CONNECTING TO NATIVE PLANTS THROUGH HERBAL MEDICINE TRADITION AT THE FOXFIRE MUSEUM AND HERITAGE CENTER

by

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(Under the Direction of Shelley Cannady)

ABSTRACT

This project aims to illuminate the importance of native southern Appalachian plants to traditional and contemporary medicine through the research-informed design and implementation of a native medicinal plant teaching garden at the Foxfire Museum and Heritage Center in Mountain City, Georgia. The Foxfire Museum is a folklife cultural center that celebrates, documents, and sustains Appalachian heritage, including the longstanding tradition of using native plants as medicine. This research asks: What plants should be included in a garden design at the Foxfire Museum and Heritage Center in order to best represent the culturally, historically, and currently significant native medicinal plants of southern Appalachia? This research establishes criteria for which plants should be included and classifies native medicinal plants from various regional cultural traditions, culminating in a plant list and garden design appropriate for the site context at the Foxfire Museum.

INDEX WORDS: Landscape Architecture, Ethnobotany, Herbal Medicine, Native Plants, Appalachian Studies, Heritage Conservation, Folklore

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CHAPTER 1

INTRODUCTION

Generations of knowledge building of the medical applications of plants has brought global humanity a common truth: plants are invaluable as sources of time-tested, powerful medicine. Empirical observations of our early ancestors developed into robust cultural traditions across the globe, all serving to carry on knowledge that for millennia has been essential to our survival. The plants that surround us are our allies. Taking plants as medicine is a practice that connects our bodies to the planet's ecosystems. Before we developed synthetic pharmaceuticals, people across the world relied on a collective understanding of the plants in our forests and fields and how to locate, identify, gather, prepare, and administer them to treat and prevent illness.

Problem

Southern Appalachia is known as one of the most botanically diverse regions in North America, home to many native and endemic species that are in high demand on the global herb market. It is known that Cherokee and Creek natives used more than 1,100 native plants of this region for medicinal purposes (Crellin 1990, 89). The medicinal value of native plants of the southern Appalachian region was recognized early in the colonization of America, and many native plants continue to be in use today. From Indigenous Traditional Medicine to Appalachian Folk Medicine to contemporary herbalists, southern

Appalachian native ecosystems have enduring value as a source of phytomedicines. The central question this research aims to answer is: What plants should be included in a garden design at the Foxfire Museum and Heritage Center in order to best represent culturally, historically, and currently significant native medicinal plants of southern Appalachia? Supporting questions include: What native medicinal plants were used by different cultural groups in the region historically, and which of these plants are still being used today? Also, which of these plants are appropriate for the conditions of the proposed garden site?

Existing resources on the medicinal uses of plants in southern Appalachia often do not differentiate native from non-native plants, and even fewer resources specifically address the medical uses of native Appalachian plants. Existing resources tend to present a singular cultural or historical perspective, as opposed to the breadth of plant-use knowledge across different groups. Additionally, the botanical or aesthetic characteristics of native Appalachian plants are rarely noted in medicinal plant resources. The lack of existing resources directly connecting the medicinal uses of native plants with the native habitat of those plants inspired this research inquiry.

Purpose and Intent

This project aims to connect the cultural heritage and ecology of native southern Appalachian medicinal plants by providing an opportunity for people to familiarize themselves with these plants in the context of a garden. A growing area of scholarship in human-nature relationships supports the idea that the closer relationship people have with the natural world, the more engaged they are with its protection (Guisti 2019). This

project intends to foster meaningful engagement with native plants through tacit knowledge building and close observation. The vehicle of this engagement effort is a native medicinal plant demonstration garden, designed to complement an herbalism classroom at the Foxfire Museum and Heritage Center in Mountain City, Georgia. The Foxfire Organization is a nationally recognized model of heritage preservation; the Foxfire books, Heritage Center, and educational programs have sustained and celebrated Appalachian traditions with new and younger audiences for over 50 years. The garden will serve as a teaching tool for herbal medicine classes and an opportunity to share Foxfire's robust archival information related to the traditional uses of plants by local people. Teaching the public about the medicinal properties of native plants in their native habitats allows this cultural heritage to come alive, connecting history and place. The intention of the teaching garden is to invite the user to engage with these plants through their senses, cultivating familiarity and reverence.

The use of the garden as an interpretive tool will necessitate an exploration of planting design aimed at increasing the legibility and aesthetics of plants that are typically found in a dispersed woodland setting. The research includes documentation of an iterative evolution of the project over time as initial design and planting choices were analyzed and a modified design was proposed.

Objectives

The first objective of this research was to develop a planting list of native Appalachian medicinal plant species that are appropriate for the site and represent the historical as well as contemporary uses of native plants. Conducting this background research was

necessary to inform the planting plan of the garden, as most guides on the medicinal uses of plants provide little information about the native range, growing conditions, and other necessary information needed to plant a viable garden. The goal of this list was to represent culturally, medically, and commercially valuable plants from southern Appalachia that will thrive at the Foxfire site. While there are numerous resources documenting the medical uses of plants in southern Appalachia, this research seeks to identify the species that fulfill six criteria: traditional use, contemporary use, native to region, conservation status, growing conditions, and aesthetic function.

A subsequent objective is to utilize the selected species to develop a native medicinal plant demonstration garden. The garden serves to concentrate these plants beyond their typical dispersed woodland distributions to aid in identification and improve access for the diversity of Foxfire visitors from school groups to herbalism students to ability-impaired visitors. The garden helps highlight these unique species with the end goal of increasing familiarity, appreciation, and ultimately conservation of these plants. One area of exploration is beauty and legibility of the garden, as this garden will incorporate plants that are unfamiliar to the designer as landscape plants. Although the site is very small, attention was given to the microclimate variations of the two garden plots so as to increase the success rates of plantings. Additionally, the garden needed to fit in with the context of the Foxfire Museum, necessitating that the design and aesthetics be modest, minimal, and historically appropriate.

Methodology

In August 2018, I met with herbalist Patricia Kyristi Howell to discuss the goals of the project. Howell had already been teaching classes at Foxfire for many years, and there was initiative at the museum to dedicate an available onsite cabin to the study of herbalism. Howell, in coordination with Foxfire staff, reached out for assistance with developing a teaching garden to complement the herbalism cabin. The initial scope of work included developing a site design and coordinating implementation of a garden that Howell and other herbal educators could use during their classes at the Foxfire Museum site. The goals were to make woodland medicinal species found in disbursed woodland areas more easily accessible for close study and to serve as a demonstration of the important native medicinal plants of the region.

The first phase of the project was a site analysis conducted in the fall of 2018, discussed in Chapter 3. The site analysis includes geography, climate, and ecoregions as well as existing site conditions, opportunities, and constraints. The process of developing a list of appropriate plant species began following the site analysis. Howell provided extensive expertise for the plant selection process. Her 2006 book, *Medicinal Plants of the Southern Appalachians* is a well-researched guide to forty-five medicinal plants native to southern Appalachia informed by over twenty-five years of clinical herbal practice. Before determining plant species selections, six criteria were developed to evaluate plant species based on the goals of the project as initially expressed by Foxfire staff and Howell, the primary stakeholders. The criteria used to select the plant list and develop the site plan is specific to this project's site, users, limitations, and goals, as is the case with any landscape design program. The process of developing criteria and

determining plant selection is discussed in Chapter 4. With an initial plant list determined, Howell and I proceeded to gather volunteers and plant donations while I developed a preliminary site plan presented in Chapter 5. The preliminary site plan focused on minimal site disturbance and remaining in-bounds with the real-world limitations of the project. Limitations included: an implementation goal of Spring 2019, a minimal budget for site improvements or plants, reliance on donated plants to complete installation, reliance on volunteer labor to complete installation, and a small, shaded site.

The garden was installed in April 2018. The opening of the garden was celebrated with an "Herb Day at Foxfire" community event in May. After reflection and further discussions with Howell following the garden installation, I decided to conduct further research to defend or revise my initial decision-making and better understand my subject and context; to give a more thorough list of appropriate plants that Foxfire could include in the garden over time; to provide an aesthetic vision for the future trajectory of the garden; and to contribute to the body of knowledge by comparing and classifying resources related to native Appalachian forest medicinal plants. This research led to the development of an aspirational planting design that could help guide the project as more funding and resources become available. The as-built site plan is illustrated and analyzed and other examples of native woodland gardens are observed to inform an improved design, proposed in Chapter 5.

Since the initial plant list was developed before a complete review of resources could be conducted, a more extensive review of literature was conducted to find resources representative of different cultural influences and aspects of the historical and contemporary use of native Appalachian medicinal plants. These resources are introduced

and placed in the context of southern Appalachia in Chapter 2. Plant species discovered in the literature review were classified in Chapter 4. Classification methods were used to develop an appropriate species list for the Foxfire site using the six criteria developed. Citations were noted for each species to generate a list that represents the range of uses of native medicinal plants in the region. Two revised plant lists are included in Chapter 4: the revised plant list includes species that would thrive on the garden site, and a second list includes species that would thrive in a sunnier area of the museum site should that become available.

Literature Review

The resources used to determine appropriate native medicinal plants for the project include examples of primary research as well as both contemporary and historical resources on native plants and herbal medicine. The literature with primary research on the topic is derived from interviews with local Appalachian healers as documented in Foxfire's books and archives (Elliot 1973, 1975; Collins 1999). Interpretive naturalist Judith Bolyard's study *Medicinal Plants and Home Remedies of Appalachia* (1981) was similarly derived from interviews with local Appalachians, mostly based in Kentucky. Resources that combine interview content with historical research on Southern Folk Medicine and herbal medicine include medical historian John Crellin's *Herbal Medicine Past and Present* (1989) and Anthony Cavender's *Folk Medicine in Southern Appalachia* (2003). Resources authored by contemporary practitioners included Cherokee medicine practitioner J.T Garrett's *The Cherokee Herbal: Native Plant Medicine from the Four Directions* (2003); practitioner of Southern and Appalachian Folk Medicine and fourth-

generation Creek herbalist Phyllis Light's *Southern Folk Medicine* (2018), and of course Howell's *Medicinal Plants of the Southern Appalachians* (2006) was an important resource.

Recent past resources listing native plants sold commercially included *A Guide to Medicinal Plants of Appalachia* published by the United States Department of Agriculture as a guide for harvesters (Krochmal et al,1971). The contemporary organic herbal supplier Mountain Rose Herbs was consulted for examples of native herbs sold on the commercial market today. Mountain Rose Herbs was chosen because they are a reputable retailer setting an example for the industry by selling organic, sustainably sourced, and fair trade herbs.

The resources consulted related to the botanical characteristics of plant species were primarily the Missouri Botanic Garden's online PlantFinder, and the *Peterson Field Guide to Medicinal Plants and Herbs* authored by medical botanist James A. Duke and herbalist Steven Foster (2014). Professor of biology Timothy P. Spira's *Wildflowers and Plant Communities of the Southern Appalachian Mountains and Piedmont: A Naturalist's Guide to the Carolinas, Virginia, Tennessee, and Georgia* was consulted to understand the composition of native Appalachian plant communities (2011).

The resources reviewed to understand the historical social context of the southern Appalachian region include historian Elizabeth Catte's lecture *Seeing Appalachia* and book *What You Are Getting Wrong About Appalachia* (2018) as well as historian Sandra Lee Barney's *Authorized to Heal: Gender, Class, and the Transformation of Medicine in Appalachia, 1880-1930* (2000). Sociologist Tammy L Werner's *The War on Poverty and*

the Racialization of "Hillbilly" Poverty: Implications for Poverty Research (2015) provided socio-economic context.

In addition to Anthony Cavender and Phyllis Light's historical context of Southern Folk Medicine, older works including *Root Digging in the Appalachians: The Geography of Botanical Drugs* by Geographer Edward T. Price (1960) and *The Sociology of Southern Appalachia* by sociologist David S. Walls (1977) were consulted. The resources consulted to understand the context of contemporary herbal medicine include published journals by the American Herbalist Guild (AHG), the work of United Plant Savers documented on their website and published journal, my AHG conference attendance in October 2018, Mountain Rose Herbs website, and personal communication with herbalists in the region.

Resources related to medicinal plant production include published papers related to Non-Timber Forest Products (NTFP) researched by forester James Chamberlain, PhD (1999, 2003, 2006, 2013), environmental scientist C.M Shackleton, PhD (2015), geoscientist Laura Rasmussen, PhD (2017), and botanist/horticulturalist Eric Burkhart (2009).

Organization

Chapter 1 introduces the project. Chapter 2 provides background and history of herbal medicine and the site context, covering Appalachia, the Foxfire organization, Cherokee traditional medicine, Southern and Appalachian Folk Medicine, and the importance of native medicinal plants to the commercial herb trade. Chapter 3 covers the site analysis. Chapter 4 covers the plant selection and evaluation process as well as providing a revised

plant list. Chapter 5 covers the implementation of the garden, analyzes the decisions made, and proposes changes to the original design with an aspirational planting design that incorporates the expanded plant list from Chapter 4. Chapter 6 provides analysis and conclusions on the project and identifies areas for continuing research.

Definition of Terms

The following are operating definitions for the purposes of this thesis. Unless otherwise stated the definitions are the my own, based on the use of the terms in the literature reviewed.

Allopathic medicine: also known as conventional medicine, is the system of medicine used by contemporary medical doctors. It is characterized by the treatment of symptoms and disease with drugs or surgery.

American contemporary herbalism: this phrase to refers to the collective clinical practitioners, educators, and personal users of herbal medicine and the contemporary state of the discipline including professional organizations, publications, educational institutions, professional practice, and materia medica.

Appalachia: Appalachia is roughly defined as the mountainous region of the eastern United States from New York to Georgia and west to Mississippi (Appalachian Regional Commission 2018) (See Figure 1.1).

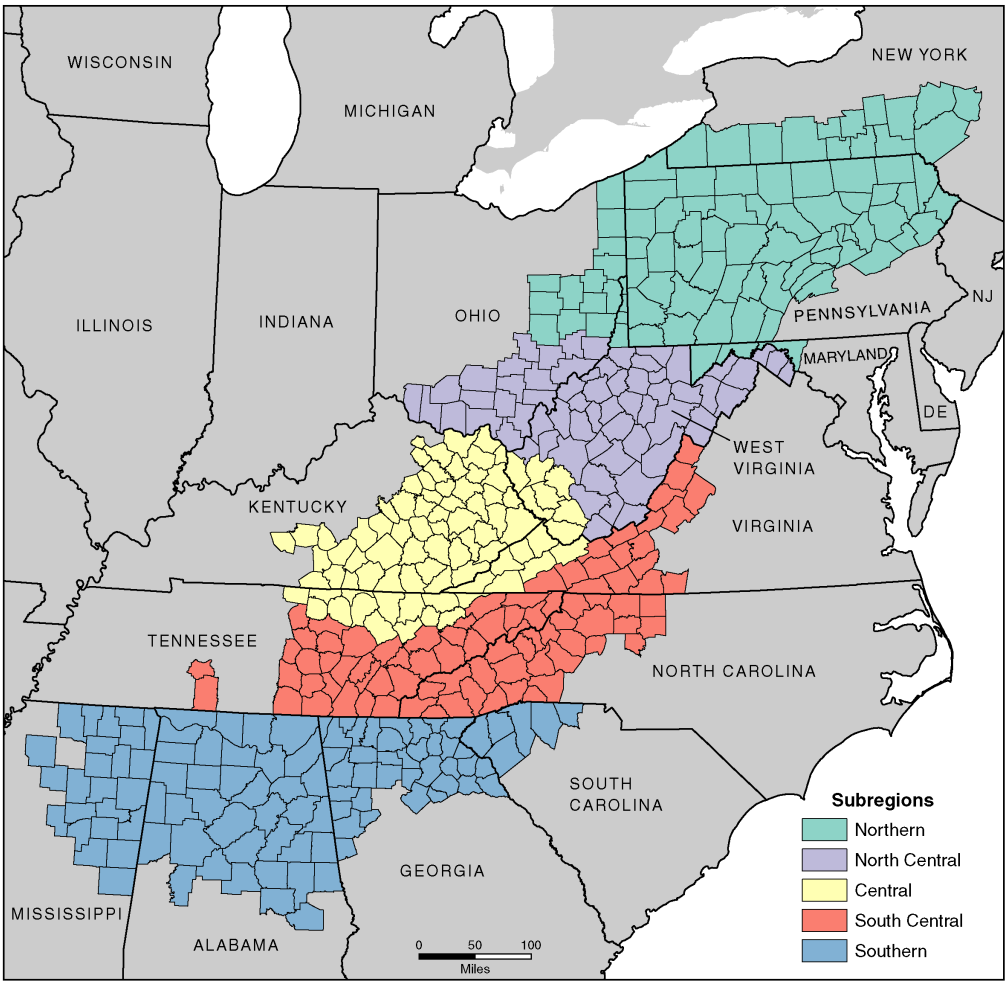

Figure 1.1 Appalachia with subregions as defined by Appalachian Regional Commission (Map by the Appalachian Regional Commission. "Subregions in Appalachia." https://www.arc.gov/research/MapsofAppalachia. asp?MAP_ID=31)

Appalachian traditional medicine: I use this term to encompass the sum of the influences of European, African, folk and Indigenous medicines that informed our historical understanding of medicine outside of "official medicine" in the region.

Category 1 non-native invasive species: "Exotic plant that is a serious problem in Georgia's natural areas by extensively invading native plant communities and displacing native species" (GA Invasives, accessed March 14, 2020)

Folk medicine: "The system of medical beliefs, knowledge and practices associated with a particular culture or ethnic group" (Light 2018, 10). This is not a static body of knowledge documented in official literature, but rather an evolving tradition with a range of influences.

Herbalism: "Using plants, food, and other natural healing techniques to support good health and the body's natural healing processes" (Light 2018, 10).

Humoral medicine: theory of medicine dating back to ancient Greece, the prevailing philosophy of health and healing in the western world until replaced by allopathic medicine at the turn of the 19th century (Lagay, accessed March 14, 2020).

Indigenous or Native American medicine: this primarily refers to the herbal practices of Cherokee and Creek native peoples whose knowledge of the southern Appalachian native plants is the source of much of our understanding of the medicinal uses of those plants.

Materia Medica: the materials used for healing. in herbalism this is the plants themselves as well as the historical body of knowledge attached to them.

Southern Appalachia: this refers to the central and south-central subregions of the Appalachian Regional Commission's definition that includes "middle and eastern Tennessee, the Blue Ridge Mountains and Shenandoah Valley of Virginia, much of western and all of eastern Kentucky, western North Carolina, southern West Virginia, northern Alabama, north Georgia, northwestern South Carolina, and much of the Piedmont of North Carolina and Virginia" (Cavender 2003, 7). When referring to cultural and sociological related subjects, I am using Cavender's definition. For plant selection, I am using an ecoregion-focused definition of Southern Appalachia that restricts focus to plants that grow in and near the mountainous areas most similar to the Foxfire site.

Southern Folk Medicine and Southern Appalachian Folk Medicine: this is referring to folk medicine traditions originating from the southeastern United States and the southern Appalachian region (Light 2018, 9).

Traditional medicine: the World Health Organization defines this as "the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, assessment, improvement, or treatment of physical and mental illnesses" (Light 2018, 10)

Justification for and Contemporary Efforts in Teaching the Medicinal Values of Native Southern Appalachian Plants

In 2003, the global market for botanical trade exceeded 6 billion USD (WHO, 2003). While plant medicine has prevailed as the primary form of medicine in much of the rest of the world (WHO, 2003), for a brief period in the United States during the mid-20th century, the practice has experienced some decline. During the 1970's the age-old practice of plant medicine experienced renewed interest with back-to-the-land and environmentalist movements, an interest that continues to grow steadily in the United States. The efficacy of plant medicine will not be discussed here. There are countless phytopharmacological studies in scientific journals attesting to the efficacy of the chemical compounds found in culturally revered medicinal plants.

Humans have carried the knowledge of plant medicine across time. In the 21st century the knowledge of the plants themselves, their physical form, their habitat, and how to find and identify them is increasingly being lost. This phenomenon has been addressed by recent scholarship seeking to overcome "plant blindness", in which individuals cannot differentiate or identify plant species (Frish et al 2010; Wandersee et al 1999). Many people are largely disconnected from the sources of their medicine, purchasing plants powdered in capsules or extracted in prepared alcohol tinctures. Purchasing dried plant material, while somewhat recognizable would not aid in identifying the plant in the forest. Plant medicinal products are purchased largely from stores or online retailers with little documentation of the product's origins. An increasing number of people reside in urban centers without access to growing or gathering herbs. Some may be wary of wild collection in their area due to the prevalence of herbicide

spraying. For these reasons, purchasing prepackaged herbs is the most accessible means of acquiring herbal medicine for many people today.

This reliance on commercial suppliers requires the user to put trust in the supplier, as the sourcing of plants is largely unverifiable. The global herbal market is a circuitous web of wild harvesters and cultivated herbs sold up the supply chain and across borders, making tracing the original sources of herbal products incredibly difficult. The Sustainable Herbs research project, conducted by the American Botanical Council, sought to trace this supply chain, revealing troubling conditions. Ann Armbrecht, director of the program, started the Sustainable Herbs Project in 2015 to document the state of the global herb trade. In her travels, she observed polluted harvesting sources, unsanitary processing practices, environmental degradation, and low compensation for harvesters (accessed February 15, 2020). To combat this issue, the organization suggests that consumers purchase Fair Trade, Organic, and Fair Wild certified products to help ensure the sustainable sourcing of purchases.

There is particular concern with forest-based medicinals, which are primarily harvested by digging up the entire plant for the root, rather than just harvesting from the aerial parts of the plant. Conservation concerns of overharvesting surround these largely wild-collected species as forests are rapidly being lost to development. Many of the most notable native Appalachian medicinal plants including American Ginseng (*Panax quinquefolius*), Goldenseal (*Hydrastis canadensis*), Black Cohosh (*Aralia racemosa*), Blue Cohosh (*Caulophyllum thalictroides*), and Bloodroot (*Sanguinaria canadensis*), fall into the category of forest medicinals harvested for the root. Still, market value for these plants on the commercial market is rising. Market value for forest-based medicinal plant

products currently exceeds one billion dollars annually in the United States according to Appalachian Beginning Forest Farmer's Coalition, a group developed to directly address the supply concerns with forest medicinals (ABFFC, accessed March 12, 2020).

Many of the forest botanicals sold on the commercial market are still wild harvested because of consumer demand for forest grown products as opposed to cultivated products (Burkart 2009, 2). This has led researchers in recent decades to pursue opportunities to address both the market opportunities and conservation concerns surrounding forest grown herbs. A rapidly expanding area of research is in the production of Non-Timber Forest Products (NFTP) including medicinal herbs. NTFPs are cultivated crops of woodland species grown in their natural habitat. They can provide a supplemental revenue stream and incentivize conservation for individual landowners, as the forest ecological system must remain intact to produce good yields. Additionally, well-managed NTFPs provide access to in-demand herbs without depleting local populations. Research topics include cultivation methods, trial and yield results, and the ecological sustainability of forest-grown products. These studies are helping further the viability of raising forest grown medicinal plants as a sustainable agricultural product (Chamberlain 1999, 2003, 2013, 2019; Effron 2006; Rasmussen 2017; Shackleton 2015; Small 2018).

Appalachian Beginning Forest Farmers Coalition (ABFFC) is a support network for growers and potential growers of medicinal NTFPs, aiming "to increase awareness of forest-grown medicinal plants through education and relationship building, and support conservation efforts through stewardship of existing plant populations and forest farming of these native botanicals" (ABFFC, accessed Feb 3, 2020). Initiatives like ABFFC are

helping to reduce the pressure on wild populations of native plants by supplementing the market supply with forest grown products.

Additionally, some recent efforts have been made to help ensure the sustainable acquisition of forest botanicals. The lack of accountability of the global market has led American herbalists to call for increasingly local sourcing of plants with traceable supply chains, ethical labor practices, and verified sustainable harvesting and cultivation practices. Pennsylvania Certified Organic recently developed a Forest Grown Certified program to create more transparency in the supply chain and ensure products sold with the certification were sourced in an ecologically and socially sustainable manner. The program was transferred in 2019 to United Plant Savers (UPS), a medicinal plant conservation organization founded by American herbalists. UPS manages numerous programs working to ensure the stability of wild populations of medicinal plants, including maintaining a list of "at-risk" and "to watch" species, which addresses trends in market demand for specific plants. UPS states their mission is to "protect native medicinal plants of the United States and Canada and their native habitat while ensuring an abundant renewable supply of medicinal plants for generations to come" (UPS, accessed March 12, 2020). Major organic herb supplier Mountain Rose Herbs has set an example for herbal retailers by teaming up with UPS to provide a level of consumer confidence for the sustainable production of their products. Mountain Rose Herbs adopted the verification program for their American Ginseng, Black Cohosh, and Blue Cohosh products, helping to close the gap between source, harvest, distribution, and consumer. Current research and initiatives in these areas suggest exciting opportunities to continue the medicinal use of Appalachian endemic species in a way that helps ensure the

stability of wild populations, while also contributing economic benefits for landowners in the Appalachian region (Rasmussen 2017).

Herbalism as it is practiced in the United States is somewhat unique in that a conservation ethic is central to the profession (Howell, personal communication Jan 2020). Numerous personal conversations and experiences with herbal practitioners have reinforced this idea, including lectures and plant walks by herbalists Janet Kent, Jen Stovall, Howell, Noelle Fuller, and Erika Gallentin; as well my participation in the 2018 American Herbalist Guild Symposium. Ensuring the continued health of the ecosystems of healing plants is a top priority for those whose profession and healthcare relies on them.

Some herbalists, such as Kent, take their conservation ethic further by practicing bioregional herbalism. Bioregional herbalism prioritizes the use of plants that are growing near where the user lives. Plants are often acquired by wildcrafting (collection of wild plants), requiring individuals to explore the landscape around them to find what they are seeking. This practice provides a powerful tool for connecting personal health with the health of one's environment. The individual's health is directly tied to the landscape they live in, helping to promote the connection of people to land. By knowing and studying a place intimately and observing changes over time Kent argues, an individual learns to steward rather than simply extract resources (Kent 2018).

As bioregional herbalism connects individuals to their home ecosystems as a practice of intention, educators in other disciplines have utilized similar strategies to connect the public with local ecosystems. The State Botanical Garden of Georgia's "Connect to Protect" program uses the implementation of pollinator supporting native

plant gardens in Georgia communities to help create a patchwork of food sources for pollinators while connecting the public with native plants and ecologies (Muller, personal communication February 23, 2020). The premise of the program is simple, pairing native plant gardens with educational material to expose the public to native plants in a direct way while teaching people about the role of pollinators and how they can support them in their home landscapes.

Programs like "Connect to Protect" are serving to combat a growing lack of prioritization, awareness, and valuing of plants and native ecosystems in our society. Conservation scientists are using unconventional means to inspire meaningful connection to plants such as the online storytelling project "Plant Love Stories" (McDonough et al 2019). The project shares personal stories of meaningful experiences with plants, employing narrative to appeal to emotion with the aim of creating a "broader social discussion and awareness of the value of plants to human and ecosystem health" (McDonough et al 2019). Whether combating "plant blindness" (Wandersee et al 1999) or developing "plant love" (McDonough et al 2019) many botanists and conservation scientists recognize the need to cultivate a public understanding and appreciation of plants to inspire conservation and protect local ecosystems. One goal of this project, to connect the public with native plants through the lens of cultural and contemporary medicinal uses of those plants, supports the position that knowing plants intimately as medicine is one of the most powerful means of developing a personal connection to those plants.

CHAPTER 2

CONNECTING TO HERITAGE

A Brief Introduction to Southern Appalachian Traditional Medicine and Foxfire's Appalachian Context

Appalachian Context

In contemporary times, southern Appalachia is a global tourism destination, known for world class outdoor recreation and natural beauty. The area is a cultural hub for everyone from artists, craftspeople, modern homesteaders, craft beer enthusiasts, and natural healing practitioners. Areas like Asheville, North Carolina have seen recent booms in population and real estate prices. It can be hard to see in this relative prosperity that Appalachia has struggled historically with resource-extracting economies and multi-generational poverty.

Prior to the end of the 19th century, much of the region lacked major infrastructure, economic and educational opportunities, and an organized medical system (Barney 2000,17). Amid difficult topography, dispersed families of homesteaders and sharecroppers survived with limited means of cash income (Barney 2000, 18). Lacking regular access to doctors, knowledge of the germ theory of disease, and adequate nutrition, many families struggled with illness and disease (Cavender 2003, 24). While there was certainly class stratification, average families in southern Appalachia lived subsistence agrarian lifestyles in simple log cabins and wood-frame homes, cultivating

crops, raising livestock, and gathering food, medicine and fuel from the surrounding forests (Cavender 2003, 11). The reviewed literature documents that this lifestyle persisted from the time of early settlers with little major technological changes until well into American industrialization in the late-1800s.

The inclusion of Appalachia into the national economy came during the late 19th to early 20th century when the development of industrialized coal and timber industries introduced Appalachia to the rest of the country. As defined by Henry Shapiro in *Appalachia on Our Mind,* in the tumultuous decades between 1870 and 1920, the traditional lifestyles of Appalachia came to be a subject of fascination in the American consciousness which developed into the fabrication of "Appalachian otherness", a stigmatization of Appalachian lifeways and people (Shapiro 1978).

Mountain residents largely of Scotch-Irish origin (many of whom by that point were of mixed heritage with Cherokee, as evidenced from frequent mentions by interviewees in the Foxfire books of grandparents of mixed Cherokee ancestry) became caught in the competing fabricated narratives of local color writers, protestant missionaries, and industrialists who were all seeking to manipulate the image of Appalachia for their own means (Werner 2015). Some sought to categorize Appalachians as "pure Americans", holding the persistence of traditional lifeways as markers of ignorant isolation from 'modern' life (Cavender 2003, 1). One could draw similarities between these notions and the racist 'noble savage' concept that long created a philosophical justification for dehumanizing non-white ethnic groups. Others saw the subsistence lifestyles of perceived whites as an abomination to notions of white racial superiority, fueling federal initiatives to study the "Appalachian problem" of poverty and

isolation (Walls 1977, 2). Depictions of Appalachia as a refuge for Anglo-Saxon purity or a haven of depravity persisted through much of the 20th century, as described by Tammy Werner in *The War on Poverty and the Racialization of "Hillbilly"*(2015, 8) and John Glen in *The War on Poverty in Appalachia* (1995, 3). As public historian and Appalachian scholar Elizabeth Catte has described, the people of Appalachia have been consistently characterized as ignorant and exclusively white; a gross mischaracterization that has led to the objectification and often negative perception of the people of the region (Catte 2018). The field of Appalachian Studies is dedicated to elucidating this multidimensional history with a large body of literature exploring this subject.

An unfortunate result of the growing awareness of Appalachia in the public consciousness of the early 20th century was the conflation of traditional lifeways and the tragedy of poverty. The development of railroads and coal mines began to rapidly change the Appalachian way of life, leading many farmers to give up their land and become miners. The increasing landlessness of this lifestyle change degraded diets and health. In the 1920's, a well-meaning movement of health reformers, supported by a rapidly professionalizing class of physicians, sought to modernize medicine in Appalachian communities and eradicate what they deemed as the competing worldview of the old ways, namely the traditional herbal medicine that the majority of families relied on (Barney 2000, 8).

A key objective of health reformers was to eradicate the folk systems of medicine, including plant medicine, which they considered dangerous (Cavender 2003, 28). Unfortunately for Appalachian families, in a justified effort to educate the public on causes of disease transmission and promote sanitation, health reformers often treated

traditional medicine with contempt. In response, many Appalachian people were skeptical of the knowledge of reformers and physicians (Barney 2000, 68), mirroring the nationwide tensions between allopathic physicians and advocates for traditional medicine that had been ongoing since the late 1800s (Crellin 1990, 29). Plant medicine's historically recognized value and known efficacy was all but ignored by these reformers, violating folk cultural traditions and ignoring the important role of herbs as an income generator in impoverished communities. Despite these outside pressures, folk medicine traditions were persistent and continued to be practiced in Appalachia, though less so, until brought back into the spotlight by a renewed interest from folklorists, back-to-the-landers and the holistic health movements of the 1960s and 70s. The hugely popular Foxfire books covered home remedies and uses of plants and sold over 9 million copies in the 1970's, introducing a global audience to the traditional and folk medicine practices of southern Appalachia (Foxfire, accessed March 12, 2020).

Appalachian communities were examined with scrutiny for much of the 20th century, as well-meaning but misguided interventionist efforts such as the Federal War on Poverty initiatives of the 1960s continued to attempt to amend the situation of poverty and elevate Appalachia economically (Werner 2015, 11-13). Many folk traditions could have been lost to modernization entirely if it weren't for the work of cultural heritage preservation groups. Folklore societies, originating at the same time as the health reform movement, contrasted those initiatives by recognizing the value of folk heritage and documenting lifeways and customs in Appalachia (Cavender 2003, 2). Folklore societies and heritage preservation groups such as Foxfire played an important role in preserving the cultural heritage of the region.

The Foxfire Organization

The Foxfire Museum and Heritage Center is a living history/ heritage museum and community center in Mountain City, Rabun County, Georgia. The Foxfire project began in 1966 as a series of interviews conducted by local high school students with their family members and community elders that was published under the direction of their teacher Eliot Wigginton as *Foxfire* magazine. Spanning fifty years, these interviews became an extensive body of ethnographic data collected by the community about itself, with global value and interest to the field of Appalachian and folklife studies (Foxfire, accessed January 15, 2020). To date the Foxfire organization has published 12 volumes that compile and interpret interviews about Appalachian lifeways covering a range of topics (Foxfire Books, 1968-2018).

The Foxfire books transcribe oral history directly as it was spoken by the interviewee, allowing the texts to convey not only the knowledge but also the dialect and voice of the subject, retaining the human connection with the information presented. The "Foxfire Method" has become an example of experiential learning where members of a culture document lifeways and traditions from other members of that culture in order to preserve knowledge, or "cultural journalism as pedagogy" as described in a dissertation by Julie Oliver specifically focused on the Foxfire program (Oliver 2011, 68). Oliver studied the Foxfire organization's history and legacy as well as the features that set it apart from other folk schools and similar institutions, stating that by the younger generation engaging in the active preservation of lifeways, these traditions were being passed down in practice as well as in documentation (Oliver 2011, 207).

In 1974, the Foxfire organization purchased land near Mountain City, in Rabun County Georgia to form a heritage center (Foxfire, accessed October 20, 2018). On these 150 acres, a living history museum and community heritage center was developed by transporting historic cabins and outbuildings with Appalachian heritage significance to the site. Those structures now house artifacts and interpretive information on Appalachian folkways derived from the ethnographic interviews (Foxfire Organization, 2018). Additionally, traditional skills, arts, and crafts are taught by locals with regular programming and classes. Events celebrating Appalachian heritage are held throughout the year.

The museum site is a forested mountainous site with minimal improvements. The sense of place resonates upon arrival. Simple log structures, gravel roads, narrow trails, split rail fences, and minimal signage make up the material experience of the site and provide a stark contrast to visitors coming from the busy, billboard-littered highway a few miles down the mountain. The heritage center is placed within the very landscape and context that it seeks to describe and interpret to the greater public, in contrast to many museums that seek to replicate or describe a context unrelated to the spatial reality of the exhibits themselves. The geographic context of the museum facilitates the Foxfire method of experiential learning, where Appalachian lifeways are passed on to students who learn by doing.

Among the practices documented by students in the Foxfire program, the traditional uses of medicinal plants was noted multiple times in various interviews; in fact, information about the subject has already been published in several books produced by the Foxfire organization (Wiggington 1973, 1975; Collins 1999). The Foxfire books are

an excellent resource, however there is also extensive unpublished information related to folk medicinal practices found in transcribed interviews in the Foxfire archive (K. Ahrens, Assistant Curator, personal communication, August 27, 2018). The Foxfire archives are an excellent collection of primary documentation of the practice of Southern Appalachian Folk Medicine (among other local lifeways and knowledges) collected from people local to Rabun County. The data includes information about the specific uses of plants and philosophies of healing and medicinal practice.

By documenting and celebrating Appalachian folklife, heritage, and context, Foxfire shed a positive light on the people of Appalachia to a global audience. The Foxfire Book (1971) made the New York Times bestseller list, and popular Foxfire character Aunt Arie inspired a Broadway play in 1980 (Oliver 1999, 155). By documenting Appalachian lifeways, Foxfire has demonstrated the value of traditional knowledge and done much to share this knowledge with a broad audience, helping to elevate the perception of Appalachia to the rest of the world. As a community-generated initiative, Foxfire is embedded in and a part of the continuing legacy of traditional Appalachian lifeways.

Traditional Medicine in Southern Appalachia

As part of the oldest mountain range on the globe, spared from the last ice age, the evolutionary path of the southern Appalachian region has led to temperate wet forests and mountain valleys with high levels of biodiversity of native and endemic species (Spira, 138). The Cherokee and Creek natives of this region relied on these plants as essential sources of medicine prior to the European colonization of America. Cherokee and Creek

natives used more than 1,100 native plants medicinally (Crellin 1990, 89). The value of many plants of the Appalachia region was recognized quickly by European colonists, with plants like American Ginseng becoming valuable exports (Wigginton 1975, 247).

According to Phyllis Light, a fourth generation herbalist with Creek Native American heritage, the Southern Folk Medicine tradition rose out of a merging of English humoral medicine, Native American plant use, healing philosophies of enslaved Africans, and the folk medicine of Scotch-Irish immigrants (Light 2018, 58). The plants cited in resources on Southern Folk Medicine include medicinal plant species of native and foreign origin, demonstrating the range of cultural influences (Light 2018; Crellin 1989; Bolyard 1981; Foxfire Organization 1968-1999; Cavender 2003). Much of the knowledge of the medicinal uses of Appalachian native plants was originally derived from Native Americans, although Europeans also readily adopted species similar to European species already known to them (Price 1960, 6).

Cherokee medicinal practices developed over thousands of years before European contact. Much of the early written documentation of Native American Appalachian plant medicinal uses can be found in the journals and writings of early American explorers and colonists such as Antoine Bonnefoy (1741), Henry Timberlake (1765), James Adair (1775), as well as naturalists and physicians seeking out native plant knowledge such as William Bartram (1791) and Benjamin Barton (1798). It is known that Cherokee natives used hundreds of plants for medicinal purposes, however written documentation of these traditions is limited, as many oral-tradition knowledge bases were lost when natives were forcibly relocated beginning in 1831 during the Cherokee Trail of Tears (Hammel 1975,

10). Additionally, many Cherokee were reluctant to share their knowledge with non-natives for fear it would be misused or appropriated (Garrett 2003).

American institutions did not show much interest in formally documenting Cherokee medical traditions until they were already being lost to the violence of a fractured society. One group that managed to forge a resistance were the Eastern Band of the Cherokee who avoided forced removal and held ground in North Carolina (Cozzo 2004, 14). Ethnographer James Mooney studied the Eastern Band of the Cherokee in the 1880's, publishing *Cherokee Theory and Practice of Medicine* (1890) for the United States Bureau of Ethnology. This work and the *Swimmer Manuscript* (1932), an expansion of Mooney's research by ethnographer Frans Olbrecht, are credited as the few remaining sources for Cherokee names and uses of plants (Cozzo 2004, 10; Mellinger 1977, 1). Even as Mooney was collecting data on the Cherokee, he feared their culture and knowledge was rapidly being lost (Cozzo 2004, 15). Mooney's work was used by researcher David Cozzo in a 2004 dissertation to elucidate the Cherokee ethnobotanical classification system, including hundreds of taxa. Although Mooney's work is undeniably valuable to understanding the medicinal uses of native plants by the Cherokee, his perspective and motivations have also been criticized. As Cherokee author J.T. Garret writes, due to Mooney's apparent dismissal of the efficacy of medicinal remedies and lack of emphasis on holistic representation of Cherokee healing philosophy, some Cherokee still harbor resentment for Mooney's work (Garrett 2003, 1). Garrett published a manual of Cherokee uses of plants in 2003, in which he acknowledges Mooney's work as essential to filling in gaps of knowledge since lost by the tribe, despite Mooney's

considerable bias. Garrett mentions over 450 species, a rare example of Cherokee plant knowledge documented and shared by a Cherokee native (Garrett 2003).

Much of the medicinal uses of native plants still remembered today can be traced back to the Cherokee knowledge shared with early European settlers and passed on through subsequent generations. Early colonists arriving to America brought with them their understanding of herbal medicine from European traditions, as well as the seeds of those plants, spreading European species by cultivation and naturalization (Light 2018, 75). There was much crossover between Native Americans and Europeans, as people shared knowledge of plant medicine as a means of survival (Light 2018, 84).

As generations of European immigrants to Appalachia settled into an American identity and mountaineer lifestyle separate from European influence, distinct folk traditions developed in the geographically isolated mountain areas largely unsupported by any organized medical system (Light 2018, 90). While the people of Appalachia have often been unfairly portrayed, the realities of poverty and difficult living conditions of the mountainous region created the circumstances by which the practice of Southern Folk Medicine formed a distinct tradition as described by Light in *Southern Folk Medicine* (Light 2018, 94). The influences of West African, English humoral medicine, and Scotch-Irish folk traditions with Native American traditions blended healing philosophies and plant knowledge to form a largely unwritten body of shared knowledge. Light acknowledges that folk medicine traditions are constantly evolving, and to define a tradition is to pick a point on an ever-evolving timeline. The distinctness of the Southern Folk Medicine tradition is debated by anthropologist Anthony Cavender, who asserts that the Southern Folk Medicine beliefs and practices are shared among other folk systems of

medicine (Cavender 2003, preface). Light acknowledged the crossover between traditions; however, she argues that the specifics of varying folk traditions are tied to place (Light 2018, 16).

As much of the knowledge of Southern Folk Medicine was carried on by oral tradition, the primary written documentation of the history of this tradition lies in the Foxfire archives (1967-1999), Light's *Southern Folk Medicine* (Light 2018), and several publications by Cavender, ranging from the mid-1990s to the mid-2000s focusing on the folk medicine and use of medicinal plants in southern Appalachia. One of the few nationally recognized practitioners of the tradition in contemporary times was Tommie Bass (1908-1996), an herbalist who both Light and Howell name as an influence. The work of Bass was documented in two volumes by John Crellin and Jane Philpott in *Herbal Medicine Past and Present* (1990) as well as by Michael Flannery in *Trying to Give Ease* (1999) and is an important resource for the practices of Southern Folk Medicine.

The Foxfire books documented oral history as it was carried by the older residents of Rabun County in the 1960s and 70s. The transcribed memories stretch back to what was learned from their ancestors, reaching back into the mid-1800s. Numerous chapters describe interviewees' home remedies and wild plant uses. Cures for ailments range from superstitious rituals to plant-based recipes. While these collections of remedies are helpful to understand what people used to treat injury and illness, Light's *Southern Folk Medicine* offers a comprehensive philosophy of healing that helps put these remedies into a philosophical framework. According to Light, the philosophy of Southern Folk Medicine was deeply rooted in the natural world. "To them, the earth, the land, was the

source of all that was good and everything we needed to stay alive. Because of the interconnectedness of people and land, we were not separate. The earth gives us food, water, shelter and medicine. If we damage the earth, then we damage ourselves." (Light 2015).

Root Digging Tradition

The pastime, profession, and tradition of root digging is evidence of Appalachian culture's close relationship with the forest ecosystem. Root digging, the identification and collection of medicinal herbs from deciduous forests, has been passed on through generations as a vital income supplement for poor mountain families (Wiggington 1975, 246). It is necessary that diggers be keen observers of the natural world, with the ability to accurately identify species in the field. Good diggers practice a conservation ethic, replanting seeds of harvested species and utilizing the Cherokee rule of thumb for harvesting which is to leave the first three plants you pass (Wiggington 1975, 246). This practice ensures the continued abundance of a species in the area and is evidence of a reverence for the natural world. Root diggers historically collected hundreds of species for commercial market and home use which were brought to local stores to be distributed to larger regional herb dealers. Root digging for the commercial market was fulfilled by diggers in the southern Appalachian region as deciduous forests elsewhere were overtaken by cultivation (Price 1960, 11). The highest concentration of crude-drug dealers in the United States were in southern Appalachia well into the 1960s (Price 1960, 11).

Of all the valuable forest plants, American Ginseng (*Panax quinquefolius)* has by far the most lore and monetary value. Ginseng, or 'sang' as called by locals, has consistently remained the single most lucrative herb on the commercial market and is notoriously elusive to find. Many of the Foxfire interviewees fondly recalled 'sang' hunts with family members from childhood (Wiggington 1975). *Foxfire 3* dedicates thirty pages to Ginseng history and lore. It is hard to overestimate the value and reputation of American Ginseng to herbal medicine.

Root digging today is still practiced for the same reasons it was practiced historically- as a pastime, to collect medicine, and for income. Student researcher Laramie Smith, a University of Georgia student, is currently studying wild foraging and root digging under the direction of Dr. James Affolter and The Ethical Forager Project. Smith is currently conducting interviews with individuals to better understand the communities that still participate in wild harvesting herbs for the botanical drug trade in the Southeastern United States.

Appalachian herbs in the commercial market

As they were historically, Appalachian forest ecosystems today are home to many of the most in-demand commercially sold herbs. There are 126 species found in Appalachia that were listed as in demand for commercial sale in a 1971 United State Department of Agriculture guide for harvesters (Krochmal et al1971, 5-9). In 2020, twenty-two of those species are listed by United Plant Savers, as "at-risk" or "to watch". Mountain Rose Herbs sells over fifty species of medicinal plants native to Eastern North America, many of which are found in Appalachia.

The global demand for plants like Ginseng led some species to be overharvested including Lady Slipper (*Cypripedium acaule, C. calceolarus*), False Unicorn Root (*Chamaelirium luteum*), and Virginia Snakeroot (*Aristolochia serpentaria*). Ginseng was added to the 1975 international treaty the "Convention on International Trade in Endangered Species of Wild Fauna and Flora" (CITES), the first international effort to protect endangered species from extinction (CITES, accessed January 15, 2020). Since the 1970's, Ginseng collection and export is regulated by nineteen states with varying restrictions for harvesting from state and federal lands in order to protect wild populations (USFWS, accessed February 23, 2020).

In 1997, Goldenseal was also added to the CITES list (CITES, accessed February 23, 2020). As discussed in Chapter 1, there are significant efforts underway to both protect these in-demand native species with dwindling wild populations as well as supplement supply with forest cultivated herbs. According to James Chamberlain in a 2006 study for the United State Forest Service, more quantitative research is needed to determine the actual economic value of the medicinal plant industry in Appalachia.

CHAPTER 3

SITE CONSIDERATIONS AND SITE ANALYSIS

The Foxfire Heritage Center is a geographically and culturally appropriate place to locate a garden highlighting the native plant species significant to Southern Folk Medicine. As an organization with a stated mission "to preserve the diverse traditions of southern Appalachia and advance the understanding and appreciation of cultural heritage through public programs, publications, and learner-centered education." (Foxfire, accessed October 2, 2018), Foxfire is equipped with the resources to complement an Appalachian medicinal garden with educational programming. Visitors to the museum may encounter the garden with no prior exposure to folk or herbal systems of medicine, thus expanding the educational potential beyond those already seeking out herbal medicine knowledge to the general public. This chapter will demonstrate how the physical and cultural geography of the Foxfire site paired with the educational mission of the site make it an ideal location for an installation dedicated to the study and continuation of the Southern Folk Medicine tradition.

Geography and Climate

The Foxfire Museum and Heritage Center's 106-acre parcel is in the southern Appalachian Mountains of North Georgia. The area is classified by the US Fish and Wildlife Service at the level IV ecoregion level as 66D Blue Ridge Southern Crystalline

Ridges and Mountains, (Griffeth et al 2001). This ecoregion is the highest and wettest area of Georgia, with high levels of biodiversity and floristic diversity. Gneiss, schist, and quartzite comprise the parent material, with soils that are deep, well-drained, acidic and loamy-sandy loam (Griffeth et al, 2001). Soil types found on the site include Bradson (in coves) and Edneyville-Ashe (mountainside) (Soilweb, accessed January 13, 2020). Soil temperature/moisture regime is mesic/udic (Soilweb, accessed January 13, 2020). The site elevation is approximately 2550 feet (Google Earth, accessed January 13, 2020). The parcel abuts 1,700 conserved acres in Black Rock Mountain State Park, just east of the Eastern Continental Divide. The closest weather station is one mile away at the Black Rock Mountain State Park, at an elevation of 3,500 feet (NOAA, accessed January 15, 2020). Mountain City, Georgia receives an average of 65 inches of rain annually and about 4 inches of snow, with an average 128 days of precipitation. Average temperatures range from 85 degrees Fahrenheit in July to 24 degrees Fahrenheit in January, with temperatures rarely above 90 or below 15 (Bestplaces, accessed January 15, 2020).

Site Context

The Foxfire Museum is a rustic site with gravel drives, split rail fencing, and historic cabins set in a deciduous forest setting (Figures 3.1, 3.2). There are more than 20 log structures on the site, transported from sites across the region to save the structures from demolition. Each cabin has a name relating to its functional use, builder, or previous owner. The cabins are scattered across the hillside, connected by small footpaths and a gravel access drive (Figure 3.3). The site is generally experienced via self-guided walking tour between cabins, with each cabin interpreting a different aspect of historic

mountaineer life. There are modern amenities including standard restrooms and electricity, but site furnishings and interpretive displays are simple and historically accurate. The ecological conditions of the 106-acre Foxfire site are such that the native soils, tree canopy, and herbaceous plant communities are relatively intact and representative of the historical ecological condition. I have not found evidence that the site was ever developed historically for agriculture or mining, which has helped to conserve the native plant communities and resist edge pressure from invasive species. Numerous medicinal plant species considered to be "at risk" or "to watch" by United Plant Savers are locally abundant on the site, including Trillium (*Trillium cuneatum*), Black Cohosh, Blue Cohosh, Maidenhair Fern (*Adiantum pendatum*), Partridge Berry (*Mitchella repens*), and Pipsissewa (*Chimaphila maculata*) (Figure 3.4). Native medicinal shrubs including Fringe Tree (*Chionanthus virginicus*) and Carolina Allspice (*Calycanthus floridus*) can also be found on the property (Figures 3.5, 3.6). Some of these species, including Pipsissewa, have mycorrhizal associations with the native soils that would make propagation of these plants outside of their native ecosystems difficult to impossible. To that effect, the creation of a native Appalachian medicinal garden outside of these environmental conditions would likely prove to be highly challenging for many woodland species.

The site location in a forested area is crucial to facilitating experiential learning of native medicinal plants used in the Southern Folk Medicine tradition. The ecological communities of the site support some of the most iconic and desired Appalachian native medicinal plant species. The steep topography and relatively high elevation of the site is significant as well, as these conditions help tell the story of why Appalachian mountain

communities were reliant on the Southern Folk Medicine tradition as primary medicine longer than more geographically accessible areas of the south (Barney 2000, 15).

Figure 3.1 Heritage vegetable garden demonstrates a traditional mountain family garden. The garden is managed by volunteers. Also visible are the ‘Carnesville House’ and the ‘Smokehouse’ to the right. (Image by author)

Figure 3.2 Access drive in museum showing split rail fencing and historic cabins. The cabins are interpreted for visitors. Visible are the ‘Ingram Mule Barn’ and the ‘Bell Gristmill’ in the top left. (Image by author)

Figure 3.3 Aerial view of the Foxfire Museum. The proposed site for the garden design is indicated in red.

(Image from Google Earth, modified by author)

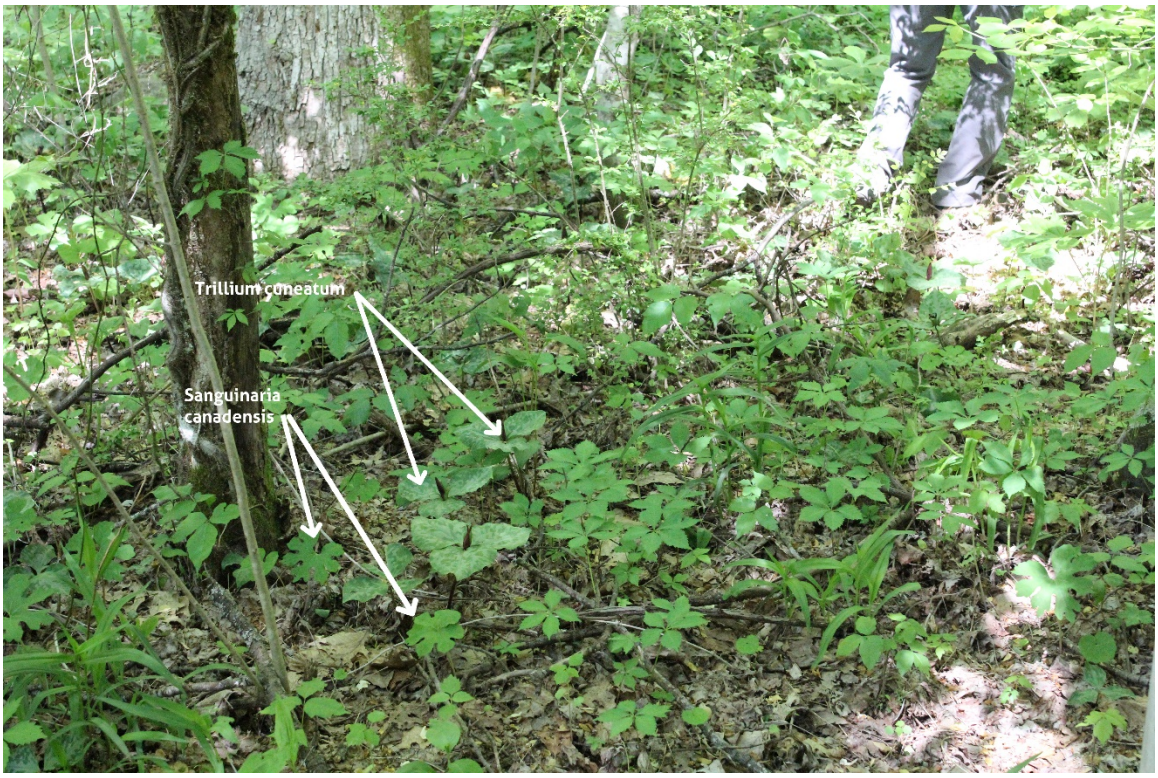

Figure 3.4 Dense forest Understory at Foxfire. Visible are Trillium *Trillium cuneatum* and Bloodroot *Sanguinaria canadensis.* (Photo by Saadia Rais, modified by author)

Figure 3.5 Native Fringe Tree on site, *Chionanthus virginicus* (Photo by Saadia Rais)

Figure 3.6 Native Carolina Allspice on site, *Calycanthus floridus* (Photo by Saadia Rais)

Site Selection

The Foxfire Museum property is a steep mountainous site, heavily wooded with dense overstory and selected clearings for museum programming. There has been a limited amount of site grading around building foundations and parking areas.

The site chosen for the garden is the area surrounding the Phillips cabin (Figure 3.7). The Foxfire property includes more than a dozen historic cabins that have been moved to the site and restored as interpretive and teaching space for the museum. The Phillips cabin was an available cabin that was restored using funds from the Lee Shaver Memorial fund, a fund dedicated to the continuation of herbal medicine study. It was decided by Foxfire staff and herbal educator Patricia Kyristi Howell that a teaching garden should surround the cabin on both sides as a complement to the herbal medicine programming planned for the Phillips cabin.

Figure 3.7 The Phillips Cabin chosen as the location for herbal medicine classes; flanking the cabin are Plot 1 (left) and Plot 2 (right). (Photo by author)

Existing Site Conditions

Two irregular shaped plots flanking the Phillips cabin and adjacent to an access drive were designated as appropriate spaces for the garden by Foxfire staff and Howell. The plots frame the Phillips cabin to the north and south. The plot north of the cabin will be referred to as Plot 1, the plot south of the cabin will be referred to as Plot 2 henceforth. The planting area is limited by steep slopes southeast of the plots and vehicular circulation to the northwest of the plots. Both plots slope northeast at approximately 7-10%. Plot 1 is approximately 360 sq/ft; Plot 2 is approximately 575 sq/ft. The entire area is a shaded site that receives partial sun exposure from a clearing northwest of the site. The site is shaded by large Tulip Poplars, Hickories, and other mixed hardwood trees and scattered conifers. Figure 3.8 illustrates the existing site conditions prior to the garden installation.

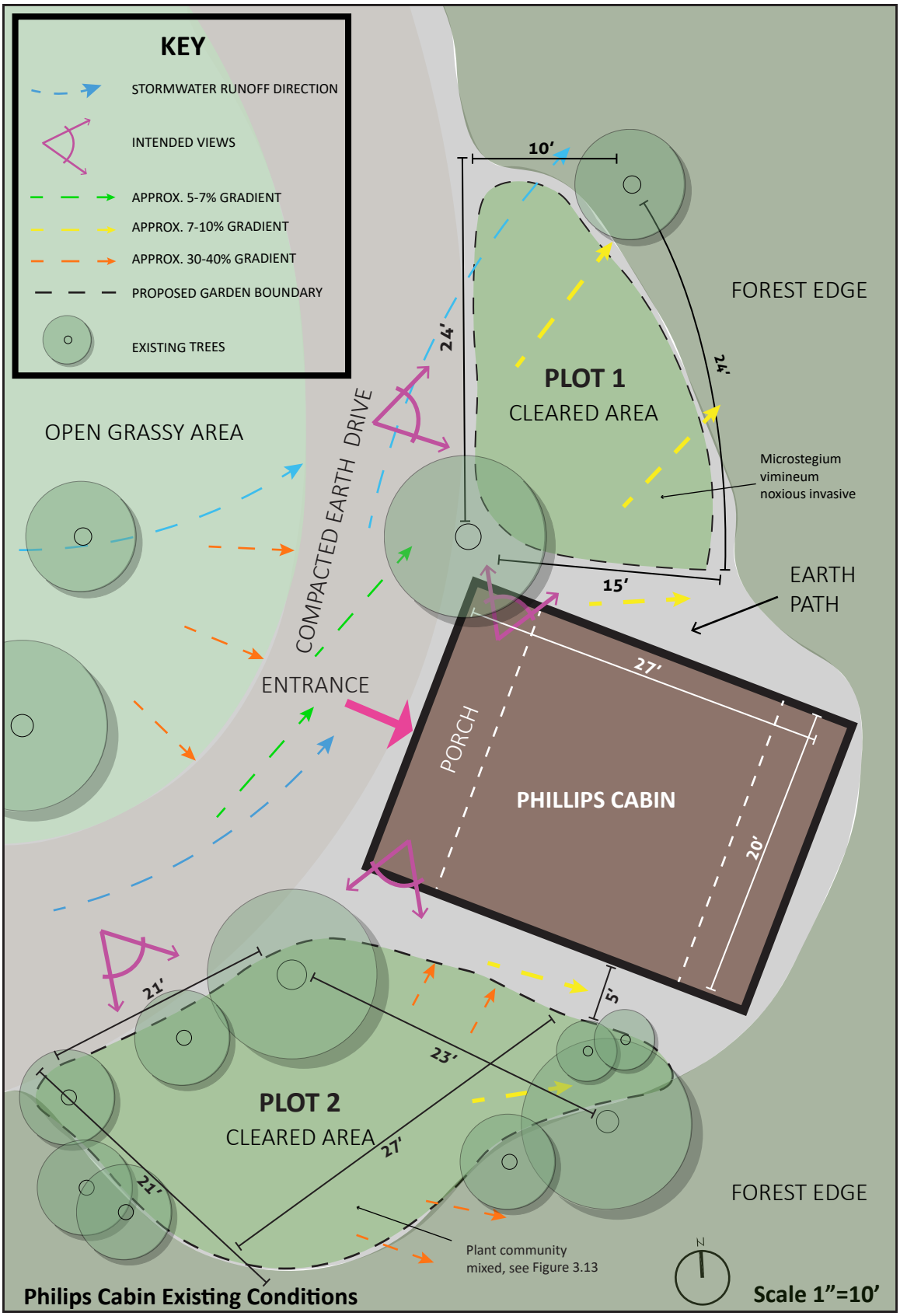

Figure 3.8 Existing Site Conditions Map (Image by author)

Site Analysis

Figure 3.8 identified views, existing circulation, locations of trees, buildings, direction of runoff, and direction of slopes. Conditions vary somewhat between Plot 1 and Plot 2. Essential differences between the two plots include available sunlight, soil conditions, existing plant material and seed bank, and runoff received during storm events. These elements determined appropriate plant selection, locations for plants in the garden, as well as treatment of the existing plant material.

Plot 1: The site slopes southeast, with steep slopes to the northeast side of the plot, shown in Figure 3.9. The gravel road and open area upslope of the site send considerable runoff into the site during storm events, as evidenced by a sandy washout. Plot 1 is in dappled shade, with small breaks in the canopy and partial sun in some areas. The soil mixture is comprised of loose organic material from decomposed brush and logs from its previous use as a brush pile. Dark, moist, loamy soil is found below the sandy washout deposited on the first few inches, shown in Figure 3.10. Existing plant material was primarily Japanese Stiltgrass (*Microstegium vimineum*), a Category 1 Non-native invasive plant in Georgia (GAEPPC, accessed July 19, 2019) as seen in Figure 3.11. Also found were Pokeweed (*Phytolacca americana*, native), and Poison Ivy (*Toxicodendron radicans*, noxious native). It was determined that the site design should not include the nonnative species, Poison Ivy, or the Pokeweed. Pokeweed is a common plant found easily in other areas nearby the site.

Figure 3.9 Plot 1 (to left of cabin) is approximately 360 Sq/Ft and has no native vegetation.

(Photo by author)

Figure 3.10 Sandy Loam soil in Plot 1; soils in this area are deep, well drained, mesic, & acidic.

(Photo by author)

Figure 3.11 Invasive Japanese Stiltgrass dominates Plot 1. This area was previously a brush pile.

(Photo by author)

Plot 2: The plot slopes southeast, with steeper slopes on the north edge of the plot, where the cabin foundation was excavated. Existing slopes direct stormwater runoff around the plot. Plot 2 is in full shade with dense overstory (see Figure 3.12). The soil mixture is a dark, rich, loamy soil with a dense root mat.

There was considerably more diversity of plant species found in Plot 2, including:

Christmas fern (*Polystichum acrostichoides*, native)
Rattlesnake fern (*Botrypus virginianus*, native)
Poison ivy (*Toxicodendron radicans*, native, noxious)
Goldenrod (*Solidago spp*., native)
Toadshade Trillium (*Trillium cuneatum*, native)
Tulip Poplar saplings (*Liriodendron tulipifera*, native)
Unidentified, possibly Mountain Wood Aster, (*Eurybia chlorolepsis)*
Crane fly orchid (*Tipularia discolor*, native)

The existing plant community in Plot 2 is shown in Figure 3.13. Many species found in Plot 2 were native species. A few existing species were not identified. It was decided that the site design should retain native plant species existing on the site and remove noxious or nonnative species to cause minimal disturbance to the existing plant communities.

Figure 3.12 Plot 2, looking towards Phillips Cabin is approximately 575 Sq/ft. The site is in denser shade than Plot 1. (Photo by author)

Figure 3.13 Existing plant community in Plot 2 includes a mix of native and non-native species.

(Photo by author)

Opportunities and Constraints

Opportunities for the site include the ability to have two different design aesthetics for Plot 1 and Plot 2. Plot 1 possesses no native species necessary to retain in the proposed design, providing the opportunity to impose a more structured design aesthetic. Plot 2 possessed an existing population of native plants that could be retained in a less structured, more naturalistic design aesthetic. Plot 1 has areas that receive dappled sunlight providing opportunities to include species that are tolerant of edge conditions. Plot 1 also has areas of the site that receive more rainfall from stormwater runoff, providing the opportunity to include species that prefer wetter conditions. Plot 2 is in deeper shade, providing opportunities to include shade dependent species. Plot 2 also has areas that slope towards the Phillips cabin, providing the opportunity to layer plantings on

the slope and improve visibility of individual species, as well as include species that prefer sloped growth conditions.

The primary constraints of the site are the size of plots and light conditions. The mostly shaded condition of the site necessitates that only shade tolerant and edge species be planted on the site, which eliminates the inclusion of more sun-dependent species in the garden. This constraint eliminates many otherwise appropriate species from being included in the garden. The small size of the plot area, which is defined by the cleared forest and the steep banks to the back of both plots is another constraint that could not be remedied without heavy site modification outside of the budget and scope of the project. The small site will necessitate that larger plants, trees and aggressive species be excluded from the garden, as these species would overtake the small site area and outcompete smaller species. The existing slopes to the rear of the site will necessitate that taller species be planted in the rear of the plots so that these species are visible behind the species planted in the front of the plots. An additional constraint found in the site analysis is the lack of irrigation available onsite. This means planted species will be reliant primarily on local rainfall supplemented by occasional watering by Foxfire staff. Species selection will be limited to species native to southern Appalachia, which should eliminate moisture requirements as a concern once the plants are established. However, establishment of species may be hindered if water is restricted after planting during the sensitive transplant stage. An additional constraint is the context of the Foxfire Museum site itself. Typical landscape design modifications such as hardscape elements would not be appropriate or match the existing material treatment of other site exhibits noted in the site context (Page 41). Proposed design interventions should fit in with the site context.

Constraints not related to the site analysis include the limited project budget for site improvements or plant stock, as well as the reliance on volunteer assistance in the garden installation.

CHAPTER 4

DEVELOPING A REPRESENTATIVE LIST OF THE NATIVE MEDICINAL PLANTS OF SOUTHERN APPALACHIA

Considerations and criteria:

Six criteria were posed to narrow species selection for the garden to those that are the most appropriate for the site, out of the hundreds of species discovered in the review of literature. These criteria represent functional limitations posed by the site, the garden's purpose, and larger ethical considerations. Each species discovered in the review of literature was evaluated using these criteria:

1. *Traditional Use*: does the plant have historical record of use in the southern Appalachia?
2. *Use in Practice*: is the plant still considered effective today? Is it used by herbalists or sold on the commercial market?
3. *Native Range*: is the plant native to southern Appalachia?
4. *Conservation status*: does it pose ethical concerns to include this (rare/endangered) species in the garden?
5. *Growing Condition/Habit*: will this plant thrive at the site? Will its growth overtake the small site? What is the mature size of the plant?
6. *Aesthetic Function*: is there anything of note about the flower or foliage that adds aesthetic value?

The following is a discussion of the reasoning and methods used to evaluate each of these six criteria.

Traditional Use

Chapter 2 reviewed relevant literature related to the historic use of native Appalachian plants from different traditions, including Cherokee traditional medicine and Southern and Appalachian Folk Medicine. The plants discovered in these resources were used as representations of the traditional uses of native plants.

Use in Contemporary Practice

Herbal medicine has evolved over time, and the contemporary materia medica has evolved as well. While there is a large list of native species that have been used historically, especially in the Cherokee tradition, many of these have fallen out of common use or are not readily available. Registered clinical herbalist Patricia Kyristi Howell researched and authored one of the key resources that informed this study *Medicinal Plants of the Southern Appalachians*. Howell, as an expert in her field, was the primary source for determining which historically used plant species are relevant to contemporary herbalists as effective remedies. Contemporary medicinal plant guides and herbal retail websites were also referenced.

Native Range

The choice to include only native plants was determined by the overall goals of the project. The intention of this project is framed by the research question: What plants

should be included in a garden design at the Foxfire Museum and Heritage Center in order to best represent the culturally, historically, and currently significant native medicinal plants of southern Appalachia? The choice to include only native plant species in the garden serves to highlight the medicinal value of southern Appalachian ecosystems. Many non-native plants were encountered in the process of discovery that had a long history of use in Appalachia. Non-native species encountered in the process of discovery were noted (see Table 4.2), but ultimately these plants were eliminated from the revised plant list as they did not represent the goals of the project.

Conservation Status

Some species such as Ginseng and Goldenseal were used heavily historically but have such depleted populations today that they are classified as endangered or "at-risk" species (UPS, accessed March 10, 2020). To include these species in a garden poses significant ethical questions. Would including these species in the garden leave them vulnerable to poaching, or otherwise put local populations at risk? Or alternatively, is this an educational opportunity to introduce the garden visitor to the problem of overharvesting? These are questions without a clear answer, and arguments could be made for or against. Ultimately, determinations were made on a species-specific basis, with the ultimate determination that the following species should not be included in the garden for the reasons stated. These include: American Ginseng, Virginia Snakeroot, Yellow and Pink Lady Slipper Orchid, and Indian Pipe (*Monotropa uniflora*). Ginseng and Goldenseal are regulated species with substantial ongoing efforts to commercially produce the plant and increase wild populations. Despite these efforts, Ginseng was excluded due to the high

commercial value of the plant and the risk of poaching. Virginia Snakeroot was noted in multiple sources to be rare and difficult to obtain and is listed by UPS as “at risk” (UPS, accessed March 13, 2020). Indian Pipe was excluded due to the inability of the plant to be propagated, transplanted or packaged commercially. Lady Slipper Orchid was excluded due to the inability of commercial growers to propagate the plant and risk of poaching. Species excluded from the revised plant list are noted in Table 4.1.

Table 4.1 Rare or Endangered Species (Table by author)

	Botanical Name	Common Name	Reason for Excluding
1	Aristolochia serpentaria	Virginia Snakeroot	"at risk", threatened in 5 states
2	Monotropa uniflora	Indian Pipe	unable to be propagated commercially
3	Panax quinquefolius	American Ginseng	threatened in 31 states, legally protected
4	Cypripedium acaule, parviflorum	Lady slipper, Pink, Yellow	"at risk", unable to be propagated commercially

Citations: UPS, CITES, USFWS.

Growing Conditions

Among native southern Appalachian medicinal plants, the natural growing conditions vary by soil type, pH and microbiology, moisture, and sunlight. The species selection was limited by plants that will tolerate the conditions of the heavily shaded site with moist loamy acidic soils. The growth habit and mature size of plant species were also considered as these affect appropriate spacing between plants. Additionally, plants with aggressive growth habit or the tendency to sucker and spread were not included due to the spatial limitation of the site.

Aesthetic Considerations

The visual impact of any garden is essential to its success, whether it be for pleasure or educational purposes. Plantings should complement each other to improve the legibility of the individual species in the garden. To achieve legibility, features such as the form, colors, textures, leaf shape, and scale were considered in the arrangement of the revised planting plan (see revised planting plan, Chapter 5).

Plant Evaluation Matrix

The six factors were evaluated by creating a comparison matrix. The structure of the plant evaluation matrix was created with the aforementioned criteria, resulting in 16 fields: Common Name, Botanical Name, Sun/Shade Tolerance, Mature Height, Mature Spread, Type (i.e. Herbaceous Perennial), Aesthetic Characteristics, Aggressive growth (Y/N), Conservation Concern, Cultural Significance (used by which groups), Native (Y/N), Current Use (Y/N), Sensitivity to Transplanting (Y/N), Citations, Frequency of Citations, Notes. The complete list of 122 native species evaluated can be found in Appendix A.

More than two hundred medicinal plants were found in the review of literature. Each species native status to southern Appalachia was either confirmed or denied before proceeding to full evaluation in the plant evaluation matrix. Eighty-three of the more than two hundred species reviewed were not native to southern Appalachia. These species were not evaluated in the plant evaluation matrix but have been included in Table 4.2 to illustrate the total species reviewed.

Table 4.2 Non-native plant species excluded from further review (Table by author)

Botanical Name	Common Name	Citations
Abelmoschus esculentus	Okra	PL
Albizia julibrissin	Mimosa	PL
Allium canadense	Wild Garlic	FF11
Allium sativum	Garlic	PL, MRH, GT, TS
Allium spp.	Onion	PL
Aloe vera	Aloe Vera	PL, MRH,TB, CH, TS
Aloysia citrodora	Lemon Verbena	PL, MRH
Althaea officinalis	Marshmallow	PL, MRH, TB
Anaphalis margaritacea	Life Everlasting	JB
Angelica sinensis	Dong Quai	PL, MRH
Arctium lappa	Burdock	PL, JB, MRH, AK, GT
Arctostaphylos uva ursi	Uva Ursi	MRH
Armoracia rusticana	Horseradish	PL, MRH, TB, FF11
Artemesia vulgaris	Mugwort	PL, MRH
Artemisia absinthium	Wormwood	PL, MRH, TS
Asparagus officinalis	Asparagus	TS
Berberis aquifolium	Oregon grape	PL, MRH
Brassica spp.	Mustard	JB
Calendula officinalis	Calendula	PL, MRH
Capsella bursa-pastoris	Shepard's Purse	PL, MRH, TB
Capsicum annuum	Cayenne	PL, TB, TS
Chenopodium ambrosioides L.	American Wormseed	PL, JB, DC, AK, TB
Chenopodium anthelminticum	Jerusalem Oat Seed	FF11
Cinnamomum verum	Cinnamon	PL, MRH
Cnicus benedictus	Blessed Thistle	PL, MRH, AK
Commiphora spp.	Myrrh	PL, MRH
Convalaria majalis	Lily of the Valley	FF11, TS
Datura stromonium L.	Jimsonweed	JB, DC, AK, NOE, TS
Daucus carota	Queen Anne's Lace	PL, TS
Ferula spp.	Asafoetida	FF11
Foeniculum vulgare	Fennel	PL, MRH, TB, GT
Frangula purshiana	Cascara Sagrada	PL, MRH, TB
Galium aparine	Cleavers	PL, MRH, AK, TB
Glechoma hederacea	Ground Ivy	PL, DC, TB
Hypericum perforatum	St Johns Wort	PL, MRH
Hyssopus officinalis	Anise Hyssop	PL, MRH
Laminariales spp.	Kelp	PL
Laurus nobili	Bay	PL, MRH
Leonurus cardiaca	Motherwort	PL, MRH
Ligusticum canadense	Angelico	TB
Ligustrum vulgare	Privet	JB
Marrubium vulgare	Horehound	PL, MRH,
Matricaria recutita	Chamomile	PL, MRH, TB, GT
Medicago sativa L.	Alfalfa	PL, MRH, TB, GT

Botanical Name	Common Name	Citations
Melissa officinalis	Lemon Balm	PL, MRH, GT
Mentha piperita	Peppermint	PL, JB, MRH, AK, TB
Mentha spicata	Spearmint	PL, JB, MRH, AK
Nepeta cataria	Catnip	JB, MRH, TB, GT, TS
Nicotina tabacum	Tobacco	JB
Nigella sativa	Nigella	PL
Pimpinella anisum	Anise	PL, MRH, TB, CH
Piper nigrum	Black Pepper	PL
Plantago lanceolata	Plantain	PL, JB, MRH, AK, DC, TB
Polygonum persicaria	Black Heart	CH
Prunus persica	Peach	JB
Punica granatum	Pomegranate Root	PL
Quassia amara	Quassia	PL
Rheum palmatum	Turkey Rhubarb	PL, MRH
Rumex crispus, Rumex Spp.	Yellow Dock	PL, JB, MRH, AK, DC, TB
Ruscus aculeatus ?	Butchers Broom	PL,
Ruta graveolens	Rue	PL
Salvia officinalis, salvia apiana	Sage	PL, MRH, AK, DC, TB
Saponaria officinalis	Bouncing Bet	CH
Serenoa repens	Saw palmetto	PL, MRH
Silybum marianum	Milk Thistle	PL, MRH
Smilax laurifolia	Bamboo-briar	CH
Stachys officinalis	Wood betony	PL, MRH
Stellaria media	Chickweed	PL, MRH, AK, TS
Symphytum officinale	Comfrey	PH, MRH, TB, FF11, GT, TS
Syzygium aromaticum	Cloves	PL, MRH
Tanacetum parthenium	Feverfew	PL, MRH
Taraxacum officinale	Dandelion	PL, JB, MRH, TB, GT, TS
Thymus spp.	Thyme	PL, MRH
Trifolium pratense	Red Clover	PL, JB, MRH, DC, AK, TB , FF11, TS
Trigonella foenum-graecum	Fenugreek	PL, MRH
Tussilago farfara	Coltsfoot	FF11, TS
Urtica dioica	Nettles	PL, MRH, NOE
Valeriana officinalis	Valerian	PL, MRH
Verbascum thapsus	Mullein	PL, MRH, TB, NOE, TS
Xanthium chinense, strumerium	Cocklebur	MRH
Yucca glauca, filamentosa	Yucca	PL, MRH, DC, CH, GT

Citation Key: PL: Phyllis Light 2018; PH: Patricia Kyristi Howell 2006; JB: Judith Bolyard 1981; MRH: Mountain Rose Herbs website; AK: Krochmal et al 1971; TB: Tommie Bass, Crellin 1990; DC: David Cozzo 2003, FF11: Foxfire 11; KU: Kansas School of Pharmacy Medicinal Garden, CH: J.T Garrett 2003

Each species determined to be native to southern Appalachia was inserted into the plant evaluation matrix (Appendix A). Botanical characteristics from Peterson's *Field*

Guide to Medicinal Plants and Herbs, USDA plant database, Missouri Botanic Garden *Plant Finder*, United Plant Savers "Species at Risk" list, and other reference guides were used to populate the matrix. Objective qualities such as shade tolerance were evaluated using the matrix, while more value-based decision-making such as conservation concern was determined by ethical reasoning informed by the literature reviewed and additional resources including UPS' "at risk and "to watch" species lists (UPS, accessed March 13, 2020). This matrix was used to determine which plants would be appropriate for the site, and where in the garden they should be located.

Plant Selection- Phase 1

Initially, in the first phase of the project, the list of plants evaluated using the plant evaluation matrix were limited to plants included in Howell's *Medicinal Plants of Appalachia* as well as the Foxfire Books and archives. Howell had already spent considerable time researching and analyzing the historical and contemporary relevance of these species to herbal medicine. The forty-five native plants Howell had already identified allowed for a concise plant list to work from, which helped streamline the research as to which plants were appropriate for the garden site. Since we were relying on donations for the installation phase of the project in Spring 2019, there was a limited timeline for more extensive research before installation. As all gardens are ever-evolving, the goal was that over time more plants would be added to the garden. The first iteration of the plant list is illustrated in Table 4.3:

Table 4.3 Initial Plant List (Table by author)

	Botanical Name	Common Name
1	Actaea racemosa	Black Cohosh
2	Viburnum prunifolium	Black Haw, Crampbark
3	Sanguinaria canadensis	Bloodroot
4	Caulophyllum thalictroides	Blue Cohosh
5	Hydrastis canadensis	Goldenseal
6	Mitchella repens	Partridgeberry
7	Chimaphila maculata	Pipsessewa, Ratsbane
8	Polygonatum biflorum	Solomon's Seal
9	Asarum canadense	Wild Ginger
10	Hamamelis virginiana	Witch Hazel
11	Xanthorhiza simplicissima	Yellowroot
12	Sambucus canadensis	Elder
13	Eutrochium purpureum	Joe Pye Weed
14	Eupatorium perfoliatum	Boneset

Citation Key: PH: Patricia Kyristi Howell 2006; FF11: Foxfire 11

This list of species met all six defined criteria and was used for the initial planting plan. Lessons learned from the shortcomings of this approach are discussed in Chapter 6.

Plant Selection- Phase 2

In Fall 2019, a more extensive review of resources was conducted to determine a broader, more representative plant list. The resources reviewed were by no means an exhaustive list of citations related to medicinal uses of plants, but rather included a sampling of a range of relevant perspectives appropriate to the goals of the project.

Research was conducted to develop a more representative list of native plants used for medicine across time and from varying traditions, still working within the same criteria as previously established. The number of citations for each species were noted to understand the overlaps where species appeared in different contexts of herbal medicine

in southern Appalachia. The most referenced species were assumed to be the most commonly known, used, and/or commercially traded species. The most referenced species encountered are listed in Table 4.4.

Table 4.4 Most Referenced Species (Table by author)

	Botanical Name	Common Name	Citations	# citations
1	Actaea racemosa	Black Cohosh	PL, PH, JB, MRH, AK, DC, TB	7
2	Eupatorium perfoliatum	Boneset	PL, PH, JB, MRH, DC, AK, TB	7
3	Panax quinquefolius	American Ginseng	PL, PH, JB, MRH, DC, AK, TB	7
4	Sambucus canadensis	Elder	PL, PH, JB, MRH, DC, AK, TB	7
5	Scutellaria Spp.	Skullcap	PL, PH, JB, MRH, AK, DC, TB	7
6	Asclepias tuberosa	Pleurisy Root, Butterfly weed	PL, PH, JB, MRH, DC, AK, TB	6
7	Ceanothus americanus	Red Root, New Jersey Tea	PL,PH, MRH, DC, AK, TB	6
8	Eutrochium purpureum	Joe Pye Weed, Gravel Root	PL, PH, MRH, AK, DC, TB	6
9	Geranium maculatum	Wild Geranium, Cranesbill Root	PL, PH, MRH, DC, AK, TB	6
10	Hamamelis virginiana	Witch Hazel	PL, PH, JB, MRH, DC, TB, AK	6
11	Hydrangea arborescens	Wild Hydrangea, sevenbark	PL, PH, MRH, DC, AK, TB	6
12	Hydrastis canadensis	Goldenseal	PL, PH, JB, MRH, AK, TB	6
13	Lobelia inflata	Lobelia, Indian Tobacco	PL, PH, JB, MRH, DC, AK	6
14	Passiflora incarnata	Passionflower	PL, PH, MRH, DC, AK, TB	6
15	Phytolacca americana	Pokeweed	PL, PH, JB, MRH,AK, TB	6
16	Plantago lanceolata	Plantain	PL, JB, MRH, AK, DC, TB	6
17	Polygonatum biflorum	Solomon's Seal	PL, PH, MRH, DC, AK, TB	6
18	Prunus serotina	Wild Cherry	PL, PH, JB, MRH, AK, TB	6
19	Rhus glabra	Sumac	PL, PH, JB, DC, AK, TB	6
20	Rumex crispus, Rumex Spp.	Yellow Dock	PL, JB, MRH, AK, DC, TB	6
21	Sanguinaria canadensis	Bloodroot	PH, JB, TB, MRH, DC, AK	6
22	Sassafras albidum	Sassafras	PL, PH, JB, MRH, AK, TB	6
23	Viburnum prunifolium	Black Haw, Crampbark	PL, PH, MRH, DC, AK, TB	6

Citation Key: PL: Phyllis Light 2018; PH: Patricia Kyristi Howell 2006; JB: Judith Bolyard 1981; MRH: Mountain Rose Herbs website; AK: Krochmal et al 1971; TB: Tommie Bass, Crellin 1990; DC: David Cozzo 2003, FF11: Foxfire 11; KU: Kansas School of Pharmacy Medicinal Garden, CH: J.T Garrett 2003

Many of the species in Table 4.4 were also included in the Table 4.3, marked in blue. Some of the most referenced species were trees, or other plants that occur in sunnier conditions outside of forest plant communities.

More than twenty native trees were identified by the literature. Most had to be excluded due to the space limitations of the site. However, many native trees can be found in other areas of the site and could be marked with botanical markers. There is future potential to add medicinal trees closer to the garden plot in the open grassy area adjacent to the garden. The native medicinal trees discovered in the literature are listed in Table 4.5.

The species that met the established criteria were next separated by native ecosystems and growing conditions to establish the most suitable list of species for the allotted plots.

Table 4.5 Native Medicinal Trees (Table by author)

	Botanical Name	Common Name	Citations
1	Alnus incana	Tag Alder	PL, TB
2	Betula lenta	Sweet Birch	JB, AK, TB, FF11
3	Diospyros virginiana	Persimmon	JB, TB, FF11
4	Fagus grandifolia	Beech	JB, TB
5	Fraxinus americana	Ash, White, Green	JB, AK,CH, FF11
6	Juglans cinerea	Butternut/White Walnut	PL
7	Juglans Nigra	Black Walnut	PL, PH, AK, TB, FF11
8	Juniperus communis	Juniper	PL, AK
9	Juniperus virginiana	Eastern Red Cedar	PL, AK
10	Liquidambar styraciflua	Sweet Gum	PL, PH, AK, TB, FF11
12	Liriodendron tulipifera	Yellow Poplar	PL
13	Magnolia acuminata L.	Cucumber Tree	JB, TB
14	Magnolia grandiflora	Magnolia	PL
15	Magnolia virginiana	Sweetbay Magnolia	PL
16	Morus rubra	Mulberry, White, Red	PL, JB, MRH
17	Oxydendrum arboreum	Sourwood	PL,TB, FF11
18	Pinus strobus	White Pine	PL, PH, JB, AK
19	Populus balsamifera	Balm of Gilead	JB, AK,CH, FF11
20	Prunus americana	Wild Plum	PL, JB
21	Prunus serotina	Wild Cherry	PL, PH, JB, MRH, AK, TB
22	Quercus alba	White Oak	JB, MRH, AK, TB
23	Salix alba	White Willow	JB, MRH, AK, TB
24	Sassafras albidum	Sassafras	PL, PH, JB, MRH, AK, TB, FF11
25	Tilia americana	Basswood, Linden	JB, MRH,CH, FF11
26	Tsuga Canadensis	Eastern Hemlock	JB, AK, FF11
27	Ulmus rubra	Slippery elm	PL, JB, TB, MRH, AK, TB

Citation Key: PL: Phyllis Light 2018; PH: Patricia Howell 2006; JB: Judith Bolyard 1981; MRH: Mountain Rose Herbs website; AK: Krochmal et al 1971; TB: Tommie Bass, Crellin 1990; DC: David Cozzo 2003, FF11: Foxfire 11; KU: Kansas School of Pharmacy Medicinal Garden, CH: J.T Garrett 2003

Revised Plant List

Shade Tolerant and Edge Species

Shade tolerant and edge species were selected for the revised plant list. Table 4.6 illustrates the final selection of suitable species for the garden site (shade tolerant species that also meet all other criteria). Fields marked in blue are species that were included in the Initial Plant List. These species meet all the defined criteria and are known to survive well under the conditions of the site. Many are found in other areas of the Foxfire property. Size constraints of the site limited the inclusion of any trees, larger shrubs, or suckering plants as they would have overtaken the small site. The botanical characteristics of each species were considered in Chapter 5.

Table 4.6 Revised Plant List: Shade Tolerant and Edge Species (Table by author)

	Botanical Name	Common Name	Citations
1	Actaea racemosa	Black Cohosh	PL,PH, JB, MRH, AK, DC, TB
2	Adiantum pedatum	Maidenhair Fern	PH, AK, FF11
3	Aralia nudicaulis	Sarsparilla	PL, PH, MRH, AK, TB
4	Aralia racemosa	Spikenard, Indian Root	JB, MRH, AK, DC, FF11
5	Asarum canadense	Wild Ginger	PH, PL, AK, DC, TB, FF11
6	Calycanthus floridus	Carolina Allspice	PL, MRH,CH
7	Caulophyllum thalictroides	Blue Cohosh	PH, MRH, AK, DC, TB, FF11
8	Chamaelirium luteum	False Unicorn Root	Chestnut School
9	Chelone glabra	Turtlehead	PH, MRH, AK, FF11
10	Chimaphila maculata	Pipsessewa, Ratsbane	PH, MRH, AK, DC, TB, FF11
11	Chionanthus virginicus	Fringetree	PL, PH, MRH, AK, TB
12	Collinsonia canadensis	Stoneroot, horsebalm	PH, JB, AK, DC
13	Cornus florida	Dogwood	PH, PL, JB, TB, FF11
14	Dioscorea villosa	Wild Yam	PH, MRH, AK, DC, TB
15	Epigea reptens	Trailing arbutus, Gravel Plant	JB, DC, CH, FF11
16	Euonymus atropurpoeus	Wahoo	PL, AK
17	Eutrochium purpureum	Joe Pye Weed	PL, PH, MRH, AK, DC, TB, FF11
18	Gaultheria procumbens	Wintergreen	JB, AK, TB
19	Geranium maculatum	Wild Geranium, Cranesbill Root	PL, PH, MRH, DC, AK, TB, FF11
20	Hamamaelis virginiana	Witch Hazel	PL, PH, JB, MRH, DC, TB, AK, FF11
21	Hydrangea arborescens	Wild Hydrangea, sevenbark	PL, PH, MRH, DC, AK, TB, FF11
22	Hydrastis canadensis	Goldenseal	PL, PH, JB, MRH, AK, TB, FF11
23	Impatiens capensis	Jewelweed	PL PH, JB, DC, FF11
24	Lindera benzoin	Spicebush	PL, PH, JB, DC, AK, FF11
25	Lobelia inflata	Lobelia, Indian Tobacco	PL, PH, JB, MRH, DC, AK
26	Mitchella repens	Partridgeberry	PH, MRH, DC, AK, TB, FF11
27	Passiflora incarnata	Passionflower	PL, PH, MRH, DC, AK, TB
28	Podophyllum peltatum	Mayapple	JB, MRH, DC, AK, TB
29	Polygonatum biflorum	Solomon's Seal	PL, PH, MRH, DC, AK, TB
30	Sambucus canadensis	Elder	PL, PH, JB, MRH, DC, AK, TB, FF11
31	Sanguinaria canadensis	Bloodroot	PH, JB, TB, MRH, DC, AK, CH, FF11
32	Scutellaria Spp.	Skullcap	PL, PH, JB, MRH, AK, DC, TB
33	Spigelia marylandica	Pink root, Indian pink	PL, DC, AK, TB
34	Trillium erectum	Bethroot, Red Trillium	PH, AK, TB, FF11
35	Viburnum prunifolium	Black Haw, Crampbark	PL, PH, MRH, DC, AK, TB
36	Viola canadensis	Violet	PL, MRH, DC, FF11
37	Xanthorhiza simplicissima	Yellowroot	PL, PH, DC, AK, TB, FF11

Citation Key: PL: Phyllis Light 2018; PH: Patricia Howell 2006; JB: Judith Bolyard 1981; MRH: Mountain Rose Herbs website; AK: Krochmal et al 1971; TB: Tommie Bass, Crellin 1990; DC: David Cozzo 2003, FF11: Foxfire 11; KU: Kansas School of Pharmacy Medicinal Garden, CH: J.T Garrett 2003

Full Sun-Part Shade Plant List: potential for the future

An additional list was made of plants that otherwise met all the required conditions except light requirements and size constraints, because it is possible that the garden project could expand in the future into a larger or sunnier area where these species could be appropriate. Table 4.7 illustrates full sun-part shade tolerant species. Fields marked in blue are species that were included in the Initial Plant List.

Table 4.7 Suitable Additions for Alternate Site: Full Sun-Part Shade Species (Table by author)

	Botanical Name	Common Name	Citations
1	Angelica atropurporea	Angelica, wild celery	PL, MRH, AK,CH
2	Aralia spinosa	Devils Walking Stick, Southern Prickly Ash	PL, PH, DC, TB
3	Asclepias syriaca	Milkweed	JB, AK, DC
4	Asclepias tuberosa	Pleurisy Root, Butterfly weed	PL, PH, JB, MRH, DC, AK, TB
5	Baptisia australis, baptisia tinctoria	Wild Indigo, Blue False Indigo	PL, MRH, AK, DC
6	Ceanothus americanus	Red Root, New Jersey Tea	PL,PH, MRH, DC, AK, TB, FF11
7	Comptonia peregrina	Sweet Fern	PH, AK, FF11
8	Crataegus spp.	Hawthorn	PL, MRH
9	Eupatorium perfoliatum	Boneset	PL, PH, JB, MRH, DC, AK, TB, CH, FF11
10	Eutrochium purpureum	Joe Pye Weed, Gravel Root	PL, PH, MRH, AK, DC, TB, FF11
11	Gentiana catesbaei, quinquefolia, villosa	Gentian	PH, MRH, AK, DC, TB
12	Hedeoma pulegioides	American Pennyroyal	JB, MRH, DC, AK, FF11
13	Humulus lupulus	Hops	PL, MRH
14	Iris versicolor	Blue Flag	PL, MRH, DC
15	Monarda punctata, didyma	Horsemint, Bergamot	JB, AK, DC, TB
16	Oenothera biennis	Evening Primrose	PH, GT
17	Passiflora incarnata	Passionflower	PL, PH, MRH, DC, AK, TB
18	Phytolacca americana	Pokeweed	PL, PH, JB, MRH, AK, TB, FF11
19	Polygala senega	Seneca (senega) snakeroot	JB, DC, AK, TB
20	PseudoGnaphalium obtusifolium	Rabbit Tobacco	PL, PH, JB, DC, TB
21	Pycnanthemum incanum, virginianum, tenuifolium	Mountain Mint	PL, PH
22	Rhus glabra, hirta	Sumac	PL, PH, JB, DC, AK, TB, FF11
23	Rosa spp., Rosa canina, carolina, eglantaria	Rose, rosehip	JB, MRH
24	Sambucus canadensis	Elder	PL, PH, JB, MRH, DC, AK, TB, FF11
25	Senna marilandica	Senna	PL, MRH, TB
26	Solidago spp.	Goldenrod (38+ species)	PH, MRH, DC, TB
27	Verbena hastata	Blue Vervain	PL, MRH, AK
28	Veronia noveboracensis, hastata	Ironweed	JB, DC, FF11

Citation Key: PL: Phyllis Light 2018; PH: Patricia Howell 2006; JB: Judith Bolyard 1981; MRH: Mountain Rose Herbs website; AK: Krochmal et al 1971; TB: Tommie Bass, Crellin 1990; DC: David Cozzo 2003, FF11: Foxfire 11; KU: Kansas School of Pharmacy Medicinal Garden, CH: J.T Garrett 2003

CHAPTER 5

IMPLEMENTATION, POST-INSTALLATION ANALYSIS, AND PROPOSED DESIGN REVISIONS

Phase 1: Initial Development of the Garden

Preliminary Site Plan

Prior to construction of the garden, a preliminary site plan was created, shown in Figure 5.1. Specific plant species and proposed locations were not identified due to the knowledge that the garden would be reliant on the availability of donated plants. It was decided that Plot 1 would be a more defined garden, as there were no existing native plants in the plot to accommodate. Plot 2 would be more naturalistic, due to the existing population of native plants already present in the area. For the garden to fit in with the context of the Foxfire Museum, its design and aesthetics needed to be modest and minimal. Elaborate or expensive site modifications, including hardscape or irrigation would have exceeded the constraints of the project and been out of character with the rest of the museum. The preliminary site plan proposes simple, low cost modifications to the existing site. Proposed changes included stabilizing the back slope of Plot 1 with logs, the creation of a perimeter wattle fence to mark the garden boundaries and provide visual definition, a small mulched path in Plot 1, and defined planting areas. The wattle fence was suggested as an attractive, zero cost option that could be made with readily available materials on site. Wattle is a traditional fence style used historically in the British Isles,

the origin of the ancestors of many Foxfire informants. The wattle fence was suggested for its aesthetic and cost benefits rather than historical reference. It was planned to use harvested dry Kudzu (*Pueraria montana var. lobate*) vine to construct the fence, but ultimately the wattle fence was not constructed due to time limitations and materials collected on the installation day.

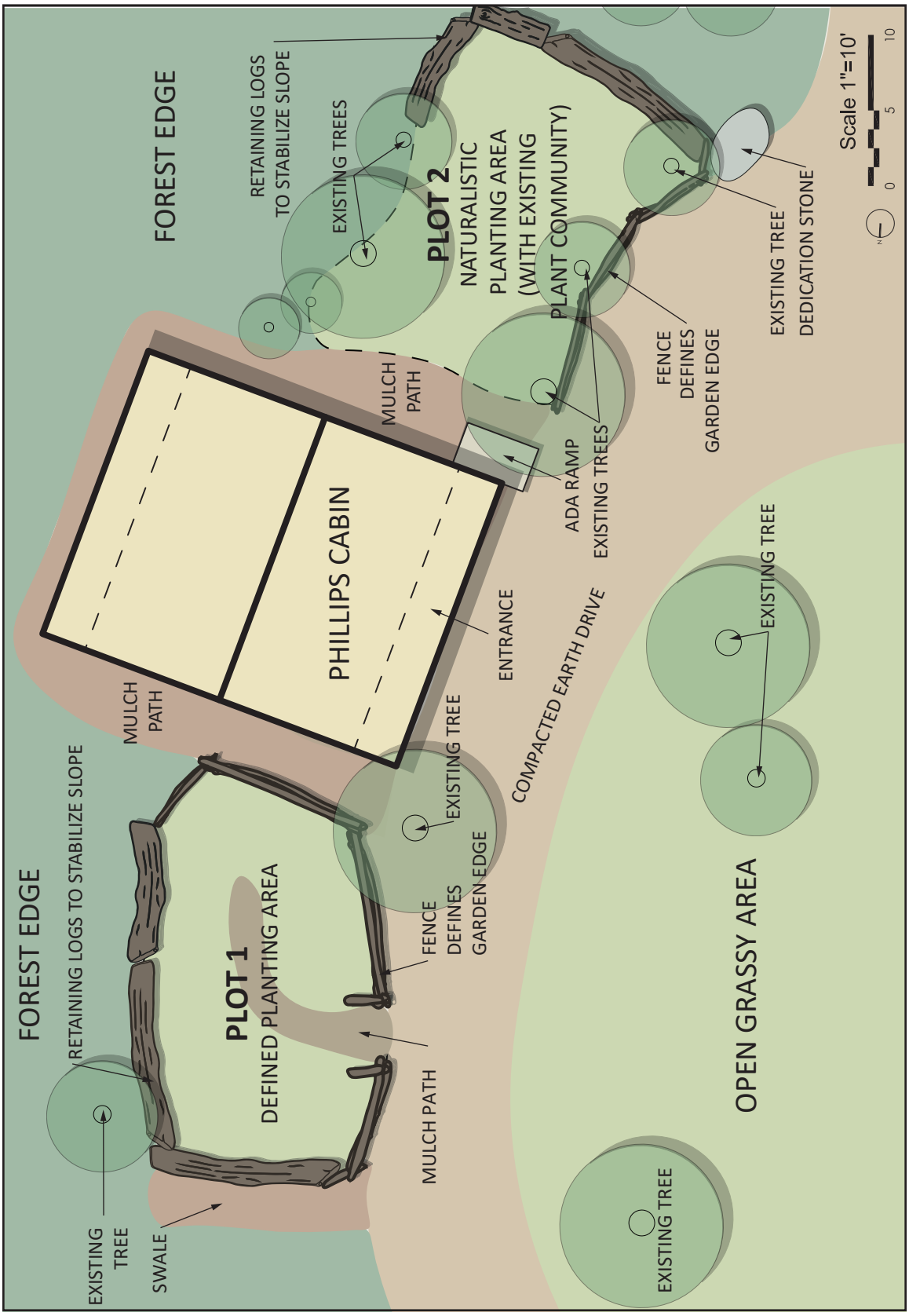

Figure 5.1 Preliminary Site Plan (Image by author)

Sourcing Plants

Plants were sourced through native plant nurseries, donations, and transplanting. Local nurseries propagating native plants include the Mimsie Center for Native Plant Studies at the State Botanical Garden of Georgia; Night Song Native Plant Nursery in Canton, Georgia; Native Forest Nursery in Chatsworth, Georgia; and Goodness Grows in Lexington, Georgia. Among native plant focused nurseries, few had relevant medicinal plants listed on their websites. There was limited funding available to support purchased plants for the project, making directly sourcing plants a limited option. I became aware of a local medicinal herb grower, Heartsong Herbs, after the garden was installed, and additional plants in the future could be sourced from this grower. A call for plant donations meeting our criteria was advertised through Howell's herbal network, including former students of hers, practitioners, friends, and local residents. Additionally, plants growing naturally on other parts of the Foxfire property were identified to be transplanted in the garden, including Black Cohosh, Blue Cohosh, and Bloodroot.

Soliciting Volunteers and Building the Garden

To generate visibility of the project to the greater community, a call for volunteers to help plant the garden was advertised through Foxfire's Eventbrite page on their website, Foxfire.org, as well as through Howell's herbal network and the author's own Athens, Georgia-based community. The installation was scheduled for April 27th, 2019.

Garden Installation

On April 27th, 2019 volunteers gathered at the Foxfire site. Before beginning installation, I discussed the background and objectives of the project with the volunteers. The volunteers included a mix of herbalists, landscape architecture students, horticulturalists, and gardeners, a decidedly more informed volunteer group than the general public. An informal retaining wall of hardwood tree trunks had been set in place at the back of both plots by Foxfire curator Barry Stiles at my request. This served to delineate the garden boundaries and combat erosion of the loose soil. Invasive species were identified and removed manually, including Japanese Stiltgrass and Poison Ivy. Beds were prepared using rakes and pickaxes to loosen the top eight to ten inches of soil and break up areas of heavy root mat. The primary circulation was laid out with construction tape. Plants previously identified by Howell for transplanting were harvested from other areas of the Foxfire property. Plant donations brought to the workday were gathered together with the transplants and inventoried. Donations included some additions to the original plant list, as noted. Some additional plantings were added after the installation day, including Black Haw and Fringe Tree. The plants installed are listed in Table 5.1:

Table 5.1 As-Built Plant List (Table by author)

As-Built Plant List	Source of Plants
1. Black Cohosh *Actaea racemosa*	transplanted 3-4 from site
2. Black Haw *Viburnum prunifolium*	1 purchased
3. Bloodroot *Sanguinaria canadensis*	2 purchased- 1 transplanted from site
4. Blue Cohosh *Caulophyllum thalictroides*	transplanted 3-4 from site
5. Goldenseal *Hydrastis canadensis*	1 donation
6. Patridgeberry *Mitchella repens*	donation cuttings
7. Pipsissewa *Chimaphila maculata*	5-6 donation plants
8. Solomon's Seal *Polygonatum biflorum*	6 or more donation
9. Wild Ginger *Asarum canadense*	2 purchased
10. Witch Hazel *Hamamelis virginiana*	1 donation 1 gallon, 1 donation 7 gallon
11. Yellowroot *Xanthorhiza simplicissima*	5-6 donation
12. Elder *Sambucus canadensis*	donation cuttings
13. Joe Pye Weed *Eutrochium purpureum*	1 donation
~~14. Boneset *Eupatorium perfoliatum*~~	~~did not receive~~
Additions to original plant list:	
15. Maidenhair Fern *Adiantum pedatum*	4-5 donation
16. Spicebush *Lindera benzoin*	1 donation
17. Passionflower *Passiflora incarnata*	2 donation
18. Fringetree *Chionanthus virginicus*	1 donation

The objective on the day of planting was to arrange plants in the garden in accordance with the site analysis findings and to take into account the plants available with consideration for their mature size and aesthetic relationships. This part of the project was loosely structured and included volunteer input and the additional expertise of Rosemary Bathurst, curator of the native plant garden at Atlanta History Center. The limitations of this strategy are discussed in Chapter 6. Space was reserved for future plants to be added to the garden. Volunteers were instructed to plant the plants and water them in. Mulch was added to identify circulation areas. All plants were marked with a flag so that their survival could be documented. Wooden stakes naming plant species

were placed within the garden beds to serve as temporary markers until permanent markers could be produced. The completed planting arrangement was photographed and documented (Figures 5.2, 5.3). After the volunteer workday, Stiles constructed a low-profile split rail fence around both plots as an alternative to the proposed wattle fence. The as-built planting plan (Figures 5.4, 5.5) illustrate that the garden is enclosed on the road facing sides and open to the woods in the back with logs retaining the slope. Plot 1 includes a small mulched path to enter the garden. Plot 2 was partially enclosed with a fence and did not include a path in order not to interrupt the existing native plant community.

Figure 5.2 Plot 1 after planting. After planting a mulched path and split rail fence were added.

(Photo by Saadia Rais)

Figure 5.3 Plot 2 after planting. The existing plant community helped create a fuller appearance. Orange flags were used to mark plantings so their survival could be documented. (Photo by Saadia Rais)

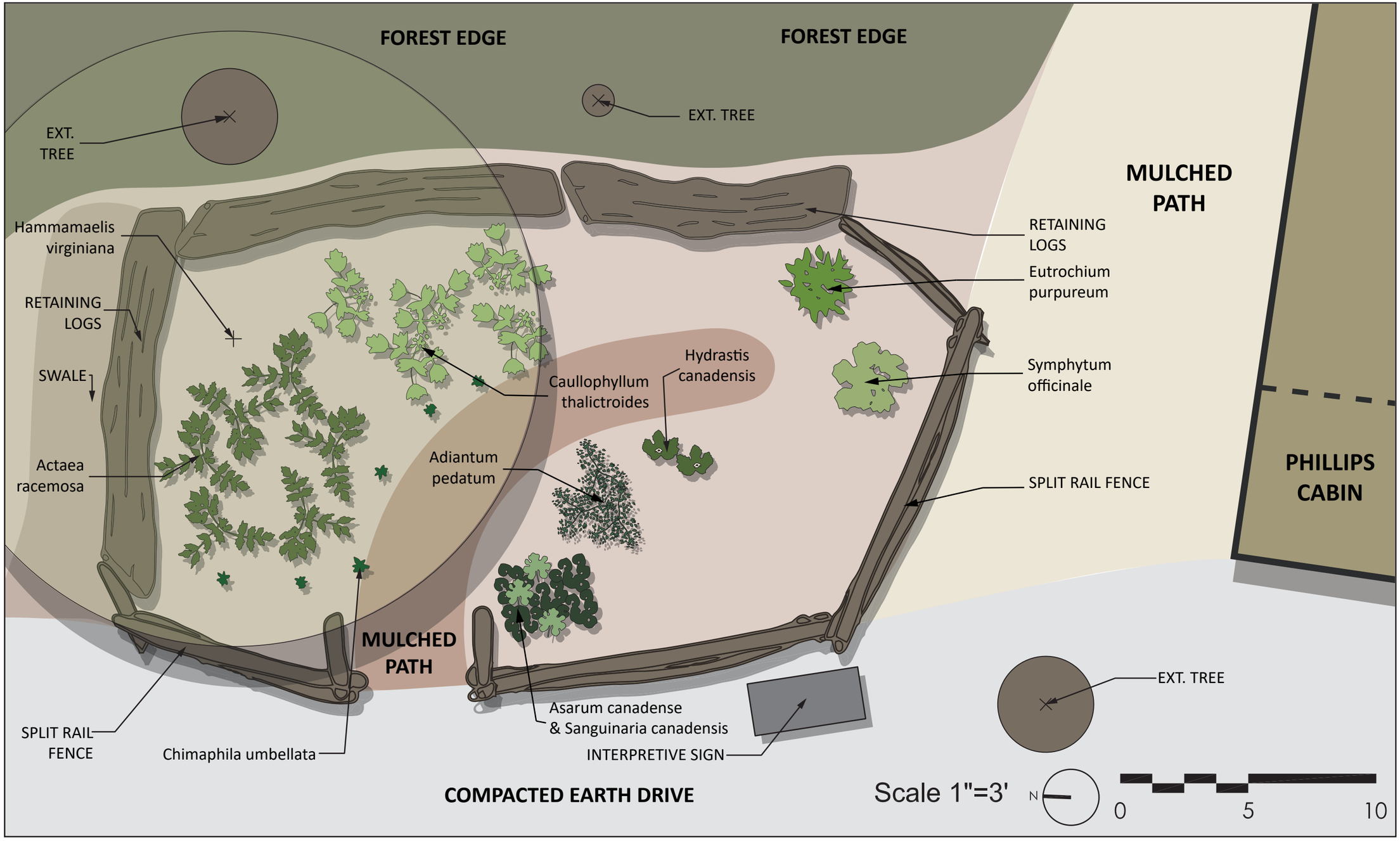

Figure 5.4 As-Built Planting Plan Plot 1 (Image by author)

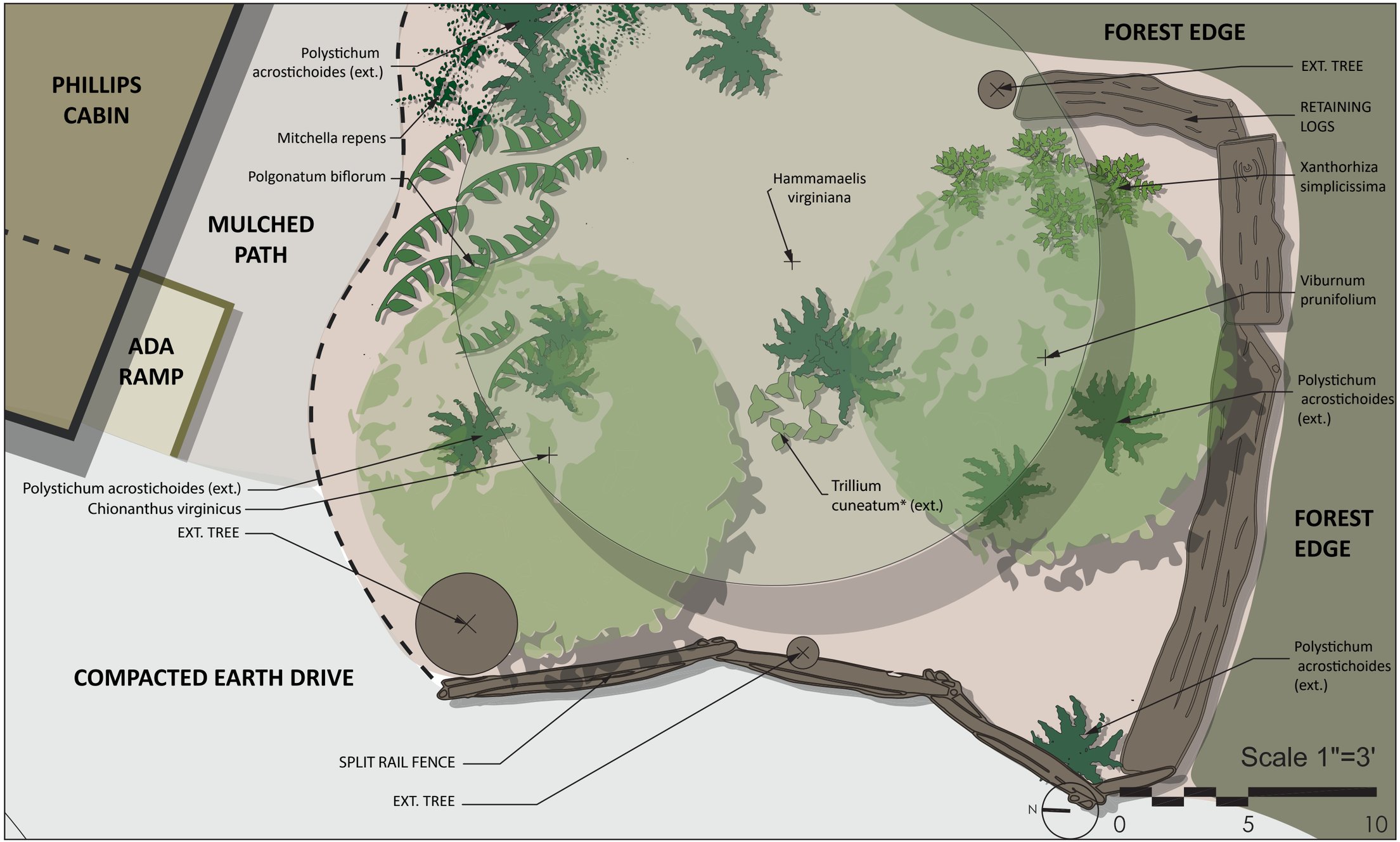

Figure 5.5 As-Built Planting Plan Plot 2 (Image by author)

Phase 2: Analysis and Design Revision

After conducting more in-depth research and monitoring the initial development of the garden in the months that followed, the decision was made to re-evaluate the original design to reflect the discoveries made in the research process as well as the lessons learned. First, the original design was analyzed critically for its successes and failures.

Analysis of As-Built Planting Plan

After a hot and dry summer, the Elder cuttings and Passionflower that were planted in Plot 2 both died. This was likely due to drought and lack of irrigation. When observed in Fall 2019, it was unclear which other plants were thriving and would survive the winter months as the plants had already gone into dormancy.

The design layout of Plot 1 is somewhat successful. The simple design allows for easy access to the plants and close observation. Planting decisions in both plots were mostly logical and appropriate, such as the planting of Solomon's Seal with Partridgeberry on the steeper sloped part of Plot 2 adjacent to the cabin. Partridgeberry prefers to grow on slopes while Solomon's Seal has an arching form that works well aesthetically in the sloped area. The two locations of Witch Hazel (*Hamamelis virginiana)*, as well as the location of Goldenseal, Blue Cohosh, Maidenhair Fern, Wild Ginger (*Asarum canadense)*, and Bloodroot are not problematic and do not necessitate changes. However, some of the choices made on the planting day were not ideal for the growing conditions of the site. For example, we planted Yellowroot (*Xanthorhiza simplicissima*) on the highest part of the site. Plot 1 has an area that receives more water than the rest of the site and would have been a more appropriate place for this species.

Additionally, some decisions made do not aid in access or identification of the plants. Low-growing plants situated at the back of Plot 2 are largely visually inaccessible. A path could have been added to improve the ability to closely study the plants in Plot 2, although this would require transplanting some species since the existing native plant community was densely populated. Some decisions failed to highlight the aesthetic features of plants. Black Cohosh reaches five feet tall in flower and would have been more advantageous as a backdrop in Plot 2 than in a small area of Plot 1. Pipsissewa is small and low-growing and was planted along the front of the path in Plot 1. The plant may have been more visible if planted in more of a mass than a line.

Including only thirteen species in the initial plant list was useful to concentrate the focus of donations, but admittedly limited the representation of native medicinal species as well as the aesthetic impact of the garden. The areas behind both Plot 1 and Plot 2 outside of the retaining logs could have been planted with larger woody and flowering shrubs that could serve as a visual backdrop or screen for the garden and would allow those larger plants room to grow without overtaking the small plots. Wild Hydrangea (*Hydrangea arborescens)*, Elder, Fringe Tree, Carolina Allspice, or Spicebush (*Lindera benzoin)* would be appropriate backdrop shrubs. In general, Plot 1 is underplanted and would aesthetically benefit from added plants. Low-growing groundcovers or trailing plants would help fill in gaps underneath larger plants. Plot 2 would benefit from a path and a modified fence opening to indicate that it is also an intentional garden and to provide better access.

Identifying Plant Communities, Botanical Characteristics, and Aesthetic Attributes

After analyzing the as-built design, the plant species identified as appropriate for the garden in Chapter 4 were investigated for their botanical characteristics. Using the revised plant list developed in Chapter 4 (Table 4.6) shade and edge species were evaluated more closely, as these species met all criteria to be used for the revised planting plan. *Wildflowers and Plant Communities of the Southern Appalachian Mountains and Piedmont* (Spira 2011) was consulted to identify the native plant communities that the shade and edge species identified are typically found in. Most species identified are found in Mountain Rich Cove Forest, Piedmont River Bluff Forest, and Basic Mesic Forest ecosystems as defined by Spira. Also found represented were some Forest Edge, Mountain Forest Streamside, Mountain Acidic Cove Forest, Piedmont Oak-Hickory Forest, and Chestnut-Oak Forest, and Xeric Hardpan Forest species. There were many overlaps found between plant communities, especially between Mountain Rich Cove forest and Piedmont River Bluff Forest communities. The Foxfire site plant communities most closely emulate the Mountain Rich Cove Forest. Of all the shade-tolerant species, most preferred moist soil conditions, with the exception of Pippsissewa, Fringe Tree, and Black Haw which prefer xeric conditions and should be located on drier areas of the site. Several forest edge species were identified that could tolerate the parts of the site with the greatest sunlight: Elder, False Solomon's Seal (*Maianthemum racemosum*), Joe-Pye Weed (*Eutrochium purpureum*), and Wild Hydrangea. Some species would do best in wetter areas of the site: Yellowroot, Turtlehead (*Chelone glabra*), and Skullcap (*Scutellaria Spp.*).

Excluding the noted exceptions above, all species identified in the revised plant list were able to be focused on specifically for their aesthetic properties for the Phase 2 design revision, as all other considerations (shade tolerance, moisture, pH, associated plant communities) were alike. The revised plant list was next grouped by mature size and type to aid in the design (Table 5.2).

Table 5.2 Revised Plant List Organized by Size and Type (Table by author)

Larger Shrubs and Small Trees	Groundcover and Small Herb. Perennials	Low Herbaceous Perennials
Calycanthus floridus	Epigea reptens	Anemone americana
Chionanthus virginicus	Gaultheria procumbens	Aplectrum hymale
Cornus florida	Mitchella repens	Arisaema triphyllum L.
Euonymus atropurpureus		Asarum canadense
Hamamaelis virginiana		Chimaphila umbellata, maculata
Hydrangea arborescens		Heuchera americana
Lindera benzoin		Pedicularis canadensis L.
Sambucus canadensis		Sanguinaria canadensis
Viburnum prunifolium		Trillium erectum
		Viola canadensis

Mid Herb. & Woody Perennials	Tall Herbaceous Perennials	Vines
Actaea pachypoda	Actaea racemosa	Dioscorea villosa
Adiantum pedatum	Aralia racemosa	Passiflora incarnata
Aralia nudicaulis	Eutrochium fistulosum	
Botrychium virginianum	Prenanthes alba	
Caulophyllum thalictroides		
Chelone glabra		
Collinsonia canadensis		
Diphylleia cymosa		
Geranium maculatum		
Hydrastis canadensis		
Lobelia inflata		
Maianthemum racemosum		
Mertensia virginica		
Podophyllum peltatum		
Polygonatum biflorum		
Polystichum acrostichoides		
Scutellaria lateriflora		
Spigelia marylandica		
Xanthorhiza simplicissima		

Mature sizes of species are noted in the complete plant evaluation matrix (see Appendix A). Groundcover and small herbaceous perennials are under 6” mature height. Low herbaceous perennials are between 6”-12” mature height. Mid-height herbaceous and woody perennials are between 1-2’ in mature height. Tall herbaceous perennials are greater than 2’ mature height. Aesthetic qualities like foliage texture and shape, flower, and form were noted in the plant evaluation matrix and considered in the design.

Aesthetic Influences

Other native woodland gardens were consulted to inspire the revised planting design. Examples of native woodland gardens in the southeast including Southern Highlands Reserve in western North Carolina as well as the Atlanta History Center were useful references for aesthetic uses of native plants. Southern Highlands Reserve is a native plant arboretum that utilizes native plant communities to achieve dramatic design effects. While I was not able to visit the arboretum, the garden website describes the curators’ design process and provides images of garden exhibits. In the Woodland Glade exhibit, understory shrubs were removed to create a strong distinction between the tree canopy and the perennial layer, creating a sense of awe in the open space. While this could not be achieved in the small area of the Foxfire garden, the example inspired the use of shrubs in the revised design to achieve the inverse affect. The use of shrubs as a backdrop in a design can, in contrast to the Woodland Glade, create a sense of enclosure and focus the viewer’s attention.

In contrast to the controlled design aesthetic of the Southern Highlands Reserve is naturalistic form of the native woodland garden at the Atlanta History Center. I visited the garden and received a tour from the garden's curator, Rosemary Bathurst. Bathurst highlights the biodiversity of native ecosystems in her designs with diverse planting arrangements. Bathhurst achieves a naturalistic effect by planting species in drifting layers, allowing plants to blend. The effect is such that visitors to the garden may not even be aware that the garden is a designed and curated area. Weaving, circuitous paths throughout the garden encourage visitors to spend time observing and lingering. I incorporated knowledge from my experience at the Atlanta History center into the as-built design as well as the revised planting plan. In the As-Built Planting Plan, plants added to Plot 2 were planted among the existing native plant community as per Bathurst's suggestion. Bathurst's layering style of planting was incorporated in the revised planting plan by arranging plant species by mature height with the smallest plants closest to the intended viewer. The revised design intends for species to blend together over time as plants fill in naturally.

Phase 2: Revised Planting Plan

After investigating the aesthetic properties of the identified plants, a revised planting plan for future implementation was developed. The site plan was split into planting zones based on height, light and moisture microclimate variation, and desired views, to help create layered visibility of all plants in the garden. A small path and split rail entry marker were proposed for Plot 2 to make more of the plants accessible to viewers and make the garden appear intentional. Individual plant species were then selected for

appropriate zones and illustrated in the final design. It was decided to exclude a few species from the design that were mentioned in the Revised Plant List (Table 4.6) of shade tolerant species. Jewelweed (*Impatiens capensis,* noted in Chapter 4 Table 4.6) was excluded as it can be commonly found across the Foxfire site. Dogwood (*Cornus florida,* also noted in Table 4.6) is already present in the open grassy area in front of the cabin and was not included in either plot. Christmas fern (*Polystichum acrostichoides*) is abundant in Plot 2 and was not added. The revised planting plans define garden form and structure and propose locations for additional plant species that expand on the as-built planting plan to include the expanded range of species and proposes additions and modifications to address concerns found in the analysis (Figures 5.6, 5.7). Additionally, a Plant Schedule (Appendix B) was included to call out quantities, spacing, and arrangement intentions of the Revised Planting Plan. This revised design and plant schedule is intended to be used by Patricia Kyristi Howell and Foxfire staff to make future additions to the garden as resources become available.

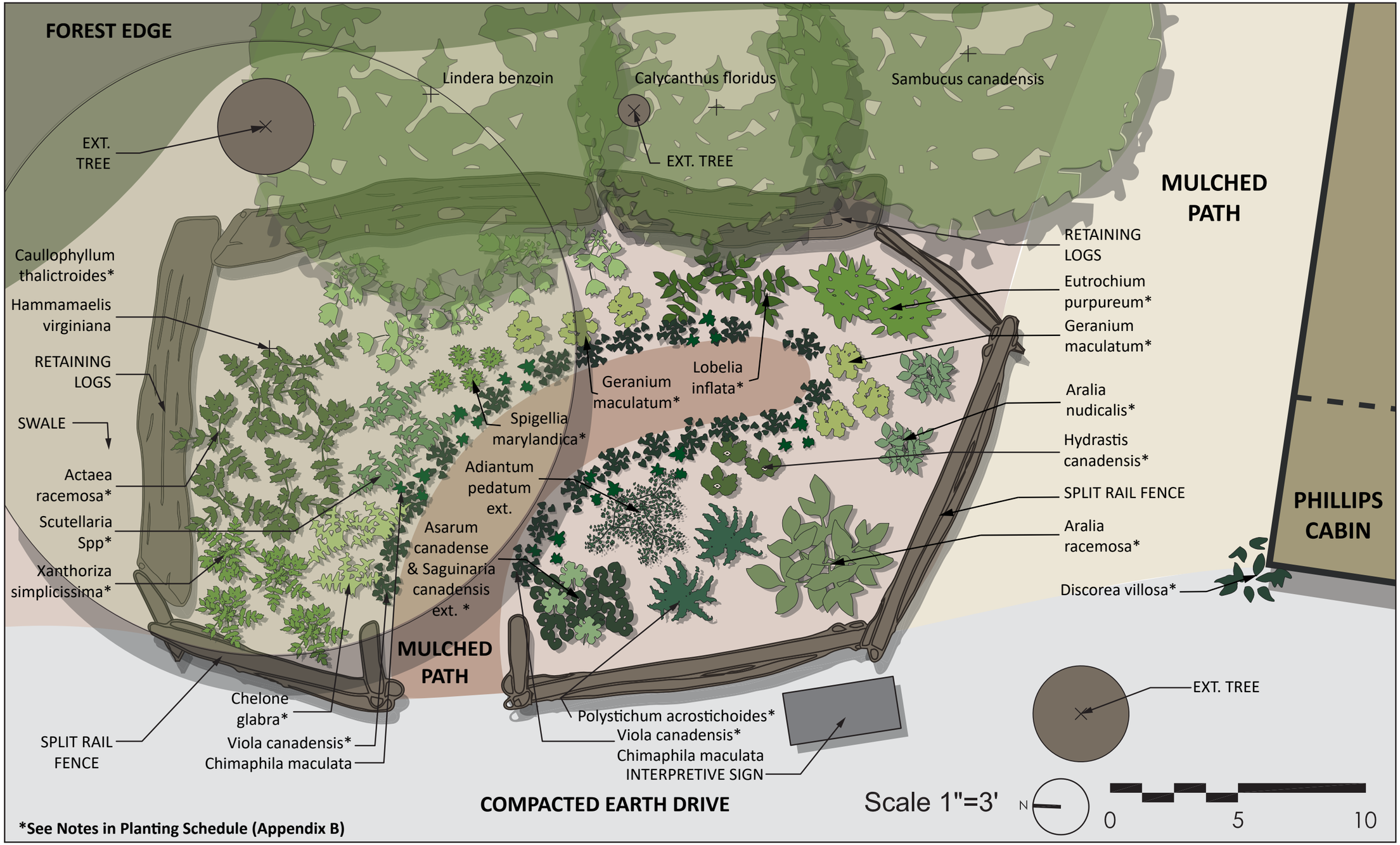

Figure 5.6 Revised Planting Plan Plot 1 (Image by author)

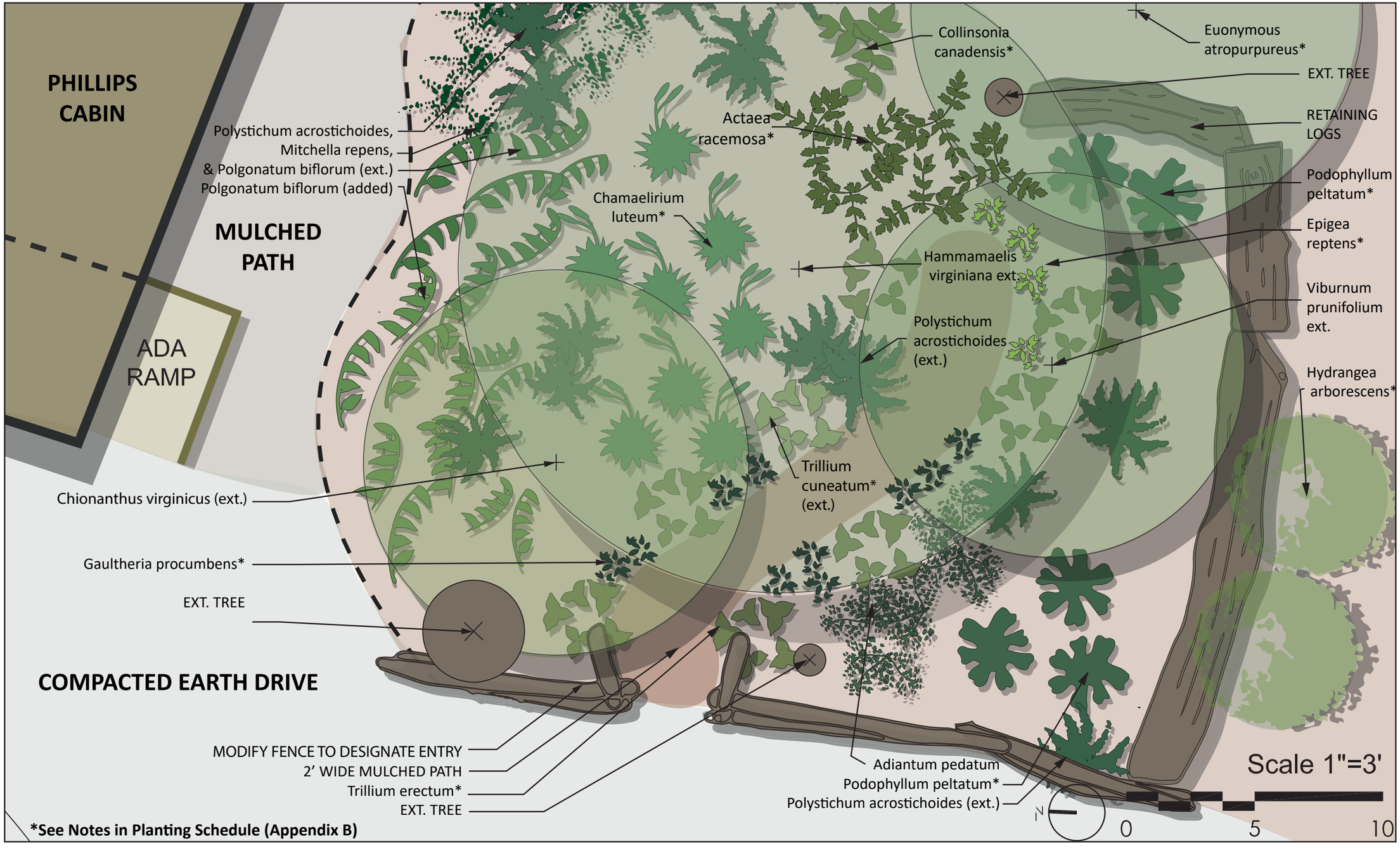

Figure 5.7 Revised Planting Plan Plot 2 (Image by author)

CHAPTER 6

CONCLUSIONS

This thesis determined which species native to southern Appalachia would appropriately represent the important medicinal plants of the region in a garden design for the Foxfire Museum and Heritage Center as laid out by my research question. Chapter 2 established the history of the medical uses of native plants in the region by identifying significant cultural groups and traditions and providing historical context to the uses of medicinal plants by those groups. Additionally, Chapter 2 established the importance of native southern Appalachian ecosystems to the global herb trade. This chapter served to establish how and under what context native medicinal plants were valued by groups historically and how native medicinal plants are still important to contemporary herbalism. Chapter 3 identified opportunities and constraints for the garden design through site analysis, providing information used to determine how the garden should be arranged. Chapter 4 established criteria to evaluate plant species discovered in the review of literature and used the criteria to classify those plant species in a Plant Evaluation Matrix (Appendix A), culminating in a Revised Plant List (Table 4.6). The classification process in Chapter 4 revealed which plant species were important native medicinal plants and which of these plant species were appropriate for the site conditions. The Revised Plant List includes a variety of native southern Appalachian species that have importance to regional cultures and historical traditions, as well as to contemporary herbalism. The

Revised Plant List also represents species that would thrive at the Foxfire site and are appropriate for the site context.

The objective of this thesis was to plan and implement a native medicinal garden appropriate for the context of the Foxfire site that accommodated the real-world limitations of the project. To fulfill this objective, the thesis research was conducted in two phases. Phase 1 produced an Initial Plant List (Table 4.3) used for implementation in the initial development of the garden. The initial development, documented in the As-Built Site Plans (Figures 5.4, 5.5), was intended to be revised with additions made over time. This initial development allowed the garden to be opened to the public in May of 2019. The As-Built Site Plan responded partially to the opportunities and constraints established in the Site Analysis (Chapter 3). As this phase of the thesis was completed before a thorough review of resources had been conducted, the successes and failures of the As-Built Site Plan were analyzed in Phase 2 to develop improvements to the implemented design (Chapter 5).

In Phase 2, the Revised Plant List (Table 4.6) was developed and utilized in a Revised Planting Design and Plant Schedule appropriate for the context of the Foxfire Museum site (Figures 5.6, 5.7; Appendix B). The Revised Planting Design takes into consideration the botanical characteristics of each plant to arrange the garden in a manner that capitalizes on microclimate variations of the site and highlights each individual species, rendering them more visible and accessible than they would be in their native habitat, fulfilling the original objective of improving access and legibility of the plants to museum visitors. The Phase 2 Revised Plant List, Revised Planting Plan, and Plant Schedule are intended to be used to guide the aesthetic vision and plant selections for the

garden in the future. The Revised Plant List and Revised Planting Design are intended to be used as more resources and funds become available at Foxfire. Additionally, the Alternate Plant List (Table 4.7) could be used in a sunnier location at the Foxfire site for a future garden design.

The second phase of this research responded to the lessons learned during the site development process in Phase 1. The Initial Plant List was limited to 13 species, which failed to provide a representative selection of the more than 1,100 known species with medicinal properties native to Appalachia. Phase 2 expanded the plant list to 49 appropriate species, allowing more species to be represented and a greater variety of plants to be used to achieve desired aesthetic effects. The undefined structure of the Preliminary Site Plan failed to provide adequate guidance for volunteers on the day of garden installation. A more detailed planting plan would have aided the installation process and provided a template for the future of the garden. A vision for the future of the garden can aid garden managers as plant donations became available. The Revised Planting Plan developed in Chapter 5 provides this future vision for the garden.

Additionally, there was not time to analyze the specific botanical characteristics of each plant during Phase 1 to adequately guide the installation process to ensure appropriate placement of plants. The analysis of the As-Built Site Plan in Chapter 5 revealed successes and failures of choices made during the installation process. The results of the analysis were addressed in the Revised Planting Plan. The additions and modifications made in Phase 2 address the concerns that arose after the completion of Phase 1.

The Revised Planting Plan serves as a vision for the future of the garden. For this future to be realized, there must be a defined plan of action. Additionally, the garden must be interpreted to the public and well maintained over time to fulfill the objectives of the project. The following is a suggestion of next steps towards implementing the Revised Planting Plan and maintaining the intention of the garden over time.

Record Keeping

Recordkeeping is essential for the operation of any museum. To manage the garden in the future, detailed records of existing plantings, additional plantings, maintenance activities, affiliated individuals, events, design proposals, and donations or grants should be kept in a single location.

The As-Built Planting Plan serves as documentation of the existing condition of the garden. Planting locations are approximate and were not geolocated. Species were marked with wooden stakes labeled with the plant common name at the time of planting. All individual plants were marked with construction flags in order to document their survival. The As-Built Planting Plan should be verified in the field and any plantings that did not survive the winter notated on the plan, keeping an up-to date site plan of plant locations. Permanent botanical markers listing the botanical and common name of plants should be installed beside each species location. This will serve to spatially document the location of plant species while providing information to visitors.

Foxfire has a record keeping system in place for the garden in the form of a Google Drive Folder titled “Herbalism Cabin” that is currently shared with myself, Assistant Curator Kami Ahrens, and Patricia Howell. Additional records related to the

garden maintenance, design proposals, and interpretation should be added here. Any future plantings or maintenance activities should be added to a "Maintenance Log and Planting Editions" spreadsheet, and an updated site plan. The garden should be photographed at least once annually in early summer to document growth and development.

Interpretation

For the garden to be a successful educational tool, it must be accompanied by interpretation to allows visitors to the museum to understand the significance of the garden when an herbal educator or tour guide is not available. An identification guide is currently being developed by myself, Patricia Kyristi Howell, and Foxfire's assistant curator Kami Ahrens to interpret the garden for visitors. The guide includes an illustration of each plant, clues to identifying the plant, its medicinal uses, and an excerpt about the plant from the Foxfire interview archives. The "ID guide" helps to illuminate the historical and contemporary understanding of each plant while familiarizing the visitor with the plant. A printed copy of the ID guide will be available for visitors to bring with them on a self-guided tour of the garden. If botanical markers were added as suggested, the ID guide could be used in tandem with the markers to help visitors locate plants successfully. Additionally, the ID guide will include a schematic of the garden layout and information about the conservation of medicinal plants and ethical harvesting practices. It is also necessary to include a warning that plants may be dangerous if used incorrectly and plants should not be used until consulting a professional herbalist.

Appendix C includes an example page of the ID guide and the proposed botanical marker design.

Maintenance and Management

Despite being a collection of native plants that thrive naturally in the region, for the garden to be physically accessible and visually legible, it must have at least minimal maintenance. Appendix D includes an outline of minimum basic maintenance activities that will reoccur on a seasonal basis or after new plantings. At the Foxfire museum, the limited staff members each wear many hats and maintenance activities are often assisted by volunteers. The Maintenance Plan outlines an easy-to-implement system that could be added to an all-staff calendar with email reminders to ensure that tasks are completed.

Next Steps

To implement the design intentions of the Revised Planting Plan, several steps will need to occur. The following is a step-by-step action plan to achieve this goal.

1. Spring 2020: the survival of plantings in the As-Built Planting Plan should be verified in the field.
2. ASAP: Professional grade aluminum botanical markers should be ordered for each plant species represented. (See design in Appendix C)
3. Summer 2020: Identification Guide development should be continued to include additional plant species. (See example in Appendix C)
4. Fall 2020: A fundraising campaign or grant should be pursued to acquire the funds necessary to purchase additional plantings and maintain the garden and Phillips cabin.
5. Winter 2020: A nursery source for each plant on the planting schedule should be identified so plants can be ordered. Contact regional native nurseries.
6. Early Spring 2021: organize a second planting day, including the original volunteers in the call for assistance.
7. Spring 2021: The second planting day should fulfill the design proposal of the Revised Planting Plan, adding all plants and proposed modifications to the fence in Plot 2.
8. Additional botanical markers should be ordered for all new plantings.
9. The proposed maintenance plan should be followed to ensure the success of plantings and continued utility of the garden. (See Appendix D)

Further Research

Further research in this subject could expand the literature review to classify a greater volume of native medicinal species. This would provide a more complete understanding of the total number of native medicinal plants and their botanical characteristics. Expanding the literature review would also provide a clearer understanding of the overlaps between different groups' use of native plants. Grouping native medicinal plants by plant community, accompanied by images, would be a useful structure for development of a field identification guide for native medicinal plants of southern Appalachia. Another opportunity for further research is an appropriate planting design for a full sun-part shade garden that incorporates the species included in the Alternate Plant List (Table 4.7). This garden could potentially be located adjacent to the heritage vegetable garden, which is one of the largest open clearings of the museum site and would likely be suitable. Adding a perennial herb garden in this location would complement the annual garden and provide an additional interpretation opportunity in this area.

Summary

This research contributes to the field of landscape architecture by providing an example of a design process methodology in which design choices were made with consideration for historical, cultural, botanical, site, and ethical considerations simultaneously. This thesis also demonstrates an example of the aesthetic use of native plants to facilitate the interpretation of cultural heritage. This thesis fulfills the interpretive goals of the garden

by connecting the cultural heritage of the medicinal uses of native southern Appalachian plants to the context of the plants' native ecosystems.

In a broader sense, this thesis demonstrates the valuable learning experience of studying native ecosystems with closer attention. Landscape architects would benefit from having a greater understanding of native ecosystems and the plants themselves in the design process. By studying native plants in greater detail and studying native plant communities, failures in planting design can be avoided. Additionally, by establishing a meaningful connection to native plants through study and observation, landscape architects will be better equipped in their design practice to propose designs that support local ecosystems. Through this process of investigation, I have cultivated in myself a familiarity and appreciation of native medicinal plants that others may now experience when visiting the garden at Foxfire. I am happy to have contributed to the Foxfire organization, and that the garden is now available for use by Patricia Kyristi Howell and her students.

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IMAGE SOURCES

FIGURE 1.1 Image courtesy of Appalachian Regional Commission. “Subregions in Appalachia.” https://www.arc.gov/research/MapsofAppalachia.asp?MAP_ID=31

FIGURE 3.1 Image provided by author

FIGURE 3.2 Image courtesy of Google Earth. Modified by author.

FIGURE 3.3 Image provided by author

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FIGURE 3.6 Image courtesy of Saadia Rais

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FIGURE 3.8 Image provided by author

FIGURE 3.9 Image provided by author

FIGURE 3.10 Image provided by author

FIGURE 3.11 Image provided by author

FIGURE 3.12 Image provided by author

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FIGURE 5.7 Image provided by author

APPENDIX A

COMPLETE PLANT EVALUATION MATRIX

The species evaluated in this matrix are species determined to be native to southern Appalachia. One hundred and twenty-two species in total were evaluated. Species were designated into four categories based on the results of the matrix: Shade Tolerant and Edge Species, Full Sun to Part Shade Species, Trees, and Rare or Endangered Species. Trees were classified by citations only, as they were excluded from the Revised Plant List due to size constraints of the site. The classifications were color coded for clarity. Highlighted fields indicate the reasoning for each species' classification. Blue fields are species that were included in the Initial Plant List (refer to Table 4.3) Refer to the key below.

Classification, Shorthand and Citation Key:

Cell Color	Classification
	Shade Tolerant and Edge Species
	Full Sun to Part Shade Species
	Trees
	Rare or Endangered
	Included in Original Plant List
	Reasoning for Classification

y= yes n=no y and n= both native and non-native species of same genera are used medicinally

Citation Key: PL: Phyllis Light 2018; PH: Patricia Howell 2006; JB: Judith Bolyard 1981; MRH: Mountain Rose Herbs website; AK: Krochmal et al 1971; TB: Tommie Bass, Crellin 1990; DC: David Cozzo 2003, FF11: Foxfire 11; KU: Kansas School of Pharmacy Medicinal Garden, CH: J.T Garrett 2003

Botanical Name	Common Name	Sunlight	Height	Spread	Type	Aesthetics	Aggressive?	Conservation Concern?	Cultural Significance	Native?	Current Use?	Transplant Concerns?	Citations	# cit	notes
Acer negundo	Box Elder				tree		n		y folk	Y	n		JB	1	
Achillea millefolium	Yarrow	full sun	2-3'	2-3'	herbaceous perennial	fernlike leaves, umbrel flowers	weedy		y native and folk	Y and N	y, sold commercially		PL, PH, MRH, AK, TB, FF11	5	needs full sun
Actaea pachypoda	White Baneberry, Doll's Eyes	shade	1-2'		herbaceous perennial		n		y folk	Y	consdidered toxic		FF11	1	
Actaea racemosa	Black Cohosh	full shade	4-6'	2-3'	herbaceuous perennial	toothed leaves	n	at risk	y, native	y	y, sold commercially	slow to establish	PL,PH, JB, MRH, AK, DC, TB	7	
Adiantum pedatum	Maidenhair Fern	part shade to full shade	1-2.5'	1-1.5'	fern	delicate fronds	n	to watch	y native and folk	Y	less common		PH, AK, FF11	2	
Agrimonia Parviflora	Agrimony	full sun to part shade	3-6"		herbaceous perennial		n		y native	Y	non native sold comm.		CH	1	
Alnus incana	tag alder				tree		n		y folk	Y	less common		PL, TB	2	
Angelica atropurporea, venenosa	Angelica, wild celery	full sun to part shade			biennial		n		y native	Y and N	y, sold commercially		PL, MRH, AK,CH	3	
Aplectrum hymale	Puttyroot	full shade			herbaceous perennial		n		y folk	Y	less common		FF11	1	
Apocynum cannabinum	Indian hemp	part shade	3-6'		herbaceous perennial		aggressive		y folk	Y	y, sold commercially		JB, AK, TB	3	
Aralia nudicaulis	Sarsparilla	full sun to shade	2'		perennial subshrub		can be weedy		y native, euro, and folk	Y and N	y, sold commercially		PL, PH, MRH, AK, TB	5	
Aralia racemosa	Spikenard, Indian Root	full sun to part shade	3 to 5'	3 to 5'	herbaceous perennial	specimen	n	to watch	y native, euro, and folk	Y	y, sold commercially		JB, MRH, AK, DC, FF11	4	
Aralia spinosa	Devils Walking Stick	full sun to part shade	10-20'	6-10'	deciduous shrub	showy blooms	weedy, suckering		y native and folk	Y	less common		PL, PH, DC, TB	4	
Arisaema triphyllum L.	Jack-in-the-pulpit	shade	1-2'		herbaceous perennial		n		y native	y	less common		FF11	1	
Aristolochia serpentaria	Virginia Snakeroot	full shade	6"-2'		perennial vine	pipe shape flower	n	at risk, threatened in 5 states	y, native	Y	y, sold commercially		PH, JB, AK, DC, TB	5	
Asarum canadense	Wild Ginger	part shade to full shade	6-12"	12-18"	groundcover	whorled pointed leaves	n		y native and euro	y	yes, less well known	split existing stands, not from seed	PH, PL, AK, DC, TB, FF11	5	likes wet and part shade
Asclepias syriaca	Milkweed	full sun			herbaceous perennial		n		y native and folk	Y	less common		JB, AK, DC	3	
Asclepias tuberosa	Pleurisy Root, Butterfly weed	full sun	1-2.5'	1-1.5'	herbaceous perennial	showy orange flowers	will spread	to watch	y native and folk	Y	y, sold commercially		PL, PH, JB, MRH, DC, AK, TB	6	
Asimina triloba	Paw paw				tree		n		y folk	Y	n		JB	1	
Baptisia australis, baptisia tinctoria	Wild Indigo, Blue False Indigo	full sun to part shade	3-5'		herbaceous perennial		n	to watch (tinctoria)	y native and folk	Y	y, sold commercially		PL, MRH, AK, DC	4	
Betula lenta	Sweet birch				tree		n		y folk, commercial	Y	less common		JB, AK, TB, FF11	3	
Botrychium virginianum	rattlesnake fern	part shade to full shade			fern		n		y folk	Y	n		FF11	1	
Calycanthus floridus	Carolina Allspice	part shade to full shade	3-9'		woody perennial		n		y native	Y	y, sold commercially		PL, MRH,CH	3	
Carya spp.	Hickory				tree		n		y folk	Y	n		JB	1	
Castanea dentata	American Chestnut				tree		n		y folk	Y	n		JB	1	
Caulophyllum thalictroides	Blue Cohosh	full shade	1-2'	6-12"	herbaceouos perennial	three part leaves	n	at risk	y native and euro	y	y, sold commercially	does ok with splitting not great.	PH, MRH, AK, DC, TB, FF11	5	
Ceanothus americanus	Red Root, New Jersey Tea	full sun to part shade	3-4'	4-5'	deciduous shrub	showy flowers	n		y native and folk	Y	y, sold commercially		PL,PH, MRH, DC, AK, TB, FF11	6	
Chamaelirium luteum	False Unicorn Root	full shade	3'		herbaceous perennial	spike shaped flower	n	rare	y folk	Y	y, sold commercially		Chestnut School	1	
Chelone glabra	Turtlehead	part shade	2-3'	1.5-2.5'	herbaceous perennial	three part leaves	n		y native and civil war	Y	y, sold commercially		PH, MRH, AK, FF11	4	likes wet
Chimaphila umbellata, maculata	Pipsessewa, Ratsbane	full shade	3-4"		evergreen herbaceous perennial	low deep green	n	to watch	y native	y	y, sold commercially	cuttings or transplant ok	PH, MRH, AK, DC, TB, FF11	5	
Chionanthus virginicus	Fringetree	full sun to part shade	12-20'	12-20'	understory tree	showy flowers	n		y native and folk	Y	y, sold commercially		PL, PH, MRH, AK, TB	5	
Collinsonia canadensis	Stoneroot, horsebalm	part shade to full shade	2 to 4'	1-3'	herbaceous perennial		will spread	to watch	y native	Y	y, specific use		PH, JB, AK, DC	4	high water need
Comptonia peregrina	Sweet Fern	full sun to part shade	2-5'	4-8'	deciduous shrub		will spread		y native	Y	y folk/ home	slow but good once established	PH, AK, FF11	2	
Cornus florida	Dogwood	part shade	15-20'		understory tree	showy flowers	n		y folk	Y	less common		PH, PL, JB, TB, FF11	4	
Crataegus spp.	Hawthorn	full sun to part shade			woody shrub		n		y folk, commercial	Y	y, sold commercially		PL, MRH	2	
Cypripedium acaule, parviflorum	Lady slipper, Pink, Yellow	full shade	4-6"		orchid	specimen	n		y folk	Y	y, but not available		JB, TB, FF11	3	
Dioscorea villosa	Wild Yam	full sun to shade	6-15'		perennial vine		n	at risk	y native	Y	y, sold commercially		PH, MRH, AK, DC, TB	5	
Diospyros virginiana	Persimmon				tree		n		y folk	Y	less common		JB, TB, FF11	2	
Diphylleia cymosa	Umbrella Leaf	shade			herbaceous perennial		n	rare	y native	Y	n		FF11	1	
Echinacea purporea	Echinacea	full sun to part shade	2-5'	1.5-2	herbaceous perennial	showy flowers	n	at risk	y native, folk, commercial	Y	y, sold commercially		PL, MRH, AK, TB, FF11	4	
Epigea reptens	Trailing arbutus, Gravel Plant	shade			evergreen groundcover		n		y native and folk	Y	y, sold commercially	impossible to transplant/cultivate	JB, DC, CH, FF11	2	
Eryngium yuccifolium	Rattlesnake Master	full sun			herbaceous perennial		n		y folk	Y	less common		KU, FF11	2	needs wet
Euonymus atropurpureus	Wahoo	full sun to part shade	12-15'	15-25'	deciduous shrub	heart shaped flowers	n		y native and folk	Y	y, sold commercially		PL, AK,	2	
Eupatorium perfoliatum	Boneset	full sun to part shade	4-6'	3-4'	herbaceous perennial	looks like joe pye	n		y native and euro	y	y, sold commercially	seed in fall or split clumps spring	PL, PH, JB, MRH, DC, AK, TB, CH, FF11	7	likes wet
Eupatorium purpureum	Joe Pye Weed, Gravel Root	full sun	5-7'	2-4'	herbaceous perennial, clumping	tall, plumed purple bloom	n		y native, euro, folk	y	y, sold commercially		PL, PH, MRH, AK, DC, TB, FF11	6	
Fagus grandifolia	Beech				tree		n		y folk	Y	less common		JB, TB	2	
Frangula caroliniana	Carolina Buckthorn				tree		n		y folk	Y	less common		PL, TB	2	
Fraxinus americana	Ash, White, Green				tree		n		y native, folk	Y	less common		JB, AK,CH, FF11	2	
Gaultheria procumbens	Wintergreen	part shade to full shade			evergreen groundcover		n		y folk	Y	y, sold commercially		JB, AK, TB	3	
Gentianella catesbaei, quinquefolia, villosa	Gentian	full sun to part shade	1-2'		biennial herb	showy flowers	n	to watch	y native, commerical	Y	y, sold commercially		PH, MRH, AK, DC, TB	5	
Geranium maculatum	Wild Geranium, Cranesbill Root	part shade to full shade	1.5-2'	1-1.5'	herbaceous perennial	showy	will spread		y native	Y	y, sold commercially		PL, PH, MRH, DC, AK, TB, FF11	6	
Grindelia squarrosa	Gumweed, Rosinweed	Full sun			herbaceous biennial		weedy		y native	Y	less common		KU	1	
Hamamaelis virginiana	Witch Hazel	full sun to part shade	15-20'	15-20'	deciduous shrub/tree	yellow fall bloom	n		y native and euro	y	y, sold commercially	cant propogate cuttings or seed	PL, PH, JB, MRH, DC, TB, AK, FF11	6	
Hedeoma pulegioides	American Pennyroyal	full sun to part shade			annual		n		y native, folk, commercial	Y	y, sold commercially		JB, MRH, DC, AK, FF11	4	
Hepatica americana	Liverwort	shade	4-8"		herbaceous perennial	purple blooms	n		y native	Y	y, sold commercially		FF11	1	
Heuchera americana	American Alumroot	part shade to full shade	1-2'		herbaceous perennial		n		y native	Y	y, sold commercially		KU, CH, FF11	3	
Humulus lupulus	Hops	full sun to part shade	15-20'		vine		n		y folk, commercial	Y	y, sold commercially		PL, MRH	2	
Hydrangea arborescens	Wild Hydrangea, Sevenbark	part shade	3-5'	3-5'	deciduous shrub	showy flower	n		y native and folk	Y	y, sold commercially		PL, PH, MRH, DC, AK, TB, FF11	6	
Hydrastis canadensis	Goldenseal	part shade to full shade	10-15"	10-15 "	herbaceous perennial	low maple like leaves	n	at risk	y native, folk, commercial	y	y, sold commercially	rhizomes successful spring	PL, PH, JB, MRH, AK, TB, FF11	6	need heavy shade
Ilex opaca	American holly	full sun to part shade			evergreen perennial		n		y folk	Y	less common		JB	1	needs wet
Impatiens capensis	Jewelweed	Full shade	2-5'	1.5-2.5'	succulant annual	orange flowers	weedy		y native, folk	Y	y, for poison ivy		PL PH, JB, DC, FF11	4	
Iris versicolor	Blue Flag	full sun to part shade			herbaceous perennial		n		y native, folk, commercial	Y	y, sold commercially		PL, MRH, DC	3	
Juglans cinerea	Butternut/White Walnut				tree		n		y folk	Y	less common		PL	1	
Juglans cinerea	White Walnut				tree		n		y folk	Y	n		JB	1	
Juglans Nigra	Black Walnut				tree		n		y folk	Y	y		PL, PH, AK, TB, FF11	4	
Juniperus communis	Juniper				tree		n		y folk, commercial	Y	less common		PL, AK	2	
Juniperus virginiana	Eastern red cedar				tree		n		y folk, commercial	Y	less common		PL, AK	2	
Lindera benzoin	Spicebush	full sun to shade	6-12'	6-12'	deciduous shrub		n		y native, folk	Y	less common		PL,PH, JB, DC, AK, FF11	5	
Liquidambar styraciflua	Sweet Gum				tree		weedy		y native and folk	Y	y		PL, PH, AK, TB, FF11	4	
Liriodendron tulipifera	Yellow Poplar				tree		n		y folk	Y	less common		PL	1	
Lobelia inflata	Lobelia, Indian Tobacco	part shade	1-2'		erect annual	inconspicuous	n	to watch	y native and euro	y	y, sold commercially		PL, PH, JB, MRH, DC, AK	6	
Lycopus americanus, virginicus	Bugleweed	shade			herbaceous perennial		n		y native and folk	Y	y, sold commercially		PL, MRH, DC, AK, TB	5	needs wet
Magnolia acuminata L.	Cucumber Tree				tree		n		y folk	Y	less common		JB, TB	2	
Magnolia grandiflora	Magnolia				tree		n		y folk	Y	less common		PL	1	
Magnolia virginiana	Sweetbay Magnolia				tree		n		y folk	Y	less common		PL	1	
Maianthemum racemosum	False Solomon's seal	part shade to full shade			herbaceous perennial		n		y folk	Y	less common		TB	1	
Menispermum canadense	Moonseed, Sarsparilla	full sun to part shade	8-20'	3-*6'	perennial vine		n		y folk	Y	y, sold commercially		JB, AK	2	likes to be wet
Mertensia virginica	Virginia Cowslip	shade	9-25"		herbaceous perennial	garden uses, blue flower	n		y native	Y	less common		CH	1	
Mitchella repens	Partridgeberry	full shade, deep	1-4"	1'	perennial vine	nice groundcover, red berries	n	to watch	y native	y	y, sold commercially	no, use cutting weighted with rock	PH, MRH, DC, AK, TB, FF11	5	put around rocks
Monarda punctata, didyma	Horsemint, Bergamot	full sun to part shade	2-4'	1-3'	herbaceous perennial	bright red blooms	n		y native, folk	Y	y, euro sold comm.	dry soils	JB, AK, DC, TB	4	
Monotropa uniflora	Indian Pipe	full shade, deep	4-6"		saprophytic perennial	white, no chlorophyll	n	at risk	y native	Y	y, but not available	cannot be propogated	PH	1	
Morus rubra	Mulberry, White, Red				tree		n		y folk, commercial	Y and N	y, sold commercially		PL, JB, MRH	3	
Nyssa sylvatica	Black Gum				tree		n		y native, folk	Y	n		JB, CH	1	
Oenothera biennis	Evening Primrose	full sun to part shade	3-5'	2-3'	herbaceous perennial	showy flowers	can be weedy		y native, euro, and folk	Y	y, sold commercially		PH	1	
Oxalis stricta	Oxalis	full sun to part shade			herbaceous perennial		n		y native	Y	less common		JB, DC	2	
Oxydendrum arboreum	Sourwood				tree		n		y folk	Y	less common		PL,TB, FF11	2	
Panax quinquefollius	American Ginseng	full shade	6-8"		herbaceuous perennial	red berries	n	CITES listed Endangered	y, highly valuable	Y	y, coveted worldwide		PL, PH, JB, MRH, DC, AK, TB, FF11	7	
Passiflora incarnata	Passionflower	full sun to part shade	6-8'	3-6'	perennial vine	showy flowers, fruit	can be weedy		y native	Y	y, sold commercially		PL, PH, MRH, DC, AK, TB	6	
Pedicularis canadensis L.	Lousewort	full sun to part shade			herbaceous perennial		n		y folk	Y	less common		Chesnut school	1	
Phytolacca americana	Pokeweed	full sun to part shade	4-10'	3-5'	herbaceous perennial	kind of unattractice	can be weedy		y native, folk, commercial	Y	y, sold commercially		PL, PH, JB, MRH,AK, TB, FF11	6	

Botanical Name	Common Name	Sunlight	Height	Spread	Type	Aesthetics	Aggreessive?	Conservation Concern?	Cultural Significance	Native?	Current Use?	Transplant Concerns?	Citations	# cit	notes
Pinus strobus	White Pine				tree		n		y folk, commercial	Y	y		PL, PH, JB, AK	4	
Pinus virginiana	Scrub pine				tree		n		y folk	Y	n		JB	1	
Podophyllum peltatum	Mayapple	shade	12-18"		herbaceous perennial		n	to watch	y native	Y	y, sold commercially		JB, MRH, DC, AK, TB	5	
Polygala senega	Seneca (senega) snakeroot	sun			herbaceous perennial		n		y native, folk	Y	y, sold commercially		JB, DC, AK, TB	4	
Polygonatum biflorum	Solomon's Seal	part shade to full shade	2-3'	8-12"	herbaceous perennial	arcing leaves and blooms	n		y native and euro	y	y, sold commercially	might need to pot divisions	PL, PH, MRH, DC, AK, TB	6	
Polystichum acrostichoides	Christmas fern	part shade to full shade	1-3'		fern		n		y native	Y	less common		FF11	1	
Populus balsamifera	Balm of Gilead				tree		n		y native, folk, commercial	Y			JB, AK,CH, FF11	2	
Prenanthes alba	Snakeroot	full shade			herbaceous perennial		n		y native	Y	less common		FF11	1	
Prunus americana	Wild Plum				tree		n		y folk	Y	less common		PL, JB	2	
Prunus serotina	Wild Cherry				tree		n		y, native	Y	y, sold commercially		PL, PH, JB, MRH, AK, TB	6	
PseudoGnaphalium obtusifolium	Rabbit Tobacco	full sun	.5-2.5'		biennial herb		n		y native and folk/home	Y	less common		PL, PH, JB, DC, TB	5	
Pycnanthemum incanum, virginianum, tenuifolium	Mountain Mint	full sun to part shade	2-3'	3-4'	herbaceuous perennial		will spread		y native and folk	Y	less common		PL, PH	2	
Quercus alba	White Oak				tree		n		y folk, commercial	Y	y, sold commercially		JB, MRH, AK, TB	4	
Rhus glabra, hirta	Sumac	full sun to part shade	9-15'	9-15'	deciduous shrub	red cones	weedy, aggressive		y native and folk	Y	less uncommon		PL, PH, JB, DC, AK, TB, FF11	6	
Rosa spp., Rosa canina, carolina, eglantaria	Rose, rosehip	full sun to part shade			woody perennial		n		y folk, commercial	Y and N	y, sold commercially		JB, MRH	2	likes wet
Salix alba	White Willow				tree		n		y folk, commercial	Y	y, sold commercially		JB, MRH, AK, TB	4	
Sambucus canadensis	Elder	full sun to part shade	5-12'	5-12'	deciduous shrub, multistemmed	wild shrubby/tee	suckers		y native, folk, commercial	y	y, sold commercially		PL, PH, JB, MRH, DC, AK, TB, FF11	7	
Sanguinaria canadensis	Bloodroot	full shade	6-9"	4-6"	low herbaceous perennial	lobed leaves, big white flower	n	at risk	y native, euro, commercial	y	y, sold commercially	can propogate from seed slowly	PH, JB, TB, MRH, DC, AK, CH, FF11	6	rhisominous
Sassafras albidum	Sassafras				tree		n		y native and folk	Y	y, sold commercially		PL, PH, JB, MRH, AK, TB, FF11	6	
Scutellaria lateriflora	Skullcap, mad dog skullcap	part shade to full shade	2-3'	1.5-2.5'	upright perennial		will spread		y native and folk	Y	y, sold commercially		PL, PH, JB, MRH, AK, DC, TB	7	needs wet
Senna marilandica	Senna	full sun	3-6'		erect perennial		n		y native and euro	Y and N	y, sold commercially		PL, MRH, TB	3	
Solidago spp.	Goldenrod (38+ species)	Full sun	4-5'	4-5'	erect perennial	yellow flowers	weedy		y native, euro, and folk	Y	y, sold commercially		PH, MRH, DC, TB	4	
Spigelia marylandica	Pink root, Indian pink	part shade to full shade	1-2'	.5-1'	herbaceous perennial	red flowers	n	to watch	y native and folk	Y	y, sold commercially		PL, DC, AK, TB	4	
Tilia americana	Basswood, Linden				tree		n		y folk, commercial	Y	y, sold commercially		JB, MRH,CH, FF11	2	
Trillium erectum	Bethroot, Red Trillium	full shade			herbaceous perennial	low to ground, 3 leaves	n	at risk	Y native and folk	Y	Y, less common		PH, AK, TB, FF11	3	
Tsuga Canadensis	Eastern Hemlock				tree		n		y folk, commercial	Y			JB, AK, FF11	2	
Ulmus rubra	Slippery elm				tree		n	at risk	y folk, commercial	Y	y, sold commercially		PL, JB, TB, MRH, AK, TB	6	
Verbena hastata	Blue Vervain	full sun	2-6'	1-2.5'	herbaceous perennial		n		y folk, commercial	Y	y, sold commercially		PL, MRH, AK	3	
Veronia noveboracensis, hastata	Ironweed	full sun			herbaceous perennial		n		y native, folk	Y	less common		JB, DC, FF11	2	
Veronicastrum virginicum	Culver's Root	full sun			herbaceous perennial		n		yes native and euro	Y	y, sold commercially		KU	1	
Viburnum prunifolium	Black Haw, Crampbark	full sun to part shade	12-15'	6-12'	deciduous shrub, multistemmed	showy white blooms, dense shrub	suckers		y native, euro and folk	y	y, sold commercially		PL, PH, MRH , DC, AK, TB	6	hardy, gets big
Viola canadensis	Violet	part shade to full shade	10"		low herbaceous perennial		n		y native and folk	Y and N	y, sold commercially		PL, MRH, DC, FF11	3	
Xanthorhiza simplicissima	Yellowroot	full shade	2-3'		woody perennial groundcover	celery or italian parsley leaves	potentially agg		y native and folk	y	y, sold commercially	rugged hardy durable	PL, PH, DC, AK, TB, FF11	5	likes streambanks
Lycopodium spp.	Club moss	shade	6"	6"	evergreen groundcover		n		y native and folk	y	y, sold commercially	cant propogate	PH, JB	2	

APPENDIX B

PLANT SCHEDULE FOR REVISED PLANTING PLAN

The plant schedule has been included to accompany the Revised Planting Plan to clarify the intentions of the planting plan and to aid future implementation. The plant schedule is separated by type and includes suggested quantities and spacing for mature species. Also included are planting instructions that refer to the "*" by each species callout in the Revised Planting Plan. Plants with quantities listed N/A are providing instructions for transplanting existing plants.

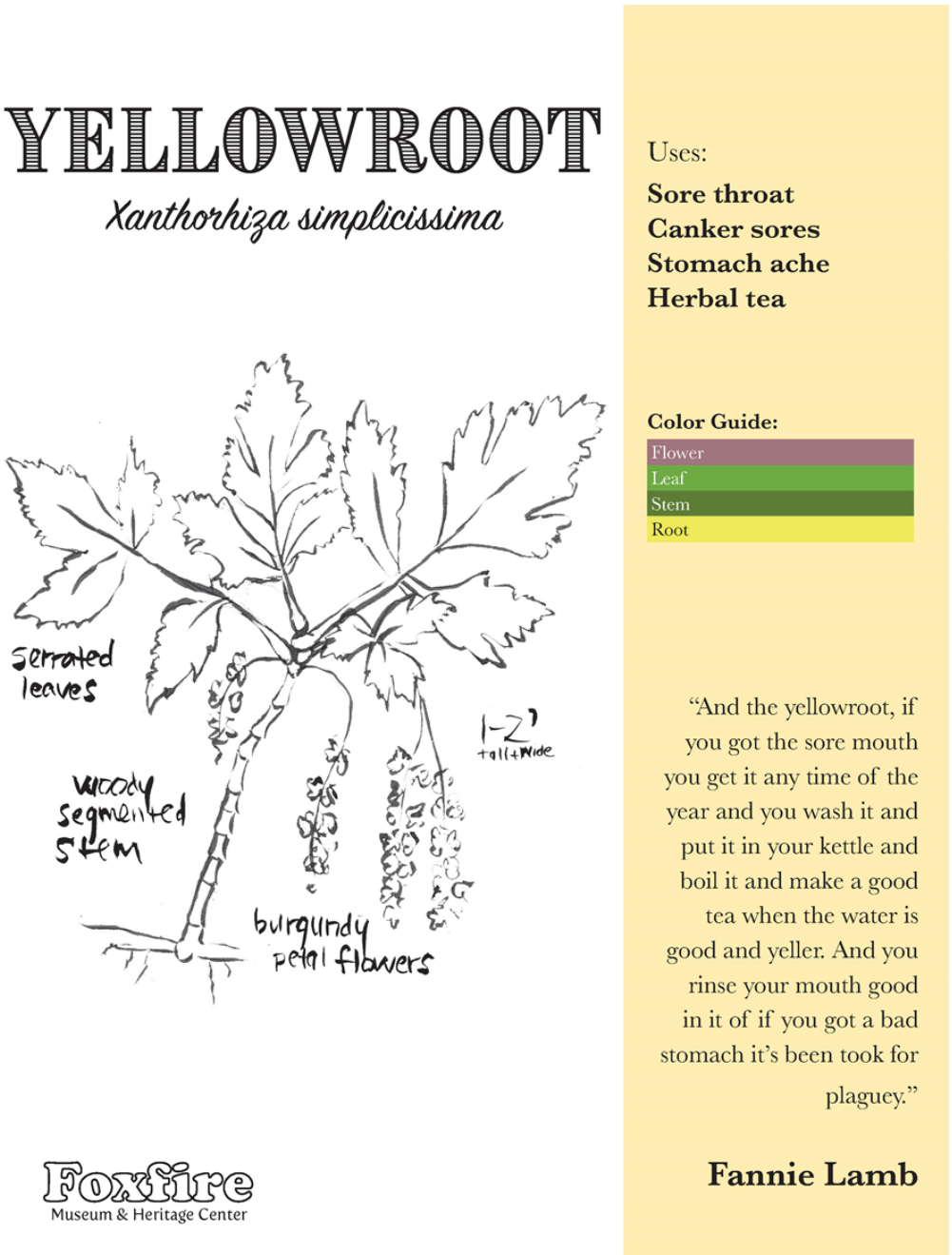
Plant Schedule (Table by author)

PLANT SCHEDULE				
Quantity	**Botanical Name**	**Common Name**	**Spacing**	**Comments**
SHRUBS:				
1	Calycanthus floridus	Carolina Allspice	6-12'	Plant behind retaining logs to naturalize at forest edge
1	Euonymus atropurpureus	Wahoo	15-25'	Plant behind retaining logs to naturalize at forest edge
2	Hydrangea arborescens	Wild Hydrangea, sevenbark	3-5'	Plant behind retaining logs to naturalize at forest edge
1	Lindera benzoin	Spicebush	6-12'	Plant behind retaining logs to naturalize at forest edge
1	Sambucus canadensis	Elder	5-12'	Plant behind retaining logs to naturalize at forest edge, will sucker and fill in area
GROUNDCOVERS, VINES, & PERENNIALS				
N/A	Actaea racemosa	Black Cohosh	2-3'	Transplant existing to fill in designated area
3	Adiantum pedatum	Maidenhair Fern	1-1.5'	
1	Aralia nudicaulis	Sarsparilla	1-2'	Plant at edge of fence
4+	Aralia racemosa	Spikenard, Indian Root	3 to 5'	Plant in fence corner
3	Asarum canadense	Wild Ginger	12-18"	Add adjacent to existing, fill in around adiantum pedatum, will form groundcover
N/A	Caulophyllum thalictroides	Blue Cohosh	6-12"	Transplant existing to fill in designated area
4	Chamaelirium luteum	False Unicorn Root	1-1.5'	Clump together among existing plant community
3	Chelone glabra	Turtlehead	1.5-2.5'	Group
10+	Chimaphila maculata	Pipsessewa, Ratsbane	5"	Add adjacent to existing
2	Collinsonia canadensis	Stoneroot, horsebalm	1-3'	Naturalize at forest edge near back of cabin
3	Dioscorea villosa	Wild Yam	6"	Vine, plant at corner of cabin to climb up tree or porch
3	Epigea reptens	Trailing arbutus, Gravel Plant	6"	use as groundcover at base of Podophyllum peltatum
N/A	Eutrochium purpureum	Joe Pye Weed, Queen of the Meadow	2-4'	Seed around existing plant along back corner of garden
4	Gaultheria procumbens	Wintergreen	1'	plant at edge, will create groundcover
3	Geranium maculatum	Wild Geranium, Cranesbill Root	10-12"	clump together behind Pedicularis canadensis
2	Hydrastis canadensis	Goldenseal	10-15 "	Add adjacent to existing
3	Lobelia inflata	Lobelia, Indian Tobacco	6-12"	seed in front of Eutrochium fisulosum
3	Podophyllum peltatum	Mayapple	2'	Naturalize at perimeter of garden (will create groundcover)
3	Scutellaria Spp.	Skullcap	1.5-2.5'	Group
4	Spigelia marylandica	Pink root, Indian pink	.5-1'	Group
4	Trillium erectum	Bethroot, Red Trillium	1-2'	Group towards entrance
4	Viola canadensis	Violet	1-2'	Use to fill in around Chimaphila maculata, will create groundcover in entire area
N/A	Xanthorhiza simplicissima	Yellowroot	1-2'	Transplant existing from Plot 2

APPENDIX C

PLANT ID GUIDE AND BOTANICAL MARKER DESIGN

The following is an example page from the Plant ID and interpretive guide developed by the author, resident herbalist Patricia Kyristi Howell, and Foxfire's assistant curator Kami Ahrens for the Medicinal Herb Heritage Garden at Foxfire. Also included are designs for custom botanical markers designed by author to mark individual species in the garden. Both the ID guide and Botanical markers are interpretation aids for visitors to the medicinal garden at the Foxfire Museum.



Example Page From Plant ID Guide with botanical illustration by the author, graphic design and historical research by Ahrens, medicinal uses by Howell, and a quote from Foxfire informant Fannie Lamb. (Image courtesy of Foxfire Museum and Heritage Center)

Botanical Marker Design 1 Botanical Marker Design 2

Botanical markers include the Common and Botanical name, the Foxfire logo, and either the name of the garden or a memorial to the late Lee Shaver, whose bequest donated funds in support of the garden and Phillips cabin restoration. Botanical marker should be of photosensitive anodized aluminum material to ensure longevity and durability. The fonts selected are consistent with the Foxfire Museum brand. (Images by author)

APPENDIX D

MAINTENANCE SCHEDULE

SEASONAL MAINTENANCE

WINTER TASKS:

- Prune large flowering shrubs within garden to encourage upward growth and prevent understory plants from being overtaken. (i.e Black Haw, Fringe Tree)

SPRING TASKS:

- Clear out dead plant material
- Add fresh mulch to paths
- Visually inspect fences for broken areas
- Visually inspect drainage swale for blockages
- Add plantings during this time if desired
- Inspect spring ephemeral plantings for survival and new growth and update Site Plan

SUMMER TASKS:

- Pull weeds (i.e. Poison Ivy, Japanese Stiltgrass, non-native invasive plants, tree volunteer saplings)
- Water by hand during periods of drought if plants appear to wilt (by staff discretion)
- Replenish mulch areas
- Visually inspect botanical markers and ID guides for condition, replace missing or damaged
- Photograph garden for records
- Inspect plantings for survival and new growth and update Site Plan

FALL TASKS:

- Gather or blow 3-4 inches of leaves into beds to insulate plants for winter

AFTER NEW PLANTINGS:

- Plant in early spring after last frost
- Mark locations of plantings with flags to document survival
- Water 2-3X the first 2 weeks after planting. 10-15 minutes of soaking by sprinkler
- Water 1X weekly. During drought periods monitor for wilting
- Continue watering schedule until plants go into dormancy for winter
- In the following spring, check plantings for survival rate and replace any failed plantings