

FOREST MANAGEMENT PLAN & COVER TYPE MAP

For

**Stonewall Business Park
Catocin District
Loudoun County, Virginia**

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Prepared for:

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Introduction

Zimar and Associates, Inc. (Z&A) was contracted to prepare this document in order to meet the requirements of The Loudoun County Facility Standards Manual Chapter 7.000 Environmental Design Standards Sub-Chapter 7.350 Forest Management Plan as required by the Loudoun County Zoning Ordinance. This section outlines the requirements for a Forest Management Plan (FMP) for sites going through the rezoning process.

Site Location

This approximately 292 acre area of study is located in Loudoun County and lies just south of the Town of Leesburg. The site extends south from just below Cochran Mill Road to the Dulles Greenway and is bordered to the east by Gant Lane and to the west by Sycolin Road.

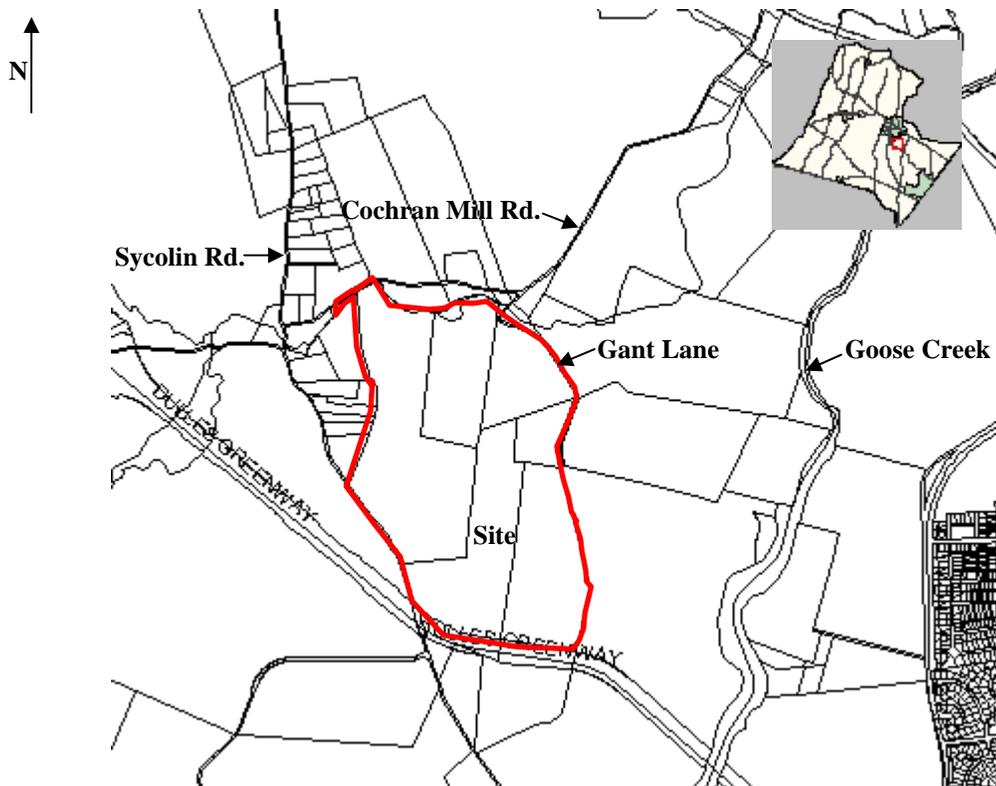


Figure 1: Vicinity Map

Loudoun County Office of Mapping and Geographic Information

Procedures

Z&A prepared an Existing Vegetation Map (EVM) for the identified property in July 2008. The methods used to prepare this map are as follows:

- Cover type lines were determined in the field using aerial photographs and traditional forestry methods for type mapping. Existing tree lines were determined using Loudoun County GIS maps, aerial photos, and existing condition maps provided by Urban Engineering and Associates, Inc. Existing features were field verified.
- Species composition was determined by identifying the predominant overstory species.
- Age classes were determined by estimating tree age from increment bore samples from a typical tree in a cover type and determining diameter ranges from tree measurement sample plots.
- Stand densities in young mature and mature forest stands were determined using randomly spaced basal area plots measured with a basal area factor (BAF) 10 prism. Trees tallied in basal area plots were a minimum of 6" DBH, alive and healthy, and of a species that would be managed for timber production. Densities of immature stands and understory regeneration were determined by counting the number of stems in randomly spaced 1/10th (37.2' radius) acre plots. These figures were used to determine per acre densities. Regeneration tallies are based on the number of stems per acre of desirable hardwood overstory species.
- Topography was determined from Loudoun County Office of Mapping and Geographic Information maps as well as maps provided by Urban Engineering and Associates, Inc.
- Health, vigor, and quality were determined by growth rate, presence of diseases or insects, and tree form, size, and structure.

Observations

This section contains the descriptions of individual stands and contains recommendations specific to each stand. Please refer to the Cover Type Map at the end of this report to identify location and extent of specific stands.

The area of study contains both forested and non-forested open areas. Existing forested areas are comprised of young mature to mature upland and mixed hardwoods, bottomland hardwoods occurring primarily along major drainages, and transitional forests containing primarily immature to young mature early successional pioneer tree species such as eastern red cedar and Virginia pine. The majority of the open areas exist as abandoned field and utility right-of-way.

Overall, there are no truly exceptional forested stands on this site. The best stands consist of mature upland hardwoods and are located within Cover Type 1.

Cover Type # 1

<u>GENERAL DESCRIPTION:</u>	Upland hardwoods containing widely scattered interspersed Virginia pine.
<u>SPECIES COMPOSITION:</u>	Overstory contains white oak (<i>Quercus alba</i>), northern red oak (<i>Quercus rubra</i>), hickory (<i>Carya spp.</i>), scarlet oak (<i>Quercus coccinea</i>), chestnut oak (<i>Quercus prinus</i>), and Virginia pine (<i>Pinus virginiana</i>). The understory contains hickory (<i>Carya spp.</i>), serviceberry (<i>Amelanchier arborea</i>), American beech (<i>Fagus grandifolia</i>), mixed oak, blackhaw (<i>Viburnum prunifolium</i>), eastern red cedar (<i>Juniperus virginiana</i>), and flowering dogwood (<i>Cornus florida</i>).
<u>ACREAGE:</u>	81 ac.
<u>AGE/SIZE CLASS:</u>	Uneven-aged, mature (12"-18" DBH).
<u>AGE:</u>	50-70 years.
<u>DENSITY:</u>	Well stocked (70 sq. ft. BA per acre).
<u>GROWTH RATE:</u>	Slow.
<u>QUALITY:</u>	Fair-good.
<u>REGENERATION:</u>	Desirable hardwood overstory species regeneration is present in moderate numbers (200 stems per acre).
<u>INSECTS / DISEASE:</u>	None.
<u># TREES 6" – 13" / ACRE:</u>	90.
<u># TREES > 14" / ACRE:</u>	65.
<u>SOILS:</u>	Kelly-Sycoline complex, Sycoline-Catlett complex, Oakhill gravelly silt loam, Legore loam, Haymarket and Jackland soils, Catlett gravelly silt loam, Kelly silt loam, Waxpool silt loam, Manassas silt loam, Albano silt loam.
<u>TOPOGRAPHY:</u>	Gentle to moderate slope.

ASPECT: Aspect varies across this Cover Type.

STAND HISTORY: Previously used for agriculture and grazing.

Cover Type # 2

GENERAL DESCRIPTION: Bottomland hardwoods.

SPECIES COMPOSITION: Overstory contains pin oak (*Quercus palustris*), red maple (*Acer rubrum*), sycamore (*Platanus occidentalis*), slippery elm (*Ulmus rubra*), and eastern red cedar. The understory contains eastern red cedar, blackhaw, spicebush (*Lindera benzoin*), and slippery elm. There are patches of honeysuckle (*Lonicera japonica*) and greenbriar (*Smilax rotundifolia*) present throughout the understory as well as significant herbaceous ground cover. Summer grape (*Vitis aestivalis*) can also be found in the understory as well as the canopy of trees within this Cover Type.

ACREAGE: 15 ac.

AGE/SIZE CLASS: Uneven-aged, primarily young mature (8"-16" DBH) with some larger trees present, primarily sycamores and pin oaks, up to 22".

AGE: 35-50 years.

DENSITY: Moderately stocked (60 sq. ft. BA per acre).

GROWTH RATE: Slow-moderate.

QUALITY: Fair.

REGENERATION: Desirable hardwood overstory species regeneration is sparse (100 stems per acre) due to wet soil conditions, competition from less desirable vegetation, and deer browse.

INSECTS / DISEASE: None.

<u># TREES 6" – 13" / ACRE:</u>	110.
<u># TREES > 14" / ACRE:</u>	35.
<u>SOILS:</u>	Bowmansville silt loam, Comus silt loam, Codorus silt loam, Manassas silt loam, Kelly silt loam, Albano silt loam.
<u>TOPOGRAPHY:</u>	Level.
<u>ASPECT:</u>	Aspect varies across this Cover Type.
<u>STAND HISTORY:</u>	Previously used for agriculture and grazing.

Cover Type # 3

<u>GENERAL DESCRIPTION:</u>	Early successional forest containing immature eastern red cedar and Virginia pine.
<u>SPECIES COMPOSITION:</u>	Overstory contains eastern red cedar and Virginia pine. There are very sparsely scattered hardwoods occurring throughout this Cover Type, primarily red maple, and white ash (<i>Fraxinus Americana</i>). The understory contains blackhaw, red maple, and white ash as well as patches of honeysuckle.
<u>ACREAGE:</u>	115 ac.
<u>AGE/SIZE CLASS:</u>	Even-aged, immature (3"-8" DBH).
<u>AGE:</u>	10-25 years.
<u>DENSITY:</u>	Medium stocking for pine (450 stems per acre).
<u>GROWTH RATE:</u>	Moderate.
<u>QUALITY:</u>	Poor.
<u>REGENERATION:</u>	Desirable hardwood overstory species regeneration is very sparse (< 10 stems per acre) due to canopy closure and heavy deer browse.
<u>INSECTS / DISEASE:</u>	None.

<u># TREES 6" – 13" / ACRE:</u>	130.
<u># TREES > 14" / ACRE:</u>	< 10.
<u>SOILS:</u>	Sycoline-Catlett complex, Kelly-Sycoline complex, Haymarket and Jackland soils, Elbert silty clay loam, Legore loam, Waxpool silt loam, Albano silt loam, Montalto silty clay loam, Codorus silt loam.
<u>TOPOGRAPHY:</u>	Level to moderately sloping.
<u>ASPECT:</u>	Aspect varies across this Cover Type.
<u>STAND HISTORY:</u>	Previously used for agriculture and grazing.

Cover Type # 4

<u>GENERAL DESCRIPTION:</u>	Virginia pine.
<u>SPECIES COMPOSITION:</u>	Overstory contains Virginia pine as well as interspersed hardwoods to a lesser degree. Hardwood species include white oak, southern red oak, white ash, and hickory. The understory contains red maple, eastern red cedar, white ash, and mixed oak and hickory. There are patches of honeysuckle and greenbrier (<i>Smilax rotundifolia</i>) scattered throughout the understory of this Cover Type.
<u>ACREAGE:</u>	9 ac.
<u>AGE/SIZE CLASS:</u>	Uneven-aged, young mature-mature (8"-16" DBH).
<u>AGE:</u>	30-50 years.
<u>DENSITY:</u>	Moderately stocked (60 sq. ft. BA per acre).
<u>GROWTH RATE:</u>	Slow-moderate.
<u>QUALITY:</u>	Poor.

<u>REGENERATION:</u>	Desirable hardwood overstory species regeneration is sparse but present (130 stems per acre).
<u>INSECTS / DISEASE:</u>	None.
<u># TREES 6" – 13" / ACRE:</u>	80.
<u># TREES > 14" / ACRE:</u>	65.
<u>SOILS:</u>	Haymarket and Jackland soils, Sycoline-Catlett complex, Montalto silty clay loam, Waxpool silt loam.
<u>TOPOGRAPHY:</u>	Gentle to moderate slope.
<u>ASPECT:</u>	Aspect varies across this Cover Type.
<u>STAND HISTORY:</u>	Previously used for agriculture and grazing.

Cover Type # 5

<u>GENERAL DESCRIPTION:</u>	Old field seeded in with early successional pioneer tree species.
<u>SPECIES COMPOSITION:</u>	Primary tree species include eastern red cedar, Virginia pine, red maple, pin oak, and southern red oak. There are patches of honeysuckle, rose (<i>Rosa multiflora</i>), blackberry, and sumac (<i>Rhus glabra</i>) present throughout this Cover Type. There is also a significant amount of herbaceous ground cover present, primarily fescue and native grasses.
<u>ACREAGE:</u>	12 ac.
<u>AGE/SIZE CLASS:</u>	Even-aged, immature (4"-8" DBH).
<u>AGE:</u>	8-15 years.
<u>DENSITY:</u>	Moderately stocked (220 stems per acre).
<u>GROWTH RATE:</u>	Moderate-fast.
<u>QUALITY:</u>	Fair-poor.

<u>REGENERATION:</u>	Desirable hardwood overstory species regeneration is very sparse due to heavy deer browse and competition from less desirable vegetation.
<u>INSECTS / DISEASE:</u>	None.
<u># TREES 6" – 13" / ACRE:</u>	140.
<u># TREES > 14" / ACRE:</u>	None.
<u>SOILS:</u>	Montalto silty clay loam, Albano silt loam, Waxpool silt loam, Sycoline-Catlett complex, Haymarket and Jackland soils.
<u>TOPOGRAPHY:</u>	Level to gently rolling.
<u>ASPECT:</u>	Aspect varies across this Cover Type.
<u>STAND HISTORY:</u>	Previously used for agriculture and grazing.

Cover Type # 6

<u>GENERAL DESCRIPTION:</u>	Open area existing primarily as abandoned field and utility right-of-way.
<u>SPECIES COMPOSITION:</u>	This Cover Type contains a few widely scattered early successional pioneer tree species, primarily eastern red cedar.
<u>ACREAGE:</u>	60 ac.
<u>SOILS:</u>	Haymarket and Jackland soils, Waxpool silt loam, Legore loam, Elbert silty clay loam, Manassas silt loam, Kelly-Sycoline complex, Sycoline-Catlett complex, Albano silt loam.
<u>TOPOGRAPHY:</u>	Level to gently rolling.
<u>ASPECT:</u>	Aspect varies across this Cover Type.
<u>STAND HISTORY:</u>	Previously used for agriculture and grazing.

Forest Management Recommendations

Cover Type 1: This Cover Type is of the highest priority for forest management and preservation considerations due to the quality and size class of the trees it contains. This Cover Type shall be left to mature and should be inspected periodically to monitor growth rate and overall stand health. Portions of this cover type may be considered for preservation as Tree Conservation Areas (TCAs) during the development planning process.

Cover Type 2: Forest management considerations are limited within this Cover Type due to the wet soil conditions present. This Cover Type is, however, a high priority for preservation as it is currently serving as a riparian buffer area. Vegetated riparian buffers promote stream bank stability and filter run off generated from agricultural and construction activities, thus increasing water quality. Furthermore these areas provide excellent wildlife habitat for a variety of native species.

Cover Type 3: Currently, this stand is of a low priority for forest management considerations and preservation due to the size and quality of the trees it contains. There are, however, numerous eastern red cedar saplings and smaller trees up to 6" DBH within this Cover Type that may be considered for transplanting for use as visual buffers or in landscaped settings.

Cover Type 4: Currently, this stand is of a low priority for forest management considerations and preservation. Virginia pine is not a desirable timber species and lacks structural integrity, thus it is prone to wind throw during windy and icy conditions.

As the preservation of Virginia pine is not a priority, many of these trees may be removed. This will allow for the release of more desirable hardwood species that are present in the understory such as oak and hickory. The removal of Virginia pine will also improve safety.

Cover Type 5: This Cover Type is of low priority for forest management considerations and preservation due to the small size of the trees it contains. There are, however, numerous oak and eastern red cedar saplings and smaller trees up to 6" DBH within this Cover Type that may be considered for transplanting for use as visual buffers or in landscaped settings.

Cover Type 6: No management considerations.

General Recommendations

GUIDELINES FOR TREE CONSERVATION AREAS (TCA'S)

The following general guidelines should be implemented for all cover types throughout the development process and as part of the future maintenance of the TCA. These guidelines provide for the maintenance and overall health and sustainability of the TCAs.

1. Develop and implement a Tree Conservation Plan (TCP) for all areas to be preserved during site development. The TCP should start with the establishment of limits of clearing and grading. It should identify the location of fencing, (welded wire or super silt fence) to be used to protect these areas from encroachment during development and specify when they are to be installed and removed. It should identify the trees adjacent to these limits that may be affected by the development activity as specified in Chapter 7 of the Facility Standards Manual (FSM) and prescribe activities aimed at mitigating those affects, such as root pruning, mulching, fertilizing, etc.
2. Trees along the proposed limits of disturbance or in other areas of the TCA that pose potential hazard should be identified and removed during the development process.
3. Invasive species such as tree of heaven should be identified and treated during the development process and as part of the long-term management program. Control techniques may include mechanical removal, herbicide, or cultural control methods based on the species, severity of invasion, and location relative to sensitive plants or areas.
4. The site should be monitored throughout development and as part of the long-term management for outbreaks of potentially serious insects an disease including gypsy moth, canker worm, wood boring insects, and other potentially devastating outbreaks. Frequent monitoring that identifies populations at low levels can prevent the need for large scale treatments.
5. Any hazardous trees should be treated to improve safety in high use areas. These include home sites, recreation facilities and trails, or other areas frequented by people. This may include the removal, pruning, or cabling of trees with a high potential for failure.
6. Disturbed edges should be mulched to reduce the potential for invasion by undesirable species.

7. Thinning and removal of poor quality trees may be necessary to improve the overall health. This item should be a part of the long-term management for any Cover Type.
8. Pest monitoring and control is important to prevent secondary and tertiary stress factors.

FORESTRY BEST MANAGEMENT PRACTICES

All forest management activities shall comply with Virginia Best Management Practices (BMP's). BMP's are methods, measures, or practices to meet non-point pollution control needs. These practices include stabilization of all exposed soil on skid trails, haul roads, and log decks, crossing streams using bridges or culverts, locating trails and roads on minimal grades, installation of water diversion structures, and leaving buffer strips along perennial streams. All BMP's shall be done in accordance with those outlined by the Virginia Department of Forestry.

In addition to the state BMPs, the following guidelines shall apply to all forestry operations according to Loudoun County requirements where timber harvesting is implemented.

1. The Loudoun County Urban Forester shall be notified at least 24 hours prior to commencement of any timber harvesting.
2. The Loudoun County Urban Forester shall be notified upon installation of all BMP's.
3. Forest management activities shall comply with the Virginia Debris in Stream Law.
4. The property shall be protected from wildfire. Any outdoor burning shall be done carefully and in compliance with all Virginia Forest Laws. The Loudoun County Sheriff's Office shall be notified immediately of any escaped fire.
5. Locations of log decks, skid trails, and haul roads shall be identified prior to any logging activity.
6. A grading permit will be required for road construction exceeding 10,000 square feet.
7. Any forest management activities shall be done in accordance with accepted silvicultural practices and methods.

APPENDIX A—FOREST COVER TYPE SUMMARY TABLE

FOREST COVER TYPE SUMMARY TABLE							
Cover Type	Composition	Primary Species	Quality	Density	Age Class	Soils	Acres
1	UH	White oak, northern red oak, hickory, scarlet oak, chestnut oak, Virginia pine	F-G	WS	M	14B, 60C, 60D, 62B, 63A, 64C, 64D, 66A, 68B, 68C, 79A	81
2	BH	pin oak, red maple, sycamore, slippery elm, eastern red cedar	F	MS	YM	2A, 3A, 6A, 14B, 63A, 79A	15
3	P	eastern red cedar, Virginia pine	P	MS	IM	2A, 60C, 62B, 64C, 65B, 66A, 67B, 67C, 68B, 69A, 79A	115
4	VP	Virginia pine	P	MS	YM-M	60C, 65B, 66A, 68B, 79A	9
5	OF	eastern red cedar, Virginia pine, red maple, pin oak, southern red oak	F-P	MS	IM	60C, 65B, 66A, 68B, 79A	12
6	O/DEV	eastern red cedar	N/A	N/A	N/A	14B, 60C, 62B, 64C, 66A, 67B, 68B, 69A, 79A	60
<i>Total acreage</i>							292

APPENDIX B—CODE DESCRIPTIONS

SPECIES COMPOSITION:

UH—UPLAND HARDWOODS

BH—BOTTOMLAND HARDWOODS

MH—MIXED HARDWOODS

VP—VIRGINIA PINE

P—(EARLY SUCCESSIONAL PIONEER EASTERN RED CEDAR AND VIRGINIA PINE)

OF—OLD FIELD SEEDED IN WITH EARLY SUCCESSIONAL PIONEER TREE SPECIES

OP/DEV—OPEN (PASTURE, FIELD, LAWN AREA, DEVELOPED LAND)

QUALITY:

P—POOR

F—FAIR

G—GOOD

DENSITY:

REPRODUCTION TO IMMATURE STANDS:

PS—POORLY STOCKED (< 200 STEMS PER ACRE)

MS—MEDIUM STOCKED (200 – 500 STEMS PER ACRE)

WS—WELL STOCKED (> 500 – 700 STEMS PER ACRE)

YOUNG MATURE TO OVERMATURE STANDS

PS—POORLY STOCKED (< 50 SQ. FT. BA*)

MS—MEDIUM STOCKED (50 TO 70 SQ. FT. BA)

WS—WELL STOCKED (70 TO 100 SQ. FT. BA)

OS—OVER STOCKED (> 110 SQ. FT. BA)

AGE CLASS:

RE—REPRODUCTION (SEEDLINGS AND SAPLINGS < 2" DBH**)

IM—IMMATURE (SAPLING AND POLE-SIZE < 6" DBH)

YM—YOUNG MATURE (6 TO 12" DBH)

M—MATURE (> 12" DBH)

OM—OVERMATURE (LARGE TREES DOMINATE WITH EVIDENCE OF DECAY AND DEATH)

SOILS:

2A—CODURUS SILT LOAM, (0-3%) OCCASIONAL FLOODING

3A—COMUS SILT LOAM, (0-3%) OCCASIONAL FLOODING

6A—BOMANSVILLE SILT LOAM, (0-3%) OCCASIONAL FLOODING

14B—MANASSAS SILT LOAM, (1-8%)

60C—SYCOLINE-CATLETT COMPLEX, (7-15%)

60D—CATLETT GRAVELLY SILT LOAM, (15-25%)

62B—KELLY-SYCOLINE COMPLEX, (3-8%)

63A—KELLY SILT LOAM, (0-3%)

64C—LEGORE LOAM, (8-15%)

64D—OAKHILL GRAVELLY SILT LOAM, VERY STONY (15-25%)

65B—MONTALTO SILTY CLAY LOAM, (3-8%)

66A—WAXPOOL SILT LOAM, (0-3%) PONDING

67B—HAYMARKET AND JACKLAND SOILS, (2-8%)

68B—HAYMARKET AND JACKLAND SOILS, VERY STONY (2-8%)

68C—HAYMARKET AND JACKLAND SOILS, VERY STONY (8-15%)

69A—ELBERT SILTY CLAY LOAM, (0-3%) PONDING

79A—ALBANO SILT LOAM, (0-3%) BRIEF PONDING

* BA = SQUARE FEET OF BASAL AREA PER ACRE

** DBH = DIAMETER MEASURED 4.5 FEET ABOVE GROUND

APPENDIX C—BIBLIOGRAPHY

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APPENDIX D—FOREST COVER TYPE MAP

