conservation Plan, as well as reforestation and afforestation standards, have been adjusted to better reflect the conservation of forests as functional units.

D. Application of the Forest Conservation Law

All persons conducting regulated activities for private or public projects on units of land 40,000 square feet or greater must have a County-approved Forest Stand Delineation (FSD) and Forest Conservation Plan (FCP), including a Forest Conservation Worksheet (FCW), completed by a licensed forester, licensed landscape architect or other qualified professional as specified in COMAR 08.19.06.01.

Regulated activities include any of the following not exempt under the Baltimore County Forest Conservation Act:

1. Subdivision;
2. Development, including construction;
3. Clearing, grubbing and grading;
4. An activity that requires an erosion and sediment control approval;
5. Certain project plans of County agencies;
6. Certain public utility projects; and
7. Certain commercial logging and timber harvesting operations.

No project plan, erosion and sediment control plan, grading plan, grading permit, or building permit for regulated activities may be approved until all forest conservation requirements have been met as described in this manual.

Exemptions are provided in Section 33-6-103(b) of the Forest Conservation Law as follows:

1. Highway construction activities under Natural Resources Article, Sec. 5-103, Annotated Code of Maryland.
2. Areas governed by the Chesapeake Bay Critical Area Protection Law, Natural Resources Article, Sec. 8-1801 through Sec. 8-1817, Annotated Code of Maryland.
3. Commercial logging and timber harvesting operations, including harvesting conducted subject to the forest conservation and management program under Tax-Property Article, Sec. 8-211, Annotated Code of Maryland, that are completed after July 1, 1991:
 - a. On property located within the Urban Rural Demarcation Line and in accordance with a current Forest Conservation and Management Agreement or a Forest Management Plan, either of which was accepted by the Maryland Department of Natural Resources prior to July 1, 1992, and which:
 - i. Has not been the subject of application for a grading or building permit for development within 5 years after the logging or harvesting operation; and

- ii. Is the subject of a declaration of intent as provided for in Section 33-6-104 of this article, approved by the Department; or
 - b. On property located beyond the Urban Rural Demarcation Line and in accordance with a current Forest Conservation and Management Agreement, Forest Management Plan or Forest Stewardship Resource Conservation Plan, any of which was approved by the Maryland Department of Natural Resources and the Department, and which:
 - i. Has not been the subject of application for a grading or building permit for development within 5 years after the logging or harvesting operation; and
 - ii. Is the subject of a declaration of intent as provided for in Section 33-6-104 of this article, approved by the Department.
- 4. Agricultural activities not resulting in a change in land use category, including agricultural support buildings and other related structures built using accepted best management practices, except that a person engaging in an agricultural activity clearing 20,000 square feet or greater of forest within a 1-year period, may not receive an agricultural exemption, unless the person files a declaration of intent as provided for in Section 33-6-104 of this article which includes:
 - a. A statement that the landowner or landowner's agent will practice agriculture on that portion of the property for 5 years from the date of the declaration; and
 - b. A sketch map of the property which shows the area to be cleared.
- 5. The cutting or clearing of public utility rights-of-way licensed under Article 78, Sec. 54A and 54B or Sec. 54-I, Annotated Code of Maryland, or land for electric generating stations licensed under Article 78, Sec. 54A and 54B or Sec. 54-I, Annotated Code of Maryland, if:
 - a. Required certificates of public convenience and necessity have been issued in accordance with Natural Resources Article, Sec. 5-1603(f), Annotated Code of Maryland; and
 - b. Cutting or clearing of the forest is conducted to minimize the loss of forest.
- 6. Routine maintenance or emergency repairs of public utility rights-of-way licensed under Article 78, Sec. 54A and 54B or Sec. 54-I, Annotated Code of Maryland.
- 7. Except for a public utility subject to (b)(6) of this section, routine maintenance or emergency repairs of a public utility right-of-way if:
 - a. The right-of-way existed before the effective date of this article; or
 - b. The initial construction of the right-of-way was approved under this article.
- 8. The construction of a public utility or highway within a utility right-of-way or highway right-of-way if:
 - a. The right-of-way existed before the effective date of this article; and
 - b. A forest does not exist within the right-of-way.
- 9. Activities, including construction, of a linear nature conducted by a public utility on more than one lot if the activity:
 - a. Is not within the boundaries of a proposed development;
 - b. Does not result in the cumulative cutting, clearing, or grading of more than 20,000 square feet of forest; and

- c. Does not result in the cutting, clearing, or grading of a forest that is subject to the requirements of a previous FCP approved under this article.
- 10. A forest clearing activity conducted on a single residential lot of any size if the lot existed before January 1, 1993 and if the activity:
 - a. Does not result in the cumulative cutting, clearing, or grading of more than 20,000 square feet of forest;
 - b. Does not result in the cutting, clearing, or grading of a forest that is subject to the requirements of an FCP approved under this article; and
 - c. Is the subject of a declaration of intent filed with the Department, as provided for in Section 33-6-104 of this article, stating that the lot will not be the subject of a regulated activity within 5 years of the cutting, clearing, or grading of forest.
- 11. Strip or deep mining of coal regulated under Natural Resources Article, Title 15, Subtitle 5, Annotated Code of Maryland.
- 12. Non-coal surface mining regulated under Natural Resources Article, Title 15, Subtitle 5, Annotated Code of Maryland.
- 13. An activity required for the purpose of constructing a dwelling house intended for the use of the owner, or a child or a grandchild of the owner, if the activity:
 - a. Does not result in the cutting, clearing, or grading of more than 20,000 square feet of forest; and
 - b. Is the subject of a declaration of intent filed with the Department, as provided for in Section 33-6-104 of this article, which states that transfer of ownership may result in a loss of exemption.
- 14. Development in accordance with a valid CRG approved before July 1, 1991 pursuant to Article 32 of the Baltimore County Code; or a valid final development plan approved before January 1, 1993 pursuant to the Baltimore County Zoning Regulations.
- 15. Development in accordance with a valid CRG approved before January 1, 1993 for a commercial or industrial CRG, pursuant to Article 32 of the Baltimore County Code.
- 16. Development in accordance with a valid development plan pursuant to Article 32 of the Baltimore County Code, which was accepted for filing before January 1, 1993.
- 17. Development in accordance with a valid 3-lot or less subdivision plan approved before January 1, 1993.
- 18. Grading and sediment control activities in accordance with a valid, unexpired grading plan, erosion and sediment control plan or grading permit approved by Baltimore County before January 1, 1993. Grading and sediment control activities for development projects must be in accordance with all appropriate State and County laws, rules and regulations.
- 19. Development in accordance with a valid planned unit development that, before January 1, 1993, has:
 - a. Met all requirements for planned unit development approval; and
 - b. Obtained initial development plan approval by the County.
- 20. A real estate transfer to provide a security, leasehold, or other legal or equitable interest, including a transfer of title, of a portion of a lot or parcel, if:
 - a. The transfer does not involve a change in land use, or new development or redevelopment, with associated land disturbing activities; and

- b. Both the grantor and grantee file a declaration of intent, as provided for in Section 33-6-103 of this article.
21. A County capital improvement project (other than Board of Education projects) for which the preliminary site design plan has been completed before January 1, 1993.
22. A County capital improvement project (other than Board of Education projects) which:
- a. Does not result in the cumulative cutting, clearing, or grading of more than 20,000 square feet of forest; and
 - b. Does not result in the cutting, clearing or grading of a forest that is subject to the requirements of a previous FCP approved under this article.

E. Summary of Forest Conservation Law Compliance Process

STEP 1: Forest Stand Delineation

The FSD is prepared as described in this manual by a licensed forester, licensed landscape architect, or other qualified professional as specified in COMAR 08.19.06.01. The completed FSD is submitted to the Environmental Impact Review (EIR) section of DEPS. EIR staff review the FSD for accuracy and completeness, which includes onsite verification of reported resources. Any missing elements or inaccuracies identified by EIR staff must be corrected in a revised FSD. Preparation of the FSD is described on page 11 of this manual.

STEP 2: Preliminary Forest Conservation Plan

Once the FSD is approved, a preliminary FCP as described in this manual is prepared by a licensed forester, licensed landscape architect, or other qualified professional as specified in COMAR .08.19.06.01. The preliminary FCP must include an FCW, show and quantify all proposed forest retention areas and any afforestation or reforestation areas, as well as indicate how any outstanding planting obligation will be met. The FCP must be submitted to EIR staff for review. EIR staff will issue comments reflecting any required revisions, if necessary. Preparation of the preliminary FCP is described starting on page 15 of this manual. If applying for a variance to Forest Conservation Law, the variance application should be submitted before or concurrently with the preliminary FCP. Contact EIR for more information about Forest Conservation variances.

STEP 3: Final Forest Conservation Plan

Once the preliminary FCP is approved and the project progresses to detailed design, a final FCP is submitted. The final FCP provides all details of forest protection and any required planting. Once the final FCP is approved, it must be submitted to EIR as a mylar to be signed by the EIR reviewer, assigned a FC plan number, and imaged for County records. This must occur prior to EIR approval of the final stage of the development activity (e.g., minor subdivision plan or permit).

STEP 4: Fulfillment of FCP approval requirements

Depending on the nature of the project, FCP review may result in an afforestation or reforestation requirement. Such requirements must be fulfilled through either onsite afforestation or reforestation, offsite planting options, the purchase of credit from a DEPS-approved forest planting bank, or through payment of a fee-in-lieu if no planting areas exist onsite and no bank credit is available. If planting, a security equal to 110% of the cost of implementing the final FCP must be posted with DEPS prior to any permit or minor subdivision approval. If purchasing bank credit, a bank authorization letter provided by EIR staff must be signed by the bank owner or representative as well as the developer or property owner. The signed letter must then be returned to EIR prior to any permit approval. If paying the fee-in-lieu, the fee must be paid to DEPS prior to any permit or minor subdivision approval.

II. FOREST STAND DELINEATION

Baltimore County Code, 33-6-107

A. Purpose

The purpose of the Forest Stand Delineation (FSD) is to identify, describe and evaluate forest vegetation on a site in order to make a preliminary assessment of the natural site constraints and forest value. The forest must be a minimum of 10,000 square feet in area and at least 50 feet wide to be included in the assessment. The FSD augments the Environmental Effects Report currently required by the Development Regulations in the Baltimore County Code, 32-4-224(a)(11) and 34-1-101(b), by providing a more detailed examination of the vegetation characteristics and structure of the forested sections of a site. An FSD is not required for properties or projects within the Chesapeake Bay Critical Area.

B. Submittal Requirements

1. Site constraints information on a site plan showing and quantifying total forest cover and delineating any forest stand breaks;
2. Forest Stand Assessment Data Sheets;
3. Summary Evaluation Narrative of Forest Site Characteristics.

C. Forest Stand Delineation Procedure

STEP 1: Provide Basic Information and Site Constraints

1. Name and address of the preparer of the plan, including verification of qualified professional certification;
2. Location or vicinity map;
3. Property boundaries;
4. Existing topography as shown on County GIS maps or other approved topographic maps, highlighting slopes greater than 25%;
5. Approximate 100-year floodplain limits or Baltimore County Department of Public Works & Transportation approved 100-year floodplain;
6. Soils mapped and labeled in accordance with the USDA NRCS Web Soil Survey;
7. Perennial and intermittent streams, seeps, ponds, or other water bodies on and within 200 feet of the development site's boundaries;
8. Wetlands;
9. Forest buffer limits, including adjustments for steep slopes and/or erodible soils in accordance with Section 33-3-111 of the County Code;
10. Existing land cover (e.g., forest, meadow, agriculture, etc.) on and within 200 feet of the development site;

11. Significant regulated plant or wildlife communities, according to the Natural Heritage Program of the Maryland Department of Natural Resources;
12. Existing well and sewage disposal systems on the development site;
13. Existing buildings and roads on the development site and within at least 200 feet of the site;
14. Designated historic structures or sites as per the Landmarks Preservation Commission or the Maryland Historical Trust Inventory;
15. Significant features (e.g., specimen trees, buildings, streetscaping, etc.) that may affect the development proposal;
16. Existing zoning of the development site.

STEP 2: Delineate Forest Stands

In the field, examine all forested areas and delineate all major tree stands. A stand is an aggregate of trees distinguished by differences in species composition or significant differences in age or structural features. Stands can also be differentiated by geographic or manmade barriers such as rivers or power lines. The boundaries between forest stands may be delineated with bright flagging on stakes, trees, or other natural features.

Record the presence of any significant disruptions not apparent on GIS. For the purposes of the FSD, forest stands less than one acre in size should be incorporated into larger, adjacent stands unless some unique characteristic makes it imperative to evaluate the small stand as a separate entity, such as the presence of a rare, threatened or endangered species, or a tree species in need of conservation (on the Maryland Natural Heritage Program watch list). A small stand of pioneer trees that is filling the gap left by the blowdown of a canopy tree should not qualify as a separate stand. The judgement of the qualified professional is critical at this early stage of the assessment. The FSD site plan should include all forest cover on the site and show the stand breaks. See Appendix B for an example of an FSD site plan.

If an alternatives analysis is required under Title 3 Section 33-3-112(c) of the Baltimore County Code, or an application for a variance to disturb forest buffers is anticipated under Section 33-3-106(a), all forest stands in which the disturbance is planned must have FSD data sheets completed. Subsequent changes to the development concept or development plan which propose disturbance of stream system forests will require that a new FSD for the FBE be submitted to DEPS and approved. Forest within the forest buffer does not require field assessment unless disturbance of that forest is anticipated.

STEP 3. Conduct Forest Stand Assessment

After the forest stands have been delineated, investigate each stand and complete the Forest Delineation Data Sheets. The data sheets have been designed to assist the field investigator in organizing observations about dominance, forest structure, apparent successional stage, and disruption patterns in order to compare the forest stands for ecological value. Although

qualitative in nature, this information should produce a sufficient approximation of the forest stand conditions without a rigorous sampling procedure. Blank datasheets as well as an example of completed datasheets can be found in Appendix B.

Record tree species in order of decreasing dominance. Dominance, as used herein, is defined as the influence exerted upon the plant community composition by the canopy species showing the greatest height and areal coverage in the community. Also record the most common diameter at breast height (DBH), which is measured at 4.5 feet from the ground, as well as the approximate average height of the ecologically dominant trees. For the understory vegetation, estimate dominance by areal coverage alone. Indicate the approximate abundance of each dominant tree species within the canopy and the understory (each column, the canopy and the understory, should total 100%) as well as any advanced regeneration species that can be identified within the shrub and ground layers. This information provides valuable clues about the age and successional stages occurring in the stand.

Specimen trees are trees with a DBH of 30 inches or greater, trees designated as national, state, or local champions, and trees measuring 75% or more of the DBH of designated State champion trees of the same species. The size, species, and condition of all specimen trees on site are to be included in a table on the FSD plan and the locations of the trees shown.

In stands where canopy dominance is very difficult to discern because of the number of canopy species, the option to use sample plots as described in the State Forest Conservation Technical Manual can be helpful. The success of this procedure depends upon the experience and knowledge of the qualified professional.

STEP 4. Prepare a Summary Evaluation of Site Characteristics

Using the information collected from the FSD Data Sheets, write a summary of forest characteristics for the site. Include the forest's proximity to other forested areas, the number of major stands present on the site, and any overall disruption patterns from significant disease or insect infestation (e.g., large-scale fungal blights or insect damage) or invasion by exotic plant species, and any fragmentation patterns from physical causes (e.g., paved roads, fire trails, clearcuts, etc.). Any stands that were eliminated from the assessment requirements should be identified, and reasons given for their elimination.

D. How to Interpret the FSD Data

The goal of the FSD is to identify ecologically valuable parts of the forest on a site that should be prioritized for retention. This information should then be used to direct the location of proposed development on the Forest Conservation Plan.

The evaluation of forest stands for retention potential depends upon four sets of information:

1. Components that are general indicators of forest structural diversity;

2. Components that have high habitat values for a range of wildlife species;
3. The degree of disruption by exotic species, fragmentation, or significant diseases; and
4. Proximity to wetland and stream resources.

The FSD Forest Structure Analysis data sheet provides a numerical score useful for prioritizing forest retention. However, forest structure represents only a partial assessment of the stand for overall habitat value. Other structural features, such as shrub and ground cover, and downed woody debris, were not given numerical values because they have different habitat value depending upon the wildlife species considered. Additionally, prevalence of nonnative and or invasive species was not given numerical values. Even so, a qualitative assessment of these features gives a better description of the stand's structural diversity than the scored parameters alone and may influence the weight of the forest structure analysis score.

E. Simplified Forest Stand Delineation

A simplified FSD may be prepared in lieu of a full FSD where no forest exists, or where all forest onsite is to be retained in Forest Conservation Easement(s). A simplified FSD must contain all applicable items listed in Step 1 of the FSD procedure above, as well as accurately show the location of all specimen trees outside forest along with information regarding their size, species and condition. Neither the forest stand assessment described in Step 3 nor the summary evaluation of site characteristics in Step 4 is required for a simplified FSD.

III. FOREST CONSERVATION PLAN

Baltimore County Code Sections 33-6-108 through 33-6-110

A. Purpose

A Forest Conservation Plan (FCP) shall be submitted as part of any regulated activity. The FCP must be prepared by a licensed forester, licensed landscape architect, or other qualified professional as specified in COMAR 08.19.01.04.

The FCP must be designed to protect existing forested areas and specimen trees to the fullest extent possible before, during, and after construction. The FCP must also include planting plans and maintenance schedules appropriate to the site conditions for any required reforestation or afforestation. The FCP must also provide legal mechanisms for the permanent protection of any retained, reforested, or afforested areas.

Specific guidance is provided for the calculations that determine forest conservation requirements, forest retention procedures, forest protection procedures, and specifications for reforestation and afforestation.

The Baltimore County Forest Conservation Law strongly recommends retention of existing forest over reforestation due to loss of forest habitat over time from negative impacts such as land use conversion, disease, drought, and herbivory. Disruptions to forest systems alter hydrologic function, displace many native plant and animals populations, encourage the proliferation of weedy, invasive plant species into the fragmented forest, and attract wildlife species that can damage reforestation plantings by their feeding activities.

The FCP influences the pattern of development on a site by:

1. Determining the minimum forest acreage that must be retained or established;
2. Directing clearing, grading, and sediment control to open areas or the least environmentally valuable forest stands; and
3. Identifying the best areas on a site for reforestation or afforestation efforts, if applicable.

B. Submittal Requirements for the Forest Conservation Plan

Preliminary & Final Forest Conservation Plans

Preliminary FCPs are required prior to development plan approval for major developments where the exact amount of forest clearing is unknown at the concept plan stage of the project and are intended only to show where and approximately how much forest will be cleared and how any forest planting will be addressed. Required components of the Preliminary and Final FCPs may be found in Baltimore County Code, Section 33-6-109 and are listed in Table 1.

Table 1. Components of Preliminary and Final FCPs

Component	Preliminary FCP	Final FCP
Approved FSD map (see Section II of this Manual)	X	X
Forest Conservation Worksheet	X	X
Location of forest retention and onsite afforestation and/or reforestation areas	X	X
Limit of disturbance, including grading limits, utilities, access road(s), staging areas, storage and stockpile areas, temporary parking, stormwater management devices, and impervious surfaces	X	X
All specimen trees, critical root zones, and any proposed impacts	X	X
Forest establishment and maintenance agreement		X
Forest and specimen tree protection measures		X
Planting and maintenance plan		X
Long-term protective agreement		X

C. Procedure for Preparing a Preliminary Forest Conservation Plan

STEP 1. Prepare the Forest Conservation Worksheet

The Forest Conservation Worksheet (FCW) is used to calculate the preliminary minimum forest retention requirement based upon pre-established Forest Conservation Thresholds for different land use categories. It also determines the reforestation requirement for sites where anticipated clearing reduces forest cover to levels below the Forest Conservation Threshold and the afforestation requirement for sites where existing forest is absent or below the Afforestation Threshold. In addition to reforestation and afforestation requirements, the FCW results in a breakeven point. Clearing above the breakeven point results in no reforestation requirement. A blank FCW as well as a completed example can be found in Appendix C.

The following information is needed to complete the FCW:

1. Land Use Thresholds (See Table 2);
2. Total site area from tax plats and boundary surveys;
3. Existing transmission line/utility easements where tree planting is prohibited;
4. Location of the 100-year floodplain as delineated using best available information;
5. Agricultural production areas;
6. Existing road rights of way or road paving where property lines extend to the centerline of a public road;
7. Existing forest cover of the site determined from the approved Forest Stand Delineation; and,
8. Forest areas proposed for clearing including anticipated utility rights-of-way, revertible grading/construction easements, road rights-of-way, stormwater and sediment control setbacks, and any similar easements or setbacks that will affect forest retention.

Land Use Category & Thresholds

The land use category of the site is used to determine the Forest Conservation (reforestation) and Afforestation Thresholds. Refer to Table 2 for the designated thresholds. Sites with multiple zoning classifications shall have discrete calculations for each zone with retention credit that may be combined with the other zones at the bottom of the worksheet to determine any planting requirement. For example, if the FCW for one zoning classification results in an afforestation or reforestation requirement but another results in forest retained above the breakeven point, the excess acreage above the breakeven point can be applied to the afforestation or reforestation requirement of the first zoning. See Appendix C for an FCW with split zoning. If the existing land use of the property differs from its zoning and is not institutional, the property's zoning classification shall be used to determine conservation and afforestation thresholds.

Table 2. Land Use Thresholds

<u>Land Use Type/Zoning</u>	<u>Conservation Threshold</u>	<u>Afforestation Threshold</u>
Agriculture and Resources Areas (RC2, RC4, RC6*, RC7, RC8)	50%	20%
Medium Density Residential (RC3, RC5, DR1)	25%	20%
Institutional Development Areas	20%	20%
High Density Residential Areas (DR2, DR3.5, DR5.5, DR10.5, DR16, ROA)	20%	15%
Mixed Use and Planned Unit Development Areas (OT, O3, OR1, OR2, RAE1, RAE2)	15%	15%
Commercial and Industrial Use (RO, RCC, BL, BM, BR, MR, MLR, ML, MH, SE, BMM, BMB, BLR, BMYC, CB)	15%	15%

*Properties designated RC6 must comply with Section 1A07 of the Baltimore County Zoning Regulations. Please see page 20 for more information.

Any Baltimore County zoning classifications created after the most recent revision of this manual shall be assigned thresholds based on their general category (e.g., resource conservation, commercial, high-density residential, etc.).

STEP 2. Identify Priority Retention Areas

This section provides a framework for prioritizing forest areas to be retained. Required forest retention can be determined using the information gathered in the FSD and forest retention criteria defined in Baltimore County Forest Conservation Law. A forest retention area shall be a minimum of 10,000 square feet in size and no less than 50 feet wide, and located a minimum of 35 feet from any existing or proposed primary residential structure or 25 feet from any commercial/industrial structure. Determine the priority level of each forest retention area from most environmentally valuable (Priority 1) to the least (Priority 3) in accordance with the definitions below:

Priority 1: High priority for retention

A forest retention area is considered Priority 1 if it includes any of the following:

1. Trees, shrubs, and herbaceous plants that are part of a community with one or more of the following characteristics:
 - a. located in sensitive areas including the riverine floodplain, intermittent and perennial streams, forest buffers, steep slopes, nontidal wetlands, and critical habitat areas of rare, threatened, or endangered species;
 - b. high forest structural diversity per the FSD datasheet;
 - c. Forest Patch Area in RC6 zones (Contact DEPS for Patch Maps);
2. Contiguous forest that connects the largest undeveloped or most vegetated tracts of land within and adjacent to the site, for example:
 - a. a contiguous forested area of approximately 100 acres that connects the largest or most vegetated tracts of land within and adjacent to the site;
 - b. part of a forested area which provides a corridor 300 feet wide or more of primarily native vegetation between two larger forested tracks;
3. Trees, shrubs, or herbaceous plants determined to be rare, threatened, or endangered under:
 - a. The Federal Endangered Species Act of 1973 in 16 U.S.C., Sections 1531 through 1544 and in 50 CFR Part 17;
 - b. The Maryland Nongame and Endangered Species Conservation Act; and
 - c. COMAR 08.03.08;
4. Trees that:
 - a. are part of an historic site;
 - b. are associated with an historic structure; or
 - c. have been designated by the state or the Department as a national, state, or county champion tree; and
5. Any tree having a diameter measured at 4.5 feet above the ground of:
 - a. 30 inches or more; or
 - b. 75% or more of the diameter, measured at 4.5 feet above the ground, of the current state champion tree of that species as designated by the State Department of Natural Resources.

Priority 2: Moderate priority for retention

A forest retention area is considered Priority 2 if it includes any of the following:

1. Forest stands or portions of forest stands with good structural diversity;
2. Contiguous forest areas approximately 20 acres or more connecting the largest or most vegetated tracts of land within and adjacent to the site; or,
3. Expansion of forest buffers up to 300 feet from a stream or to the ridge top, whichever is wider.

Priority 3: Low priority for retention

A forest retention area is considered Priority 3 if it includes either of the following:

1. Stands or portions of stands with poor forest structural diversity;
2. Stands or portions of stands with none of the characteristics of Priority 1 and 2 above.

STEP 3. Designate Forest Retention Areas

Designate forest areas for retention and long-term protection in accordance with the following guidelines:

1. Protect highest quality forest stands

Priority 1 areas, as defined in Step 2, should be set aside as forest retention areas first. If additional acreage is needed to reach the forest retention target, it should be taken from Priority 2 areas. Construction and other disturbances should be directed toward Priority 3 areas. If the forest in Priority 2 areas is above the target retention acreage, use the following elements in deciding between stands of apparently equal environmental value:

- a. Increase forest buffer width along streams and wetlands to safeguard hydrologic function and protect riparian habitat from degradation. Buffers of at least 300 feet in width can also serve as usable wildlife corridors;
- b. Connect separate Priority 1 areas by using Priority 2 areas that are at least 300 feet wide;
- c. Consider the shapes of forest fragments which may be connected to forest areas offsite (see Figure 6 in Appendix H). Triangular or other narrow strips of forest retention should be avoided.

2. Considerations for Priority 1 Impacts

Whenever disturbance to Priority 1 forest is proposed, a Forest Retention Investigation Report (FRIR) must be submitted to DEPS per Baltimore County Code 33-6-111 (b). The FRIR must demonstrate that reasonable efforts have been made to protect Priority 1 forests, the development plan cannot be reasonably altered, and that all other development regulations would be met. The FRIR must include alternate layouts, which

may be chosen by DEPS over the applicant's preferred layout. The FRIR and its resulting development layout must be approved prior to DEPS approval of any development plan or permit, whichever comes first.

Any forest delineated as patch forest on the RC6 patch maps or designated by DEPS as Priority 1 on RC6 land shall be retained per Section 1A07.7 of Baltimore County's zoning regulations. Sites with RC6 zoning require a site analysis map that is created in part from the preliminary FCP and must be approved by both DEPS and the Baltimore County Department of Planning. The site analysis map may be submitted with the preliminary FCP. That plan must show all Priority 1 forest to be retained in a Forest Conservation Easement (FCE) and show any other proposed FCEs along with the DEPS-approved Forest Buffer Easement (FBE) limits.

3. Specimen Tree & Critical Root Zone Impacts

Any specimen tree shall be retained unless a special variance to Forest Conservation Law is granted to allow its removal or impact to its critical root zone (CRZ) leading to its removal. Any such variance must be granted prior to final FCP or project plan approval. Mitigation for any specimen tree will be calculated at 100% of the tree's CRZ and may be addressed by planting or paying a fee in lieu. CRZs may be calculated according to the following table:

Table 3. Calculating the CRZ of a Specimen Tree

Location of Specimen Tree	CRZ Calculation	Example
Inside Forest	DBH (in) = CRZ radius (ft)	34-in DBH = 34-ft CRZ radius
Outside Forest	DBH (in) = 1.5 x CRZ radius (ft)	34-in DBH = 51-ft CRZ radius

4. Determining Retention Area Edges

Factors to consider in delineating retention area borders:

- a. Trees that have developed in the low light and high humidity of the forest interior will be exposed to the stresses of sunscald and desiccation when adjacent forest is cleared;
- b. Newly created edges will also be immediately subject to invasion by weedy species, placing planted trees into severe competition for survival;
- c. The later seral stage tree species occurring in County forests are typically intolerant of compaction and transplantation. Older trees tend to be less resistant to disturbances;
- d. Existing trees along newly created edges will tend to increase their crown growth in the direction of the openings, causing imbalances in form and stability;
- e. Bark damage, disease, insect presence, and decay are all natural conditions of forest trees and useful sources of food, shelter, and nest sites for the animal species that depend upon forests for their survival. Signs of damage or disease in a forest tree do not necessarily make it a candidate for removal;
- f. Whenever possible, follow the line of existing edges in which the trees and other plants have already adjusted successfully to prevailing environmental conditions.

When this is not practical, plan on the loss of older or shade-tolerant trees in the newly-created edges for all the above reasons. Tall trees along the new edges may also have to be removed because they become more vulnerable to shear damage due to increased exposure to high winds.

STEP 4. Address Afforestation and/or Reforestation Requirements

The FCP must indicate how the applicant intends to meet any afforestation and/or reforestation requirement determined by the FCW. Based upon a thorough diagnosis of the existing site conditions, the following options in order of priority must be considered when determining the manner by which the applicant shall fulfill any afforestation or reforestation requirement:

1. Onsite reforestation and/or afforestation of forest buffer areas;
2. Supplemental afforestation to increase the size of Priority 1 and 2 forest retained onsite;
3. Onsite reforestation or afforestation within other priority areas identified in Step 2;
4. Onsite reforestation or afforestation within remaining open areas (underplanting within existing forest shall not be considered afforestation or reforestation);
5. Offsite afforestation on property owned or controlled by the developer and approved by DEPS;
6. Offsite reforestation or afforestation at a DEPS-approved forest planting bank. Please note that these banks are privately owned and operated. Therefore, all purchase negotiations are between the bank operator and the customer. A letter with a list of currently available banks and a proof of purchase form must be obtained from DEPS staff. *Information regarding planting bank standards for planting bank managers can be found in Appendix E;*
7. When it can be shown to the satisfaction of DEPS that the preceding sequence was applied, that the proposed development site is not suitable for onsite reforestation or afforestation, that an exhaustive search of offsite planting areas was unsuccessful, and no forest planting banks are available, a fee-in-lieu assessed at the rate determined by Baltimore County may be paid;
8. Natural regeneration may be appropriate in certain situations as approved by DEPS, but may require additional protective measures and a higher survival requirement.

STEP 5. Draft the Preliminary Forest Conservation Plan

At the same scale as the concept plan or development plan submitted for approval, clearly indicate the location and acreages of all forest and specimen tree impacts, proposed construction, forest retention areas, and planting areas. The preliminary FCP must also indicate any alternate method of forest conservation mitigation such as purchase of credits from a third-party mitigation bank, off-site planting, or payment of a fee-in-lieu, etc. See the next section for more information.

STEP 6. Procedure for Preparing the Final Forest Conservation Plan

A. Forest and Specimen Tree Protection Procedures

There are certain requirements for the management of forest retention and planting areas as designated on the FCP. This section of the manual provides guidance throughout a project's pre-construction and post-construction phases.

Pre-Construction

Any limits of forest planting areas must be protected prior to construction activities. Construction is prohibited in these areas given the permanent damage to CRZs and suitable planting medium that results from soil compaction by construction machinery traffic and grading.

The following details, where applicable, are to be referenced on the FCP:

1. Details of pre-construction activities, such as stress reduction and protective measures and devices. Stress reduction may include root pruning (see Figure H-1 in Appendix H), crown reduction or pruning, watering, and/or mulching;
2. For all retained areas, including all specimen trees (both isolated and within forest) and planting areas:
 - a. Highly visible, well-anchored, temporary protection devices shall be installed along the project's limit of disturbance (LOD) anywhere the LOD is within 50 feet of a retention area (see Figure H-2 in Appendix H);
 - b. Protective signage shall be installed along the outer boundary of any Forest Conservation Easement or other forest retention area. Sign specifications and locations must be included on the FCP (see Figure H-3 in Appendix H);
 - c. All protection devices shall be in place prior to any grading or land clearing;
 - d. All protection devices shall remain in place until all construction has ceased in the immediate vicinity;
 - e. Attachment of signs or any other objects to trees is prohibited;
 - f. No equipment, machinery, vehicles, materials, or excessive pedestrian traffic shall be permitted within protected areas;
3. Pre-construction inspection – After the boundaries of the retention area have been staked and flagged and before any disturbance has taken place, EIR staff shall inspect and approve the installation of any forest and specimen tree protective measures such as easement signage and high visibility fencing;
4. Onsite decisions – Any significant changes made to the FCP due to onsite conditions or unforeseen circumstances shall be made with approval from DEPS.

Post-Construction and Monitoring

Post-construction, the following measures shall be taken:

1. Corrective measures shall be taken if damages to forest retention areas or specimen trees were incurred due to negligence, including stress reduction and removal of dead or dying trees if they pose an immediate safety hazard;
2. Removal of temporary structures:
 - a. No burial of discarded materials may occur onsite within the retention or planting areas;
 - b. No open burning within 100 feet of a forested area;
 - c. All temporary forest protection structures shall be removed after construction. Signage designating retention and reforestation/afforestation planting areas shall remain in place permanently.

Long Term Protections

The long term protection of retention areas, as well as reforestation and afforestation areas, is required by both the State and Baltimore County Forest Conservation Laws. These areas shall be protected by legal mechanisms such as perpetual Forest Conservation Easements (FCEs) and a Declaration of Protective Covenants governing those easements (see Appendix D for an example of this Declaration). FCEs are typically recorded prior to reduction of the DEPS-held securities, permit approval, or Use & Occupancy Certificate approval, depending on the type of development activity. Compatible uses within an FCE may include silvicultural activities associated with an approved forest management plan or other activities as specified in the Declaration of Protective Covenants. Any timber harvest in an FCE requires approval from the Maryland Department of Natural Resources Forestry Board and DEPS (easement language or maps may provide an exception). A Forestry Declaration of Intent (DOI) is required to be recorded in Baltimore County Land Records for any timber harvest regardless of existing FCEs. A Forest Harvest application must be submitted to Baltimore County Soil Conservation District, who will then coordinate with DEPS for review and approval. No development activity is permitted on the subject land within 5 years of the DOI's effective date.

The final FCP, along with all future plans or plats for the property, must show the correct boundaries of all FCEs or other forest retention areas, along with the following notes:

1. "There shall be no clearing, grading, construction, or disturbance of vegetation in the Forest Conservation Easement except as permitted by the Baltimore County Department of Environmental Protection and Sustainability."
2. "Any Forest Conservation Easement shown hereon is subject to protective covenants which may be found in the Land Records of Baltimore County and which restrict disturbance and use of these areas."

Penalty for Violation

DEPS may inspect a project site for compliance with protection measure requirements at any time during construction. Should any construction activities take place in designated retention areas or if trees in the retention areas are found to be damaged or dead due to mechanical

intrusion, these disturbed areas may no longer be credited toward retention. Construction within the retention areas may also result in a penalty for violation of the FCP agreements. Fees may be assessed accordingly at a rate determined by DEPS, and a revised FCP may be required.

If any required reforestation or afforestation is not completed within one year or two growing seasons of project approval, DEPS reserves the right to cash the planting security and perform the work.

B. Planting Plans for Reforestation and Afforestation

The following elements are required for any planting plan included on an FCP for the purpose of onsite reforestation or afforestation:

1. Locations of reforestation and afforestation areas;
2. Summary of the site assessment and site preparation needed;
3. Plant materials table including plant material sources. Please refer to the following sections regarding species selection, plant material selection, and site stocking;
4. Planting methods and specifications including any soil amendments, installation of tree shelters, or other protective measures;
5. Maintenance specifications (watering, weeding, pest management);
6. Itemized cost estimate including materials and labor for installation and maintenance;
7. Binding Three-year Maintenance Agreement (Appendix G), signed by the individual responsible for tree care and addressing:
 - a. Watering plans;
 - b. Control of competing vegetation and invasive species;
 - c. Protection from disease, pests, and mechanical injury;
 - d. Reinforcement planting provisions if survival falls below accepted levels; and
 - e. Name of the company or individual responsible for tree care.

The planting shall be monetarily secured at 110% of the DEPS-approved cost estimate through an Environmental Agreement filed with DEPS. It is the responsibility of the applicant to inform DEPS once planting is complete to conduct an initial inspection to start the three-year maintenance and monitoring period. Photos of the completed work must accompany the written request for the initial inspection.

One year from DEPS approval of the initial inspection, a written request for re-inspection of the planting must be submitted to DEPS. A monitoring report prepared by a qualified professional must accompany the written request. This report must include information regarding the number, health, size, form, and vigor of the trees; control of insects, disease, and competing vegetation; watering; mechanical injury; and the name of the company responsible for tree care. If the stem density of planted areas falls below established survival requirements, replanting will be required to bring the planting density up to the survival requirements. If the year one inspection is successful the planting security may be reduced by 25%.

The same procedure is followed for years two and three. The security may be reduced by 25% after a successful second full year inspection, and the remaining 50% returned after a successful third year inspection.

Species Selection

Species native or naturalized in Baltimore County shall be used. There shall be a minimum of five different tree species (unless sites are to be actively managed under an approved Forest Management Plan) in the following distribution:

1. Approximately 75% pioneer species and 25% mid-to-late successional species;
2. Approximately 70% canopy-dominant species and 30% understory species;
3. Conifers may not exceed more than 5% of the planting stock, in order to imitate the current natural distribution of coniferous species in Baltimore County.

Site Stocking

Stocking, as a minimum standard, shall meet the density requirements represented in the following table:

Table 4. Density Requirements for Site Stocking

Trees per Acre	Size*	Equivalent Tree Units	Individual Spacing
100	2-inch caliper	7 units/plant	20' x 20'
200	¾-inch caliper	3.5 units/plant	15' x 15'
350	3-5-gallon container	2 units/plant	12' x 12'

*The size used must depend upon individual site conditions. No seedlings may be used.

Other requirements:

1. Plantings shall consist of a variety of early- to mid-successional species, in a spacing pattern that allows for watering, invasive control, and other required activities during the maintenance period;
2. All stock must be Zone 7 or hardier;
3. Ground cover shall include native leguminous species such as clovers and native clumpgrasses, and not turfgrasses;
4. Mowing the entire planting area is not an acceptable method for protecting plantings during the maintenance period; however, limited mowing in close proximity to individual trees can reduce the growth of invasive species and limit impact from insects and rodents. The FCP must address, in detail, all proposed measures for protecting planted areas from invasive plant species;
5. Seedlings, shrubs, and bare root stock may not be used in these plantings;
6. Tree shelters (at least 5-foot tall plastic or biodegradable ventilated tree tubes) with a 6-foot oak or bamboo stake must be used;
7. Survival requirement: The minimum survival rate shall be 75% of the total number of trees planted per acre at the end of the three-year maintenance period. Wild tree seedlings from natural regeneration may be counted up to 50% towards the total survival number at

the end of the maintenance period if they are healthy, native species at least 24 inches tall.

Recommendations

1. Stock should have been raised or acclimatized within a 250-mile radius of the planting site for the greatest survival potential;
2. A thin layer of aged hardwood mulch may be used to slow invasion by weedy, invasive plant species;
3. In addition to tree shelters, electrified deer fencing may be used if site conditions permit.

Additional Planting Standards and Specifications for Implementing the Final FCP

1. Plant Material Selection
 - a. All plant materials greater than 1-inch caliper shall meet or exceed requirements of the American Nurserymen's Association standards. 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 root systems. They shall be free of disease, insect pests, and mechanical injuries.
 - b. Planting stock less than 1-inch caliper should be containerized and between 24 and 48 inches high.
2. Planting Site Preparation
 - a. Undisturbed sites
 - i. Disturbance of soils should be limited to the planting field for each plant. For plantings where large stock is chosen, the planting field radius of 1.5 times the diameter of the root ball is recommended.
 - ii. 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.
 - b. Disturbed areas
 - i. Soils should be treated as directed in Figure H-4 in Appendix H, 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.
 - ii. If fill material is used at the planting site, it should be clean fill with 12 inches of native soil at the top. Stockpiling of native topsoils must be done in such a way that the height of the pile does not damage the seed bank.
3. Planting Period – Fall planting takes place mid-late September through December until the ground freezes. Spring planting is mid-late March through May once the ground is free of frost.
4. 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. Nursery stock should not

be left unplanted for more than 2 weeks. Onsite or local transplanted materials should be stored in tree banks if unplanted for more than 24 hours.

5. Onsite Inspection of Stock – 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 should be replaced.
6. Planting Specifications for Different Forms of Stock
 - a. Container-grown stock
 - i. Successful planting of container-grown stock requires careful site preparation and inspection of the planted material root system. Caution is recommended when selecting plants grown in a soil medium different from that of the planting site.
 - ii. 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 as necessary. Remove all encircling roots, girdling roots, and matted roots.
 - iii. The planting field should be prepared as specified As shown in Figure H-4 in Appendix H. Native stockpiled soils should be used to backfill the planting field. Rake soils evenly over the planting field and cover with 2 to 4 inches of mulch.
 - b. Balled and Burlapped Trees
 - i. Tree spades are usually employed to plant larger tree stock (balled and burlapped stock greater than 2-inch caliper). This technique is particularly useful when transplanting onsite or with local plant materials. For trees larger than 6-inches DBH, specialized equipment is recommended.
 - ii. 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.
7. Planting Methods
 - a. Planting fields should be created as shown in Figure H-4 in Appendix H. Use watering to settle soil backfilled around trees. Stockpiled native topsoils, if available, should be used to backfill the planting field.
 - b. 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 over the planting field and covered with 2 to 4 inches of mulch.
 - c. Staking of trees is not recommended except in areas of high winds or steep slopes. On steep slopes stakes must be oak or hardwood 2"x2"x6' stakes or 6' fiberglass stakes. Staking may be used for trees larger than 8 feet in height. Movement is necessary to strengthen the roots of the planted tree. If stakes are used, they should be removed after the first growing season. See Figure H-5 in Appendix H for more information regarding tree staking.

- d. Wrapping trees is not recommended due to increased opportunities for insect infestation and disease.
8. Post-planting Considerations
- a. Soil stabilization – For areas of large-scale disturbance, soils must be stabilized using a non-turfgrass ground cover or engineering fabric.
 - b. Protection Devices – To prevent damage of planted areas, all reforestation and afforestation site must be posted with appropriate permanent protective signage as specified on the FCP.
 - c. Soil and Watering
 - i. Soil texture influences the downward flow of water. Soils with more clay tend to retain water longer and can be watered less often, while 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 any drainage problems; however, scarification of the planting hole walls is recommended for clay soils.
 - ii. If there is restricted infiltration of water, then the soil may have been compacted during construction and not aerated before planting, or there may be a clay hardpan.
 - iii. The best way to water is deeply and slowly using a regular hose, soaker hose, drip irrigation, or refillable gator bags. On larger trees, start by watering the root ball thoroughly and then expand the watered area to include the whole root zone after the tree becomes more established.
 - iv. Mulching around the base of newly transplanted trees insulates roots from drying too quickly while still providing air movement to the roots.
 - d. Fertilizing
 - i. Trees depend on three major nutrients—nitrogen, phosphorus, and potassium—and a host of other 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 factor. Nothing should be added to the soil before testing it first to determine its needs. Fertilizer should not be used in wetlands or along wetland and stream buffers.
 - ii. 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 sudden canopy growth which the roots cannot support. It is best to wait until after the end of the first growing season in the late fall.
 - iii. If fertilizers are to be used, 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 water supply. Some synthetic fertilizers can mimic this slow-release action and may be appropriate for use.

- e. Mulching
 - i. As a preventative 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.
 - ii. Mulch is one of the best deterrents to weeds. Spread a 2 to 4-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.
 - f. Control of competing vegetation
 - i. An optimal cover crop such as clover, legume, or radish can be used to deter growth of invasive species.
 - ii. As a last resort, chemical treatments administered by a licensed herbicide applicator might be suitable to control competing vegetation. Herbicide use should be limited to spot treatment with a hand-held applicator and properly timed for effectiveness. Chemical use near streams and wetlands should be avoided.
 - g. Protection from 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. Professional IPM programs have reduced pesticide use by 90%. Some aspects of a full IPM program are the following:
 - i. Elimination of some low vegetation before planting, which helps control rodent populations that thrive in bushy environments.
 - ii. Use of tree shelters to protect the trunks of new plantings from animal damage. Trees with tree shelters need more water than those without.
 - iii. Mulching around the trees to prevent invasion of exotic plant species
 - iv. Pruning dead and diseased branches with a clean cut and sanitized tools to prevent the spread of disease
 - v. Using stakes and guy wires in locations with high winds in order to support newly planted trees with weak structural roots. Stakes and guy wires must be removed after one growing season or they may cause damage to the tree as it grows. They should not be used in areas not typically subject to high winds, as movement of the trunk is required to help strengthen the structural root system of the tree.
9. Design Guidance for Special Circumstances
- a. Forest Buffers—borders of streams and other waterways may have been damaged before reforestation and afforestation, and therefore may need more extensive

restoration work before reforestation or afforestation can be successful. The following are guidelines for any work within a riparian zone:

- i. Check for erosion problems;
 - ii. Minimize or eliminate any chemical use;
 - iii. Maintain an undisturbed leaf layer and understory; and
 - iv. Eliminate exotic and invasive species.
- b. Steep Slopes—Plantings can stabilize steep slopes; however, there may still be erosion problems until the roots become established. Monitoring the stability of the soil will be important to the survival of the trees.

10. Reinforcement plantings

- a. In order to avoid the penalty for violating the survival requirement, the applicant must establish reinforcement plantings onsite should the reforestation or afforestation not meet the survival standards at any time during the maintenance period.
- b. Inspection for survival potential should take the following into account:
 - i. Vigor of planted specimens;
 - ii. Significant signs of water stress in the foliage;
 - iii. Signs of mechanical damage to the trunks or other woody tissue; and
 - iv. Extent of competing vegetation on the planting site and in-place procedures to protect planted specimens.

11. After the final planting inspection

- a. If afforestation or reforestation planting does not meet the survival standards at the final inspection, reinforcement plantings must be inspected again after one growing season before the remainder of the planting security is released.
- b. By the end of the maintenance period, all tree shelters, stakes, sediment controls, high-visibility fencing, or other construction materials must be removed from the planting site and recycled if possible.
- c. Forest Conservation signs must remain in place.

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Appendix A: Glossary of Terms

Act (Baltimore County) - the Forest Conservation Act, Baltimore County Code Sections 33-6-101-122.

Act (State) - the Forest Conservation Act, Natural Resources Article, 5-1601 et seq., Annotated Code of Maryland.

Afforestation -

- 1) the establishment of a forest on an area on which forest cover has been absent for a long period of time;
- 2) the planting of open areas which are not presently in forest cover; or
- 3) the establishment of a forest according to afforestation or reforestation procedures in the Baltimore County Forest Conservation Technical Manual.

Agricultural Activity - farming activities including plowing, tillage, cropping, installation of best management practices, seeding, cultivating, and harvesting for the production of food and fiber products (except commercial logging and timber harvesting operations), the grazing and raising of livestock, aquaculture, sod production, orchards, Christmas tree plantations, nursery, and other products cultivated as part of a recognized commercial enterprise and in accordance with a Soil Conservation and Water Quality Plan approved by the Baltimore County Soil Conservation District.

Agricultural and Resource Areas - areas zoned for densities of less than or equal to one dwelling unit per five acres and corresponds to Baltimore County Zoning Classifications RC2, RC4, RC6, RC7, RC8.

Breakeven Point - the point at the Forest Conservation requirements can be met solely through forest retention and no reforestation. Note, if good quality forest is present, retention above the break even point may be required.

Caliper - stem diameter of a woody plant measured at 6 inches above the ground level.

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.

Codominant Trees - Trees with crowns forming the general level of the crown cover and receiving full sunlight from above but little from the sides; generally, they are shorter than the dominant trees.

Commercial and Industrial Uses - includes areas zoned for manufacturing operations, office complexes, shopping centers, and other similar uses and their associated storage areas, yarding, and parking areas and corresponds to Baltimore County Zoning Classifications RO, RCC, BL, BM, BR, MR, MLR, ML, MH, SE, BMM and BMB, BLR, BMYC, CB.

Commercial Logging and Timber Harvesting - the cutting and removing of tree stems from a site for commercial purposes, leaving the stump root mass intact.

Conservation Threshold - the point at which the reforestation requirement changes from a ratio of 1/4 acre planted for every one acre removed above the threshold to 2 acres planted for every one acre removed below the threshold, as determined by the land use category.

Critical Habitat for Endangered Species - a habitat occupied by an endangered species as determined or listed under Section 4-2A-04 and Section 10-2A-04, Natural Resources Article, Annotated Code of Maryland.

Critical Habitat Area - a critical habitat for endangered species and its surrounding protection area. A critical habitat area shall

- 1) be likely to contribute to the long-term survival of the species;
- 2) be likely to be occupied by the species for the foreseeable future; and
- 3) constitute habitat of the species which is deemed critical under Section 4-2A-06, Section 4-2A-04 and Section 10-2A-06, Natural Resources Article, Annotated Code of Maryland.

Critical Root Zone - a circular region measured outward from a tree trunk representing the essential area of the roots that must be maintained or protected for the tree's survival; for the purpose of this manual critical root zone is one foot of radial distance for every inch of tree diameter (DBH) measured at 4.5 feet from the ground, with a minimum of 8 feet. For specimen trees outside of a forest the formula increases to 1.5 feet for every inch of DBH.

Department - the Baltimore County Department of Environmental Protection and Sustainability.

Development Project – includes, but is not limited to, building or grading permits, minor subdivisions, major developments and redevelopment.

Development Project Completion - means for the purposes of afforestation or reforestation:

- 1) the release of the public works agreement security on residential projects, if required;
- 2) the recordation of a minor subdivision;
- 3) the return of grading security;
- 2) the release of the use and occupancy permit on non-residential projects;
- 3) acceptance of the project's streets, utilities, and public services by the County; or
- 4) designation by the County that a particular stage of a staged development project, including a planned unit development, has been completed.

Diameter at Breast Height – diameter of a tree in inches measured at 4.5 feet from the ground

Dominant Trees - trees with crowns extending above the general level of the crown cover and receiving full sunlight from above and partly from the side; larger than the average trees in the stand.

Floodplain-see One Hundred Year Floodplain definition

Forest - a biological community dominated by trees and other woody plants covering a land area of 10,000 square feet or greater. Forest includes

- 1) areas that have at least 100 trees per acre with at least 50% of those having a two inch or greater diameter at 4.5 feet above the ground and larger;
- 2) areas with mature trees that provide a contiguous canopy over unimproved land; and
- 3) forest areas that have been cut but not cleared. Forest does not include orchards.

Forest Conservation - the retention of existing forest or the creation of new forest at the levels prescribed by the State or Department.

Forest Conservation Fund - a fund into which payments for reforestation and for penalties will be made when an applicant is not in compliance with the Forest Conservation Plan.

Forest Conservation Plan - a plan attached to the site for which approval for a regulated activity has been made. The plan must contain a map drawn to scale which shows

- 1) areas required for forest conservation;
- 2) an afforestation plan showing planting areas on or off site;
- 3) a construction timetable; and
- 4) management and protective agreements for the conservation areas.

Forest Conservation Program - a program developed under the Forest Conservation Act by any jurisdiction with planning and zoning authority that is consistent with the intent, requirements and standards of the Act, Natural Resources Article, 5-1601 et seq., Annotated Code of Maryland.

Forest Cover - the area of a site meeting the definition of forest.

Forest Management Plan - a plan establishing best conservation and management practices for a landowner in assessment of the resource values of forested property.

Forest Product - any wood fiber product extracted from a forest which can be sold on the commercial market.

Forest Stand - a contiguous group of trees sufficiently uniform in species composition, arrangement of age classes, and condition to be a distinguishable, homogeneous unit.

Forest Stand Delineation - the methodology for evaluating the existing natural features and vegetation on a site proposed for development, taking into account the environmental elements that shape or influence the structure or makeup of a plant community.

Forested Slopes - an area meeting the definition of forest and growing on an area with a slope of 25% or more and covering an area of at least 10,000 square feet.

Forest Structure - is a measure of the vertical and horizontal structural diversity within a stand; is related to stand age and habitat.

Growing Season - the time, from spring to fall, during which consecutive frost-free days occur.

High Density Residential Areas - areas zoned for densities 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, and corresponds to Baltimore County Zoning Classifications of DR2, DR3.5, DR5.5, DR10.5, DR16 and ROA.

Historic Sites - as defined by local, state or federal Historic Register.

Hydric Soils - are generally defined as soils that are saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions in the upper layer of soil.

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

Intermittent Stream - a stream with an intermittent base flow of groundwater origin as confirmed by field verification.

Maintenance Agreement - a legally binding agreement to ensure the survivability of all sites afforested, reforested or landscaped.

Medium Density Residential Area - 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, and corresponding to the Baltimore County Zoning Classifications of RC3, RC5 and DR1.

Mixed Use Development - a single, relatively high density development project, usually commercial in nature, which includes two or more types of uses, and corresponds to the Baltimore County Zoning Classifications of OT, O3, OR1, OR2, RAE1 and RAE2.

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

Net Tract Area - the total area of a site, including both forested and non-forested areas, to the nearest one-tenth acre, reduced by the area found to be within the boundaries of the 100-year floodplain easement or reservation, utility easements, or any portion of the tract remaining in agricultural production as defined above.

Nontidal Wetland - an area that is 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. The determination of whether an area is considered a nontidal wetland

shall be made in accordance with the publication known as the "Federal Manual for Identifying and Delineating Jurisdictional Wetlands, Atlantic and Gulf Coast Supplement" as may be amended and interpreted by the U.S. Environmental Protection Agency. Nontidal wetlands do not include tidal wetlands regulated under Environment Article, Title 26, Annotated Code of Maryland.

One-Hundred Year Floodplain - 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. This is the water surface elevation. A 100-year flood is that which has a 1% chance of being equaled or exceeded in any given year. For purposes of calculating net tract area, the 100-year floodplain easement or reservation, which contains any vertical freeboard and which limit is accepted by Baltimore County Dept. of Public Works, shall be used.

Perennial Stream - a stream with a continual base flow of groundwater origin, as confirmed by field verification.

Permanent Tree Protection Devices - structural measures, such as retaining walls that are designed to protect the tree and its root systems throughout its lifetime.

Person - includes the federal government, the state, any county, municipal corporation, or other political subdivision of the state, or any of their units, or an individual, receiver, trustee, guardian, executor, administrator, fiduciary, or representative of any kind, or any partnership, firm, association, public or private corporation, or any of their affiliates, or any other entity.

Planned Unit Development - a development comprised of 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.

Prime Agricultural Soils - fertile soils as defined by USDA, Soil Conservation Service.

Priority Retention Areas - a hierarchy of forest stands and stand characteristics, defined in Section III. C. STEP 2 that are used to prioritize forested areas to retain.

Qualified Professional – licensed forester, licensed landscape architect, or other qualified professional as specified in COMAR 08.19.06.01.

Reforestation or Reforested - the 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 two inch or greater diameter measured at 4.5 feet above ground, within seven years.

Regulated Activity - means any of the following activities that are not exempt under the Baltimore County Forest Conservation Act, and that occur on a unit of land which is 40,000 square feet or greater:

- 1) subdivision;

- 2) development, including construction activities that require a County permit;
- 3) clearing, grubbing and grading;
- 4) an activity that requires an erosion and sediment control approval;
- 5) project plan of a County agency; or
- 6) logging and timber harvesting operations.

Retention - the deliberate holding and protecting of existing trees, shrubs or herbaceous plants on the site according to established standards as set forth in the Baltimore County Forest Conservation Manual.

Selective Clearing - the careful and planned removal of trees, shrubs, and herbaceous plants using specific standards and protection measures under an approved Forest Conservation Plan.

Slope Aspect - the orientation of the site with regard to the sun.

Soil Amendments - the modification of soil properties for improvement of soil structure; not to be confused with fertilizers whose purpose is to correct chemical imbalances in soils for silvicultural purposes.

Special Variance - the allowance for deviation from the requirements of the Forest Conservation Act for circumstances where strict adherence to the Act would result in unwarranted hardship. Variance does not mean a zoning variance.

Specimen Tree - trees having a diameter measured at 4.5 feet above the ground of 30 inches or more, or trees having 75% or more of the diameter of the current state or Baltimore County champion tree of that species.

Stand Structure - the composition of the forest stand with reference to forest association (Society of American Foresters cover type), dominant and co-dominant species, understory and herbaceous species, ground litter composition and depth, and the stand's structural diversity.

State Program - the State of Maryland's Forest Conservation Program administered by the Department of Natural Resources.

Steep Slopes - areas with slopes greater than 25 percent.

Steep Erodible Slopes - areas with slopes greater than 15 percent and have soils with K values greater than 0.35.

Stream Buffer - forest buffer as defined in Title 33 of the Baltimore County Code.

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

Temporary Tree Protection Devices - structural measures, such as fencing, installed prior to construction for the purpose of preventing access to forest retention areas or afforestation areas during construction.

Tree - 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.

Tree Line - the boundaries of existing forests as determined by the last recent aerial photography and/or field verification.

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

Watershed - all lands lying within an area described as a subbasin in the water quality regulations adopted by the Maryland Department of the Environment under COMAR 26.08.02.08.

Appendix B: Forest Stand Delineation Datasheets
Example Datasheets and Forest Stand Site
Plan

BALTIMORE COUNTY
DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

Forest Stand Delineation: Dominant Plant Species

Project Name: _____ Date: _____

Location: _____ Investigator(s): _____

Stand: _____ Type: _____ Acreage: _____

Slope: _____ Aspect: _____

Reviewed by: _____ Date: _____

<i>Botanical Names of Dominant Species</i>	<i>Median dbh (in)</i>	<i>dbh Range</i>	<i>Average height (ft)</i>	<i>% of species in canopy*</i>	<i>% of species in understory*</i>
1. _____	_____	_____	_____	_____	_____
2. _____	_____	_____	_____	_____	_____
3. _____	_____	_____	_____	_____	_____
4. _____	_____	_____	_____	_____	_____
5. _____	_____	_____	_____	_____	_____
6. _____	_____	_____	_____	_____	_____

Common regeneration species: _____

<i>**Common shrubs and vines</i>	<i>Average height (in)</i>	<i>Approx. % cover</i>	<i>Herbaceous Species</i>	<i>Approx. % Cover</i>
1. _____	_____	_____	1. _____	_____
2. _____	_____	_____	2. _____	_____
3. _____	_____	_____	3. _____	_____
4. _____	_____	_____	4. _____	_____
5. _____	_____	_____	5. _____	_____
6. _____	_____	_____	6. _____	_____
7. _____	_____	_____	7. _____	_____
8. _____	_____	_____	8. _____	_____

Rare, threatened, or endangered plant species listed by the MNHP⁺ and/or found:

List specimen trees (dbh ≥ 30 in or 75% of champion tree dbh):

<i>Species</i>	<i>Dbh (in.)</i>	<i>Condition</i>
_____	_____	_____
_____	_____	_____
_____	_____	_____

*Dominant tree species; each column reading down should equal 100%

** Shrubs include plants that are taxonomically considered tree species but are less than six feet tall

% Cover for vines - indicate % distribution between the canopy and understory

+ Maryland Natural Heritage Program of the Department of Natural Resources

BALTIMORE COUNTY

DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

Exotic plant species most likely to be found in forest communities

Indicate the occurrence of any of the following species using one symbol from both (a) and (b).

- (a) O = occasional
 C = common
 A = abundant

- (b) S = scattered throughout
 L = localized

Occurrence	Species	If occurrence is A and L, record location in stand
	<i>Acer platanoides</i> (Norway Maple)	
	<i>Ailanthus altissima</i> (Tree of Heaven)	
	<i>Albizia julibrissin</i> (Mimosa Tree or Persian Silk Tree)	
	<i>Alliaria officinalis</i> (Garlic Mustard)	
	<i>Ampelopsis brevipedunculata</i> (Porcelain Berry)	
	<i>Arthraxon hispidus</i> (Small Carpetgrass)	
	<i>Barberis thunbergii</i> (Japanese Barberry)	
	<i>Celastrus orbiculatus</i> (Oriental Bittersweet)	
	<i>Euonymus alatus</i> (Winged Euonymus or Burning Bush)	
	<i>Euonymus fortunei</i> (Climbing Euonymus)	
	<i>Fallopia japonica</i> (Japanese Knotweed)	
	<i>Glechoma hederacea</i> (Ground Ivy)	
	<i>Hedera helix</i> (English Ivy)	
	<i>Herocallis fulva</i> (Common Daylily)	
	<i>Lonicera japonica</i> (Japanese Honeysuckle)	
	<i>Lonicera tatarica</i> (Tatarian Honeysuckle)	
	<i>Microstegium vimineum</i> (Japanese Stiltgrass)	
	<i>Miscanthus sinensis</i> (Chinese Silver Grass)	
	<i>Pachysandra terminalis</i> (Japanese Pachysandra)	
	<i>Paulownia tomentosa</i> (Empress Tree)	
	<i>Pueraria lobata</i> (Kudzu)	
	<i>Polygonum perfoliatum</i> (Asian Tearthumb)	
	<i>Oplismenus undulatifolius</i> (Wavyleaf Basketgrass)	
	<i>Rosa multiflora</i> (Multiflora Rose)	
	<i>Rubus phoenicolasius</i> (Wineberry)	
	<i>Vinca minor</i> (Periwinkle)	
	<i>Wisteria floribunda</i> (Japanese Wisteria)	
	<i>Wisteria sinensis</i> (Chinese Wisteria)	
Others:		

Estimate total % cover by all exotic species in:

Canopy _____

Shrub Layer _____

Understory _____

Ground Cover _____

BALTIMORE COUNTY
DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

Forest Stand Delineation: Forest Structure

Project Name: _____ Date: _____

Location: _____

Stand: _____ Type: _____

Acreage: _____ Slope: _____ Aspect: _____

% Canopy closure: _____

% Shrub cover: _____ Shrub height range: _____ feet to _____ feet

% Ground cover (May to October): _____

Number of woody vegetation layers: _____

Litter depth (in) to mineral soil: _____ (exclusive of fresh leaf fall)

Downed woody debris (≥ 6 " dia.): _____ rare _____ common _____ abundant

Tally standing snags (≥ 20 " dbh): _____

Stand Narrative

1. Condition of canopy trees:

2. Evidence of significant disease or insect infestation in the stand:

3. Patterns of disruption within the stand:

4. Evidence of management:

5. Recommendations for improving the structural diversity of the stand:

BALTIMORE COUNTY

DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

Forest Structure Analysis

For each of the following parameters, circle the value that best describes the structural conditions in the stand. Add the numerical score for each parameter to get a total value for the stand.

1. Percent canopy closure

- ≥ 80% 6
- 50%-79% 4
- 30%-49% 2
- < 30% 0

5. Number of native shrub species
(April through October)

- >6 3
- 4 - 6 2
- 2 - 3 1
- 0 - 1 0

2. Size class of dominant trees

- ≥20 in. dbh 6
- 12-19 in. dbh 4
- 6-11 in. dbh 2
- <6 in. dbh 0

6. Number of native herbaceous species
(April through October)

- >12 3
- 8 - 12 2
- 3 - 7 1
- 0 - 2 0

3. Number of native tree species (≥6" dbh)

- > 6 6
- 4 - 6 4
- 2 - 3 2
- 1 0

7. Average litter depth (in.)
(exclusive of fresh leaf fall in autumn)

- >6 3
- 4 - 6 2
- 1 - 3 1
- < 1 0

4. Number of woody vegetation layers

- ≥ 5 6
- 4 4
- 3 2
- < 3 0

Total value = _____

Interpretation of Forest Structure Score

	April through October	November through March
Priority forest structure	22 - 33	18 - 27
Good forest structure	14 - 21	11 - 17
Poor forest structure	0 - 13	0 - 10

Forest Structure Assessment (circle one):

Priority

Good

Poor

Example FSD Datasheets

BALTIMORE COUNTY

DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

Forest Stand Delineation: Dominant Plant Species

Project Name: Dahlia Woods Date: 9/15/22
 Location: 416 Sunshine Blvd Investigator(s): E. Errickson
 Stand: 1 Type: Tulip poplar / Red oak Acreage: 12.6
 Slope: 20% Aspect: North
 Reviewed by: _____ Date: _____

Botanical Names of Dominant Species	Median dbh (in)	dbh Range	Average height (ft)	% of species in canopy*	% of species in understory*
1. <u>Liriodendron tulipifera</u>	<u>12</u>	<u>4-12</u>	<u>80</u>	<u>35</u>	
2. <u>Quercus alba</u>	<u>18</u>	<u>12-30</u>	<u>80</u>	<u>15</u>	
3. <u>Q. rubra</u>	<u>6</u>	<u>6-9</u>	<u>70</u>	<u>35</u>	
4. <u>Nyssa sylvatica</u>	<u>6</u>	<u>2-6</u>	<u>20</u>		<u>50</u>
5. <u>Acer rubrum</u>	<u>4</u>	<u>1-6</u>	<u>25</u>	<u>15</u>	<u>10</u>
6. <u>Amelanchier arborea</u>	<u>3</u>	<u>1-4</u>	<u>12</u>		<u>20</u>

Common regeneration species: _____

**Common shrubs and vines	Average height (in)	Approx. % cover	Herbaceous Species	Approx. % Cover
1. <u>Viburnum acerifolium</u>	<u>3</u>	<u>20</u>	1. <u>Polystichum acrostichoides</u>	<u>40</u>
2. <u>N. sylvatica</u>	<u>5</u>	<u>20</u>	2. <u>Medeola virginiana</u>	<u>5</u>
3. <u>Rhododendron nudiflorum</u>	<u>3</u>	<u>5</u>	3. <u>*Platanthera orbiculata</u>	<u>5</u>
4. <u>Vaccinium sp.</u>	<u>2</u>	<u>25</u>	4. _____	
5. <u>A. rubrum</u>	<u>6</u>	<u>10</u>	5. _____	
6. _____			6. _____	
7. _____			7. _____	
8. _____			8. _____	

Rare, threatened, or endangered plant species listed by the MNHP+ and/or found:

P. orbiculata - not listed but not often found in Baltimore County forests

List specimen trees (dbh ≥ 30 in or 75% of champion tree dbh):

Species	Dbh (in.)	Condition
<u>Quercus alba</u>	<u>30</u>	<u>Good</u>
_____	_____	_____
_____	_____	_____

*Dominant tree species; each column reading down should equal 100%

** Shrubs include plants that are taxonomically considered tree species but are less than six feet tall

% Cover for vines – indicate % distribution between the canopy and understory

+ Maryland Natural Heritage Program of the Department of Natural Resources

BALTIMORE COUNTY

DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

Exotic plant species most likely to be found in forest communities

Indicate the occurrence of any of the following species using one symbol from both (a) and (b).

- (a) O = occasional
C = common
A = abundant

- (b) S = scattered throughout
L = localized

Occurrence	Species	If occurrence is A and L, record location in stand
	<i>Acer platanoides</i> (Norway Maple)	
	<i>Ailanthus altissima</i> (Tree of Heaven)	
	<i>Albizia julibrissin</i> (Mimosa Tree or Persian Silk Tree)	
	<i>Alliaria officinalis</i> (Garlic Mustard)	
	<i>Ampelopsis brevipedunculata</i> (Porcelain Berry)	
	<i>Arthraxon hispidus</i> (Small Carpetgrass)	
OS	<i>Barberis thunbergii</i> (Japanese Barberry)	
	<i>Celastrus orbiculatus</i> (Oriental Bittersweet)	
	<i>Euonymus alatus</i> (Winged Euonymus or Burning Bush)	
	<i>Euonymus fortunei</i> (Climbing Euonymus)	
	<i>Fallopia japonica</i> (Japanese Knotweed)	
	<i>Glecoma hederacea</i> (Ground Ivy)	
OS	<i>Hedera helix</i> (English Ivy)	
	<i>Herocallis fulva</i> (Common Daylily)	
	<i>Lonicera japonica</i> (Japanese Honeysuckle)	
	<i>Lonicera tatarica</i> (Tatarian Honeysuckle)	
	<i>Microstegium vimineum</i> (Japanese Stiltgrass)	
	<i>Miscanthus sinensis</i> (Chinese Silver Grass)	
	<i>Pachysandra terminalis</i> (Japanese Pachysandra)	
	<i>Paulownia tomentosa</i> (Empress Tree)	
	<i>Pueraria lobata</i> (Kudzu)	
	<i>Polygonum perfoliatum</i> (Asian Tearthumb)	
	<i>Oplismenus undulatifolius</i> (Wavyleaf Basketgrass)	
AL	<i>Rosa multiflora</i> (Multiflora Rose)	Southern part of stand
	<i>Rubus phoenicolasius</i> (Wineberry)	
	<i>Vinca minor</i> (Periwinkle)	
	<i>Wisteria floribunda</i> (Japanese Wisteria)	
	<i>Wisteria sinensis</i> (Chinese Wisteria)	
Others:		

Estimate total % cover by all exotic species in:

Canopy —

Shrub Layer 30%

Understory —

Ground Cover <10%

BALTIMORE COUNTY

DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

Forest Stand Delineation: Forest Structure

Project Name: Dahlia Woods Date: 9/15/22

Location: 4116 Sunshine Blvd

Stand: #1 Type: Tulip poplar / Red oak

Acreage: 12.6 Slope: 20% Aspect: North

% Canopy closure: 80

% Shrub cover: 70 Shrub height range: feet to feet

% Ground cover (May to October): 50

Number of woody vegetation layers: 3

Litter depth (in) to mineral soil: 6 (exclusive of fresh leaf fall)

Downed woody debris (≥ 6 " dia.): rare common abundant

Tally standing snags (≥ 20 " dbh): 1

Stand Narrative

1. Condition of canopy trees:
Excellent - white oaks in particular have full, spreading crowns, probably predate the succession of the stand
2. Evidence of significant disease or insect infestation in the stand:
None - trees are healthy, no significant bark damage or diseased branches
3. Patterns of disruption within the stand:
None apparent. The high structural diversity and open spacing in the understory indicate this stand is entering mid-to-late seral stage towards maturity
4. Evidence of management:
Several decomposing large stumps may indicate selective harvesting in the past
5. Recommendations for improving the structural diversity of the stand:
The understory is clearly dominated by black gum - a minor thinning could benefit the white oaks. Management of multiflora rose recommended.

BALTIMORE COUNTY

DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

Forest Structure Analysis

For each of the following parameters, circle the value that best describes the structural conditions in the stand. Add the numerical score for each parameter to get a total value for the stand.

1. Percent canopy closure

- ≥ 80% 6
- 50%-79% 4
- 30%-49% 2
- < 30% 0

5. Number of native shrub species

- (April through October)
- >6 3
- 4-6 2
- 2-3 1
- 0-1 0

2. Size class of dominant trees

- ≥20 in. dbh 6
- 12-19 in. dbh 4
- 6-11 in. dbh 2
- <6 in. dbh 0

6. Number of native herbaceous species

- (April through October)
- >12 3
- 8-12 2
- 3-7 1
- 0-2 0

3. Number of native tree species (≥6" dbh)

- > 6 6
- 4-6 4
- 2-3 2
- 1 0

7. Average litter depth (in.) (exclusive of fresh leaf fall in autumn)

- >6 3
- 4-6 2
- 1-3 1
- < 1 0

4. Number of woody vegetation layers

- ≥ 5 6
- 4 4
- 3 2
- < 3 0

Total value = 25

Interpretation of Forest Structure Score

	April through October	November through March
Priority forest structure	22 - 33	18 - 27
Good forest structure	14 - 21	11 - 17
Poor forest structure	0 - 13	0 - 10

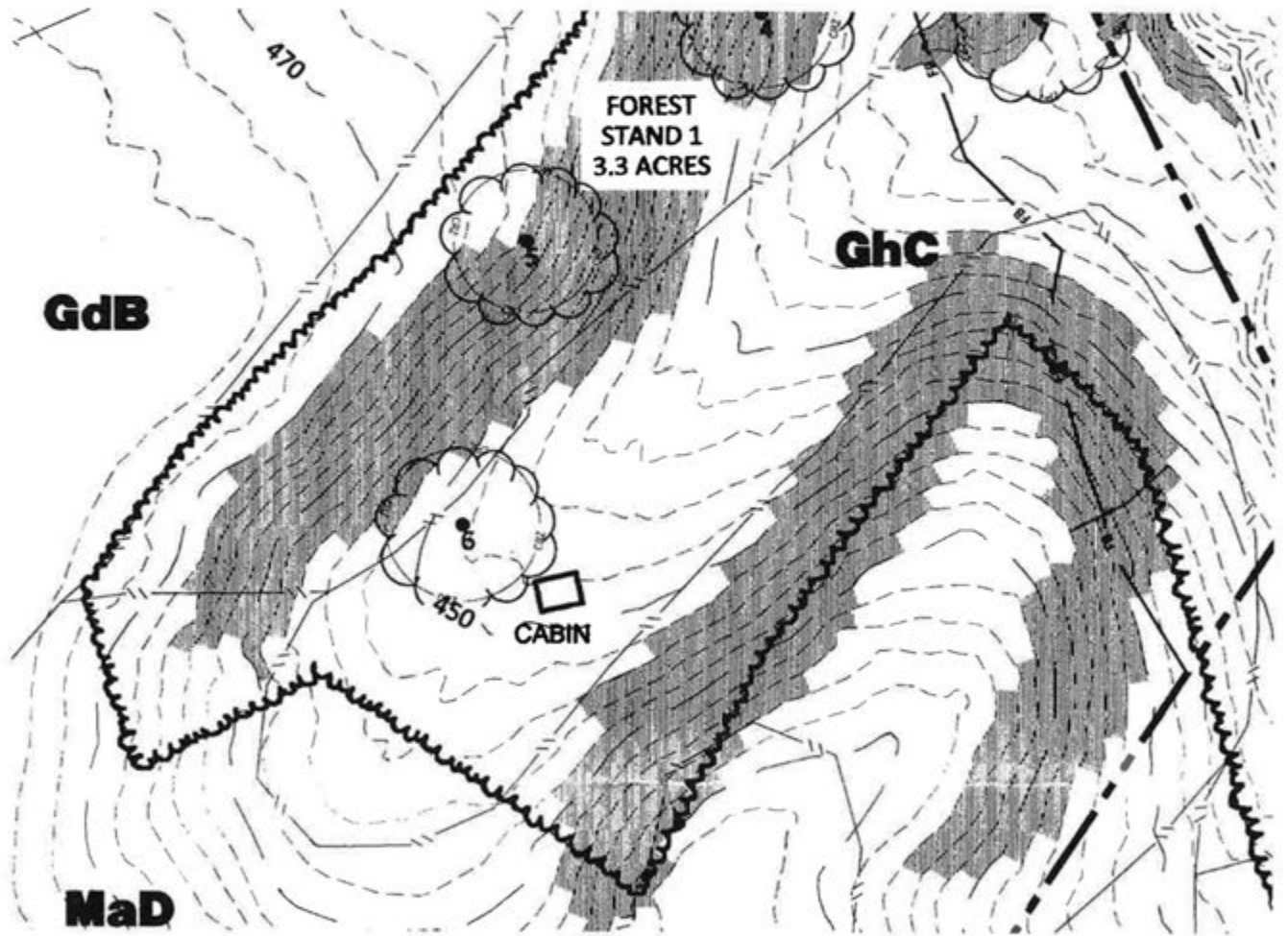
Forest Structure Assessment (circle one):

Priority

Good

Poor

Example Forest Stand Site Plan



Appendix C: Forest Conservation Worksheet and Examples

Forest Conservation Worksheet for Baltimore County

Project Name/Property Owner: _____ Date: _____

Location: _____

I. Basic Site Data Acres (0.1 acre)

Gross site area	_____
- Area within 100-year floodplain	_____
- Area within agricultural use or preservation parcel (if applicable)	_____
- Area in utility, road, or construction easements (if applicable)	_____
Net tract area (Gross site area – floodplain/agriculture/utility areas)	_____
Zoning Designation	_____

II. Information for Calculations

A. Net tract area	_____
B. Forest Conservation Threshold (___% x A)	_____
C. Afforestation Threshold (___% x A)	_____
D. Existing forest on net tract area	_____
E. Existing forest above forest conservation threshold	_____
F. Breakeven Point [(E x 0.2) + B] (the amount of forest to be retained for no mitigation)	_____
G. Forest to be cleared	_____
H. Forest to be retained	_____

III. Applicability of afforestation and reforestation to site

1. Afforestation Only

If existing forest areas are below the Afforestation Threshold (if D is less than C), and no forest clearing is proposed, afforestation requirements apply. GO TO SECTION IV.

2. Combined Afforestation and Reforestation

If existing forest areas are below the Afforestation Threshold (if D is less than c) AND forest clearing is proposed, both afforestation and reforestation are required. GO TO SECTION IV.

3. Reforestation Only

- a. If existing forest areas are at or above the Afforestation Threshold (if D is equal to or greater than C) and no clearing of existing forest resources is proposed, no reforestation is required. STOP. No further calculations are needed.

- b. If existing forest areas are retained at or above the breakeven point (if H is equal to or greater than F), STOP. No further calculations are needed and no mitigation is required.
- c. If existing forest areas are at or above the Afforestation Threshold (if D is equal to or greater than C), and clearing of forest areas is proposed, reforestation requirements may apply. GO TO SECTION V.

IV.	Afforestation Calculations	<u>Acres (0.1 acre)</u>
	A. Net tract area	_____
	C. Afforestation Threshold (___% x A)	_____
	D. Existing forest on net tract area	_____
	G. Forest areas to be cleared	_____
	H. Forest areas to be retained	_____

Select the alternative that applies:

1. No clearing:

If existing forest areas are below the Afforestation Threshold (if D is less than C) and no clearing is proposed, the following calculations apply:

Total afforestation required = $C - D$ _____

Afforestation must make the forest area equal to the Afforestation Threshold.

2. Clearing:

If existing forest areas are below the Afforestation Threshold (if C is less than D) and clearing is proposed, the following calculations apply:

Afforestation for unforested areas below Afforestation Threshold = $C - D$ _____

Reforestation for clearing below Afforestation Threshold = $G \times 2$ _____

Total planting required = $(C - D) + (G \times 2)$ _____

The afforestation planting brings the site up to the minimum forest required (the Afforestation Threshold). The reforestation compensates for clearing.

V. Reforestation Calculations

A. Net tract area	_____
B. Forest Conservation Threshold (___% x A)	_____
D. Existing forest on net tract area	_____
E. Existing forest above Forest Conservation Threshold	_____
G. Forest areas to be cleared	_____
H. Forest areas to be retained	_____

- I. Forest areas cleared above Forest Conservation Threshold _____
 If H equals or is greater than B, Alternative 1.
 If H is less than B, Alternative 2.
- J. Forest areas cleared below Forest Conservation Threshold _____
 B – H, if applicable
- K. Forest areas retained above Forest Conservation Threshold _____
 H – B, if applicable

Select the alternative that applies:

- 1. Clearing above the Forest Conservation Threshold only

If forest areas to be retained are at or above the Forest Conservation Threshold (if H is equal to or greater than B), the following calculations apply:

Reforestation for clearing above Forest Conservation Threshold = $I \times 0.25$ _____
 Credit for forest areas retained above threshold = K _____
 Total reforestation required = $(I \times 0.25) - K$ _____

If the total reforestation requirement is equal to or less than 0, no reforestation is required.

- 2. Clearing below the Forest Conservation Threshold

If forest areas to be retained are below the Forest Conservation Threshold (if H is less than B), the following calculations apply:

Reforestation for clearing above Forest Conservation Threshold = $I \times 0.25$ _____
 Reforestation for clearing below Forest Conservation Threshold = $J \times 2$ _____
 Total reforestation required = $(I \times 0.25) + (J \times 2)$ _____

STOP

Forest Conservation Worksheet for Baltimore County: Split Zoning

Project Name/Property Owner: _____ Date: _____

Location: _____

I. Basic Site Data	Acres (0.1 acre)	
	Zoning 1	Zoning 2
Gross site area	_____	_____
- Area within 100 year floodplain	_____	_____
- Area within agricultural use or preservation parcel (if applicable)	_____	_____
- Area in utility, road, or construction easements (if applicable)	_____	_____
Net tract area (Gross site area – floodplain/agriculture/utility areas)	_____	_____
Zoning designation	_____	_____
II. Information for Calculations		
A. Net tract area	_____	_____
B. Forest Conservation Threshold (____% x A), (____% x A)	_____	_____
C. Afforestation Threshold (____% x A), (____% x A)	_____	_____
D. Existing forest on net tract area	_____	_____
E. Existing forest above forest conservation threshold	_____	_____
F. Breakeven Point [(E x 0.2) + B] (the amount of forest to be retained for no mitigation)	_____	_____
G. Forest to be cleared	_____	_____
H. Forest to be retained Forest retained above the breakeven point	_____	_____

III. Applicability of afforestation and reforestation to site

1. Afforestation Only

If existing forest areas are below the Afforestation Threshold (if D is less than C), and no forest clearing is proposed, afforestation requirements apply. GO TO SECTION IV.

2. Combined Afforestation and Reforestation

If existing forest areas are below the Afforestation Threshold (if D is less than C) AND forest clearing is proposed, both afforestation and reforestation are required. GO TO SECTION IV.

3. Reforestation Only

a. If existing forest areas are at or above the Afforestation Threshold (if D is equal to or greater than C) and no clearing of existing forest resources is proposed, no reforestation is required. STOP. No further calculations are needed.

- | | | |
|--|-------|-------|
| D. Existing forest on net tract area | _____ | _____ |
| E. Existing forest above Forest Conservation Threshold | _____ | _____ |
| G. Forest areas to be cleared | _____ | _____ |
| H. Forest areas to be retained | _____ | _____ |
| I. Forest areas cleared above Forest Conservation Threshold | _____ | _____ |
| If H equals or is greater than B, Alternative 1. | | |
| If H is less than B, Alternative 2. | | |
| J. Forest areas cleared below Forest Conservation Threshold | _____ | _____ |
| B – H, if applicable | | |
| K. Forest areas retained above Forest Conservation Threshold | _____ | _____ |
| H – B, if applicable | | |

Select the alternative that applies:

1. Clearing above the Forest Conservation Threshold (CT) Only

If forest areas to be retained are at or above the Forest Conservation Threshold (if H is equal to or greater than B), the following calculations apply:

Reforestation for clearing above CT = $I \times 0.25$ _____

Credit for forest areas retained above threshold = K _____

Reforestation required = $(I \times 0.25) - K$ _____

Zoning 1 Reforestation Requirement + Zoning 2 Reforestation Requirement = _____

If the total reforestation requirement is equal to or less than 0, no reforestation is required.

2. Clearing below the Forest Conservation Threshold

If forest areas to be retained are below the Forest Conservation Threshold (if H is less than B), the following calculations apply:

Reforestation for clearing above Forest Conservation Threshold = $I \times 0.25$ _____

Reforestation for clearing below Forest Conservation Threshold = $J \times 2$ _____

Total reforestation required = $(I \times 0.25) + (J \times 2)$ _____

Zoning 1 Reforestation Requirement + Zoning 2 Reforestation Requirement = _____

Total afforestation and reforestation requirement for all zonings = _____

Forest acreage in excess of the breakeven point for one zoning can be used as forest retained for another zoning. **Subtract any forest retained above the breakeven point in any zoning from the total requirement = _____**

Example Forest Conservation Worksheet for a property with a single zoning:

Forest Conservation Worksheet for Baltimore County

Project Name/Property Owner: Dahlia Woods Date: 10/26/22
 Location: 4116 Sunshine Blvd

I.	Basic Site Data	Acres (0.1 acre)
	Gross site area	<u>17.9</u>
	- Area within 100 year floodplain	<u>0.5</u>
	- Area within agricultural use or preservation parcel (if applicable)	<u>-</u>
	- Area in utility, road, or construction easements (if applicable)	<u>-</u>
	Net tract area (Gross site area – floodplain/agriculture/utility areas)	<u>17.4</u>
	Zoning Designation	<u>RC4</u>
II.	Information for Calculations	
	A. Net tract area	<u>17.4</u>
	B. Forest Conservation Threshold (50% x A)	<u>8.7</u>
	C. Afforestation Threshold (20% x A)	<u>3.5</u>
	D. Existing forest on net tract area	<u>12.6</u>
	E. Existing forest above forest conservation threshold	<u>3.9</u>
	F. Breakeven Point [(E x 0.2) + B] (the amount of forest to be retained for no mitigation)	<u>9.8</u>
	G. Forest to be cleared	<u>5.5</u>
	H. Forest to be retained	<u>7.1</u>
III.	Applicability of afforestation and reforestation to site	
	1. <u>Afforestation Only</u>	
	If existing forest areas are below the Afforestation Threshold (if D is less than C), and no forest clearing is proposed, afforestation requirements apply. GO TO SECTION IV.	
	2. <u>Combined Afforestation and Reforestation</u>	
	If existing forest areas are below the Afforestation Threshold (if D is less than c) AND forest clearing is proposed, both afforestation and reforestation are required. GO TO SECTION IV.	
	3. <u>Reforestation Only</u>	
	a. If existing forest areas are at or above the Afforestation Threshold (if D is equal to or greater than C) and <u>no clearing of existing forest resources is proposed</u> , no reforestation is required. STOP. No further calculations are needed.	

- b. If existing forest areas are retained at or above the breakeven point (if H is equal to or greater than F), STOP. No further calculations are needed and no mitigation is required.
- c. If existing forest areas are at or above the Afforestation Threshold (if D is equal to or greater than C), and clearing of forest areas is proposed, reforestation requirements may apply. GO TO SECTION V.

IV. Afforestation Calculations	<u>Acres (0.1 acre)</u>
A. Net tract area	_____
C. Afforestation Threshold (____% x A)	_____
D. Existing forest on net tract area	_____
G. Forest areas to be cleared	_____
H. Forest areas to be retained	_____

Select the alternative that applies:

1. No clearing:

If existing forest areas are below the Afforestation Threshold (if D is less than C) and no clearing is proposed, the following calculations apply:

Total afforestation required = C - D _____

Afforestation must make the forest area equal to the Afforestation Threshold.

2. Clearing:

If existing forest areas are below the Afforestation Threshold (if C is less than D) and clearing is proposed, the following calculations apply:

Afforestation for unforested areas below Afforestation Threshold = C - D _____

Reforestation for clearing below Afforestation Threshold = G x 2 _____

Total planting required = (C - D) + (G x 2) _____

The afforestation planting brings the site up to the minimum forest required (the Afforestation Threshold). The reforestation compensates for clearing.

V. Reforestation Calculations

A. Net tract area	<u>17.4</u>
B. Forest Conservation Threshold (<u>20</u> % x A)	<u>3.5</u>
D. Existing forest on net tract area	<u>12.6</u>
E. Existing forest above Forest Conservation Threshold	<u>9.1</u>
G. Forest areas to be cleared	<u>5.5</u>
H. Forest areas to be retained	<u>7.1</u>

- I. Forest areas cleared above Forest Conservation Threshold
If H equals or is greater than B, Alternative 1.
If H is less than B, Alternative 2.
- J. Forest areas cleared below Forest Conservation Threshold
B – H, if applicable
- K. Forest areas retained above Forest Conservation Threshold
H – B, if applicable

3.9

1.6

—

Select the alternative that applies:

- 1. Clearing above the Forest Conservation Threshold only

If forest areas to be retained are at or above the Forest Conservation Threshold (if H is equal to or greater than B), the following calculations apply:

Reforestation for clearing above Forest Conservation Threshold = $I \times 0.25$ _____
 Credit for forest areas retained above threshold = K _____
 Total reforestation required = $(I \times 0.25) - K$ _____

If the total reforestation requirement is equal to or less than 0, no reforestation is required.

- 2. Clearing below the Forest Conservation Threshold

If forest areas to be retained are below the Forest Conservation Threshold (if H is less than B), the following calculations apply:

Reforestation for clearing above Forest Conservation Threshold = $I \times 0.25$ 1.0
 Reforestation for clearing below Forest Conservation Threshold = $J \times 2$ 3.2
 Total reforestation required = $(I \times 0.25) + (J \times 2)$ 4.2

STOP

Example Forest Conservation Worksheet for a property with two zonings:

Forest Conservation Worksheet for Baltimore County: Split Zoning

Project Name/Property Owner: Dahlia Woods Date: 10/26/22

Location: 416 Sunshine Blvd

I. Basic Site Data

	<u>Acres (0.1 acre)</u>	
	Zoning 1	Zoning 2
Gross site area	<u>16.5</u>	<u>4.5</u>
- Area within 100 year floodplain	<u>-</u>	<u>-</u>
- Area within agricultural use or preservation parcel (if applicable)	<u>-</u>	<u>-</u>
- Area in utility, road, or construction easements (if applicable)	<u>0.1</u>	<u>-</u>
Net tract area (Gross site area – floodplain/agriculture/utility areas)	<u>16.4</u>	<u>4.5</u>
Zoning Designation	<u>RC4</u>	<u>DRS.5</u>

II. Information for Calculations

A. Net tract area	<u>16.4</u>	<u>4.5</u>
B. Forest Conservation Threshold (<u>50%</u> x A), (<u>20%</u> x A)	<u>8.2</u>	<u>0.9</u>
C. Afforestation Threshold (<u>20%</u> x A), (<u>15%</u> x A)	<u>3.3</u>	<u>0.7</u>
D. Existing forest on net tract area	<u>12.6</u>	<u>0.3</u>
E. Existing forest above forest conservation threshold	<u>4.4</u>	<u>0</u>
F. Breakeven Point [(E x 0.2) + B] (the amount of forest to be retained for no mitigation)	<u>9.1</u>	<u>0.9</u>
G. Forest to be cleared	<u>3.1</u>	<u>0.3</u>
H. Forest to be retained	<u>9.5</u>	<u>0</u>
Forest retained above the breakeven point	<u>0.4</u>	<u>0</u>

III. Applicability of afforestation and reforestation to site

1. Afforestation Only

If existing forest areas are below the Afforestation Threshold (if D is less than C), and no forest clearing is proposed, afforestation requirements apply. GO TO SECTION IV.

2. Combined Afforestation and Reforestation

If existing forest areas are below the Afforestation Threshold (if D is less than C) AND forest clearing is proposed, both afforestation and reforestation are required. GO TO SECTION IV.

3. Reforestation Only

a. If existing forest areas are at or above the Afforestation Threshold (if D is equal to or greater than C) and no clearing of existing forest resources is proposed, no reforestation is required. STOP. No further calculations are needed.

- b. If existing forest areas are retained at or above the breakeven point (if H is equal to or greater than F), STOP. No further calculations are needed and no mitigation is required.
- c. If existing forest areas are at or above the Afforestation Threshold (if D is equal to or greater than C), and clearing of forest areas is proposed, reforestation requirements may apply. GO TO SECTION V.

IV. Afforestation Calculations

	Acres (0.1 acre)	
	Zoning 1	Zoning 2
A. Net tract area		4.5
C. Afforestation Threshold (___% x A), (___% x A)		0.7
D. Existing forest on net tract area		0.3
G. Forest areas to be cleared		0.3
H. Forest areas to be retained		0

Select the alternative that applies:

1. No clearing:

If existing forest areas are below the Afforestation Threshold or AT, (if D is less than C) and no clearing is proposed, the following calculations apply:

Afforestation required = C - D _____

Total Afforestation Required (Zoning 1 + Zoning 2) = _____

Afforestation must total the Afforestation Threshold of both zoning categories.

2. Clearing:

If existing forest areas are below the Afforestation Threshold (if C is less than D) and clearing is proposed, the following calculations apply:

Afforestation for unforested areas below the AT = C - D _____ 0.4

Reforestation for clearing below AT = G x 2 _____ 0.6

Planting required = (C - D) + (G x 2) _____ 1.0

Total Planting Required (Zoning 1 + Zoning 2) = 1.0

The afforestation planting brings the site up to the minimum forest required (the Afforestation Threshold). The reforestation compensates for clearing.

V. Reforestation Calculations

A. Net tract area		
B. Forest Conservation Threshold (___% x A), (___% x A)		

D. Existing forest on net tract area	_____	_____
E. Existing forest above Forest Conservation Threshold	_____	_____
G. Forest areas to be cleared	_____	_____
H. Forest areas to be retained	_____	_____
I. Forest areas cleared above Forest Conservation Threshold	_____	_____
If H equals or is greater than B, Alternative 1.		
If H is less than B, Alternative 2.		
J. Forest areas cleared below Forest Conservation Threshold	_____	_____
B - H, if applicable		
K. Forest areas retained above Forest Conservation Threshold	_____	_____
H - B, if applicable		

Select the alternative that applies:

1. Clearing above the Forest Conservation Threshold (CT) Only

If forest areas to be retained are at or above the Forest Conservation Threshold (if H is equal to or greater than B), the following calculations apply:

Reforestation for clearing above CT = $I \times 0.25$ _____
 Credit for forest areas retained above threshold = K _____
 Reforestation required = $(I \times 0.25) - K$ _____

Zoning 1 Reforestation Requirement + Zoning 2 Reforestation Requirement = _____

If the total reforestation requirement is equal to or less than 0, no reforestation is required.

2. Clearing below the Forest Conservation Threshold

If forest areas to be retained are below the Forest Conservation Threshold (if H is less than B), the following calculations apply:

Reforestation for clearing above Forest Conservation Threshold = $I \times 0.25$ _____
 Reforestation for clearing below Forest Conservation Threshold = $J \times 2$ _____
 Total reforestation required = $(I \times 0.25) + (J \times 2)$ _____

Zoning 1 Reforestation Requirement + Zoning 2 Reforestation Requirement = _____

Total afforestation and reforestation requirement for all zonings = 1.0

Forest acreage in excess of the breakeven point for one zoning can be used as forest retained for another zoning. Subtract any forest retained above the breakeven point in any zoning from the total requirement = 0.0

Appendix D: Protective Agreements for Forest Conservation Areas

Deed restrictions are a means of protecting or restricting the use of certain land areas. For the purposes of this Act, any areas set aside for preservation shall be protected by perpetually binding deed restrictions recorded in Baltimore County Land Records. These areas include but are not limited to:

1. Forest within sensitive areas including 100-year floodplain, intermittent and perennial streams 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. Areas with trees, shrubs or plants identified on the list of rare, threatened and endangered species;
4. Areas with 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. Areas with 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;
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. The Declaration of Protective Covenants for Forest Conservation Easements is the primary method used to accomplish this. 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 as well as for the recreational and resource management purposes cited above, 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 organizations such as Maryland Environmental Trust or Maryland Agricultural Land Preservation 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 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. Reforestation shall be required when a final regeneration harvest is complete or if deemed necessary due to the lack of adequate natural regeneration.

For information concerning the development of a forest management plan, please contact the Department of Natural Resources project forester for Baltimore County at:

9405 Old Harford Road
Baltimore, Maryland 21234
Telephone: 410-665-5820

Declaration-Forest Conservation-Drawing-H

RW
J.O.
Item (FC)
Election District

FOREST CONSERVATION
DECLARATION OF PROTECTIVE COVENANTS, CONDITIONS AND
RESTRICTIONS

THIS DECLARATION, made this _____ day of _____, 20____, by _____, (the "Declarant"); and BALTIMORE COUNTY, MARYLAND, A BODY CORPORATE AND POLITIC (the "County").

WHEREAS, the Declarant is the owner in fee simple of all that property, situate and lying in the _____ Election District of Baltimore County, Maryland, and more particularly described in a Deed dated _____, and recorded in the Land Records of Baltimore County in Liber _____, folio _____, from _____ to (the "Property"); and

WHEREAS, Code of Maryland Regulations, as amended (hereafter referred to as "COMAR") Section 08.19.05.02 requires the establishment of long-term protective measures for all land retained as forest, afforested, or reforested areas defined in Md. Code Ann. Nat. Res. § 5-1601.

WHEREAS, the Baltimore County Environmental Protection and Sustainability ("EPS") has primary responsibility for developing and implementing a local forest conservation program within Baltimore County pursuant to Md. Code Ann. Nat. Res. § 5-1603; and

WHEREAS, in order to protect the environmental quality of the area of the Property, said area containing _____ acre (_____ sq. ft.), more or less, as designated and shown as _____ (the "Forest Conservation Easement") on Baltimore County Real Estate Compliance Drawing No. RW _____, which is attached hereto and made a part hereof, the Declarant desires to protect said Forest Conservation Easement by imposing covenants, conditions and restrictions which will bind the lots and the present and future owners thereof. The County shall have the legal right to enforce the covenants, conditions and restrictions as set forth herein together with the enforcement rights referenced in Section 4.

NOW, THEREFORE, in consideration of the benefits derived by the Declarant and its successors in interest, the said Declarant, for itself, its successors and/or assigns, does hereby agree as follows:

1. Except as provided for in an approved Forest Conservation Plan pursuant to § 33-6110 of the Baltimore County Code, as amended (hereafter referred to as "the Code"):

- a. Existing vegetation within the Forest Conservation Easement shall not be disturbed. This includes, but is not limited to, disturbance by tree removal, shrub removal, clearing, mowing, burning, spraying, and grazing;
- b. Soil disturbance shall not take place within the Forest Conservation Easement by grading, stripping of topsoil, plowing, cultivating, or other practices;
- c. Filling or dumping shall not occur within the Forest Conservation Easement;
- d. Animals shall not be housed, grazed, or otherwise maintained within the
- e. Forest Conservation Easement;
- f. Pesticides shall not be stored, used, or applied within the Forest Conservation Easement, except for the spot spraying of noxious weeds consistent with the recommendations of the
- g. University of Maryland Cooperative Extension Service;
- h. Motorized vehicles shall not be stored or operated within the Forest Conservation Easement, except for planting, maintenance, and emergency use approved by EPS;
- i. Materials shall not be stored within the Forest Conservation Easement;
- j. Logging and timber harvesting operations shall not occur within the Forest Conservation Easement except in accordance with a Forest Management Plat that has been approved by EPS as part of the Forest Conservation Plan.

2. Waiver by EPS. The aforementioned covenants, conditions and restrictions may be waived or modified by variance only by EPS as provided in Code § 33-6-116.

3. Easement for Access. The Declarant hereby grants to Baltimore County, Maryland, an easement of access to the Forest Conservation Easement (on, over, and across ***(name of road) or*** (as shown and indicated “ACCESS EASEMENT” on Baltimore County Real Estate Compliance Drawing No. RW _____), which is attached hereto and made a part hereof), for the limited purposes of inspecting and maintaining the Forest Conservation Easement and to ensure compliance with the Forest Conservation Plan and Title 6 of Article 33 of the Code, and for no other use or purpose.

4. Miscellaneous.

- a. Enforcement shall be pursuant to the Enforcement Procedures of §§ 33-6 118 et seq. of the Code. Invalidation of any one or more of these covenants by judgment or court order shall in no way affect any other provisions, which shall remain in full force and effect.
- b. Any failure by any party entitled to enforce any of the covenants, conditions and restrictions herein contained, shall in no event be deemed a waiver of the right to do so thereafter as to the same breach, or as to one occurring prior to, or subsequent thereto.
- c. These covenants shall run with and be binding upon the Property and shall inure to the benefit of and be binding upon the Declarant, its successors and/or assigns. These covenants and the rights and liabilities arising hereunder are

governed by and shall be determined in accordance with the laws of the State of Maryland.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

ATTEST/WITNESS

DECLARANT:

(Seal)

(Seal)

STATE OF MARYLAND, COUNTY OF BALTIMORE, to wit:

I HEREBY CERTIFY, that on this ____ day of _____, in the year _____, before me, the subscriber, a Notary Public, personally appeared _____ and he/she acknowledged the foregoing Declaration to be his/her act, and IN MY PRESENCE SIGNED AND SEALED THE SAME.

AS WITNESS my hand and Notarial Seal.

Notary Public

My Commission expires: _____

[OR]

STATE OF _____, CITY/COUNTY OF _____, to wit:

I HEREBY CERTIFY, that on this ____ day of _____, in the year _____, before me, the subscriber, a Notary Public, personally appeared [name of person who made acknowledgement on behalf of the Grantor entity], and that he/she as [title of corporate officer or other description of legal capacity], being authorized to do so, executed the foregoing Declaration for the purposes therein contained, by signing the name of [Name of Grantor] by himself/herself as such [title of corporate officer or other description of legal capacity], and IN MY PRESENCE SIGNED AND SEALED THE SAME.

AS WITNESS my hand and Notarial Seal.

Notary Public

My Commission expires: _____

This is to certify that the within instrument was prepared by an attorney admitted to practice before the Court of Appeals of Maryland.

APPROVED:

Environmental Protection and Sustainability

APPROVED FOR LEGAL FORM AND SUFFICIENCY*
(Subject to Execution by A Duly Authorized County
Administrative Official and County Council, if Indicated)

OFFICE OF THE COUNTY ATTORNEY

*Approval of Legal Form and Sufficiency Does Not Convey
Approval or Disapproval of Substantive Nature of Transaction.
Approval is Based Upon Typeset Document. All Modifications Require Re-Approval.

APPROVED AND ACCEPTED this _____
Day of _____, 20____.

ATTEST/WITNESS

BALTIMORE COUNTY, MARYLAND:

BY: _____
Name:
County Administrative Officer

All language on this page is required by Baltimore County for this document.

[Attach Joinder by Trustee(s)/Mortgagee if applicable]

Declaration-Forest Conservation-Plat-I

RW
J.O.
Item (FC)
Election District

FOREST CONSERVATION
DECLARATION OF PROTECTIVE COVENANTS, CONDITIONS AND
RESTRICTIONS

THIS DECLARATION, made this _____ day of _____, 20____, by _____, (the "Declarant"); and BALTIMORE COUNTY, MARYLAND, A BODY CORPORATE AND POLITIC (the "County").

WHEREAS, the Declarant is the owner in fee simple of all that property, situate and lying in the _____ Election District of Baltimore County, Maryland, and more particularly described in a Deed dated _____, and recorded in the Land Records of Baltimore County in Liber _____, folio _____, which was granted and conveyed by _____ to _____ (the "Property"). Said property is shown on a Subdivision Plat entitled _____ and recorded among the Plat Records of Baltimore County in Plat Book _____, folio _____ (the "Plat"); and

WHEREAS, Code of Maryland Regulations, as amended (hereafter referred to as "COMAR") Section 08.19.05.02 requires the establishment of long-term protective measures for all land retained as forest, afforested, or reforested areas defined in Md. Code Ann. Nat. Res. § 5-1601.

WHEREAS, the Baltimore County Environmental Protection and Sustainability ("EPS") has primary responsibility for developing and implementing a local forest conservation program within Baltimore County pursuant to Md. Code Ann. Nat. Res. § 5-1603; and

WHEREAS, in order to protect the environmental quality of the area of the Property, said area containing _____ acre (_____ sq. ft.), more or less, as designated on the Plat as _____ (the "Forest Conservation Easement"), the Declarant desires to protect said Forest Conservation Easement by imposing covenants, conditions and restrictions which will bind the lots and the present and future owners thereof. The County shall have the legal right to enforce the covenants, conditions and restrictions as set forth herein together with the enforcement rights referenced in Section 4.

NOW, THEREFORE, in consideration of the benefits derived by the Declarant and its successors in interest, the said Declarant, for itself, its successors and/or assigns, does hereby agree as follows:

1. Except as provided for in an approved Forest Conservation Plan pursuant to § 33-6110 of the Baltimore County Code, as amended (hereafter referred to as “the Code”):

- a. Existing vegetation within the Forest Conservation Easement shall not be disturbed. This includes, but is not limited to, disturbance by tree removal, shrub removal, clearing, mowing, burning, spraying, and grazing;
- b. Soil disturbance shall not take place within the Forest Conservation Easement by grading, stripping of topsoil, plowing, cultivating, or other practices;
- c. Filling or dumping shall not occur within the Forest Conservation Easement;
- d. Animals shall not be housed, grazed, or otherwise maintained within the Forest Conservation Easement;
- e. Forest Conservation Easement;
- f. Pesticides shall not be stored, used, or applied within the Forest Conservation Easement, except for the spot spraying of noxious weeds consistent with the recommendations of the University of Maryland Cooperative Extension Service;
- g. Motorized vehicles shall not be stored or operated within the Forest Conservation Easement, except for planting, maintenance, and emergency use approved by EPS;
- h. Materials shall not be stored within the Forest Conservation Easement;
- i. Logging and timber harvesting operations shall not occur within the Forest Conservation Easement except in accordance with a Forest Management Plat that has been approved by EPS as part of the Forest Conservation Plan.

2. Waiver by EPS. The aforementioned covenants, conditions and restrictions may be waived or modified by variance only by EPS as provided in Code § 33-6-116.

3. Easement for Access. The Declarant hereby grants to Baltimore County, Maryland, an easement of access to the Forest Conservation Easement (on, over, and across ***(name of road) or*** (as shown and indicated “ACCESS EASEMENT” on the aforesaid Plat) for the limited purposes of inspecting and maintaining the Forest Conservation Easement and to ensure compliance with the Forest Conservation Plan and Title 6 of Article 33 of the Code, and for no other use or purpose.

4. Miscellaneous.

- a. Enforcement shall be pursuant to the Enforcement Procedures of §§ 33-6-118 et seq. of the Code. Invalidation of any one or more of these covenants by judgment or court order shall in no way affect any other provisions, which shall remain in full force and effect.
- b. Any failure by any party entitled to enforce any of the covenants, conditions and
- c. restrictions herein contained, shall in no event be deemed a waiver of the right to do so thereafter as to the same breach, or as to one occurring prior to, or subsequent thereto.
- d. These covenants shall run with and be binding upon the Property and shall inure to the benefit of and be binding upon the Declarant, its successors and/or

assigns. These covenants and the rights and liabilities arising hereunder are governed by and shall be determined in accordance with the laws of the State of Maryland.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

ATTEST/WITNESS

DECLARANT:

_____ (Seal)

_____ (Seal)

STATE OF MARYLAND, COUNTY OF BALTIMORE, to wit:

I HEREBY CERTIFY, that on this _____ day of _____, in the year _____, before me, the subscriber, a Notary Public, personally appeared _____ and he/she acknowledged the foregoing Declaration to be his/her act, and IN MY PRESENCE SIGNED AND SEALED THE SAME.

AS WITNESS my hand and Notarial Seal.

Notary Public

My Commission expires: _____

[OR]

STATE OF _____, CITY/COUNTY OF _____, to wit:

I HEREBY CERTIFY, that on this ___ day of _____, in the year _____, before me, the subscriber, a Notary Public, personally appeared [name of person who made acknowledgement on behalf of the Grantor entity], and that he/she as [title of corporate officer or other description of legal capacity], being authorized to do so, executed the foregoing Declaration for the purposes therein contained, by signing the name of [Name of Grantor] by himself/herself as such [title of corporate officer or other description of legal capacity], and IN MY PRESENCE SIGNED AND SEALED THE SAME.

AS WITNESS my hand and Notarial Seal.

Notary Public

My Commission expires: _____

This is to certify that the within instrument was prepared by an attorney admitted to practice before the Court of Appeals of Maryland.

APPROVED FOR LEGAL FORM AND SUFFICIENCY*
(Subject to Execution by A Duly Authorized County
Administrative Official and County Council, if Indicated)

OFFICE OF THE COUNTY ATTORNEY

*Approval of Legal Form and Sufficiency Does Not Convey
Approval or Disapproval of Substantive Nature of Transaction.
Approval is Based Upon Typeset Document. All Modifications Require Re-Approval.

APPROVED AND ACCEPTED this _____
Day of _____, 20____.

ATTEST/WITNESS

BALTIMORE COUNTY, MARYLAND:

BY: _____
Name:
County Administrative Officer

All language on this page is required by Baltimore County for this document.

[Attach Joinder by Trustee(s)/Mortgagee if applicable]

Appendix E: Forest Planting Bank Standards

Bank Operator Obligations

The bank operator must be a Maryland DNR Forest Conservation Qualified Professional, licensed forester, or licensed landscape architect. The bank operator is responsible for implementation, maintenance, and remediation of the mitigation as detailed on the approved mitigation bank plan. Responsibilities include, but are not limited to, ensuring the success of planting areas, reporting the results of annual monitoring of the mitigation site, and managing and reporting credit sales and balances. The bank operator is responsible for ensuring the success of the mitigation bank and for monitoring the mitigation to identify problems at predetermined intervals, and following through with required remedial action.

Siting Considerations

In order to be consistent with State-mandated Forest Conservation Law requirements, mitigation banks in Baltimore County may be permitted only in priority areas as identified in Natural Resources Article § 5-1607(d) and shall:

1. Establish or enhance forest buffers* adjacent to intermittent and perennial streams to widths of at least 75 feet;
2. Establish or increase existing forested corridors to connect existing forests within or adjacent to the site, and forested corridors should be a minimum of 300 feet wide to facilitate wildlife movement, where practical;
3. Establish or enhance forest buffers* adjacent to critical habitats;
4. Establish or enhance forested areas in 100-year floodplains;
5. Establish plantings to stabilize slopes of 25% or greater and slopes of 15% or greater with a soil K value greater than 0.35 including the slopes of ravines or other natural depressions;
6. Establish forest areas adjacent to existing forests; and,
7. Use native plant materials for afforestation or reforestation.

*Forest buffers identified under Natural Resources Article § 5-1607(d) are separate from and not to be construed as Baltimore County Forest Buffer Easements. Unforested Baltimore County Forest Buffer Easements cannot be planted for mitigation bank credit.

For further information regarding the siting, review, design, and approval of mitigation banks in Baltimore County, please contact Environmental Impact Review.

Appendix F: Exotic and Invasive Plants

Exotic and/or invasive species are of concern because they may displace native vegetation. Please refer to the following online resources for updated lists of invasive plant species found in Baltimore County and information regarding their management:

<https://www.invasive.org/maweeds.cfm>

<https://www.invasive.org/alien/pubs/midatlantic/midatlantic.pdf>

<https://dnr.maryland.gov/Invasives/Pages/default.aspx>

<https://extension.umd.edu/resource/forest-threats-invasive-plants-and-shrubs>

Appendix G: Maintenance Agreement

In accordance with Section 33-6-110 of the Baltimore County Code (BCC), a grading permit or building permit for regulated activities may not be issued until the final Forest Conservation Plan (FCP) has been approved by the Department of Environmental Protection and Sustainability (DEPS). Furthermore, the FCP must incorporate a binding three-year forest establishment and maintenance agreement. The FCP performance security shall be in the amount equal to 110% of the estimated cost of implementing the FCP. The estimated cost must be prepared by a qualified professional and approved by DEPS. In no instance shall the amount of the performance security be less than 25 cents per square foot of the required afforestation or reforestation area.

Inspection and certification prepared by a licensed forester, licensed landscape architect, or other qualified professional (QP) specified in COMAR 08.19.01.04, is required at specific stages of implementation in accordance with Section 33-6-118 of the BCC. The applicant is responsible for providing an inspection report and shall submit the report to DEPS for approval in accordance with the plan requirements.

The report shall include information regarding the number, health, size, form and vigor of the trees; control of insects, disease, and competing vegetation; watering; mechanical injury; and the name of the company or individual responsible for tree care.

Any deviation from the approved final FCP shall be documented on a revised FCP, prepared by a QP. The revised FCP plan shall be reviewed and approved by DEPS prior to approval of the initial planting.

The FCP performance security may be reduced in accordance with Section 32-4-313 of the BCC. DEPS shall entertain requests for security reduction at the following stages of construction, subject to conditions herein:

- i. Implementation of the FCP: Upon inspection of the planting and approval of the report, DEPS may begin the three-year maintenance agreement. No reduction in security shall be entertained at this stage.
- ii. Upon completion of the first year of the maintenance agreement: The requirement for inspection and certification prepared by a QP and submittal of an inspection report is repeated at the end of the first year. If the reforestation or afforestation does not meet the survival requirement after the first year, the applicant shall establish reinforcement plantings in accordance with the Baltimore County Forest Conservation Manual. If deficiencies exist, and they are not corrected, DEPS reserves the right not to reduce the performance security and to extend the maintenance period. Upon inspection of the planting and approval of the report, DEPS may request the Office of Budget and Finance (OBF) to approve reduction of the performance security to an amount equal to 75 percent of the original security. Upon OBF approval, the performance security may be reduced.
- iii. Upon completion of the second year of the maintenance agreement: The requirement for inspection and certification prepared by a QP and submittal of an inspection report is repeated at the end of the second year. Upon inspection of the planting and approval of the report, DEPS may request the OBF to approve reduction of the performance security

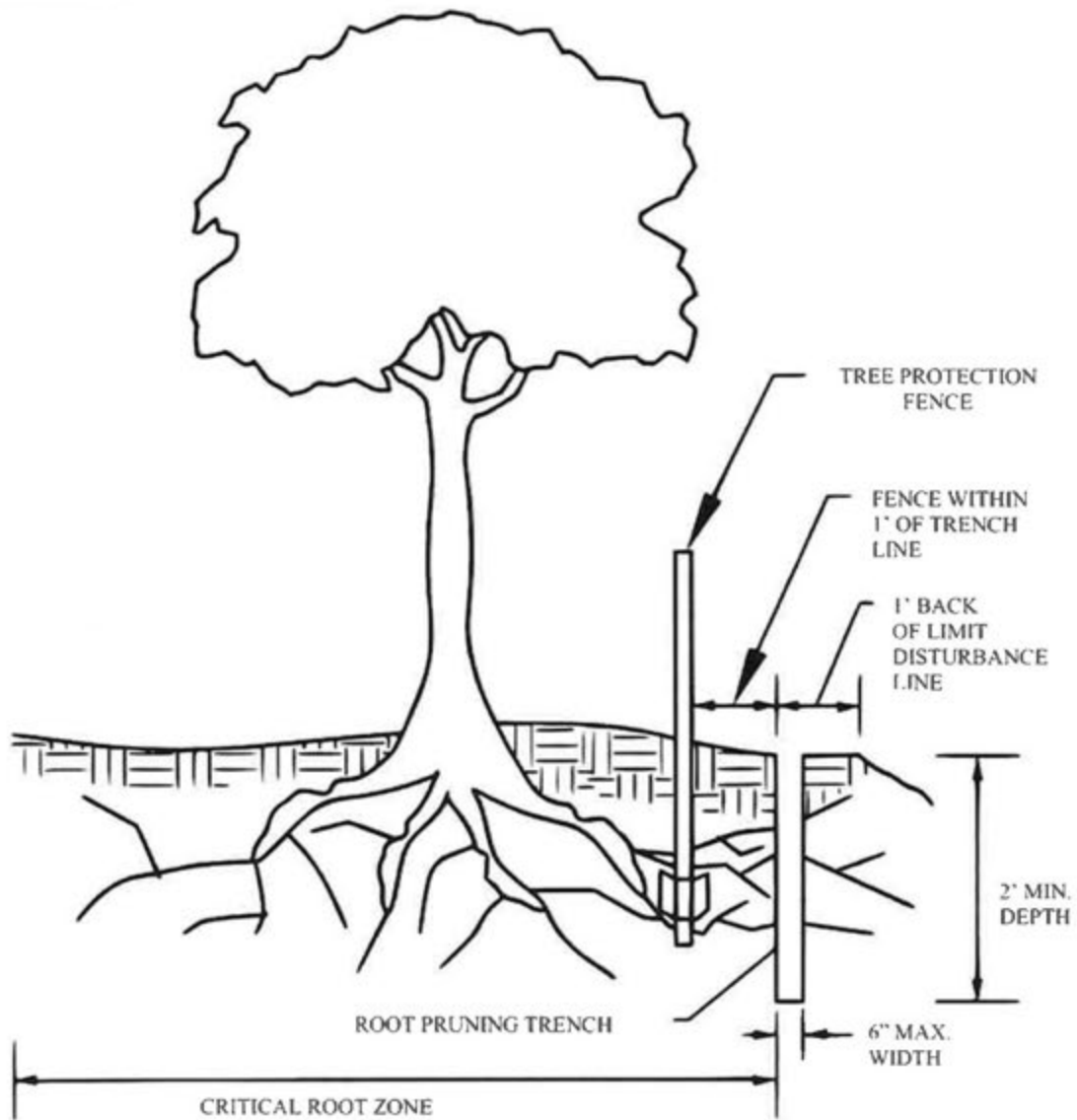
to an amount equal to 50 percent of the original security. Upon OBF approval, the performance security may be reduced.

- iv. Upon completion of the third year of the maintenance agreement: The requirement for inspection and certification prepared by a QP and submittal of an inspection report is repeated at the end of the third year. The minimum survival rate shall be 75 percent of the total number of trees planted per acre at the end of the three-year maintenance agreement. Wild tree seedlings from natural regeneration on the planting site may be counted up to 50 percent towards the total survival number, if they are healthy, native species at least 12 inches tall. Upon inspection of the planting and approval of the report, DEPS may request the OBF to reduce the performance security to zero. Upon OBF approval, the security may be fully reduced.

Appendix H: Forest and Specimen Tree Protection Figures

Figure H-1

ROOT PRUNING



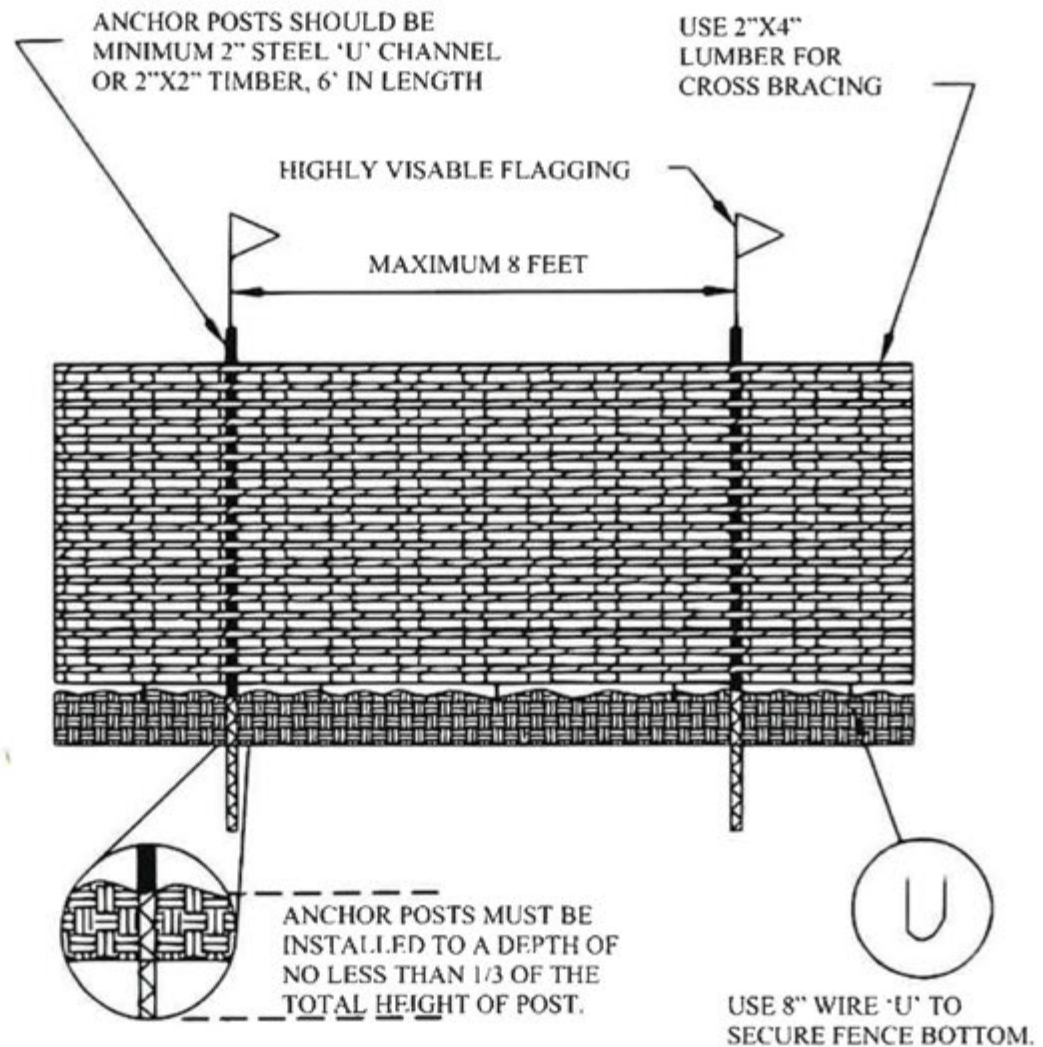
NOTES:

1. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
2. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO TRENCHING.
3. EXACT LOCATION OF TRENCH SHOULD BE IDENTIFIED.
4. TRENCH SHOULD BE IMMEDIATELY BACKFILLED WITH SOIL REMOVED OR OTHER HIGH ORGANIC SOIL.
5. ROOTS SHOULD BE CLEANLY CUT USING VIBRATORY KNIFE OR OTHER ACCEPTABLE EQUIPMENT.

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

Figure H-2

BLAZE ORANGE PLASTIC MESH TREE PROTECTION FENCE



SHOWN AS: _____

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 PROR TO INSTALLING DEVICE.
4. ROOT DAMAGE SHOULD BE AVOIDED.
5. PROTECTIVE SIGNAGE MAY ALSO BE USED.
6. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSATRUCTION.

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

Figure H-3

Easement Sign Specifications & Suppliers

The companies listed below have agreed to stock signs for "Forest Buffer", "Forest Conservation Area", and "Chesapeake Bay Critical Area Easement". Sign specifications include:

- 6" x 3" size
- .040 gauge aluminum
- Green text on white background
- Center hole top & bottom
- Text includes EPS's name & EIR's phone #

***SIGNS SHALL BE 4-FEET OFF THE GROUND ON HEAVY GAUGE METAL "U" POSTS.
*AFFIX SIGNS USING GALVANIZED METAL BOLTS.**



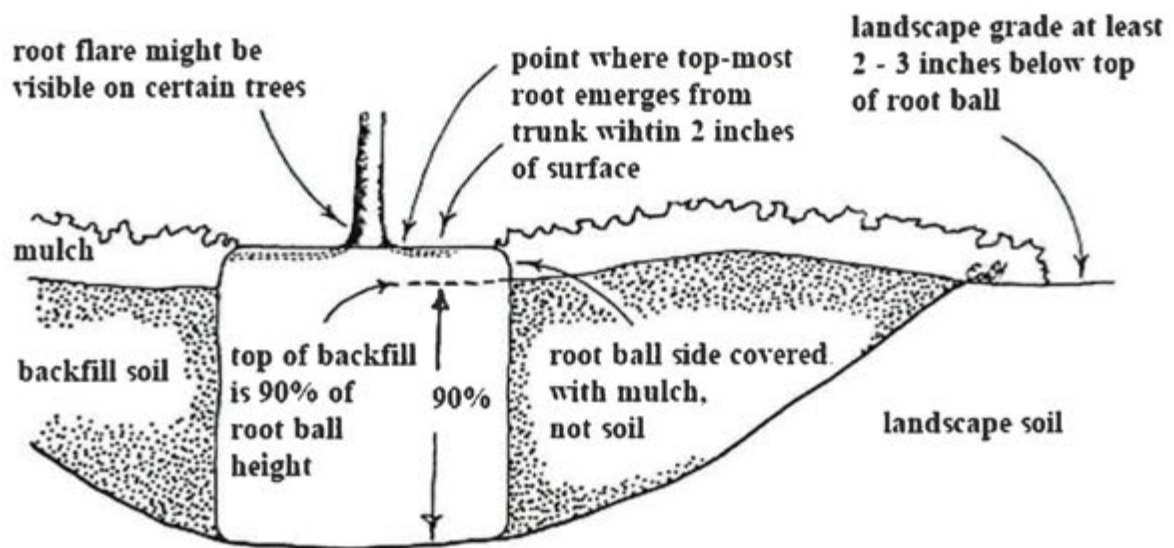
Contact DEPS for an updated list of sign suppliers.

The Forest Conservation/Forest Buffer/Critical Area Easement must be posted with protective signs as shown on the approved Forest Conservation Plan, Forest Buffer Protection Plan, Critical Area Management Plan and/or building permit (as applicable or as required by EPS). Please be advised that all protective signage is permanent and shall remain after all construction is complete.

Each sign shall be attached with two (2) bolts to a heavy gauge metal "U" post (weight 1.12 lbs. /ft.). The aboveground portion of each sign/post shall be 4 feet high and each post shall be installed to a depth of 2 feet below grade.

Figure H-4

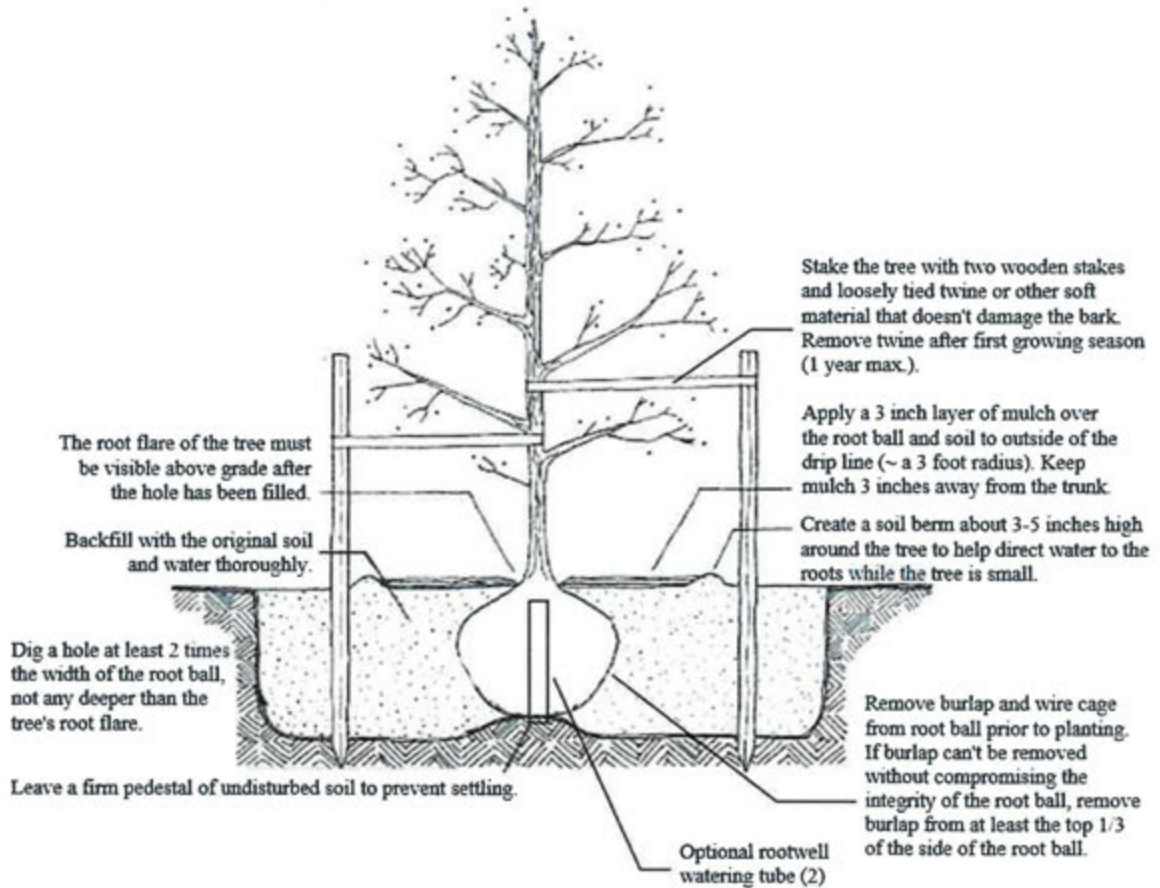
PLANTING DETAIL



Source: <https://hort.ifas.ufl.edu/woody/images/plantingdetail.gif>

Figure H-5

TREE STAKING DETAIL



Source: https://www.ci.sandy.or.us/sites/default/files/fileattachments/public_works/page/13771/176166.pdf

Figure H-6

Unacceptable Easement Configuration Example

