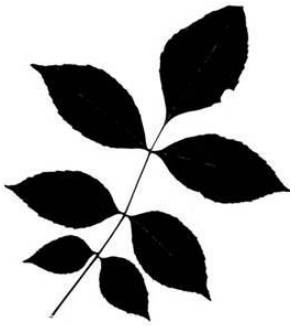
Forestlands Stewardship Plan

Plan Period: 2023-2033



Prepared for:

MARYVILLE COLLEGE
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MARYVILLE, TN 37804

October 31, 2023

TN Department of Agriculture | Forestry

Introduction

This plan describes various areas of the property, and management recommendation options based on your specific goals for the next 10-year period. The individual management units are shown on the attached map. Technical handouts on specific management topics can be requested through this office. The plan provides general information about your woodlands to assist with decision-making. If required, contact the Tennessee Division of Forestry for more detailed guidelines and information before carrying out any management recommendations.

WOOD PRODUCTS

RECREATION

WILDLIFE

Management Objectives

Forest Health	Control / eliminate exotic invasive plants to prevent further spread and damage
Wildlife	Create / maintain habitat diversity for wildlife species through vegetation management
Demonstration	Utilize suitable forest management techniques for demonstration purposes
Recreation	Create / maintain trail system for ease of access and enjoyment for recreational users

STREAM PROTECTION

SOIL STABILITY

PLANT DIVERSITY

"In every walk with Nature, one receives far more than he seeks."

~ John Muir

Property Description			
Location:	**GPS coordinates**: N35^0 44.818'; W83^0 57.421' **Property ID**: M058 > P001.00		
Land Use:	~ 124.3 forested acres	~ 9.4 open acres	~ 133.7 total acres
Description:	This approximately 125-acre forested tract is part of the Maryville College Campus located within Maryville City Limits of Blount County, Tennessee, at the corner of East Lamar Alexander Parkway and South Court Street, with Wilkinson Pike to the south. The Maryville College Woods resides within the Level III Ridge and Valley and Level IV Southern Limestone/Dolomite Valleys and Low Rolling Hills ecoregion; part of the Great Appalachian Valley that stretches 1,200 miles from Alabama to Quebec. Terrain in the Woods is generally less than 5% slope with moderate slope leading to Duncan Branch and Brown Creek, both perennial streams, which merge at the northeastern reaches of the Woods. Brown Creek reaches Pistol Creek in downtown Maryville, eventually flowing to the Little River on its way to the Tennessee River, ~ 9 river miles north of the Woods. Maryville College Woods is part of the Pistol Creek 12-digit hydrologic unit code (HUC) subwatershed; which encompasses just over 25,000 acres. Slopes range from 0% to 22% with elevations above sea level ranging between 925 feet and 1,005 feet. The highest point in the Woods lies where the RT Lodge resides, in the southwest corner. Residential properties can be found adjacent to the Woods to the east and southeast. The ~ 10 acres of open ground can be delineated between a system of trails throughout the Woods that connect common areas, such as the orchards, ropes course, picnic areas along the creeks, and disc golf fairways, the home site, and the RT Lodge campus. These sites will not be included in any management recommendations found in this document. Urban sites can often be the source of many nonnative, invasive plant species that escape to the woodlands. English Ivy is a prime example of one of the threats the Maryville Woods faces in the near-term. These plant species lower the biodiversity as well as hinder natural forest regeneration. Secondarily, invasive plant species can dimmish the quality of wildlife habitat by hindering cover, food, and structure. Accompanying this Stewardship Plan will also include the Rapid Forest Health Assessment (RaFHA) plan which details all nonnative, invasive species observed throughout and corresponding fact sheets that speak to description, ecological threat, distribution, and control methods. The Maryville College Woods can serve as an excellent outdoor classroom for not only students but the public at large, in demonstrating the control and elimination on nonnative, invasive plant species. During my initial site survey, it appeared that control efforts have been ongoing in eliminating both English Ivy and Amur Honeysuckle through Rx burning and chemical application. There are several soil types on this property, each of which will be detailed in the following 3 MU summations. Only the dominant soil types will be referred to during the following management unit summaries. Several maps will be provided to be used as visual references. Site Index (SI) varies between soil types. *See Soil Maps Appendix B.* Enclosed will be several maps; including aerials from 1956, 1984, 1997, 2002, and 2021 which can visually tell the story of change. Also enclosed will be maps that display the Inventory Plots, various trails throughout the Woods, Soils, and Hill Shade and Contours. A total of 9 site visits between the end of September to the beginning of November of 2023 were made to collect Forest Inventory data. This data was compiled and used to make forest management recommendations. Separate descriptions and recommendations of the individual forested units for the management of timber and other natural resources during the next ten-year period are presented below:		

MU1 (42.0 acres) UPLAND MIXED HARDWOOD/PINE

Site Conditions

Terrain	Mostly level with gentle slope and runoff to the NW and SE from central high point.
Soil Type *(u=update)*	**(uDcB3) Dewey-Collegedale complex, severely eroded (2-6% slope):** Clayey alluvium and/or residuum weathered from dolomitic limestone interbedded with shale. Deep and well drained with high acidity, low in organic matter, and moderately low in natural fertility. Permeability moderate to moderately slow. Capable of producing ~ 1,032 board feet of Yellow Poplar timber volume per acre per year. Better suited for agricultural production. **(Dv) Dunmore gravelly silt loam (5-12% slope):** Developed from clayey residuum weather from limestone. Moderately to very deep, well to somewhat excessively drained, extremely acid to slightly alkaline (pH 3.5-7.8). Typically, not subject to flooding or ponding. Permeability very slow to very rapid. Capable of producing ~ 1,032 board feet of Yellow Poplar timber volume per acre per year. Most is cleared and used for growing hay and pasture.
Site Index	**SI for Yellow Poplar (YP): 90-100** (*reference Appendix A & B for definitions)*

Forest Conditions

Forest Cover Type	Shortleaf Pine – Oak
Associate Species	Red and White Oak, Hickory, Sweetgum, Blackgum, Virginia Pine, Black Cherry, Maple species, American Beech, Ash seedlings > 41.7% Misc. Hardwood
Age Class	Saw timber - (*Appendix A for definitions)* AVG DBH = 16.7" > 3,761 BF/AC > 80.1 (49 Pole) TPA
Stocking Level	Under Stocked in pockets - (*Appendix A for definitions)* BA = 63
Stand Life Stage	Prime – (*Appendix A for definitions)*
Forest Health	**Overview**: Prioritize mitigation efforts for nonnative, invasive plant species.
	Nonnative, Invasive Species: English Ivy, Bush Honeysuckle, Chinese Privet, Winged Burning Bush, Paulownia.
	Wildfire Damage Risk: Low: Damp area due to aspect and forest floor cover.

Special Features

Streams	None observed.
Special Habitats	None observed.
Cultural Features	Recreational Trail, Morningside/RT Lodge.

Forester Comments

This Upland Mixed Hardwood/Pine unit can be considered a sink for many invasive plant species. English Ivy is carpeted throughout preventing natural regeneration of native tree species. Fortunately, much of the English Ivy is contained within this stand. Before any alterations to the canopy or harvest operations begin, invasive plant species mitigation will need to be addressed. Standing dead trees, or snags, will benefit the landscape by becoming den trees for cavity nesters and eventual organic matter to enrich the soil. Canopy gaps caused by windthrow were observed which promote an Irregular uneven-aged stand structure. Uneven-aged management will ensure a cohort of large trees for aesthetic value which meets the recreation objective.

Management Recommendations

- **Invasive Mitigation:** Measures should be taken to eliminate and prevent the spread of multiple invasive plant species found in MU1. Elimination of the invasives will provide sunlight to the forest floor that can stimulate the seed bank and allow native plant species back on the landscape. Rx burning and/or chemical treatments may be achievable methods of mitigation. *See RaFHA plan for control measures.*
- **Create a Food Plot:** *See Web Link **PB1769** Appendix B.* Provides additional nutrition while increasing carrying capacity for wildlife.
- **Conduct Timber Stand Improvement (TSI) operations**: Enhance growth and vigor, improve stand quality, and control species composition within this 10-year management. Crop Tree Release (CTR) is the selection and release of desirable trees by removing adjacent trees that are in competition for light. Pine removals can convert the mixture to an upland hardwood forest cover type. *See Web Link **PB1774** Appendix B.*

MU2 (45.2 acres) UPLAND MIXED HARDWOOD

Site Conditions

Terrain	Level to modest slope towards the creeks with Southeast to Northwestern aspect.
Soil Type	**(Dv) Dunmore gravelly silt loam (5-12% slope):** Developed from clayey residuum weathered from limestone. Moderately to very deep, well to somewhat excessively drained, extremely acid to slightly alkaline (pH 3.5-7.8). Typically, not subject to flooding or ponding. Permeability very slow to very rapid. Capable of producing ~ 1,032 board feet of Yellow Poplar timber volume per acre per year. Most is cleared and used for growing hay and pasture. **(Dt) Dewey silty clay loam; eroded (6-15% slope):** Developed in residuum from limestone. Highly weathered and leached with low nutrient levels and low pH. Moderately to very deep, well to somewhat excessively drained. Permeability very slow to very rapid. Not rated for Yellow Poplar timber volume per acre per year. Most is cleared and used for growing hay and pasture.
Site Index	**SI for YP: 90-100** (*reference Appendix A & B for definitions)*

Forest Conditions

Forest Cover Type	White Oak / Red Oak / Hickory
Associate Species	Yellow Poplar, Maple species, Shortleaf Pine, Flowering Dogwood, American Beech, Blackgum, Sassafras, Black Walnut, Black Oak, Sweetgum > 32.4% Misc. Hardwood
Age Class	Saw timber - (*Appendix A for definitions)* AVG DBH = 18.2" > 5,120 BF/AC > 70.8 (37 Pole) TPA
Stocking Level	Under to Appropriately Stocked - (*Appendix A for definitions)* BA = 71
Stand Life Stage	Prime to Middle Age - (*Appendix A for definitions)*
Forest Health	**Overview**: Consider nonnative, invasive plant species a health concern.
	Nonnative, Invasive Species: Bush Honeysuckle, Chinese Privet, Winged Burning Bush, some English Ivy, and adjacent Kudzu
	Wildfire Damage Risk: Moderate: W to SW aspect w/ canopy gaps allow for dryer, fine fuels.

Special Features

Streams	None observed.
Special Habitats	None observed.
Cultural Features	Recreational Trail, House in the Woods, Knoll Orchard Plot.

Forester Comments

This stand is the epitome of the most common Forest Cover type in Tennessee; Oak/Hickory. Comparatively speaking, this stand had the least amount of invasive plant species present. Lack of invasive plants species has produced a hearty seedling / sapling layer. Timber was of high quality and within 5-10 years of financial maturity. As with any harvesting operation, invasive mitigation and best management practices should be conducted. An Even aged stratified mixture of Pole and Saw timber sized trees was observed.

Management Recommendations

- **Shelterwood Low-Impact Harvest:** *See Web Link **SP676** Appendix B.* Promote advanced regeneration of preferred species while maintaining aesthetic value of the stand. Intermediate light should promote advanced regeneration of desirable species while suppressing mesic species. Consulting foresters can aid in the tree marking process. Utilize walking trails as fire breaks should you exercise a Prescribed Fire regime post-harvest.
- **Practice Demonstration Agroforestry**: Utilize areas in the stand that complement your management and research vision for the forest. Examples may include mushroom farming, medicinal plant gardening, walnut harvesting, participate in a carbon market, firewood extraction, etc. *See Web Link in Appendix B.*
- **Eliminate pockets of nonnative, invasive plants**: Amur honeysuckle and other invasive plant species were observed. These can inhibit the regeneration of desirable tree species, so removal and control should remain a priority. Prior to any timber harvest operations, control and eradication should be conducted months prior to harvest.

MU3 (46.5 acres) BOTTOMLAND MIXED HARDWOOD

Site Conditions

Terrain	Gently sloping with aspects ranging from North to Southeast to West.
Soil Type	**(Dv) Dunmore gravelly silt loam (5-12% slope):** Developed from clayey residuum weathered from limestone. Moderately to very deep, well to somewhat excessively drained, extremely acid to slightly alkaline (pH 3.5-7.8). Typically, not subject to flooding or ponding. Permeability very slow to very rapid. Capable of producing ~ 1,032 board feet of Yellow Poplar timber volume per acre per year. Most is cleared and used for growing hay and pasture. **(Le) Lindside silt loam, occasionally flooded (0-3% slope):** Loamy alluvium derived from limestone, sandstone, and shale**.** Moderately to very deep, very poorly to excessively drained, extremely acid to moderately alkaline (pH 3.5-8.4), very slow to very rapid permeability. Frequencies of flooding and ponding range from none to frequent. Capable of producing ~ 1200 board feet of Yellow Poplar timber volume per acre per year. Best suited for row crops and pasture.
Site Index	**SI for YP: 90-100** (*reference Appendix A & B for definitions)*

Forest Conditions

Forest Cover Type	Yellow Poplar / White Oak / Northern Red Oak
Associate Species	American Hophornbeam, American Sycamore, Hackberry, Black Walnut, Sweetgum, Maple species, Eastern Hemlock, Hickory species, American Beech > 52.8% Misc. Hardwood
Age Class	Saw timber (*Appendix A for definitions)* AVG DBH = 18.5" > 5,569 BF/AC > 86.8 (57 Pole) TPA
Stocking Level	Appropriately Stocked (*Appendix A for definitions)* BA = 77
Stand Life Stage	Prime to Middle Age (*Appendix A for definitions)*
Forest Health	**Overview**: Consider nonnative, invasive plant species a health concern.
	Nonnative, Invasive Species: Amur Honeysuckle, English Ivy, Winter Creeper, Tree of Heaven, Chinese Privet, Winged Burning Bush,
	Wildfire Damage Risk: Low: Riparian zone with dense forest floor cover.

Special Features

Streams	Brown Creek and Duncan Branch.
Special Habitats	Riparian Buffer Zone.
Cultural Features	Recreational Trail, Mountain Challenge Ropes Course, Educational Kiosks, Picnic Areas.

Forester Comments

The understory in this riparian stand is dominated by nonnative, invasive plant species. While there is a seedling / sapling layer in certain areas, it is sparce due to the dominant layer of invasives. The diversity of miscellaneous tree species and their growth rates, along with 2 creeks, creates an agreeable blend for both the recreational user and wildlife. The Southern Pine Beetle outbreak of the late 1990's is evidenced by the coarse woody debris (CWD) observed in some areas of this stand. Subsequent canopy gaps promote an Irregular uneven-aged stand structure.

Management Recommendations

- **Leave Alone:** Multiple past disturbances have created a diversity of age classes. Allowing the older age class to follow the natural processes of stand dynamics, canopy gaps will allow light to the forest floor to initiate another generation of timber.
- **Eliminate nonnative, invasive plants**: Numerous nonnative, invasive plant species were observed. These can inhibit desirable tree species, so removal and control should remain a priority. Prior to any harvesting or TSI operations, control and eradication should be conducted while also following best management practices (BMP's).
- **Pollinator Habitat:** Replace cool-season grasses in picnic areas with pollinator friendly gardens and wildflowers. Pollinator habitat can enhance natural resources needed for robust landscapes and support agricultural communities. These habitats will also support habitat for wild turkeys and other wildlife.

Additional Recommendations

Endangered/Threatened/Deemed in Need of Management/Special Concern Species: All information here is provided by TDEC-Division of Natural Areas. "**Endangered**" refers to a species in danger of extinction throughout all or a significant portion of its range. "**Threatened**" refers to a species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. "**Deemed in Need of Management**" refers to any species or subspecies of nongame wildlife which the executive director of the Tennessee Wildlife Resources Agency (TWRA) believes should be investigated in order to develop information relating to populations, distribution, habitat needs, limiting factors, and other biological and ecological data to determine management measures necessary for their continued ability to sustain themselves successfully. This category is analogous to "Special Concern. **"Special Concern"** refers to any species or subspecies of plant that is uncommon in Tennessee or has unique or highly specific habitat requirements or scientific value and therefore requires careful monitoring of its status. **"Rare, Not State Listed"** refers to understudied species, e.g., cave obligates, from being State Listed through TWRA.

No threatened/deemed in need of management/special concern/ rare, not state listed plant or animal species have been documented on the property. Please note that many areas of Tennessee have never been surveyed for rare species, so the absence of documented occurrences does not mean that rare species are not present. Torrey's Mountain-Mint has been documented on the property. The following species have been observed within a 4 mile radius of your property and, where suitable habitat is present, may be found on site:

BIRD > *Ixobrychus exilis*: **Least Bittern** > Marshes along with Artificial Wetlands > **Deemed in Need of Management**
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.106202/Ixobrychus_exilis

BIRD > *Rallus elegans*: **King Rail** > Marshes, Flooded Farmlands, Shrub Swamps > **Deemed in Need of Management**
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.962122/Rallus_elegans

FISH > *Hemitremia flammea*: **Flame Chub** > Springs and Spring-Fed Streams with Lush Aquatic Vegetation; Tennessee & Middle Cumberland River Watersheds > **Deemed in Need of Management**
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.101542/Hemitremia_flammea

FLOWERING PLANT > *Pycnanthemum torrei*: **Torrey's Mountain-Mint** > Barrens > **Endangered**
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.141413/Pycnanthemum_torreyi

MOLLUSC > *Lasmigona holstonia*: **Tennessee Heelsplitter** > Spring Runs, Creeks, and Small Rivers in Sand and Mud Substrate; Upper Tennessee and Conasauga River Watersheds > **Rare, Not State Listed**
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.827419/Lasmigona_holstonia

Follow this link for a list of rare species by TN county:
https://dataviewers.tdec.tn.gov/dataviewers/f?p=9014:3:118904174220701:::::

Stream Protection: Stream ecosystems consist of the stream itself and the associated riparian habitat. They support both aquatic species and a wide variety of terrestrial species that use the associated riparian habitat. Sedimentation and erosion resulting from disturbance in and around streams are a threat to water quality and aquatic species. Intact riparian habitat, particularly forest habitat, protects both water quality in the stream and provides many benefits to terrestrial wildlife species (i.e. travel corridors, floodplain wetlands, and food foraging opportunities). Utilize Best Management Practices (BMP) in Tennessee guidebook to prevent sedimentation of streams. This involves establishing a Streamside Management Zone (SMZ) that provides a sufficient undisturbed buffer to protect the stream habitat. The width of the buffer varies with the steepness of the terrain and special features of the riparian zone. Contact your forester for assistance prior to any management projects.

Mark Property Boundaries: All property boundaries should be identified. Mark trees every 30 to 50 feet along the boundary with brightly colored paint at eye level on both sides of the trees to prevent timber or property trespass.

Wildfire Control: Protect your woodland from wildfire, which is very damaging to the present and future quality of standing trees. Keep in mind that October 15 through May 15 is Tennessee's wildfire season, and a burning permit is required before doing certain outdoor burning. For assistance in case of wildfire or for a burning permit, contact the Tennessee Division of Forestry office in Loudon County at 865-986-8395.

Selling Timber: Assistance with selling timber is available from qualified forestry consultants, a list of which is available upon request.

Financial Assistance: The Agriculture Enhancement Program could offer cost-share incentives to help offset the cost of many forest practices such as tree planting, thinning crowded woodlands, enhancing wildlife habitat, etc. Contact the Tennessee Division of Forestry for more information. The Tennessee Wildlife Resources Agency (1-800-332-0900) and the Natural Resources Conservation Service, Jason Miller, (423-442-2202, jason.miller@usda.gov) may also have cost share programs for conservation practices for farm and forest lands.

Additional Information: This Stewardship Plan provides only general information on managing your woodlands to assist you with decision-making. Contact the Tennessee Division of Forestry for more detailed guidelines and information before carrying out any management recommendations.

Stewardship Plan Update: This plan should be updated in 2033.

Forestlands Stewardship Plan Prepared By:

Eric J Miller

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Eric J Miller, Area Forester – Blount, Loudon, Monroe
TN Department of Agriculture, Division of Forestry

Appendix A: Definitions and Examples

Forest cover type is a term used to group stands of trees that share similar characteristics (ie. hardwood species, coniferous species, elevation, site preferences) which may be used to differentiate them from other groups of stands. The classification is based on existing tree cover and must meet the following three criteria: the dominant cover must be of trees; the type must occupy a large area in the aggregate, but not necessarily in continuous stands; and forest cover type must be based on entirely biological considerations.
https://apps.fs.usda.gov/forest-atlas/grow-forest-types.html

Age class is a term we are using to group trees into the following three classes:
(a) ***Seedling/ Sapling*** is defined as woody vegetation from new seedlings up to 5.0 inches in diameter at breast height (DBH) and greater than or equal to 20 feet in height, exclusive of woody vines.
(b) ***Pole timber*** is defined as trees that are at least five inches in DBH, but smaller than the minimum utilization standard for saw timber.
(c) ***Saw timber*** is defined as softwoods at least 9" DBH hardwoods at least 12" DBH.
(d) ***Board Feet (BF)*** is measure of volume in standing timber.

Stocking level is a measure of growing space that the trees utilize expressed on an area basis. The following definitions are commonly used:
(a) ***Appropriately stocked stands*** - Stands in which the growing space is effectively occupied but which still have ample room for development of the crop trees.
(b) ***Over stocked stands*** - Stands in which the growing space is so completely utilized that growth has slowed and many trees are declining. Trees are stressed in over stocked stands because there are not enough resources (space, water, and light) to support continued growth. Trees are not vigorous and become more susceptible to insects and diseases contributing to unhealthy conditions. The solution is to remove a few trees through release, timber stand improvement or thinning to allow the remaining trees more resources for continued growth and development.
(c) ***Under stocked stands*** - Stands in which the growing space is not effectively occupied by crop trees, usually too few trees per unit area.
(d) ***Basal Area (BA)*** is a measurement of the cross-sectional area of all trees at DBH on the uphill side. Provides an idea of stocking of trees in a stand.

Stand Life Stage is an understanding of different species of trees that grow at different rates and have different life expectancies. Knowing a stand's chronological age is not as useful as being able to recognize its current life stage. An analogy of the life stages in a stand is similar to our own. Young stands are the most resilient and adaptable and can be managed aggressively. Stands in their prime (maturity) through older ages seldom respond quickly to management actions. The life stages, regeneration, teenagers, stem exclusion, prime, middle age, and older ages are described below. Once the life stages are recognized, then management actions can be taken. Life stages, site quality, species composition and stocking are all integral components in describing the stand.
Regeneration*:* Trees beginning to grow from sprouts, seeds, or advance reproduction (small seedlings already in place).
Stem Exclusion*:* All the space in the overhead canopy is filled with tree crowns, not allowing light to reach the forest floor to initiate new reproduction. This stage is when tree crowns begin to stratify giving different crown levels. Trees are now old enough to produce seed. Intermediate stand management options are available to shape the future stand toward desirable growing conditions.
Teenagers*:* These trees (saplings and small poles) have long, slender branches and pointed or pyramidal crowns. Trees are growing quickly to occupy unused growing space.
Prime*:* Trees in their prime have full, round-topped crowns filled with long, strong branches. Trees are growing at an increasing to steady rate.

Middle Age: Trees are mature, both physiologically and financially, and growth rates are beginning to decline. Middle-aged tree crowns are beginning to flatten out on top and limbs are growing thicker.
Older Ages*:* Trees have flat-topped crowns filled with heavy limbs that are covered with short branches. Gaps start appearing in the crown as major limb systems begin to decline and die. Tree growth is minimal as trees produce just enough energy resources to maintain themselves.

Site Index is a measure of a forest's potential productivity. It is calculated using the average total tree heights of dominant or co-dominant trees along with stand age of ***site trees***. Site index curves are constructed and differ by tree species and region. Site index numbers help predict timber productivity, wood volume, and potential rate of growth of a forest; higher the number = increase in productivity. Forest managers use the site index to evaluate the site quality for the production of timber. Site quality is defined as the productive capacity of the site. The productive capacity is associated with the soils, landforms (ridges, slopes, valleys, and bottoms), moisture, and previous land use (if applicable). Soils that are moist, relatively deep, and well-drained have the best productivity. Ridges and upper slopes are usually moisture-limited, shallow soils that are lower in site productivity. Bottomlands with their ample moisture are some of the better productive forested sites. However, too much water, especially standing water that remains puddled and stagnated on the site, decreases soil oxygen needed by tree roots. These waterlogged soils are low in productivity. (*reference Appendix B*)

Species-Site Relationships are important to the growth and health of your forest. Most species occur on sites that are favorable to their growth and development. Some species are adaptable in that they can inhabit a range of sites (examples are white oak, pines, and red maple), while others are very specific in their site requirements (examples black walnut, cherry, and red oaks). Although species may occur on a wide variety of sites, they may only make their best production on a narrow range of specific site conditions.
Sites are characterized based on the physical setting (landform and topography), soils (texture, structure, drainage, and depth) and moisture profiles. Generally, the most limiting factor affecting tree growth is moisture. Sites on lower slopes, stream valleys, and floodplains (generally concave surfaces) have better moisture profiles than the convex surfaces of upper slopes and ridges. Too much water (floodplains and alluvial areas) can have as much of a detrimental effect on tree growth and survival as too little water.

A C***omplex*** consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

Two examples are presented to illustrate the importance of matching the species to the site:

Example 1: Black walnut is a species that brings one of the highest prices for lumber. Thus, many people would like to plant black walnut to increase their financial returns. However, black walnut will only grow well on a very specific site: one where soils are relatively rich and deep, moist, and well-drained. Often black walnut is planted on marginal sites where it is not well-adapted and other species outgrow it. Thus, the investment in planting black walnut - site preparation, seedlings, planting, and maintenance cost far exceeds the expected revenue once walnut reaches maturity, if it reaches maturity.

Example 2: **N**atural stands of yellow poplar. Its habitat is usually on lower slopes and stream valleys where moisture is plentiful. Yellow poplar will not tolerate poorly drained soils where flooding and soil puddling are prevalent. During periods of higher-than-normal rainfall, yellow-poplar is successful in colonizing dryer sites. However, during periods of drought, these same yellow poplar that survived on the dryer sites during periods of high moisture, are now declining because of the lack of moisture. Trees are stressed, diameter growth decreases sharply, and crowns become sparse. The decline of these trees makes them more susceptible to diseases such as hypoxylon canker. Yellow poplars are not adapted to these dryer sites during adverse conditions, while trees on the more favorable, moister sites are not stressed.

Most all trees grow best on deep, moist, well-drained soils. However, most of these better sites are usually in some other, more valuable land use, than forests. Thus, matching the correct species to the site conditions is critical for the health of forests. Species that prefer dryer sites are not adapted to wetter sites. The trees adapted to wetter sites will probably out-compete or out-grow the dry-adapted, slower-growing species on these moist sites. A species that prefers more moist sites, usually will be moisture-stressed, and not do well on drier sites.

Appendix B: Basal Area > Management Units Inventory Tally Data > Other Attachments

The documents in this appendix can be used to determine average tree diameter per management unit. In each of the tally documents, locate both UNIT BA cell (in the header section) and the TREES/AC cell (far right column). Simply use the chart in the Basal Area document to find the specific UNIT BA (e.g. BA60, BA70, etc.) and the figure in the TREES/AC cell. For example, locate BA60 across the top, scroll your finger down to the approximate 84.8 TREES/AC, then scroll your finger left to the corresponding DBH. This will give you average diameter of the tress per MU. A hard copy of all TNTally4.0 and Basal Area documents are provided.

Basal Area > Management Units Inventory Tally Data:

Basal_Area_DBH_Trees_Per_Acre_Guide_Sep

TNTally4.0UPPER_UNIT1.pdf

TNTally4.0MID_UNIT2.pdf

TNTally4.0LOWER_UNIT3.pdf

Soils Maps:

MU1_Soil_Map.pdf

MU2_Soil_Map.pdf

MU3_Soil_Map.pdf

Other Attachments: (click the links to open)

PB1769: Landowners' Guide to Wildlife Food Plots:
https://trace.tennessee.edu/utk_agexfish/16/

SP676: Oak Shelterwood Forest System:
https://trace.tennessee.edu/utk_agexfores/22/

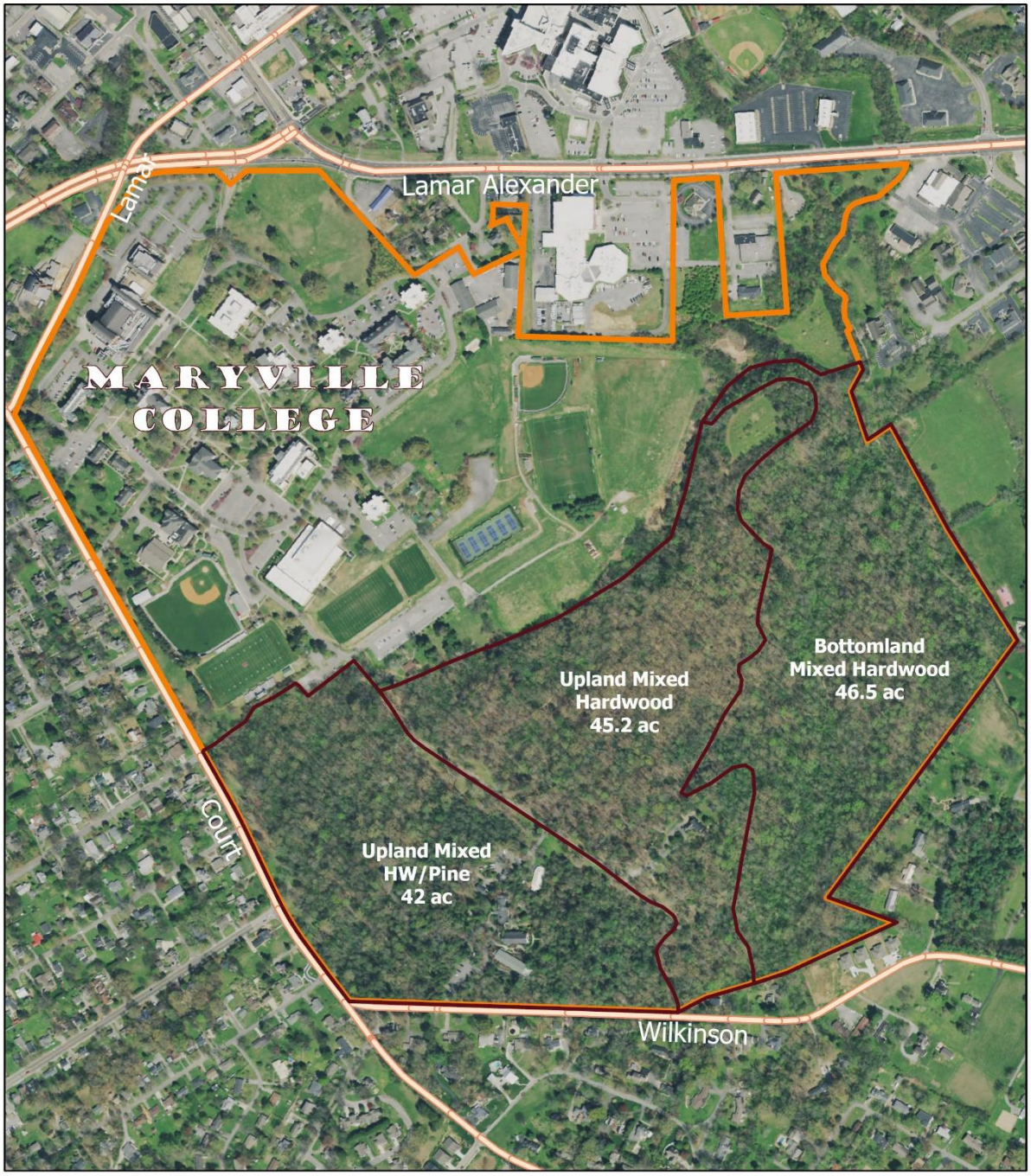
PB1774: Crop Tree Release:
https://trace.tennessee.edu/utk_agexfores/19/

Site Index:
https://www.srs.fs.usda.gov/pubs/rn/rn_srs025.pdf

Agroforestry:
https://www.usda.gov/topics/forestry/agroforestry

NOTES:

2023 Management Unit Map



884 Highway 70W
Lenoir City, TN 37771
Phone: 865-986-7335
Email: eric.j.miller@tn.gov

January 15, 2024

Maryville College
502 E. Lamar Alexander Parkway
Maryville, TN 37804

To Whom It May Concern:

Attached is your ***Forestlands Stewardship Plan***. Please look it over and contact me with any questions you may have regarding detailed information about any of the management recommendations. If you do carry out any recommended forest practices, please let me know so I can update the plan and keep it current.

If I can be of further assistance, please contact me.

Sincerely,

Eric J Miller
Area Forester