FOREST MANAGEMENT PLAN

5/3/2013

VIRGINIA TECH STADIUM WOODS

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Client Data

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Property Location

Virginia Tech is located in Montgomery County, Virginia; in the city of Blacksburg (Figure 1). The Virginia Tech Stadium Woods is located north of the Southgate Center, south-west of the Washington Street Tennis Courts, south-east of the Cranwell International Center, and east of Lane Stadium and Jamerson Athletic Center (Figure 2).

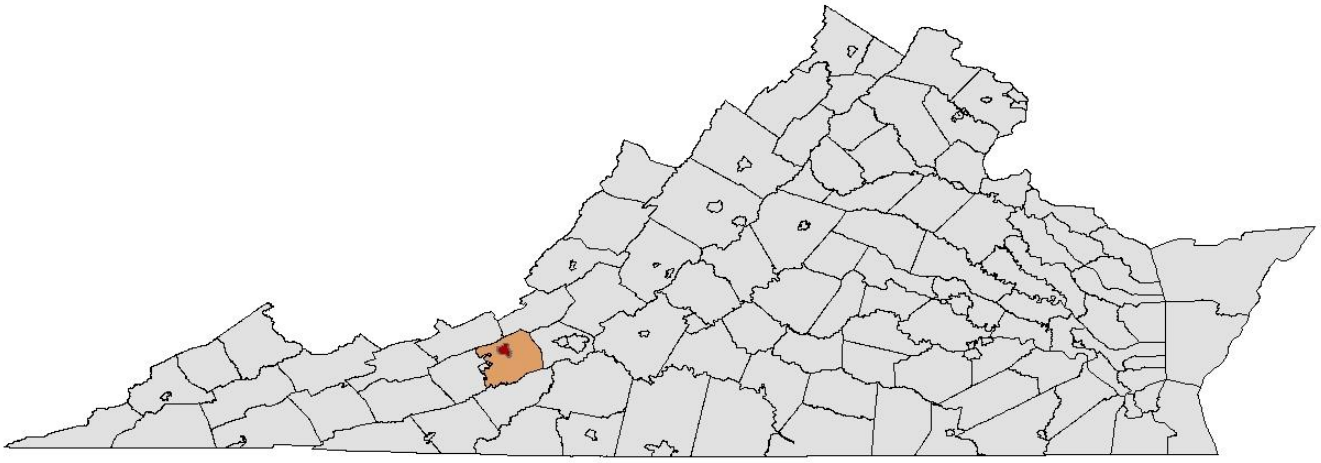


Figure 1: Location of Montgomery County (orange) and the city of Blacksburg (maroon).

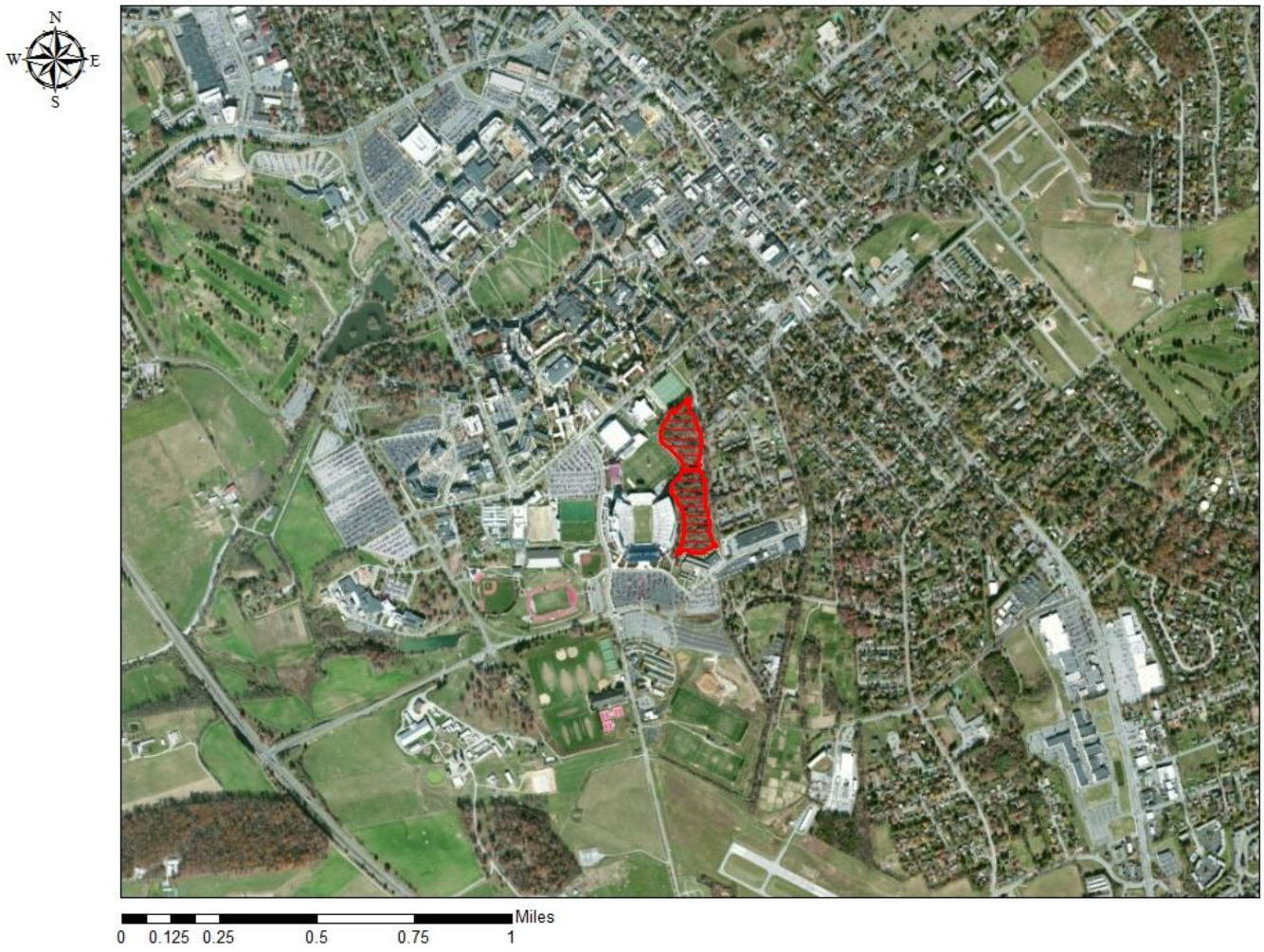


Figure 2: Virginia Tech Stadium Woods' location on the Virginia Tech Campus.

Property Background

The Virginia Tech Stadium Woods has a unique history. It is one of very few old growth stands in Virginia, and probably the most accessible. It has recently been used for Corps of Cadets training (Appendix 3), education purposes, recreation, and as a route for Blacksburg residents to the football stadium. Following World War II the woods were used for housing married veterans, attending Virginia Tech (Figure 3). This housing area

was known as Hurricane Hill. Prior to this, it witnessed the Civil War and American Revolution. In the last year, plans to build a football practice facility on the site stirred controversy in Blacksburg. The construction plans were abandoned but permanent protective status was not approved. While the canopy covers about 16 acres, the size of the area on the ground, that is not regularly mowed, measures 11.3 acres.

The overstory is dominated by white oak (*Quercus* alba), some of which are at least 300 years old. The midstory contains a large component of black oak (*Quercus* velutina), black cherry (*Prunus* serotina), and sassafras (*Sassafrass albidum)*. Some of the understory is composed of native species such as dogwood *(Cornus* florida) and blackhaw (*Viburnum* prunifolium), however a large percentage is invasive. Many of these invasive plants are actively being removed by volunteers.

The woods are a travel route for students and football fans. Hence, there is a network of trails, varying in degrees of use and improvement. There is also a training area for the Corps of Cadets in the North end of the woods. There are several ongoing studies and inventories, including permanent plots that high school students measure annually. In addition there is a complete inventory and tagging program of all trees over 12 inches in diameter, administered by volunteer, Master Naturalists.

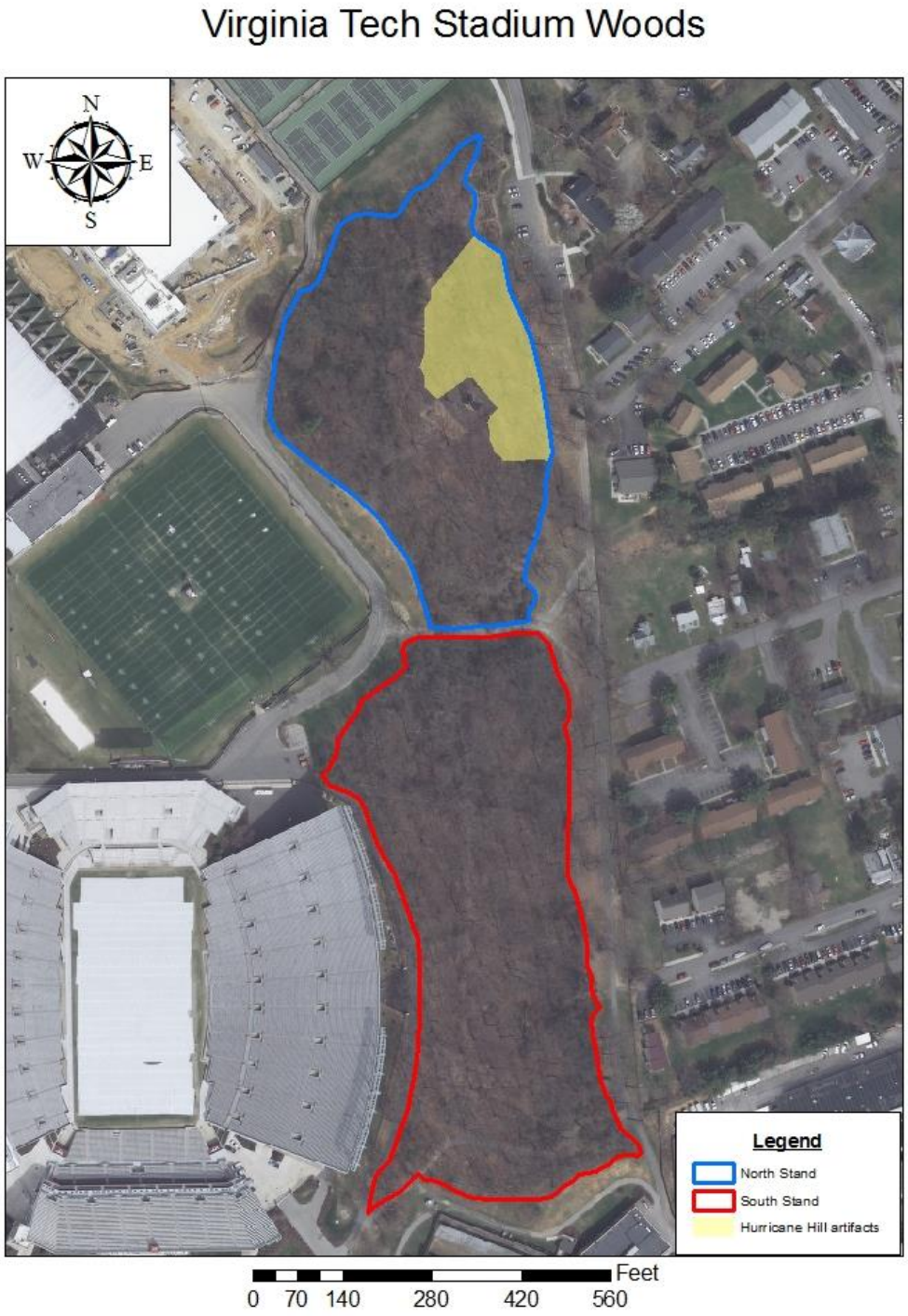


Figure 3: Location of remains of Hurricane Hill.

Client Objectives

The Office of University Planning has three objectives for managing Stadium Woods. They wish to protect the old growth ecosystem, to encourage responsible use of the area, and to increase safety to trail users. Protecting the ecosystem is important to the University simply due to the significance of old growth forest. With the acreage of old growth declining, the University does not wish to play a role in its demise or attract negative publicity due to unfavorable environmental decisions. Secondly, according to the University, the Woods is not being utilized to the best of its ability. Increased recreation, decreased vandalism and crime, and increased awareness of importance are all areas that the university and other interest groups would like to address. Finally, safety is a concern that the University must consider. Trails, trees, debris and crime are all potential causes of unsafe use and pose a liability threat to the University aside from the health concerns of students. There are several community stakeholders with interests in Stadium Woods.

Concerns About Stadium Woods

The University held a series of meetings with a wide variety of stakeholder groups in attendance. The groups included the Friends of Stadium Woods, the Virginia Master Naturalists, the College of Agriculture and Life Sciences, the Alumni Association, the Recreational Sport Department, the Athletic Department, the Corps of Cadets, the Town Council, the Environmental Coalition, and the Virginia Tech Police Department.

The following is a list of these groups and their issues that have been shared with University Planning during the series of three meetings, held on 1/31/2013, 2/5/2013, and 2/8/2013. The first meeting was held with the administrative user group, the second was held with the maintenance group, and the third was held with the Community user group.

Friends of Stadium Woods

- Permanent preservation of Stadium Woods(SW)
- Elimination of parking in or near SW
- Elimination of mowing in or around the edges of SW, expect in close proximity of existing impervious walkways
- Natural succession of grassed 3 acres
- Elimination of present trash/dumping debris and the discontinuation of such
- No newly constructed impervious walkways
- Close off additional forks of emergency access route
- Removal of invasive plant species
- Evaluation of possible soil remediation in troubled areas
- Community representation on any/all management committees

Virginia Master Naturalist

- Primarily outreach education
- In favor of trails

- Want more informational signage
- Remove invasive plant species
- Availability for field trips for Master Naturalist training

College of Agriculture and Life Sciences

- Anything that preserves SW and promotes use

Alumni Association

- Preservation of SW
- Promote educational use
- Educational/informational signage
- Use for relaxation location during Alumni Events (similar to Hahn Gardens use)

Recreational Sports Department (Chris Wise)

- Create impervious trails to tie into existing roads/ trails
- Informational signage
- Small amphitheater for outdoor education setting
- Outdoor exercise stations

Athletic Department

- Improved emergency evacuation route through the North section
- Currently using it for parking spaces for athletes during home football games

- Propose to compromise the North Section of the woods by clearing underbrush, maintaining the larger trees and possibly installing a picnic area for people to enjoy the woods by recreating in it
- Maintain the southern section as old growth and leave it virtually untouched
- Proposed deck area on north side where erosion is high

Corps of Cadets

- Currently use the forest for training purposes, especially the state of the art repelling tower
- Clear underbrush for potential "park" area
- Clear the forest of debris from post WWII housing and create a safe training environment

Town Council

- Increase awareness of the old growth forest
- Placed a large emphasis on making the woods a safe place for people to recreate

Environmental Coalition

- Worried about the athletes parking in the woods because driving on the forest floor may cause soil compaction and in turn, root damage
- Would like to see informational signs about the significance of the woods

- Work to minimize littering, victimless crimes and vandalism
- Clearing the underbrush may help to minimize the latter concerns
- Increased lighting and pedestrian trail management
- Maintain emergency access route

Client Constraints

There are two constraints to meeting the University's objectives. A budget for potential improvements must be found if they are to be implemented. Also, understory clearing and maintaining the old growth forest structure are mutually exclusive. This exclusivity is due to the definition of old growth which, according to the Old Growth Forest Network, involves untouched "stages" which contribute much to the ecosystem. Clearing the understory would destroy one, if not multiple stages.

Project Description

The goal of writing a management plan for the Stadium Woods is to address the concerns of the client in order to successfully meet their objectives. These concerns are stated in the previous section. As part of the management plan, an inventory analysis is to be conducted. Such an analysis will summarize various characteristics of the stand. These characteristics include timber resource inventories, non-native species impacts and intensities, soil compaction impacts due to parking during athletic events. We also assessed soil compaction of the athletic parking area in order to measure the impact of the parking.

Assessment Methods

The inventory of the vegetation on the Stadium Woods tract was conducted using two different measures. The inventory included an assessment of the standing overstory as well as a measurement of regeneration with respect to invasive/non-native species.

Overstory Inventory

The overstory inventory was conducted using one plot per acre, with the implementation of additional plots as needed. The overstory was measured using 1/20th acre plots with a radius of 26.3 feet, where following observations and measurements will be conducted: slope, aspect, slope position, tree tag number, species identification, diameter at breast height (DBH), total tree height, and whether the species is acceptable growing stock (AGS) or unacceptable growing stock (UGS). Trees with DBH greater than and equal to 3.6 inches were included in the overstory plots and the number on the tag of trees with a DBH greater than 12 inches was recorded. DBH measurements were taken to the nearest 1/10th of an inch and total height was measured to the nearest whole foot. AGS and UGS were evaluated on a tree health and safety basis, as well as species type. Trees designated as AGS are considered healthy growing trees that pose no immediate threat to human safety and are of native species types. Trees designated as UGS are considered to be un-healthy trees, pose a threat to human safety, and or are of a non-native species type.

Regeneration/ Invasive Species Inventory

Regeneration/invasive species plots were established on a four per 1/20th acre plot basis. These plots were 1/1000th of an acre with a radius of 3.7 feet. Regeneration plots were positioned at 22.6 feet from the 1/20th acre plot center in each cardinal direction (North, South, East, and West). The following observations and measurements were conducted at each regeneration plot: species identification, number of stems by species type for native species, intensity class of non-native species (woody stems), percent ground cover of non-native species within plot area (herbaceous stems/vines etc.), AGS or UGS, and total height for both the tallest native and non-native species stem. Intensity class for non-native species (woody stems) are defined as follows: 0-50 stems represents class 1, and 50+ stems represents class 2. Native species in the regeneration plots were considered AGS while non-native species are to be UGS.

Soil Assessment

Soil density was measured along transects in the grassy area on the East end of the tract, where vehicles are parked during football games. Bulk density was also measured in the woods, where athletes park their vehicles to determine if the use for parking causes significant compaction and in turn, detrimental effects. Soil types and descriptions are also included, and obtained from USDA Web Soil Survey.

Assessment Findings

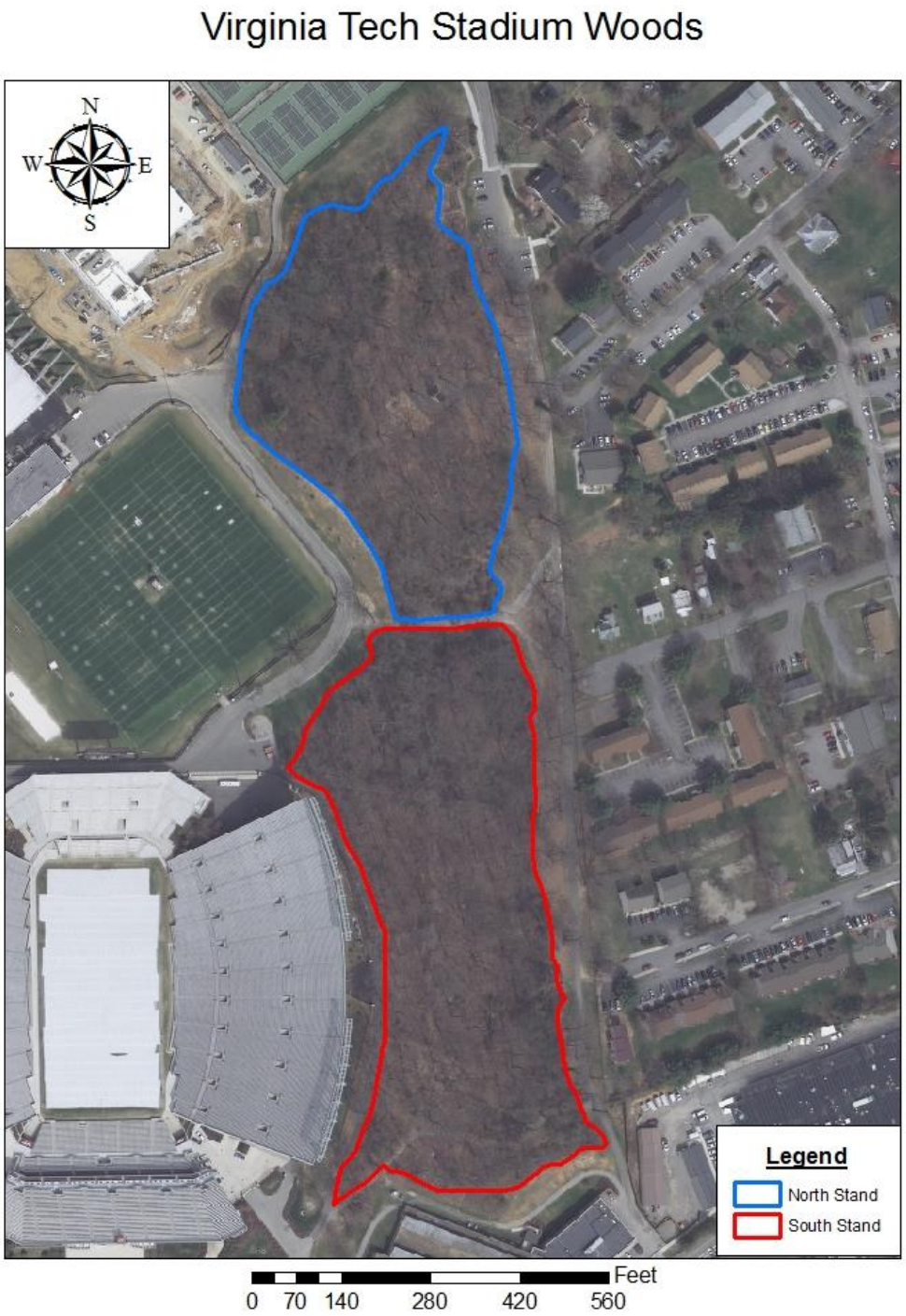


Figure 4: Stand Map of Virginia Tech Stadium Woods.

North Stand

Stand Description

The North Stand is located in the northern most section of Stadium Woods, just south of the Washington Street tennis courts (Figure 4). This stand measures 4.8 acres. The dominant overstory species is white oak, with black cherry and sweet cherry as a dominant component in the midstory. The North Stand is where the remnants of the World War II era family housing structures are located. Also within this stand is the Corps of Cadets rappelling training tower (Figure 5, Appendix 3).

Soils Description

The soils in this stand are primarily composed of a Groseclose-Urban land complex (Figure 6 and 6.1). This soil type has a depth to bedrock of over 80 inches. With a 10 inch loam surface, the top layer of this soil is quite fertile and can contain a high level of organic matter. The complex is well drained which prevents plant roots from potential root problems due to over saturation and flooding potential. The parent material of this soil is limestone, shale, siltstone, and sandstone residuum. The 50 year site index for white oak in this area is 85 feet. This means that a dominant white oak will be 85 feet tall after 50 years of growth.

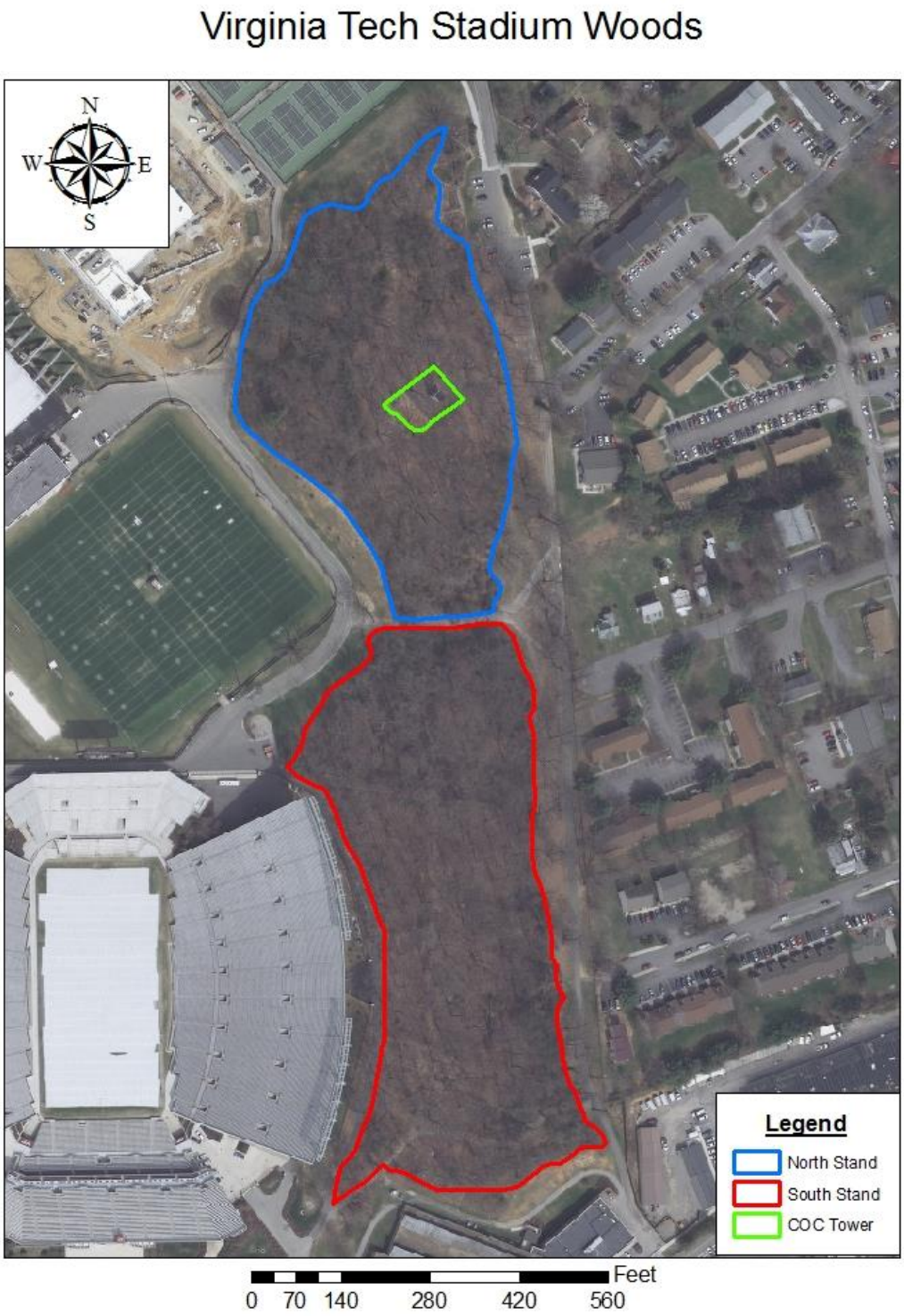


Figure 5: Location of Corps of Cadets Rappelling Training Tower.

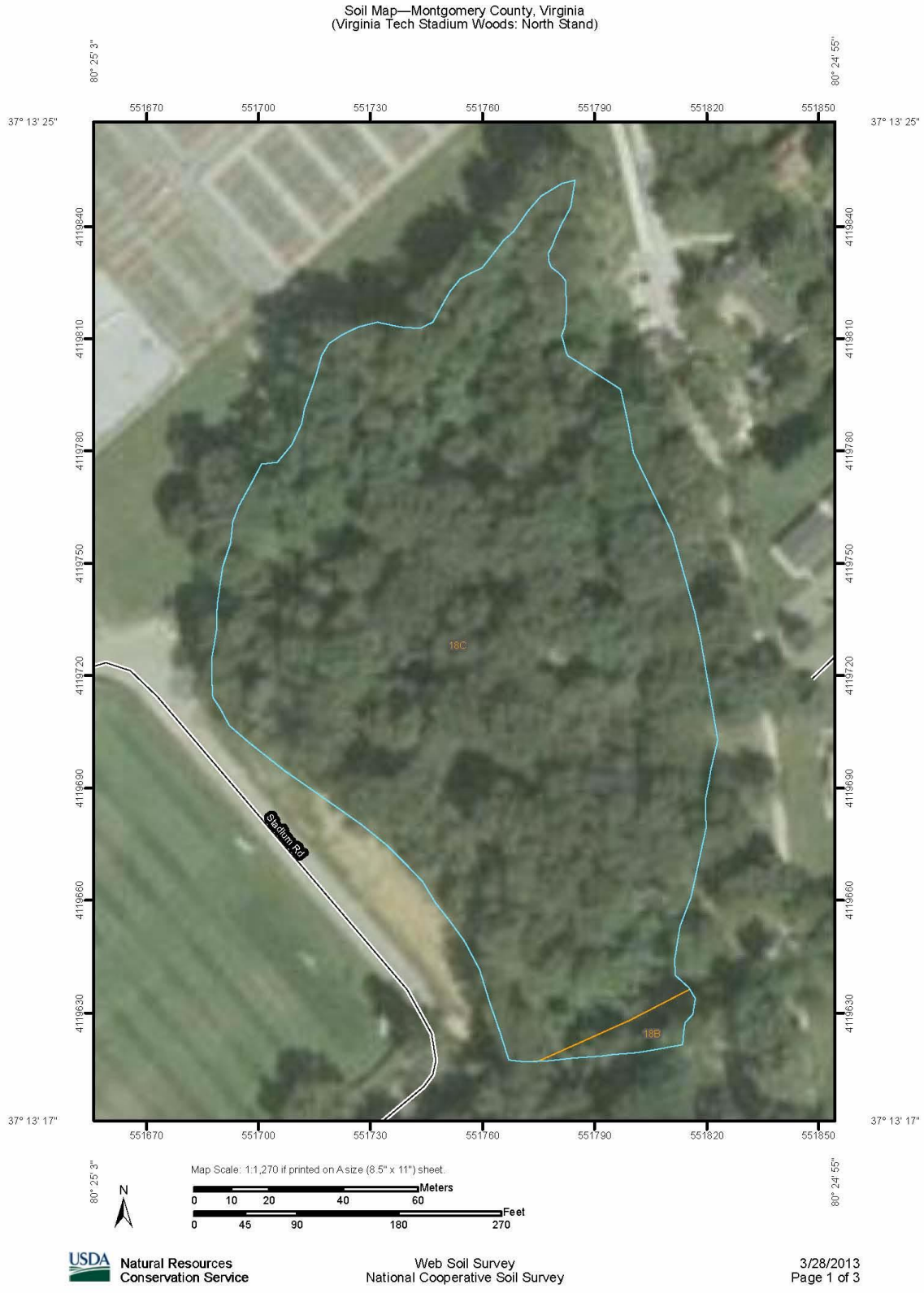
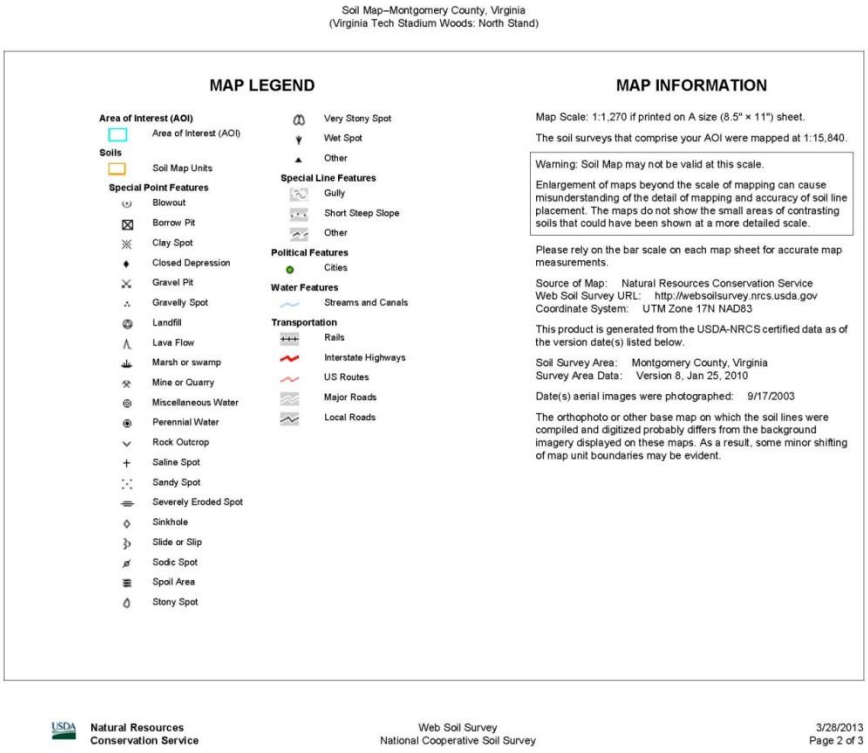


Figure 6: Soil Type Map of North Stand.



Map Unit Legend

Montgomery County, Virginia (VA121)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
18B	Groseclose-Urban land complex, 2 to 7 percent slopes	0.1	1.5%
18C	Groseclose-Urban land complex, 7 to 15 percent slopes	4.7	98.5%
Totals for Area of Interest		**4.7**	**100.0%**

Figure 6.1: Map Unit Legend of North Stand Soil Type Map.

Inventory Method

The North Stand was inventoried by measuring 5 plots on a 3 chain by 3 chain spacing with plot layout being derived using Virginia Tech's InForest website (Figure 7). Coordinates were derived from the website, and plots were located using GPS. Stand

delineation was based on the fact that the stand is in the northern-most section of the tract, separated from the South Stand by the graveled emergency access route.

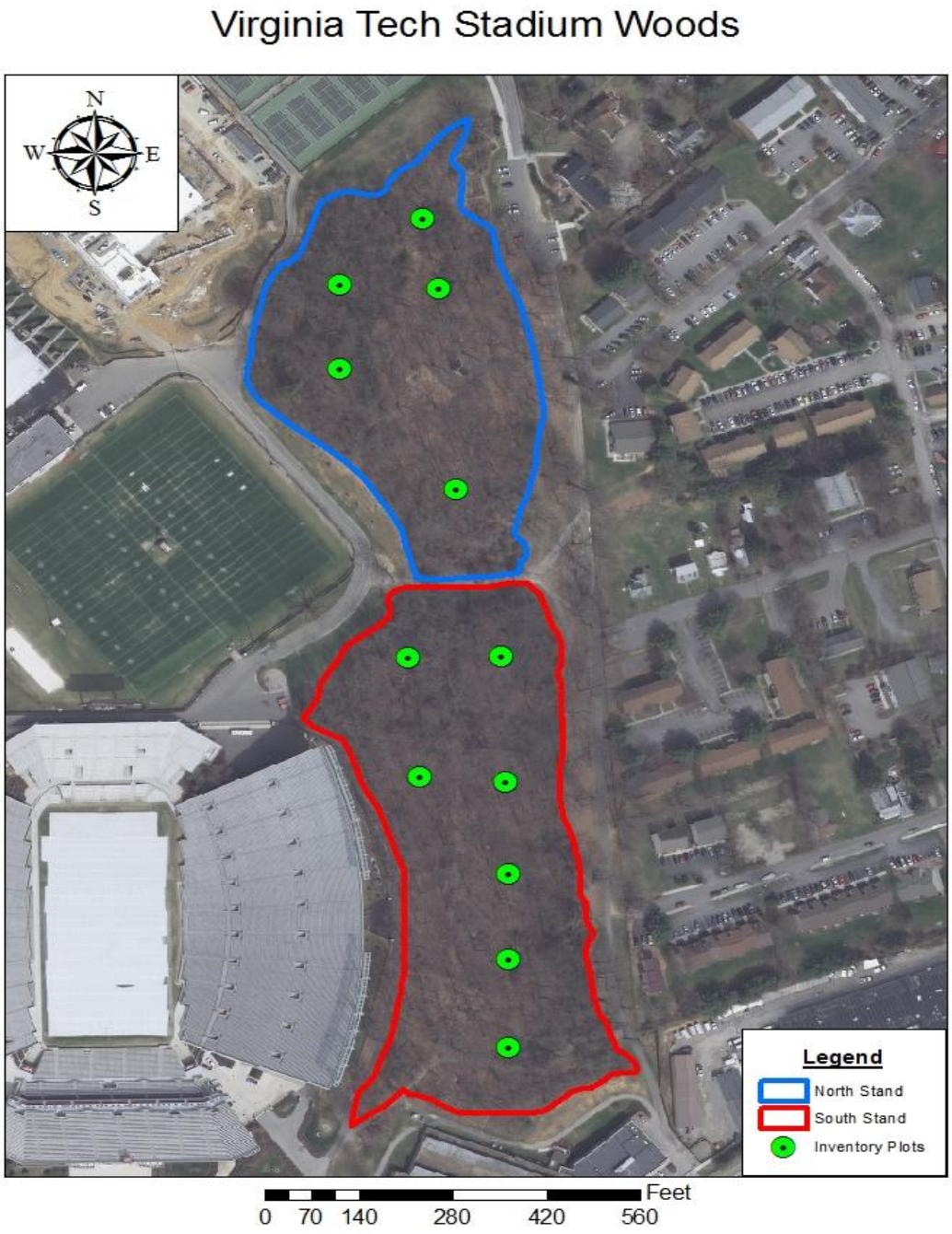


Figure 7: Plot distribution on North Stand and South Stand.

Species Distribution

The overstory species distribution of the North Stand is expressed in two different ways; by stems per acre, and by basal area (Appendix 2 shows species codes).

The four species with the largest count of stems per acre are, sweet cherry, white oak, black cherry, and other hardwoods (Figure 8). Other hardwoods pertains to the following species: boxelder, yellow-poplar, red maple, Norway maple, and little leaf linden.

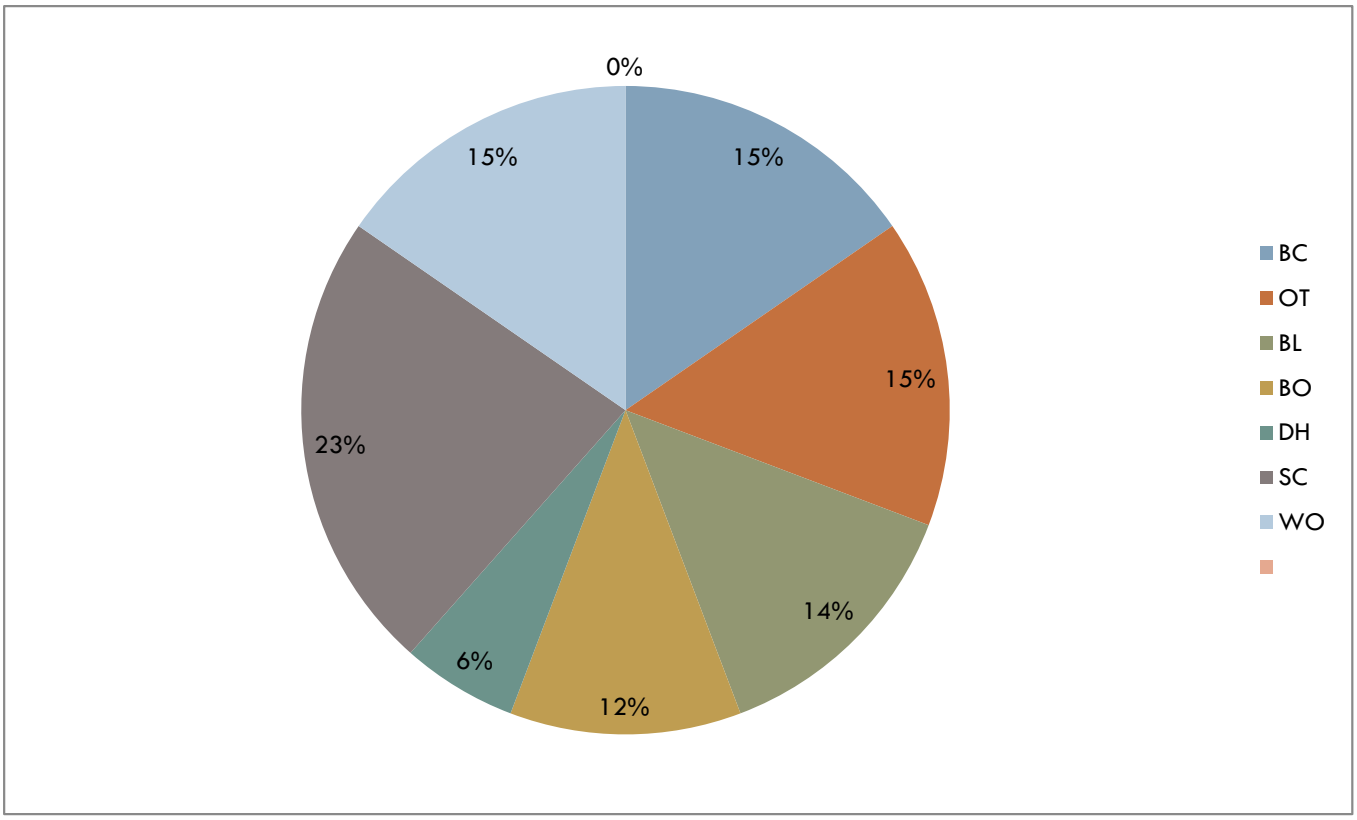


Figure 8: Species distribution based upon stems per acre of the North Stand.

The species with the largest basal areas are white oak and black oak (Figure 8.1). White oak dominates the basal area distribution for this stand, making up 65 % of the stand.

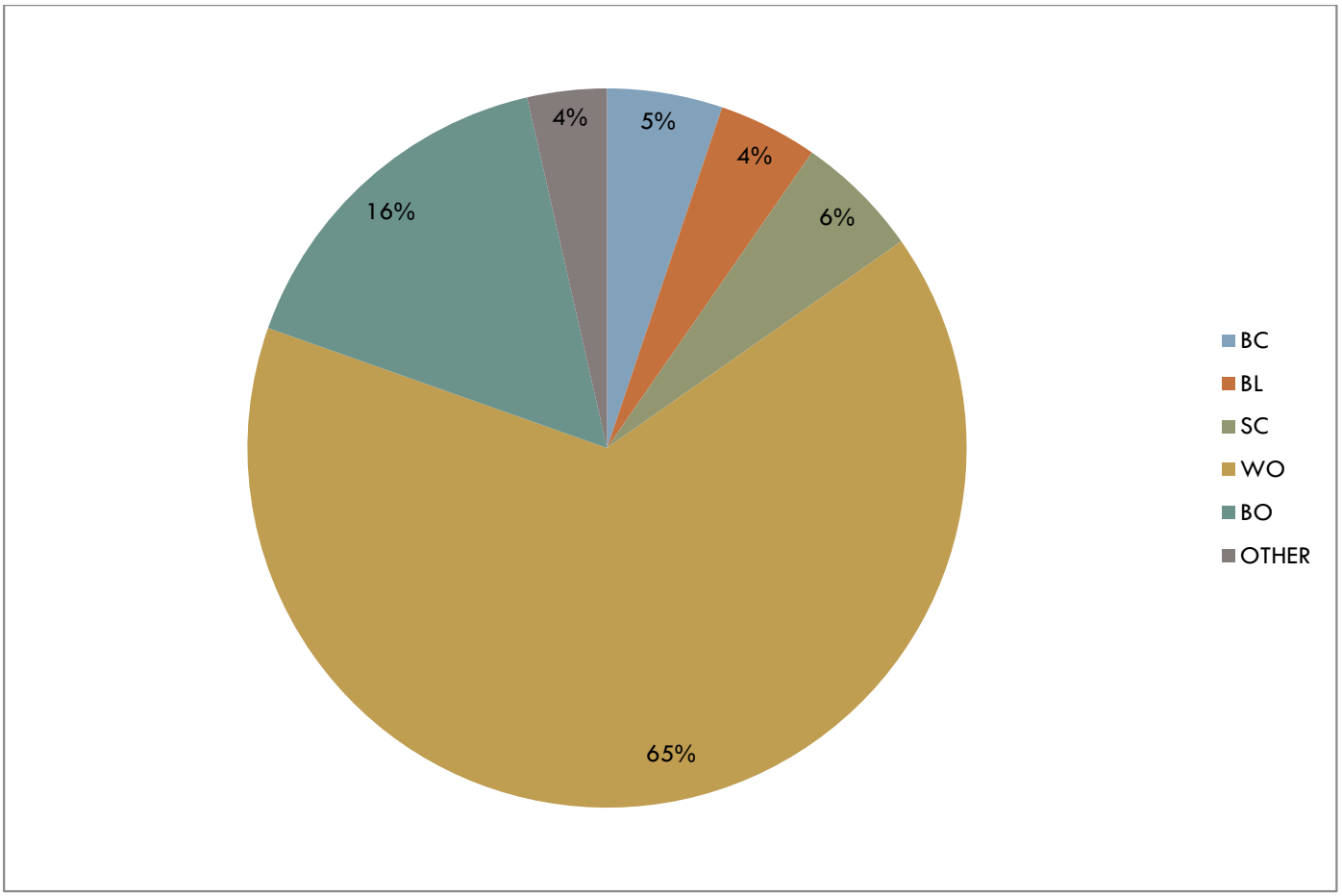


Figure 8.1: Species distribution based upon basal area of the North Stand.

Diameter Distribution

The diameter distribution of the North Stand depicts the number of each one inch diameter class relative to its stems per acre value. The diameter class distribution for the North Stand is shown in figure 9. The dominant diameter class is the 7.0 inch class, with 48 stems per acre. Secondarily the 10.0 inch class has over 30 stems per acre. The distribution in figure 9 shows the characteristic inverse J curve of an uneven age stand, except in the lowest diameter classes, due to the higher use in the stand around the repelling tower and Peace Garden. Figure 9.1 however shows that this pattern is not present in the diameter distribution of oak species.

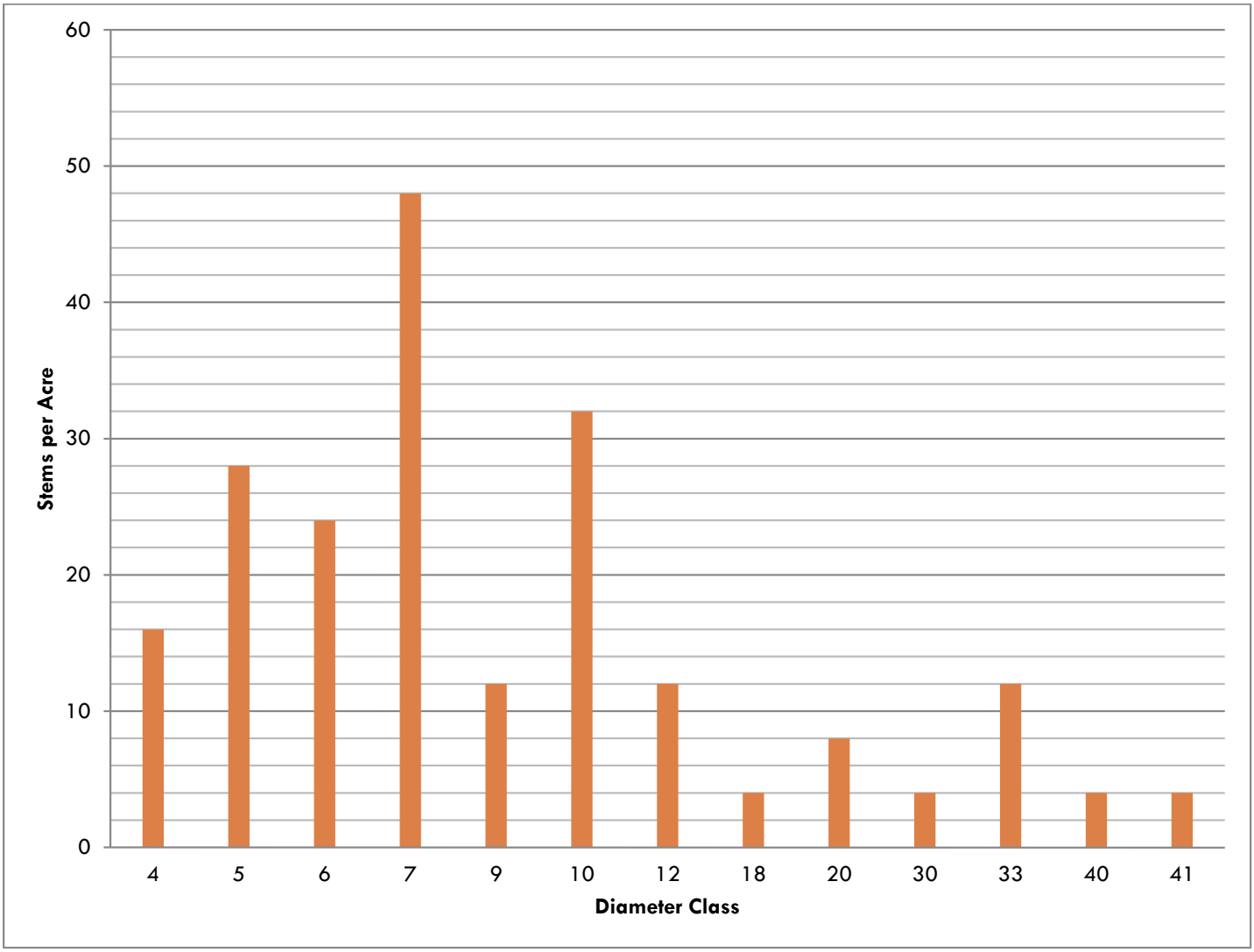


Figure 9: Diameter class distribution of the North Stand.

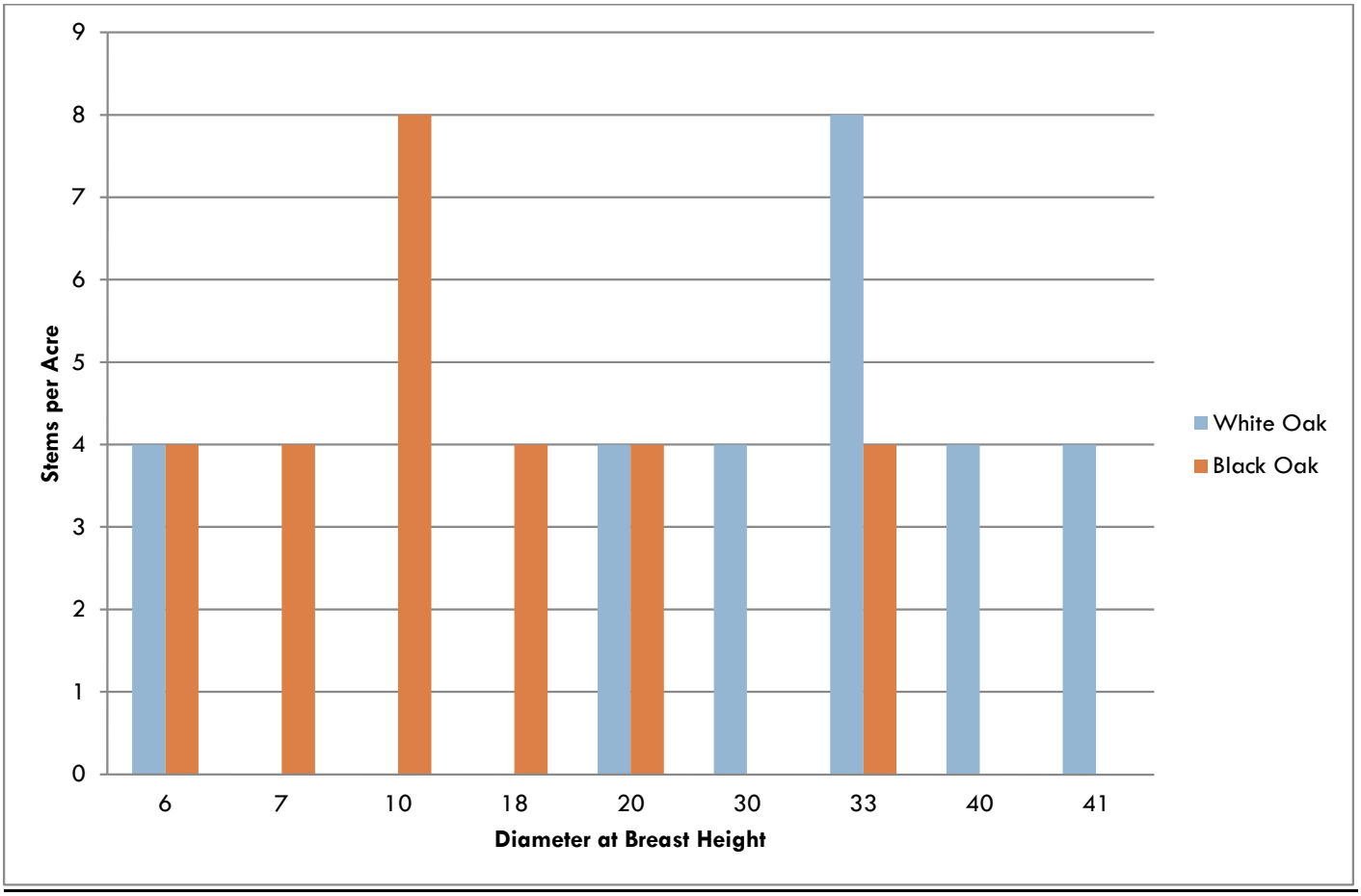


Figure 9.1: Diameter distribution of oaks in the North Stand.

Biomass

Volume data was calculated by green weight in tons per acre. The white oak stems have the highest volume of 206.5 tons/acre, making up 76 % of the whole stands volume of 272.6 tons/acre. Carbon content was also calculated on a tons per acre basis. White oak has the highest carbon content of 73.3 tons/acre, making up 80% of the whole stands carbon content of 91.9 tons/acre (Table 1).

Table 1: Green weight volume and carbon content of the South Stand

Species	Tons per Acre	Tons Carbon per Acre
black cherry	8.3	2.1
box elder	0.2	0.1
black gum	0.5	0.1
black locust	6.8	2.3
black oak	41.0	11.7
little leaf linden	0.5	0.1
Norway maple	0.9	0.3
red maple	0.6	0.2
sweet cherry	6.0	1.5
white oak	206.5	73.3
yellow-poplar	1.3	0.3
Total	272.6	91.9

South Stand

Stand Description

The South Stand is located in the southern most section of Stadium Woods, just north of the Southgate Center, and adjacent to the East Stands of Lane Stadium (Figure 4). This stand measures 6.5 acres. The dominant overstory species is white oak, with black cherry and sweet cherry as a dominant component in the midstory.

Soils Description

The soils in this stand are primarily composed of a Groseclose-Urban land complex (Figure 10 and 10.1). This soil type has a depth to bedrock of over 80 inches. With a 10 inch loam surface, the top layer of this soil is quite fertile and can contain a high level of organic matter. The complex is well drained which prevents plant roots from potential root

problems due to over saturation and flooding potential. The parent material of this soil is limestone, shale, siltstone, and sandstone residuum. The 50 year site index for white oak in this area is 85 feet.

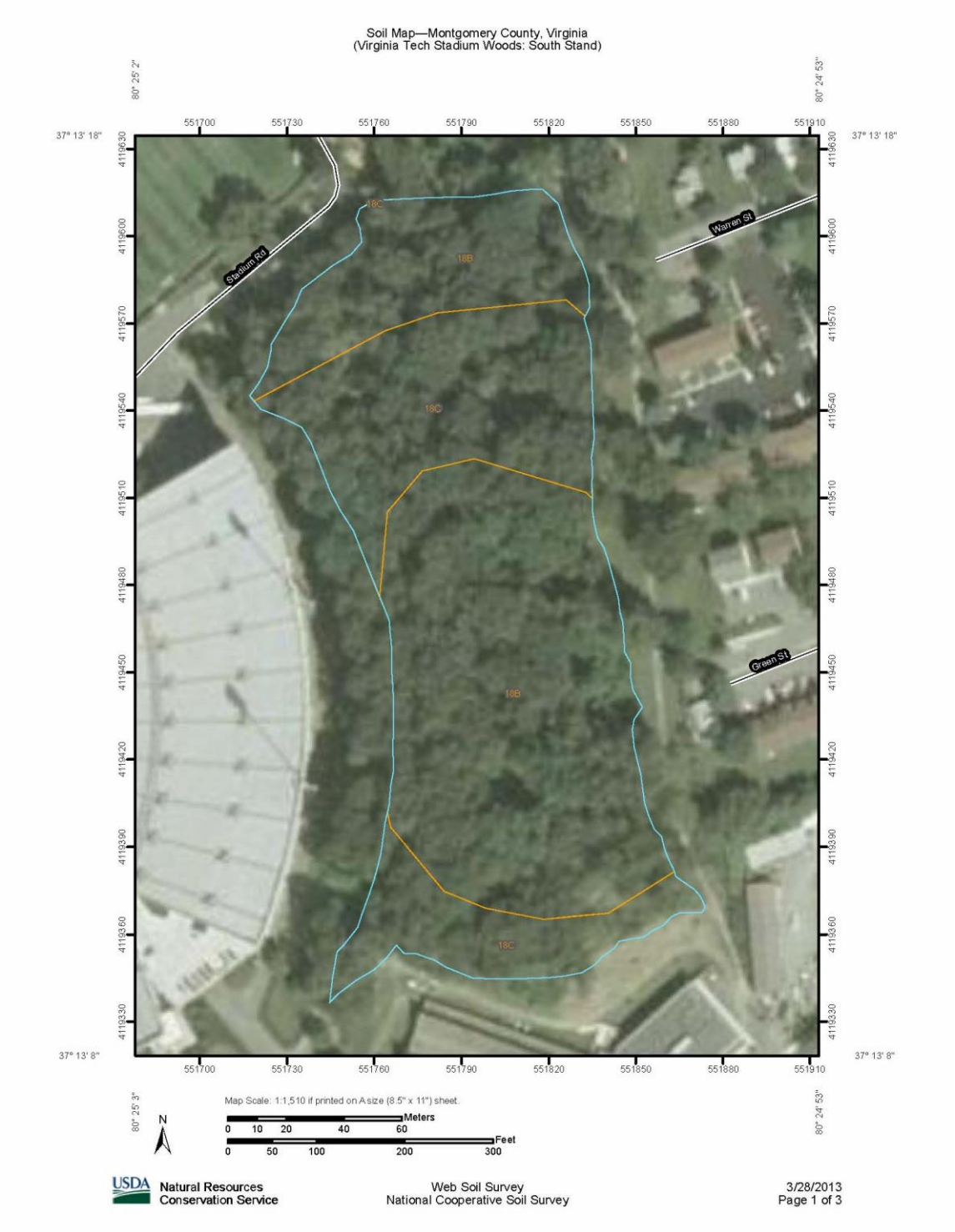
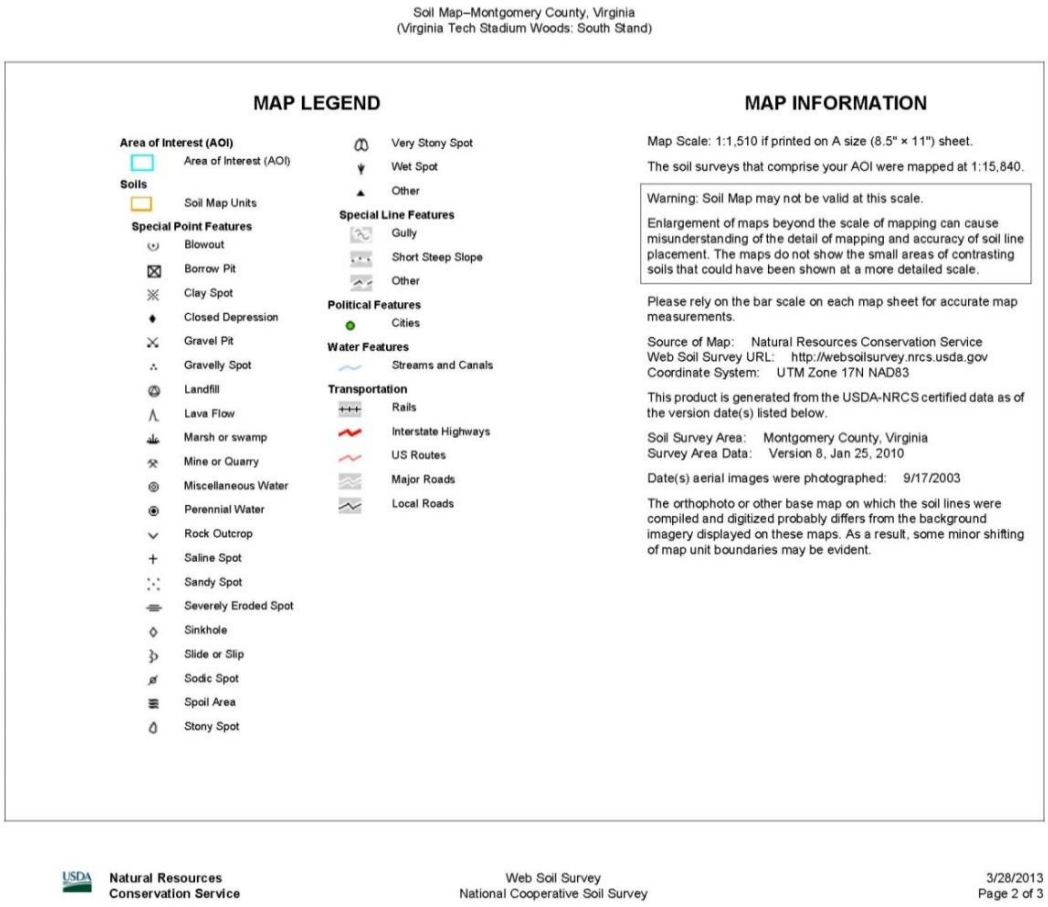


Figure 10: Soil Type Map of South Stand.



Map Unit Legend

Montgomery County, Virginia (VA121)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
18B	Groseclose-Urban land complex, 2 to 7 percent slopes	3.9	65.1%
18C	Groseclose-Urban land complex, 7 to 15 percent slopes	2.1	34.9%
Totals for Area of Interest		**6.1**	**100.0%**

Figure 10.1: Map Unit Legend of South Stand Soil Type Map.

Inventory Method

The South Stand was inventoried by measuring 7 plots on a 3 chain by 3 chain spacing with plot layout being derived using Virginia Tech's InForest website (Figure 6). Coordinates were derived from the website, and plots were located using GPS. The South Stand is separated from the North Stand by the graveled emergency access route.

Species Distribution

The overstory species distribution of the South Stand is expressed in two different ways; by stems per acre, and by basal area.

The species with the largest count of stems per acre is other hardwood (Figure 11). Other hardwoods pertains to the following species: American elm, black cherry, black locust, black oak, downy service berry, little leaf linden, mockernut hickory, Norway maple, sassafras, sugar maple, red maple, and sourwood.

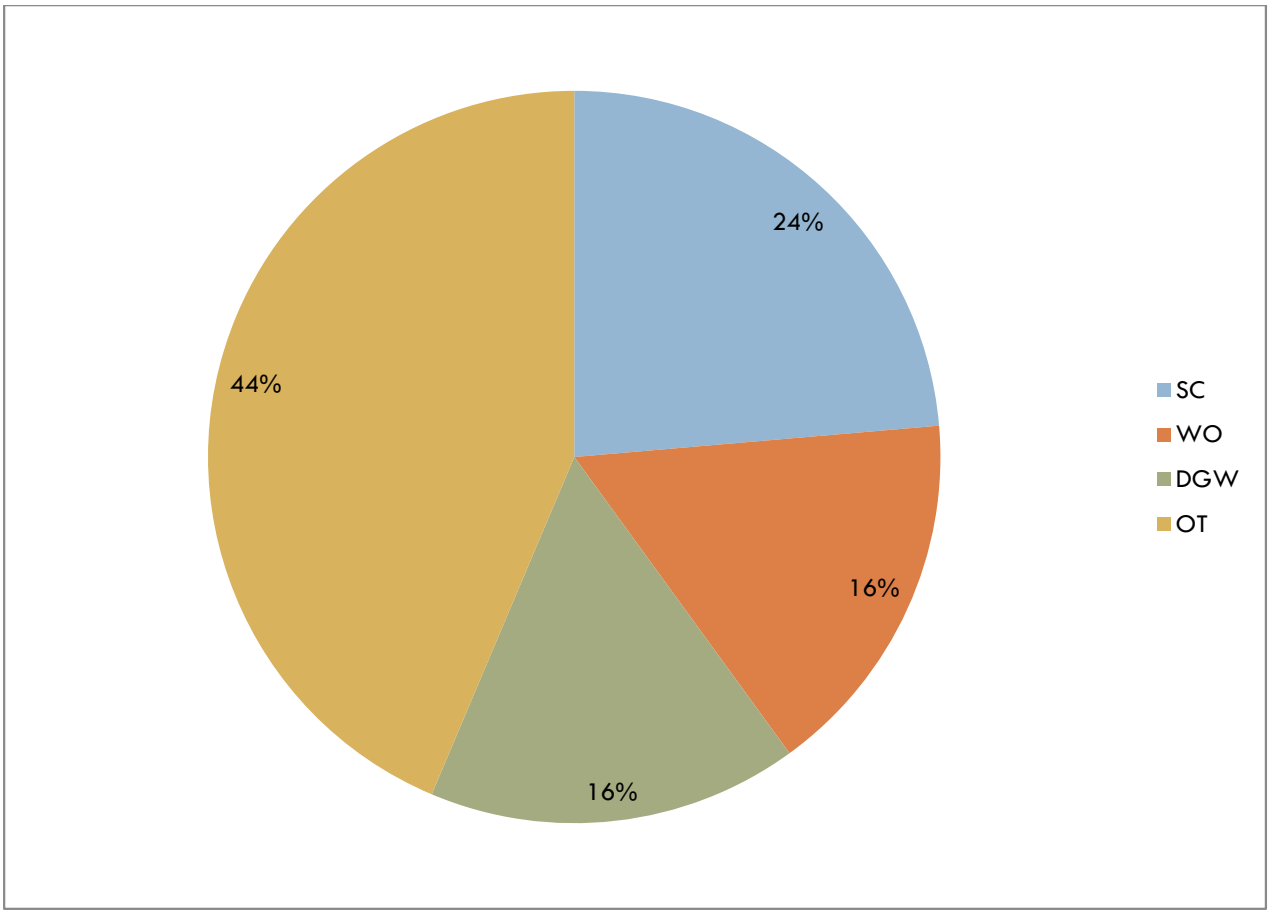


Figure 11: Species distribution based upon stems per acre of the South Stand.

The species with the largest basal areas are white oak and other hardwood (Figure 11.1). Other hardwood pertains to American elm, black locust, black oak, dogwood, downy service berry, little leaf linden, mockernut hickory, Norway maple, sassafras, sugar maple, and sourwood. White oak dominates the basal area distribution for this stand, making up 76 % of the stand.

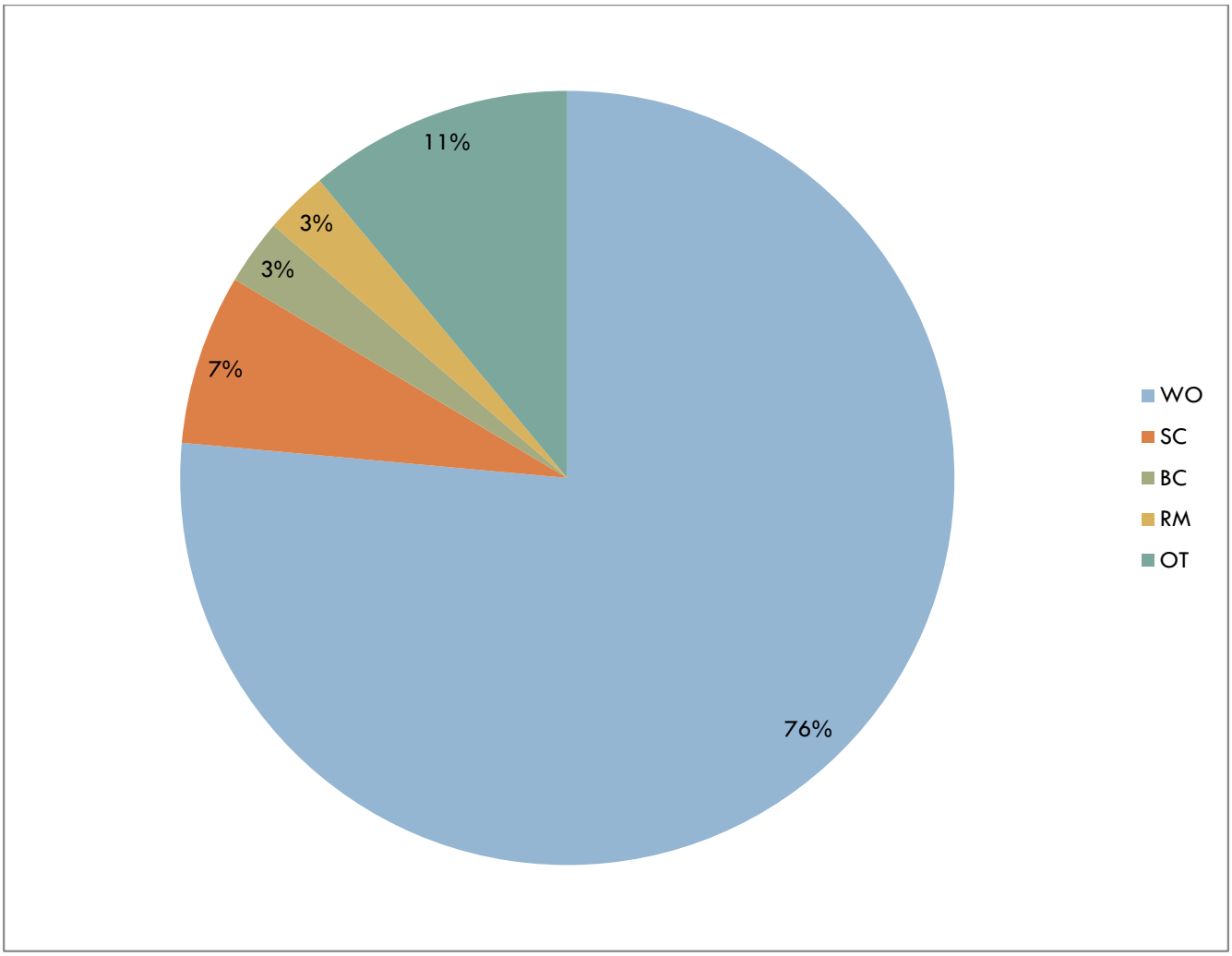


Figure 11.1: Species distribution based upon basal area of the South Stand.

Diameter Distribution

The diameter class distribution for the South Stand is shown in Figure 12. The dominant diameter class is the 5.0 inch class, with over 35 stems per acre. Secondarily the 4.0 inch and 6.0 inch classes have fewer than 35 stems per acre.

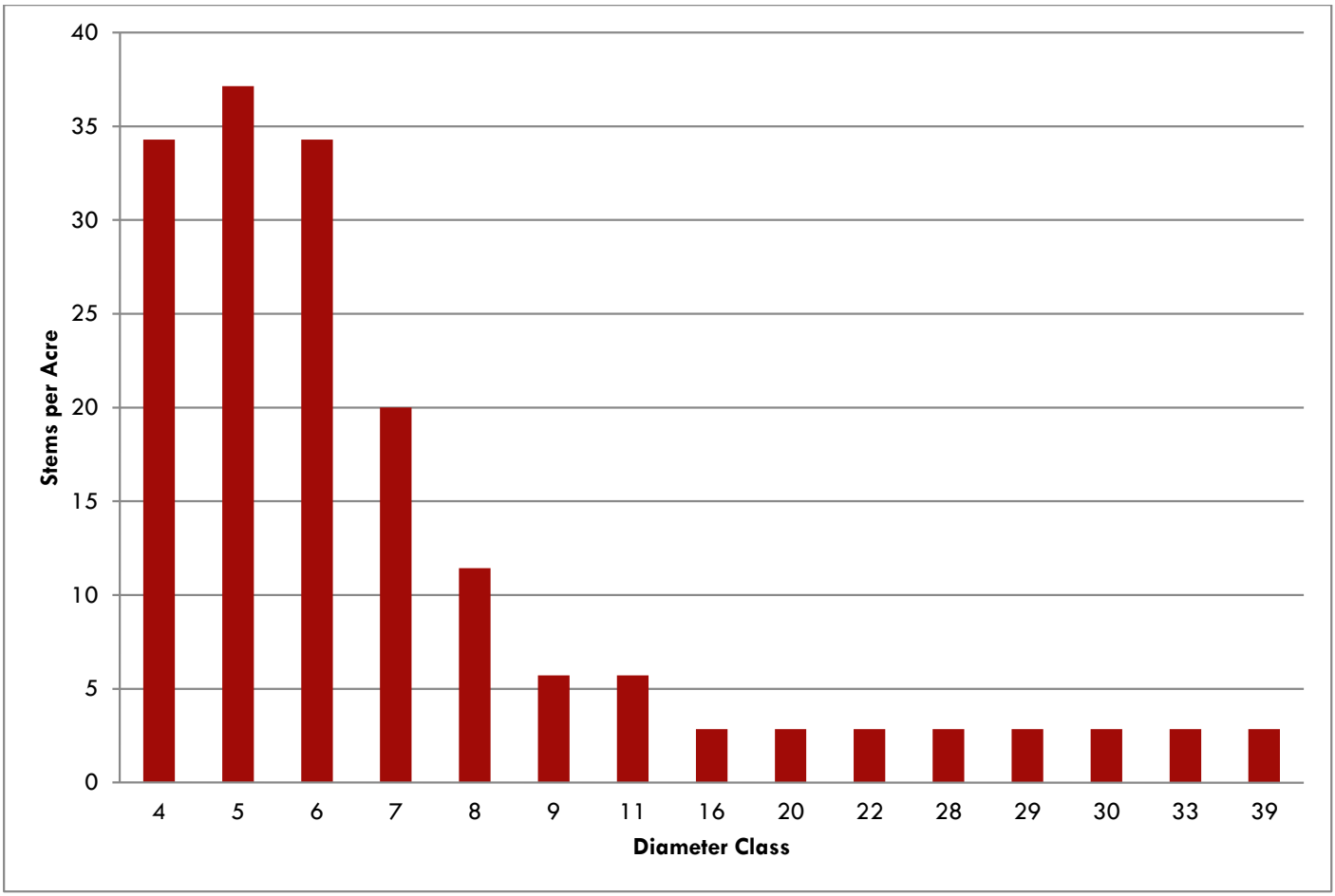


Figure 12: Diameter class distribution of the South Stand.

Biomass

Volume data was calculated by green weight in tons per acre. The white oak stems have the highest volume of 148.1 tons/acre, making up 89 % of the whole stands volume of 166.3 tons/acre. Carbon content was also calculated on a tons per acre basis. White oak has the highest carbon content of 52.6 tons/acre, making up 91% of the whole stands carbon content of 57.6 tons/acre (Table 2).

Table 2: Green weight volume and carbon content of the South Stand.

Species	Tons per Acre	Tons Carbon per Acre
American elm	0.1	0.0
black cherry	2.5	0.6
black locust	0.5	0.2
black oak	0.7	0.2
flowering dogwood	0.9	0.3
downy serviceberry	0.3	0.1
little leaf linden	0.6	0.1
mockernut hickory	0.5	0.1
Norway maple	0.3	0.1
red maple	2.3	0.7
sassafras	0.7	0.2
sweet cherry	5.9	1.5
sugar maple	0.7	0.2
sourwood	2.1	0.7
white oak	148.1	52.6
Total	166.3	57.6

Regeneration Analysis

Regeneration data is summarized for the entire tract, as there was no significant difference between the north and south stands. The native and naturalized species are presented in stems per acre in table 3. The two most common native species in the regeneration plots were Virginia creeper and blackhaw. Oak regeneration makes up a small portion with 53 stems per acre. The relative stems per acre are shown in figure 13.

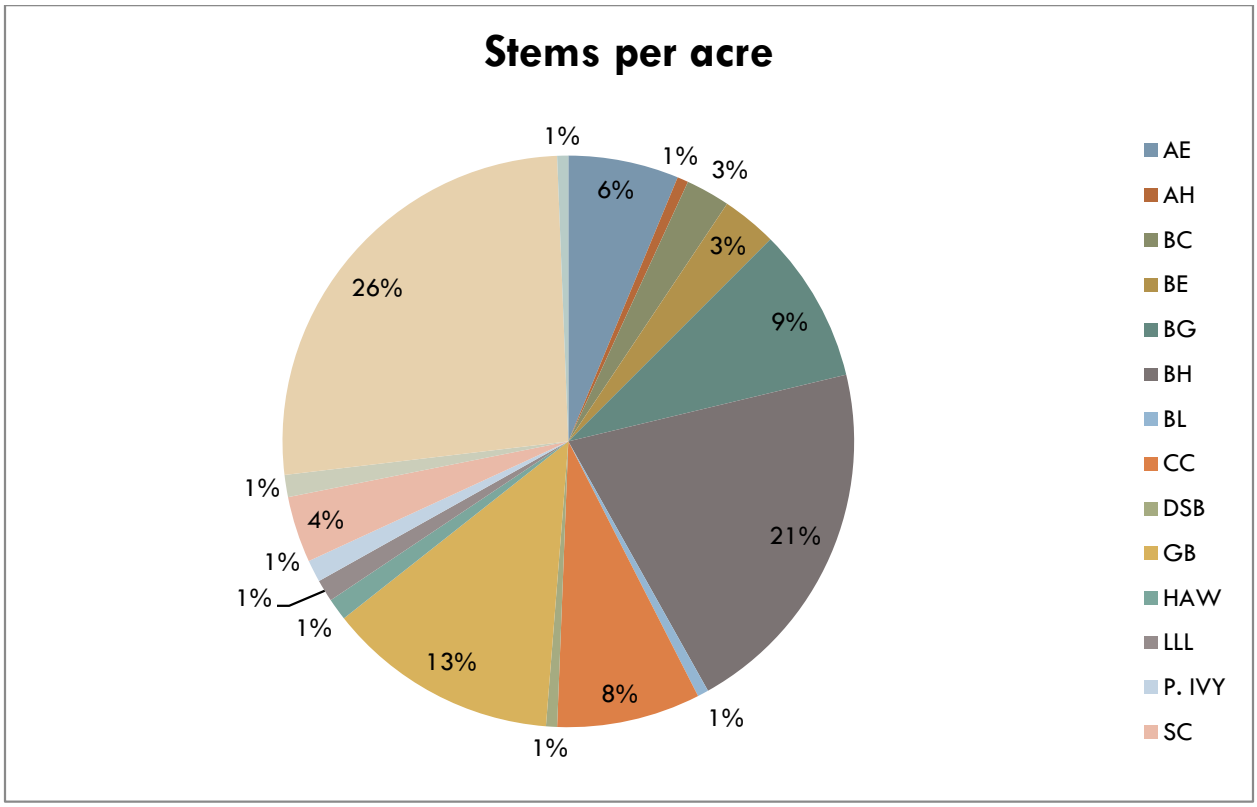


Figure 13: Proportion of stems by species in regeneration survey of Stadium Woods.

Table 3: Stems per acre by species in regeneration survey of Stadium Woods.

Species	Stems per acre
American elm	526
American holly	53
black cherry	211
box elder	263
black gum	737
bitternut .hickory	1737
black locust	53
choke cherry	684
downy serviceberry	53
green briar	1105
hawthorn	105
little leaf linden	105
poison ivy	105
sweet cherry	316
scarlet oak	105
Virginia creeper	2211
white oak	53

The invasive species are divided into two categories. Vines are recorded by percent ground cover, while trees and shrubs are recorded by the percent of area where present. These results are shown in tables 4 and 5. The most significant invasive shrub is Chinese privet which is present in 59 percent of the area. The most significant invasive vine is English ivy, which covers 23 percent of the ground.

Table 4: Percent of area with invasive species present in Stadium Woods by species

Species	Percentage of Area where Present
privet	59
Burning Bush	2
Norway Maple	28

Table 5: Percent of groundcover by invasive vines in Stadium Woods by species

Species	Percentage of ground Coverage
Jap HS	6
E. ivy	23

Recommendations

The gathering of information and data has allowed our group to develop a number of recommendations for the controversial areas and topics of Stadium Woods. These include the trails, the invasive species, the area that is currently used for athlete parking on the Northwestern edge of the tract, and the debris found in the understory.

Trails

The University and many of the involved interest groups have mentioned the trails, which are located throughout the tract, as an important topic of discussion (Figure 14). Our group has developed a number of options and recommendations for these trails. The first of these is the establishment of a class system in which the University designates certain trails for specific uses based on the current size and utilization rates of each (Table 6). For example, the gravel road that separates the North Stand and the South Stand would be designated as a heavy traffic trail and would allow use by automobiles, bikers, and pedestrians. The trails that have high use and show signs of compaction could be covered in mulch in order to mitigate compaction risks (Figure 15). The cost of mulching these trails is $3,546.40. This was calculated by measuring the distance of all the trails and forks in them, an average width of six feet and depth of four inches at an estimated $20.00 per cubic yard of mulch (Table 7).

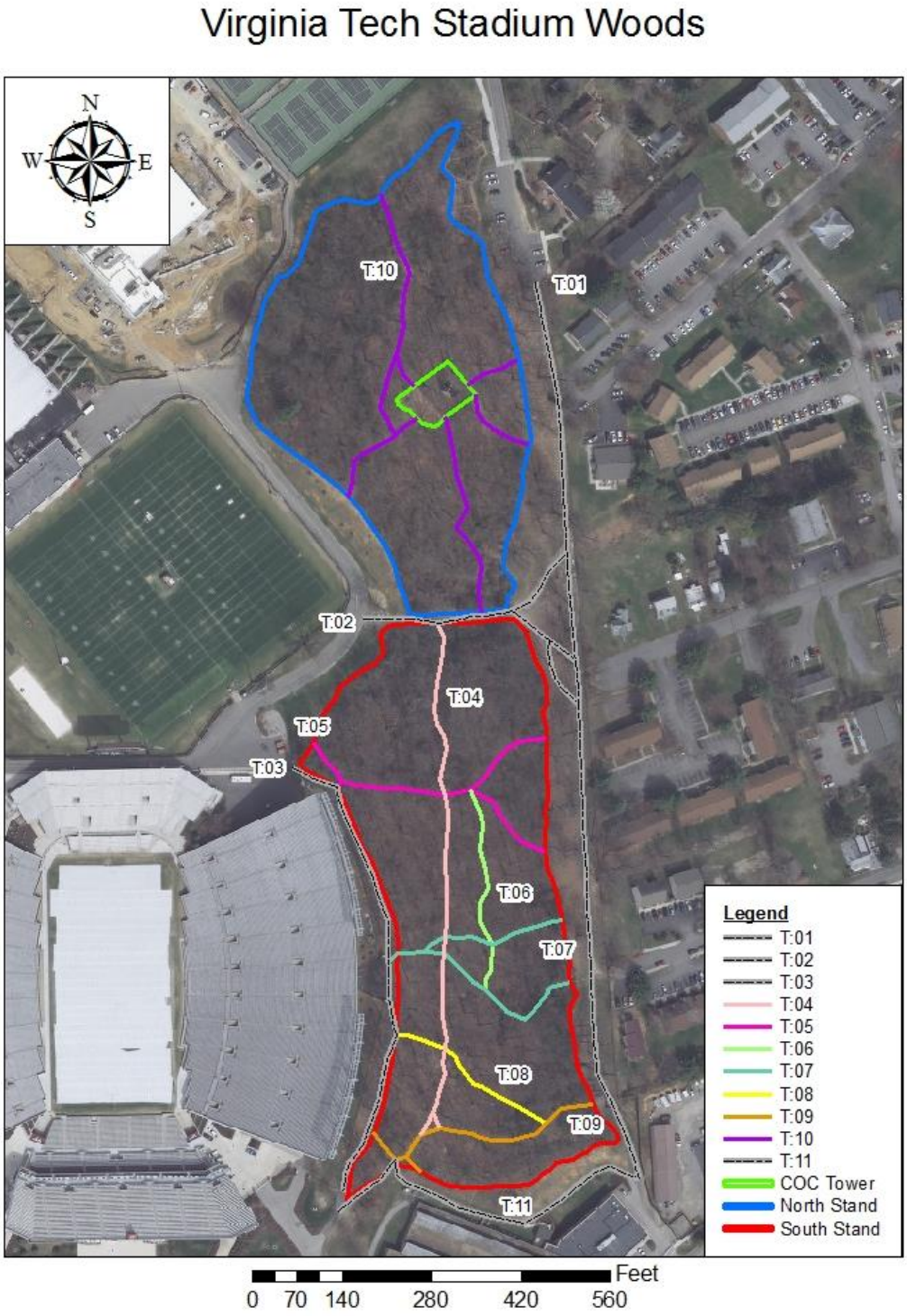


Figure 14: Trails within Stadium Woods

Table 6: Details of trails in Stadium Woods

Class #	Description	Trail #	Class #	Use code
1	impervious paved	T:01	1	F/V/B
2	graveled	T:02	2	F/V/B
3	Soil, high use compacted	T:03	1	F/B
4	Soil, medium use	T:04	3|4	F
5	Soil, low use	T:05	3|4	F
6	Leaf-liter, low use	T:06	3|4	F
Use code	**Description**	T:07	4	F/B
F	Foot travel	T:08	6	F
V	Vehicle travel	T:09	2	F/B
B	Bicycle travel	T:10	3|4	F
		T:11	1|2	F/B

Table 7: Cost of mulching trails and forks within Stadium Woods

	length (yd)	width(yd)	depth(yd)	cubic yards	$/ cubic yard	cost
trails	776	2	0.11	170.72	$ 20.00	$ 3,414.40
fork	4	5	0.11	2.2	$ 20.00	$ 44.00
fork	5	8	0.11	4.4	$ 20.00	$ 88.00
						$ 3,546.40

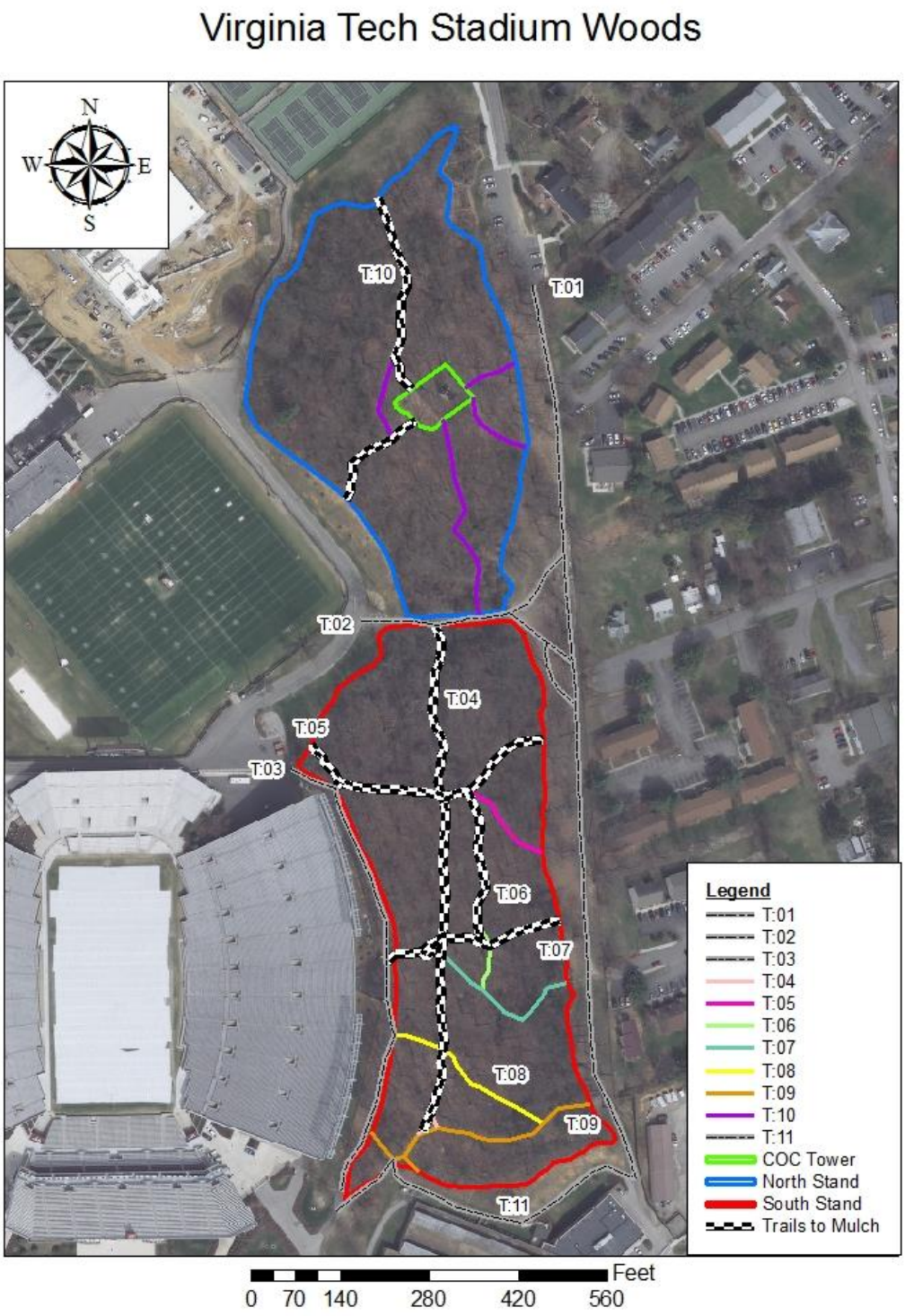


Figure 15: Trails to mulch in Stadium Woods

Our second recommendation is to increase lighting on the currently paved trails which are located on the East and West edges of the tract. This would increase the safety of these trails which are used heavily by pedestrians throughout the school year and especially during game days. Another area of interest is the slope on the Northwestern edge of the tract which overlooks the practice field. Here, building a set of stairs that prevents pedestrians from traversing the hill would be possible and would reduce erosion and improve the game day experience for many fans. This area is shown in Figure 16. A final recommendation is to establish an attraction such as an archway upon entering the Woods. This would be most appropriate on the emergency access route on the Eastern side in order to draw awareness of their importance and to aid in preventing the use of other trails.

Figure 16: Hillside with erosion issues in North Stand.

Parking Area

We have also developed a number of propositions for the grassy area currently used by athletes for parking (Figure 17). The first of which is to mulch the area in its entirety. This option would lessen future compaction and allow for further recovery through the incorporation of organic matter over time. The cost of mulching this area would be $5,183.20 with 2,356 square yards of area at four inches of mulch at $20.00 per cubic yard.

The soil compaction testing in the area east of the North Stand, showed a significant difference between the woods and parking area. The soil strength at 10 cm, and the depth to root limiting soil strength (Figures 18 and 18.1). This means that rooting is limited in this area and even though it is outside of the woods, it is still in the rooting zone of trees in the woods.

A second option would be to leave the current area as is and to relocate the parking athletes to the eastern edge of the South Stand (Figure 17). This area is completely covered by grass and parking here would have no adverse effects on the roots of the old growth trees within the stand.

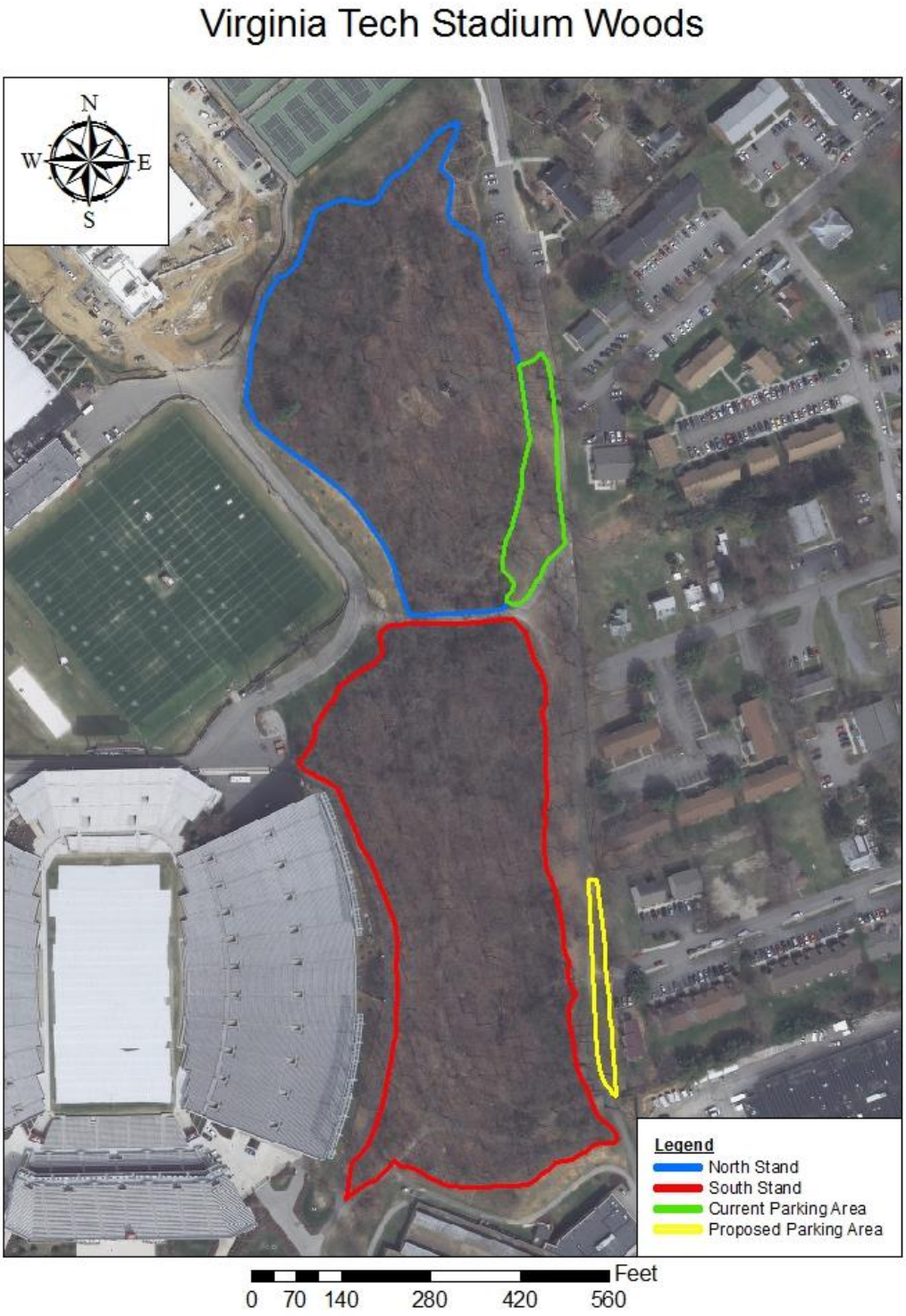


Figure 17: Current and proposed athlete parking areas.

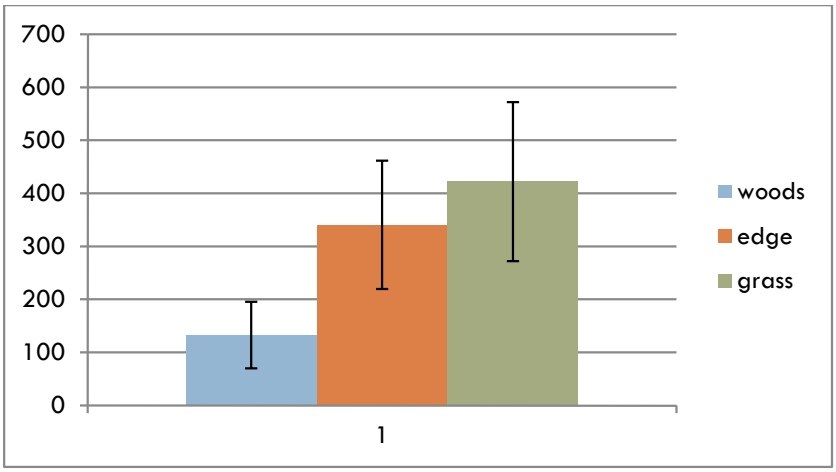


Figure 18: Soil strength in psi at 10 cm in parking area.

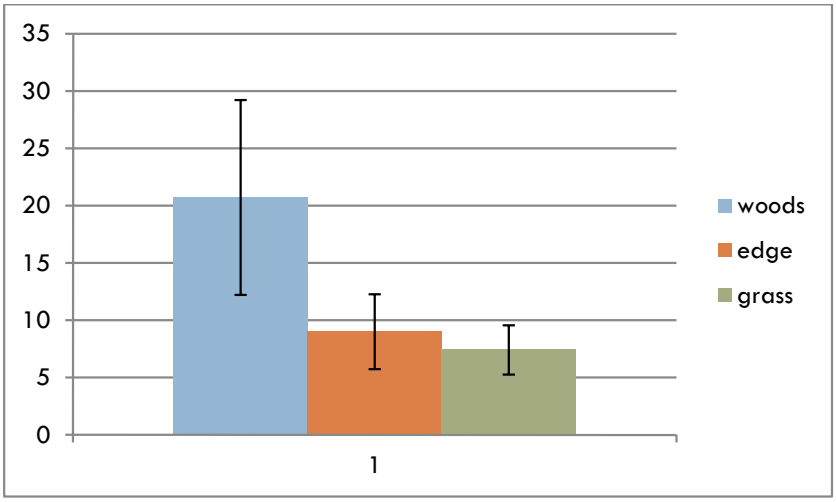


Figure 18.1 Depth to root limiting soil strength in cm, in parking area.

Invasive Species

Management of invasive species is another topic for which our group has developed a number of options. The first of these options is to continue to allow the Virginia Master Naturalists to cut and reduce these species. This would be a free option but may not prove to be as effective as other options. This is due to the stump sprouting

potential of privet which has created denser populations. Also, privet and black haw look very similar and we noticed a number of areas where the black haw was mistaken for privet and cut. Other options such as hiring professionals to do the job will eliminate such mistakes while also removing all of the invasive species.

A second option is for the university to pay a third party to spray for and manage invasive growth. While it would be the more expensive option, it is likely that it would be the most effective in removing undesirable invasive species and would allow for native regeneration to occur. Through research of various companies we estimate cost per acre to be $95.

Our final proposition is to leave these species as they are. This would be the lowest cost option.

Debris

Finally, our group has laid out a number of options for the debris found in the underbrush which is a result of post-WWII housing and continued university dumping of concrete, mulch, woody debris, and garbage. The university has used part of the South stand as a "dump" for materials and waste extracted from other parts of campus. In the North stand, near the International Peace Garden, housing debris may be found from the area formerly known as Hurricane Hill which was designated as a housing site for married, World War II veterans that were attending Virginia Tech under the G.I. Bill. According to Robert L. Young, this site once was home to 76 trailers. In the early 1950s, these trailers

were removed but much of their remnants were left on the floor of the site and today, this debris raises an issue that we believe should be dealt with (Figure 19).

The first and cheapest option is to leave it the way it is. Obviously, the dumping of other garbage would have to stop and a new place for waste materials such as grass clippings, woody debris, concrete and others would need to be established.

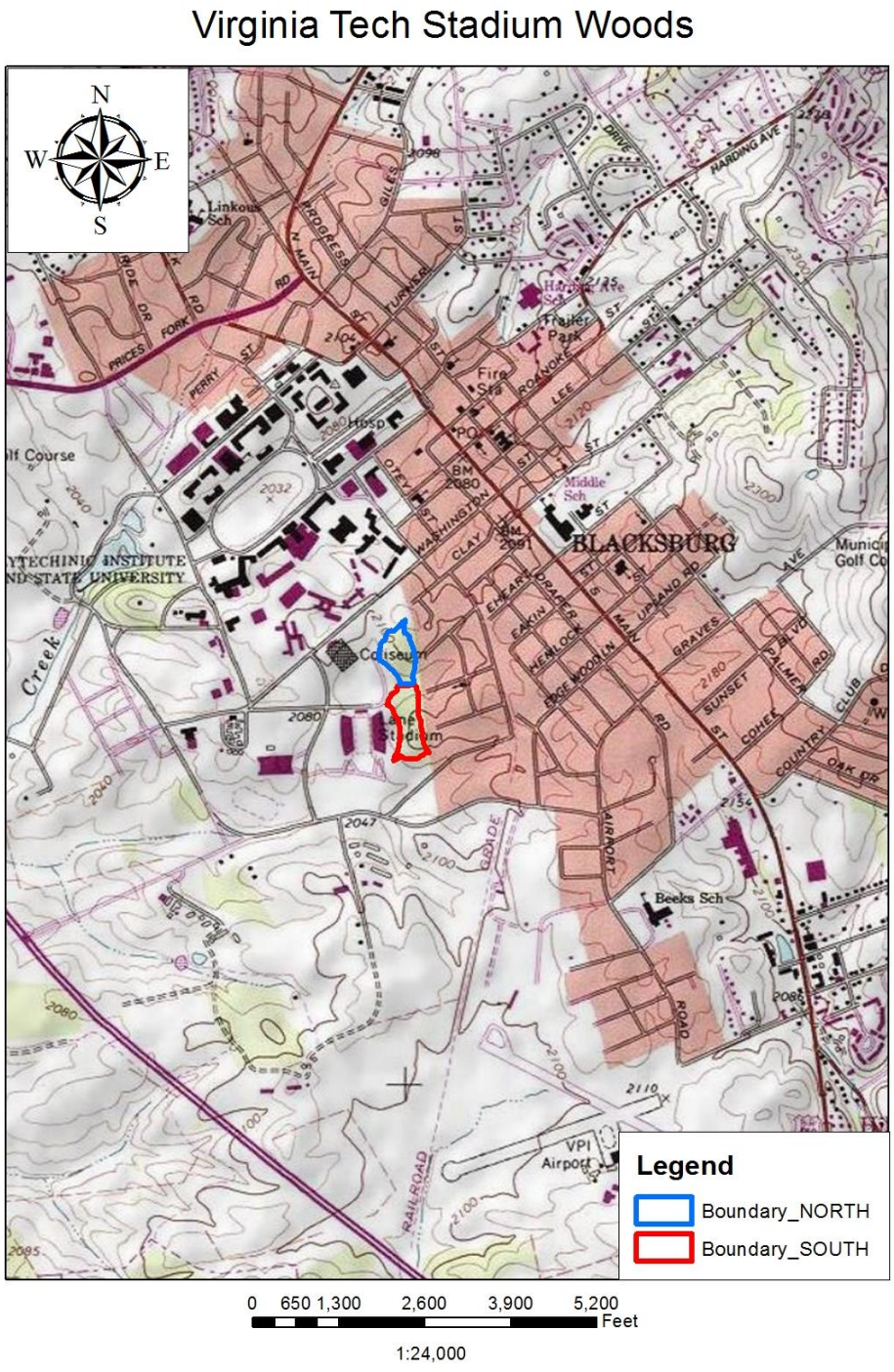
A second option is to remove the debris to return the understory to its previous state. This option would be costly and presents the possibility of damaging the Woods through the use of equipment. Renting a 35D John Deere excavator would cost $90 per hour and at 16 hours or two eight hour work days, the final price would be $1,440 plus labor costs and potential dump costs of $51 per ton according to the Montgomery Regional Solid Waste Authority.

A final option is to post signage to indicate to those passing by the significance of the debris and its historical value. Creating awareness of this historic area would be much less costly and potentially attract those interested in learning more about the campus.

Figure 19: Sidewalk remains of Hurricane Hill

Appendices

Appendix 1



Topographic map of Stadium Woods

Appendix 2

Species	Code	Species	Code
American elm	AE	mockernut hickory	MH
American holly	AH	northern red oak	NRO
bitternut hickory	BIT H	Norway maple	NM
black cherry	BC	pignut hickory	PH
black gum	BG	poison ivy	P. IVY
black locust	BL	privet	PRIVET
black oak	BO	raspberry	RASB
black walnut	BW	red maple	RM
blackhaw	BH	sassafras	SAS
box elder	BE	scarlet oak	SO
burnbush	BB	shagbark hickory	SH
choke cherry	CC	silver maple	SVM
dead hardwood	DH	sourwood	SW
dogwood	DGW	sugar maple	SGM
downy service berry	DSB	sweet cherry	SC
English ivy	E. IVY	Table Mountain pine	TMP
grape	GRAPE	Virginia creeper	VAC
green briar	GB	Virginia pine	VP
hawthorn	HAW	white ash	WA
Japanese honey	JAP	white oak	WO
little leaf linden	LLL	yellow-poplar	YP

Appendix 3

Corps of Cadets rappelling training tower

Appendix 4

Quercus Omnipotens colberticas: White oak named after Steven Colbert, May 1, 2012

Closing

We would like to give a special thanks to Dr. Seiler, Dr. Sullivan, all stake holders, Office of University Planning, and all others for all of their support and motivation that aided in the creation of this management plan. We hope this information will be viable for any future plans for Stadium Woods. Please feel free to contact any one of us in the future for more information or future help. Thank You!

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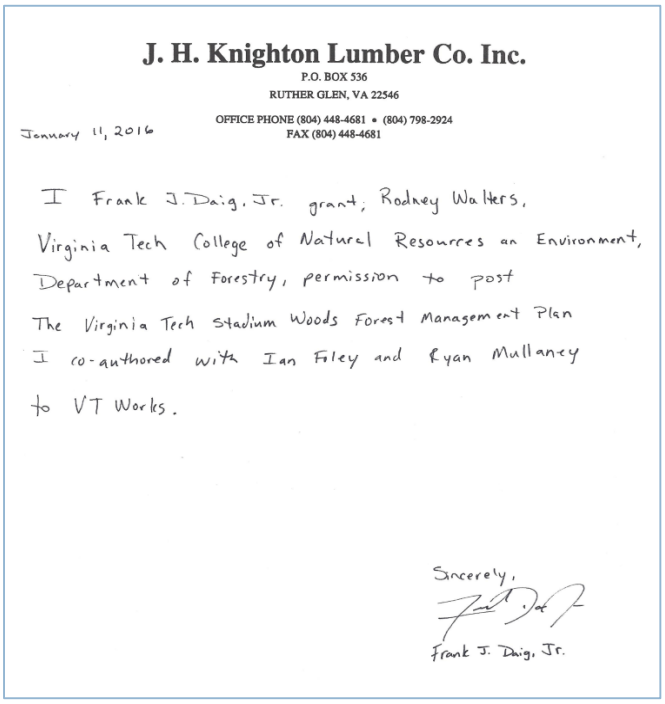

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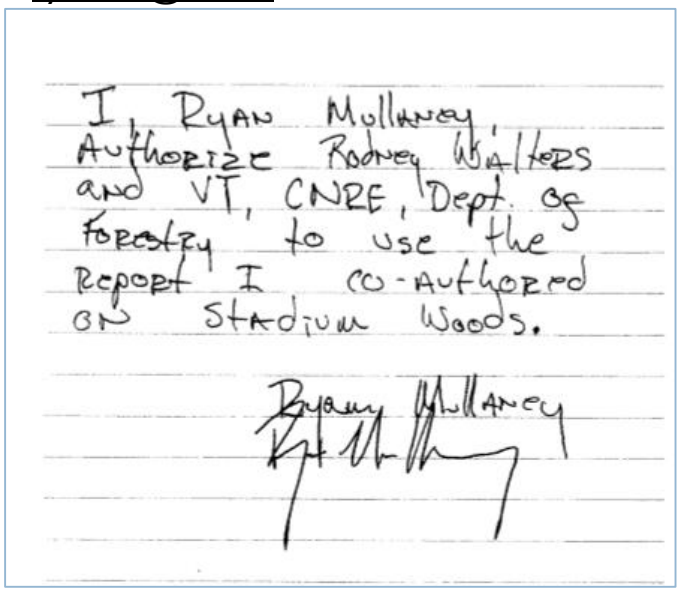
January 11, 2016

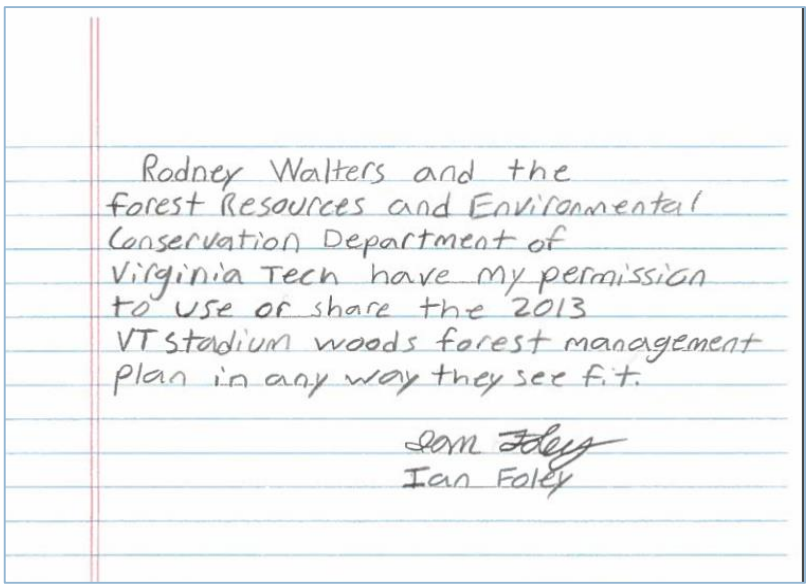
I Frank J. Daig, Jr. grant, Rodney Walters, Virginia Tech College of Natural Resources an Environment, Department of Forestry, permission to post The Virginia Tech Stadium Woods Forest Management Plan I co-authored with Ian Foley and Ryan Mullaney to VT Works.

Sincerely,
Frank J. Daig, Jr.



I, Ryan Mullaney, Authorize Rodney Walters and VT, CNRE, Dept. of Forestry to use the Report I co-Authored on Stadium Woods.

Ryan Mullaney



Rodney Walters and the Forest Resources and Environmental Conservation Department of Virginia Tech have my permission to use or share the 2013 VT stadium woods forest management plan in any way they see fit.

Ian Foley