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Independent Study – Advanced Arboriculture
Virginia Tech, FOR5974: Final Project

Review - Institutions of Higher Education: Old-Growth Forest Fragment & Urban Tree Care Plans

INTRODUCTION:

The purpose of this review is to examine approaches other universities and colleges have taken to manage their urban forest and remnant forest areas. The intention is to provide a context as to how the Stadium Woods Stewardship Plan may fit in the larger community of universities and to see what may be learned by examining the processes and plans undertaken by other institutions of higher learning. This information will help inform the writing of the Stadium Woods Stewardship Plan by considering the experiences and knowledge previously gained by others.

This report delineates the methods that were utilized to conduct reviews; describes the findings; and provides conclusions of what was discovered. The findings sections of this review are divided into: question responses from old-growth forest managers; urban forest management plan question responses from peer institution urban forest managers, and reviews of natural land area forests stewardship/management plans and webpages.

This review summarizes and addresses details and themes about what has been discovered from campus old-growth forest plans and information found online and makes a record of interview responses about the maintenance of campus old-growth forest fragments. In addition, responses from Virginia peer institutions about urban forest management are noted. Finally, two college webpages showcasing the management of their natural land areas are reviewed.

METHODS:

The focus of the early 2015 internet search was in finding institutions with small old-growth remnant forests. The internet search initially explored all the universities which appeared in internet search engines, such as Google, Bing, and Ask.com using the search phrase *university old-growth forests, college old-growth forests, old-growth on university campuses, campus old-growth forests, old-growth forests on campus, etc.* This initial search focused on universities that contain small remnant old growth forest stands. The search was then refined to include only colleges or universities that have old-growth forest remnants and management/stewardship plans for their old growth forest natural land areas. There was also a focus on finding colleges and universities that have old-growth on or near their main campus areas

Small old-growth forest remnant stands on university properties that are actively managed proved to be difficult to find. There are several colleges and university webpages that advertise a presence and engagement of old-growth forests on or near their campuses. However, closer examinations showed many of these old-growth forest areas to be of varying quality and most often be located away from main campus locations. Based on the on-line descriptions of these stands, the old-growth forest remnants on college or university campuses generally appear to be of lower ecological health, to be younger in age, and to have smaller trees than Virginia Tech's Stadium Woods (SW). In addition, stewardship, or management plans were not available for these wooded areas. Instead, many of these stands appear to be utilized in a way for colleges and universities to advertise a commitment to sustainability and may reflect recruitment efforts. This suggests that SW may be very rare as a small old-growth forest fragment located in an urban setting on the main part of a university campus.

The initial searches yielded less than 5 university or college campuses in the U.S. which have actively managed old-growth forest remnants that include management/stewardship plans. The search was then expanded to include woodlots and natural land area forests located on and managed by universities. The emphases of the search focused on old-growth remnant natural land areas less 300 acres in size. These inquiries revealed that woodlots and forested natural land areas were much more commonly listed online by colleges and universities and were more

likely to include management plans. Several searches for both old-growth forests and woodlots on college campuses with natural land areas under 300 acres in size were conducted. Two old-growth forest remnants less than 30 acres in size (Olmstead Woods and Nialani Nature Walk) were found to have significance, because they are small old-growth forest remnants, include management plans, and are actively managed with the forest ecologies as a consideration. Olmstead Woods was of particular interest, because it is a small white oak old-growth forest remnant located in an urban setting which has undergone a full restoration process.

After these searches were conducted, the following list was compiled:

- Cornell University
- Earlham College
- Ithaca College
- Lake Forest College
- Lakeshore Technical College
- Nialani Nature Walk
- Pennsylvania State University
- Sweetbriar College
- The Washington National Cathedral (Olmstead Woods)
- University of California San Francisco (Mout Sutro)
- University of Massachusetts Amherst
- Warren Wilson College

The people most closely associated with the oversight or management of these wooded areas were then found online and contacted by e-mail asking the following questions:

1. What is the nature of the remnant forest stand/s?
2. What are their issues/challenges/priorities with managing the stand/s?
3. What has been the approach to addressing these issues/challenges/priorities?
4. What can we learn from your experiences that might be applicable to the Stadium Woods Stewardship Plan?

Of the 12 institutions contacted, 3 responded to my inquiries the following people responded (Table1). In addition, Dr. Tom O'Halloran from Sweet Briar College was able to provide some perspective about the Sweet Briar old-growth forest during his February visit to The Virginia Tech, Department of Forest Resources and Environmental Conservation to deliver a graduate seminar. Unfortunately, on March 3rd, 2015, Sweet Briar College suddenly announced it would

be closing and the future of the Sweet Briar old-growth forest is now unknown. Communications from these individuals is summarized below under findings.

Table 1: campus old-growth forest managers

Name	Title	Institution	City & State
Todd Bittner	Director of Natural Land Areas	Cornell Plantations (Cornell University)	Ithaca, NY
Dr. Brent Smith	Natural Land Areas Manager	Earlham College	Richmond, IN
Bryan Koeser	Plant Manager	Lakeshore Technical College	Cleveland, WI

Institutional approaches in old-growth forest fragment management were examined from plans and/or information found online. The following universities, colleges, and organizations were found to have valuable old-growth forest management information, and/or old-growth forest fragments, or natural land area forests for which they have written plans:

- Ithaca College
- Lake Forest College
- Pennsylvania State University
- Nialani Nature Walk
- The Warren Wilson College Forest
- The Washington National Cathedral (Olmstead Woods)
- University of California San Francisco (Mount Sutro)
- University of Massachusetts Amherst

These plans were selected, studied, and evaluated for their relevance and/or applicability in providing useful information, insights, and or methodologies for old-growth forest fragment management and are summarized in the findings.

In addition, eight peer Virginia universities were contacted by e-mail and were asked to respond to inquiries about their university tree plans, most or all of which take the form of urban forests. The following questions were asked:

- A. How many trees does your university have?
- B. How many arborist are employed at your university?
- C. What types of tree care equipment do you have available?
- D. Does you university have a tree care or arboriculture plan?

E. Are there any forested tree dominated natural land areas at you university?

-And-

1. What is the nature of the remnant forest stand/s?
2. What are their issues/challenges/priorities with managing the stand/s?
3. What has been the approach to addressing these issues/challenges/priorities?
4. What can we learn from your experiences that might be applicable to the Stadium Woods Stewardship Plan?

Of the eight institutions contacted, the representatives of the following institutions responded (Table 2):

Table 2: Tree and forest managers at peer Virginia universities

Name	Title	Institution	City & State
Helen Wilson	Landscape Architect	University of Virginia	Charlottesville, VA
Paul Thrift	Grounds Superintendent	Virginia Commonwealth University	Richmond, VA
Chad Peevy	Grounds Supervisor	Old Dominion University	Norfolk, VA

E-mail and interview responses to the questions were then recorded and are listed in the Findings section below, along with a summary of old-growth plans and online information.

FINDINGS:

1. Old-growth Forest Manager Responses

Although very interesting and informative, information about Niaulani Nature Walk in Hawaii and the Washington National Cathedral (Olmstead Woods) in Washington D.C. are not considered with equal interest because the socio-ecological-economic dynamics surrounding the management of these natural land areas are very different than what may be generally found around institutions of higher education. For example, the Volcano Art Center, Nialulani Nature Walk in Hawaii has been restoring the Nialulani Rain Forest, an old growth forest remnant, since 1996. The Volcano Art Center is a nonprofit 501 (c) (3) organization founded in 1974 to

develop, promote and perpetuate the artistic, cultural and environmental heritage of Hawaii's people through the arts and education. Botanical educational courses within the forest have been active since 1996 and funded in part by a grant by the Hawaii Tourism Authority's Natural Resources Program (Tucker D. 2013. 8 Oct. *Backyard Forest Restoration Workshop at Volcano Art Center*). This may highlight a visitor or tourism value for such remnant old growth forest stands, yet it does not reflect much about possible management approaches for SW. Likewise, Olmstead Woods may represent an excellent case study for future SW stewards, however, the monetary investment of over three million dollars which facilitated its restoration is currently beyond the budgetary realities of Virginia Tech.

The focus of this section will be on the three universities and colleges this study found to have old-growth forest fragment remnants that are actively being managed: Lakeshore Technical College (LTC), Earlham College, and Cornell University. The following descriptions of those interviews may help to inform management approaches for Virginia Tech's Stadium Woods old growth forest.

Lakeshore Technical College

2/25/2015, Telephone Interview
Bryan Koeser (Physical Plant Supervisor)
(920) 693-1731

An interview was held with Bryan Koeser about the old-growth forest at Lakeshore Technical College (LTC) near Cleveland, Wisconsin. This old-growth forest remnant fragment is known as LTC Old Growth Forest. The Lakeshore Technical College Hetzel Nature Trail Guide Book describes the LTC Old Growth Forest (Lakeshore Technical College, 2010). The LTC old growth segment may be as small as 4 or 5 acres, estimated by comparing the LTC Trail Guide Book and the measure tool on Google Earth (Lakeshore Technical College, 2010). The old growth area is contained within a larger 25 acre forest (Lakeshore Technical College, 2010). The forest fragment is surrounded by development, roads, or agriculture and are, therefore, isolated away from a contiguous forest. LTC is a very small college, consisting of just a half a dozen buildings, yet it has found its old growth forest remnant valuable enough to invest in

building a trail, writing a hand book, and displaying elements of their forests with self-guided tours.

When asked what the nature of the LTC old growth remnant stand was, Bryan Koeser explained that LTC sits on a total of 167 acres and is composed of developed areas, wetlands, and a 25 acre forest, which has the smaller old growth section contained within it. He said a wetland limits access to the woods and may have been the reason this section of the forest was never harvested. He spoke of a presentation given by a visiting representative of the Wisconsin Department of Natural Resources (DNR) who emphasized that old growth remnant stands are very rare. He described the Hetzel Nature Trail that directs people through the woods. Mr. Koeser reflected upon how much interests people have in the LTC Old Growth Forest remnant, stating “Lots of people stop and walk the path”. He stated that a majority of the parents who visit LTC tour the woods, especially during graduation. He said he often talks with Wisconsin residents who consistently drive 50 miles or more to visit the woods.

Bryan Koeser then described the LTC Hetzel Nature Trail a little more in detail. He spoke of the kiosk the college has built at the trail entrance containing: self-guided trail brochures; signs describing ecology and forest elements; foot scrapers; and sand. Bryan Koeser explained that the foot scrapers and sand are stations where people are asked to wipe off their feet before entering the woods in order to prevent the spread of invasive plants. Mr. Koeser related how they cut a round from a tree, which had fallen in the old growth section and mounted it in a shadow box to display the 180 tree rings that indicate the old age of the trees.

When asked what issues, challenges, or priorities he faces in maintaining the old growth remnant, Bryan Koeser responded that he has very few challenges with the woods. He said there is no formal plan for the woods, instead a spirit of community and involvement has evolved to meet the maintenance needs. He noted that they just leave the dead wood from trees and branches in the woods, because doing so is an ecologically sound practice for the old growth forest fragment. He explained that there is a small amount of upkeep with the entrance and exit areas of the pathway and said there are volunteers who help out. There is some minimal cleanup involved when the occasional tree or branch falls on the path and there is a small effort dedicated

to keeping the tree identification tags and signs in proper display order. He said local community groups have provided the college with funding to install interpretive signs in the woods. The two invasive plant species, garlic mustard (*Alliaria petiolata*) and hawthorns (*Crataegus* spp.), are controlled by a local horticulture club and by local Boy Scout troops. Mr. Koeser explained that the invasive plant species in the LTC Old Growth Forest are well controlled with an ongoing invasive plant species removal effort along the creek, which flows through the woods and occasionally overruns its banks during periods of heavy rain. The creek flows through the farmland adjacent to the area and then carries garlic mustard seeds into the woods. The garlic mustard is easily controlled by vigilantly removing it periodically throughout the year.

Mr. Koeser said LTC College explored two options with the state in the formal designation of the LTC Old Growth Forest with the Wisconsin DNR. The first option with the state DNR would have involved the woods being put into a conservation easement. This would have taken decision making control out of the hands of LTC. So, LTC choose the second option, which involved designating the woods as an old-growth forest with the Wisconsin DNR, but allowed LTC to retain full control of all decisions and responsibilities involving the old growth forest fragment.

When asked what lessons Virginia Tech may learn from LTC's experience in managing their old-growth forest fragment, Mr. Koeser replied their community has really helped. He said they help him a lot, because they are very knowledgeable and enthusiastic partners. Mr. Koeser said it would have been a burden for the physical plant of the small LTC College to take on maintenance of the old-growth remnant alone. He said he has found partners with educators at the college who have tied the importance of the woods to their curriculum and give meaning to the knowledge students gain from the woods in their studies of horticulture. He also praised some of the community leaders who make their LTC Old Growth Forest possible (Bryan Koeser. telephone interview, 2/25/15)

Earlham College

2/20/2015, Telephone Interview
Professor Brent Smith (Natural Land Areas Manager)
765-983-1457
765-914-0795 (cell)

An interview was held with Dr. Brent Smith about Earlham College's natural land area old-growth remnant fragments. Earlham College advertises the fact that it owns several natural land area field sites composed of ponds ephemeral ponds, early and mid-successional forest, grass prairie, old field growths, woody succession areas, forest stands, and old growth forest remnants. Earlham College praises "three outstanding college forest preserves owned by the college located within a short driving distance from campus" (Earlham College, 2015a). The three forests include Sedwick's Rock Preserve, Wildman Woods, and Iverson Woods.

Sedwick's Rock Preserve, a 13-acre preserve gifted to the college, is an "exquisite, mixed woodland with beach-maple and oak-hickory". This forest stand is used extensively for experimental field projects, particularly on under-story vegetation. **Wildman Woods** is a 40 acre mature forest preserve containing sections of *old-growth* and second-growth upland and lowland forest. This forest remnant contains an extensive trail system and is used "intensively" for course field trips and student/faculty collaborative research. **Iverson Woods** is a 28-acre preserve containing a stream valley and upland woodlands (Earlham College Biology webpage). Brent Smith, Earlham Biology Professor, characterized all three of these Earlham forest remnant stands as old growth (Brent, Smith. telephone interview, 2/20/15). The following is Dr. Smith's e-mail reply and interview summary, including a copy of Dr. Smith's college website biography (Figure 1).

Dr. Brent Smith is a biology professor at Earlham College as an old-growth forest ecologist specializing in presettlement (pre-European) vegetation. Dr. Smith is the supervisor of Earlham College's forests. In addition, Dr. Smith is active in teaching and conducting research projects, both independently and in collaboration with other staff in the natural land areas of the college (Figure 2).

When asked what the nature of Earlham College's remnant stands were, Dr. Smith described Earlham's natural land areas as the "Front Campus" and the "Back Campus". The forest remnants, "Back Campus", are all located within a five minute drive from campus

(Earlham College. 2015a). Dr. Smith described the forests as agricultural land forest fragments and said that the college forests are connected in a contiguous way to other forested areas. He named Sedwick's Rock, Wildman Woods, Iverson Woods, Crane Woods, Reller, and the Test Biological Preserve all as part of the Earlham College natural land woodland areas. Dr. Smith described Sedwicks' Rock Preserve and Iverson Woods as having old growth forest characteristics, with Wildman Woods having sections of old growth existing within the stand.

Figure 1: 2/18/2015 E-mail Reply from Dr. Brent Smith

From: Brent Smith [mailto:brents@earlham.edu]
Sent: Wednesday, February 18, 2015 9:33AM
To: Walters, Rodney
Cc: Meghan Janice Hennessey; John Iverson
Subject: Fwd: Questions about your old growth forest remnants

Dear Rodney Walters,

Earlham College owns 5 forested properties, three of which I would call "old growth" and the other two "quite mature". I am the College's supervisor of those forests. I would be happy to discuss our management/stewardship of these properties over the phone. We happen to be on a break beginning tomorrow (Thursday), so my schedule is pretty open. Let me know via email when you want to make contact.

Best,
 Brent

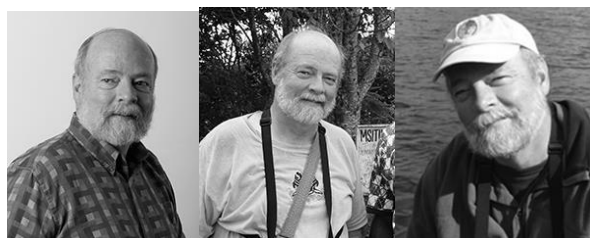
Road West
 Richmond, IN 47374
 Phone: 765-983-1457 Brent H. Smith
 Professor of Biology
 Earlham College
 801 National
 Phone: 765-914-0795 (cell)

Figure 2: Dr. Brent Smith - Old-growth Forest Ecologist, Profile (Earlham College. 2015b.)

Brent Smith
 Professor of Biology

Brent Smith teaches a variety of ecological, evolutionary and conservation-based courses and he regularly involves students in his research. With his wife, Professor of Art Nancy Taylor, he has led Earlham's off-campus program in East African several times.

He says of Earlham students, "I love the students that Earlham is able to attract. They are bright, eager young people with a real sense of integrity — people of real substance who are committed to making a real difference in the world."



When asked what the issues, challenges, and priorities were in managing the woods, Dr. Smith named the goal of increasing access to the woods and addressing invasive plant species problems. Dr. Smith stated that the greatest management priority for Earlham College's forest remnants is to remove the invasive plant species effecting the woods. Bush honeysuckle (*Lonicera* spp.) and garlic mustard (*Alliaria petiolata*) are the two most common invasive plant species affecting Earlham College's natural land areas. The college has been very successful in removing the bush honeysuckle in their stands and the garlic mustard removal has been an ongoing effort.

Dr. Smith reported that Earlham College is increasing access to their woodlands by building unobtrusive trail systems into the interiors. The trails are built to control erosion using different techniques including the utilization of log cross bars, the installation of stairs, and the building of bridges. The trails are also designed to follow contour lines as another erosion control method. Earlham College has an athletics, wellness, physical education (AWPE) program where students can build trails and participate in invasive species control for college AWPE credit.

Dr. Smith said the forests are able to be managed, in part, by an endowed fund which pays the salary of a part time property manager, who works 29 hours per week for around \$10 per hour. Dr. Smith said Earlham College only uses their woodlands for teaching and research purposes and the woods are not advertised for public use, which helps to reduce human impacts. The woodland properties, owned by the college, were given for the purpose of ecological conservation and education and, therefore, must be restored and maintained as forest ecosystems. Dr. Smith suggested that Virginia Tech may benefit by designating a management entity that is specifically responsible for the woods, such as an academic department. He encouraged the consideration of increasing access to the woods by considering the trails and suggested a kiosk self-guiding touring system (Dr. Brent Smith. telephone interview, 2/20/15.)

Cornell University

2/17/2015, E-mail Response

Todd Bittner (Director of Natural Areas, Cornell Plantations, Cornell University)

todd.bittner@cornell.edu

Todd Bittner responded to the questions by e-mail. Below is a copy of his e-mail response, complete with live links to Cornell's natural land area websites (Figure 3):

Figure 3: Todd Bittner E-mail Response to Forest Management Questions:

Hi Rodney

Plantations has one old growth forest and a couple others that have old growth characteristics. [Fischer Old Growth Forest Natural Area](#) is our best example and the website should help answer some of your questions. Two years ago we registered it in the [Old Growth Forest Network](#), reaffirming our commitment to conserve this unique area. Joan Maloof (JEMALOOF@salisbury.edu), who founded it, would be a good person to talk to as well.

Our two main conservation challenges here have been deer and Hemlock Woolly Adelgid. Our deer management program, detailed [here](#), is our primary strategy, though [harvest](#) has been inadequate to reduce browse rate to our program goals there (below 15% browse rate on indicator preferred herbaceous species). HWA is a primary threat to the 300+ year old hemlocks at the site. We have been treating HWA there with a variety of application treatments of imidacloprid and/or dinotefuran. Our [HWA webpage](#) hasn't been updated recently to reflect our shifting treatment approaches though. If you are interested in that in greater detail, let me know. We are also presently developing a detailed management plan for Fischer, and if you remind me in 6 months or so, it should be done and I can send you a copy.

One notable difference I would point out between our old growth, hemlock dominated forest, and a Virginia white oak OGF would be fire. Fire return intervals in the finger lakes region in this type of natural community would have been extremely rare events (possibly even 500+ year fire return intervals). Oak forests, including white oak, develop in a landscape with fire as a natural disturbance ecosystem function; oaks prefer open/partly open sun for seedling development. I am not an expert for this community type in your region, and actually haven't visited VA, so would suggest you reach out to a fire ecologist in your area to learn more about how prescribed fire should be included in your management planning efforts.

After you review Plantations website information, feel free to reach out with any additional questions.

Best regards

Todd Bittner

Director of Natural Areas
Cornell Plantations
www.cornellplantations.org
607.255.9638

Cornell University has a natural land area management entity, Cornell Plantations, which emulates the structure of a well-organized foundation (Cornell University. 2015). The natural land management plan takes the form of an online interactive webpage that directs online audiences to areas of interests through many links contained within the website. The website is divided into 5 main areas:

Visit - Hours of operation, visitor amenities, and directions

Gardens - Botanical gardens, the F.R. Arboretum, and more.

Natural Areas - Information on natural land areas; including an old-growth forest

- Maps of recreational activities
- Stewardship volunteer opportunities
- Information about management strategies and goals
- Invasive species control
- Deer management

Learn - Community education

- Exhibits
- Lecture series
- Youth programs
- Teen education
- Internship program
- Graduate leadership program
- Publications,
- Group tours
- Volunteer programs
- Cornell Natural Areas Academy.

Support - Memberships

- Donations
- Memorials and tributes
- Planned monetary gifts
- Volunteer programs.

The Cornell Plantation webpage is informative, intuitive, easy to navigate, exceptionally well designed and complete with a slogan that reads “cultivation, preservation, education” (Cornell University. 2015)

This electronic natural land areas management webpage is an exemplary model of a comprehensive and interactive natural land area management education and engagement

strategy. The Cornell Plantations website reaches out to a wide audience and invites community members, both local and distant, to join and participate in the activities and community, which abounds within their natural land area assets. This model demonstrates a wide range of possibilities and ideas. The Cornell model demonstrates that there is an opportunity to create an excellent natural land area community at Virginia Tech with Stadium Woods serving as the centerpiece, if Virginia Tech and community members choose to rise up and meet the challenge.

Plans & Information Online about Old-growth Forest Management

In addition to the interviews above, other notable old-growth forest management resources were located. The University of Massachusetts Amherst has a webpage titled *Restoring Old-Growth Characteristics* that explicitly addresses methodologies for restoring old-growth forest characteristics, along with other related concepts and management practices (University of Massachusetts Amherst. 2015). This website contains a wealth of scientifically based, practical, old-growth forest restoration information, techniques, and management practices. This information includes increasing old-growth structure characteristics, restoring late successional structure, managing old-growth structure, understory vegetation in old growth stands, and more. The website also includes links to forestry organization, laws, forest health, wildlife, biomass, water, recreation, community and more. The webpage contains a wealth of practical information, which will help to inform SW old-growth forest stewards.

A complete old-growth forest management and restoration plan titled *A Restoration Management Plan for the Hartley Wood in The Arboretum at Penn State* for the 29.5 acre Hartley Wood located on the Pennsylvania State University Arboretum is available online (Grinstead. 2007). This plan may provide valuable information for Stadium Woods stewards, especially in specific strategies for invasive plant species control. This old-growth management plan makes a thorough assessment of the Hartley Woods's structure and composition. The main objective categories of the plan involve changes in over story species composition, historical/educational value, wildlife, and invasive plant species. The greatest portion of this plan, by far, delves into a thorough study of specific invasive plant species and research for specific control methods of each invasive plant species including: privets (*Ligustrum* spp.); bush

honeysuckle (*Lonicera* spp.); common buckthorn (*Rhamnus cathartica*); garlic-mustard (*Alliaria petiolata*); multiflora rose (*Rosa multiflora*); Norway maple (*Acer platanoides*); Mazzard cherry (*Prunus avium*); Oriental bittersweet (*Celastrus orbiculatus*); and other species causing potential problems (Grinstead. 2007).

2. Peer Institution Urban Forest Plans

The Stadium Woods old-growth forest natural land area is a subset of Virginia Tech's urban forest. This part of the review turned to Virginia universities to seek insights into university tree stewardship from trees asset managing entities of Virginia Tech peer institutions. The goal is to explore the possibility of learning anything of potential value from peer institutions, who may share similarities with Virginia Tech. These inquiries resulted in one email response (Figure 4) and two interviews. Accounts of those responses are listed in the following sections.

University of Virginia (UVA)

2/12/2015, E-mail response
Helen Wilson (UVA Landscape Architect)
haw2X@eservices.virginia.edu

Figure 4 on the following page shows the UVA e-mail response to the tree care plan questions listed in the methodologies section above summarize the key points of the e-mail.

Figure 4: UVA, Helen Wilson –Landscape Architect E-mail Response

Thu 2/12/2015 11:10 AM

Wilson, Helen A. (haw2x) <haw2x@eservices.virginia.edu>

RE: Questions About your Arboretum & Landscape Committee

TO: Towns, Anna Kathryn (akt2m) akt2m@eservices.virginia.edu ; Walters, Rodney rodneyw1@exchange.vt.edu

Cc: Hopkins, Richard M. (rmh3f) <rmh3f@eservices.virginia.edu>; Wilson, Helen A. (haw2x) <haw2x@eservices.virginia.edu>

Rodney:

UVA does not have an old growth forest, but we do have extensive tree canopy, both throughout the developed areas of our grounds, as well as woodland remnants, such as Observatory Hill and several areas of stream valleys. I am copying our Landscape Superintendent, Rich Hopkins, as I think he can add much to this discussion. In fact, you should arrange a time to speak with him.

Some of the biggest challenges involve safety and tree maintenance. We cannot possibly climb and inspect every tree on grounds. Visual inspections from the ground are made regularly and trees climbed/inspected accordingly. Trees in our most populous areas receive yearly inspection, climbing and pruning. Another challenge is tree protection, not so much stemming from Capital building projects, (which follow standard tree protection standards and are reviewed for such measures, and where the Landscape Superintendent works with projects on tree protection measures on site) but the smaller projects that are not reviewed with the same rigor, such as utility repairs or small scale projects or even just vehicles parking on tree roots. We end up finding out about potential tree impact in a haphazard way, or not at all. Ideally, we would find a way to better spread knowledge about tree protection to those folks managing these projects so there is better awareness, and coordination.

We have a robust tree replacement program as well as a memorial tree program. We have arborists on staff; larger jobs are contracted out to trusted arborists. We have a Landscape and Arboretum Committee which reviews and approves all voluntary tree removal requests.

I would like to see us have a tree replacement policy, such that trees that have to be removed by a project must be replaced; if a location cannot be found by the Office of the Architect and the Landscape Superintendent, then the project must contribute a fee to the tree replacement account. I've not managed to get much traction on this idea....

We get pressure to increase tree canopy on grounds to satisfy laudable sustainability goals, however, also believe that on a college campus, it is important to also have sunny, open spaces for outdoor activities- passive recreation, study, gathering, sunning. Also, our grounds are so laced with underground utilities that it is often surprisingly difficult to even find a place to plant a tree.

We would like to have a complete tree inventory and have our tree stewards utilize electronic records in the field to keep the inventory updated as well as record and track tree maintenance, removals and replacements.

Please let me know if you have any questions on this material. Best of luck on your project! I would love to see the old growth forest on your campus one day.

Best,
Helen

Helen Wilson
Landscape Architect
Office of the Architect
University of Virginia
434-924-6007

Virginia Commonwealth University (VCU)

3/03/2015, Telephone Interview
Paul Thrift (Grounds Superintendent)
pthrift@vcu.edu
(808) 828-6604

Paul Thrift was interviewed about aspects of VCU's tree care program and was asked the previously listed questions during the interview conversation.

When asked how many trees VCU has, Mr. Thrift answered there are about 2500 trees on their small campus area of 110 acres located within an urban setting. He said 2000 of those trees are campus trees with many of them as small or maturing trees with an average 9" diameter. Paul Thrift said most of the VCU trees are Foster's holly (*Ilex x attenuata* 'Fosteri'), crape myrtle (*Lagerstroemia indica*), and Japanese zelkova (*Zelkova serrata*). He said 285 of those trees are city trees, contiguous to campus, which involves a "grey area" for who is responsible for their care. He said the City of Richmond and VCU have kind of worked it out by sharing in the city tree maintenance. Mr. Thrift stated that VCU has two arborists on staff, himself and one other supervisor. VCU's tree care equipment includes chain saws, and hand tools. He said there are two aerial lifts to which the grounds crews have limited access, because they belong to the roofing department.

Paul Thrift explained that VCU does have a tree care plan that was written as a means to achieve Tree Campus USA status. He said VCU's Tree Campus USA status has now lapsed. Paul Thrift reported there are no natural land areas at VCU with the exception of the Charles Wright Center which is not located on the main part of campus. He described it as a natural land area that is affiliated with their academic program as a living laboratory. He related that the Charles Wright Center natural land area is not actively managed, rather, it is just observed.

Having described the nature of VCU forest, which he described as very urban, Paul Thrift then illuminated the major challenges he faces in addressing VCU's tree care maintenance. He characterized a limited budget, which does not explicitly include tree maintenance as an objective. He said this is a limiting factor in his department's ability to provide tree care

maintenance. He thought the budget could be there, but explained how the need to specifically address tree maintenance was not on people's radar. Mr. Thrift said there were many construction and infrastructure conflicts with trees and depicted how the very dense urban environment of 30,000 people on a 110 acre campus translated to there being many trees in poor locations. He said de-icing salts, compaction, limited space, and the overall urban environment was very challenging in maintaining tree health. Paul Thrift commented about how campuses with larger spaces and more lawn areas provided much better growing environments for trees than what the urban campus at VCU was able to provide.

When asked what lessons we might learn from their experiences that might be applicable to Stadium Woods, Paul Thrift could not think of any. Instead, he asked some basic questions about Stadium Woods. In general, some of the main themes of the interview circled around the fact that the grounds crew is doing the best they are able under the circumstances. However, without help from the academic community in showing an interest in their urban forest, and the university becoming engaged as a community to show that trees are important, they would continue to be somewhat limited in their ability to do the quality of work they would like to regarding the trees.

Old Dominion University (ODU)

3/03/2015, Telephone Interview
Chad Peevy (Grounds Supervisor)
CPeevy@odu.edu
(757) 683-3388

To begin the interview, Chad Peevy described ODU as a Tree Campus USA designated university for the 3rd year in a row. ODU is characterized as urban (200 acres) in downtown Norfolk, with an enrollment of 8,677 students (Fall 2014). Mr. Peevy said ODU has 3400 – 4000 trees (estimated), 2200 of which are inventoried. When asked how many arborists they have, Chad Peevy answered that they have 1 arborist, himself. As the grounds supervisor, Mr. Peevy has been at ODU for 9 years. He is one of 2 people on campus who holds a fertilizer applicator license.

Mr. Peevy uses his own climbing gear when it is occasionally necessary for him to access a tree. He explained that ODU has 6 staff gardeners who are each responsible for maintaining a campus zone. He trains his gardeners in arboricultural practices and they maintain all trees smaller than 8” in caliper. In addition, Mr. Peevy said that the turf crew will lift tree crowns, trim branches away from buildings, and away from lights during the winter. He said ODU generally contracts out their tree work for trees greater than 8” in caliper.

Mr. Peevy was then asked what types of equipment ODU has available for tree care activities. He said they have a backhoe for planting trees, a stump grinder for less than 18” sized stumps, a water wagon to water trees (use recovered storm water), saws, hand tools, personal protective equipment (PPE), and Gater carts. He commented that much of ODU’s tree care activities directly involves the planting of trees.

Mr. Peevy was then asked if ODU has a tree care plan. He replied that they have a GIS based tree maintenance plan, which has been contracted to Bartlett Tree Experts for 3 years. He explained that they just received budgetary approval for this year as well. Mr. Peevy said ODU does have a tree care plan and ODU is Tree Campus USA designated. He said he modeled their tree care plan from the Georgia Tech & Virginia Tech plans. The following is an outline description of the ODU tree care plan, as described by Chad Peevy:

1. Tree Advisory Board

- 2 Facilities Services members
- 2 professors (Civic Engineering & Biology)
- 1 community master gardener
- 1 City of Norfolk City Forester (Michael Nentwich – Norfolk City Forester)

2. Tree Care Policies - Based on ANSI standards and ISA Best Management Practices

3. Removal, Planting, Transplanting, Trimming, & Fertilization Specifications and Procedures

4. Protection & Preservation Policies & Specifications (for preconstruction, during construction, and post construction - including tree damage assessment penalties)

5. Tree Inventory which is Incorporated into the Master Plan

6. Annual Goals & Targets

7. Involve Students in Annual Projects

- Have an Urban Tree Trail with 30 distinctly urban adapted trees
- I.D. Taxonomic Plates
- Self guided and guided tours

8. Section Describing how Students Fit into the Urban Tree Care Plan

(Communications to Students in the form of attachments).

- Definitions
- Plant Palette
- Prohibited Plants List
- Tree Protection Zone (TPZ) standards for construction
- Arbor Day Activities
- Annual Budget

Mr. Peevy explained that the ODU natural land areas consists of Riparian zones on 4 separate sites, which overlap with state owned lands on shorelines of the river fronts on the Lafayette & Elizabeth Rivers.

Mr. Peevy described ODU's greatest tree issues as construction related, public safety, and learning how to communicate with students on student tree projects. Chad said there have been over 20 capital construction projects since he began working at ODU 9 years ago. He stated that construction projects involved mostly defending the trees that have been selected to stay by enforcing tree protection specifications (tree protection zones) and replanting after the construction projects have been completed. Public safety concerns for Chad involve finding and correcting issues in trees before they become a tree hazard. Another safety matter involves the realities of working in a very urban congested work environment where there is a great deal of pedestrian, bicycle, and vehicular traffic. Chad talked about the process he has undertaken in learning how to establish a connection with the students, who seem to communicate a little differently with each passing year. He seeks out students to help teach him how to effectively communicate with other students.

When asked what lessons we may learn from his experience, Chad said that networking was critical for success. He said that he has benefitted by finding partners on campus. They help him to know who to go to in order to get things done. He said partners taught him how to

navigate procurement needs and were invaluable in teaching him the ins and outs of contract writing. He said he has assembled partners and allies who include Civil Engineering and Biology professors as well as graduate students. He relayed a story of hiring a GIS graduate student who then taught him about the power of apps in communicating with students. Chad has fostered a partnership with the Norfolk City Forester – Michael Nentwich. He talked about their partnership and current plans to hold a joint City of Norfolk and ODU Arbor Day Celebration. Chad talked about how his involvement with local community colleges, in the form of giving lectures, has helped him to attract talent into his ODU grounds team.

Mr. Peevy also stated that having diplomacy skills and learning how to speak the bureaucratic language associated with the university has been vital for helping him to learn how to communicate the benefits of his tree care plan to decision makers. Chad also reported that learning how develop really solid plans that prove to people that he knows what he is talking about has been vital. He referred to his Storm Response Plan as an example, which has helped them to deal effectively with some of the serious storms they have encountered in the past few years. He said this has helped him with position descriptions and in finding well qualified employees. He related that it has made a significant difference in some of the state contract rewrites he has been involved in, such as including that a company must have a certified arborist **on site** and must provide evidence that the company holds routine safety meetings.

3. Natural Land Area, Forest Stewardship/Management Plans, & Information From Higher Education Institutions

This section will begin by addressing relevant aspects of information and/or plans that were available online from institutions of higher learning. Some plans and websites of note include:

- *UCSF, Mount Sutro Open Space Reserve Management Plan* (EDAW, Inc. & Ralph Osterling Consultants, Inc. 2001)
- *Ithica College Natural Lands Management Plan* (Zadrozny A., et al. 2011)
- Middlebury College, *Ecological Stewardship of College Lands* (Jenks-Jay, N, et al. 2002)

- The Warren Wilson College, Forestry Homepage (Warren Wilson College. 2015)
- Shooting Star Savanna at Lake Forest College Homepage (Lake Forest College. 2015)

These plans and websites were selected for their ability to inform varying aspects of the Stadium Woods Stewardship Plan, such as public controversy at Mount Sutro or a faculty lead volunteer effort at Shooting Star Savanna. After examining many natural land area forest stewardship/management plans, it is evident university and college natural land area management plans take on many different forms and address issues specific to the objectives of the communities for which they have been written. Most of these plans are written by multiple authors, including consulting firms, and are quite often co-authored by faculty members and students. The more comprehensive plans are those that have been written to address socio-ecological processes and for institutions that have multiple natural land areas and/or utilize their natural land areas for income.

The University of California San Francisco

The *UCSF, Mount Sutro Open Space Reserve Management Plan* was developed by two separate consulting firms for the University of California, San Francisco (USCF). This open space plan was developed to inform the University's Long Range Development Plan in order to address several issues that had arisen with the 80 acre forest in the heart of San Francisco on the USCF property. The plan was developed to meet 7 goals:

1. Ensure public safety
2. Improve the health of the forest
3. Protect and improve native plants
4. Enhance wildlife habitat values
5. Maintain scenic quality
6. Improve public access
7. Implement the resource management plan

(EDAW, Inc. & Ralph Osterling Consultants, Inc. 2001)

This Mount Sutro plan engaged these seven planning principles with the public through a set of public stakeholder meetings to identify management issues and opportunities. A comprehensive plan was then developed and implemented to meet its objectives and address issues. The plan

employs an adaptive management approach, which allows for a periodic assessment of the effectiveness of the plan and its implementation. The plan is rewritten after a set amount of time in order to accommodate new developments. This plan actively seeks partners for community involvement and funding including the City and County of San Francisco, California Parks and Recreation, the Department of Agriculture, and more. The plan was informed by the Parnassus CAG Action Team consisting of San Francisco community members, USCF planners, USCF community members, the merchants association, the San Francisco Tree Council, The Sierra Club, The Bay Area Ridge Trail Council, the California Native Plant Society, and more. The plan serves as a rationale for the management of the forest and trail system to address issues that invariably arise as maintenance activities are employed.

Ithaca College

The *Ithaca College Natural Lands Management Plan* (ICNLMP) was written as a document to “outline past activities, current priorities, and future management of Ithaca College’s protected natural areas” (Zadrozny A. et al. 2011). This plan was written by faculty members and students for the Topics in Geography and Planning Course (ENVS331) in the spring of 2011 to inform and direct the activities of the Ithaca College Natural Land committee. The ICNLMP informs four management values of:

1. Preservation
2. Education
3. Research
4. Recreation

One very interesting aspect of the ICNLMP is the way it has addressed proposals for putting Ithaca College’s natural lands into a conservation easement. The plan calls for “internal conservation easements (ICE) for the entire natural lands system...to serve as a model for sound land management for other institutions. The Ithaca College natural land areas are becoming increasingly valuable and are at an increasing risk of development, which would compromise the highest value of education” (Zadrozny A., et al. 2011). The intent of the ICE is to provide the Ithaca College administration the opportunity to demonstrate a positive working relationship with the Ithaca College Natural Land Committee and to allow flexibility for Ithaca College in the custom design of each situation in education, sustainability, and democratic governance. The

idea is to involve the Ithaca College community in an ongoing process of their natural land stewardship and to save the Ithaca College administration the considerable restrictions, management costs, and transaction fees associated with the legally binding deed restrictions of a formal conservation easement.

Middlebury College

The Middlebury College, *Ecological Stewardship of College Lands* is also a faculty and student written plan which covers the topics of education, agricultural stewardship, and green certification of Middlebury's college forests and natural lands. This plan is a very nice example of a co-authored comprehensive natural land area management plan. Middlebury College natural land areas include;

1. Scientific research and teaching sites
2. Agricultural Lands
3. Forest Lands
4. Campus Natural Land Areas

The forest component of this plan researched the forestry standards of the Forest Stewardship Council, the Sustainable Forestry Initiative, and the Vermont Family Forest stewardship model so Middlebury College could develop its own standards to reflect its goals and values. They found that a forestry certification was important for Middlebury College to demonstrate the college's commitment to sustainability, especially since they use timber from their natural land forests for construction. One of the conclusions of this plan is the determination that Middlebury College needs a permanent structure in place to oversee land stewardship. The college has a need to increase dialogue between all its natural land area stakeholders. The plan recommends the formation of a stewardship committee that includes a college education faculty member, the college forester, a student representative, a Middlebury College planner, and a Middlebury Facilities manager. The committee group would then be able to formulate and adjust goals: and ensure the natural land area goals are being achieved. As an institution of higher learning, a desire to setting a good stewardship example for the county was emphasized. (Jenks-Jay, N, et al. 2002). This plan is a well written example of how the university is empowering itself in the efficacy of its natural land areas. One way this plan may be applicable

to SW is to demonstrate how Virginia Tech may benefit by developing a natural land area management plan for all its natural land areas, in which SW is one of many stewardship units.

Warren Wilson College and Lake Forest College

The web sites of Lake Forest College *Shooting Star Savanna* and Warren Wilson College provide just a couple examples, from dozens that appear on the internet, of how colleges and universities are valuing and capitalizing upon their natural land areas (Lake Forest College. 2015 & Warren Wilson College. 2015). These two colleges provide exemplary approaches in the enterprises of investing in their natural land areas. These colleges have taken innovative and proactive approaches in the enhancement of their natural land areas in order to present their communities as optimistic in their embracement of a positive vision of their future.

The Shooting Star Savanna at Lake Forest College is an example of a flourishing restoration project that was initially taken on by faculty members. The college began the project when it stopped mowing a two hectare area of lawn and degraded woodland. A group of volunteers including faculty, staff, and students, rallied around the idea and began the restoration work. Then, a local landscaper joined the project and contributed his extensive knowledge of native plant landscaping. The core group of volunteers has grown to include Greek organizations, and environmental studies students. The volunteers remove invasive species, maintain trails, and contribute the extensive labor needs. To the college's surprise, native plant savanna species emerged from under what had been lawn and became reestablished. Donors have since contributed to the project to provide benches and interpretive signs. The area has also been officially sanctioned with a name and inclusion on the Lake Forest College map. The Shooting Star Savanna, representing one of the Mid-West's rarest and endangered ecosystem types, now stand as a source of pride and recognition for the college and community (Lake Forest College. 2015).

Warren Wilson College presents a sustainable persona with its environmental studies program, Green Living Guide, and Environmental Leadership Center (Warren Wilson College. 2015a). The Warren Wilson College Forestry webpage presents the college 640 acre forest and announces its dedication to sustainability. The forestry department announces a "mixed use

management of the forest that helps the college to realize environmental, social, and economic aspects of sustainable forestry” (Warren Wilson College. 2015b) as it presents a series of management practices including:

1. Exotic Invasive Management
2. Enrichment Planting
3. Prescribed Burning
4. Silvicultural Prescriptions (including selective thinning)
5. Trail Maintenance
6. Forest Product Optimization

The college features innovative approaches such as non-timber forest products like mushrooms, sustainable firewood harvesting from the university arborist, and bandsaw wood production to reduce sawdust wastes. Logs are skidded using Belgian draft horses pulling a log arch to reduce compaction in the forest. The program demonstrates sustainability in the employment of all its forestry practices, showing that production and sustainability may be mutually inclusive (Warren Wilson College. 2015b).

During the creation of this review, a trend was observed on dozens of college and university main webpages. College natural land areas are being utilized to showcase institutional dedication to sustainability, attract prospective students, and demonstrate the desirability of these campuses as places to both work and learn.

Growing Networks of Old Growth Forest Professionals and Organizations

An interesting phenomena has occurred during the course of this study. Other people have emerged, who have also been looking for examples or plans addressing small old growth forest fragments located in urban settings. There seems to be a growing network of professionals and organizations seeking information about old growth forest fragments. These people are finding one another and sharing information. The Old Growth Forest Network (Maloof J. 2015) and other nonprofit and community organizations are evolving as networking hubs where professionals and community groups are seeking each other’s collective experiences. We were contacted on three separate occasions by people seeking examples of plans for old-growth forest fragments in urban settings. An example of this, which may be noteworthy for Stadium Woods, is the Ecological Society of America Meeting scheduled to be held in mid-August 2015, where a

list of campuses with natural land areas is being compiled for a presentation. The theme of the list is how natural land areas on those campuses have or have not been protected. It may be safe to assume that SW will be included on that list.

CONCLUSIONS

This study has conducted a search for examples of campuses that have natural land area plans, with an emphasis toward old-growth forest remnants. The occurrence of old-growth forest natural land areas, on or near the main part of a university or college campus is rare and difficult to find. There are people actively searching for these old-growth forest areas and the management plans which govern them. In addition, networks of interested professionals and organizations, who are documenting and listing these areas and plans, are forming and growing.

The stewardship of natural land areas often involves strong emotions and controversy, which create issues between managers and community members; this is especially true in the remaining places where old-growth forests occur. Formal processes, which include the formation of advisory councils/committees and management plans, are being developed in order to facilitate the knowledge, communication, and understandings that are required to address disputes, maintain, and restore these valued properties. One plan agreed the idea of an “internal conservation easement” (Zadrozny A., & J. C. Brenner. 2011) as a way to provide protection to the natural land area and allow the college administration to avoid the considerable restrictions, management costs, and transaction fees associated with the placement of the land into a formal conservation easement. As communication and understanding increases, partnerships are formed, thus enhancing the implementation of these plans. These natural land area plans offer a way forward, allowing maintenance and stewardship activities to take place, and may even reflect the pride of community based efforts.

Old-growth forest and natural land area plans include common goals of invasive plant species control, accommodations for public access, safety, ecological health, restoration, education, research, and wildlife habitat maintenance. Invasive plant species control is, by far, the most common concern and is usually listed as a primary objective. Safety, protection,

education, research, and restoration are also listed as major considerations and objectives. Proactive managers include storm response action guidelines in their procedures. Some plans include memorial tree programs and encourage public donations for funding.

The old-growth forest and natural land area management plans that appear to be successful, tend to embrace community participation, find common goals, and forge partnerships. These partnerships assist institutions in maintaining a positive image and provide volunteers who help to maintain and provide appropriate access and even cultural identities for these valued areas. In addition, educational activities embrace and support the natural land areas. In many cases, management activities and plans are administered by an advisory committee comprised of faculty, staff, students, management, and community representation. Some even include an independent environmental consultant. Successful managers stated that networking, building community partnerships, and having diplomatic skills were critical factors for success.

The most successful old-growth forest are professionally managed and usually have some financial structure in place to administer and physically maintain the natural land areas. Managers who embrace positive relationships with community leaders and work in conjunction with them to increase public engagement, increase awareness, and involve community and student volunteers stand out as exemplary in their efforts.

Universities are expanding the processes of community engagement and collaboration. They are perusing these processes, in part, through explorations, activities, and socio-ecological processes of their natural land areas. These natural land areas are being utilized to showcase the general propensity for institutions of higher learning to embrace their dedication to sustainability, attract prospective students, and demonstrate the desirability of their campuses as places to work and learn. These natural land areas serve as examples of positive future orientations and innovations in community partnerships.

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