THE UNIVERSITY OF THE SOUTH, SEWANEE, TENNESSEE

2012 Domain Strategy White Paper

Natural Resources Advisory Committee

May 2012

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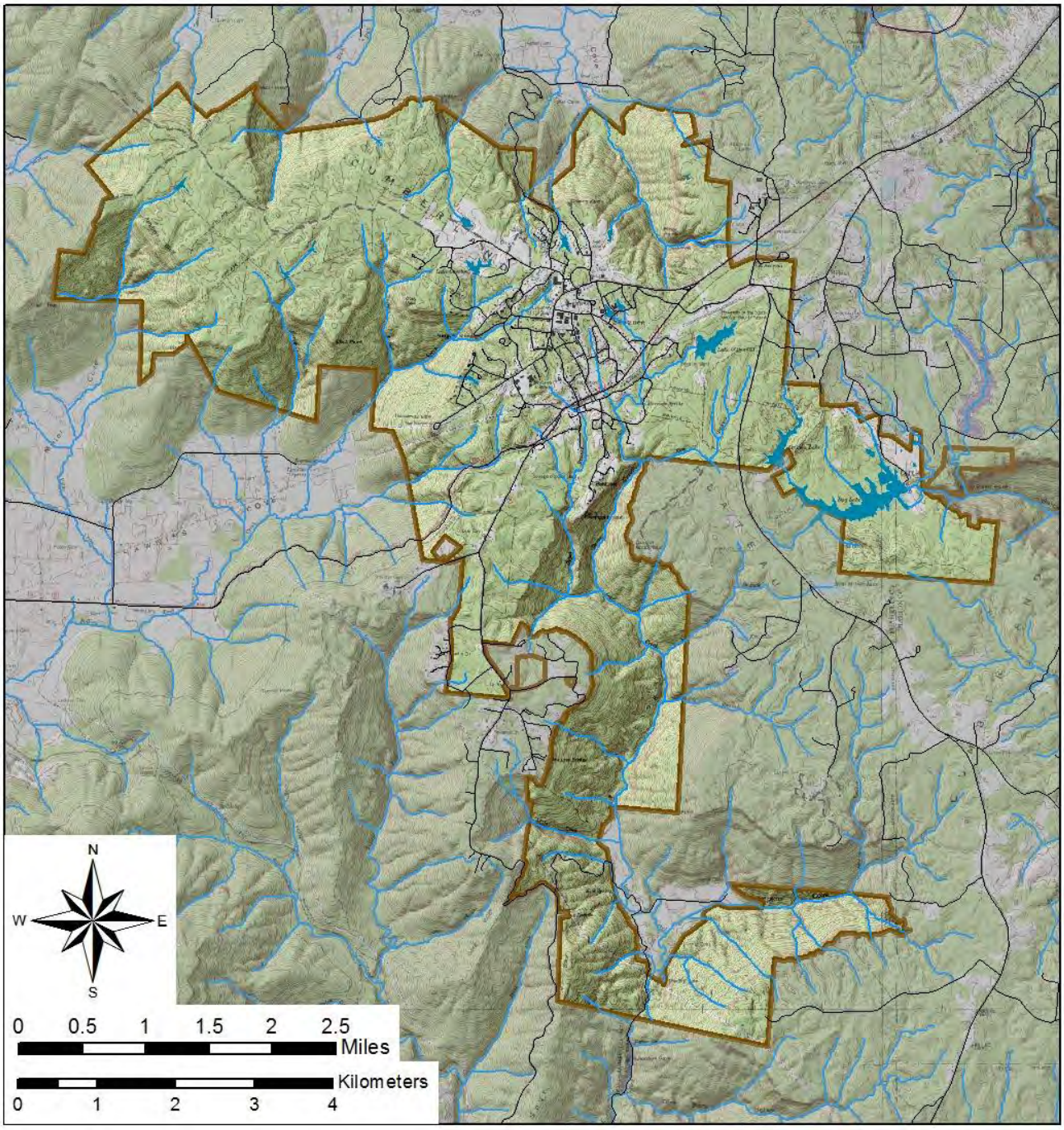

The Domain: Sewanee's 13,000 acres

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Foreword

In October 2010, an expanded Natural Resources Advisory Committee sought to shepherd a new Domain Management Plan. A smaller, multidisciplinary group, called the Domain Planning Working Group and consisting of one faculty member each from biology, forestry, and environmental studies, as well as the Sewanee Outing Club Director, the University Archaeologist, one student each from Biology and Forestry, and the Domain Manager, who chaired the group, spearheaded progress. The group met for Domain walks to discuss approaches to planning in the context of specific sites.

In the fall of 2011, the Natural Resources Advisory Committee began meeting more regularly, and nearly weekly, to discuss principles, procedures, and planning, and the Committee constituted four additional small groups to assess four sites on the Domain. From the reports of these four groups the Committee sought to learn not only about the sites, but the extent to which history and current data can be gathered in a feasible and timely manner, and how these can be used to set out, in a preliminary way, guidance for projects on the Domain.

In the spring of 2012, the Committee approved new procedures for management proposals and considered again the challenge of specificity in a Domain Plan. On one hand, the Committee reached a set of goals for the Domain, and on the other hand, the Committee recognizes that every proposal will be different, meeting different goals to different degrees, and must therefore be individually considered before approval and implementation. Still, the Committee sought to articulate some form of additional guidance—whether spatially explicit or otherwise—beyond the set of overall goals, in order to shape the use of the Domain over the next several years. The Committee agreed that further work would be necessary to produce such a document.

The Natural Resources Advisory Committee is grateful to all those who contributed to the document, whether directly or indirectly, and especially those who set the project in motion by drafting and seeking approval of the 2008 Strategic Planning Addendum on Environmental Education and Sustainable Living. We are grateful as well for all those who, over the University's long history, have served as stewards of the Domain.

Section I: Purpose

Preamble

The purpose of a liberal education is to develop the whole person in those disciplines that increase knowledge, understanding, and wisdom. At Sewanee, a liberal education is pursued in a close community of inquiry and experience which recognizes the essential connection between the human community and the ecosystems upon which it is dependent. As a liberal arts university with one of the largest landholdings in the country and a goal of land management for "education," the University of the South has a unique mandate. Our management should simultaneously demonstrate and explore the latest in scientific knowledge of conservation, while cultivating an intellectual curiosity for why and how our culture interfaces with the natural world. As we explore how sustainable resource management can be implemented, we should also explore how current and past practices impact our ecosystem, our neighbors, and our world.

The 2008 Strategic Planning Addendum for Environmental Education and Sustainable Living states that the Domain and campus management shall support the policies, practices, and management to serve as learning opportunities in the curricula of the University. In addition, the addendum recommends an inclusive planning process focused on conservation and appropriate use of natural resources, as well as the restoration of areas previously subjected to environmental damage with special attention given to the immediate environment of the historically underprivileged parts of our community.

The ultimate goal of this White Paper is to set forth a guiding vision for Domain management. In this document, we do not identify or suggest specific management interventions, but we set out goals for the use of the Domain as well as a process by which management activities can be proposed and reviewed before implementation. We also outline expectation for annual goal setting and reporting for the Domain Manager and the Natural Resource Advisory Committee.

Vision

The University of the South envisions a Domain where the imprint of human existence is interwoven into the fabric of the natural world. Our relationship with the ecosystem is interdependent, so we are consumers as well as cultivators. To that end, management should promote ecosystem resilience and biodiversity across the landscape, recognize humanity's material necessities, and cultivate a reverence for the world that celebrates God's role for us as stewards of our natural environment. To achieve this vision of Domain management, we will adopt the following goals and values to guide our actions over the next ten years.

1. Manage habitats to enhance, protect and promote biodiversity across the landscape.
2. Foster ecological communities that can be resilient in a changing climate.
3. Consider management to increase net carbon sequestration.
4. Employ adaptive management in a contemporary and exemplary fashion using the best available science and monitoring data.
5. Integrate management into the curriculum so that student involvement is encouraged in all steps of the process from planning to implementation.
6. Encourage cross disciplinary research and provide locations and logistical support to ensure that long-term research is protected.
7. Ensure that management increases the total value of the forest (economic and ecological) over time.
8. Protect culturally significant sites proactively.
9. Focus areas of future development toward the central core of campus and village.
10. Cultivate conversation about the balance between preservation and resource conservation on the Domain and minimize the burden of production on other communities.
11. Recognize that students of all disciplines can learn and understand the consequences of society's natural resource consumption through responsible active management of Domain resources.
12. Support student recreational use of the Domain and integrate the academic program with outdoor opportunities.
13. Demonstrate a sustainable flow of natural resources that can be utilized directly on the Domain where appropriate (e.g., lumber, biomass, sandstone, meat) and which offsets consumption of the University where appropriate (i.e., paper, coal, natural gas).
14. Maintain a transparent communication process where all stakeholders are involved or well informed of management and research activities on the Domain.
15. Utilize capabilities of GIS technology to spatially organize historic and current Domain resource data in a format that is readily accessible and promotes interdisciplinary use of the Domain.

Section II: Environment

The Domain of the University of the South comprises approximately 13,000 acres located on the southern Cumberland Plateau in Franklin and Marion Counties, Tennessee, and this property is divided into 40 compartments for management purposes (Figure 1). The Domain is located close to the Franklin State Forest, the Nature Conservancy's Carter Property, and several state protected areas. The property is a key component of land conservation in the South Cumberland region (Figure 2).

The land holdings of the University of the South are highly diverse and home to over 1,000 species of plants identified to date *(Sewanee Herbarium 2012)*. This diversity is due to a number of factors: the geographic position on the continent, the varied topographic relief, parent materials, soils, and history of land use. The Tennessee Wildlife Resources Agency lists five of the six habitats most associated with wildlife species of greatest conservation need as occurring, or having historically occurred, on the Domain.

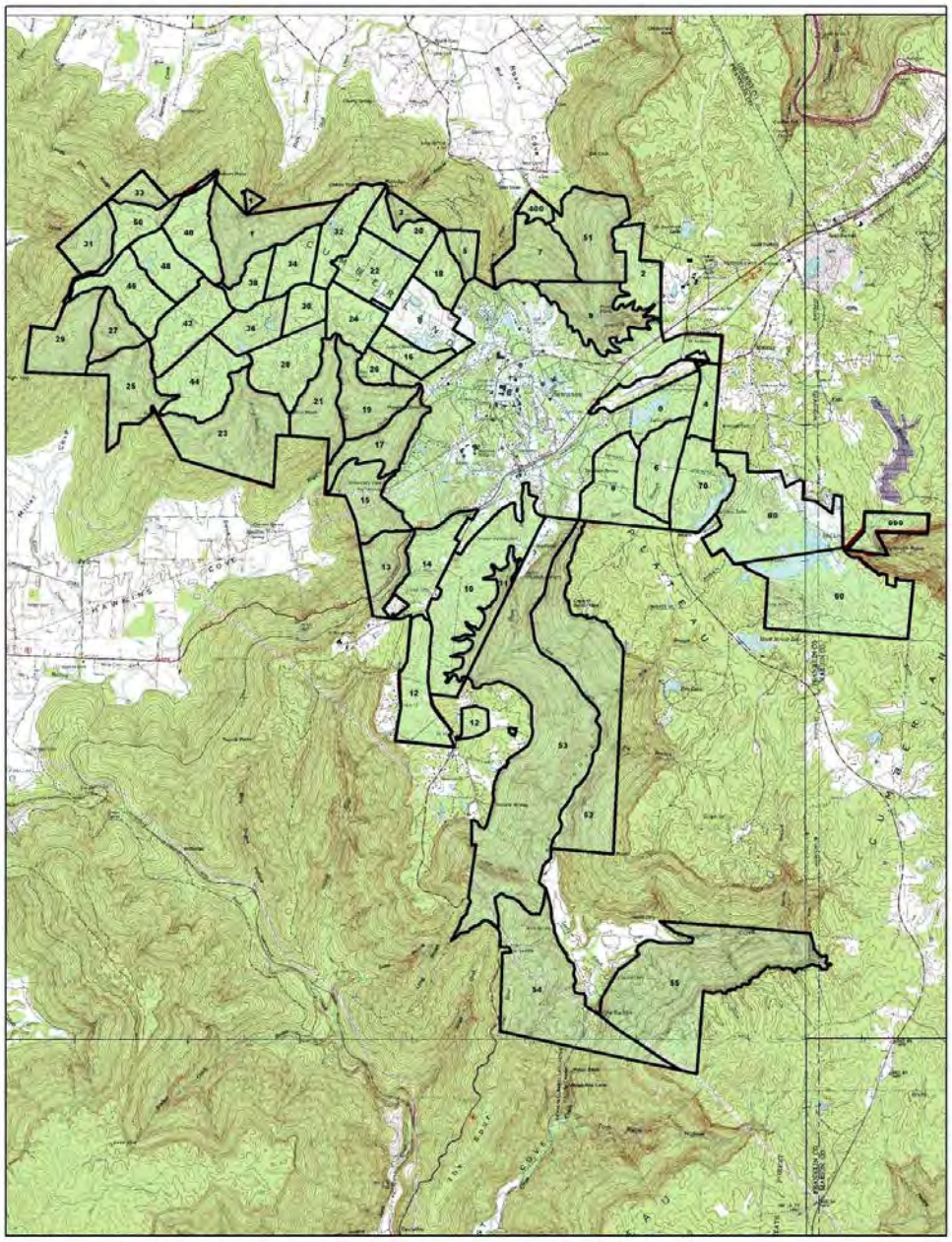

Figure 1. Sewanee's Domain Compartment Map, 2012.

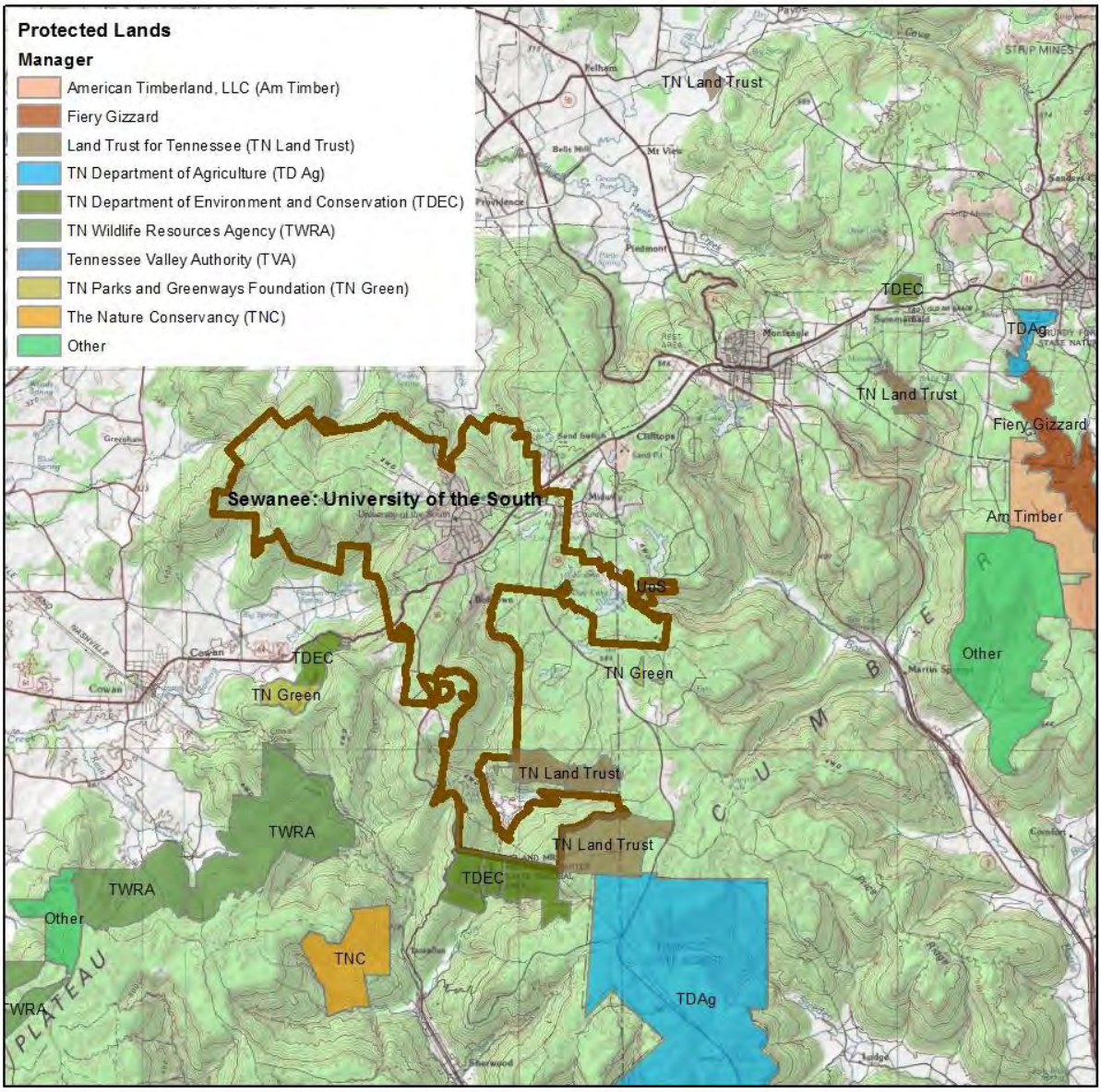

Figure 2. Lands adjacent to the Domain and under conservation status.

Detailed descriptions of the Domain's weather, geology, soils, and land types can be found in Potter and Knoll (1998), Burckle and Smith (2003), and Potter (2008). An updated land type map developed by Dr. Glen Smalley divides the Domain into 21 land types that correspond to bedrock geology, soil depth, slope, aspect, and drainage (Figure 3). Land type maps are useful for land management planning when used in coordination with knowledge of plant and animal habitat and cultural resources. For our purposes, a simpler land type map was created using eleven broad land type classifications; although we recognize that more detailed land type maps will be useful for individual management proposals and plans at the compartment level (Figure 4).

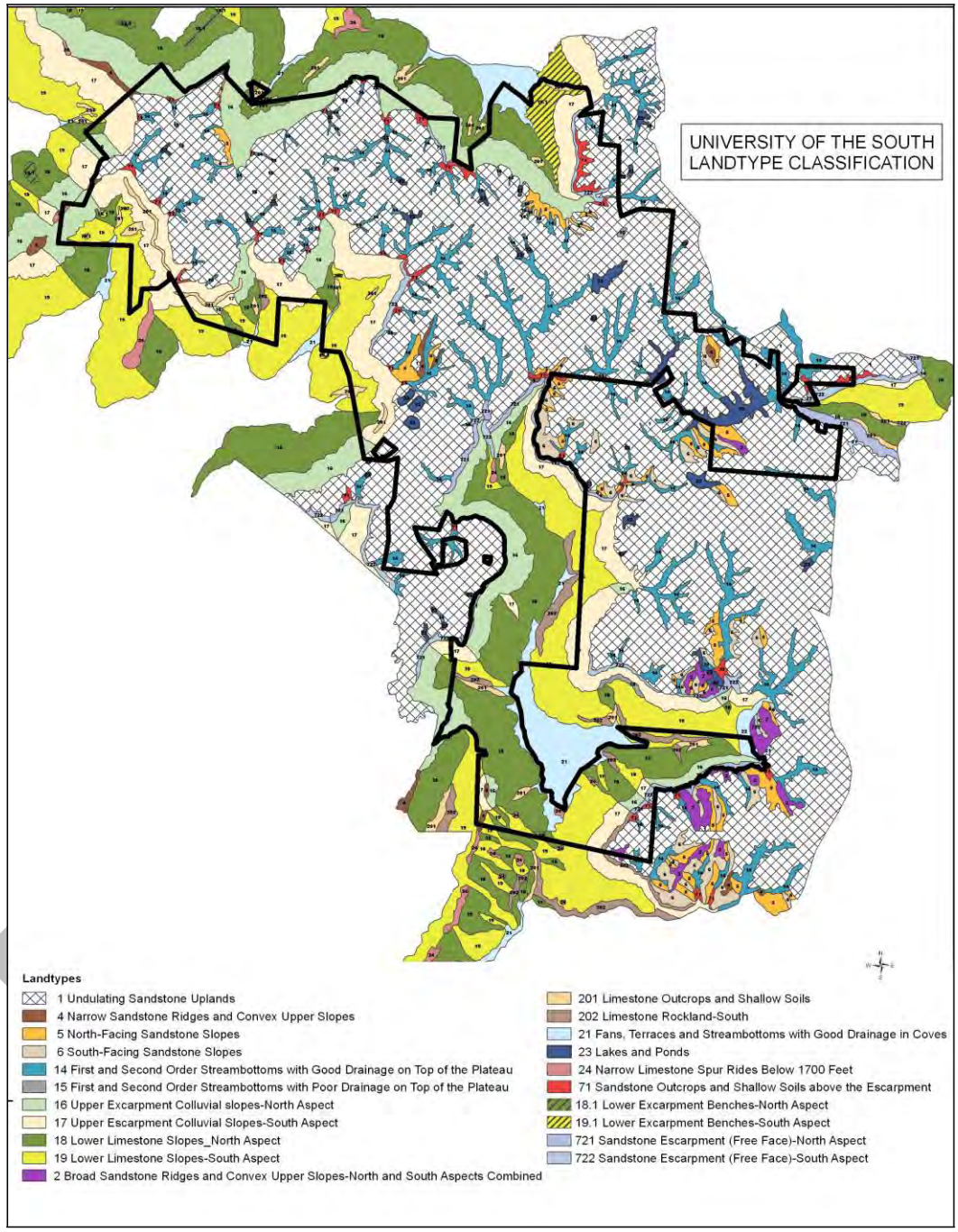

Figure 3. Glen Smalley's 2011 landtype classification of the Domain with 21 land types.

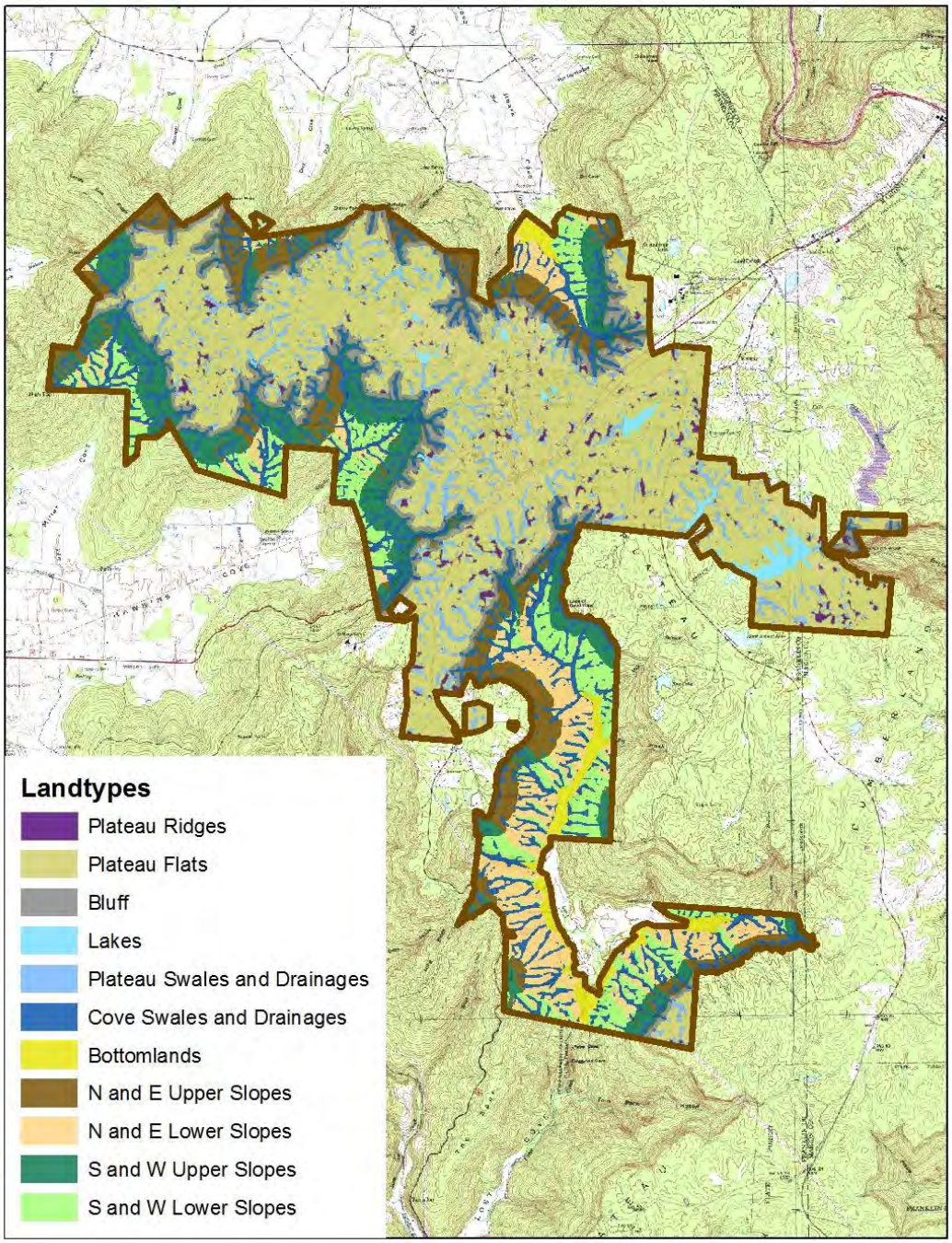

Figure 4. The eleven land types of the Domain. Plateau flats = 40%, cove drainage = 13%, SW upper cove = 8%, SW lower cove = 8%, NE upper cove = 7%, NE lower cove = 7%, bluff = 7%, plateau swales and drains = 5%, plateau ridge = 2%, bottomlands = 2%, lakes (reservoirs) = 1%.

Section III: History

Pre-history

The extensive archaeological record at Sewanee indicates that indigenous peoples inhabited the Southern Cumberland Plateau for at least the last 10,000 years. Our knowledge of the prehistory of the Cumberland Plateau is primarily based on the material culture and chronological sequence from Russell Cave, located approximately 18 miles south of Sewanee (Griffin 1974). This sequence is one of just a few professional excavations reported from caves and rockshelters in the region. (Unfortunately, these complex archaeological sites are often the target of illegal digging and relic hunting that can destroy these important cultural resources for future generations.)

According the studies that have been completed on the Southern plateau, the Eastern Highland Rim, and the Tennessee Valley, it is clear that the earliest immigrants were attracted to the area due to the rich resources such as the mature oak/hickory forests, the high quality tool making stone, and the abundant riverine resources. Throughout the first half of the Holocene, Native Americans hunted and foraged across the region moving seasonally with resources availability. The large springs on the Domain attracted important game and provided reliable water sources for these mobile populations. Later in the Holocene, around 4,500 years ago, some groups of people began to cultivate local plants and ultimately domesticated several of them. At this point we see the first pottery in the region. The invention of pottery was likely linked to plant processing including cooking and storage.

By about 800 AD, maize introduced from Mesoamerica and the American Southwest significantly changed social organization and settlement patterns. Native peoples began living more sedentary lifestyles, congregating in population centers in the fertile river valleys off the Domain. Use of the plateau was probably limited to forays to collect seasonal resources, primarily nuts, and specialized ritual practices that resulted in an unusually high concentration of prehistoric pictographs and petroglyphs along the bluffs and deep within caves.

Among the significant questions both here on the Domain and elsewhere on the Plateau is the degree to which the indigenous people managed the land, what techniques they used and how these may have changed over time. Whether it was intentional or not, parts of the plateau were likely exposed to anthropogenic burning beginning at least 3,000 years before European settlers arrived. To exactly what end, the extent of, and the long term impacts of this burning have yet to be determined (Delcourt and Delcourt 2004).

Selection of the Domain

The Cumberland Plateau was familiar to many in the South due to the popularity of Beersheba Springs as a resort for residents of the Gulf States. Both Bishops Leonidas Polk and James Otey insisted that a new university be located in the higher elevations near

Chattanooga where several railroads converged. The site of the University of the South was chosen by the Board of Trustees on November 28, 1857, and Sewanee was selected over more than twenty other sites near McMinnville, Huntsville, Chattanooga, Cleveland, and Atlanta. Sewanee was chosen because of its natural beauty, its isolation from malaria and yellow fever, the abundance of springs for water, the availability of transportation via the Sewanee Mining Company Railroad, the abundant natural resources needed to support the community (Fairbanks 1905, Baker 1932), and because of generous donations of land from the Sewanee Mining Company and from other residents.

Although described as a grand tract of 10,000 acres, the actual acreage, some of which would remain in dispute for nearly eighty years, was somewhat less than 7,000 acres. The Domain was divided into a core area, called the Reserve and intended to be perpetually free of taxation, and a larger forested area surrounding the reserve. The original Reserve included most of what is understood today as the central campus and the village of Sewanee. In addition, several smaller Reservations were designated around the bluffs and were set aside for the use of the owning dioceses.

As the University was reconstructed following the Civil War, much of the land surrounding the Domain was actively used by Euroamericans, African American and Native American subsistence farmers, and others engaged in various local cottage industries from coal mining to moonshine production. Our knowledge, however, of who these early occupants were and how they used the land of the Southern Cumberland Plateau is poorly documented at best. Their story is an integral part of the history of this landscape and, in preserving the early history of the University, our institutional interests encompass not only the Founders of the University, but also those who came before and the broader community of Sewanee and the Domain.

Early Management

Early Domain management was initially shaped by the first of the campus plans drawn by Bishop James Henry Hopkins of Vermont, who laid out the suggested locations of the first academic buildings, noted the topographic high points of the land, and marked the critical springs for the locations of boarding houses and faculty residences. Hopkins, along with Polk and other bishops, also made suggestions about the layout of the village of Sewanee. The academic center of the new university was located at a point near Fowler Center and was called University Place. Nearby was a great circular area, Louisiana Circle, which was the site of the laying of the cornerstone of the first academic building in October of 1860. After the Civil War, George Fairbanks oversaw the early development of the campus and the building of the initial village of Sewanee. Under Fairbanks' leadership, an office of Buildings and Lands was created which controlled the allotment of leases and set regulations for both leases and for use of the forested land. During the first forty years of the University's history, however, the management of the Domain forest was often a matter of irregular exploitation. Timber harvesting, livestock grazing, coal mining, quarrying, woods burning, and other activities continued despite the efforts of Fairbanks and the Board of Trustees. Sanitation was a major concern of the early Vice-Chancellors, and it was

recognized that the forests around springs had to be protected to insure water quality for the University.

Beginning in 1897, Vice-Chancellor Wiggins recognized the need for professional management of the timber resource, and, with the help of President Theodore Roosevelt, began correspondence with Gifford Pinchot. In 1898 Pinchot, the first American forester and head of the nascent Division of Forestry, visited the Domain to initiate a management plan. He enlisted the assistance of Dr. Carl Schenck, a German forester and founder of the Biltmore forestry school, to conduct the work necessary to complete the plan. Schenck visited the Domain with five of his students, and they submitted their first report in 1899. The University's difficult financial situation held it back from following all of Schenck's suggestions, particularly his recommendation that the University completely enclose the Domain in a fence to prevent poaching and burning. University reluctance, and then refusal, to build the fence, together with other misunderstandings, began to sour the relationship between the University and Schenck. Fortunately, Pinchot intervened, and assigned Overton Price, one of Schenck's former students, as special field agent in charge of forestry at Sewanee. Later, John Foley replaced Overton Price. The Bureau of Forestry published a report on Schenck's management plan and Foley's and Price's subsequent work titled "Conservative Lumbering at Sewanee, Tennessee," in 1903. This work contained the first published map of the Domain (Figure 5) based upon management compartments and helped the University get one of the earliest starts with scientific forest management in the area. For more detailed descriptions of these early years on the Domain, please refer to two chapters authored by Gerald Smith and Bran Potter (Smith and Suarez 2008, Potter 2008).

The University completed other management plans and land use studies in 1939, 1953, 1966, 1979, 1992, and 2003 (Burckle and Smith 2003). In the early years, timber stand improvement, stand management and revenue were top priorities, along with the infrastructure development needed to support those efforts. An extensive network of firelanes was built to control fire, and harvests were used directly at the University sawmill as well as sold regionally to support the educational mission. In the last 50 years, water management, teaching, housing developments, and recreation moved to the forefront of University planning.

Figure 5. The first published map of the Domain (Foley 1903).

Section IV: Domain Management – Future Issues and Concerns

The first section of this document sets out a purpose and goals to guide management on the Domain. In this section, we identify some of the major issues facing Domain management and, in some cases, the tools and techniques that will be relied upon to address these issues.

Aesthetics

In its purest form, aesthetics is a branch of philosophy dealing with the nature of beauty, art, and taste. In the context of Domain management, aesthetics should be about maintenance of the existing beauty of overlooks, sacred wild spaces, and the sylvan community that is Sewanee. These goals can be accomplished by using GIS to understand management implications on established viewsheds and wildlands. In addition, the way we manage the Domain should broaden the horizon of our aesthetic philosophies to include managed landscapes.

Agriculture

The University grew much of its food until the 1960s. These early agricultural efforts were necessitated by Sewanee's isolation and by the lack of an efficient regional food storage and transportation infrastructure. When food grown elsewhere became readily available and cheaper, the University closed down its agricultural operation and today, the recreational equestrian center is the only agricultural operation funded by the University. At the time of writing this document, there is renewed interest from students and the Sustainability Steering Committee to revive some form of agriculture beyond the equestrian program on

the Domain. This interest culminated in a Food Working Group Report issued in the Spring of 2011 (Haskell et al. 2011), and the search to fill a Food Coordinator position in 2012. The revival of the student garden area and the raising of livestock will be high priorities for 2012 as Sewanee seeks to develop its agriculture program.

Biodiversity and Habitat Conservation

"Biodiversity" is defined in many ways, but these definitions usually agree that biodiversity refers to the diversity of life on Earth at all its levels, from genes to ecosystems, and includes the ecological and evolutionary processes that sustain diversity. Biodiversity includes organisms from all parts of the tree of life.

The University's Domain is located in a regional context of very high biodiversity (Dobson et al 1997; Olson and Dinerstein 2002). As such, we have particular responsibility to manage biodiversity carefully.

Main threats to biodiversity here and elsewhere are: habitat loss (e.g., conversion of native vegetation to other land covers), habitat fragmentation (e.g., by roads in natural areas), habitat degradation (e.g., loss of structural and functional diversity), non-native species (that may outcompete, prey on, or infect natives), pollution (e.g., by dumps, movement of sediment into waterways, etc), and over-harvesting (e.g., removal of top mammalian predators, over-digging of ginseng, etc).

Areas that harbor particularly unique and sensitive biodiversity include the following:
- Vernal pools
- Streams
- Upland sandstone outcrops
- Limestone outcrops in coves
- Caves
- Old growth forests
- Bluff edges

Some potential quantifiable metrics that relate directly or indirectly to biodiversity are:
- Number of exotic species naturalized on the Domain
- Percent cover of exotic species
- Degree of fragmentation of habitat
- Amount of sediment/other particulates entering streams
- Number and types of roads through natural areas
- Structure and composition of forests
- Status of threatened, endangered, range-restricted, or endemic species

Coarse Woody Debris and Snag Trees

The maintenance of live cavity trees, snags, and downed woody debris is critical to many wildlife species that inhabit the Domain. They are important food sources or habitats for a

variety of organisms including rodents, shrews, salamanders, turtles, snakes and a number of bird species. Birds use standing dead trees to build nests, search for insects, and as a hunting perches, and as many as 40% of forest birds depend on tree cavities (Hunter 1990). Dead wood acts as a large carbon storage pool and slowly releases carbon and nutrients back to the soil and the forest. In addition, nitrogen fixation in coarse woody material is an important source of this limiting element in both terrestrial and aquatic ecosystems (Harmon et al. 1986).

Due to their importance to a variety of organisms, managers should maintain as many snags >10cm DBH (approx. 4 inches) as possible. In an ideal situation, a variety of diameter classes, species, and decay classes would be retained. In areas that are also managed with prescribed fire, some of the larger diameter snags should be ringed in order to protect them from the fire. If a managed compartment has fewer than 5 snags per acre (12 per ha), Domain Management should enhance the creation of snags through tree girdling or use of herbicides after the forest treatment. If exotic tree species are located in the stand, these trees should be the primary target for snag development.

As previously mentioned, coarse woody debris is also an important source of food for winter foragers, and Domain Management should attempt to leave logging debris of all diameters distributed across the site after a forest treatment. Again, if a treatment is to be followed by fire, some areas inside the burn should be isolated from the fire to maintain a variety of downed wood sizes and decay classes on the forest floor.

Carbon neutrality and sequestration

In 2008, Vice-Chancellor Joel Cunningham signed the Presidents' Climate Commitment, pledging University of South to become carbon neutral by 2030. In this the document, the Vice-Chancellor referenced the expansive forestlands of the Domain as an essential tool in this effort and acknowledged the estimated 1.6 million metric tons of carbon already stored in our forests. Cognizant of the intent of the Presidents' Climate Commitment, Sewanee's Climate Action Plan does not count "business as usual" maintenance of the Domain towards our carbon sequestration goals, but management that enhances the sequestration of the Domain does.

Forest management that is designed to enhance carbon sequestration can take on several forms on the Domain. The goal over the long term is to capture more carbon in the forest and long-lived forest products, and to displace fossil fuel use (Figure 6). Quantification of enhanced carbon storage can provide a myriad of research opportunities for students, and this analysis will be critical in our ability to use management to meet our carbon neutrality goals. Some potential management actions on the Domain include the following:

1. Increasing structural complexity of forests through preservation of reserve trees, snags, and coarse woody material (Keeton 2006, Harmon and Marks 2002).

2. Thinning harvests to increase growth, particularly in high-graded stands with suppressed canopy trees (Ward et al. 2002).
3. Adoption of low-impact harvesting methods to decrease carbon release (Pershel 2007).
4. Management to promote long lived forest products (Sohngen et al. 2007).
5. Promotion of medium density mixed species stands in with uneven aged distribution (Chen et al 2000).

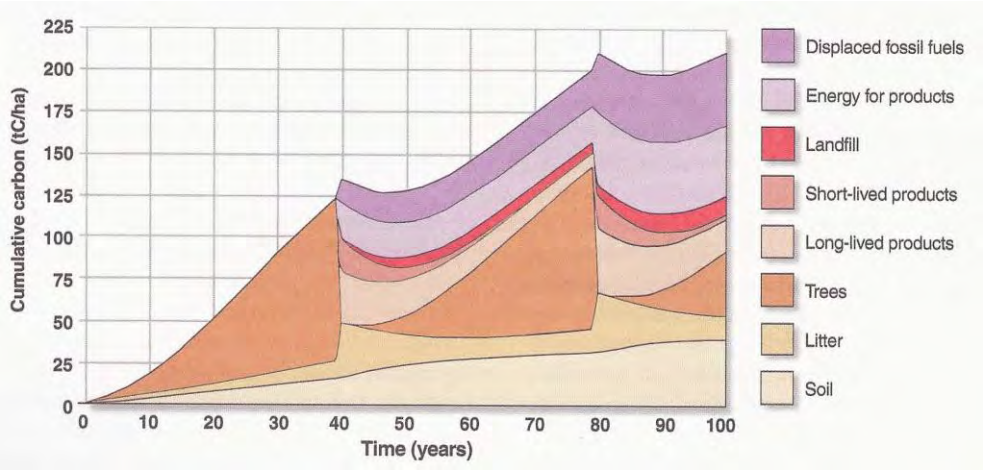

Figure 6. Hypothetical C sequestration over time in a managed southern forest (IPCC, 2001).

Chemical Use

Herbicides and insecticides are powerful tools in land management allowing succession and pest populations to be quickly and cost effectively altered at many scales. When used inappropriately they can also be a detriment to biodiversity and human health. In many instances, they are an appropriate and effective tool for control of exotic species and native ecosystem restoration but are generally not an appropriate silvicultural tool for broad scale application. Because Domain management strives to work within the natural succession patterns of plants the area, chemical use should be limited in scope and duration. In all applications, care should be exercised to limit contact to intended species. Non-chemical and integrated pest management solutions should be preferred management options when applicable.

Climate Change Resilience

Many of the principles of forest management that are used to enhance carbon sequestration are also helpful in creating a forest more resilient to climate variability. Practices such as thinning to reduce crown competition and removal of suppressed individuals from the stand will aid in individual tree vigor. For example, shifting management to more mixed species stands and interspersing pines and hardwoods can add diversity to the forest and increase resilience.

On a broader scale, silvicultural manipulations should be cognizant of the potential for range shifts of canopy species. Sugar maple, already near the southern extent of its native range, is currently increasing in dominance in many cove sections of the Domain. In at least some of these areas, it would be prudent to shift long-term species composition back toward the oak-hickory forest that is in current canopy position. The possibility also exists to introduce species to the Domain whose historical range has been further south. One example is mountain longleaf pine, *Pinus palustris var. montaine,* a highly drought- and fire-resistant southern pine whose current natural range is within 50 miles of the Domain. Experimental plantings of mountain longleaf were planted by the University on the Smith Tract (now part of the Franklin State Forest) in 2002 and have been successful. No species introduction or control should be undertaken without a sampling design that will allow Sewanee to monitor these effects over long time scales.

Cultural Resources

The Domain contains a rich legacy of historic and prehistoric archaeological sites and historic structures. In the early 1990s, a cultural resources inventory sponsored by the Tennessee Historical Commission and the Getty Foundation was undertaken in an attempt to prepare a nomination for the University of the South Archaeological and Historic District to the National Register of Historic Places. This document provides a sample of the types of sites, prehistoric and historic, and an inventory of the historic structures and landscape features (452 of which are considered eligible) found on the Domain.

The University remains committed to a comprehensive inventory of cultural resources that can inform management on the Domain in a timely manner. To that end, a new University Archaeologist has recently been charged with expanding the inventory of the cultural resources and working with Domain Management to ensure that management activities do not negatively impact these resources. “Cultural resources” are defined as sites, structures, landscapes, and objects of some importance to a culture or community for scientific, traditional, religious, or other reasons.” Any future ground disturbance, either research or facilities related, on the Domain will include consideration of significant cultural resources among the potential impacts. Notification of disturbance projects should be submitted with enough leeway that if any significant cultural resources are to be impacted then the archaeologist can work with Domain Management and PPS to initiate a mitigation plan. A mitigation plan can be anything from avoidance or documentation to scientific excavation. Currently the plan is to make every attempt to integrate mitigation plans into curricular activities where students and interns can be actively involved in the process.

Fire

Fire has played a role in the forests of the Domain and in the southeastern United States for millennia. Through the reading of historical accounts, soil charcoal dating, and dendrochronology, scientists have begun to piece together an understanding of fire’s role in shaping forest communities and how fire can be used to restore diversity and productivity to native plant communities. On the Domain, fire has likely played a formative

role in many of the plant communities on top of the plateau. Frequent fires in the late 19th and early 20th century were cited as one cause of the poor forest condition of the Domain as described in the 1903 management plan. Fire suppression since the 1940s has altered these communities as well by increasing basal area, reducing understory ground cover, and altering species composition. Prescriptive fire can play an increasing role in the management of many areas of the Domain to expand native shortleaf and oak savannahs and woodlands and to reduce expansion of white pine.

Invasives

Invasive species pose a significant threat to the native plant population on the Domain. Recent surveys of exotic species have found over 20 species of exotic plants as well as several exotic insects and animals (*Mary Priestly, personal communication).* When evaluating treatment options for non-native species on the Domain, each species should be evaluated based on its anticipated impact on the native ecosystem. Some exotics warrant aggressive treatment and eradication from the Domain when possible, while others should be monitored. The history of human habitation on the Domain has created a novel ecosystem where it may not be possible or desirable to remove all exotic species entirely. Invasives remain a fruitful area for student research.

Inventory and sustainable harvest

The last forest inventory conducted on the Domain was started in 1999 and completed in 2001 (Burckle and Smith 2003). As part of the Domain Management plan, a new inventory will be undertaken that will assess on a compartment level current timber stocking, regeneration, current growth, and volume estimates. This inventory will also tally ecological attributes for compartments including shrub, forb, and grass inventory, downed woody debris and snag density. Inventory should be conducted so baseline indices of plant diversity and habitat suitability for species of greatest conservation need can be evaluated. There are currently several faculty in multiple departments with long-term inventory plots in various locations. This data should be pooled and a common format adopted so that our collective efforts can yield data that will give us reliable information concerning species composition, growth, and carbon storage across the Domain.

Outdoor Recreation

Sewanee's Domain is a mecca of outdoor recreation for students, faculty, staff, local residents and alumni. In today's society, outdoor recreation often is the first and most significant interaction humans have with the natural world. As such, management should work to protect areas of significant recreational use and minimize the disruption where it is unavoidable. Caves, climbing and bouldering areas, as well as swimming and fishing areas should be protected from development. Trails and firelanes used by hikers, runners, cyclists and horseback riders should be maintained as much as possible to suit user needs, and when management necessitates closing or temporary relocation of trails, adequate

signs and alternate routing should be suggested. Camping areas should be managed to encourage use and maintained to provide safe venues for student use.

Plantations

Currently less than 2% of the Domain is artificially regenerated forest cover. These areas range in size from less than one acre to approximately 44 acres and are generally associated with areas that were previously cleared for other purposes. Though much acreage identified as plantation is in pine, several hardwood plantations are scattered throughout the Domain.

Archetypical plantation forestry is based on single-aged forest stands managed to produce high volumes of wood fiber on short rotations. These high-yield production stands are typically established by planting or artificial seeding and the structure, composition and processes found in natural forests are largely absent or significantly altered due to the use of short rotations, herbicide control of competing species, tree spacing control and fertilization.

When applied at a landscape level, plantation forestry has the potential to reduce wildlife habitat and biological diversity, however because the fiber yield in plantations on the plateau are much larger than most natural stands, by concentrating high yields on fewer acres, plantation stands can potentially reduce pressures on natural forests.

Because of its prevalence as a silvilcultural system worldwide, it is important that students at Sewanee are able to experience plantation management at some level on the Domain. Given the University's goal of management for education, we have a unique opportunity to take areas of plantation management in different directions from other landowners and study and experiment with techniques that minimize the biological downside of plantations and focus management toward a restoration of resilient ecosystems. Toward this end, some limited new plantations may be appropriate on the Domain. Locations for new plantations must consider previous land use and be managed as a compliment to adjacent stands.

Quarries and coal mining

Historically, Sewanee quarried most of the cut stone used for the exterior of our campus buildings. Many of these quarries were located on what we now call the Perimeter Trail (Steve Shaver, personal communication). In 1998, during the construction of McClurg Dining Hall, stone was imported from Crossville, outside the Domain, and we continue to import stone during new construction projects.

Sewanee was originally formed in large part due to a land gift from the Sewanee coal company. On our current holdings, coal was strip mined to the south of Lake Dimmick, and there are several small coal pits and mines all over the Domain. There are currently no plans to resume coal mining on the Domain.

Research on the Domain

Because of the long history of the Domain as an educational facility and Forest Service research station, there are areas where forest study has led to many decades of uninterrupted forest research. An example would be some of the Forest Service regeneration studies in compartment 4 installed in the 1970's that are used yearly in many forestry classes. While the research usefulness for some of these areas is past, many of these areas continue to provide excellent teaching opportunities. As part of this plan, all Domain biological research areas (USFS, Forestry, Geology, Biology, Archaeology) should be cataloged in a readily accessible GIS format and in a fashion similar to the cultural resources. As previously mentioned, management should seek to protect those areas with continued observational merit.

Many management projects will naturally be the subject of study through multiple disciplines, and in interdisciplinary ways as well. A collaborative and collegial approach should be taken for class projects and other research inside long-term management projects on the Domain. University personnel representing all disciplines should be free to conduct projects in manipulated sites. If a research group's objectives, treatment procedures, or other relevant information regarding site management will be considered as part of another group's study, the first group should be notified and given an opportunity to present that information to the other group before the study begins, if at all possible, and in any case before results are published or publicized. While interpretations of data may differ, joint visits to project sites, open discussion of preliminary results, and public presentation and discussion of results are strongly encouraged. Faculty, staff, and students that play a supporting role in the design or implementation of a project should receive proper acknowledgement during internal and external publication of results. These guidelines will assist in creating a collaborative academic community that freely studies the Domain and avoids misunderstandings.

Roads and Firelanes

The Domain contains a varied assortment of primary and secondary roads and firelanes throughout the property. Many of these roads were built for historic logging and fire protection, but today are used for recreational hiking and biking and access to research sites while still remaining functional for their original uses. Sometimes roads that are "upgraded" for logging and mining use can become less desirable for recreationalists due to gravel size and compaction, but these conditions can be remedied when management activities are concluded. Roads throughout the Domain will be maintained differently based on their frequency of vehicle use and their use by recreationalists. When management occurs, every attempt will be made to return the surface condition suitable for continued recreational use.

Signage

In order to facilitate our educational objectives beyond the students actively involved in management projects, signage should become a normal part of most management operations. Students hiking through the woods might otherwise not know that a hole in the ground is really an archaeological excavation, or understand that the herbicide applied to an *Ailanthus* tree can have positive ecological ramifications. Likewise harvest operations, once complete, should highlight the amount of energy (biomass), paper (pulp), or building materials that were harvested and how that compares to Sewanee's consumption. Likewise trails and areas of historic interest should be clearly marked to facilitate the enjoyment of the community.

Utility Corridors

Utility corridors crisscross the Domain for both electrical and water use. These permanent and linear clear-cuts are kept free of trees by chemical and manual methods creating novel early successional habitats across the Domain. TVA has a history of working with local landowners to minimize the impact of the corridors on the surrounding landscape and has expressed an interest in working with Sewanee as well. The Duck River Electric Cooperative has been using an Integrated Vegetation Management (IVM) approach to their right of ways for several years now and works closely with the Office of Domain Management to limit chemical application in sensitive areas. The Sewanee Utility District also maintains a series of corridors throughout the Domain. Many of these fall alongside natural drainages and should be considered ideal locations to locate walking paths and trails.

Water Resources

There are currently 13 ponds and reservoirs on the Domain that range in size from less than one acre to over 80 acres. Two of the largest reservoirs are used by the Sewanee Utility District as a supply for drinking water, while others serve primarily as swimming and recreational areas. Currently, water is the only natural resource that Sewanee produces in a sustainable manner and the management of our reservoirs and the lands surrounding our reservoirs is of vital importance to our community. In addition, as the Sewanee community grows, new and innovative ways to treat our growing wastewater should be investigated. Our current system of treatment and spraying effluent on a 65 acre forest is working well, but at some point in the future, our waste capacity will exceed what we can apply to our existing spray field.

In addition to our reservoirs, there are over 83 kilometers of perennial and intermittent streams and wetlands that feed our reservoirs and the surrounding landscape. These stream corridors provide habitat for a myriad of plants and animals and add greatly to the diversity experienced on the plateau. Management will increase the value of these corridors by eliminating siltation, restoration of degraded streams, and reducing the impact of impervious surface development in the watersheds.

Current issues include the maintenance of older dams and the expense in maintaining these dams. As the dams of the older ponds start to leak, we need to prioritize which ponds should be maintained and which ponds should be drained and restored. Also, Lake Dimmick has a growing population of water shield that will require a commitment of resources to at least partially clear the reservoir of this plant for the benefit of the crew team. In addition, beavers have relocated at Lake Jackson and Dimmick, and we will need to monitor their activities to ensure that dam stability is maintained and that spill ways are kept clear.

White-tailed Deer

A 2010 estimate of population done by Scott Torreano's Wildlife Management class in cooperation with Domain management estimated the population in and around campus at approximately 148 animals per square mile. In the spring of 2011, Deborah McGrath's Ecology class replicated the population estimate and found similar numbers. This level of population is almost 5 times the 25 deer per square mile average density recommended by Tennessee Wildlife Resources Agency for high quality habitats in the state. Estimates by the Office of Domain Management have the sex ratio of the population in town close to 6 does for every buck.

The result of this increased population is being felt on the Domain in many ways. Residents interface with this increased density mostly through unwanted garden browsing and deer-vehicle collisions. Ecologically this increased population has reduced available browse in the forest and is shifting the species composition of the understory.

Sewanee will continue to monitor the deer population in our area and tailor herd reduction efforts through the cull to reduce the deer herd to desirable levels. Efforts will be focused on regaining a sex ratio of does to bucks as close to 1:1 as possible and a population density below 30 deer per square mile. Current efforts to reduce the population are being undertaken within the confines of the Tennessee State hunting regulations. If these efforts are not successful, additional efforts can be undertaken outside of the regular season in cooperation with Tennessee Wildlife Resources Agency.

Section V: Considerations for Management Proposals

Our biggest challenge in managing land and in evaluating management proposals is to accomplish what are sometimes conflicting education-related goals while sustaining the integrity of the ecological landscape and being proper stewards of the cultural landscape. It is important that we develop policies and practices that allow us to optimize the wide diversity of educational opportunities and benefits associated with the Domain. As proposals are submitted to the NRAC for management or research activities, the following four management considerations will provide a mechanism to allow us to recognize and evaluate, in a fair and equitable fashion, all educational values and perspectives when it comes to land-use decision making. In the next section, the white paper sets out approved procedures for proposing management activities on the Domain.

1. Sustainability

A foundation of management decision-making will be our role in the environment, and we will encourage proposals that promote Sewanee's sustainable use of its natural resources while protecting its ecological integrity and ecosystem services. If Sewanee is to achieve a more sustainable and carbon-neutral status, an examination of the balance between sourcing goods locally while continuing to protect these other areas of consideration will be essential.

Furthermore, the protection of ecological integrity is a vital part of sustainable management practice. The Domain is part of a landscape of dynamic, diverse and functioning ecosystems. Protection of the integrity of the biological and physical components of these ecosystems will help protect numerous values, including ecosystem services, biological diversity, natural beauty, and the inherent value of native ecosystems. One of the significant components of our management decision-making will be to ensure that the health of the Domain's ecological landscape will be safeguarded for the long-term. Specifically, management decisions will be based on our best understanding of the ecological interactions and processes necessary to sustain the composition, structure and function of ecological communities on the Domain.

2. Community Interests

With the understanding that the life of the university and the health of its students are inextricably tied to the surrounding community, the interests of that community (including students, faculty, and staff of the university) will be taken into consideration when making management decisions. Management that protects the ecological integrity of the Domain (as described above) as well as utilizing our land in a sustainable fashion will serve the best interests of the community. Management proposals that protect and retain the integrity and inherent value of the landscape for future generations of the community will be encouraged by this committee.

Community interests include the intrinsic aesthetic value of the landscape, but it must be taken into consideration that aesthetic value is subjective and is often culturally defined in ways that do not always coincide with the greatest biological diversity, sustainable practice, and protection of ecosystem services. For example, it must be taken into consideration that the micro ecosystems found within locations of low aesthetic value for many (e.g. the clearcut land beneath a power line) can provide valuable learning experiences for students, and may in fact contribute to the other areas of consideration outlined in this section. Consequently, aesthetics must be a factor of domain management, largely because it can contribute to other areas of consideration, but aesthetic value is subjective. Another important aspect of community interests is the possibility for recreation on the Domain. Recreation within the landscape is a way by which the community becomes aware of and subsequently values and desires to sustain the ecological integrity of a landscape, and thus must be considered in management decisions.

3. Cultural heritage

The current GIS database for archaeological sites on the Domain is incomplete and the information it contains is considered sensitive. Therefore it cannot be made available to general perusal or for open access. Currently, the best approach to monitoring threats is for any activity (construction, recreation, research, etc.) that may cause ground disturbance on the Domain, be it by PPS, a property considered by the lease committee or a student research project, to be submitted in a brief proposal form to the NRAC and the University Archaeologist.

A special note: state law that does impact private property is that of Tennessee Cemetery Statutes, Tennessee Code Title 46. This law outlines specific legal responsibilities and protocols to private landowners who might inadvertently disturb human remains, whether in marked or unmarked graves. Since we do not know the locations of all historic and prehistoric burial places here on the Domain, this will be an important consideration with the proposal review process.

4. Educational opportunities

The Domain is a landscape of educational opportunities and benefits. As a liberal arts college and a school of theology, we have an institutional mandate to use our land in the mission of educating students. This is the overarching goal for why we own this land. Direct educational opportunities associated with the Domain reflect a variety of interests and needs including: environmental studies, outdoor lab exercises, recreation, scientific research, leadership training in environmental stewardship, spiritual reflection, aesthetic appreciation, offsetting our consumption of resources, and reducing our carbon footprint. In addition, it is important to recognize that a critical component of a successful educational plan for the Domain is the safety and well-being of students. This includes securing boundaries from trespassers, hunting, road maintenance, and proper use of herbicides and pesticides.

Section VI. Procedures for Domain Management Proposals

The following procedures, adopted March 6, 2012, will continue to be evaluated and modified as appropriate.

Proposals fall into three distinct tiers.

1. Short-term nondisturbance activity- Tier 1 involves all nondisturbance projects that span 6 months or less. These projects receive blanket approval with no required oversight from NRAC. An email to the LAL and Domain Manager indicating location and class use will allow database tracking and insure no conflicts with other tiers of activities.

2. Long-term nondisturbance activity- Tier 2 involves all nondisturbance projects that span more than 6 months and could be impacted by other research or management in the area. All Tier 2 proposals begin with the first step described below. If the LAL indicates that the project falls within an active management zone and would be impacted by anticipated activities, then the proposal will continue through step two so that the NRAC can discuss possible impacts to future management. Steps three and four of the process are generally not applicable to this tier of proposal, but would be appreciated.

3. Long-term disturbance activity- Tier 3 projects proceed through all of the steps below.

Step One: Announcement

The announcement should be an opportunity to give a preliminary heads-up to NRAC and an invitation for collaboration. The announcement should include a brief overview of the project, its objectives, and a preliminary timeline. This announcement should be distributed beyond the NRAC, at least to the environmental studies faculty, in order to promote cross-disciplinary participation in the project.

The announcement should also include a review request and timeline for the process of project approval with the Domain Manager, as well as a request to the LAL to make preliminary proposal maps. These maps should then go to the University Archaeologist, Sewanee Herbarium representative, and the Outing program for review. Depending on the scope of the project, they may need reasonable time for due diligence on their part in order to come up with preliminary recommendations for the proposal.

Step Two: Proposal

The proposal should include a brief description of the project, its location, collaborators, and objectives, and the preliminary assessment of the groups listed in Step one. In addition to the above items, the proposal should answer the four broad objectives laid out in section seven of the management plan. Depending on the scope and direction of the project it may fulfill many more of the 15 goals laid out in the planning process, but at a minimum it should address the issues of

- sustainability
- community interests
- cultural resources
- educational opportunities for students
- monitoring plan
- follow-up management

Step Three: Endorsement

The process and planning in step one should provide for a robust document for review by NRAC. If the proposal meets the spirit of the objectives and values statement and all stakeholders, then passage should occur unanimously. If there is disagreement about the project that cannot be reconciled, a vote can be called with majority ruling.

Step Four: Execution

There should be regular updates to both the NRAC and the Environmental Studies faculty in order to keep information flowing and to provide additional opportunities for cross-disciplinary work. Depending on the scope and duration of the project these updates can vary in intensity from verbal communications at meetings or email updates on a quarterly basis. The intent is that there is some ownership of all projects across the curriculum. A faculty member need not have peer-reviewed research in a project to incorporate it in classes.

Step Five: Follow-up

The duration and complexity of a project will dictate the level of follow-up desired for projects. Research manipulations should include a monitoring plan. At a minimum, the project manager should verify the following:

- Has flagging, signage, or other temporary marking been removed?
- Did proposal work? How can things be improved if replicated?
- Has a final project summary been submitted to the LAL?
- Have the recreational assets in the vicinity been restored to operation and function?

Finally, the results of research projects must be distributed to the NRAC, as well as the LAL to be incorporated into a historical database.

Section VII: Annual goal setting and assessment of Domain Management

In order to better communicate the mission of Domain Management to the University and the local community, the Domain Manager will develop a set of goals for each calendar year, and then will report back to the NRAC about progress towards meeting these goals at the end of the year. This goal setting and annual reporting will provide important historical documentation of Domain centered activities. A timeline for the setting and reporting of these goals and activities shall be as follows:

- The Domain Manager will lead an effort to write an annual report to the NRAC with highlights of Domain management activities. This report will be turned in to the NRAC in January of each year and discussed at the first NRAC meeting of each year

- At the first NRAC meeting in January of each year, the Domain Manager will highlight the annual priorities for the coming year and will receive feedback from the NRAC regarding these goals.

Section VIII: Summary and Conclusions

The lands managed by the University of the South have a long history of human use and occupation. In 2012, and going forward, we face a unique set of challenges that will require a flexible and collaborative management style. The goals and procedures highlighted in this document were designed to guide us over the next decade, and it is our hope that they in some way represent the interests of the diverse group of people that cherish the Domain. Working together, we intend to oversee the University's property in a manner that will meet the educational goals of the institution and enable us to pass on a healthy and well-managed Domain to its future stewards.

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Appendix A

Sample Compartment Analyses

During 2011-2012, the NRAC decided that a full analysis of each individual compartment would be time-consuming and ultimately infeasible. Instead, the NRAC sent its members into the field to tour compartments that were historically used in different ways by the people that have inhabited the Domain. The goal of these visits was to have the members discuss what they saw on the ground, to summarize what is known about current and past activities in the compartment, to compile their observations in a short document presented to the NRAC, and by doing so to learn what is practical and feasible for planning given the large size of the Domain. These interdisciplinary field visits are a good model for open discourse about future projects on the Domain. Note that the compartment visits and conclusions represent snapshots in time, and since proposed courses and projects have changed since the moment of analysis, some conclusions may be less relevant.

NRAC Report: Compartments 50 & 31 ---Submitted by Jon Evans

Group Visit: Jan 20 -- Jon, Ken, Nate, Chris Van de Ven

We toured and discussed the timber harvest area associated with the Cheek Farm former fields in compt 50

Compt 50 is an odd shaped compartment that encompasses a variety ofland cover types at the end of Breakfield Road. Much of the compartment is dominated by the historical land-use of the Cheek Farm:

There is an old homesite near the bluff that has a remnant foundation, surface artifacts and persisting yucca plants. Site is of archaeological, historical, and ecological interest.

There are small and large cleared areas that were used for agricultural purposes in the early 1900s. (These cleared areas spill over into portions of erupts 46 &48.) These areas were planted in pine when the University acquired this tract of land in the 1950s. Pines were not actively managed and so accumulated a large proportion of regenerating hardwoods.

According to Nate's research: "the University won most of the Cheek farm in Chancery court from the Cheek family in January of 1958. The dispute revolved around the actual location of the old Rutledge Grant Corner. The Cheeks lost 133 acres in the court decision, then sold their remainder to a Gilliam, who then sold it to us. „

The timber large fields (41acres) were harvested as part of a contract sale in 2001 that was initiated as a response to an infestation of southern bark beetle. Seed trees (10 trees;acre) and 5 small clumps of hardwood trees where left standing. The rest was cut and removed down to small pulpwood diameter size classes. Hardwood pulpwood constituted 47% of the total tonnage removed. A survey conducted shortly after the harvest found that 35% of the hardwood leave trees were damaged during the harvest and it is evident today that there has been considerable mortality of these trees since harvest. However, there have been no management or monitoring records maintained for this site since 2001.

A portion of the 41acres was burned following harvest and planted in shortleaf pine. This burn turned out to be hotter than expected impacting forest regeneration. This area has a low density cover of mostly loblolly pine and ground cover is grasses and sedges. Planted shortleaf pine survived but growth has been curiously stunted. Very high deer browse and usage of this former burned area.

Desired future condition (accordingly 2001report by Joe Burckle) was to be a natural forest reflecting composition ofleave trees (tulip popular and chestnut oak). This was partially successful given the high density of young tulip poplar in the

western portion of the site, but there seems to be little evidence of chestnut oak regeneration. Dominant tree throughout much of the regenerating stand is loblolly pine which came up from seed in the soil following the pine harvest. This unanticipated regrowth of loblolly poses a current management challenge. Regeneration of slower growing hardwoods has also been impacted by high levels of deer browse.

We discussed the various lessons learned from this operation that can help inform future decisions. We also discussed the possible use of the site in the future to cultivate a source of biofuel for a campus biomass plant.

Smaller stands of loblolly and white pine in old clearings closer to the homesite remain standing.

The compartment is used by forestry classes and by my Reading the Landscape class. The regeneration of forest on former agricultural land has been a topic of many student projects in the Biology Dept. The perimeter trail also passes through a good portion of the compartment. Road maintenance and access my non-University folks remain an issue.

Compartment 31 (I made a brief visit on Dec. 20)

The north-facing slope forest in this compartment consisted of a mixture of mature oak, hickory, ash and maple. A deer stand was found in the middle of the compartment. Evidence of intermediate levels of deer browse were present throughout. No ecological, botanical, zoological, or archaeological surveys have been conducted in this compartment. There are no records of past or present usage by classes. Interesting features include plant communities on bouldertops and sandstone cliff-face communities with associated rare plant species.

According to Marshall Hawkins, deer poaching is high in this area and therefore there are safety concerns for student use.

<u>Compartment 1 – Dick's Cove</u> : toured on Jan 27, 2012 by Sarah Sherwood, Ken Smith, Nate Wilson, Andrew Carey; submitted by Ken Smith

- Easy access from valley floor to plateau, a likely route for plateau access for humans and wildlife for thousands of years.
- Currently, recreation route to Solomon's Cave and used by hikers, bikers, and horses from valley.
- Heavy deer pressure, the understory is nothing like Shakerag in the spring.
- Small pine plantation at the top of the cove as well as heavy white pine regeneration.
- Cedar Mountain and Summit Developments at bottom of cove

Research

Gene McGee, US Forest Service, (reported in 1984 and 1986 articles)

- 1982 sampling found 11% of overstory had died in previous 8 years, northern red oak (135 years-old), white oak and hickory (210 years-old) had the highest mortality
- predict shift of oak dominated forest to sugar maple and yellow poplar dominated forest (with a hickory component)
- **dead trees were 90 to 375 years-old**
- by 1986, 20% of oak in overstory had died

Kevin Hiers and Jon Evans, Conservation Biology 1997

- **98% decline of dogwood** since 1982 McGee sampling in cove
- Significant increases in black gum, spice bush and yellow poplar in understory
- Based on prior research elsewhere, noted potential influence of dogwood loss on soil calcium cycling, particularly on upland sites

Stacy, Clark, Scott Torreano, Dave Loftis and others. 2006. Report in Proceedings of 15th Central Hardwood Forest Conference.

- In 2005, re-examined 18 McGee plots from 1982
- Advanced oak and hickory regeneration disappear as well as dogwood
- Models predict white ash, sugar maple and yellow poplar will dominate in the future
- **Shift from oak dominance**

Clark, Torreano, Schweitzer, and Dimov – Poster 2006

- Tree cores aged in Dick Cove, white oak and red oak (dead and alive)
- **Large pulse of oak establishment in cove in late 1800s** (1870-1900) – post Civil War settlement
- Other cores from larger trees yet to be analyzed (Clark personal communication)

Jon Evans, Leighton Reid, and two other former students – 2008, Journal of Torrey Botanical Society.

- Sampling above the cove and in the cove in 1995 and 2005
- In both sites, maple presence increased while oak (especially the red oak group) decreased
- Spice bush and black gum in the cove that was noted in 1997 study had been heavily browsed by deer
- Chestnut oak increasing in upland overstory (replacing scarlet oak)
- **In cove, understory dominated by sugar maple, white ash, and yellow poplar**

Teaching
The cove is used by multiple classes for labs.

Compartment 80: the Cheston Farm site Submitted by Marvin Pate

This site is the 177 acre area located generally to the north of Lake Dimmick and extending northward and eastward to the property boundary of the Domain in this area; thus it shares a boundary line with a host of neighbors. It is bisected by the gated drive that extends from Midway Road to the Lake Dimmick dam.

A review of aerial photos beginning in 1959, before the creation of Lake Dimmick, reveals that most of this land was forested at that time. Timber harvesting in preparation for the impoundment of Lake Dimmick occurred in 1968 and 1969, and presumably the lake was in place shortly afterwards. It first shows up in the 1974 aerial photo and is not present in the 1969 photo. The farm was purchased by the University in 1992 from Charles Cheston. It affords access to the Clarence Day gift of Lake Dimmick.

Mr. Cheston raised Angus cattle on the 100 plus acres of pasture on both sides of the road. When the University bought it, they immediately leased it to a local cattle farmer. It was later leased to Mark Lovett for grazing, but his lease was cancelled in 1997. Presumably grazing ceased sometime between 1994 and 1997 while Lovett was leasing it. This land does have the distinction of being that part of the Domain that was most recently grazed.

A total of five ponds were created on the site; two of which do not hold water now. The other three are holding water but will need maintenance on the dams to deal with tree growth.

There are at least four structures on the site including two old barns, a tool shed, and a cabin located near the top of Little Mountain, which is a hill on the westernmost section of the farm and the only part of the farm now forested. The old barns have damage but are repairable. The cabin has not been used probably since at least 1992, but it could be fixed up for use at reasonable cost.

Historically, the Little Mountain area was used for coal mining in the 1860's. This mining produced spoils piles on the surface that are potential contaminant sources for surface waters and soils. The abandoned mines are areas of abnormally high Fe concentrations and abnormally low pH values.

The Domain Manager Nate Wilson has been working with a bushhog and tree grinder to clear the pasture since 2010. The work has been going slowly. About twenty acres or so has been cleared.

Devan McGranahan has an extant proposal for using a section of the Cheston Farm on the east side for grazing cattle as part of his environmental studies classes in the spring and fall of 2012. Conversations are ongoing with a local farmer that might situate his cattle on the site, grazing them from spring through fall, before slaughter. With such feeding and other

practices, organic beef from the herd could be beneficial in our quest for increasing local, organic food in the dining hall.

The SEI Archaeological Field School conducted an extensive shovel test survey during the summer of 2011. Approximately 230 shovel tests were placed across the 4 fields on the east-southeast side of the entry road near Day Lake. Only one site was found, likely an early 20th century house site that had been clearly bulldozed and buried as there was no remnant of the house site on the surface. This probably occurred while the fields were being prepared for cattle. This site would not be considered eligible for the national register, so there is no reason to preserve this site. Sarah Sherwood is preparing a report with the results of this survey that will be submitted to the Domain Management office in early summer. The area around Lake Dimmick to the west of the access road has not been surveyed. Any significant ground disturbance there would need to undergo survey for cultural resources.

There are a number of features of this site that are of interest for teaching:

The western side had been used for the Reading the Landscape class which studies the human modifications (including clearing, mining, pond building) to the area and the effects on the subsequent ecology.

The pond in the northeast corner has a wetland that contains a woody plant, fetterbush, which is unique on the Domain. Also unique in the wetlands near this pond are white gentian and bedstraw. A rock outcropping near this pond contains flameflower and elfin orpine. Both of which are protected by the state and are unusual on the Domain.

The biology department is considering recruiting an aquatic ecologist, and the ponds on this site would be important for student research. For that reason, the ponds should be protected from any direct contact with cattle (note: the McGranahan planned course keeps the cattle away from the ponds).

Compartment 0 (near Tennessee Ave): Report to NRAC regarding the S of T/Tennessee Williams/SES quadrant of land Submitted by Cindy Crysdale

On December 2, a number of us walked down behind Hamilton Hall, on the extension of Ely Lane, between Kentucky Avenue and the Sewanee Elementary School/downtown Sewanee. The group included Cynthia Crysdale, Colin Mathewson, Martin Knoll, Nate Wilson, Sarah Sherwood, Mary Priestley, and Jon Evans.

We observed and discussed a number of phenomena and the issues they raised.
These include:

Historical aspects:
The remains of a number of houses sit just below the edge of the current parking lot for Hamilton Hall. These were homes on Ely Lane at one point, housing university staff persons, mostly of African American decent. The timeframe of these homes, exactly who

lived there, and what roles they played in University and community life is yet to be determined. Likewise, it is yet to be assessed just what care needs to be taken with regard to these as potential educational or research sites.

In addition to these homesteads, there was an African American church that sat where the current playground for the Sewanee Elementary School is now located. Nearby there was an Order of Goodfellows Lodge. (??) Again, the usefulness and importance of these sites in terms of archeological significance is yet to be determined.

In both cases, the narrative of who lived, worked and worshipped in this place is significant and ought not to be lost with any developments that take place in this quadrant.

Watershed/drainage:
Martin pointed out the amount of silt in the water draining both from behind Kentucky Avenue and from Tennessee Avenue and Ely Lane. This silt continues to affect drainage in this quadrant, and its effects can be seen as far away as the bottomlands of Lost Cove. This silt is the result of two construction projects: the building of the Chapel of the Apostles and of the Tennessee Williams Center. As both of these took place almost a decade ago, the lasting effect of these construction projects is noteworthy. Those who recalled the streambed prior to such construction mentioned how many kinds of life were evident in the stream, which no longer seems to be the case.

As the Master Plan puts new construction for the School of Theology (and most likely the demolition of Hamilton Hall) on its first list of priorities, this is a major concern for the near future. There are ways to prevent this silt, and these are most often included in construction contracts. However, enforcement of such precautions will require ongoing vigilance.

Cell Tower:
We explored the site where the new cell tower is to be placed. It will, unfortunately, displace some nice woodlands. The need for better cell coverage and the long saga with regard to putting up a cell tower on the Domain mean that it is good news that this is finally going to happen. However, we are sorry to see so much of this nice, woody hillside be opened up. The placement of the cell tower exactly here within this quadrant has to do with concerns over the view-shed from Chapel of the Apostles. As of now, the view of the cell tower will be blocked from COTA by Hamilton Hall. The irony is that, with the new Master Plan, it is likely that Hamilton Hall will be demolished, so that, depending on where new buildings for the School of Theology are placed, the cell tower may in the future be very visible from COTA and the Seminary complex.

No matter where such a cell tower is placed, it will take up a good deal of land once it is fenced in and has a road built to give access to it. Nevertheless, it addresses the needs of modern communication and is the kind of interface that we may face in other places on the Domain.

Corridor for pedestrians/cyclists:

There is a road bed, an extension of Ely Lane, which extends all the way down to Highway 41A. This is where the Master Plan has indicated the creation of a corridor from the School of Theology area to the village of Sewanee. We explored several places where such a path might come up into the village (e.g., over the shoulder of land between SES and Parson's Green) but in the end agreed with the provisional plan to take such a walking/biking path all the way down along the creek, to come in below Parson's Green, to Reed's Lane – behind The Crust and in beside Woody's Cycle shop, beside Shenanigans.

We noticed the water saturation issues that have plagued a few of the houses on Parson's Green. We also noticed a stand of Bald Cypress that is non-native to Sewanee (but native to the deep South) and was planted between Parson's Green and Highway 41A. This is not an aggressive invasive exotic and has been planted other places on campus. In addition, the old roadbed crosses a power-line easement, which is now home to many invasive grass species. Miscanthus grass in particular is purely ornamental, probably out of control and is bound to cause ecological problems in time. The Bald Cypress, while naturalizing to some extent, is probably important from an educational standpoint. Dendrology professors in the Forestry Department would probably argue for keeping the Bald Cypress stand, whereas this is not the case with the invasive grasses.

A few issues surfaced with regard to the creation of this corridor:

- the creation or refurbishing of a "spur" path up to the back of the elementary school. This path exists, with a good bridge across the stream, but needs to be attended to, spruced up, and otherwise "advertised" to seminary families and others who may find it useful. A better pathway across the stream at the base of Ely Lane is necessary to make access to the Seminary possible.
- the surface of the path itself. While paving it makes the most sense, and may be most comfortable with regard to bikers, we had some concerns about drainage and long term durability. Different kinds of gravel beds were discussed, with the hope that something might be found that would be user friendly both to bikers and to the forest floor.
- Franklin County and SES – it was simply noted that the University cannot do anything with the land on which the elementary school sits, as long as it houses a public school for Franklin County.
- crossing Highway 41A. While it would be nice to have the pathway from Ely Lane culminate directly in a crosswalk over 41A, to connect with trails behind the Community Center, a single way of getting pedestrians across the highway is the safest, and business owners in Sewanee prefer a crossing by the main intersection (i.e., where it now is).

Nature Trail:
A nature trail was built over a decade ago, from the back of SES through the woods between there and Kentucky Avenue. It is still there, though somewhat in decline, with identification markers having disappeared or diminished. It would be nice to see this "renovated" and brought to the attention of the general public. Its maintenance and use

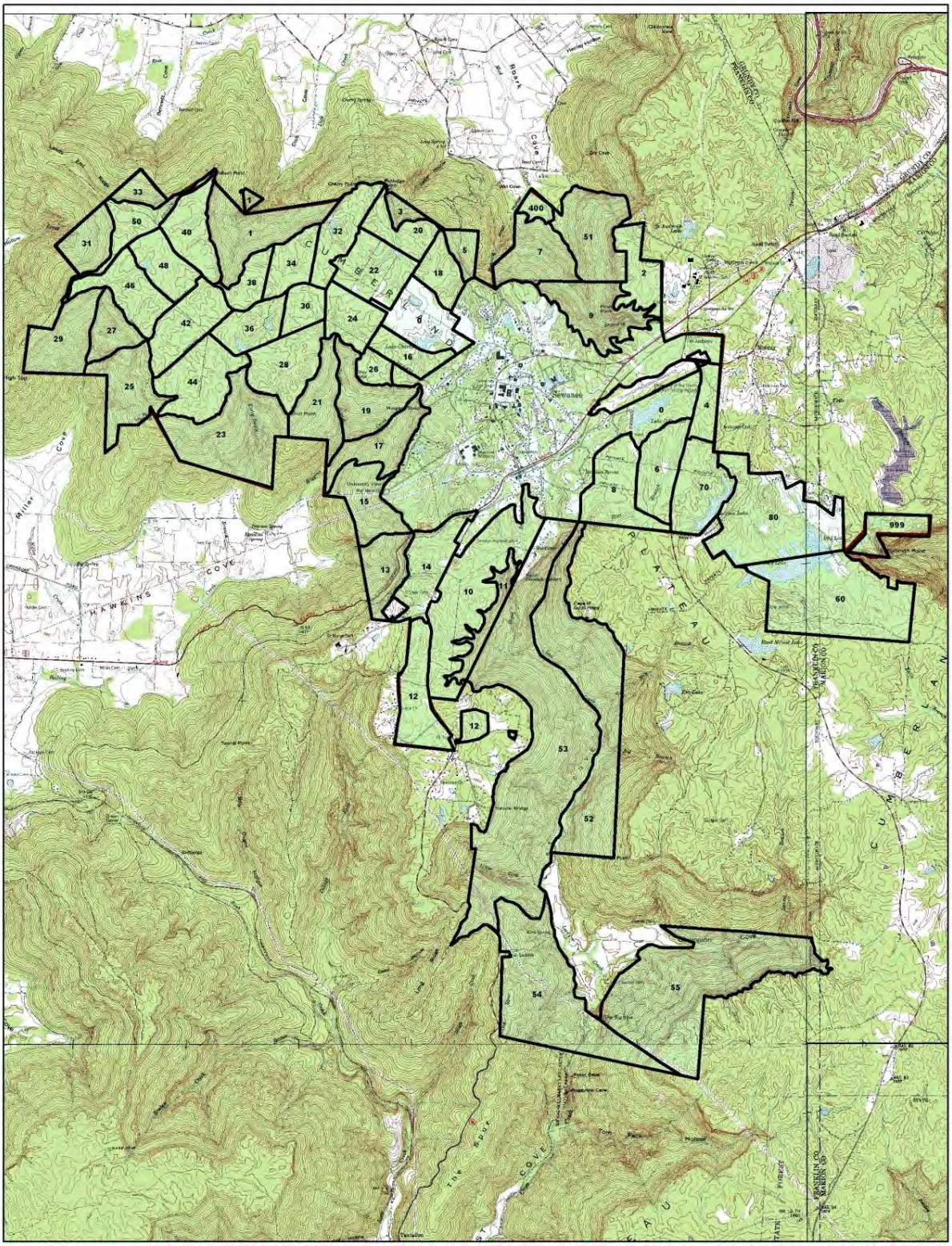
does seem to depend on citizen interest – especially the care and attention of teachers at SES who wish to use it educationally.

Everybody's Backyard:
This piece of land falls into the category of a "backyard ditch" within the community. That is to say, it lies in the backyard of homes and school buildings and thus tends to be treated as a forgotten place where disposables and refuse can be left, deposited, and otherwise ignored. It is also a place where invasive species proliferate. Bringing this small piece of woods and water to the forefront of citizen imagination is warranted. There are stories to be told about the lives that have been lived here. There are wonders large and small that can be highlighted and brought to public attention. And there are corridors of movement that can develop and integrate disparate parts of the community. It should shift from being a forgotten backyard to an appreciated, noticed, and accessible asset to community life.

Conclusion:
A few final things can be noted about the learning process involved in our visit to this area. First, walking the land, especially with folks with a variety of expertise, makes all the difference in taking stock of what is there, what is to be valued, and what issues arise as we consider "developments" to the area. Second, each of the topics mentioned above are pertinent for many places in Sewanee where the Domain meets human interaction.

As we negotiate the nature/human interface on the Domain these issues must be attended to:
1) historical dimensions of the land and where/how people have lived,
2) watershed concerns, especially with regard to new construction plans as the Master Plan unfolds (the work on Cannon Hall is the most salient in the near future, as the land drains directly into the Abbo's Alley watershed),
3) technology developments that require chunks of land to be usurped,
4) the corridors by which students, faculty, staff, and other citizens move through natural spaces in their transit of daily routines, and
5) the degree to which forgotten "ditches" go unnoticed and become havens of either invasive species of plants and/or depositories for refuse – either ordinary trash or left-overs from construction projects.

Appendix B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COWAN
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Roark Cove
Millar Cove
Johnnys Cove
Fiery Gizzard Trail
The Spur
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Branch
Lake
Pond
Trail
Road
Church
Cemetery
Spring
Ridge
Mountain
Plateau
Forest
Park
Tower
Overlook
Falls
Trailhead
Campground
Shelter
Bridge
Dam
Golf Course
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