

Urban Forestry Sustainability and Management Audit



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Summary

Agnes Scott College's urban forest has been recognized as a very important asset to the college. It supports both the college's core mission and sustainability goals, as well as contributing to its widely recognized aesthetic appeal. In order to ensure that the college derives maximum benefit from its efforts to care for its trees, the Agnes Scott Arboretum Advisory Committee requested that the U.S. Forest Service partner with the college on an audit of every aspect of the campus urban forest's management, from policies to budget to program execution. This process also allowed the U.S. Forest Service to beta test an Urban Forestry Sustainability and Management audit system (process and program audit worksheet) to be employed by other college campuses and local government urban forestry programs across the United States. The partnership resulted in this campus Urban Forestry Sustainability and Management Audit (the "audit").

Key findings of this audit show that the campus urban forest is home to significant green assets, which provide many benefits to the college, from ecosystem services to aesthetic appeal, and that these assets have been under systematic care based upon the recommendations of a qualified certified arborist. The audit also demonstrates that the college lacks a cohesive, encompassing policy codifying its intended approach to maintenance of its urban forest. As a result, management of the urban forest is inconsistent, and maintenance is performed largely on an as-needed basis. The lack of this cohesive policy results in frequent disconnects between on-the-ground work, managerial decisions, and standing guidance documents.

This report renders a series of recommendations which, if accepted, would clarify Agnes Scott College's approach to managing this valuable resource in a way that would insure its long term health and sustainability, reduce risk, and enhance its educational value, while at the same time maximizing its appeal to students, alumnae, and the larger community.

Process

Auditing is a systematic and independent examination of data, statements, records, operations and performance of an organization for a stated purpose. The audit team collects and evaluates evidence related to the stated purpose of the audit, and communicates the evaluation through an audit report. The following report and recommendations are intended to provide program direction to Agnes Scott College that raises its level of professionalism in urban forest management, optimizes this management for ecosystem services, and increases the health of the green assets managed by the program.

This audit was conducted over a seven-month period (January-July 2014) by a team led by the U.S. Forest Service, and comprised of Agnes Scott faculty, students, and staff, including the campus' consulting arborist. The audit began with a *discovery phase* where the team collected any and all discoverable documents pertaining to maintenance and management of the urban forest or its relationship to other campus elements. These documents were then sorted through a matrix (Appendix 3) that conformed with elements on the Urban Forest

Management and Sustainability Checklist (Appendix 2B). Sorting and review of these documents enabled the team to identify the degree to which elements were met, or missing, and informed the *initial discussion phase*. During this phase, the audit team met face to face to review the discovery documents in terms of the potential findings, identifying key questions, implications and consequences of this information. The initial discussion phase was followed by a green asset evaluation phase, where the audit team conducted a walking tour of the campus, examining the condition of the urban forest (tree health, diversity, presence of risk) and management indicators (evidence of application of best management practices). This evaluation is outlined in Appendix 1. An *interview phase* then followed, where college administration and staff were asked some of the key questions that arose during audit team discussions. The purpose of this phase was to seek clarification and validation of emerging issues. A *final discussion phase* followed the interview phase, where findings of the green asset evaluation and interview phase were discussed, along with their relationship to the findings of the discovery phase. The discussion in this phase resulted in the development of a series of major findings and recommendations, as explained further in the report. Tabulation of the Urban Forestry Sustainability and Management Audit Checklist resulted in an overall rating which is discussed below.

Urban Forestry Sustainability and Management Audit Checklist Rating

The audit checklist encompassed the following four broad topics accounting for 11 categories of competency in urban forest management, each of which was itself comprised of multiple components (see Appendices 2A and 2B):

Operation

- Policy and Ordinances
- Professional Capacity
- Funding & Accounting
- Authority

Planning & Practice

- Inventories
- Urban Forest Management Plans
- Risk Management
- Disaster Planning
- Practices (Standards & BMPS)

Relationships

- Community (Internal & External)

Outcomes

- Green Asset Evaluation (Soil, Trees)

In the attached checklist (Appendix 2B), Agnes Scott College is evaluated according to these standards. If the audit team found evidence indicating some level of competency in a

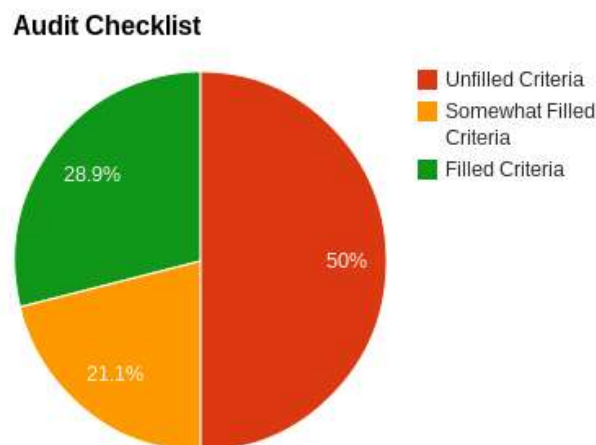
category or subcategory, it is indicated by a check (scored as 1), a check minus (scored as ½), or check plus (scored as 1½). If there was no action or level of competency noted, the category was left blank (scored as 0). The summation of checks, minuses, and pluses has been used to establish the “score” for each category.

Note that the components indicated as “standard of care” relate to a basic level of management that addresses Agnes Scott College’s fundamental duty of care (i.e. its legal responsibility). Components indicated as “core competencies” represent an expanded level of urban forest management performance or accomplishment. Proficiency in these areas would move the management program to a higher professional level that should improve the overall health of the urban forest and maximize ecosystem services. The following chart summarizes the assessment of program strengths and weaknesses:



As indicated on p. 9 of the Appendix 2B, Agnes Scott College’s total score on all competencies is **29.5, out of a possible 91 points**. The college scores **3.5 out of 23 possible points in core competencies** and **3.5 out of 14 possible points in standard-of-care competencies**.

This pie chart captures, in broad outline, the college’s proficiency in urban forest management:



A summary of the audit team’s evaluation of Agnes Scott College’s urban forestry sustainability and management is as follows:

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✓ Level One	Meets prerequisites for classification as an urban forest. Needs improvement in multiple areas to achieve minimal overall competency
<i>Level Two</i>	Meets minimal level of overall competency, notwithstanding multiple opportunities for improvement within individual categories
<i>Level Three</i>	Exceeds minimal level of overall competency, with commendable performance in some individual categories
<i>Level Four</i>	Greatly exceeds minimal level of overall competency, with best-in-class performance in several individual categories

Commendations

Professional capacity

For at least the last two decades, the Agnes Scott College campus has benefited from the expertise of an ISA-certified arborist serving in a consulting capacity. Contract arborist and urban forester Dudley Hartel has been committed to the maintenance and continual reshaping of the Agnes Scott College urban forestry management program, in capacities ranging from direct on-the-ground treekeeping to campus-specific research, planning, and advice. Hartel holds a BS in Forest Management from Michigan State University and a Masters of Forest Management from Clemson University. His urban forestry experience is the result of 30 years of work as an urban forestry consultant in the southeast. He became a Certified Arborist in 1992 and Tree Risk Assessment Qualified in 2013.

Retention of a single dedicated arborist who is particularly familiar with and devoted to Agnes Scott College’s signature treescape, is a practice to be valued and carried on. The audit team’s on-site evaluation of the campus’s trees and landscaping provided ample evidence of Hartel’s impact and his collaborative working relationship with the Office of Facilities. Hartel’s dedication to and care for campus forestry has proven to be a significant contribution to the integration of Agnes Scott College’s built and natural environments, and thus a key component of the campus’ historic and consistently recognized beauty.

Standards and Best Management Practices

Both discovery phase and the green-asset evaluation phase of this audit has revealed that with the substantial assistance of its consulting arborist, Agnes Scott College has been successful in following some standards and BMPs in certain aspects of its tree management. These include well-planned and executed tree plantings, pruning, and risk assessment. Notably, the Campus Master Plan from 1998, updated in draft format in 2003, acknowledges the importance of the urban forest and includes standards for design that specifically require trees and provide guidance for tree placement. The college is to be commended on these achievements, but the team has reservations and recommendations in this category, as will be discussed in the section Findings and Assessment below.

Community Relationships

The Agnes Scott Arboretum has clearly been a major step forward for the college in securing the interest and support of the wider community for its historic and beloved campus forest. For many years, Agnes Scott College has garnered praise and appreciation from the college community and Decatur. Now, with the benefit of computer technology and external recognition from such entities as the Morton Register of Arboreta's ArbNet certification program, Agnes Scott College's trees have new admirers nationally, and even worldwide. The college can have a reasonable expectation that support for and interest in its urban forest will continue to grow.

Also commendable are Agnes Scott College's programs of allowing faculty and staff to select a tree planting to honor their long service to the college, the designation of Agnes Scott College as a Tree Campus USA, the long history of observing Arbor Day, activities such as the sponsoring of natural invasive removal by Ewe-niversally Green's sheep and goats, student and faculty tree plantings in partnership with Trees Atlanta, regular Community Day mulching projects, and this audit itself, carried out in coordination with the U.S. Forest Service.

The team also noted some use of the campus forest as an educational laboratory. The resource is currently used occasionally, both in expected ways as the subject of scientific research and student art and as a setting for non-traditional classroom experiences.

Green Assets

Agnes Scott College's urban forest is home to significant green assets, which provide many benefits to the college, from ecosystem services, to monetary value, to aesthetic appeal. See Appendix 3A for full documentation and explanation of the Green Asset Evaluation findings, and Appendix 9 for an overview of campus ecosystem services.

Findings and Recommendations

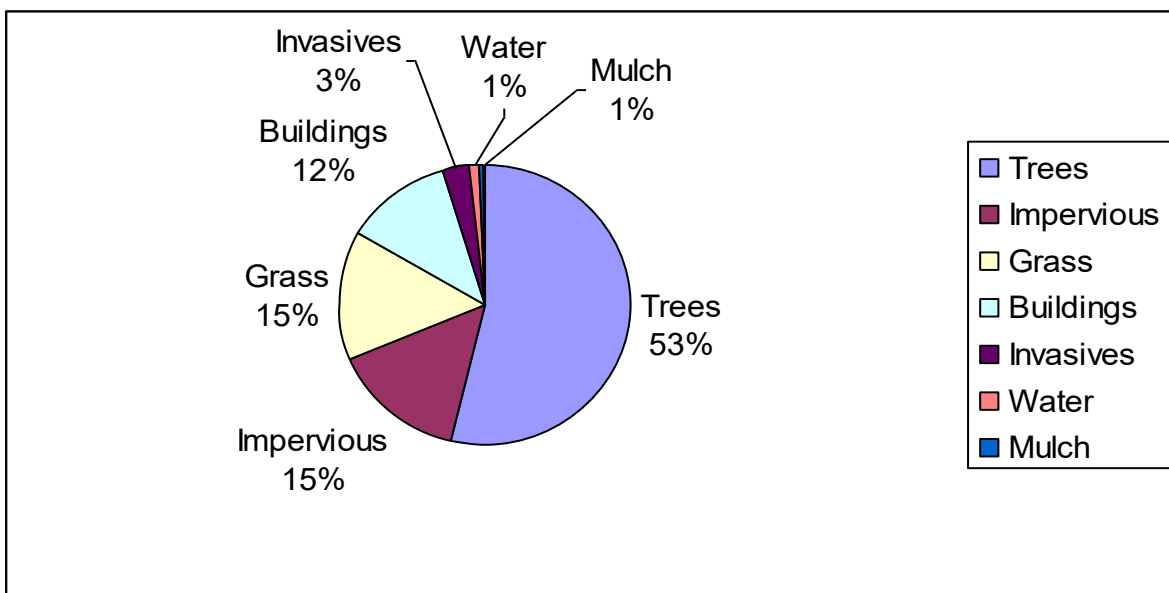
Program Documentation- Findings

The discovery process of this audit involved the collection of any and all documentation related to the Agnes Scott College campus trees and their management. These documents were acquired from a variety of sources, including the campus consulting arborist, the sustainability director, and the Arboretum Advisory Committee.

The audit team's experiences during the discovery process suggest that Agnes Scott College can derive substantial benefit from investment in and improvement of its program documentation. It appears that no central archive of documents exists. Some documents referenced in others and sought by the audit team were never located, while other information was shared only anecdotally -- to take one example, information relating to specific practices, such as memorial and honor trees. An archival process will insure continuity in campus tree management through inevitable changes in administration, practitioners, and Arboretum Advisory Committee leadership, and create a lasting legacy and history of the campus trees and their management. Continual assurance of management efficacy is best achieved through knowledge of past practices and management capabilities.

The audit team also noted the absence of a current geospatial representation of the campus urban forest that documents specific information about tree location, maintenance, protection and potential impact from other activities on campus. The team itself conducted a basic canopy assessment. On June 26, 2014, team member Kimberly Reeves conducted a canopy analysis using Google maps aerial photography and a tool called i-Tree Canopy. 500 data points were plotted campus-wide, resulting in the following data set:

Agnes Scott College Canopy Coverage



This coverage is consistent with previous canopy coverage analysis done in 2010 resulting in 50% tree canopy. It should be noted that the Agnes Scott College canopy is slightly higher than the surrounding average canopy in the City of Decatur, which is currently measured at 46%. Full tree canopy information can be found in Appendix 6, and a tree inventory for ecosystem services in Appendix 9.

Program Documentation- Recommendations

- A. Develop a campus arboretum archive to house all documentation related to management, planning, mapping, inventories, policy, budgeting and correspondence. Establish a protocol for maintenance of this archive.

- B. Establish and maintain with regular updates a geospatial representation of all trees in the campus urban forest (a tree inventory) to document specific information related to their location, maintenance, protection and potential impact from other activities on campus. Include campus buildings and infrastructure to prevent unnecessary interference between these systems. Use GIS (Geographic Information System) software to capture, manage, and analyze such information on the campus urban forest. (See Appendix 5C).

Cohesive Campus Urban Forest Policy- Findings

Having consistent, reliable guidance systems in place is vital to the maintenance and efficient use of resources within an urban forestry program. At Agnes Scott College, a cohesive, well-articulated approach and protocol towards managing the campus urban forest (i.e., campus-wide policy) is lacking. Instead, management decisions are made on an as-needed basis, without an established system of prioritization or a clear line of authority. Moreover, there is no clearly defined role for the Campus Arboretum Advisory Committee.

The Campus Master Plan was adopted in 1998, and revised in draft format in 2008. In accordance with the college's Tree Campus USA Certification in 2012, Agnes Scott College also adopted an official Campus Tree Care Plan and accompanying policy. While this master plan and tree care policy appears to be followed in spirit, there are indications through our on-site evaluation of the campus that on-the-ground practices are often in conflict with elements of the plan. In addition to this failure to consistently follow the plan's best management practices (BMPs), the college has not updated the BMPs to reflect scientific advances and current practices.

The audit team regrets the lack of a clearly-stated, driving vision statement or statements for urban forest management at Agnes Scott College. Such a vision statement could and should guide the development, articulation, and implementation of a cohesive campus urban forest policy.

Of particular note is the opportunity to build campus tree policy around critical contemporary issues, such as natural disaster preparation and response, risk management, campus tree resilience, sustainability planning, and climate change. Finally, a cohesive, guiding

campus tree policy could enhance the integration of educational opportunities and community outreach as this relates to Agnes Scott College's urban forest.

An authoritative cohesive campus tree policy would allow management continuity through changes in administration. As the process stands now, there is no way to ensure that current practices will continue to be upheld, as they are not reinforced by established policy.

Cohesive Campus Urban Forest Policy- Recommendations

- A. Convene a campus urban forest planning task force comprised of the Arboretum Advisory Committee, sustainability director, administration and leadership, students, and alumnae.
- B. In coordination with the task force defined above, draft a guiding vision for the Agnes Scott campus forest. The task force should then produce a unified, *authoritative* campus urban forestry policy that reflects and supports this shared vision for its urban forest. The policy should define campus canopy goals, establish a protocol for management decisions and communication, and produce plans for every aspect of urban forest management. These plans should include tree protection (see Appendix 5E), disaster recovery planning, risk management, program relevance to sustainability goals, and community outreach and education (see Appendix 5A). Incorporate state-of-the-science best management practices.
- C. Coordinate the vision, policies and plans for tree protection with the City of Decatur's Planning Department in order to confirm the college's best approach to compliance with the Decatur Tree Ordinance (adopted July 2014).

Funding and Accountability- Findings

The discovery phase of the audit provided little to no disclosure as to the annual budgeting process, contingency budget processes, funding based on community attributes (funding per campus capita), an urban forest line item, or asset evaluation and accounting.

The interview phase has confirmed that there is no specific urban forest management line item. In lieu of such a line item, funding is disbursed from a general facilities budget to support tree planting, pruning, and removals. This practice reinforces the impression that management occurs largely on an as-needed basis and that there is inadequate effort to establish long-term priorities. The presence of a carefully considered forest management line item would help to ensure that funds are being used efficiently, and that proper attention to ecosystem welfare does not occur at the expense of fiscally responsible management, or vice versa. A thoughtfully developed budget will provide incentive for such preventive tree care practices that lead to more balanced costs in the long term.

Funding and Accountability- Recommendations

- A. Allow the planning process outlined above in section B of the Campus Urban Forest Policy recommendations to inform the development of a specific campus tree line item in the college's annual budget, based on critical priorities and long term goals in support of management and sustainability of the resource. (See Appendix 5D.)
- B. Incorporate inventory-based "asset thinking" into the urban forest management and budgeting process to establish values for the green asset, guide maintenance and management prioritization, encourage resource protection, and enhance fundraising.
- C. Engage alumnae of Agnes Scott College through their personal relationships and experiences with trees on campus, in the development of a working green asset fund to support campus urban tree management. Enable and encourage Agnes Scott College partner organizations and friends of the college to participate in such programming (see Appendix 5D).

Closing

Agnes Scott College's mission is to educate women to think deeply, live honorably, and engage the intellectual and social challenges of their times. Its care for the urban forest should reflect and support this mission. Since environmental conservation, climate change action, and ecosystem protection are among today's greatest challenges, it is imperative that the college be a responsible steward of its urban forest, both to meet these challenges and to ensure that its students are aware of and participating in positive sustainable action. The best way to accomplish this is by properly caring for the urban forest, and managing it in such a way as to facilitate its integration into a dynamic liberal arts and sciences curriculum.

Moreover, proper management of the urban forest is the college's only practical means of protecting and even enhancing one of its most valuable assets. The trees on campus provide precious ecosystem services, including lowering energy consumption, reducing stormwater runoff, and improving water and air quality. As noted above, they offer a natural classroom and laboratory for faculty and students. Not least, the simple beauty they contribute to the campus landscape is a significant part of the campus' widely acknowledged aesthetic appearance, which is, undoubtedly, an important factor in some prospective students' decision to enroll.

In order to maintain this valuable and beloved resource, Agnes Scott must make some adjustments in its urban forestry management. The college clearly has good intentions in regards to this program, and within the limits of existing policies, practices, staffing, and budget, Agnes Scott has achieved a great deal, as the audit team hopes that it has made clear in the report. Still, the lack of a well-articulated vision for the college's campus forest, together with a cohesive set of policies that implement that vision, hinders the staff and consultants who are charged with managing Agnes Scott's green assets. Currently, as determined by this audit, the Agnes Scott urban forestry program has a Level One rating. However, if the described

recommendations are successfully implemented by the college, and program deficiencies are properly addressed in coordination with the information provided in this report, the college would be able to achieve a Level Three rating, a vast improvement. Producing a set of clearly-defined policies, driven by a guiding vision, would promote excellence in urban forestry management, help to lower maintenance costs over time, and extend the feeling of ownership of the campus forest to faculty, staff, students, and alumnae.

Long-term sustainability requires continuity and a cohesive approach to management, and the forest's value will only increase with proper care. Because of the college's laudable commitment to sustainability, and its core liberal arts values, Agnes Scott stands to gain much from an improved urban forestry program.

Glossary

Urban Forest- A forest or collection of trees that grow within a city, town, campus, or other urbanized space.

Arboretum- A botanical garden devoted to trees.

Ecosystem Services- The ways in which humans benefit from functioning ecosystems. Some relevant ecosystem services include stormwater diversion, natural cooling and shade, and air purification.

Green Infrastructure- The network providing services and structures for solving urban and climate challenges by building with nature.

Best Management Practice- A method or technique that has consistently shown results superior to those achieved with other means, and that is used as a benchmark. Particularly within stormwater management practices.

Tree Care Policy- A guideline of procedures for proper tree care and management. See <http://www.isa-arbor.com/education/onlineResources/treeOrdinanceGuidelines.aspx> for more information about properly developing and evaluating tree care policies.

Risk Management- The identification, assessment, and prioritization of risks followed by coordination and application of resources to minimize and monitor the probability and impact of unfortunate events. In the context of urban forestry, this mainly refers to the potential dangers of falling trees, branches, etc.

