U.S. FOOD AND DRUG ADMINISTRATION
MUIRKIRK ROAD CAMPUS MASTER PLAN

Final Environmental Impact Statement
Appendix G –Tree Conservation/ Forest Management Plan

March 2023

Prepared by:

GSA

In cooperation with:

FDA U.S. FOOD & DRUG ADMINISTRATION

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U.S. Food and Drug Administration
Muirkirk Road Campus Master Plan

Tree Replacement and Conservation/ Forest Management Plan

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LIST OF ACRONYMS

ANSI	American National Standards Institute
CFSAN	Center for Food Safety and Applied Nutrition
CRZ	Critical Root Zone
CVM	Center for Veterinary Medicine
dbh	diameter at breast height
FDA	U.S. Food and Drug Administration
FE.G	Federal Element Section G
FRC	Federal Research Center
GSA	U.S. General Services Administration
gsf	gross square feet
MIHP	Maryland Inventory of Historic Places
MRC	Muirkirk Road Campus
NCPC	National Capital Planning Commission
NCR	National Capital Region
NRHP	National Register of Historic Places
TPC/FM-P	Tree Preservation and Conservation/Forest Management Plan
TPRP	Tree Preservation and Replacement Policy
USDA NRCS	United States Department of Agriculture Natural Resources Conservation Service

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1.0 INTRODUCTION

The U.S. General Services Administration (GSA), National Capital Region (NCR), on behalf of and in cooperation with the U.S. Food and Drug Administration (FDA), is engaging in a master planning effort for the Muirkirk Road Campus (MRC) to consolidate additional FDA employees to the MRC, located at 8301 Muirkirk Road, Laurel, Maryland. FDA owns 249 acres of land at Muirkirk Road, of which 197 acres is the West Parcel and the East Parcel makes up 52 acres. The Master Plan proposes development on the West Parcel and anticipates a total development of 383,300 gross square feet (gsf) for lab, office and shared use space, and two parking garages to accommodate 900 cars at a parking ratio of one space for every two employees. The Master Plan also includes infrastructure improvements including a new front entrance gate house, a visitor parking area, and new truck screening facility.

Currently, the site is a largely untouched natural landscape that gives the MRC its unique character and distinctive identity. Most of the campus is made up of densely forested areas and open pastures, shaped by multiple stream valleys, steep slopes, and significant grade changes. The Master Plan carefully balances the FDA's need for additional facilities to support its mission and enhance the site's natural character.

The locations for the new buildings have been chosen because they are in relatively flat parts of the site, celebrate the site's woodlands and make the woodlands accessible for staff as amenity space. While there are some places where the woods will be removed for building pads, every effort has been made to minimize and preserve the natural woodlands.

As the Master Plan is implemented, the architecture and landscape will play important roles in making the space successful. As the architecture organically defines the edge of the woodlands, it will also need to reinforce FDA's image as a leading scientific institution that fosters collaboration and embodies design excellence. Leading edge sustainable strategies at the time of execution will need to be embraced. The landscape will make the new development unique and inviting to be in and, as such, it will need to be carefully executed and ecologically responsive.

In support of master plan development, a Tree Replacement and Conservation/Forest Management Plan (TRC/FM-P) has been developed. This TRC/FM-P was prepared in compliance with the National Capital Planning Commission's (NCPC) *Tree Preservation and Replacement Policy* (TPRP), Maryland's *Forest Conservation Act* (COMAR 8.19), and Prince George's County's *Woodland and Wildlife Conservation Ordinance* to prevent and mitigate tree canopy loss proposed under the FDA MRC Master Plan.

2.0 BACKGROUND

In 2020, NCPC updated their *Comprehensive Plan for the National Capital: Federal Environment Elements* (Comprehensive Plan). The update to the Comprehensive Plan, expands on existing policies with an enhanced prioritization on tree preservation and focuses on transplanting or replacing existing trees when they are impacted by development (NCPC, 2022). The policies that were updated are found in Section G of the Federal Environment Element (FE.G). These policies - FE.G.1, FE.G.2, and FE.G.3 - direct the Federal government to preserve existing trees, especially individual trees, stands, and forests of healthy, native, or non-invasive species, and the policies further direct applicants to account for existing trees early in the planning and design

processes when development occurs to maximize preservation and incorporate the natural landscape into the design.

Specifically, the policies state that the Federal government should:

FE.G.1 Preserve and protect existing trees, especially individual trees, stands, and forests of healthy, native or non-invasive species. Account for existing trees early in the planning and design processes when development occurs to maximize preservation and incorporate the natural landscape into the design. In addition:

1. Trees 31.85-inches in diameter (100 inches in circumference) or greater may not be removed, unless:

    a. Removal is critical to accomplishing the mission of the agency and planning/design alternatives that would preserve such tree(s) have been explored and determined incapable of accommodating program requirements, or

    b. The tree(s) are considered invasive, hazardous, or high risk per an Arborist's evaluation.

2. All possible considerations should be taken to preserve and protect trees in areas determined to be critical to the health of tidal waters, tidal wetlands, and tributary streams of the Chesapeake Bay or Potomac River watersheds, and on sites with old growth forests and/or with significant ecosystems (NCPC, 2022).

FE.G.2 Transplant or replace existing tree(s) when they are impacted by development and preservation is not feasible, according to the following procedures:

1. Transplant healthy, native, or non-invasive tree(s) where practicable. Consult an Arborist and consider the following factors when determining if transplanting is appropriate:

    a. Tree species, size, and condition

    b. Historic or cultural significance of the tree (e.g., "legacy tree or legacy vegetation" or those that contribute to historic city plans and cultural landscapes)

    c. Current location of the tree(s) compared with the proposed location of the tree(s) (e.g., urban condition vs. open field; shade vs. sun)

    d. Soil quality at the current and proposed locations (e.g., sandy loam vs. silty clay; availability of organic matter)

    e. Percent of critical root area that can be retained

    f. Maintenance of tree(s) after transplanting

2. Replace tree(s) when they require removal. Replacement tree(s) should increase biodiversity, be native species or non-invasive species, and have a mature canopy spread equivalent to, or greater than, the tree(s) removed. Replacement tree(s) should be planted at a minimum caliper size of 2.5 inches for shade trees, 1.5 inches for ornamental trees, and six-foot height for multi-stem and evergreen trees.

3. Locate replacement or transplanted trees, in order of preference, on:

    a. The project site (e.g., within or adjacent to the limits of disturbance)

    b. The property where the project site is located

c. Another site within the agency's jurisdiction (authority) only if the preferred locations cannot accommodate the replacement trees without overcrowding, or

d. A combination of the above locations.

4. Ensure the amount of planting soil volume is consistent with current industry best practices. Consult with federal and local stakeholders to determine the appropriate standards based on the type of tree (e.g., shade tree, ornamental, evergreen, etc.) and location (e.g., above structure, on-grade, etc.).

5. Specify replacement trees in accordance with the most current edition of American National Standards Institute (ANSI) Z60.12. Transplant, install, and maintain trees in accordance with the most current edition of ANSI-A3003.

6. Offset the balance of replacement trees (if the total quantity of replacement trees cannot be met) with sustainable, low impact development practices on the project site or property. These practices should provide similar environmental benefits to those of canopy trees, such as stormwater capture and treatment, reduced urban heat island effect, and/or carbon sequestration (NCPC, 2022).

FE.G.3 Enhance the environmental quality of the National Capital Region by preserving existing trees, replacing trees where they have died, and transplanting or replacing trees where they require removal due to development. Tree preservation, transplant, and replacement should adhere to the procedures provided herein to prevent a net loss of tree canopy in the development area (NCPC, 2022).

Maryland's *Forest Conservation Act* was enacted in 1992 and seeks to minimize the loss of Maryland's forests during land development by making the identification and protection of forests and other sensitive areas an integral part of the site planning process. Prince George's County's *Woodland and Wildlife Conservation Ordinance* seeks to conserve and protect trees, woodlands, and wildlife habitat by requiring site planning techniques and construction practices. The only difference between the County's and the State's policy is the naming of the zoning code. Prince George's County refers to site zoning as Reserved Open Space (R-O-S) and the State refers to the same zoning as Agriculture and Resources Areas. Based on the State's and County's requirements, the replacement of trees is required based on a conservation threshold acreage. This is a benchmark percent of the total area of the site (forested and non-forested) by which replanting acreage is calculated via Maryland's Forest Conservation Worksheet. The replacement requirements are that 0.25 acres would be replaced for each acre cleared onsite above the conservation threshold acreage (1/4:1) and 2 acres for each acre cleared below the conservation threshold acreage (2:1) (MDNR, 2021 and Prince George's County – Planning Department, 2021).

3.0 SITE DESCRIPTION

The main entrance to the MRC is at 8301 Muirkirk Road. It lies approximately two miles east of the terminus of Maryland Route 200, 1.5 miles northwest of the Powder Mill Road/Maryland 295 interchange, and 6 miles from FDA's headquarters campus at the Federal Research Center (FRC). The main campus of the MRC is west of Baltimore Avenue (US 1) and east of Baltimore-Washington Parkway (US 295) in Prince George's County. The MRC West Pracel is bounded to the north by residential properties, to the east by Odell Road and the Maryland National Guard, to the south by Odell Road and the Beltsville Information Management Center and the Special Collection Service, and to the west by Ellington Drive. The FDA East Parcel is made up of the

Maryland Army National Guard, which occupies and occupies a 23.45-acre tract; the South Laurel Water Pumping Station, which occupies a 4-acre tract; and the remaining 24.55-acre area is undeveloped (**Figure 1**).

Forest data collection was performed within the MRC West Campus that is in consideration for the proposed Master Plan. The interior of the campus consists of laboratories, offices, and support buildings. The facilities are surrounded by several large parking lots, pastures, open space, and mature forests.

Forests to the southeast of the study area connect with tracts of mostly undeveloped, forested land. Laurel is a heavily populated urban landscape, and the large tracts of forest constitute an important greenway.

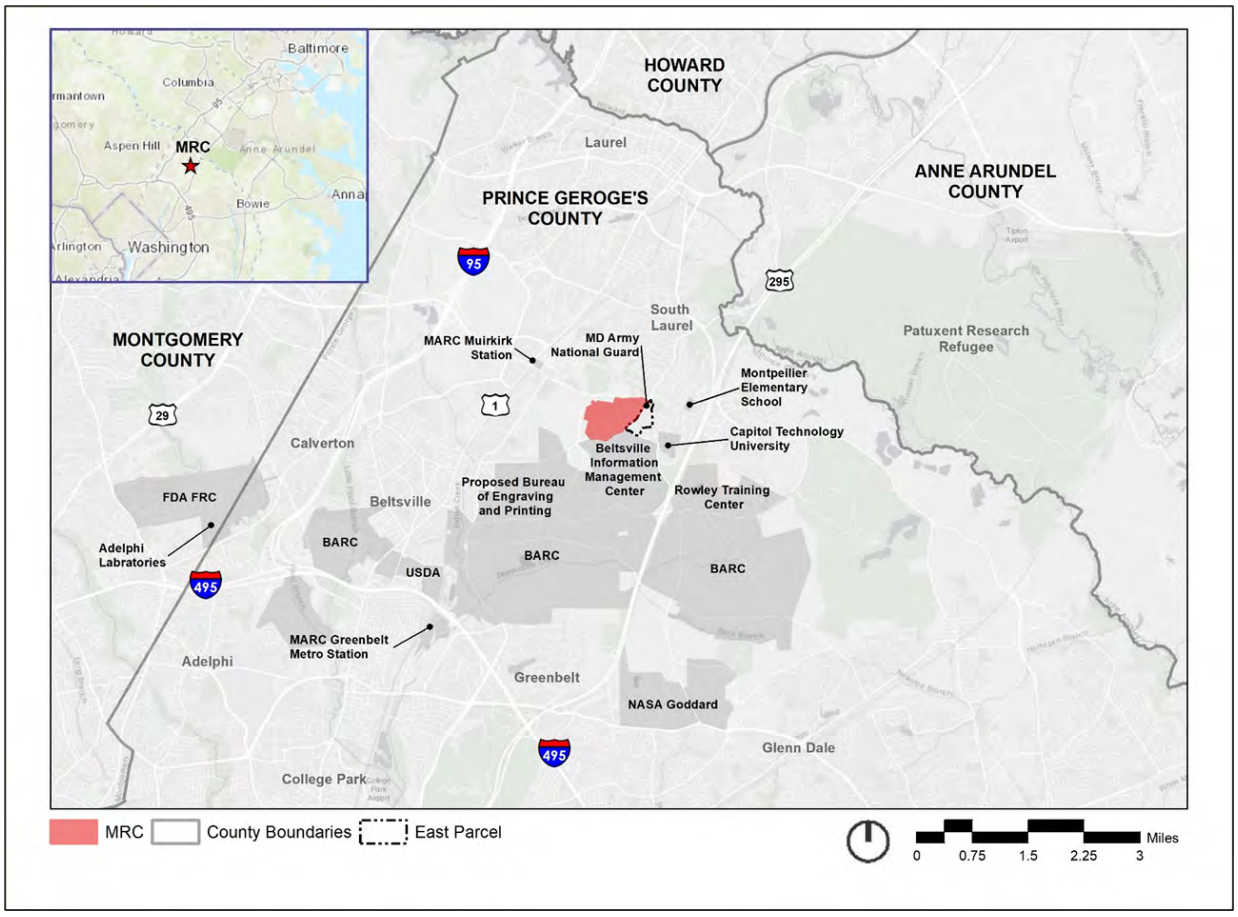

Figure 1. FDA Muirkirk Road Campus

4.0 SITE CONDITIONS

Stantec Consulting Services Inc (Stantec) conducted a Forest Stand Delineation at the MRC in November 2020. The West Campus consists of laboratories, offices, and support buildings. The facilities are surrounded by several large parking lots, pastures, open space, and mature forests. Forests to the southeast connect with tracts of mostly undeveloped, forested land. Laurel is a heavily populated urban landscape, and the large tracts of forest constitute an important greenway.

A total of nine forest stands were identified during Stantec's field investigations. The total acreage of the forest stands was 57.8 acres (**Figure 2**). A list of specimen trees is attached in Appendix B. Appendix C contains the specimen tree list.The field datasheets and forest stand summary sheets are included in Appendices D and E.

Stantec reviewed historical and cultural sites listed in the National Register Historic Places (NRHP) and the Maryland Inventory of Historic Properties (MIHP) to document the presence of trees that are part of a historic site or associated with a historical structure. No historic sites or structures were listed in the NRHP or the MIHP (NRHP, 2020 and MIHP, 2020). In the spring of 2022, Stantec conducted a tree survey and assessment in the area to be impacted by new development.

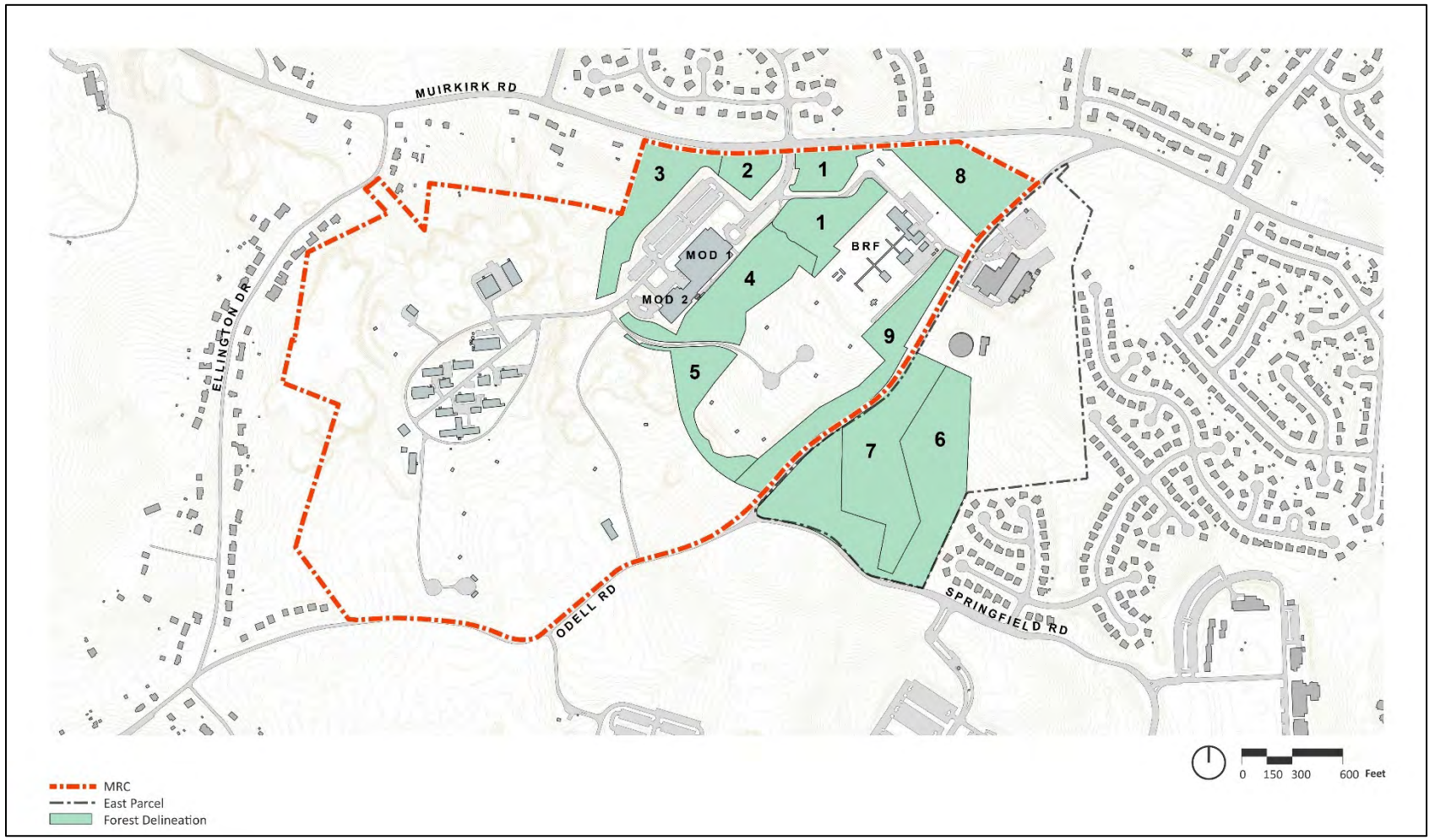

Figure 2. Delineated Forest Stands

Forest Stand 1

Forest Stand 1 is an early mid-successional forest that encompasses 5.9 acres within the study area (**Figure 3**). The stand is characterized by small to medium-sized hardwood trees. Canopy cover throughout the stand is consistent, ranging from 85 percent to 89 percent cover. In part due to leafy canopy coverage, herbaceous plants are mostly absent. The ground is covered in leaf litter and greenbrier stems (Smilax rotundifolia). Japanese honeysuckle (Lonicera japonica) was the only invasive species observed in the stand during field data collection. The potential for wildlife habitat is limited because of building development and roadways that surround the stand and the lack of water systems within the stand.

The dominant trees within Forest Stand 1 include chestnut oaks (*Quercus montana*) in the 2-17.9 inches diameter at breast height (dbh) size class and Lolblolly pine (*Pinus taeda*) in the 10 – 17.9 inches dbh size class. Black gum (*Nyssa sylvatica*), red maple (*Acer rubrum*), and holly (*Ilex opaca*) were commonly identified as co-dominant and understory trees. Trees are healthy and well established. One specimen tree was recorded in the stand. The average basal area for Forest Stand 1 is 120 square feet per acre, and the stand supports approximately 200 trees per acre.

Soil map units include Udorthents (5-15 percent slopes) and Evesboro-Downer complex (5-10 percent slopes). According to the United States Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS), both soils are well drained and neither of the soils are hydric. These soils are not at a high risk of erosion based on the K-factor.

Figure 3. View of Forest Stand 1 (sample plot 1-1)

Forest Stand 2

Forest Stand 2 is an early mid-successional forest that encompasses 1.7 acres within the study area (Figure 4). Dominant trees in the stand are commonly found in the 6-9.9 inches or 10-17.9 inches dbh size classes. Sample plot data indicates that canopy cover averages 82 percent. Wildlife habitat is limited because of building development and roadways that surround the stand and the lack of water systems within the stand.

The dominant tree species identified in the stand were loblolly pine (*Pinus taeda*) and black gum (*Nyssa sylvatica*). Co-dominant species include black gum, loblolly pine, chestnut oak, sweet gum (*Liquidambar stryaciflua*), and American beech (*Fagus grandifolia*). Herbaceous and shrub layers in the stand are generally comprised of greenbrier, chestnut oak, and lowbush blueberry (*Vaccinium angustifolium*). There were no invasive species observed within this stand. No specimen trees were recorded in the stand area. Sample plots indicate that the average basal area for the stand is 100 square feet per acre, and the stand supports approximately 260 trees per acre.

Soil map units include Udorthents (5-15 percent slopes), Evesboro-Downer complex (0-5 percent slopes), and Evesboro-Downer (5-10 percent slopes). According to the USDA-NRCS, the soils are well drained, and the soils are not hydric. These soils are not at a high risk of erosion based on the K-factor.

Figure 4. View of Forest Stand 2 (sample plot 2-1)

Forest Stand 3

Forest Stand 3 is a mid-successional forest that encompasses 5.1 acres within the study area (**Figure 5**). Dominant trees in the stand are commonly found in the 10-17.9 inches dbh size classes. Sample plot data indicates that canopy cover ranges from 86 percent to 91 percent. There were several fallen trees within the sample plot. Forest Stand 3 has a high capacity to support wildlife due to the stand being outside of the FDA fence and the presence of streams and wetlands within the stand.

Dominant trees in Forest Stand 3 are comprised of red maple, white oak (*Quercus alba*), loblolly pine, and sweetgum. Holly, sweet gum, and white oak were noted as a co-dominant species, and understory trees include holly, sweetgum, black gum, white oak, and American beech (*Fagus grandifolia*). Herbaceous and shrub layers in the stand are generally comprised of greenbrier, chestnut oak, and loblolly pine. There were no invasive species within this forest stand. No specimen trees were recorded in the stand. The average basal area for the stand is 110 square feet per acre, and sample plots indicate the stand supports approximately 310 trees per acre.

Soil map units within Forest Stand 3 include Evesboro-Downer (5-10 percent slopes), Sassafras and Croom soils (10-15 percent slopes), and Downer-Hamonton complex (5-10 percent slopes). According to the USDA-NRCS, Evesboro-Downer and Sassafras and Croom soils are well drained and the soils are not hydric. Downer-Hamonton complex are moderately well drained and not hydric. These soils are not at a high risk of erosion based on the K-factor.

Figure 5. View of Forest Stand 3 (sample plot 3-1)

Forest Stand 4

Forest Stand 4 is a mid-successional forest that encompasses 6.6 acres within the study area (**Figure 6**). Dominant trees in the stand are commonly found in the 10-17.9 inches dbh size class. Canopy cover at sample plot points averaged 89 percent. There were several fallen trees within the sample plot Forest Stand 4 is located between a large FDA building and the FDA pastures. There is potential for wildlife in this stand due to the streams and wetlands that occur on site.

Black gum, white oak, red maple sweet gum, and tulip poplar (*Liriodendron tulipifera*) are dominant trees in Forest Stand 4. Co-dominants include hickory (*Carya*), sweet gum, white oak, red maple, tulip poplar, black gum, and American holly. The presence of understory cover is relatively high, in part because of holly, sweet gum, black gum, white oak, and red maple. At the sample plot locations, herbaceous plant cover is low with mostly greenbrier, holly, sweet gum, and invasive species. Japanese barberry (*Berberis thunbergii*) and Japanese honeysuckle (*Lonicera japonica*) were the invasive species commonly observed in the plot areas. One specimen tree was recorded in the stand area. The average basal area for Forest Stand 4 is 90 square feet per acre, and the stand supports approximately 295 trees per acre.

The primary soil map units are Downer-Hamonton complex (5-10 percent slopes) and Evesboro-Downer complex (15-25 percent slopes). Downer-Hamonton complex is classified not hydric and moderately well drained. Evesboro-Downer complex is not hydric, and it is well drained. These soils are not at a high risk of erosion based on the K-factor.

Figure 6. view of Forest Stand 4 (sample plot 4-1)

Forest Stand 5

Forest Stand 5 is a mid-successional forest that encompasses 3.5 acres within the study area (**Figure 7**). Dominant trees in the stand are commonly found in the 2-5.9 inches dbh size class. Canopy cover at sample plot points indicate 85 percent closure. There is potential for wildlife in this stand due to the streams and wetlands that occur on site and the lack of development around the stand.

Dominant species include black gum, red maple, and white oak. Codominant species include sweet gum, black cherry (*Prunus serotina*), and hickory. Understory trees were also commonly observed. Species include holly, white oak, black cherry, hickory, sweetgum, highbush blueberry (*Vaccinium corymbosum*), and sweetbay magnolia (*Magnolia virginiana*). No specimen trees were recorded within the stand. Herbaceous and shrub cover is comprised of greenbrier, holly, and sweet fern (*Comptonia peregrina*) with a high percent of cover comprised of invasive species. The dominant invasive species include Japanese stiltgrass (*Microstegium vimineum*), Japanese honeysuckle, and Japanese barberry. Based on the sample plot data, the average basal area of the stand is 100 and the stand supports 230 trees per acre.

The soil map units underlying the stand is Christiana-Downer complex (5-10 percent slopes), Evesboro-Downer complex (10-15 percent slopes), and Evesboro-Downer complex (15-25 percent slopes). According to the USDA-NRCS, the soils are well drained, and the soils are not hydric. These soils are not at a high risk of erosion based on the K-factor. The only soil with potential erosion concerns is the Christiana-Downer complex with a K-factor of 0.49.

Figure 7. View of Forest Stand 5 (sample plot 5-1)

Forest Stand 6

Forest Stand 6 is an early mid-successional forest that encompasses 14.4 acres within the study area (**Figure 8**). Trees in the stand are well established and are commonly found in the 10-17.9 inches dbh size class. Canopy cover provided by trees is generally high and ranges from 80-95 percent. Based on its location the stand has potential to support wildlife, but it is bordered by two roads and residential development.

Dominant trees in the stand consist of northern red oak (*Quercus rubra*), Virginia pine (*Pinus virginiana*), chestnut oak, red maple, and black gum. The total number of tree species identified within sample plots was highest among the stands (10). Understory species include American holly, chestnut oak, black gum, red maple, sweet gum, and American hornbeam (*Carpinus caroliniana*). Herbaceous species within the stand include greenbrier and lowbush blueberry. There were no invasive species in this stand. No specimen trees were recorded within the stand. The average basal area for Forest Stand 6 is 105 square feet per acre, and the stand supports approximately 265 trees per acre.

The primary soil map units are Christiana-Downer complex (5-10 percent slopes), Christiana-Downer complex (10-15 percent slopes), Evesboro-Downer complex (5-10 percent slopes), Downer-Hamonton complex (5-10 percent slopes), Galestown-Urban land complex (5-15 percent slopes), Woodstown sandy loam (5-10 percent slopes), Russett-Christiana-Urban land complex (0-5 percent slopes), and Matapeake silt loam (2-5 percent slopes). All of the soils are classified as not hydric. Christiana-Downer complex, Evesboro-Downer complex, and Matapeake silt loam are classified as well drained. Downer-Hamonton complex, Woodstown sandy loam, and Russett-Christiana-Urban land complex are classified as moderately well drained. Galestown-Urban land complex is classified as somewhat excessively drained. These soils are not at a high risk of erosion based on the K-factor. The only soils with potential erosion concerns are the Christiana-Downer complex and Matapeake silt loam with K-factors of 0.49.

Figure 8. View of Forest Stand 6 (sample plot 6-1)

Forest Stand 7

Forest Stand 7 is an early mid-successional forest that encompasses 8.8 acres within the study area (**Figure 9**). Forest Stand 7 is adjacent to Forest Stand 6 but is differentiated from it due to dominance of Virginia pine and tulip poplar. Dominant trees in the stand are commonly found in the 10-17.9 inches and 18-29.9 inches dbh size classes. Canopy cover provided by trees ranges from 80-95 percent across the plots. This stand has the potential to support wildlife as it is located within a larger forested area and is protected from roadways and other urban development.

Dominant tree species in the stand are Virginia pine and tulip poplar. The most common understory species are red maple, American holly, sweet gum, slippery elm (*Ulmus rubra*), sassafras (*Sassafras albidium*), and American beech. Herbaceous species within the stand include greenbrier and lowbush blueberry. There were no invasive species within the stand. No specimen trees were recorded within the stand. The average basal area for Forest Stand 7 is 110 square feet per acre, and the stand supports approximately 270 trees per acre.

The primary soil map units are Christiana-Downer complex (10-15 percent slopes), Evesboro-Downer complex (5-10 percent slopes), Downer-Hamonton complex (5-10 percent slopes), Galestown-Urban land complex (5-15 percent slopes), Woodstown sandy loam (5-10 percent slopes), and Matapeake silt loam (2-5 percent slopes). All of the soils are classified as not hydric. Christiana-Downer complex, Evesboro-Downer complex, and Matapeake silt loam are classified as well drained. Downer-Hamonton complex and Woodstown sandy loam are classified as moderately well drained. Galestown-Urban land complex is classified as somewhat excessively drained. These soils are not at a high risk of erosion based on the K-factor. The only potential soils of concern are the Christiana-Downer complexes and Matapeake silt loam with K-factors of 0.49.

Figure 9. View of Forest Stand 7 (sample plot 7-1)

Forest Stand 8

Forest Stand 8 is an early-successional forest that encompasses 5.5 acres within the study area (**Figure 10**). Dominant trees in the stand are commonly found in the 6-9.9 inches and 10-17.9 inches dbh size classes. Canopy cover provided by trees is lowest among stands, with a range of 55-80 percent cover (average of 74 percent), in part because needle-leaved trees (Virginia pine) and holly are included among dominant species. This forest stand is bordered by two roads and the FDA MRC on the third side, which reduces the forest stand's ability to support wildlife.

Dominant tree species in the stand are loblolly pine, Virginia pine, and holly. The most common understory species are sassafras, chestnut oak, sweet gum, and northern red oak. Herbaceous species within the stand include greenbrier and lowbush blueberry. There were no invasive species within the stand. No specimen trees were recorded within the stand. The average basal area for Forest Stand 8 is 115 square feet per acre, and the stand supports approximately 295 trees per acre.

The primary soil map units are Evesboro-Downer complex (5-10 percent slopes), Galestown-Urban land complex (5-15 percent slopes), and Udorthents (0-5 percent slopes). All of the soils are classified as not hydric. Evesboro-Downer complex and Udorthents are classified are well drained. Galestown-Urban land complex is classified as somewhat excessively drained. These soils are not at a high risk of erosion based on the K-factor.

Figure 10. View of Forest Stand 8 (sample plot 8-1)

Forest Stand 9

Forest Stand 9 is an early mid-successional forest that encompasses 6.3 acres within the study area (**Figure 11**). Dominant trees in the stand are commonly found in the 6-9.9 inches dbh size class or smaller. Canopy provided 65-85 percent cover for the plots (75 percent average), mostly due to the low number of dominant trees in the stand. The forest stand is long and narrow running along a road, so it does not have a high capacity to support wildlife.

Dominant tree species in the stand are hickory, sweet gum, Virginia Pine, loblolly pine, white oak, and northern red oak. The most common understory species are red maple, holly, black cherry, and red osier dogwood (*Cornus sericea*). Herbaceous species within the stand include greenbrier, holly, and lowbush blueberry. Growth of the invasive Japanese honeysuckle was observed in a few localized areas throughout the stand. No specimen trees were recorded within the stand. The average basal area for Forest Stand 9 is 120 square feet per acre, and the stand supports approximately 270 trees per acre.

The primary soil map units are Christiana-Downer complex (5-10 percent slopes), Downer-Hamonton complex (5-10 percent slopes), and Galestown-Urban land complex (5-15 percent slopes). All of the soils are classified as not hydric. Christiana-Downer complex is classified as well drained. Downer-Hamonton complex is classified as moderately well drained. Galestown-Urban land complex is classified as somewhat excessively drained. These soils are not at a high risk of erosion based on the K-factor. The only potential soil of concern is the Christiana-Downer complex with a K-factor of 0.49.

Figure 11. View of Forest Stand 9 (sample plot 9-1)

5.0 TREE PRESERVATION AND CONSERVATION/FOREST MANAGEMENT

The MRC Master Plan would involve the clearing of approximately 4.33 acres of forest. This equates to less than 8 percent of the existing forest within the project area that is proposed for removal as part of the proposed Master Plan. In addition, 38 specimen trees are proposed for removal. This TPC/FM-P provides the proposed forest and tree removal locations, as well as mitigation measures for tree and forest replacement (Appendix A). Appendix B provides a list of significant trees found within the study area. The specimen tree list can be found in Appendix C. An estimate based on the Maryland Forest Conservation Act and M-NCPPC requirements allows for the removal of 14.38 acres of forest as a 'break even' point before mitigation would be required. Maryland's Forest Conservation Worksheet can be found in Appendix F. Therefore, tree preservation and conservation, forest management, and mitigation would follow NCPC's more stringent *Tree Preservation and Replacement Policy.*

Tree Preservation and Protection

The Tree Preservation and Replacement Policy (TPRP) FE.G.1 recommends the preservation and protection of existing trees by accounting for existing trees early in the planning and design process. At this stage of the Master Plan, the Design Team has used a preliminary limit of disturbance (study area) as a guide to determine all forest and trees to be removed and impacted (**Figure 12**). The number of trees that will be impacted has been determined by considering the critical root zone (CRZ) impacts, species, and health of the trees. Tree protection and mitigation will include but not limited to, tree protection fencing, root pruning, selective pruning, mulching, soil aeration, watering, and fertilization schedules.

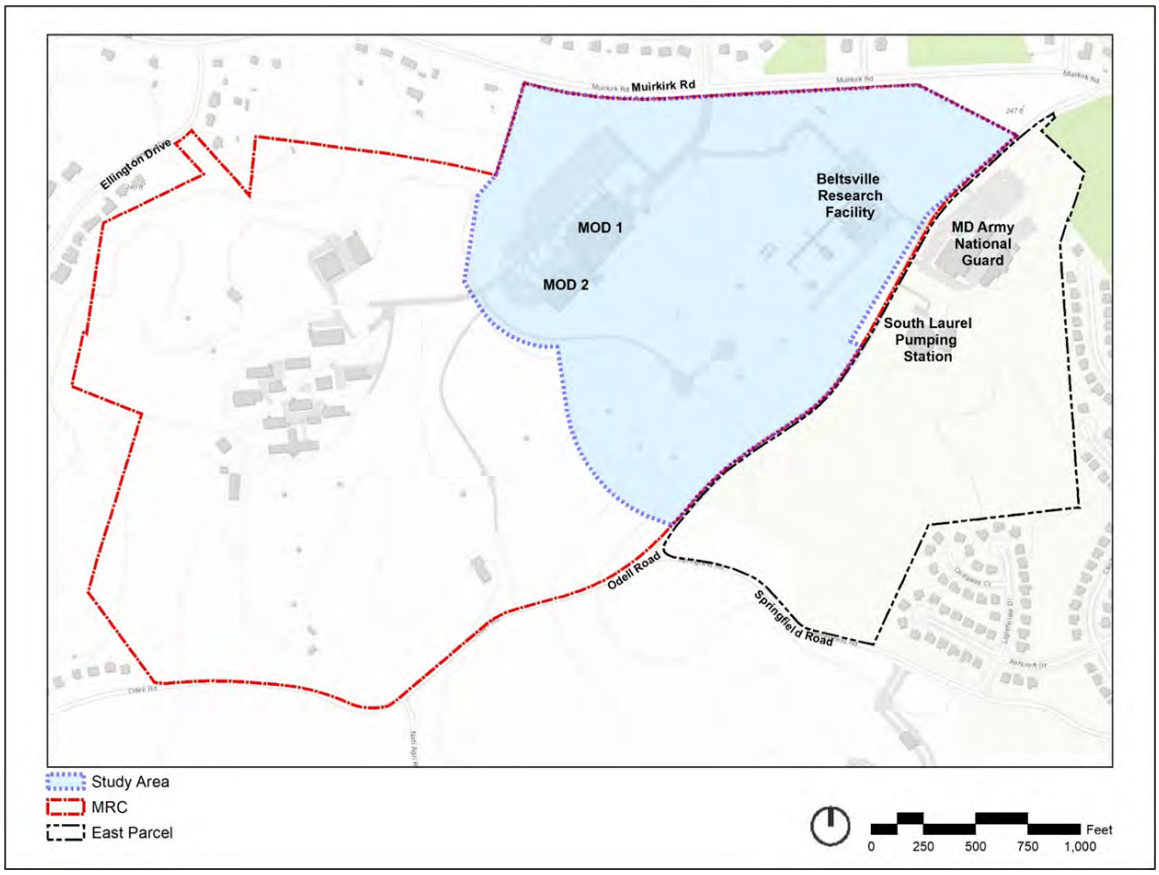

Figure 12. Tree Conservation and Forest Management Limits of Disturbance (Study Area)

Reforestation

The TPRP FE.G.2.c recommends replanting a minimum of one acre of forested area for every acre removed for development projects. A total of 4.33 acres of forested area will be removed as a result of the proposed Master Plan (**Figure 13**). There are some constraints onsite which restrict the area available for reforestation such as a large pasture area needed for facility research purposes. However, there is approximately 4.33 acres of open space adjacent to the project area that is appropriate for reforestation (within environmental buffers, adjacent to existing forest) (**Figure 13**).

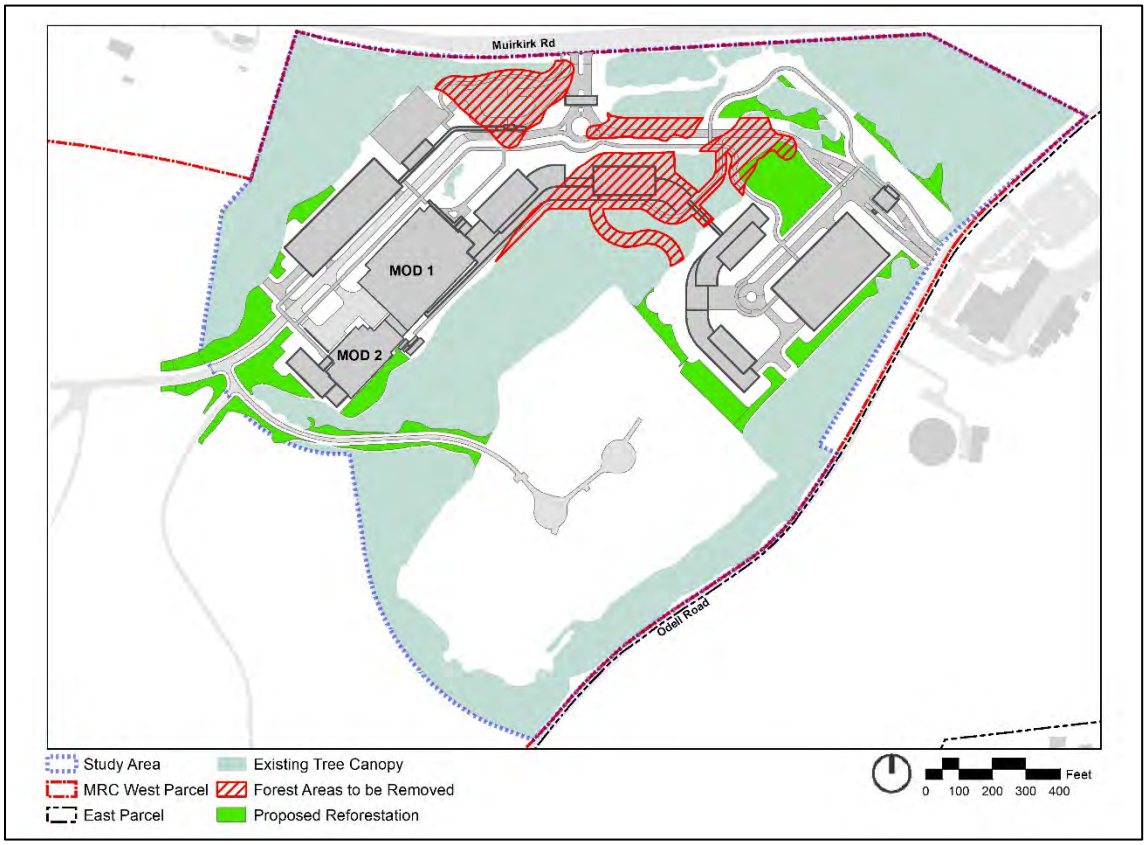

Figure 13. Forest Areas to be Removed and Proposed Reforestation

Reforestation Management

For establishing forest as part of the reforestation effort, the following planting method shall be followed:

There must be a minimum of five (5) species. The plant list should contain a mixture of dominant and understory and early to late seral stage trees. Plants must be native to region and similar to or match existing species onsite. Shrubs are not necessary since these reforestation areas are designed to provide canopy cover. All planting stock must meet accepted nurserymen's standards. As a minimum standard, stocking should be the one hundred (100) 2-inch caliper trees per acre.

Performance Specifications

The goal for the reforestation areas is to have 75 percent survivability of the planted species after 5-years. A maintenance and management agreement will be agreed to between the selected contractor and FDA to ensure this result. Management guidelines for achieving this goal are listed below.

VEGETATION MANAGEMENT: Prior to installation of the reforestation plantings, the area should be cleared of any dead vegetation and debris and mowed. The herbaceous vegetation and grasses in the planting areas should be kept at manageable levels throughout the 5-year maintenance and management period to avoid resource competition with the reforestation planting. All invasive species should be removed and kept away throughout the management period.

DEER PROTECTION: It is recommended to provide deer protection fencing around each individual planting after installation. Four-feet high minimum galvanized wire mesh fence, staked with metal t-post at four corners three to four feet from the trunk is recommended. All deer protection is to be removed after the five-year maintenance and management period.

WATERING: The root balls of all plant material and the dug holes for plantings should be adequately watered prior to installation. Sufficient watering should be provided for at least the first two growing seasons. The soil conditions should never be allowed to reach past field capacity and every effort should be made to avoid drought conditions for the first two growing seasons. After two years, the watering schedule should be the discretion of the contractor based on site conditions.

MULCHING: Three- to four-inches of natural mulch, preferably shredded hardwood bark, should be applied to each planting to the dripline at installation prior to the first watering. Re-application of the mulch should be done at the beginning of each growing season each year of the management period. Mulch should be kept away from the trunks and root flares of the trees to keep the root flare exposed.

FERTILIZING: No fertilizer treatment should be applied throughout the first two growing seasons. A general health analysis should be conducted after two years for the plantings. If signs indicating nutrient deficiency are observed, a soil sample should be tested. If the soil test indicates nutrient deficiency, fertilizer supplementation should be considered. Natural fertilizer such as compost is recommended. If that is unavailable, a 'complete' fertilizer applied at the label recommend rate should be used.

DEAD AND DISEASED MATERIAL: For the reforestation plantings; all dead plantings should be removed and replaced as soon as possible. If any signs of disease are observed on any plantings, they should be removed and replaced with healthy plantings of the same species. It is the discretion of the contractor to use Integrated Pest Management practices if determined to be worth the cost to treat the trees.

INSPECTION SCHEDULE: A general heath analysis inspection should be conducted every two (2) weeks following the date of initial planting, for the remainder of the growing season. Two inspections throughout the dormant season and one per month during the growing season is suggested for the remainder on the management period.

Tree Removal and Replacement

The TPRP FE.G.2.2 recommends replacement trees when they require removal. Replacement trees should increase biodiversity, be native species, and have a mature canopy spread equivalent to, or greater than, the trees removed. Replacement trees should be planted at a minimum caliper size of 2.5 inches for shade trees, 1.5 inches for ornamental trees, and six-foot height for multi-stem and evergreen trees.

As part of the impacts of the proposed Master Plan, approximately 38 trees outside of the forested areas would be removed (**Figure 14**). Based on TPRP guidelines described in FE.G.2.2.a&b, it was determined that a total of 70 trees are proposed as replacements (**Figure 14**). These replacement trees will be selected based on the criteria specified per FE.G.2.2 in relation to the species, number, and size proposed for each tree to be removed. In addition, there are existing trees that are to be protected during construction (**Figure 14**).

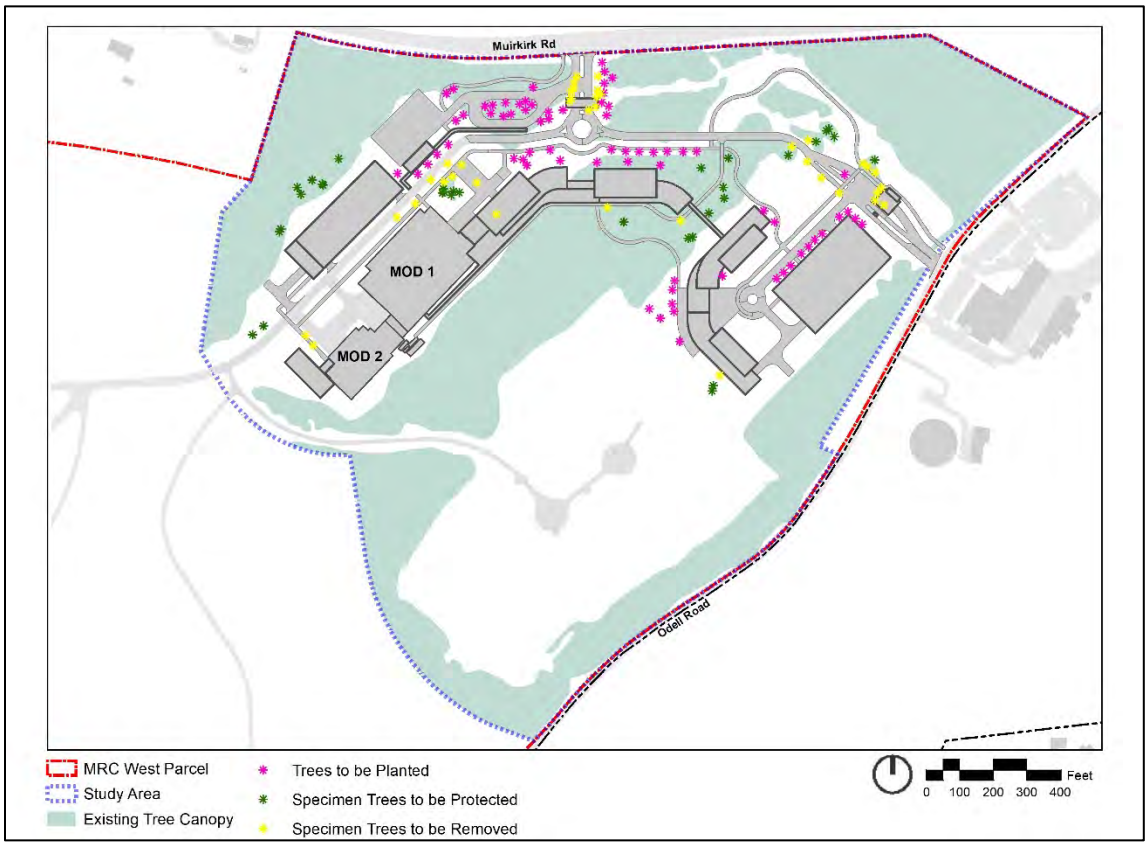

Figure 14. Specimen Trees to be Removed, Protected, and Planted

Canopy Coverage

The TPRP FE.G.2.3 recommends that tree preservation, transplant, and replacement should prevent a net loss of tree canopy in the development area.

A total of 4.33 acres is proposed for reforestation for the 4.33 acres proposed for removal, as well as 70 replacement trees are proposed for the 38 trees to be removed. In addition to the

mitigation plants and reforestation; forest improvement methods to benefit the existing forest to remain have been provided. The replacement trees, forest improvements and reforestation are proposed within/directly adjacent to the project site. The replacement trees, forest Improvements and reforestation will result in a net-positive tree canopy coverage for the site.

Forest Stand Management and Improvement

For the areas of forest that are to be retained within and directly adjacent to the proposed development, general forest stand improvements are recommended. Approximately 1.32 acres fall into this category (**Figure 15**). These areas were selected as important since they will be directly accessible by pedestrians within the campus walkways and visible by the site's occupants. The following sections detail the proposed forest stand improvements.

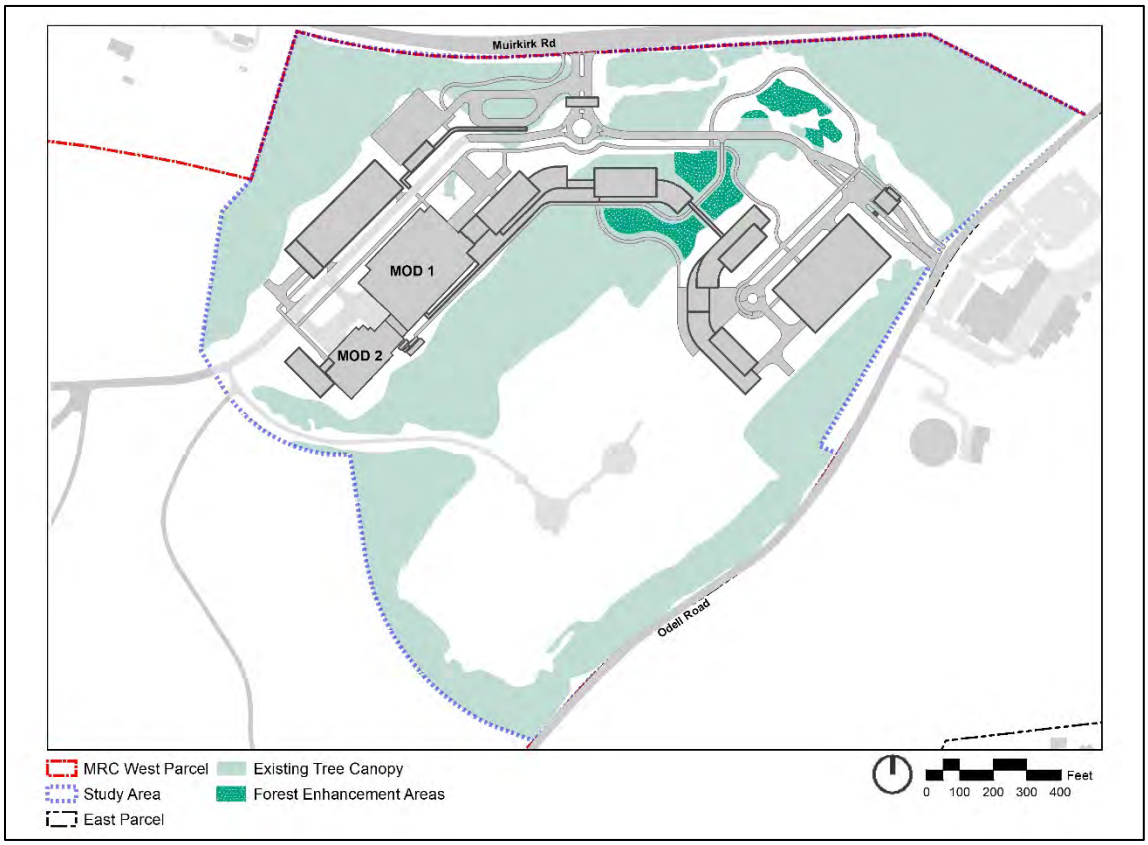

Figure 15. Forest Improvement Areas

Invasive Species Removal

Forest Stands 1, 2, 3 and 4 occur within the proposed development area. Portions of each of the stands are proposed for retention. Of these four, only Forest Stand 4 contains a high percentage of invasive species and is in need of management. Forest Stand 4 exists east of the MOD 1 laboratory, and contains large forested wetlands and an expansive stream valley. Invasive species in the understory of Forest Stand 4 include Japanese honeysuckle (*Lonicera japonica*) and Japanese barberry (*Berberis thunbergii*). Treatment may include chemical (herbicide) and mechanical treatments or a combination of the two methods. The methods may be classified as (a) Individual-stem treatments (with or without herbicides); (b) Foliar spraying; and (c) Soil applications of herbicides. Larger stemmed plants, such as Japanese barberry would be cut

with the remaining stem sprayed with herbicide to prevent regrowth. Appropriate chemicals registered and approved for use by the EPA will be used and will be under the current Maryland Department of Agriculture Integrated Pest Management guidelines. Chemicals will be applied following the label for each selected herbicide for optimum season for treatment, dosage and applications and applied according to label directions and safely precautions. Removal will be conducted by licensed personnel registered with Maryland Department of Agriculture in accordance with Maryland's pesticide laws and regulations. No herbicide will be sprayed in or near bodies of water. A maintenance plan will be developed and employed to prevent recruitment and re-establishment of invasive species.

Restocking of Native Species

The forest analysis indicates that some of the existing forest could use understory regeneration. Restoking of native species may be necessary due to the current dominance of invasive and non-native species in the understory. Native seedlings and habitat appropriate species would be planted where deemed appropriate.

Selective Thinning

Selective thinning in these areas may also improve forest health. Diseased, dying, or other poor conditioned trees would be identified and targeted for removal. Creating canopy openings and clearings would encourage the growth of planted saplings and provide early successional habitat, increasing diversity of forest species and wildlife. Snags and brush from thinning operations would provide additional cover habitat for wildlife species

6.0 CONCLUSION

The development proposed as part of the FDA MRC Master Plan would involve the removal of 4.33 acres of forest and 38 specimen trees. In order to meet the requirements set forth in the NCPC's *Federal Elements of the Comprehensive Plan for the Nation's Capital*, Maryland's *Forest Conservation Act*, and Prince George's County's *Woodland and Wildlife Habitat Conservation Ordinance* the following key objectives need to be met:

- Preserve and protect existing trees, especially individual trees, stands, and forests of healthy, native or non-invasive species
- Transplant or replace existing tree(s) when they are impacted by development and preservation is not feasible
- Tree preservation, transplant, and replacement should adhere to the provided herein to prevent a net loss of tree canopy in the development area.

In order to meet these objectives, a total of 4.33 acres is proposed for reforestation and 70 key specimen trees are proposed as replacement. In addition to the mitigation trees and reforestation, forest improvement methods to benefit the existing forest to remain have been provided. The replacement trees, reforestation, and forest improvements are proposed within/directly adjacent to the project site. The replacement trees, reforestation, and forest improvements will result in a net-positive tree canopy coverage for the site.

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7.0 LIST OF PREPARERS

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8.0 REFERENCES

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APPENDIX A: TREE REPLACEMENT AND CONSERVATION / FOREST MANAGEMENT PLAN

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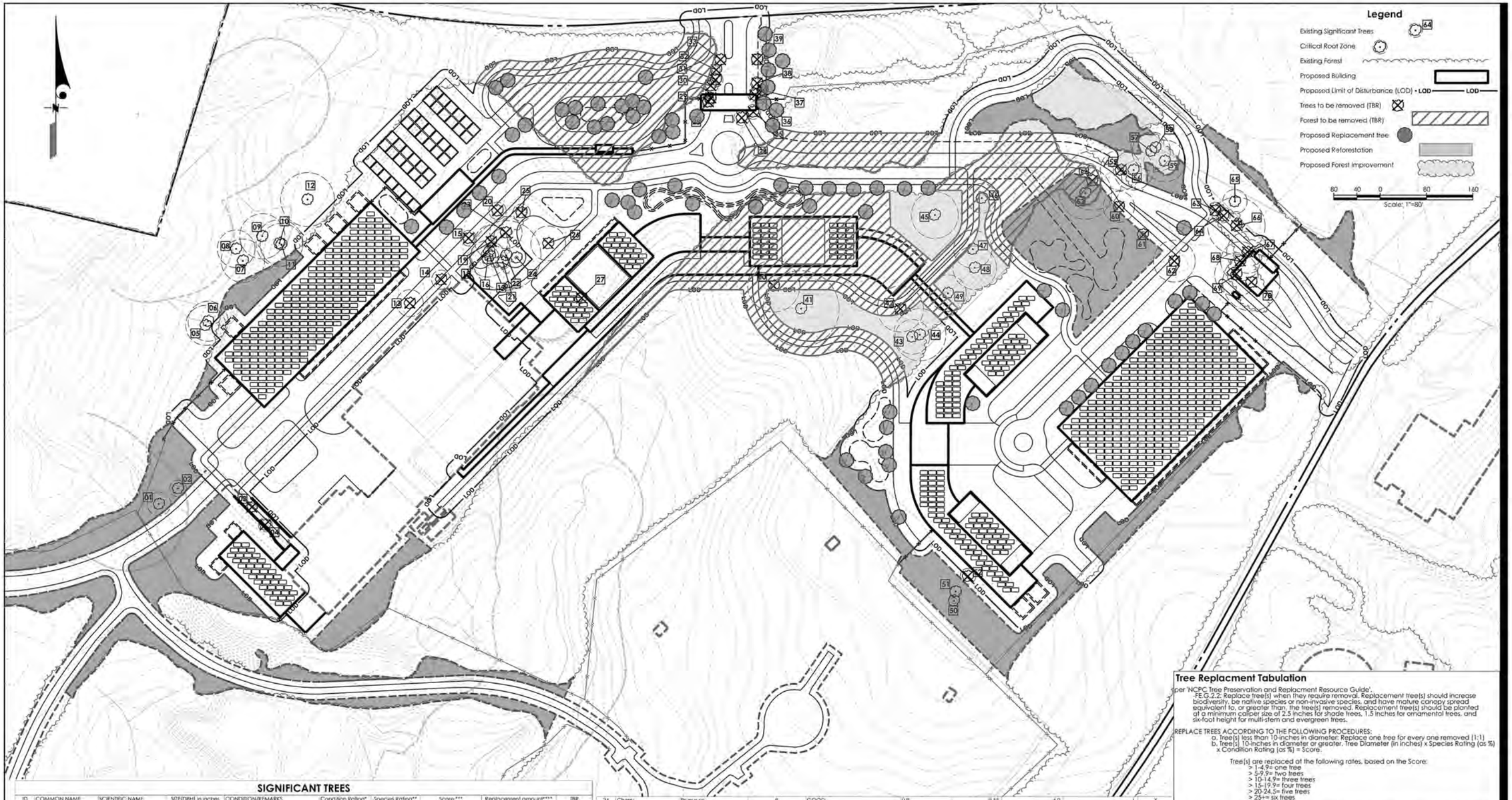

SIGNIFICANT TREES

ID	COMMON NAME	SCIENTIFIC NAME	SIZE(DBH) in inches	CONDITION/REMARKS	Condition Rating*	Species Rating**	Score***	Replacement amount****		TBR
1	Red Maple	Acer rubrum	13.5	GOOD	0.9	0.70	8.5			N
2	Red Maple	Acer rubrum	9.5	GOOD	0.9	0.70	6.0			N
3	Redbud	Cercis canadensis	4-4.5	GOOD/ 3-stem tree	0.9	0.73	3.3		1	Y
4	Redbud	Cercis canadensis	8	FAIR	0.7	0.73	4.1		1	Y
5	Red Maple	Acer rubrum	23	GOOD	0.9	0.70	14.5			N
6	N. Red Oak	Quercus rubra	23	FAIR	0.7	0.75	12.1			N
7	Chestnut Oak	Quercus montana	25	GOOD	0.9	0.75	16.9			N
8	Red Maple	Acer rubrum	21.5	GOOD	0.9	0.70	13.5			N
9	N. Red Oak	Quercus rubra	26	FAIR	0.7	0.75	13.7			N
10	N. Red Oak	Quercus rubra	27	GOOD	0.9	0.75	18.0			N
11	N. Red Oak	Quercus rubra	24.5	FAIR	0.7	0.75	12.9			N
12	White Oak	Quercus alba	31	GOOD	0.9	0.88	24.4			N
13	Pin Oak	Quercus palustis	15.5	GOOD	0.9	0.65	9.1	2		Y
14	Pin Oak	Quercus palustis	11	GOOD	0.9	0.65	6.4	2		Y
15	Red Maple	Acer rubrum	9	GOOD	0.9	0.70	5.7	1		Y
16	Pin Oak	Quercus palustis	21	GOOD	0.9	0.65	12.3			N
17	N. Red Oak	Quercus rubra	10	GOOD	0.9	0.75	6.8			N
18	American Holly	Ilex opaca	3.5, 4	GOOD/ 2-stem tree	0.9	0.73	3.3			N
19	Pin Oak	Quercus palustis	19	GOOD	0.9	0.65	11.1	3		Y
20	Red Maple	Acer rubrum	10	GOOD	0.9	0.70	6.3	2		Y
21	Pin Oak	Quercus palustis	8	GOOD	0.9	0.65	4.7			N
22	Pin Oak	Quercus palustis	40	GOOD	0.9	0.65	23.4			N
23	Beech	Fagus sp.	18.5	GOOD	0.9	0.80	13.3	3		Y
24	Pin Oak	Quercus palustis	2	GOOD	0.9	0.65	1.2			N
25	Cherry	Prunus sp.	10	GOOD	0.9	0.55	5.0	2		Y
26	Beech	Fagus sp.	20	GOOD	0.9	0.80	14.4	3		Y
27	River Birch	Betula nigra	4.5,6	GOOD/ 3-stem tree	0.9	0.70	3.8	1		Y
28	Red Maple	Acer rubrum	7	GOOD	0.9	0.70	4.4	1		Y
29	Cherry	Prunus sp.	7	GOOD	0.9	0.55	3.5	1		Y
30	Willow Oak	Quercus phellos	8.5	GOOD	0.9	0.75	5.7	1		Y
31	Cherry	Prunus sp.	8	GOOD	0.9	0.55	4.0	1		Y
32	Red Maple	Acer rubrum	4.5	GOOD	0.9	0.70	2.8	1		Y
33	Cherry	Prunus sp.	6.5	GOOD	0.9	0.55	3.2	1		Y
34	Cherry	Prunus sp.	9	GOOD	0.9	0.55	4.5	1		Y
35	Cherry	Prunus sp.	8.5	GOOD	0.9	0.55	4.2	1		Y
36	Cherry	Prunus sp.	8	GOOD	0.9	0.55	4.0	1		Y
37	Red Maple	Acer rubrum	5	GOOD	0.9	0.70	3.2	1		Y
38	Cherry	Prunus sp.	7.5	GOOD	0.9	0.55	3.7	1		Y
39	Cherry	Prunus sp.	7	GOOD	0.9	0.55	3.5	1		Y
40	Chinkapin Oak	Quercus muehlenbergii	30	GOOD	0.9	0.75	20.3	reforestation mitigation		Y
41	Tulip poplar	Liriodendron tulpifera	43.7	GOOD	0.9	0.70	27.5			N
42	N. Red Oak	Quercus rubra	26.5	GOOD	0.9	0.75	17.9	reforestation mitigation		Y
43	White Oak	Quercus alba	20	FAIR/ Poison Ivy. Couldn't measure	0.7	0.88	12.3			N
44	N. Red Oak	Quercus rubra	30	GOOD/ Couldn't measure	0.9	0.75	20.3			N
45	Black gum	Nyssa sylvatica	27	GOOD/ Nice specimen	0.9	0.80	19.4			N
46	Beech	Fagus sp.	17	GOOD/ Worth preserving	0.9	0.80	12.2			N
47	N. Red Oak	Quercus rubra	22	GOOD	0.9	0.75	14.9			N
48	N. Red Oak	Quercus rubra	25	GOOD	0.9	0.75	16.9			N
49	American Sweetgum	Liquidambar styraciflua	21	GOOD	0.9	0.65	12.3			N
50	Unknown ornamental		3.5	FAIR	0.7	?				N
51	Bradford Pear	Pyrus calleryana	5.7	GOOD/ 9-stem	0.9	0.50	3.2			N
52	Black Locust	Robinia pseudoacacia	9	FAIR/ Overgrown electric panel	0.7	0.55	3.5	1		Y
53	N. Red Oak	Quercus rubra	30	GOOD/ Worth preserving	0.9	0.75	20.3			N
54	N. Red Oak	Quercus rubra	34	GOOD/ Worth preserving	0.9	0.75	23.0	5		Y
55	Pin Oak	Quercus palustis	23.5	GOOD	0.9	0.65	13.7	3		Y
56	White Pine	Pinus strobus	23	GOOD	0.9	0.55	11.4			N
57	White Pine	Pinus strobus	22	GOOD	0.9	0.55	10.9			N
58	White Oak	Quercus alba	28	GOOD	0.9	0.88	22.2			N
59	White Pine	Pinus strobus	24	GOOD	0.9	0.55	11.9			N
60	N. Red Oak	Quercus rubra	18	GOOD	0.9	0.75	12.2	3		Y
61	Jap. Maple	Acer palmatum	3.5	GOOD	0.9	0.80	2.5	1		Y
62	Pin Oak	Quercus palustis	24	GOOD	0.9	0.65	14.0	3		Y
63	Black Locust	Robinia pseudoacacia	5.6,6	GOOD/ Multi-stem	0.9	0.55	3.0	1		Y
64	Black Locust	Robinia pseudoacacia	8.6,4	GOOD/ 3-stem tree	0.9	0.55	4.0	1		Y
65	American Holly	Ilex opaca	12.14,14	GOOD/ 3-stem tree	0.9	0.73	9.2			N
66	White Pine	Pinus strobus	33	GOOD	0.9	0.55	16.3	4		Y
67	White Pine	Pinus strobus	24	GOOD	0.9	0.55	11.9	3		Y
68	White Pine	Pinus strobus	22.5	GOOD	0.9	0.55	11.1	3		Y
69	N. Red Oak	Quercus rubra	25	GOOD	0.9	0.75	16.9	4		Y
70	N. Red Oak	Quercus rubra	33	GOOD	0.9	0.75	22.3	5		Y

Tree Replacment Tabulation

per 'NCPC Tree Preservation and Replacment Resource Guide'.
-FE.G.2.2: Replace tree(s) when they require removal. Replacement tree(s) should increase biodiversity, be native species or non-invasive species, and have mature canopy spread equivalent to, or greater than, the tree(s) removed. Replacement tree(s) should be planted at a minimum caliper size of 2.5 inches for shade trees, 1.5 inches for ornamental trees, and six-foot height for multi-stem and evergreen trees.

REPLACE TREES ACCORDING TO THE FOLLOWING PROCEDURES:
a. Tree(s) less than 10-inches in diameter: Replace one tree for every one removed (1:1)
b. Tree(s) 10-inches in diameter or greater. Tree Diameter (in inches) x Species Rating (as %) x Condition Rating (as %) = Score:

Tree(s) are replaced at the following rates, based on the Score:
> 1-4.9= one tree
> 5-9.9= two trees
> 10-14.9= three trees
> 15-19.9= four trees
> 20-24.5= five trees
> 25+= six trees

c. Forest and Stands of Trees: Plant 1 acre minimum for every 1 acre removed, Consult with federal and local stakeholders to determine the appropriate density, mixture, and size replacement plantings.

Tree numbers proposed for removal (TBR)as part of the project improvements:
>3, 4,13-15, 19, 20, 23, 25-40, 42, 52, 54, 55, 60-64, 66-70
(38 Trees TBR total)

Replacement Trees proposed per FE.G.2.2(b) replacement rate:
>70 trees
>2.5" Cal. minimum for shade trees, 1.5" Cal. for ornamental trees, and six-foot height for multi-stem and evergreen trees.

Forest proposed for removal: 188,402 sf. (4.33 ac.)
Proposed reforestation: 188,733 sf. (4.33 ac.)
Proposed forest improvement: 57,474 sf. (1.32 ac.)
>Reforestation is proposed in areas directly around the project site where it abuts existing forest.
>The 70 replacement trees are proposed outside of the reforestation areas.
>The existing forest to remain within the campus area is proposed for improvement.
>The mitigation efforts described within will result in canopy coverage which is equal to or exceeding the existing conditions prior to the proposed development.

NOTE- The proposed mitigation measures listed within are preliminary in nature and subject to change as the project progresses. The ultimately goal is to provide overall canopy coverage equal to or exceeding existing conditions prior to the proposed development.

*Conditon Rating is based on a percentage representation of the Good/Fair/Poor tree condition rating. Good=0.9 (90%) / Fair=0.7 (70%) / Poor=0.5 (50%)

**Species rating is based on the 'ISA Mid-Atlantic Tree Species Rating Guide'. The value listed is the average rating from the range provided for each species.

***Trees are replaced at the following rates, based on the 'Score':

****Score= Tree Diameter (in inches) x Species Rating (as percentage) x Condition Rating (as %)
>1-4.9= One (1) tree
>5-9.9= Two (2) trees
>10-14.9= Three (3) trees
>15-19.9= Four (4) trees
>20-24.5= Five (5) trees
>25+=six trees

$$DATE$$

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No.	Revision	Date	By

Owner/Developer:
CLIENT/COMPANY NAME
Address, City, State and Zip Code
Phone: (301) 222-0000
Contact/Attn.: Contact Person

TREE PLAN
FDA- Muirkirk Road Campus
Laurel, Maryland

Seal

Project No.	Scale
2028113321	1"=80'

Design	Checked
DK	HC
Drawn	Date
DK	Nov. 2022

Sheet
1 of 1

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APPENDIX B: SIGNIFICANT TREE LIST

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SIGNIFICANT TREES

	COMMON NAME	SCIENTIFIC NAME	SIZE(DBH) in inches	CONDITION/ REMARKS	Condition Rating*	Species Rating**	Score ***	Replacement amount****	TBR
1	Red Maple	Acer rubrum	13.5	GOOD	0.9	0.70	8.5		N
2	Red Maple	Acer rubrum	9.5	GOOD	0.9	0.70	6.0		N
3	Redbud	Cercis canadensis	4,4,5	GOOD/ 3-stem tree	0.9	0.73	3.3	1	Y
4	Redbud	Cercis canadensis	8	FAIR	0.7	0.73	4.1	1	Y
5	Red Maple	Acer rubrum	23	GOOD	0.9	0.70	14.5		N
6	N. Red Oak	Quercus rubra	23	FAIR	0.7	0.75	12.1		N
7	Chestnut Oak	Quercus montana	25	GOOD	0.9	0.75	16.9		N
8	Red Maple	Acer rubrum	21.5	GOOD	0.9	0.70	13.5		N
9	N. Red Oak	Quercus rubra	26	FAIR	0.7	0.75	13.7		N
10	N. Red Oak	Quercus rubra	27	GOOD	0.9	0.75	18.2		N
11	N. Red Oak	Quercus rubra	24.5	FAIR	0.7	0.75	12.9		N
12	White Oak	Quercus alba	31	GOOD	0.9	0.88	24.4		N
13	Pin Oak	Quercus palustis	15.5	GOOD	0.9	0.65	9.1	2	Y
14	Pin Oak	Quercus palustis	11	GOOD	0.9	0.65	6.4	2	Y
15	Red Maple	Acer rubrum	9	GOOD	0.9	0.70	5.7	1	Y
16	Pin Oak	Quercus palustis	21	GOOD	0.9	0.65	12.3		N
17	N. Red Oak	Quercus rubra	10	GOOD	0.9	0.75	6.8		N
18	American Holly	Ilex opaca	3.5, 4	GOOD/ 2-stem tree	0.9	0.73	3.3		N
19	Pin Oak	Quercus palustis	19	GOOD	0.9	0.65	11.1	3	Y
20	Red Maple	Acer rubrum	10	GOOD	0.9	0.70	6.3	2	Y
21	Pin Oak	Quercus palustis	8	GOOD	0.9	0.65	4.7		N
22	Pin Oak	Quercus palustis	40	GOOD	0.9	0.65	23.4		N
23	Beech	Fagus sp.	18.5	GOOD	0.9	0.80	13.3	3	Y
24	Pin Oak	Quercus palustis	2	GOOD	0.9	0.65	1.2		N
25	Cherry	Prunus sp.	10	GOOD	0.9	0.55	5.0	2	Y
26	Beech	Fagus sp.	20	GOOD	0.9	0.80	14.4	3	Y

	COMMON NAME	SCIENTIFIC NAME	SIZE(DBH) in inches	CONDITION/ REMARKS	Condition Rating*	Species Rating**	Score ***	Replacement amount****	TBR
27	River Birch	Betula nigra	4,5,6	GOOD/ 3-stem tree	0.9	0.70	3.8	1	Y
28	Red Maple	Acer rubrum	7	GOOD	0.9	0.70	4.4	1	Y
29	Cherry	Prunus sp.	7	GOOD	0.9	0.55	3.5	1	Y
30	Willow Oak	Quercus phellos	8.5	GOOD	0.9	0.75	5.7	1	Y
31	Cherry	Prunus sp.	8	GOOD	0.9	0.55	4.0	1	Y
32	Red Maple	Acer rubrum	4.5	GOOD	0.9	0.70	2.8	1	Y
33	Cherry	Prunus sp.	6.5	GOOD	0.9	0.55	3.2	1	Y
34	Cherry	Prunus sp.	9	GOOD	0.9	0.55	4.5	1	Y
35	Cherry	Prunus sp.	8.5	GOOD	0.9	0.55	4.2	1	Y
36	Cherry	Prunus sp.	8	GOOD	0.9	0.55	4.0	1	Y
37	Red Maple	Acer rubrum	5	GOOD	0.9	0.70	3.2	1	Y
38	Cherry	Prunus sp.	7.5	GOOD	0.9	0.55	3.7	1	Y
39	Cherry	Prunus sp.	7	GOOD	0.9	0.55	3.5	1	Y
40	Chinkapin Oak	Quercus muehlenbergii	30	GOOD	0.9	0.75	20.3	reforestation mitigation	Y
41	Tulip poplar	Liriodendron tulipifera	43.7	GOOD	0.9	0.70	27.5		N
42	N. Red Oak	Quercus rubra	26.5	GOOD	0.9	0.75	17.9	reforestation mitigation	Y
43	White Oak	Quercus alba	20	FAIR/ Posion Ivy, Couldn't measure	0.7	0.88	12.3		N
44	N. Red Oak	Quercus rubra	30	GOOD/ Couldn't measure	0.9	0.75	20.3		N
45	Black gum	Nyssa sylvatica	27	GOOD/ Nice specimen	0.9	0.80	19.4		N
46	Beech	Fagus sp.	17	GOOD/ Worth preserving	0.9	0.80	12.2		N
47	N. Red Oak	Quercus rubra	22	GOOD	0.9	0.75	14.9		N
48	N. Red Oak	Quercus rubra	25	GOOD	0.9	0.75	16.9		N

	COMMON NAME	SCIENTIFIC NAME	SIZE(DBH) in inches	CONDITION/ REMARKS	Condition Rating*	Species Rating**	Score ***	Replacement amount****	TBR
49	American Sweetgum	Liquidambar styraciflua	21	GOOD	0.9	0.65	12.3		N
50	Unknown ornamental		3.5	FAIR	0.7	?			N
51	Bradford Pear	Pyrus calleryana	5,7	GOOD/ 9-stem	0.9	0.50	3.2		N
52	Black Locust	Robinia pseudoacacia	9	FAIR/ Overgrown electric panel	0.7	0.55	3.5	1	Y
53	N. Red Oak	Quercus rubra	30	GOOD/ Worth preserving	0.9	0.75	20.3		N
54	N. Red Oak	Quercus rubra	34	GOOD/ Worth preserving	0.9	0.75	23.0	5	Y
55	Pin Oak	Quercus palustis	23.5	GOOD	0.9	0.65	13.7	3	Y
56	White Pine	Pinus strobus	23	GOOD	0.9	0.55	11.4		N
57	White Pine	Pinus strobus	22	GOOD	0.9	0.55	10.9		N
58	White Oak	Quercus alba	28	GOOD	0.9	0.88	22.2		N
59	White Pine	Pinus strobus	24	GOOD	0.9	0.55	11.9		N
60	N. Red Oak	Quercus rubra	18	GOOD	0.9	0.75	12.2	3	Y
61	Jap. Maple	Acer palmatum	3.5	GOOD	0.9	0.80	2.5	1	Y
62	Pin Oak	Quercus palustis	24	GOOD	0.9	0.65	14.0	3	Y
63	Black Locust	Robinia pseudoacacia	5,6,6	GOOD/ Multi-stem	0.9	0.55	3.0	1	Y
64	Black Locust	Robinia pseudoacacia	8,6,4	GOOD/ 3-stem tree	0.9	0.55	4.0	1	Y
65	American Holly	Ilex opaca	12,14,14	GOOD/ 3-stem tree	0.9	0.73	9.2		N
66	White Pine	Pinus strobus	33	GOOD	0.9	0.55	16.3	4	Y
67	White Pine	Pinus strobus	24	GOOD	0.9	0.55	11.9	3	Y
68	White Pine	Pinus strobus	22.5	GOOD	0.9	0.55	11.1	3	Y
69	N. Red Oak	Quercus rubra	25	GOOD	0.9	0.75	16.9	4	Y
70	N. Red Oak	Quercus rubra	33	GOOD	0.9	0.75	22.3	5	Y

* Condition Rating is based on a percentage representation of the Good/Fair/Poor tree condition rating. Good=0.9 (90%) / Fair=0.7 (70%) / Poor=0.5 (50%)
** Species rating is based on the *TSA Mid-Atlantic Trees Species Rating Guide*. The value listed is the average rating from the range provided for each species.
*** Trees are replaced at the following rates based on the "Score" = Tree Diameter (in inches) x Species Rating (as percentage) x Condition Rating (as percentage)
**** Score >1 – 4.9 = One (1) tree
>5 – 9.9 = Two (2) trees
>10 – 14.9 = Three (3) trees
>15 – 19.9 = Four (4) trees
>20 – 24.5 = Five (5) trees
>25+ = Six (6) trees

APPENDIX C: SPECIMEN TREE LIST

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Specimen Tree List

Tree No.	Common Name	Scientific Name	DBH (inches)	Condition
SP-1	tulip poplar	*Liriodendron tulipifera*	43.7	Good
SP-2	tulip poplar	*Liriodendron tulipifera*	38	Good

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APPENDIX D: FIELD DATA SHEETS

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Property: FDA **Prepared By:** DGV/ MRB

Stand #: 1 **Plot #:** 1 **Plot Size:** 1/10 Acre **Date:** 10/26/2020

Basal Area in sf/acre: 110	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Diospyros virginiana			1													1
Fagus grandifolia							3									3
Carya	1															1
Sassafras albidum	1															1
Pinus taeda							3									3
Quercus montana		2	1	2	1		1									7
Acer rubrum				1												1
Liquidambar styraciflua				1												1
																0
																0
																0
																0
Total Number of Trees per Size Class	6			5			7			0			0			18
Number & Size of Standing Dead Trees	0			0			1			0			0			1

List of Common Understory Species 3' - 20':
Ilex opaca, Quercus montana

% of Canopy Closure						
C	*N*	*E*	*S*	*W*	*Total*
90	95	95	80	85	89

% Understory Cover 3' - 20'						
C	*N*	*E*	*S*	*W*	*Total*
60	60	65	55	65	61

Percent of Invasive Cover per Plot (All Layers): 3%

Plot Successional Stage: Early-Mid

List of Herbaceous Species 0' - 3':
Smilax spp, Quercus montana, Lonicera

% of Herbaceous Cover 0' - 3'						
C	*N*	*E*	*S*	*W*	*Total*
10	10	5	5	10	8

% of Invasive Species Coverage					
C	N	E	S	W	*Total*
0	5	5	0	5	3

Comments

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 1 **Plot #:** 2 **Plot Size:** 1/10 Acre **Date:** 10/26/2020

Basal Area in sf/acre: 130	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Acer rubrum		1	1		1		1	1								5
Carya			2				1									3
Ilex opaca						2										2
Nyssa sylvatica			1	1	2		1									5
Pinus taeda					1		5									6
Quercus alba							1									1
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	5			7			10			0			0			22
Number & Size of Standing Dead Trees	1			0			1			0			0			2

List of Common Understory Species 3' - 20':
Ilex opaca, Nyssa sylvatica

% of Canopy Closure						
C	*N*	*E*	*S*	*W*	*Total*
90	90	90	80	75	85

% Understory Cover 3' - 20'						
C	*N*	*E*	*S*	*W*	*Total*
55	50	55	45	45	50

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Early-Mid

List of Herbaceous Species 0' - 3':
Smilax spp, Quercus alba, Sassafras albidum

% of Herbaceous Cover 0' - 3'						
C	*N*	*E*	*S*	*W*	*Total*
15	10	15	5	15	12

% of Invasive Species Coverage					
C	N	E	S	W	*Total*
0	0	0	0	0	0

Comments

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 2 **Plot #:** 1 **Plot Size:** 1/10 Acre **Date:** 10/26/2020

Basal Area in sf/acre: 100	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Pinus taeda				1	2		6									9
Quercus montana							1		1							2
Fagus grandifolia								1								1
Liquidambar stryaciflua							1	1								2
Ilex opaca			3													3
Nyssa slyvatica			1			1	2	1								5
Sassafras albidum			1			2										3
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	5			6			14			0			0			25
Number & Size of Standing Dead Trees	0			1			0			0			0			1

List of Common Understory Species 3' - 20':
Ilex opaca, Quercus alba, Quercus montana

% of Canopy Closure					
C	*N*	*E*	*S*	*W*	*Total*
85	80	85	85	75	82

% Understory Cover 3' - 20'					
C	*N*	*E*	*S*	*W*	*Total*
55	65	60	60	65	61

Percent of Invasive Cover per Plot (All Layers): 2%

Plot Successional Stage: Early-Mid

List of Herbaceous Species 0' - 3':
Smilax spp, Carya, Sassafras albidum, Vaccinium angustifolium

% of Herbaceous Cover 0' - 3'					
C	*N*	*E*	*S*	*W*	*Total*
25	20	10	15	20	18

% of Invasive Species Coverage					
C	N	E	S	W	*Total*
0	10	0	0	0	2

Comments

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 2 **Plot #:** 2 **Plot Size:** 1/10 Acre **Date:** 10/26/2020

Basal Area in sf/acre: 100	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Sassafras albidum			1													1
Acer rubrum			1													1
Ilex opaca			3													3
Quercus montana								1								1
Pinus taeda							5	1								6
Nyssa slyvatica			2	1	2	5		1								11
Quercus velutina					1					1						2
Quercus alba			1													1
Carya					1											1
																0
																0
																0
Total Number of Trees per Size Class	8			10			8			1			0			27
Number & Size of Standing Dead Trees	0			0			0			0			0			0

List of Common Understory Species 3' - 20':
Ilex opaca, Carya, Nyssa slyvatica

% of Canopy Closure					
C	*N*	*E*	*S*	*W*	*Total*
80	75	85	85	80	81

% Understory Cover 3' - 20'					
C	*N*	*E*	*S*	*W*	*Total*
45	70	60	55	50	56

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Early-Mid

List of Herbaceous Species 0' - 3':
Smilax spp, Querccus montana, Pinus taeda

% of Herbaceous Cover 0' - 3'					
C	*N*	*E*	*S*	*W*	*Total*
20	10	20	15	15	16

% of Invasive Species Coverage					
C	N	E	S	W	*Total*
0	0	0	0	0	0

Comments

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 3 **Plot #:** 1 **Plot Size:** 1/10 Acre **Date:** 10/27/2020

Basal Area in sf/acre: 130	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Ilex opaca			7		2	8										17
Liriodendron tulipifera								1		1						2
Quercus alba				1	2											3
Quercus palustris										1						1
Quercus montana								1								1
Liquidambar styraciflua				1	1		2									4
Carya		1	1													2
Nyssa slyvatica							1	1		1						3
																0
																0
																0
																0
Total Number of Trees per Size Class	9			15			6			3			0			33
Number & Size of Standing Dead Trees	0			0			0			0			0			0

List of Common Understory Species 3' - 20':
Ilex opaca, Quercus alba, Nyssa slyvatica

% of Canopy Closure						
C	*N*	*E*	*S*	*W*	*Total*
95	85	90	95	65	86

% Understory Cover 3' - 20'					
C	*N*	*E*	*S*	*W*	*Total*
70	75	75	70	70	72

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Mid

List of Herbaceous Species 0' - 3':
Smilax spp.

% of Herbaceous Cover 0' - 3'					
C	*N*	*E*	*S*	*W*	*Total*
5	15	10	5	15	10

% of Invasive Species Coverage					
C	N	E	S	W	*Total*
0	0	0	0	0	0

Comments

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 3 **Plot #:** 2 **Plot Size:** 1/10 Acre **Date:** 10/27/2020

Basal Area in sf/acre: 90	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Ilex opaca			3													3
Quercus montana										2						2
Acer rubrum			2				1			1						4
Liquidambar styraciflua			1		3		1	2								7
Fagus grandifolia			1			1		2	1							5
Quercus alba					1		1	1								3
Nyssa slyvatica			3		1											4
Pinus taeda							1									1
																0
																0
																0
																0
Total Number of Trees per Size Class	10			6			10			3			0			29
Number & Size of Standing Dead Trees	0			0			0			0			0			0

List of Common Understory Species 3' - 20':
Ilex opaca, Liquidambar styraciflua, Fagus grandifolia

% of Canopy Closure					
C	*N*	*E*	*S*	*W*	*Total*
95	95	85	90	90	91

% Understory Cover 3' - 20'					
C	*N*	*E*	*S*	*W*	*Total*
70	65	75	60	70	68

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Mid

List of Herbaceous Species 0' - 3':
Smilax spp., Quercus montana, Pinus taeda

% of Herbaceous Cover 0' - 3'					
C	*N*	*E*	*S*	*W*	*Total*
10	5	15	10	5	9

% of Invasive Species Coverage					
C	N	E	S	W	*Total*
0	0	0	0	0	0

Comments

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 4 **Plot #:** 1 **Plot Size:** 1/10 Acre **Date:** 10/28/2020

Basal Area in sf/acre: 80	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Liquidambar styraciflua		2	6		1			1								10
Ilex opaca			3		1											4
Quercus alba							2	1		2						5
Nyssa slyvatica			6		2	2	2									12
Acer rubrum										1						1
																0
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	17			6			6			3			0			32
Number & Size of Standing Dead Trees	1			0			0			0			0			1

List of Common Understory Species 3' - 20':
Ilex opaca, Liquidambar styraciflua, Nyssa slyvatica

% of Canopy Closure					
C	*N*	*E*	*S*	*W*	*Total*
90	85	85	90	90	88

% Understory Cover 3' - 20'					
C	*N*	*E*	*S*	*W*	*Total*
70	70	65	65	70	68

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Mid

List of Herbaceous Species 0' - 3':
Smilax spp., Ilex opaca, Liquidambar styraciflua

% of Herbaceous Cover 0' - 3'					
C	*N*	*E*	*S*	*W*	*Total*
15	15	10	50	20	22

% of Invasive Species Coverage					
C	N	E	S	W	*Total*
0	0	0	0	0	0

Comments

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 4 **Plot #:** 2 **Plot Size:** 1/10 Acre **Date:** 10/28/2020

Basal Area in sf/acre: 90	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Acer rubrum			2			1	3	1								7
Quercus alba			1					1								2
Liquidambar styraciflua		2	1				1									4
Nyssa slyvatica			2			1	1									4
Ilex opaca			3													3
Liriodendron tulipifera					1		1			1			1			4
Carya					1			1								2
Cornus sericea			1													1
																0
																0
																0
																0
Total Number of Trees per Size Class	12			4			9			1			1			27
Number & Size of Standing Dead Trees	0			0			0			0			0			0

List of Common Understory Species 3' - 20':
Ilex opaca, Quercus alba, Nyssa slyvatica, Acer rubrum

% of Canopy Closure						
C	*N*	*E*	*S*	*W*	*Total*
95	95	90	75	90	89

% Understory Cover 3' - 20'					
C	*N*	*E*	*S*	*W*	*Total*
65	65	55	65	60	62

Percent of Invasive Cover per Plot (All Layers): 12%

Plot Successional Stage: Mid

List of Herbaceous Species 0' - 3':
Smilax spp., Ilex opaca, Liquidambar styraciflua, Lonicera japonica

% of Herbaceous Cover 0' - 3'					
C	*N*	*E*	*S*	*W*	*Total*
15	20	20	20	20	19

% of Invasive Species Coverage					
C	N	E	S	W	*Total*
15	10	20	5	10	12

Comments
Invasives: Japanese Honeysuckle and Japanese Barberry

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 5 **Plot #:** 1 **Plot Size:** 1/10 Acre **Date:** 11/4/2020

Basal Area in sf/acre: 100	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Ilex opaca			5													5
Nyssa slyvatica			1				1	1								3
Quercus alba								1		1						2
Acer rubrum			1		1		3			2						7
Carya			3		1											4
Prunus serotina			2													2
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	12			2			6			3			0			23
Number & Size of Standing Dead Trees	0			0			0			0			0			0

List of Common Understory Species 3' - 20':
Ilex opaca, Quercus alba, Prunus serotina, Carya

% of Canopy Closure						
C	*N*	*E*	*S*	*W*	*Total*
85	85	85	75	80	82

% Understory Cover 3' - 20'						
C	*N*	*E*	*S*	*W*	*Total*
60	60	60	55	50	57

Percent of Invasive Cover per Plot (All Layers): 4%

Plot Successional Stage: Mid

List of Herbaceous Species 0' - 3':
Smilax spp., Ilex opaca

% of Herbaceous Cover 0' - 3'					
C	*N*	*E*	*S*	*W*	*Total*
10	15	20	30	35	22

% of Invasive Species Coverage					
C	N	E	S	W	*Total*
0	0	5	5	10	4

Comments
Invasives: Japanese Honeysuckle, Japanese Barberry, and Microstegium

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 5 **Plot #:** 2 **Plot Size:** 1/10 Acre **Date:** 11/4/2020

Basal Area in sf/acre: 90	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Nyssa slyvatica			1					1								2
Liquidambar styraciflua			1		2	2		1								6
Acer rubrum								3		3			2			8
Carya			2			1										3
Prunus serotina			1		1											2
Ilex opaca			2													2
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	7			6			5			3			2			23
Number & Size of Standing Dead Trees	0			0			0			0			0			0

List of Common Understory Species 3' - 20':
Vaccinium corymbosum, Liquidambar stryaciflua, Magnolia virginiana

% of Canopy Closure					
C	*N*	*E*	*S*	*W*	*Total*
95	65	85	85	95	85

% Understory Cover 3' - 20'					
C	*N*	*E*	*S*	*W*	*Total*
20	65	50	45	65	49

Percent of Invasive Cover per Plot (All Layers): 34%

Plot Successional Stage: Mid

List of Herbaceous Species 0' - 3':
Smilax spp., Comptonia peregrina, Microstegium, Berberis thungergii, Lonicera japonica

% of Herbaceous Cover 0' - 3'					
C	*N*	*E*	*S*	*W*	*Total*
65	50	25	65	65	54

% of Invasive Species Coverage					
C	N	E	S	W	*Total*
70	30	10	20	40	34

Comments
Invasives: Japanese Honeysuckle, Japanese Barberry, and Microstegium

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 6 **Plot #:** 1 **Plot Size:** 1/10 Acre **Date:** 11/4/2020

Basal Area in sf/acre: 100	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Pinus virginiana				1			4	1								6
Quercus montana			3	1			3									7
Quercus alba					2			2								4
Quercus rubra				1			2									3
Nyssa slyvatica			5			1	1	1								8
																0
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	8			6			14			0			0			28
Number & Size of Standing Dead Trees	2			0			0			0			0			2

List of Common Understory Species 3' - 20':
Nyssa slyvatica and Quercus montana

% of Canopy Closure

C	*N*	*E*	*S*	*W*	*Total*
90	95	90	85	90	90

% Understory Cover 3' - 20'

C	*N*	*E*	*S*	*W*	*Total*
50	45	55	60	60	54

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Early - Mid

List of Herbaceous Species 0' - 3':
Smilax spp., Vaccinium angustifolium

% of Herbaceous Cover 0' - 3'

C	*N*	*E*	*S*	*W*	*Total*
55	15	60	60	40	46

% of Invasive Species Coverage

C	N	E	S	W	*Total*
0	0	0	0	0	0

Comments

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 6 **Plot #:** 2 **Plot Size:** 1/10 Acre **Date:** 11/4/2020

Basal Area in sf/acre: 110	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Pinus virginiana							4									4
Liquidambar stryaciflua		1			1			1								3
Acer rubrum		1					1	1	1							4
Ilex opaca			2													2
Fagus grandifolia						2										2
Quercus rubra					1	1										2
Nyssa slyvatica			2													2
Querus alba						1										1
Liriodendron tulipifera			1							1						2
Quercus montana					1			2								3
																0
																0
																0
																0
Total Number of Trees per Size Class	7			7			10			1			0			25
Number & Size of Standing Dead Trees	0			0			2			0			0			2

List of Common Understory Species 3' - 20':
Acer rubrum, Ilex opaca, Liquidambar sytraciflua, Carpinus caroliniana

% of Canopy Closure						
C	*N*	*E*	*S*	*W*	*Total*
90	90	85	80	85	86

% Understory Cover 3' - 20'						
C	*N*	*E*	*S*	*W*	*Total*
45	60	55	60	65	57

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Early - Mid

List of Herbaceous Species 0' - 3':
Smilax spp., Vaccinium angustifolium

% of Herbaceous Cover 0' - 3'					
C	*N*	*E*	*S*	*W*	*Total*
20	15	20	15	10	16

% of Invasive Species Coverage					
C	N	E	S	W	*Total*
0	0	0	0	0	0

Comments

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 7 **Plot #:** 1 **Plot Size:** 1/10 Acre **Date:** 11/4/2020

Basal Area in sf/acre: 120	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Pinus virginiana			1			1	1	3	1	8	1					16
Ilex opaca			4													4
Liquidambar stryaciflua			1			2										3
Ulmus rubra						1										1
Quercus rubra			1			2										3
Liriodendron tulipifera								1		1						2
																0
																0
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	7			6			6			10			0			29
Number & Size of Standing Dead Trees	0			0			0			0			0			0

List of Common Understory Species 3' - 20':
Acer rubrum, Ilex opaca, Liquidambar sytraciflua, Ulmus rubra

% of Canopy Closure

C	*N*	*E*	*S*	*W*	*Total*
95	90	85	90	90	90

% Understory Cover 3' - 20'

C	*N*	*E*	*S*	*W*	*Total*
50	70	70	60	65	63

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Early - Mid

List of Herbaceous Species 0' - 3':
Smilax spp., Vaccinium angustifolium

% of Herbaceous Cover 0' - 3'

C	*N*	*E*	*S*	*W*	*Total*
20	10	10	15	15	14

% of Invasive Species Coverage

C	N	E	S	W	*Total*
0	0	0	0	0	0

Comments

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 7 **Plot #:** 2 **Plot Size:** 1/10 Acre **Date:** 11/4/2020

Basal Area in sf/acre: 100	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Sassafras albidum			4													4
Ilex opaca			1													1
Liquidambar stryaciflua			2			2		1	1							6
Quercus rubra						1										1
Pinus virginiana							5	4		3						12
Faugs grandifolia									1							1
																0
																0
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	7			3			12			3			0			25
Number & Size of Standing Dead Trees	1			0			0			0			0			1

List of Common Understory Species 3' - 20':
Sassafras albidum, Fagus grandifolia, Liquidambar stryaciflua

% of Canopy Closure

C	*N*	*E*	*S*	*W*	*Total*
90	85	85	90	80	86

% Understory Cover 3' - 20'

C	*N*	*E*	*S*	*W*	*Total*
65	60	50	55	70	60

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Early - Mid

List of Herbaceous Species 0' - 3':
Smilax spp., Vaccinium angustifolium

% of Herbaceous Cover 0' - 3'

C	*N*	*E*	*S*	*W*	*Total*
10	10	20	20	30	18

% of Invasive Species Coverage

C	N	E	S	W	*Total*
0	0	0	0	0	0

Comments

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 8 **Plot #:** 1 **Plot Size:** 1/10 Acre **Date:** 11/6/2020

Basal Area in sf/acre: 120	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Sassafras albidum			2													2
Ilex opaca			2		1	1	12	4		2						22
Quercus rubra			1													1
Quercus montana			6													6
Acer rubrum			1													1
Quercus phellos			1													1
																0
																0
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	13			2			16			2			0			33
Number & Size of Standing Dead Trees	0			0			0			0			0			0

List of Common Understory Species 3' - 20':
Sassafras albidum, Quercus montana, Quercus rubra

% of Canopy Closure

C	*N*	*E*	*S*	*W*	*Total*
80	75	65	70	80	74

% Understory Cover 3' - 20'

C	*N*	*E*	*S*	*W*	*Total*
60	70	60	75	65	66

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Early

List of Herbaceous Species 0' - 3':
Smilax spp., Vaccinium angustifolium

% of Herbaceous Cover 0' - 3'

C	*N*	*E*	*S*	*W*	*Total*
70	65	75	75	70	71

% of Invasive Species Coverage

C	N	E	S	W	*Total*
0	0	0	0	0	0

Comments

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 8 **Plot #:** 2 **Plot Size:** 1/10 Acre **Date:** 11/6/2020

Basal Area in sf/acre: 110	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Pinus virginiana					3		3		1	2						9
Sassafras albidum			3			5										8
Ilex opaca			1													1
Liquidambar stryaciflua			1													1
Pinus strobus			1													1
Quercus rubra						2										2
Quercus montana			1													1
Pinus taeda				2	1											3
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	7			13			4			2			0			26
Number & Size of Standing Dead Trees	0			0			0			0			0			0

List of Common Understory Species 3' - 20':
Sassafras albidum, Quercus montana, Quercus rubra, Liquidambar stryaciflua

% of Canopy Closure

C	*N*	*E*	*S*	*W*	*Total*
75	80	55	80	75	73

% Understory Cover 3' - 20'

C	*N*	*E*	*S*	*W*	*Total*
60	55	70	65	65	63

Percent of Invasive Cover per Plot (All Layers): 0%

Plot Successional Stage: Early

List of Herbaceous Species 0' - 3':
Smilax spp., Vaccinium angustifolium

% of Herbaceous Cover 0' - 3'

C	*N*	*E*	*S*	*W*	*Total*
20	70	45	75	75	57

% of Invasive Species Coverage

C	N	E	S	W	*Total*
0	0	0	0	0	0

Comments

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 9 **Plot #:** 1 **Plot Size:** 1/10 Acre **Date:** 11/6/2020

Basal Area in sf/acre: 120	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Pinus virginiana					3		3		1	2						9
Sassafras albidum			3			5										8
Ilex opaca			1													1
Liquidambar stryaciflua			1													1
Pinus strobus			1													1
Quercus rubra						2										2
Quercus montana			1													1
Pinus taeda				2	1											3
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	7			13			4			2			0			26
Number & Size of Standing Dead Trees	1			0			0			0			0			1

List of Common Understory Species 3' - 20':
Acer rubrum, Ilex opaca, Prunus serotina

% of Canopy Closure						
C	*N*	*E*	*S*	*W*	*Total*
75	65	80	75	75	74

% Understory Cover 3' - 20'					
C	*N*	*E*	*S*	*W*	*Total*
50	60	70	35	65	56

Percent of Invasive Cover per Plot (All Layers): 32%

Plot Successional Stage: Early-Mid

List of Herbaceous Species 0' - 3':
Smilax spp., Lonicera japonica, Ilex opaca

% of Herbaceous Cover 0' - 3'					
C	*N*	*E*	*S*	*W*	*Total*
55	70	75	70	60	66

% of Invasive Species Coverage					
C	N	E	S	W	*Total*
45	35	40	25	15	32

Comments
Invasive: Japanese honeysuckle

Sheet of

Forest Sampling Data Worksheet **C:1**

Property: FDA **Prepared By:** DGV/ MRB

Stand #: 9 **Plot #:** 2 **Plot Size:** 1/10 Acre **Date:** 11/6/2020

Basal Area in sf/acre: 120	**Size Class of trees >20' height within sample plot**															
Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-9.9" dbh			# of Trees 9.9-17.9" dbh			# of Trees 18-29.9" dbh			# of Trees > 30" dbh			
Crown Position	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Dom**	**CoD**	**Other**	**Total**
Ilex opaca			9		1	2			1							13
Carya					1		1									2
Acer rubrum			2		1											3
Quercus rubra							2			1						3
Quercus alba										1						1
Prunus serotina				2												2
Liquidambar stryaciflua							2			1						3
Pinus virginiana								1								1
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	11			7			7			3			0			28
Number & Size of Standing Dead Trees	0			0			0			0			0			0

List of Common Understory Species 3' - 20':
Acer rubrum, Ilex opaca, Cornus sericea

% of Canopy Closure						
C	*N*	*E*	*S*	*W*	*Total*
85	70	70	75	80	76

% Understory Cover 3' - 20'					
C	*N*	*E*	*S*	*W*	*Total*
60	70	55	60	70	63

Percent of Invasive Cover per Plot (All Layers): 14%

Plot Successional Stage: Early-Mid

List of Herbaceous Species 0' - 3':
Smilax spp., Lonicera japonica, Ilex opaca, Vaccinium angustifolium

% of Herbaceous Cover 0' - 3'					
C	*N*	*E*	*S*	*W*	*Total*
60	45	55	65	55	56

% of Invasive Species Coverage					
C	N	E	S	W	*Total*
0	10	20	30	10	14

Comments
Invasive: Japanese honeysuckle

Sheet of

Forest Sampling Data Worksheet **C:1**

APPENDIX E: FOREST STAND SUMMARY SHEETS

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Property Name: FDA MRC Master Plan	
Location: Laurel, MD	
Prepared By: Dave Votta and Maddie Berg	**Date:** 10/26/2020

Stand Variable	**Stand # 1**
1. Dominant/Codominant species	*Fagus grandifolia, Carya, Sassafras albidum, Pinus taeda, Quercus montana, Acer rubrum, Liquidambar styraciflua, Nyssa sylvatica, Quercus alba*
2. Successional stage	Early-Mid
3. Basal area in square feet per acre	12 average
4. Size class of dominant species	10-17.9" DBH
5. Percent of canopy closure	87%
6. Number of tree species per acre	8
7. Common understory species per acre	*Ilex opaca, Quercus montana, Nyssa sylvatica*
8. Percent of understory cover 3' to 20' tall	56%
9. Number of woody plants species 3' to 20' tall	3
10. Common herbaceous species 0' to 3' tall	*Smilax spp., Quercus montana, Lonicera japonica, Quercus alba, Sassafras albidum*
11. Percent of herbaceous and woody plant cover 0' to 3' tall	10%
12. List of major invasive plant species and percent cover	*Lonicera japonica at 3%*
13. Number of standing dead trees 6" dbh or greater	2
14. Comments	

Forest Stand Summary Worksheet Sheet 1 of 1

Property Name: FDA MRC Master Plan	
Location: Laurel, MD	
Prepared By: Dave Votta and Maddie Berg	**Date:** 10/26/2020

Stand Variable	**Stand # 2**
1. Dominant/Codominant species	*Fagus grandifolia, Carya, Pinus taeda, Quercus montana, Liquidambar styraciflua, Nyssa sylvatica, Quercus velutina*
2. Successional stage	Early-Mid
3. Basal area in square feet per acre	10
4. Size class of dominant species	10-17.9" DBH
5. Percent of canopy closure	82%
6. Number of tree species per acre	9
7. Common understory species per acre	*Ilex opaca, Carya, Nyssa sylvatica, Quercus alba, Quercus montana*
8. Percent of understory cover 3' to 20' tall	56%
9. Number of woody plants species 3' to 20' tall	3
10. Common herbaceous species 0' to 3' tall	*Smilax spp., Quercus montana, Pinus taeda, Quercus alba, Sassafras albidum, Vaccinium angustifolium*
11. Percent of herbaceous and woody plant cover 0' to 3' tall	17%
12. List of major invasive plant species and percent cover	*~2% cover*
13. Number of standing dead trees 6" dbh or greater	1
14. Comments	

Forest Stand Summary Worksheet Sheet 1 of 1

Property Name: FDA MRC Master Plan	
Location: Laurel, MD	
Prepared By: Dave Votta and Maddie Berg	**Date:** 10/27/2020

Stand Variable	**Stand # 3**
1. Dominant/Codominant species	*Fagus grandifolia, Carya, Pinus taeda, Quercus montana, Liquidambar styraciflua, Nyssa sylvatica, Acer rubrum, Quercus alba, Ilex opaca, Liriodendron tulipifera, Quercus palustris*
2. Successional stage	Mid
3. Basal area in square feet per acre	11 average
4. Size class of dominant species	10-17.9" DBH
5. Percent of canopy closure	89%
6. Number of tree species per acre	8
7. Common understory species per acre	*Ilex opaca, Nyssa sylvatica, Quercus alba, Liquidambar stryaciflua, Fagus grandifolia*
8. Percent of understory cover 3' to 20' tall	70%
9. Number of woody plants species 3' to 20' tall	3
10. Common herbaceous species 0' to 3' tall	*Smilax spp., Quercus montana, Pinus taeda*
11. Percent of herbaceous and woody plant cover 0' to 3' tall	10%
12. List of major invasive plant species and percent cover	None
13. Number of standing dead trees 6" dbh or greater	0
14. Comments	
Forest Stand Summary Worksheet	Sheet 1 of 1

Property Name: FDA MRC Master Plan	
Location: Laurel, MD	
Prepared By: Dave Votta and Maddie Berg	**Date:** 10/28/2020

Stand Variable	**Stand # 4**
1. Dominant/Codominant species	*Liquidambar styraciflua, Nyssa sylvatica, Acer rubrum, Quercus alba, Ilex opaca, Liquidambar styraciflua, Liriodendron tulipifera, Carya*
2. Successional stage	Mid
3. Basal area in square feet per acre	9 average
4. Size class of dominant species	10-17.9" DBH
5. Percent of canopy closure	89%
6. Number of tree species per acre	8
7. Common understory species per acre	*Ilex opaca, Nyssa sylvatica, Quercus alba, Liquidambar stryaciflua, Acer rubrum*
8. Percent of understory cover 3' to 20' tall	65%
9. Number of woody plants species 3' to 20' tall	4
10. Common herbaceous species 0' to 3' tall	*Smilax spp., Ilex opaca, Liquidambar stryaciflua, Lonicera japonica*
11. Percent of herbaceous and woody plant cover 0' to 3' tall	10%
12. List of major invasive plant species and percent cover	*Lonicera japonica and Berberis thunbergia @ 12%*
13. Number of standing dead trees 6" dbh or greater	0
14. Comments	
Forest Stand Summary Worksheet	Sheet 1 of 1

Property Name: FDA MRC Master Plan	
Location: Laurel, MD	
Prepared By: Dave Votta and Maddie Berg	**Date:** 11/4/2020

Stand Variable	**Stand # 5**
1. Dominant/Codominant species	*Liquidambar styraciflua, Nyssa sylvatica, Acer rubrum, Quercus alba, Liquidambar styraciflua, Liriodendron tulipifera, Carya*
2. Successional stage	Mid
3. Basal area in square feet per acre	100 average
4. Size class of dominant species	2-5.9" DBH
5. Percent of canopy closure	84%
6. Number of tree species per acre	6
7. Common understory species per acre	*Ilex opaca, Quercus alba, Liquidambar stryaciflua, Prunus serotina, Carya, Magnolia virginiana, Vaccinium corymbosum*
8. Percent of understory cover 3' to 20' tall	53%
9. Number of woody plants species 3' to 20' tall	7
10. Common herbaceous species 0' to 3' tall	*Smilax spp., Ilex opaca, Lonicera japonica, Berberis thunbergia, Microstegium, Comptonia peregrina*
11. Percent of herbaceous and woody plant cover 0' to 3' tall	38%
12. List of major invasive plant species and percent cover	*Lonicera japonica, Microstegium, Berberis thunbergia @ 19%*
13. Number of standing dead trees 6" dbh or greater	0
14. Comments	
Forest Stand Summary Worksheet	Sheet 1 of 1

Property Name: FDA MRC Master Plan	
Location: Laurel, MD	
Prepared By: Dave Votta and Maddie Berg	**Date:** 11/4/2020

Stand Variable	**Stand # 6**
1. Dominant/Codominant species	*Pinus virginiana, Quercus montana, Quercus alba, Quercus rubra, Nyssa sylvatica, Liquidambar stryaciflua, Acer rubrum, Quercus rubra, Liriodendron tulipifera*
2. Successional stage	Early Mid
3. Basal area in square feet per acre	110 average
4. Size class of dominant species	10 – 17.9" DBH
5. Percent of canopy closure	88%
6. Number of tree species per acre	10
7. Common understory species per acre	*Ilex opaca, Liquidambar stryaciflua, Quercus montana, Nyssa sylvatica, Carpinus caroliniana*
8. Percent of understory cover 3' to 20' tall	56%
9. Number of woody plants species 3' to 20' tall	5
10. Common herbaceous species 0' to 3' tall	*Smilax spp., Vaccinium angustifolium*
11. Percent of herbaceous and woody plant cover 0' to 3' tall	31%
12. List of major invasive plant species and percent cover	None
13. Number of standing dead trees 6" dbh or greater	2
14. Comments	

Forest Stand Summary Worksheet Sheet 1 of 1

Property Name: FDA MRC Master Plan	
Location: Laurel, MD	
Prepared By: Dave Votta and Maddie Berg	**Date:** 11/4/2020

Stand Variable	**Stand # 7**
1. Dominant/Codominant species	*Pinus virginiana, Liquidambar stryaciflua, Liriodendron tulipifera*
2. Successional stage	Early Mid
3. Basal area in square feet per acre	110 average
4. Size class of dominant species	10 – 17.9" DBH
5. Percent of canopy closure	88%
6. Number of tree species per acre	6
7. Common understory species per acre	*Ilex opaca, Liquidambar stryaciflua, Acer rubrum, Ulmus rubra, Sassafras albidum, Fagus grandifolia*
8. Percent of understory cover 3' to 20' tall	62%
9. Number of woody plants species 3' to 20' tall	6
10. Common herbaceous species 0' to 3' tall	*Smilax spp., Vaccinium angustifolium*
11. Percent of herbaceous and woody plant cover 0' to 3' tall	16%
12. List of major invasive plant species and percent cover	None
13. Number of standing dead trees 6" dbh or greater	0
14. Comments	

Forest Stand Summary Worksheet Sheet 1 of 1

Property Name: FDA MRC Master Plan	
Location: Laurel, MD	
Prepared By: Dave Votta and Maddie Berg	**Date:** 11/6/2020

Stand Variable	**Stand # 8**
1. Dominant/Codominant species	*Ilex opaca, Pinus taeda, Pinus virginiana*
2. Successional stage	Early
3. Basal area in square feet per acre	120 average
4. Size class of dominant species	10 – 17.9" DBH
5. Percent of canopy closure	74%
6. Number of tree species per acre	8
7. Common understory species per acre	*Quercus montana, Quercus rubra, Liquidambar stryaciflua, Sassafras albidum*
8. Percent of understory cover 3' to 20' tall	65%
9. Number of woody plants species 3' to 20' tall	4
10. Common herbaceous species 0' to 3' tall	*Smilax spp., Vaccinium angustifolium*
11. Percent of herbaceous and woody plant cover 0' to 3' tall	64%
12. List of major invasive plant species and percent cover	None
13. Number of standing dead trees 6" dbh or greater	0
14. Comments	

Forest Stand Summary Worksheet Sheet 1 of 1

Property Name: FDA MRC Master Plan	
Location: Laurel, MD	
Prepared By: Dave Votta and Maddie Berg	**Date:** 11/6/2020

Stand Variable	**Stand # 9**
1. Dominant/Codominant species	*Ilex opaca, Pinus taeda, Pinus virginiana, Carya, Acer rubrum, Quercus rubra, Prunus serotina, Liquidambar stryaciflua*
2. Successional stage	Early-Mid
3. Basal area in square feet per acre	120
4. Size class of dominant species	6 - 9.9" DBH
5. Percent of canopy closure	75%
6. Number of tree species per acre	8
7. Common understory species per acre	*Acer rubrum, Ilex opaca, Prunus serotina, Cornus sericea*
8. Percent of understory cover 3' to 20' tall	60%
9. Number of woody plants species 3' to 20' tall	4
10. Common herbaceous species 0' to 3' tall	*Smilax spp., Lonicera japonica, Ilex opaca, Vaccinium angustifolium*
11. Percent of herbaceous and woody plant cover 0' to 3' tall	64%
12. List of major invasive plant species and percent cover	*Lonicera japonica @ 23%*
13. Number of standing dead trees 6" dbh or greater	0
14. Comments	

Forest Stand Summary Worksheet Sheet 1 of 1

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APPENDIX F: MARYLAND FOREST CONSERVATION WORKSHEET

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FOREST CONSERVATION WORKSHEET
FDA - Muirkirk Road Campus Master Plan

NET TRACT AREA:

A. Total tract area	A=	197.00
B. Land dedication acres (parks, county facility, etc.)	B=	0.00
Land dedication for roads or utilities (not being constructed by this plan)		0.00
Area to remain in commercial agricultural production/use		0.00
Other deductions (specify)		0.00
C. Net Tract Area = A - B	C=	197.00

LAND USE CATEGORY: (from *Trees Technical Manual*)
Input the number "1" under the appropriate land use, limit to only one entry.

ARA	MDR	IDA	HDR	MPD	CIA
0	0	1	0	0	0

D. Afforestation Threshold (C x 15%)	D=	29.55
E. Conservation Threshold (C x 20%)	E=	39.40

EXISTING FOREST COVER:

F. Existing forest cover	F=	57.80
G. Area of forest above afforestation threshold = F - D	G=	28.25
Area of forest above conservation threshold = F - E		18.40

BREAK EVEN POINT:

H. Forest retention above threshold with no mitigation = (.2 x G)+ E	H=	43.08
I. Clearing permitted without mitigation = F - H	I=	14.72

PROPOSED FOREST CLEARING:

J. Total area of forest to be cleared	J=	4.33
K. Total area of forest to be retained = F - J	K=	53.47

PLANTING REQUIREMENTS:
If Total Area of Forest to be Retained (K) is at or above the Breakeven Point (H), no planting is required, and not further calculations are required (L=0, M=0, N=0, P=0, Q=0, R=0).

L. Reforestation for clearing above conservation threshold =	L=	0.00
M. Reforestation for clearing below conservation threshold =	M=	0.00
N. Credit for retention above conservation threshold =	N=	0.00
P. Total reforestation required =	P=	0.00
Q. Total afforestation required =	Q=	0.00
R. Total reforestation and afforestation required =	R=	0.00

worksheet updated 8/5/2002

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