
ENVIRONMENTAL STUDIES CAPSTONE: ACHIEVING TREE CAMPUS USA CERTIFICATION FINAL REPORT

Introduction

After reviewing the impact of establishing a Tree Campus USA certification on colleges and universities around the nation, the Environmental Studies Capstone group has worked to add Southwestern University to the Arbor Day Foundation's list of national Tree Campus USA members. Over a hundred colleges and universities throughout the United States have made the promise to take steps to improve the health of their campus by maintaining the proper health of their existing trees and creating a "fallow ground" for new ones (Tree Campus USA, 2016). For Southwestern University, the opportunity to foster stewardship within the campus community, effectively implement the Tree Campus USA standards, and raise awareness for tree health and sustainability will also connect the campus with the surrounding Georgetown community and influence future forest preservation. In order to acquire this certification, we have completed all five Tree Campus USA standards, including: creating a campus tree advisory committee; establishing a campus tree care plan; producing a campus tree program with dedicated annual expenditures; hosting an Arbor Day observance; and completing a service learning project.

The Tree Campus USA initiative is a nationwide certification for college campuses through the Arbor Day Foundation. The Arbor Day Foundation is a 501 non-profit conservation and education organization. Founded in 1972 in Nebraska, by John Rosenow, it is the largest membership organization dedicated to environmental stewardship following their mission statement, "we inspire people to plant, nurture, and celebrate trees". The foundation reaches others through their conservation and education programs such as replanting forests habitat and ecosystems, Tree City USA, Tree Campus USA, and Nature Explore Classroom. These programs are supported by members, donors, and corporate sponsors who believe in a healthier and more sustainable world. Specifically, the Tree Campus USA program's mission is to "help colleges and universities around the country establish and sustain healthy community forests" by encouraging "two- and four-year accredited colleges and universities [to] meet five standards developed to promote healthy trees and student involvement" (Tree Campus USA 2016). These standards include creating a campus tree advisory committee that meets annually, writing a campus tree care plan containing informative and concise guidelines, allocating a campus tree program to be recognized each year, and holding an Arbor Day observance and student learning project. The completion of these standards earns the campus recognition as a Tree Campus USA, which is a

certification that shows that the campus is dedicated to creating a more sustainable environment. Out of the hundreds of certified institutions nationwide, Texas alone claims 21 Tree Campus USA certified colleges/universities and now Southwestern University will join this list and in turn will bring prestige, recognition, and a potential increase in campus admissions.

Tree Campus USA at Southwestern University

There are numerous benefits that can be acquired from establishing and maintaining a healthy campus forest. These include:

Carbon Sequestration:

As a result of planting trees, carbon dioxide in the air is reduced because trees naturally sequester carbon dioxide. Trees, like other green plants, use photosynthesis to convert carbon dioxide into sugar, cellulose, and other carbon-containing carbohydrates that they use for food and growth. By doing this, trees are able to store carbon for a very long period of time. Newly planted or regenerating trees can continue to absorb carbon for 20–50 years or more (Salmond et al. 2016).

Health and Recreation:

By creating green spaces and enhancing those that we already have around campus, trees can provide a setting for students, faculty, and staff to relax. Students are shown to respond positively to universities that promote their green spaces and this green infrastructure can also improve the image of the surrounding community (Speake et al. 2013). Having access to green spaces can reduce health inequalities, improve well-being, and aid in treatment of mental illness. Some analysis suggests that physical activity in a natural environment can help remedy mild depression and reduce physiological stress indicators.

Campus Aesthetics:

The quality and condition of the trees at Southwestern University is the first impression projected to campus visitors. Trees add beauty to their surroundings by adding color to an area, softening harsh lines of buildings, screening unsightly views and contributing to the character of their environment (Speake et al. 2013). Trees planted along and around buildings provide a distraction for the eye, enhancing the foreground and screening unsightly views. In addition to simply improving the health and beauty of the physical environment, the values of a sustainable university will be promoted as a result of the physical enhancements. In becoming a Tree Campus USA, Southwestern University will be benefitted not only as to the university's longevity, but will also serve as a draw for the city of Georgetown.

Achieving Tree Campus USA Membership

Collaborating with various Southwestern and Georgetown community stakeholders, including members of the physical plant, Good Water Master Naturalists, and a local arborist, the Environmental Studies Capstone worked over a period of four months to complete the following five standards.

Standard 1: Tree Advisory Committee

A Campus Tree Advisory Committee comprised of members representing the diverse audience of those with a stake in our campus trees has been established and will meet regularly in the future.

This committee includes a representative from each category:

- Student
- Faculty
- Facility Management
- Community

The Environmental Studies Capstone group has achieved this standard by establishing the group as part of the existing Southwestern University Sustainability Committee. This committee is made up of undergraduate students, facility management representatives, and faculty. The new Tree Advisory committee will also include community members such as Chris Doleva, a contracted arborist used by the university already.

While responsibility for the campus trees ultimately lies with Southwestern University's facilities department, the Campus Tree Advisory Committee's purpose is to assist in providing guidance for future planning, approving our comprehensive campus tree care plan, educating the campus population on the benefits of our campus trees, and developing ways to reach out to the Southwestern community and beyond in the future.

Standard 2: Campus Tree Care Plan

As defined by Tree Campus USA, a Campus Tree Care Plan should be flexible enough to fit the needs and circumstances of our campus specifically. The Tree Care Plan should be goal oriented and provide the opportunity to set policies and clear guidance for planting, maintaining, and removing trees. The plan also provides education to the campus community, contractors, and consultants about the importance of protection and maintenance of trees as part of the growth and development of our campus forest.

In order to create the tree care plan specifically for Southwestern University, our group initially reviewed and borrowed from the tree care plans of other peer universities (St.

Edward's University 2016, Texas State University 2016, Sam Houston State University 2015) as well as aspirational example institutions (Virginia Tech 2010 and Georgia Tech 2009). We then met with important stakeholders on campus in order to discuss the current arboricultural practices that are followed for our campus, which was a first for our institution. We then consulted with the contracted arborist that Southwestern uses for tree care, Chris Doleva, in order to compile the rest of the plan according to his recommendations for our area. Now that the plan has been approved, it will be annually reviewed by the Tree Advisory committee and its practices will be carried out on campus in the near future.

Standard 3: Campus Tree Program with Dedicated Annual Expenditures

In order for a college campus to be designated a Tree Campus USA, it must allocate finances for its annual campus tree program on a yearly basis. Evidence should be shown that an annual work plan has been established and that expenditures dedicated towards that work plan have been accounted for. It is suggested by the Arbor Day Foundation (but not mandatory) that campuses work towards an annual expenditure of \$3 per full-time enrolled student. The Environmental Studies Capstone approached this standard with a proposed budget for the university under the guidance of Shorty Schwartz, Manager of Facilities and Maintenance Operations at Southwestern University, and Mike Miller, Associate Vice President of Facilities Management for Southwestern. This budget included a start-up budget to include necessary tools and equipment that we need immediately as well as an annual budget that allocated for annual contractor pruning and tree planting among other items. After a series of meetings and refining, the Environmental Studies Capstone finalized a proposed budget for Craig Erwin, Vice President of Finance and Administration for Southwestern, to review and approve.

Standard 4: Arbor Day Observance

Tree Campus USA defines an Arbor Day observance as “a golden opportunity to educate the campus community on the benefits of the trees on their campus property and in the community”. In order to provide an enjoyable educational experience for students, faculty, staff, as well as outside community members, the Environmental Studies Capstone met this standard by hosting a Campus Tree Tour on Monday April 24th 2017.

This event was led by Ben Nava, who currently works in the Physical Department at Southwestern University as the Lead Groundskeeper, as well as horticulturalist, municipal arborist, and Good Water Master Naturalist, Rachel Hagan.

Rachel provided information about the different types of trees, such the history of the pecan as our state tree; as well as general information about the importance of tree health for our campus environment. She also assisted in tree identification on campus for the Southwestern University Inventory. Ben discussed Native American usages of trees, such as utilization of red oak, and cedar elm. He also discussed edible plants on campus and the

spiritual significance of specific trees, such as the Cottonwood. There was a turnout of between 50-75 students, faculty, and outside community members. We hope that the participants will actively use the information gathered at the SU Tree Tour in the future, especially in relation to the well-being of our campus forest.



Rebecca introduces Rachel Hagan



Ben Nava and Rachel Hagan lead the Tree Walk on April 24th



Rachel and Ben talk to the crowd about the Bradford Pears



Rachel discusses the underground root system of Live Oak trees underneath the “Mushroom Tree” (Live Oak behind the library)



On the main lawn, Ben and Rachel educate the campus community about Sycamore Trees.



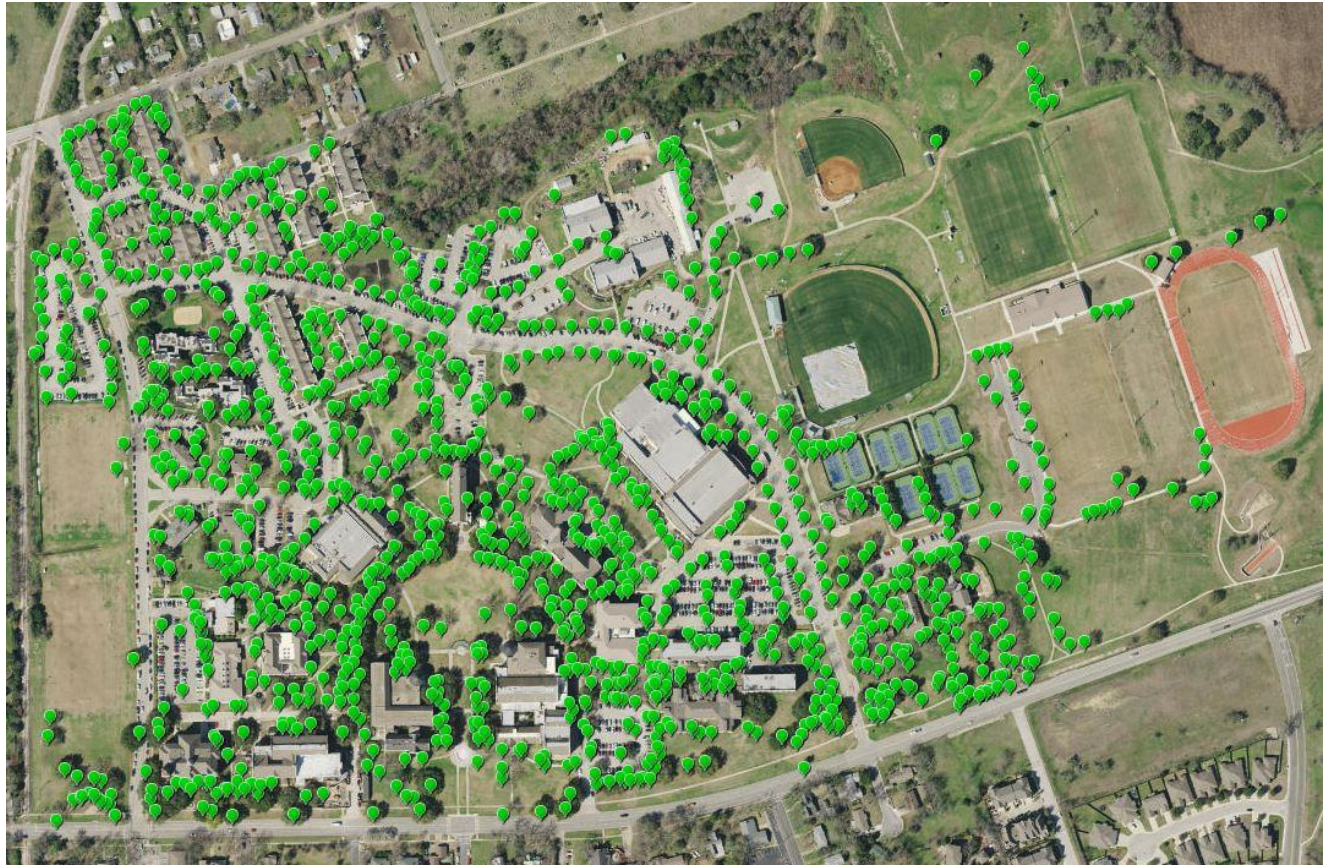
Over 50 students and community members attended

Standard 5: Service Learning Project

In the spirit of the Tree Campus USA initiative, the Service Learning Project provides an opportunity to engage the student population at Southwestern University with projects related to trees. The Environmental Studies Capstone met this standard by creating a Tree Inventory for Southwestern University's maintained campus through GIS software, with the help of fellow GIS student, Caitlin Schneider ('17).

The Tree Inventory was conducted through ArcGIS using the Collector App in which we downloaded a map of Southwestern University. The Tree Campus USA Capstone collectively compiled the location and species of trees on the maintained area of campus with identification help from Master Naturalist Rachel Hagan as well as Central Texas Tree Guides. The Collector App uses GPS tracking, allowing the user to document the latitude and longitude coordinates of objects (trees in this case) nearby. The inventory is linked to a public ArcGIS map, and has been converted into an interactive web application that allows anyone to view species types, distribution, and other useful functions. This inventory will be utilized by Physical Plant in the future, provided that they edit and keep track of all trees on campus. They will be able to account for trees cut down as well as new trees that are planted. For the first time in 175 years, Southwestern University has a functioning and accurate tree inventory, and it is available to the public. Future recommendations for the utilization of this inventory include adding measurements for tree width/height as well as analyzing and recording tree health for each tree.

Below is a map of the over 1,500 trees that we recorded on the maintained Southwestern University campus:



Some ideas for future service learning projects that our capstone group has compiled for future use include:

- Tree Plantings in correlation with The Big Event or Family Day
- Removal of invasive Ligustrum on campus
- A reception to honor Tree Board members in the community
- Creation of future classes about tree biology/care/identification

Southwestern University



Conclusion

As detailed in this document, establishing a maintained campus forest can provide a multitude of benefits for the campus and the surrounding environment. Along with physical ecosystem services like carbon sequestration, decreased erosion, and wildlife habitats, many social factors can also be gained from a sustainable landscape such as increased outdoor recreation, improved mental health, and expanded awareness about the ecoregion. Taking these benefits into consideration, becoming a Tree Campus USA will not only serve the school well in the present, but it will serve as a catalyst for the development of practices to increase environmental well-being and efficiency in the future.

In addition to the inherent benefits associated with planting trees, Tree Campus USA certification brings recognition to the campus community, promotes sustainability, and ensures proper procedures for managing the campus trees. Once people become involved in Tree Campus USA, they are likely to become educated and involved in the sustainable practices that are being promoted on campus and may also develop a greater sense of identity with the environment at the school. In their article, Zhaofang et al. support this claim

by stating the impact campus landscapes have by “[serving] a key role in university identity” (2016, 47). These kinds of activities can initiate and create better attitudes about environmentally responsible behaviors in students and may motivate them to advocate for the environment in the future.

For the past ten years, universities have been incorporating new programs that promote sustainable ways of thinking into their curriculums. For instance, Stewart (2010) describes in his article that liberal arts institutions, in particular, have a unique culture in which to create individualized opportunities to “approach sustainability from every social, cultural, political, and artistic angle” in order to develop “broad, creative, and critical ways of thinking about local and global issues” (2010, 2). A focus on sustainability can inspire students to advocate for the environment. Universities across the United States have begun taking steps to educate their residential bodies (students, faculty/staff, and administration) about environmental sustainability. As a result, integration of environmentally conscious infrastructure as well as environmentally sustainable landscapes and green spaces can be achieved (Zhaofang et al. 2016; Lawrence 2012; Parker 2007). Additionally, having a campus that is interested in becoming more environmentally sustainable further perpetuates an increasing awareness of other environmental concerns within the community. The education of present and future generations secures the lasting vitality of individual tree populations, which all serve an important role within their ecosystem. With the involvement of the students, the school itself can better serve as an agent for environmental stewardship and advocacy in the community.

By becoming certified as a Tree Campus USA member, Southwestern University can garner several positive results including education and awareness about campus trees for future classes as well as expectations of sustainability. Establishing proper maintenance precedents for the trees on campus will be beneficial because this sort of structure has never been previously implemented at our institution. In completing the requirements that are necessary to receive a Tree Campus USA designation, the hope is that Southwestern University will be able to maintain a sustainable and healthy campus forest. With the completion of this capstone project, our group has laid a foundation for Southwestern that can be expanded upon in the future. The university has made a promise to keep up with the environmentally conscious plan that has been established and to involve the community in all of the standards that have been met. Students on campus will now be able to become involved in decision making about our campus trees and their care. Southwestern is now on track for becoming a certified Tree Campus and once our application is approved we will be notified in March of 2018. The hope of this capstone group is that Southwestern University will be able to serve as a model for other institutions in the future, as our goal is to make this report, our tree care plan, and our interactive tree map accessible via the school website. Overall, the Tree Campus USA certification as a whole will effectively and positively impact the Southwestern University campus as well as the Georgetown community.

Works Cited

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