UNDERSTANDING SLAVE SUBSISTENCE IN THE CONTEXT OF CHANGING AGRICULTURAL PRACTICES: PALEOETHNOBOTANY AT THOMAS JEFFERSON'S POPLAR FOREST

A Thesis Presented

by

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ABSTRACT

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August 2013

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During the 18th and 19th centuries, enslaved people at Thomas Jefferson's Poplar Forest utilized provisioned, gardened, and wild plants from local environments surrounding their homes to provide for their own subsistence. The Wingo's quarter was home to a number of these enslaved individuals at the end of the 18th century. Using macrobotanical data, I describe the subsistence strategies of the people living at this quarter, showing how enslaved Africans and African Americans at Wingo's utilized different sources of food to shape their foodways. Additionally, edible and inedible botanical remains provide a picture of the local environment around Wingo's within which the slaves subsisted. Using a diachronic study, comparing botanicals from the Wingo's site with other slave quarters at Poplar Forest, the botanical remains paint a

picture of how large scale agricultural activities, as well as more local horticulture and foraging, shaped the landscape in which the slaves lived as well as their subsistence strategies within this landscape.

While these quarters were inhabited, Jefferson began switching from tobacco as a major cash crop to wheat. The charred wood data from the slave quarters show how ecological succession played out on the landscape as a result of these new agricultural practices. Macrobotanical evidence from Poplar Forest illustrates that the environment in the Piedmont in the 19^{th} century is drastically changing. Despite all these environmental changes and changes in the provisions from planters, slaves in the Piedmont managed to provide food for themselves and their families from all over the plantation.

Within these changing landscapes, the enslaved people at Poplar Forest sought to provide for themselves. Bringing with them food traditions from elsewhere in Virginia and even from Africa these people used the plant resources of this changing landscape to cook their food, cure their illnesses, and warm their homes. The edible macrobotanicals from all of the sites studied suggest that in spite of massive environmental changes, the foodways of the slaves at Poplar Forest were fairly consistent. I believe this speaks to the beginning of a foodways tradition that would eventually come to define food throughout the South, food of slaves, freedmen, and whites alike.

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CHAPTER I

INTRODUCTION

In the late 18th and early 19th centuries, Piedmont Virginia was changing rapidly. In the 18th century, planters from Tidewater Virginia were moving out to the Piedmont, abandoning the quickly crowding and degrading coastal lands for the relative frontier. These people sought new fresh lands with which they could make their fortunes growing tobacco (Kulikoff 1986; Morgan 1998; Walsh 1989, 1993). Just as in the Tidewater, however, it did not take long for nutrient depleting tobacco agriculture to begin to take its toll on the fertile fields of the Piedmont. As the environment and the market for tobacco changed, planters became farmers (Walsh 1989:404). Most switched from large scale planting of a single cash crop to a diversified strategy of growing several crops, especially wheat (Morgan 1998; Walsh 1989).

Prior to the mass immigration of Euro-American farmers into the Piedmont, Native groups had practiced smaller scale agriculture in the Piedmont but much of the landscape remained forested. The arriving planters viewed the Piedmont as untouched frontier. The drastic changes in agricultural practices, from initial breaking in of frontier lands to intensive tobacco cultivation and finally to farming wheat and other crops, had significant impact of the environment of the Piedmont.

For the people living on newly established plantations, the landscapes around them were changing quickly. One such plantation was Poplar Forest. Poplar Forest is located in the Piedmont of Virginia and was owned by Thomas Jefferson. It was originally established by John Wayles in 1730s as a tobacco plantation; Thomas Jefferson continued tobacco planting at Poplar Forest until the 1790s when he began shifting crop rotations towards wheat (Heath and Gary 2012). At Poplar Forest, these changes were realized through to the labors of the slaves. They cleared the land, planted the fields, and built the houses; their actions transformed the Piedmont of Virginia from a forested frontier to farms and fields.

This study looks at how changing land use practices in Piedmont Virginia in the 18th and 19th centuries affected both the landscape of a plantation and the subsistence of the slaves living within it. To do this, I analyzed botanical materials from features at the Wingo's quarter, a slave's house associated with Thomas Jefferson's Poplar Forest located in Bedford, VA. The Wingo's quarter was in use in the 1770s through the 1790s, a time when Jefferson first acquired the Poplar Forest property, but prior to the construction of his residence there (Heath et al. 2012). He brought slaves from his Indian Camp planation, about 85 miles east, to live at Wingo's and grow tobacco. Like other planters, around 1790, Jefferson shifted Poplar Forest from a single crop plantation to a farm growing wheat and numerous other crops (Betts 1944; Proebsting 2012).

With the botanical data from Wingo's, I describe the subsistence strategies of the people living at this quarter. The botanicals recovered from this site include both edible and inedible plants such as wood use for fuel or construction. I analyze the edible macrobotanicals in terms of modes of procurement (provisioned crops, foraged/gathered wild plants, and gardened plants) showing how slaves at Wingo's utilized different sources of food to shape their foodways. The edible and inedible botanical remains provide a picture of the local environment around Wingo's within which the slaves subsisted.

When the data from the Wingo's site are compared to data from other domestic slaves sites at Poplar Forest (Bowes and Trigg 2012; Raymer 1996, 2003), it is possible to see change though time in both agricultural practices of the plantation and subsistence strategies of the people inhabiting it. From this diachronic study, the botanical remains paint a picture of how large scale agricultural activities, as well as more local horticulture and foraging, shaped the landscape in which the slaves, their overseers, and the plantation owners lived. These processes, however, also shaped how they are able to provide for themselves within this landscape.

Landscapes are both shaped by the actions of the people living within them and shape the actions of those people (Ingold 2010). A plantation landscape is a complex creation that accommodates both agricultural needs and ornamental desires. In Virginia during the 18th and 19th centuries, plantations were home to wealthy Euro-American planters, overseers, and African and African American slaves. Each group influenced their landscape. Thomas Jefferson sought to design, create, and manage the landscape around his retreat at Poplar Forest, shaping it into an ideal of a peaceful retirement home as well as an income-generating plantation.

The agricultural work of enslaved African Americans planting and managing the cash crop fields for Jefferson drastically altered the composition of the landscape. Simultaneously they utilized resources from all different parts of the landscape, forests and thickets, lowland marshy area, and the areas around their homes, in order to provide food and medicine for themselves to supplement those provisioned to them. The macrobotanicals collected from Wingo's reflect this complex interaction between the enslaved people and the plantation landscape. When compared with other sites at Poplar Forest, the botanicals show this might have changed over time.

Paleoethnobotanical data does not just speak to the environments around the plantation and the use of changing landscape but it can also be used to understand foodways. Food is simultaneously a necessity of life and a point of enjoyment for all human beings, and it plays an important role in shaping and reflecting cultural practices (Franklin 2001; Yentsch 1994; Yentsch and Hall 2007). In analyzing the foodways of the 18th and early 19th centuries, archaeologists can better understand the lives of enslaved people because a change in foodways is an important indicator of changes happening in and around enslaved African populations (Franklin 2001; Zafar 1999).

Studies of slave foodways address African American food traditions using archaeological data, historical accounts, and anthropological studies. Interpretations of archaeobotanical data vary from how food from botanicals contributes to achieving well being (Mrozowski et al. 2008) to how historical food practices contributes to modern conceptions of soul food today (Franklin 2001). Archaeologists, anthropologists, and historians have studied slave foodways and the many factors shaping food practice for enslaved people, as well as how those foodways in turn shaped the cultural history of the south (Carney and Rosomoff 2009; Crader 1996; Franklin 2001; McKee 1999; Yentsch 1994; Yentsch and Hall 2007; Zafar 1999). These studies inform the interpretation of the Wingo's and Poplar Forest data, providing ideas for how some of the plants recovered in the assemblage may have been used as food and showing how cultural traditions change or remain constant in the face of these changing landscapes.

The importance of power dynamics on the plantation and in the lives of enslaved African Americans cannot be understated. Planters, Jefferson included, sought to control the lives of their enslaved workers and controlling the available food was an important tool for control. In some ways a plantation was designed by planters as way to control their enslaved work force. Archaeologists and historians have discussed the importance of planter control in the daily lives of enslaved African Americans (Edwards 1998; Epperson 1999; Kealhofer 1999; McKee 1999). Provisioning practices limited resources and, because provisions were often meager, these practices also forced enslaved African Americans to seek out other food sources. Paleoethnobotanical data can also demonstrate the importance of provisioning as a form of control (Bowes and Trigg 2012). It also is clear, however, that enslaved peoples constantly pushed their boundaries within these managed landscapes, exercised resistance, and adapted to these controls (McKee 1999). While this power dynamic is extremely important, this study seeks to illustrate the lived experience within these controls, how people created food in their daily lives under Jefferson's control.

CHAPTER II

AGRICULTURE AND SLAVERY IN VIRGINIA AND AT POPLAR FOREST

Agriculture and Slavery in Virginia

Colonial Virginia was not always reliant on slave labor to make plantations, whether large or small, profitable. During much of the 17th century, Virginia planters primarily used European indentured servants as a labor source. As a colony Virginia became profitable with the large-scale cultivation of tobacco for export. Even during the height of the tobacco boom in the early to mid-17th century, most of the tobacco grown in Tidewater Virginia was planted, grown, and harvested by a largely European population (Hatfield 2007; Kulikoff 1986; Morgan 1975; Morgan 1998).

While African slaves were among some of the first people brought to the Virginia colony, they were in a minority during most of the 17th century. Late in the 17th century there was a shift in the labor market in Virginia away from indentured servant to African slave. Historians have referred to this shift as a change from Virginia being a society with slaves to a slave society (Hatfield 2007; Kulikoff 1986), and offer different explanations for this shift. Morgan (1998) attributes it to financial motivations. In the first half of the 17th century, life expectancies in the New World were low and investing in a slave, whom a planter owned for the slave's lifetime, cost more than an indentured servant. However, life expectancies increased in the late 17th and early 18th centuries making the purchase of slaves more financially viable (Morgan 1998). This combined with a drop in the number of indentured servants seeking transport to the colonies may have led to a shift to slaves as the primary labor force (Morgan 1998; Walsh 1989). Other historians suggest that influxes of planters to Virginia in the mid-17th century from existing slave societies, like Barbados, brought about the shift in both the make up of the labor force and the conception of slavery overall (Hatfield 2007).

By the 1760 Virginia received nearly two thirds of all incoming slaves to the American colonies (Walsh 2001:149). "Virginia slaves were introduced into a system of production that was already in working order. The substitution of slaves for servants probably increased productivity and almost certainly increased the profitability of the plantation system" (Morgan 1975:316). As a result, the number of African and African American slaves grew rapidly in the 18th century, and they quickly outnumbered Europeans in Virginia (Morgan 1975; Morgan and Nicholls 1989; Walsh 2001).

The shift towards slaves as a primary labor source in Virginia took place only a century before Wingo's was settled. After the initial shift towards slavery in the mid to late 17th century, there was another major shift in Virginia in the mid-18th century (Morgan and Nicholls 1989; Walsh 1989:398-399). During the 18th century, plantations began to spread even further, taking up any available land and expanding into new, unsettled lands. The Tidewater area was the main locus of settlement and agriculture in Virginia. Prior to the mid-18th century over 90% of the population of Virginia lived there.

As the population in the Tidewater grew, land became scarce and many families sought new tobacco lands in Piedmont Virginia (Walsh 1989, 1993).

In the mid to late 18th century, the population of the Piedmont grew significantly. In 1729 the population of the Piedmont made up only 8% of the population of Virginia, including both freedmen and slaves over the age of 16. By 1773, it held 44% of Virginia's population (Morgan and Nicholls 1989:215). By the 1760s the enslaved population in the Piedmont was greater than that of the Tidewater. During the 18th century, population statistics suggest that the enslaved population of Virginia was increasing naturally (Morgan and Nicholls 1989:221; Morgan 1998), but the region also garnered most of the trade in incoming slaves from Africa (Walsh 1993). This rapid influx of people was due primarily to expanding tobacco agriculture.

The development of tobacco as a major cash crop in the 17th century set the tone of agriculture in Virginia for the subsequent centuries. Planters adapted tobacco growing techniques from Native American agricultural practices (Morgan 1998; Walsh 1993:173). The large-scale tobacco cultivation that developed in the mid-17th century involved massive land clearance as new, previously uncultivated land was ideal for tobacco growth. Older lands, which had been planted with tobacco previously, required long fallow periods to replenish the soils (Kulikoff 1986; Morgan 1998). This need for land led to the push into the Piedmont.

In addition to labor required for extensive land clearing, tobacco cultivation itself was extremely labor intensive. It involved building seed beds with hoes, planting seeds, transplanting seedlings in new mounds, worming and weeding daily, priming and topping plants in order to insure the large possible plants, and constant maintenance to ensure high quality tobacco. This entire process took four months of management before harvesting. It took a skilled overseer to determine the ideal time to harvest tobacco, when the plants were at their peak but before the crop was ruined by frost or from remaining in the fields past their peak. After harvesting, the leaves were then cured, packaged, and most shipped to Europe (Morgan 1998).

This system of cultivation was developed and changed little in the 17th century, prior to the large-scale adoption of slavery in Virginia. The enslaved people brought to Virginia would have been incorporated into this agricultural system, performing all the labor-intensive tasks European indentured servants had done (early in the 17th century even alongside European servants) (Hatfield 2007; Morgan 1975; Morgan 1998). This agricultural structure, however, had already begun to change in the 18th century, around the same time that planters were expanding to new lands in the Piedmont.

In the 18th century, seeking out virgin lands for tobacco growth in the Piedmont provided a temporary solution to the problem of depleted fields in the Tidewater. Eventually, planters in the Tidewater and the Piedmont had to change their system of agriculture in order to make lands damaged by tobacco cultivation profitable. Most planters were forced to diversify their crops, focusing on a mixture of wheat, maize, and other crops, although tobacco remained an important crop for many planters, especially in the Piedmont (Morgan 1998; Proebsting 2012; Walsh 1989, 1993). Wheat replaced tobacco as the primary cash crop in the late 18th century. Planters did not completely abandon tobacco but typically grew grains every year and planted tobacco when prices were favorable (Walsh 1989).

The rapid adoption of enslaved Africans as the primary labor source, the shift in the locus of agriculture towards the Piedmont area of Virginia, and the rise in the importance of wheat over tobacco as a cash crop all took place within a little more than a century, from the end of the 17th century through the end of the 18th century. It was during this period of change that Poplar Forest was originally established and subsequently acquired by Jefferson. The lives of the people at Wingo's would have been significantly shaped by the agricultural changes occurring around them.

Agriculture and the Environment

The transformations in the Piedmont landscape were initiated by the economic draw of plantation production and the social relations of slavery, but they were also governed by physical, chemical, and biological processes inherent in the natural world. The activities associated with agriculture altered soil chemistry and soil texture, but the most visible modification was to the plant communities comprising the natural and cultural landscapes. Plantation vegetation was a mosaic of deliberately managed fields of cash crops, subsistence fields, orchards, gardens for food and ornamentals, cleared and fallow fields and woodlands. Deliberately cultivation and management lands altered natural vegetation regimes by modifying species composition and typically reducing species richness (the number of species). Jefferson was renowned for introducing new crops and ornamental plants to his plantations. These activities also interrupted ecological succession.

Ecological succession in plants describes how the species growing in an area changes over time depending on the history of the location (Chave 2001; Oosting 1942). There are two types of succession: primary and secondary. Primary succession originates in areas where there was no previous plant growth. Secondary succession is the process of re-growth after an event, whether natural or man-made, that destroys the extant vegetation in an area (Oosting 1942; Wright and Fridley 2010). In the case of land disturbed by agriculture, secondary succession typically occurs when fields are abandoned after cultivation, often due to erosion of soils or a lack of productivity in those fields.

In the Piedmont of Eastern North America, prior to large-scale human disturbance through cash cropping, the landscape consisted primarily of deciduous forests. In Virginia, these forests consisted predominately of oaks and hickories with a diverse understory of smaller hardwood species (Farrell and Ware 1991; Gemborys 1974; Oosting 1942). Planters sought out this "new ground," considering soils best in lands "first disrobed of woods" (Tatham 1800:6). It is at this point, according to Reverend Hugh Jones in 1724, that the land is cleared:

> by felling the trees about a yard from the ground…What wood they have occasion for they carry off, and burn the rest, or let it lie and rot upon the ground.

The land between the logs and stumps they hoe up, planting tobacco in the spring…This will last for tobacco some years, it the land be good; as it is where fine timer, or grape vines grow (quoted in Tatham 1800:107, see Figure 1).

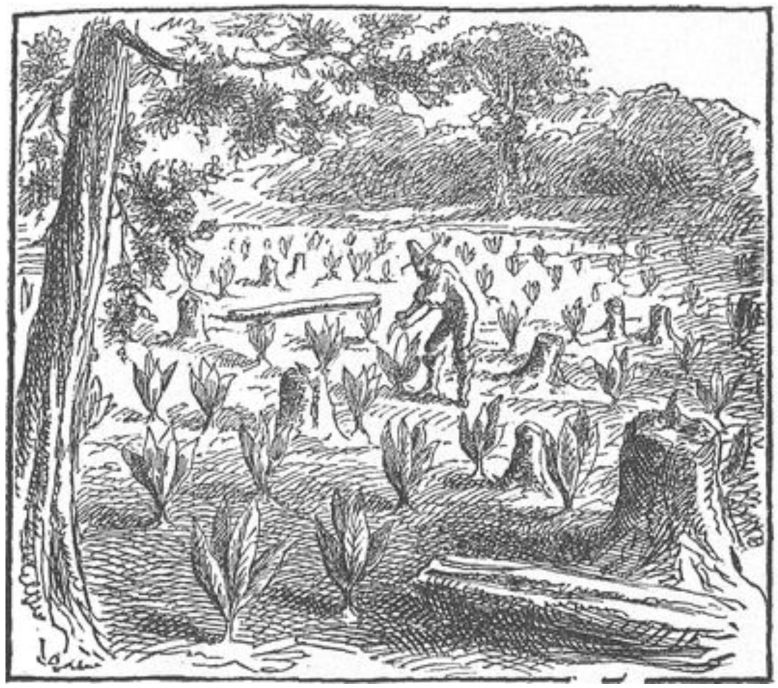

Figure 1: Illustration of Tobacco Field under cultivation, with tobacco plants interspersed with tree stumps (Tatham 1800).

Good land could be cultivated for tobacco for around six years, after which the soils were no longer rich enough to support a quality tobacco crop (Walsh 1993). Some attempts were made to replenish nutrient lost in the soil using manure but this tobacco was considered lower quality (Tatham 1800:7). Additionally, once land was “tired of tobacco” it could be planted with maize, wheat, or other grains “with wonderful increase” (Jones quoted in Tatham 1800:107). Early in tobacco agriculture, lands were often merely left in long fallow for 10 to 15 years to replenish the soil (Morgan 1998; Walsh 1993). This process of long fallows, adapted from Native American agriculture, allows the soil to naturally replenish nutrients using natural succession processes.

Succession of the Piedmont is described as progressing from initial colonizing plants such as weeds and grasses, taxa such as goosefoot, knotweed, purslane, nightshades, and numerous wild grasses. This is followed by growth of scrubby species such as junipers, berry bushes (e.g. blueberry, sumac, and elderberry), and smaller hardwoods (e.g. holly, dogwood, and willow). This occurs in the first couple years after abandonment. The first dominant tree species are typically pines, which grow beyond seedling state after the first three to four years. After that pines remain the dominant species in succession for the next 50+ years. During those years, however, deciduous trees such as oaks and hickories begin to grow and soon overtake the pines. As pines begin to lose dominance to hardwoods, and the tree canopy closes other species increase as well as a diverse understory grows which includes: dogwoods, poplars, mulberries, maples, and other shade tolerant tree species (Farrell and Ware 1991; Gemborys 1974; Oosting 1942).

The common practice of long fallows in tobacco agriculture encouraged natural plant succession processes as a way to replenish nutrients leeched out of the soil by tobacco cultivation. Throughout Virginia in the 18th and 19th century, the process of plant succession would have been observed in disturbed, abandoned fields and forest. As wheat agriculture superseded tobacco, long fallow fields became less popular and crop rotation became a preferable method of soil replenishment. The fields that failed to produce adequately would have been abandoned to re-growth or planted with a crop like clover that replenished the nutrients in the soil. Jefferson experimented extensively with agricultural regimes and wrote in detail about crop rotation at his plantations (Betts 1944).

History and Archaeology of Poplar Forest

Poplar Forest plantation is located in Bedford County, Virginia in the foothills east of the Appalachian Mountains. The land was originally patented in 1745. In 1764, John Wayles, Thomas Jefferson's father-in-law, acquired the property (Heath and Gary 2012:2). Wayles was likely the first planter to begin using slaves to cultivate the property, focusing on tobacco cultivation (Proebsting 2012:51). In 1773, Thomas Jefferson inherited Wayles' properties through his wife Martha Wayles Jefferson, including the Poplar Forest plantation, and land in Amherst, Cumberland, and Goochland counties (Heath 2012:109; Heath and Gary 2012:2). Jefferson also inherited Wayles' slaves, a total of around 135 individuals (Heath and Gary 2012:2). When Jefferson inherited the properties, he relocated several populations of slaves and established several new settlements on his lands for tobacco farming.

Wingo's was a small, 1000-acre farm approximately three miles from the historic core of the plantation (Heath 2012:110; Heath et al. 2012). This area, identified as the "Old Plantation" in historic maps, is near where Jefferson established his core of the plantation a few decades later (see Figure 2 and 3). The farm was named for John Wingo, an overseer at Poplar Forest. Archaeological and historic evidence suggests that the site was most likely established in 1773, when Jefferson inherited the property. In

1790, Jefferson gave the Wingo's parcel of land to his daughter, Martha, upon her marriage to Thomas Mann Randolph (Heath 2012:110). It was eventually sold out of the family and the land now serves as cattle pasturage for a local farm (Heath et al. 2012).

Around the same time that Wingo's was established, another group of enslaved people settled at the North Hill quarter located nearer to the Old Plantation. The North Hill population also likely included people from John Wayles' properties. These two groups were separated by only a few miles and were possibly the closest populations to one another, indicating that they may have interacted. Historic sources suggest that there was a great deal of mobility in enslaved populations during their free time. Families were often divided between multiple plantations and people might travel miles to other plantations to visit family and friends (Heath 2012:113-114; Yentsch 1994). The people at Wingo's likely would have had a great degree of contact with those at North Hill and even other quarters not owned by Jefferson in Bedford County.

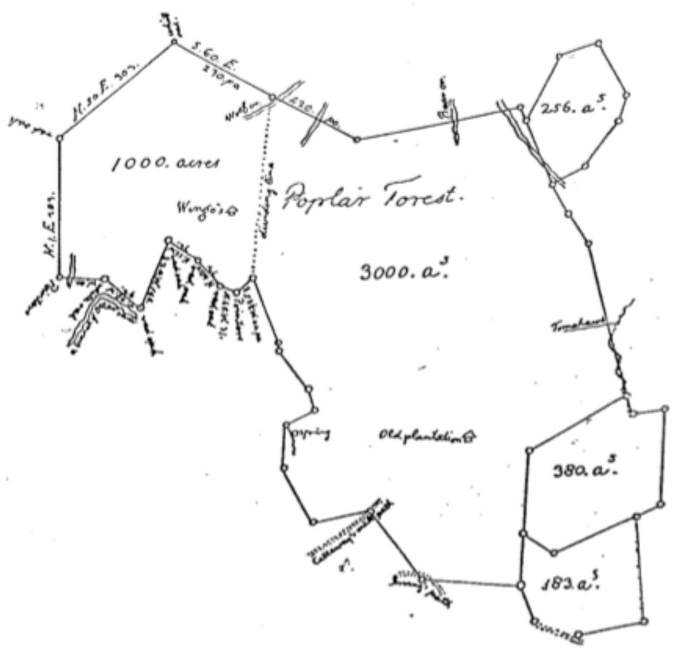

Figure 2. Eighteenth-century map of the Poplar Forest land, including Wingo's and the Old Plantation (Heath et al. 2012)

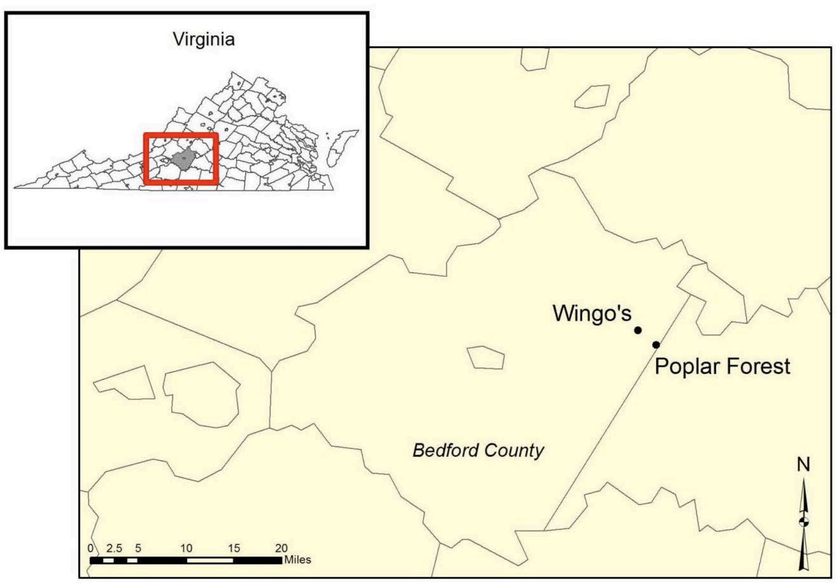

Figure 3. Map of Poplar Forest and the Wingo's Quarter

The archaeological evidence at the Wingo's site suggests that it was uninhabited by the time Jefferson initiated construction on his retreat home at Poplar Forest in 1806 (Heath et al. 2012). The Quarter site was established after Wingo's and North Hill, probably in the 1790s, and was in use until 1812. The Quarter site, another slave quarter, was located close to the North Hill site, near the plantation core and Jefferson's mansion, whose construction began in 1806 (Heath and Gary 2012). The people at the Quarter, just a few decades later, would have experienced and created a different landscape at Poplar Forest, including the ornamental landscape designed by Jefferson. Surrounding the house, Jefferson designed a complex ornamental landscape meant to combine Classical inspired design with naturalistic plantings (Heath and Gary 2012:2). He planted clumps of trees in areas around the house, excavated a large, flat, grassed lawn behind the house, and extensively managed the 61-acre Curtilage area around the house (Trussell 2012). Jefferson's Garden book, a record of his ornamental landscaping and agricultural endeavors at his properties, shows his preoccupation with controlling the appearance of the landscape (Betts 1944).

At both Monticello and Poplar Forest, Jefferson treated the landscape around his home as an extension of the organized space. Just as he designed his ornamental plantings to order the environment around his retreat, Jefferson sought to optimize and organize his agricultural practices. He was extremely interested in agricultural experimentation and managed his agricultural endeavors with as much zeal as he did his ornamental landscaping. Knowing that tobacco cultivation was damaging to soils, Jefferson, in the late 18th century, began a system of crop rotation designed to improve the quality of the soil damaged by years of tobacco cultivation (Betts 1944). While Jefferson's ornamental landscape would not have existed while the structure at Wingo's was in use, its impact on the landscape at Poplar Forest, however, is important to understand when considering the change over time of the local environment and how people lived within this ever-changing landscape.

Jefferson visited Poplar Forest intermittently from the beginning of the 19^{th} century until his death in 1826. In 1824, however, Jefferson relinquished management of Poplar Forest to his grandson Francis Eppes who inherited the property with Jefferson's death but sold it to William Cobb in 1828. Cobb managed Poplar Forest until 1840 when he turned over management of the property to his son-in-law Edward Hutter (Heath and Gary 2012:6-7). Hutter attempted to use extensive soil replenishment techniques and crop rotations to garner as much profit from the land as possible. Hutter owned the property through the Civil War. It was during Hutter's ownership of the property that Site A was occupied as a domestic slave quarter (Heath and Gary 2012).

Archaeological excavations at Poplar Forest began in 1986 and have continued since then. Initial research focused on understanding and restoring the plantation core and the Jeffersonian ornamental grounds. Archaeological investigations of the ornamental plantation landscape continue, but beginning in the 1990s, archaeologists excavated several domestic slave communities at Poplar Forest, including the Quarter Site, North Hill Site, Site A, and most recently the Wingo's Site. All of these excavations have taken an interdisciplinary approach to understanding the nature of life within these communities, including the use of paleoethnobotanical, faunal, material culture, ecological, and landscape analyses (Heath and Gary 2012:9-12).

Previous archaeological research has focused on understanding slaves' lifeways, but archaeologists have begun investigating the landscape changes associated with the shift from tobacco to wheat at Poplar Forest (Heath 2012; Proebsting 2012). Proebsting (2012:53) discusses briefly, using primarily charred wood data, the environmental impact of tobacco cultivation at Poplar Forest. Heath examines enslaved practices of gardening for providing food for themselves and making additional money in local markets (Heath and Bennett 2000). She also discusses the dynamics of the enslaved community at Poplar Forest and Jefferson's other plantations, showing how groups shifted to new or different plantations often, creating community instability (Heath 1999:10-11). The slaves at Poplar Forest and Wingo's, for example, were made up of people Jefferson brought from his other plantations and those who were previously owned by Jefferson's father-in-law, John Wayles (Heath 2012).

Paleoethnobotanical investigations have shed light on slaves' foodways from several time periods. Jessica Bowes (2009) studied a botanical assemblage from Site A, a slave quarter dating to Hutter's tenure at Poplar Forest and discussed how provisioning choices made by planters impacted food choices of enslaved people at Poplar Forest. The trends she identified are reflected in the Wingo's assemblage but my study focuses on how, in light of these changing provisioning strategies (which are the result of changing agricultural practices), the enslaved populations used the other resources available to them (Bowes and Trigg 2012). This study focuses primarily in the late 18^{th} to early 19^{th}

century, before Site A was occupied in the mid 19th century (Heath 2004). Additionally, Leslie Raymer's (1996; 2003) analyses from the Quarter and North Hill sites discuss subsistence at Poplar Forest. The data collected by Bowes and by Raymer from the slaves' quarter sites demonstrate change over time. What is lacking, however, is a botanical assemblage that dates to the earliest period of the slavery under Jefferson, but more importantly to the critical period of the shift from tobacco to wheat agriculture. The analysis of botanical materials at the Wingo's site fills this gap.

CHAPTER III

MATERIALS AND METHODS

Excavation of Wingo's Site

Between 2000 and 2011, archaeologists and students associated with the University of Tennessee Knoxville and Thomas Jefferson's Poplar Forest surveyed and tested the area historically identified as the Wingo's site. According to 18th-century historic maps, the Wingo's settlement was located in the northwest corner of Poplar Forest (Figure 2; Heath 1994). The Wingo's site is currently located on the western edge of a modern farm, approximately 3 miles from the modern area of Poplar Forest (Figure 3) During the summer of 2009, two features (designated ER281 and ER285) were identified as subfloor pits. The two features are 4 feet apart but both are contained within a single 10.5 x 18 ft. structure (Figure 4). Both pits were capped by a layer of topsoil and the plowzone (levels A and B respectively), which were not sampled for flotation (Heath et al. 2012).

The western pit ER281 was roughly circular, with a diameter ranging from 4.2 to 6.5 ft., and was approximately 1.5 ft. deep. The stratigraphy of ER281 contains 8 cultural layers, 281C through 281K (without a layer labeled I due to possible confusion with the number 1) and a series of rodent burrows, 281L (Figure 5). Artifact analysis suggests that Layer K represents a layer of primary deposition during which time artifacts and botanicals fell into or were swept into the pit. Layer J most likely represents a period during which the structure was abandoned but the pit was left open. Subsequently the structure was destroyed resulting in several layers of debris from the destruction of the structure (layers C-H), with particularly dense concentrations of charred wood and daub in Layer G (Heath et al. 2012).

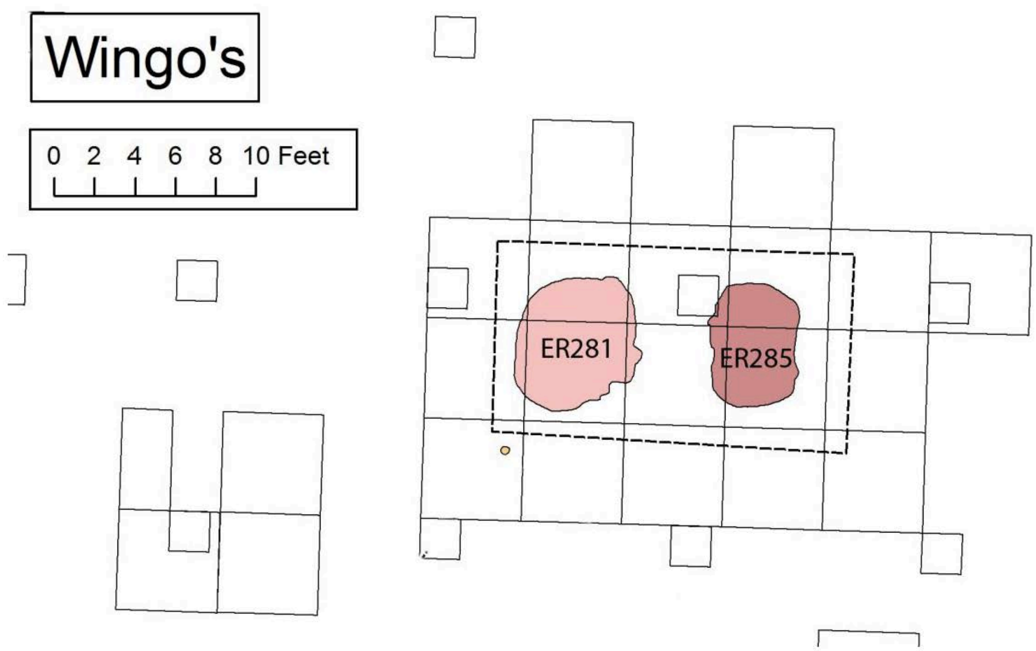

Figure 4. Map of structure at Wingo's, including subfloor pits ER281 and ER285 (Heath et al. 2012).

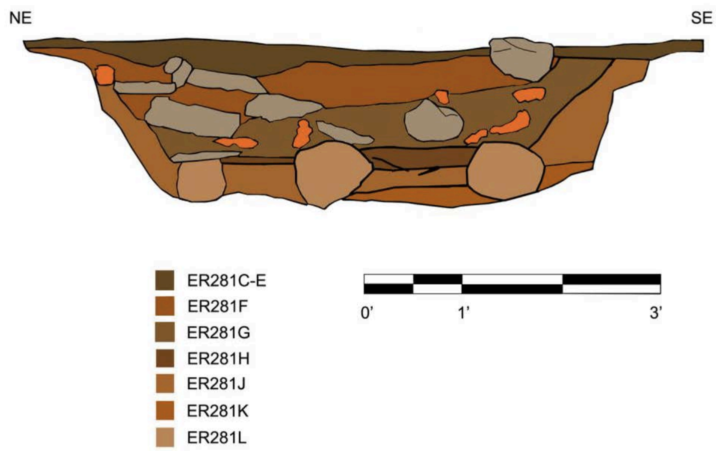

Figure 5: Stratigraphy of ER281 (Heath et al. 2012).

Feature 285 is located approximately 4 feet east of ER281. It is similar in size and shape to ER281 but had significantly different fill. ER285 was oval in shape measuring 6ft. long by 4ft. wide and 1.5ft. deep from the bottom of the plowzone (Heath et al. 2012). The feature was bisected and the southern half of the feature excavated first. The feature contained 8 cultural layers, ER285 C-H, J, and K, and one level most likely representing an animal burrow along the southern and western edges (Heath et al. 2012; Figure 6). Whereas the artifacts within ER281 suggested that it was left open for the abandonment and destruction of the structure, ER285 appears to have been filled before the structure was abandoned as it does not contain the large amounts of architectural debris seen in ER281 (Heath et al. 2012).

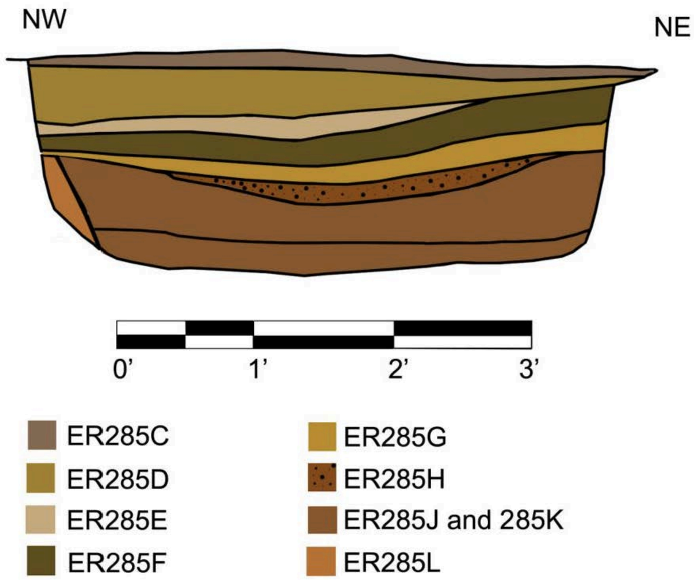

Figure 6: Stratigraphy of ER285 (Heath et al. 2012).

Sample Collection and Processing

Botanical remains were recovered from these features using three different methods: flotation, waterscreening, and dry screening. Archaeologists at Poplar Forest bisected the features and removed sediment for flotation and waterscreening. In ER281, soil from the western two thirds of the pit was saved for flotation and waterscreening. The eastern third of the pit was dry screened in the field. From ER281, 37 flotation samples were taken, most having a volume of 2.5L, but with volume ranging from 1 to 2.75L. A total of 91.25L was floated. From ER285, sediment from the southern half of the feature was floated and waterscreened while the northern half was dry screened in the field. Fifty-nine flotation samples were taken with volumes ranging from 0.75L to 2.5L (the majority being 2.5L) for a total volume of 140.75L of floated soil (Appendix Table

1) These samples were floated at Poplar Forest in a Flote-Tech Model A machine. Due to the clayey nature of the soil, all samples were soaked in water and 2-3 teaspoons of Calgon for 10-30 minutes prior to flotation (Heath et al. 2012).

In addition to the soil collected for flotation, the remaining soil from the western half of ER281 and the southern half of ER285 was waterscreened through 1/4 in. and 1/16 in. mesh. From ER281 a total of 462L of soil was waterscreened and from ER 285 a total of 342L. Students and volunteers at the University of Tennessee Knoxville sorted this material. From the 1/4 in. mesh all organic material was removed and sent to the University of Massachusetts Boston. The material collected in the 1/16 in. mesh was passed through a 1/8 in. screen and a 1/16 in. screen. All organic material from the 1/8 in. screen was then bagged and sent to Boston. Material smaller than 1/8 in. was examined, but no attempt was made to collect all of the charcoal or organic material of this size (Heath et al. 2012). As a result, remains recovered from the waterscreened soils are biased towards larger and more durable organic remains.

Sample Examination and Identification

Of the 95 samples floated and sent to the University of Massachusetts Boston, 93 were scanned and the organic remains removed and identified (Appendix Table 1) The two unscanned samples are light fraction samples 75 and 76, from ER285 level E; 24.5L of soil in 10 light fraction samples from this level were already scanned. These samples appeared to have floated poorly, and contained primarily sediment and little organic material. Due to the large amount of soil that had already been processed from level E of ER285, it was deemed unnecessary to scan these additional samples.

The analyzed samples were scanned under 10 to 40x magnification using a binocular dissecting microscope. With the exception of charred wood, all charred seeds, plant parts, nutshell, and botanical tissues were removed and identification was attempted. In samples with large numbers seeds from one specific taxon, for example samples with over 100 seeds identified as wild Poaceae, a sample of 30 seeds were removed; the remaining seeds were counted and returned to the sample. From each light fraction, a sample of 25 charred wood fragments over 2mm in size were randomly collected and identified. These were initially viewed under 10 to 40x magnification, but some were viewed under a compound microscope at 200 to 600x when necessary for a more specific identification. Identified botanical materials were stored with the original sample.

All botanical materials were identified as specifically as possible -- to family, genus, or, when possible, species. Some seeds, plant parts, and wood pieces remained unidentified, either due to distortion from original charring, poor preservation, or, in the case of wood, small size which reduced the number of distinguishing characteristics. Botanical materials and charred wood were identified using standard print references (Hoadley 1990; Martin and Barkley 1961; Montgomery 1977), the comparative collection housed at the Fiske Center for Archaeological Research at the University of Massachusetts Boston, and the United States Department of Agriculture plant database (http://plants.usda.gov).

While non-carbonized seeds from late 18th and 19th century deposits could potentially survive in certain environments such as waterlogged or desiccated contexts, these subfloor pits do not have the protective conditions that would support the preservation of non-carbonized plant material. Previous macrobotanical analyses at Poplar Forest have excluded uncharred material from analysis (Bowes and Trigg 2012; Raymer 1996, 2003). As a result, non-charred plant remains were not collected or identified from the Wingo's samples, as they likely represent recent intrusions and do not relate to archaeological contexts.

CHAPTER IV

RESULTS

Identified Seeds and Plant Material

There were over 3000 identified seed and plant remains from the Wingo's as well as over 2000 identified fragments of charred wood. See Trigg and Henderson (2012) for the identifications of the plant remains in each sample. The taxa identified varied from weedy plants to trees and from cash crops to gardened plants. For the purpose of this analysis I divide the various taxa into interpretive categories: plantation crops, provisioned crops, gardened crops, wild edibles, medicinal plants, and non-economic plants. There are some taxa which may cross cut these categories. The various environments in which different taxa grow, the numerous uses for different taxon, and the potential economic importance of many taxa can illustrate multidimensional nature of plant use at Wingos. The different ways plant taxa were used and useful to the people at Poplar Forest can show how the enslaved population negotiated the various natural and manipulated spaces surrounding them.

Plantation Crops

The purpose of any plantation was to make money. Thomas Jefferson established Poplar Forest to grow crops, first tobacco then wheat and other crops. He could then either sell those crops for a profit or use those crops to make the plantation more self-sufficient. Many of these crops played a pivotal role in the lives of the enslaved people at Wingo's but did not play a role in their foodways. This category includes crops which are inedible and therefore not provisioned as food to the slaves.

Two taxa were categorized as plantation crops: *Nicotiana tabacum* (tobacco) and *Linum* sp. (Appendix Table 2). One seed of *Nicotiana tabacum* was identified in level K in ER281. This species of tobacco is the most common cultivated tobacco species. Documentary evidence suggests that the Wingo's settlement was established to produce tobacco, the profits from which would have been used to pay off Jefferson's father-in-law's large debts (Heath et al. 2012). The presence of the tobacco seed supports the notion of production of tobacco rather than consumption. During cultivation, tobacco plants were "topped" a process that prevented the plants from wasting energy producing flowers and seeds (Morgan 1998; Tatham 1800). As a result, tobacco seeds are not present in fully-grown and harvested tobacco plants. Thus the presence of a charred tobacco seed in this subfloor pit is suggestive of the planting of tobacco, not merely its use for smoking or chewing (Cotton 1998; Tatham 1800).

Linum ussitatissimum is the most common cultivated species of flax and has been cultivated for thousands of years for fiber and oil. The 2 *Linum* seeds identified are consistent with *L. usitatissimum* used in linen production. In a 1790 letter, Jefferson wrote of the beginning the "domestic cultivation & manufacture of hemp, flax, cotton & Wool for the negroes" at Poplar Forest (Betts 1944:152). Later in the 19th century, he writes of slaves at Poplar Forest spinning flax (Betts 1944:466). Jefferson included flax planting in his crop rotation processes at his plantations (Betts 1944:194) and he set aside a meadow area at Poplar Forest within which to grow flax.

Edible Crops

While some crops grown at Poplar Forest, like tobacco, were grown almost exclusively for sale in the market, many of the crops, particularly grains, grown at Poplar Forest were harvested with the purpose of providing for the inhabitants of the plantation. Additionally in the 18th-century, some edible grains were purchased off the plantation to be directly provisioned to the enslaved population on the plantation. Examples of these crops identified at Wingo's include wheat (*Triticum aestivum*), rye (*Secale* sp.), and maize (*Zea mays*) (Appendix Table 3).

Wheat, along with tobacco, was a major cash crop at Poplar Forest during Jefferson's ownership of the property. The switch from focusing on tobacco production to wheat drastically changed the nature of slave labor in Virginia. Many plantation owners eventually switched completely from tobacco, which was labor-intensive to grow, depleted soils, and, while valuable was not as profitable as it had been in the 17th century. Instead they emphasized wheat as a cash crop, since the market for wheat was more stable than the tobacco market. As a food, wheat seeds were typically ground into flour and used in baking of breads.

During the occupation of Wingo's, tobacco was still a more major cash crop at Poplar Forest. The wheat identified at Wingo's was likely a provisioned crop, rather than evidence of its growth as a cash crop. I identified 35 kernels of wheat at the Wingo's site, in both the occupation layers of the subfloor pits and the destruction layers. Wheat rachis fragments—the rachis is the portion of the stem which holds wheat shafts together—are typically indicators of wheat production on a site. The lack of wheat rachis fragments at Wingo's may suggest that production of wheat was limited. Although I acknowledge that this is negative evidence, it suggests the wheat present at Wingo's was potentially provisioned rather than produced in the vicinity of Wingo's.

Other grains, such as rye, oats, and barley, were commonly provisioned to slaves for food or fodder. At Wingo's, 6 grains of rye (*Secale* sp.) were identified. Rye was grown are Poplar Forest as a field crop, produced for the support of the farm (Betts 1944:641). It was commonly used both as food—combined with cornmeal, it could be baked into bread—and also as fodder for animals kept by the slaves (Carney and Rosomoff 2009; Sumner 2004).

In addition to wheat, maize was a popular provisioned food crop to enslaved populations. Maize has a long history of cultivation in the New World. Both maize kernels and cupules (the part of the cob that holds the kernels) were recovered. This may reflect their use as tinder or fuel. Kernels were eaten whole, made into hominy, added to stews or ground into flour. Maize flour was provisioned to slaves, but they were also allowed to grow it in their gardens. The presence of the cupules in the deposits suggests that the slaves were growing maize.

Several cultivated fruit species were grown at Poplar Forest appear to have been consumed by the people living at Wingo's. Several whole peach (*Prunus persica*) pits and over 200 pit fragments were recovered. Jefferson grew peaches at both of his plantations and his records indicate that he allowed his slaves to pick fruit from the trees for themselves (Betts 1944). Additionally, one pear (*Pyrus* sp.) pip was identified. Pears could have grown wild around Poplar Forest, having "escaped from cultivation," in thickets and woods (http://plants.usda.gov). However, it is likely in the 18th century that any pears in Virginia would have been intentional cultivars. Pears, unlike most other orchard fruits, were typically reserved for "in the house" but there are many accounts of slaves stealing them (e.g., WPA interview with Levi Pollard in Perdue et al. 1992).

Gardened Plants

Maize, as discussed above, was an edible crop provisioned to slaves but it was also commonly gardened around the quarters. Slaves were permitted to grow various crops in small plots around their homes. In addition to maize, there were several types of bean (*Phaseolus* sp., *Vigna* sp., and some seeds only identified to family) and squashes (*Cucurbita maxima* and pieces of Cucurbitaceae rind) identified from the Wingo's that would have been gardened (Appendix Table 4).

Phaseolus includes, among others, *Phaseolus vulgaris*, *Phaseolus lunatus* (lima bean), and *Phaseolus coccineus.* The common bean flourishes in marginal soils making it a popular gardened crop. The cow pea (*Vigna* sp.) was domesticated in Africa and was introduced in North America as a result of the slave trade, either by slavers providing food for the trip across the Atlantic or by slaves bringing familiar crops to their New World (Carney and Rosomoff 2009:14). While cow peas are a cultivated species, they will grow wild after having "escaped from cultivation" (Britton and Brown 1896(2):339-340). As a food, beans have a variety of uses: in soups, stews, or baked, or as succotash, cooked with maize cut from the cob (Sumner 2004:77-78).

The Cucurbitaceae family includes pumpkins, squashes, melons, and gourds. With over 100 genera, this family includes Old World and New World taxa. Many species are edible and were cultivated in gardens throughout the world. Dry gourds were commonly used as vessels. *Cucurbita maxima* is a close relative to *Cucurbita pepo*, a native squash to North America, and commonly cross-pollinates with the native species. Pumpkins, of various species, were a gardened crop and had a variety of food uses. Colonists and Native Americans alike typically stewed pumpkins or baked it in breads. Large, fibrous pumpkins were used as livestock feed (Sumner 2004:126-129). There is some evidence that several Native American groups used parts of *Cucurbita maxima* medicinally, as a diuretic (Moerman 1998:187). In 1794, Jefferson indicated that he planned to plant squashes, interpreted by Betts (1944:213) as possibly *C. maxima*

Another gardened crop tentatively identified at Wingo's is potato. A starchy material identified as possibly charred potato tubers were identified in both subfloor pits, with the highest amounts in the destruction layers of ER281. Potatoes were common gardened crops and many sources suggest that one purpose for subfloor pits was to store potatoes and sweet potatoes (Samford 2007).

Wild Edible Plants

Intentionally planted gardened crops such as beans and potatoes would have been important foods to supplement the diet of grains and meat provisioned by Jefferson to the people at Wingo's. In addition to these intentional cultigens, wild plants, weeds and grasses, surrounding the quarter could have been utilized as food (Appendix Table 6)

Some wild grasses, including millet and panic grasses, are useful as food grains. Panic grasses would have grown around the plantation and the quarter and would have been easily collected as a supplemental grain. These grains grow wild in waste places but was also cultivated or encouraged. *Panicum miliaceum,* broomcorn millet, was most likely grown in gardens at Wingo's as a supplementary grain or fodder for livestock. This is not a species of millet associated with the African diaspora. Although not found at Wingo's, other species of millet, including *Pennisetum glaucum* (pearl millet), *Eleusine coracana* (finger millet), and *Digitaria* ssp., were cultivated in Africa and historical documents note the continued use of millet in gardens of African slaves in the New World (Carney and Rosomoff 2009).

Edible weedy plants identified at Wingo's include: knotweed, dock, goosefoot, and purslane. All of these plants are common weeds in Virginia, found in fields and waste places. They would have easily been collected around the quarter and in the fields where the slaves were working. All of these weeds were typically consumed as greens, either raw or cooked (Britton and Brown 1896(1):555-570). Some, specifically species of *Polygonum* and *Rumex*, were traditionally used as a medicine (Leighton 1986:468; http://herb.umd.umich.edu/; http://plants.usda.gov). *Chenopodium* is also useful as a vermifuge (Moerman 1998:154-155). There were hundreds from these edible weedy plants recovered in the Wingo's samples, both in occupation and destruction layers.

Two other weedy species identified from Wingo's, sage and mint, may have been utilized as food or medicine. Both are common cooking herbs which grow wildly in Virginia and are also utilized in teas. Mint is also used as a medicinal herb (Sumner 2004:176, 198). Only one specimen of each of these species was identified suggesting that they may have been accidently incorporated but the data still indicates herbs growing around the structure.

Edible weedy plants could have been collected near the structure in the fields and cleared land around Wingo's. Other wild edibles such as nuts and wild berries grew in the forests around the plantations. There were several species of wild berry identified from Wingo's, including sumac (*Rhus* sp.), blueberry or huckleberry (*Vaccinium* sp.), raspberry (*Rubus* sp.), and grape (*Vitis* sp.) (Appendix Table 5). These berries all typically grow in woods and thickets. While there are cultivars of blueberries, raspberries, and grapes, they also commonly grew wild in Virginia (Britton and Brown 1896(2):407-410, 579). These berries could have been consumed raw. Sumac is commonly consumed as a lemonade. Some of these berries, like sumac, ripen late in the winter and would have been useful as an emergency food when food was scarce (Moerman 1998:472).

A small amount of nutshell was recovered from the Wingo's site, suggesting that nutmeat was potentially utilized by the people living there (Appendix Table 7). The most common type of nut identified was black walnut (*Juglans nigra*). A small amount of hickory nutshell (*Carya* sp.) was also identified. There were, however, over 100 pieces of nutshell identified to the family Juglandaceae, which could either be walnut or hickory nut. Walnuts and hickory nuts were used in foods such as bake breads and soups as well as consumed raw or pickled (Sumner 2004:150-151). Even smaller amounts of acorn (*Quercus* sp.) and chestnut (*Castenea* sp.) were identified. Acorns are commonly consumed as food but they are bitter and require substantial processing before they can be eaten (Sumner 2004). Chestnuts were a popular food among Native Americans and Europeans. The nuts ripen in the late summer (USDA 1974:273-274) and would typically be roasted or stored dry (Sumner 2004:150). One honey locust seed was also identified. These seeds could be pulverized and used as a sweetener or eaten as food.

Wild edible plants, whether they were collected in nearby fields or in forests, are consistently found in all the Wingo's contexts. While provisioned and gardened plants may have been stables in their foodways, wild plants could have been important supplements to the diets of enslaved people at Wingo's, providing variety and important nutrients not present in provisioned foods.

Medicinal Plants

A few taxa identified at Wingo's could have been used a medicinal plants. Jimsonweed, *Datura stramonium*, is a wild weed that grows in fields and waste places. It is poisonous in large amounts and not utilized as a food. Jimsonweed is known, however, for its medicinal uses in the New World by Native American groups (http://plants.usda.gov; Moerman 1998). Jimsonweed is "officially recognized properties" as a vermifuge (Groover and Baumann 1996:25). In addition to jimsonweed, sage, mint, dogwood, smartweed, and sumac all have ethnohistorically documented uses as folk remedies (Groover and Baumann 1996:23-26). Sage and mint, while also commonly utilized in food as a seasoning, are also commonly used in teas and as medicinal herbs (Sumner 2004:176, 198). While the number of potentially medicinal plants recovered from Wingo's is small, it is important to remember that enslaved populations used plants for purposes besides consumption as food (Groover and Baumann 1996; Mrozowski et al. 2008).

Non-economic Wild Plants

In addition to the numerous plants recovered from Wingo's that played a role in diet, several taxa were identified that are not commonly consumed as food or medicine (Appendix Table 8). While these taxa may not have been consumed, they can still provide additional information about the environment within which the people at Wingo's lived. Wild grasses and weeds were identified in large numbers from the Wingo's assemblage. Plants like clover, spurry, oxalis, sweet pea, and pinks have little economic use but all grow in fields and waste places; their presence suggests a possible proximity to that environment.

Wild grasses are especially prevalent in the Wingo's assemblage. Wild grasses grow in almost every type of environment, from swamps to fields and waste places. Poaceae seeds were identified in almost every layer of both subfloor pits at Wingos. Grasses were used to insulate subfloor pits (Samford 2007) and by Jefferson to maintain his manicured lawns. There are historical references to slaves selling grass seeds to Jefferson and other plantation owners (Heath pers. comm.; Morgan 1998).

Several seeds identified to the sedge family (Cyperaceae) found in the Wingo's assemblage suggest that there was a marshy or moist, lowland area nearby as well. Additionally, the presence of a *Nyssa biflora* (swamp tupelo) seed also suggests a nearby wetland or overgrown gully (http://plants.usda.gov). The presence of these non-economic wild plants, when combined with the other wild plants that may have been more useful, shows the diverse environment surrounding the Wingo's quarter.

Charred Wood

In addition to the seeds and other plant material recovered from the Wingo's site, a sample of charred wood was identified from each of the samples. The charred wood assemblage consists of seven specific taxa, identified to genus, and additional taxonomic categories (hardwood/softwood as well as ring-porous and diffuse porous hardwoods).

Hardwoods

In Piedmont Virginia, hardwoods make up a majority of the tree species in mature forests. The charred wood identified reflects the use of many types of hardwoods as fuel wood and possible construction material at Wingo's (Appendix Table 9, 10, and 11).

Oak, hickory, and chestnut are the most common canopy trees with numerous species of understory tree. Oak is the most common taxon identified from the Wingo's samples (a total of 1395 pieces). There are around 300 species of oak, which grow in mature forests through out North America. In Virginia oaks are the dominant species with hickory in mature forests (Farrell and Ware 1991; Gemborys 1974; Medve and Medve 1990:204-205). Oak is valued for its timber, especially white oak, and is an excellent fuel wood (Raymer 2003; USDA 1948:297). Both red oak and white oak are found in Virginia (Petrides 1988:141-145; Samuelson and Hogan 2006:230, 288).

In addition to oak, hickory was a dominant species of deciduous trees in the Piedmont hardwood forests. Hickory is a heavy wood (Petrides 1988:98) which provides a lot of heat when burned (Medve and Medve 1990:210-211). Hickory wood was common in the Wingo's assemblage (60 pieces identified). *Castenea dentata* (chestnut) was the most important species of chestnut in North America and is the only native species to the United States. It was a major timber species in the Appalachian region, until most of the mature trees were destroyed by blight in the late 19th century (Sumner 2004:152). It is not a prime fuel wood and only 1 piece of chestnut wood was identified.

Other hardwoods in the assemblage include Kentucky coffee tree, maple, and tulip poplar. Maple and tulip poplar are common understory trees that prefer moist soils (Samuelson and Hogan 2006:76, 80-86, 352-353). Small amounts of both maple and tulip poplar were recovered, seven fragments and one fragment respectively. Kentucky coffee tree, however, was recovered in more significant amounts, 73 pieces with significant proportions in Layer 285G. Kentucky coffee tree is native to areas west of the Appalachian Mountains but is naturalized east of the mountains. Its roots were used for medicines and the wood used for timber and many construction purposes (USDA 1974). It can be used as fuel but it generates little heat so it would not be a prime fuel wood.

In some cases pieces of charred wood could not be identified to genus or species but it was possible to distinguish a specimen as either softwood (gymnosperm) or hardwood (angiosperm). Within the hardwoods, two morphological types--ring porous or diffuse porous-- can often be distinguished based on the arrangement of pores within the rings (see Hoadley 1990). Thirty-seven pieces of charred wood could only be identified as hardwoods. Ring porous woods include oaks, hickory, ash, and mulberry (among others). We identified 563 pieces of ring porous hardwood. Diffuse porous woods include maple, cherry, dogwood, tulip poplar, magnolia, and aspen. Thirty-four pieces of diffuse porous hardwood were identified.

Softwoods

The only softwood species identified from Wingo's was pine. About 30 species are native to North America and mainly grow in dry, sandy soils (Petrides 1988:34). Pines are commonly early colonizers of disturbed soils, such as abandoned fields and are also found on forest margins (Petrides 1988:34; USDA 1974: 360). Of the pine species, white pine is the largest and most valuable (Petrides 1988:62-63). Pines are considered inferior to hardwoods as a fuel wood and only 9 pieces of pine were recovered from Wingo's.

Monocot Stems

In addition to charcoal recovered from the botanical assemblage, a large number of monocot stems (90 pieces) were identified in the assemblage, only from ER281.

These stems could have been used as fuel, or been packed within the daub of the structure. These stems are consistent with maize stalks, but smaller grasses were used to make baskets and insulate subfloor pits (Samford 2007).

CHAPTER V

SUBSISTENCE OF ENSLAVED AFRICAN AMERICANS AT WINGO'S

Stratigraphic History of the Wingo's Site

It is important to understand how the plant remains recovered from Wingo's were introduced into the archaeological record and how they came to be charred. An understanding of the site's stratigraphic history refines the analysis of the botanical material. This allows distinctions to be made between botanicals that were likely introduced during the use of the structure and those introduced after the abandonment of the Wingo's site.

The complex archaeological history of the Wingo's site has been interpreted by Heath based on the stratigraphy of the site and the artifact remains recovered (Heath et al. 2012). The botanical remains can speak to this stratigraphic record and can aid in the interpretation of the site history. Heath divides the stratigraphy of the two pits into three periods: Occupation, including the period during which the structure was inhabited; Abandonment, the point at which the structure was no longer in use but likely remained standing and unoccupied; and Demolition, when the structure was potentially burned and demolished (Heath et al. 2012). These stratigraphic differences are seen most obviously in the wild grass seeds identified in these layers (Figures 7 and 8).

Occupation: Contexts 285C-H and 281K

Layers C through H of Feature 285 and layer K of Feature 281 are interpreted as being deposited during the occupation of the structure. This was determined based on the thin superimposed layers of ash, which characterized all these deposits. The plant remains recovered from within these occupation deposits were likely a part of the activities of enslaved African Americans at the Wingo's during the occupation of the structure.

Cultivated plants recovered from these contexts include: tobacco, clover, flax, maize, wheat, beans and cowpeas, and fruits such as peaches and pear. Several types of wild fruits were also identified from these deposits including blueberry, sumac, and grape. Documents indicate that, during this time, Jefferson cultivated fruits such as grape and blueberry at Monticello; these fruits, however, are commonly found in the wild. A few nutshell fragments, of either hickory or black walnut, were also recovered. Small amounts of wild edible weeds, including goosefoot, knotweed, dock, and purslane, were recovered within these contexts. Few wild grass seeds were identified within these deposits, unlike those associated with the demolition of the structure (Figure 8).

Abandonment: Contexts 281J

Layer J of Feature 281 was formed after the occupation of the structure but before its demolition. The depositional history of the structure suggests that for some time after the abandonment of the structure Feature 281 was left open and the structure left standing. Some of the botanical remains from this post occupational layer may have been charred during the occupation of the structure and then swept into the pit, via natural forces, or left in the pit after the structure was abandoned.

Taxa recovered from this deposit include cultigens such as wheat, rye, maize, and peaches. Some nutshell of either hickory or walnut was identified. Goosefoot was the only weedy taxa from this context. There are significantly more wild grass seeds per liter of soil analyzed in this deposit than in ER 281J-K and the entirety of ER 285 (Figure 7 and Figure 8). The number of Poaceae seeds in this deposit, however, is still lower than the upper layers of ER 281, associated with the demolition of the structure. These wild seeds may have been included in the pit through the linings of the pit (typically with grass) or from sweepings, but may also be a part of natural seed rain. A charred starchy material, tentatively identified as potato, occurs in the highest density in this layer (Figure 9). This may suggest that potatoes or other starchy root vegetables were stored and left within the pits. This was a common practice for enslaved populations to store root vegetables in subfloor pits in their homes (Samford 2007).

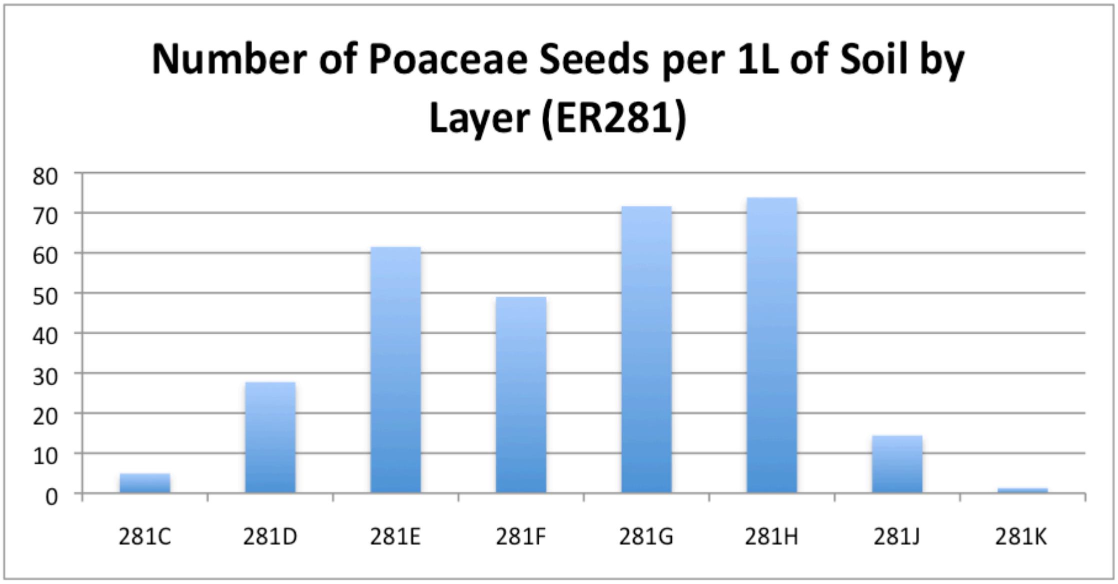

Figure 7. Number of Poaceae, wild grass, seeds by layer within ER281

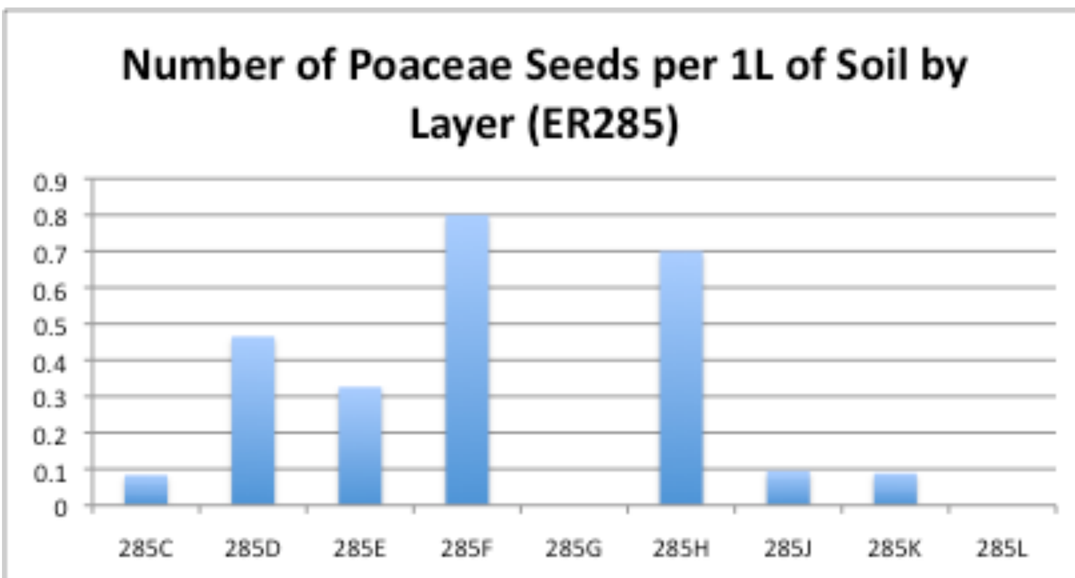

Figure 8. Number of Poaceae, wild grass, seeds by layer within ER285

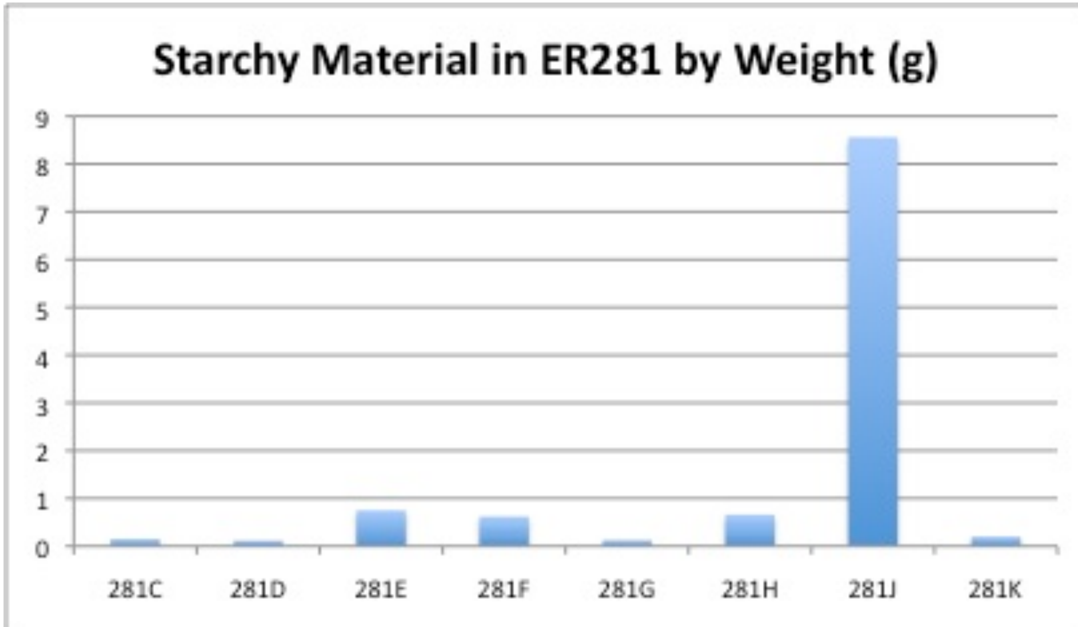

Figure 9: Charred Starchy Material, possibly *Solanum tuberosum*, recovered in ER281 by layer.

Demolition: Contexts 281C-H

Contexts 281 C through H were associated with the demolition of the structure at Wingo's due to the high amounts of architectural remains, such as daub, found within the deposits. Within these contexts the charred materials must be interpreted carefully because they may represent either human or animal introduction to the archaeological record. Many of the weedy seeds are found in the largest amounts in these contexts. These may represent natural seed rain. Additionally, wild grass seeds occur in extremely large quantities in these deposits (Figure 7). Both of these types of plant reflect the disturbed nature of the area around the structure and the re-growth that may have occurred after the abandonment of the structure. These weeds and grasses could have been growing in and around the abandoned structure and then burned and became a part of the demolition deposits with the destruction of the structure.

In addition to natural growth contributing plant material to the archaeological deposits, animals likely introduced material into the structure while it was abandoned. The dogwood and tupelo are two taxa that have no food value and were likely introduced by animals. The raspberries, while useful food taxa for humans, are also a common food for animals. The nutshell recovered from these deposits includes a large portion of the hickory and walnut shell and the only examples of acorn and chestnut. These also must be considered likely to represent animal inclusions.

Like tree nuts and weedy seeds, cultivated taxa could have also been introduced into these deposits through use during the occupation of the structure but may have also been introduced through natural forces. Small seeds such as wheat, maize, and rye (of which there are large amounts in the demolition contexts) could be introduced during the occupation of the structure. These may have only been burned and added to the pit deposits during the demolition of the structure. However, animals also collect these taxa and could have brought them into the building after the occupation of the structure. Natural forces, as well, may have altered the peach pit assemblage and they may not be attributed to human consumption. A majority of the peach pits and pit fragments were identified from the demolition contexts. Animals hoard and consume them. In addition to possible animal activity introducing these pits, at least one charred peach pit was identified embedded in daub excavated from ER281. This suggests that some of the peach pits and organic material from the daub may have been introduced from around the chimney, either burning during the use of the chimney or during the demolition of the structure.

Determining the origins of the archaeobotanical remains provides a more precise interpretation of the foodways of enslaved African Americans. Demolition contexts, for example, may not always indicate intentional use; rather they could be intrusions due to natural seed rain. Some of the following analyses that discuss the sites as a whole will include demolition contexts in basic comparisons, such as presence of some cultigens. While animals may have brought these into the structure they would have been in the area and could still be indicative of cultivation around the site.

Foodways

The botanical assemblage from Wingo's reflects a diverse foodways system that encompasses provisioned crops and gardened crops but also utilizes wild resources extensively. Provisioned crops, often consisting primarily of grains like maize or wheat, were an important part of enslaved diet, but they rarely met caloric needs (Franklin 2001:93). Enslaved people were often compelled to add to and diversify their food with plants grown in their own gardens (Franklin 2001; Heath and Bennett 2000; McKee 1999; Samford 1996) and with food gathered from around the plantation. In addition to having to collect food from various sources around the plantation, enslaved African Americans had cook meals around long work schedules. At Wingo's the botanical assemblage also suggests utilization of New World and Old World crops, also perhaps demonstrating how a myriad of traditions influenced the foodways of the people at Wingo's.

Historical sources identify maize as a major element of enslaved African American diets, both as a crop provisioned to them and as one grown in their gardens (Covey and Eisnach 2009; Franklin 2001; Hall and Yentsch 2007; Morgan 1998:134). The plant remains strongly suggest that the enslaved people at Wingo's grew maize in their own gardens. In Feature 285, maize cupules (portions of the cob that hold the kernel) were present in every layer and cupules were present in 6 of the 8 layers in Feature 281. Site wide, whole kernels were also present in 60% of the layers. The presence of whole kernels and cupules is consistent with production of maize, rather than provisioning as meal.

Many narratives of former enslaved African Americans, collected by the WPA, note the importance of corn in enslaved African Americans' diets and it prevalence in numerous dishes. Cornmeal, the most common way of consuming corn in enslaved African American recipes, could be used to make a variety of dishes and baked goods. Cornbread, cornmeal mush, corn pone (or cakes), waffles, muffins, hoe cakes, hushpuppies, grits, and hominy are all dishes made from cornmeal that were very popular in various regions of the South. Cornmeal mush was a particularly popular food for enslaved children to eat (Covey and Eisnach 2009:80-83, 144-147). In addition to the use of cornmeal, even corn cobs were used, burned as fuel or also to make soda for leavening breads and cakes (Covey and Eisnach 2009:153).

Wheat, on the other hand, was not a typical gardened crop; as it was a major plantation crop, wheat was likely provisioned. Wheat was typically provisioned as flour but whole wheat kernels were recovered from over 50% of the contexts. It is possible that the enslaved people grew their own wheat, but the lack of rachis fragments or chaff, typically associated with production suggests otherwise. They may have received wheat directly from the plantation's wheat crop, with the enslaved people being responsible for grinding it themselves. Another possible explanation for the presence of wheat kernels is that slaves were typically provisioned the coarsest type of flour, called "seconds" (Covey and Eisnach 2009:152-153, 159; Yentsch and Hall 2007). The kernels may represent poorly ground provisioned flour, with whole kernels still present. Other domesticated crops recovered included cow pea, an African crop. Cow peas and squashes were likely some of the plants gardened around the Wingo's quarter.

Weedy plants and wild edible grasses would have grown around the quarter, encouraged by the disturbance of daily activities around the quarter. This includes greens like goosefoot, purslane, and pokeweed. At Wingo's wild edible weeds are present in almost every layer of both the occupation and the demolition contexts. They occur in large numbers in the demolition contexts but that is likely due to the nature of the deposit. There are extremely large numbers of inedible weeds and grasses as well, suggesting that much of the weedy material from these contexts are a result of natural seed rain. In the occupation contexts, however, the proportion of edible weeds/grasses to inedible weeds/grasses is 3 to 4. In the demolition contexts that proportion is only 1 to 8. If the wild botanicals in the demolition contexts represent natural seed rain, then the difference in proportion suggests that human activities are bringing in more edible wild greens, presumably for consumption. Young wild weeds are consumed but once they flower and produce seeds they are not edible. Their inclusion in the samples might also indicate encouraging the growth wild plants around the structure.

These greens would provide extra nutrients and flavor to bland diets of grains. Wild greens were a popular staple in enslaved African American foodways. Turnip greens, dandelion, collards, kale, mustard, pokeweed, and other wild greens would be cooked with lard and fatty skin of meat. “Pot likker,” or pot liquor, was another common greens dish. Made from the leftover liquid from boiling vegetables, this broth was combined with cornbread, and sometimes meat, to make a meal (Covey and Eisnach 2009:78; Perdue et al. 1992).

Less common foods, like fruits and other vegetables, were typically combined with grains to add variety to meals. For example, cowpeas or black-eyed peas were almost exclusively consumed by slaves as they were considered a “base food,” or a lowering food, by white Southerners, although, interestingly they are now served throughout the South as a traditional dish on New Year’s Day to bring good luck (Covey and Eisnach 2009:83-85; Franklin 2001). Black-eyed peas could be combined with cornmeal and made into fried cakes or made into a Hoppin’ John, a one pot meal using cowpeas, rice or grits, a fatty meat, and tomato sauce (Covey and Eisnach 2009:85).

Non-cultivated plants such as sumac, grapes, blueberries, and raspberries were probably gathered from forest margins or old abandoned fields. Because Wingo’s was occupied prior to Jefferson implementing large scale landscaping and introducing many cultivated varieties of plants, it is likely that the fruits such as grape and berries were collected from wild varieties in the late 18th century at Poplar Forest

Fuel and Construction

The wood assemblage is composed primarily of oak and hardwoods (Figures 10 and 11). Analyzing the data according to the depositional history discussed above, there are several trends visible in the charred wood assemblage. While oak is the dominant species within most of the occupation and abandonment layers, non-oak species, particularly Kentucky coffee tree and hickory, occur in greater proportions in the occupation/abandonment layers than in the demolition layers (Figure 10). The use and abandonment layers contained several species in addition to oak including hickory, tulip poplar, maple, Kentucky coffee tree, and pine. While all of these species make up only a small amount of the overall charcoal assemblage, the diversity of the species suggests that the people living at Wingo's had a variety of fuel woods from which to choose. While oak and hickory are good fuel woods, the presence of tulip poplar, Kentucky coffee tree (which occurs in high proportions in one of the layers), and pine suggest that they were not always selecting for ideal fuel woods but using the wood nearby which were available to them.

Meanwhile, the demolition contexts are all dominated by oak, with oak comprising over 90% of the wood identified from these contexts (Figure 11). Due to the fact that ER 281 C-H likely represent the demolition of the structure, the higher amounts of oak in these deposits compared to non-demolition deposits suggests that the structure was constructed primarily of oak. The presence of monocot stems in these contexts, like the peach pits, may have been in the daub of the structure or used as fuel as well.

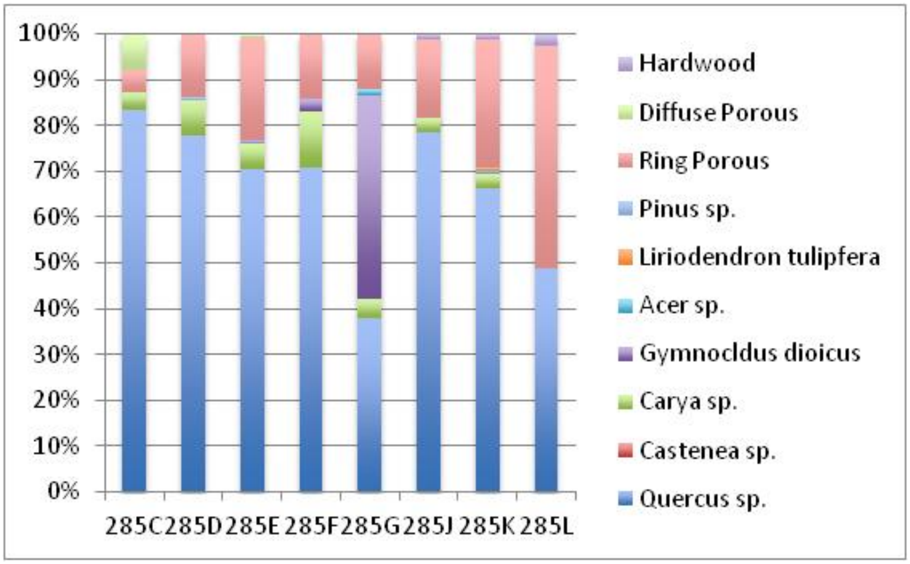

Figure 10: Proportions of Charred Wood identified from ER285.

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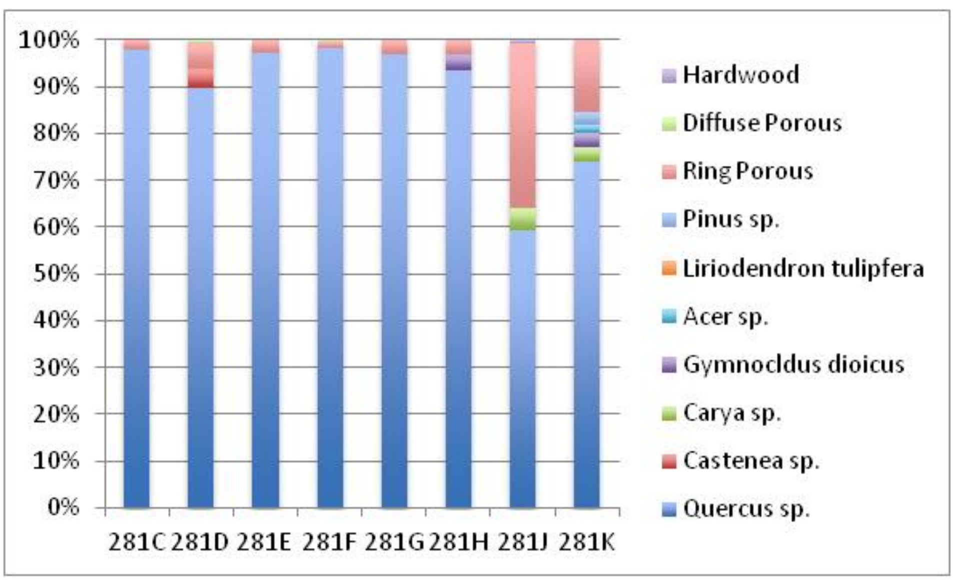

Figure 11: Proportions of Charred Wood identified in ER281.

The macrobotanicals and charred wood remains from Wingo's illustrate how the enslaved African Americans utilized the local environments during the late 18th century to provide food and medicine from themselves. They were able to use local wood to build their homes as well as fuel fires for heat and cooking. During the period right after Wingo's was occupied, however, major changes occurred around the plantation, specifically switching from tobacco cash cropping to wheat, that would have significantly influenced the lives of the enslaved population around Poplar Forest. Combining the Wingo's data with later dated sites can show how the subsistence practices seen at Wingo's may have changed, or remained the same, while these land use practices were significantly altering the local environments.

CHAPTER VI

LANDSCAPE AND FOODWAYS IN A COMPARATIVE PERSPECTIVE

The Piedmont of Virginia in the late 18th century was a dynamic, rapidly changing landscape. The sudden influx of new planters into the region brought new agricultural techniques, new people, and new settlements all making their mark on the expanses of newly settled land. Tobacco agriculture, in the mid to late 18th century drastically altered the dense hardwood forests of the Piedmont into agricultural fields. Through macrobotanical analysis it is possible to see how the interaction, between the changing landscape and changing uses of the landscape, plays out in the daily lives of people. The presence of different types of plants can show both changing access to various environments as well as individual choice. At Poplar Forest, a diachronic study of macrobotanical remains from slave quarters shows how the enslaved population created and used the landscape around them as well as how the landscape changed as a result of their agricultural work.

For the diachronic analysis of macrobotanical assemblages from Poplar Forest designed to explore changes in landscape and foodways of enslaved African Americans, I compare the data collected from the Wingo's site to several other sites from Poplar

Forest. The North Hill and Quarter sites were located close to the plantation core; they are the primary sites compared to Wingo's as they are chronologically close. There are two phases of deposits at the North Hill. Phase 1 (1770s through the mid-1780s) deposits include a subfloor pit (ER1546), an exterior pit (ER1700), and several layers of fill within an erosion gully. Deposits from phase 2 (1790s-1810s) include one exterior pit (ER1476) and upper layers of fill within the erosion gully (Raymer 2003:1-2). The Quarter site dates from the 1790s to 1812 with deposits that include a root cellar (ER829), a destruction deposit, and an ash filled pit (Raymer 1996:5).

The amount of carbonized seed material recovered from these sites varies significantly. According to Raymer (2003:33), the botanical assemblage from the North Hill consists of 1.15 seeds per liter analyzed while the Quarter assemblage has on 0.28 seeds per liter. The Wingo's assemblage consists of 17.32 seeds per liter. Much of this variation is likely due to the differential nature of the deposits at each site (specifically the large numbers of grass seeds within ER 281 at Wingo's).

The Quarter site macrobotanical collection appears to have good recovery of larger seed and plant remains, like those of domestic species such as wheat or maize previously discussed, but significantly poorer recovery of smaller seeds commonly produced by wild plants such as edible weeds. While some smaller seeded species were recovered, like raspberry and blueberry, almost no weedy plants or grasses were identified. The species richness of the Quarter site is 17, while the species richness of the other three sites studied is over 30 for each site. This is important, especially considering that the volume of material floated from the Quarter was higher than both the North Hill and the Wingo's site (see Table 1). This significant difference in species richness could potentially be explained by a major difference in plant use; however, it is also likely that it is a result of a difference in recovery, as many of a species not present at the Quarter but found at the other sites were weedy species with smaller seeds that might have easily not been recovered with the less systematic recovery techniques for the Quarter site. As a result of this differential recovery rate, the Quarter site is only considered in analyses of larger seed remains and in terms of presence.

The Changing Landscape of the Piedmont

In the 1770s, Jefferson originally created the Wingo's and North Hill settlements at Poplar Forest to cultivate tobacco (Heath et al. 2012; Heath and Gary 2012). Planters in Virginia began settling the Piedmont in the 1730s in search of new tobacco lands. Leaving the Chesapeake where crop yields had begun to decline drastically and land was becoming scarce, these planters set up small settlements of enslaved African Americans throughout the Piedmont to clear huge tracts of forest for tobacco fields (Morgan and Nicholls 1989; Walsh 1993). In the 1770s, Wingo's and North Hill were established for this purpose.

Tobacco cultivation in the Piedmont created a distinct landscape, very different from the natural hardwood forests that preceded it. Europeans, when they adopted tobacco agriculture, abandoned many of the agricultural traditions of Europe in favor of local Native American practices of clearing, long fallows, and hoe planting (Kulikoff 1986; Morgan 1998). This method of agriculture suited the needs of Tidewater planters in the 17th and 18th century. While land was plentiful, prior to the growth of the slave trade in the 18th century, labor was not and this method of agriculture utilized large portions of rich land without requiring large labor forces (Morgan 1998). In the Chesapeake, by the 18th century, planters began ordering their landscape with fences and large plantation homes. The Piedmont, however, in the mid to late 18th century would have been the frontier of tobacco agriculture. The Piedmont would have been dotted with large areas of mature forests separating cleared and planted fields as well as fallow fields left for wild plants to recolonize.

There is some direct macrobotanical evidence that is indicative of tobacco agriculture. At Wingo's, one tobacco seed was recovered from an occupation deposit of subfloor pit 281. This seed, however, is the first recovered from Poplar Forest. While tobacco agriculture itself is a challenge to see in the macrobotanical record, it is possible to see the environmental effects of tobacco cultivation.

Tobacco agriculture during the late 18th century and early 19th century would have created a mixed landscape of planted fields, fallow lands growing wild, and remnant patches of hardwood forest. Tobacco cultivation required clearing much of the hardwood forests that had just a few decades before had dominated the Piedmont. In the macrobotanical record, the charcoal recovered throughout Poplar Forest's history shows how the destruction of the hardwood forests of the Piedmont drastically impacted the fuel wood available to the enslaved population, removing old growth forests and leading to secondary succession in long fallow fields.

The charred wood data from the sites studied at Poplar Forest paint an interesting picture of plant succession at Poplar Forest. Previous research at Poplar Forest has argued that a comparison of the charcoal recovered from the Quarter site (1790-1812) and the North Hill site (1770s-1812, with deposits primarily filled in the 1770s-1790s), shows a notable change in the local environments (Bowes and Trigg 2012; Proebsting 2012; Raymer 2003). Within the area of the plantation, there is a significant change in the species of wood used as fuel during the course of only a few decades, between the 1770s and the 1810s. There is a decrease in the use of oak, an excellent fuel wood and the dominant species in the Piedmont forests, and an increase in pine, a poor fuel wood but "pine would have been common in the new brush that regenerated over the abandoned tobacco fields" (Proebsting 2012:53). This change illustrates the likely removal of most of the oak forests in the area. Secondary succession would have begun in abandoned fields, leading to higher availability of pines after only a few years of abandonment.

The charcoal recovered from Wingo's adds even further time depth to this interpretation (Figure 12). At Wingo's, oak makes up 81% of the total charcoal analyzed and 89% of the charcoal identified to genus. Oak and hickory, the two dominant species of most old growth Piedmont forests, combined make up 93% of the charcoal identified to genus. Pine comprises less than 1% of the identified charcoal assemblage. The remaining identified charcoal included small quantities of maple, chestnut, and tulip poplar (each less than 1%), all of which would have been common species in Piedmont oak-dominated forests. Kentucky coffeetree comprised less than 3 percent of the charcoal; this hardwood species is not as common as the other species identified but would have been present amongst the oak/hickory forests.

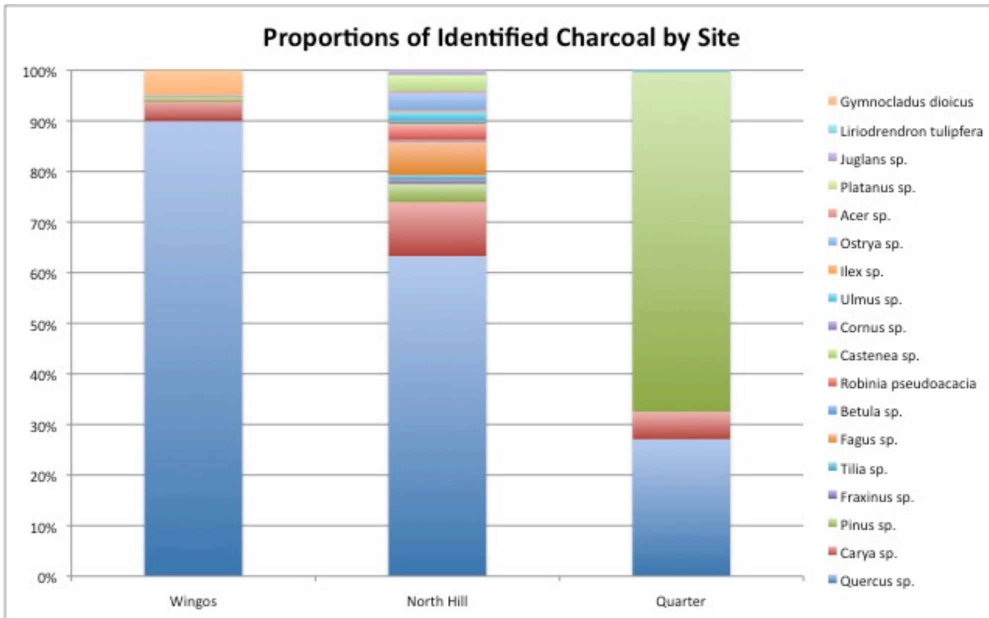

Figure 12: Proportions of Charred Wood by site, showing the decline in oak within the assemblages. Wingo's dates to the 1770s-1790s, North Hill 1770s-1810s, and the Quarter 1790s-1812.

As seen in Figure 12, the proportion of oak charcoal drops precipitously between the 1770s-1790s period (as seen in Wingo's) and the 1790s-1812 period (seen at the Quarter site). The North Hill site covers both of these time periods and represents a transition. At the North Hill site oak comprises 63% of the identified charcoal, hickory is 11% and pine is 4%. This shows a slight drop in the use of these dominant hardwoods at the North Hill site during its five decades of use. During the later period, at the Quarter, oak only makes up 27% of the charcoal assemblage and hickory just 5%. Pine, meanwhile, comprises 67% of the charcoal assemblage. This switch from the use of ideal fuel woods like oak and hickory to pine suggests that oak was no longer an abundant available resource nearby and the enslaved population at Poplar Forest had to make do with an inferior fuel source or else travel much further afield for better wood. This is an especially significant change to note between the North Hill and Quarter sites as they are both close to the plantation core and each other.

The North Hill site has the highest charcoal species richness, with 16 species identified, despite having a smaller sample size than Wingo's (see Table 1 for charred wood sample sizes for these sites). Compared to the North Hill site, Wingo's and Quarter have noticeably low species richness, seven and four respectively, although the Quarter site has a small sample size. This may be in part due to the longer occupation of North Hill compared to the other two sites. It also indicates a use of a greater variety of fuel woods, which vary greatly in quality. Site A, which was occupied later in the 19th century, shows evidence for further progression of secondary succession, with a re-growth of hardwoods, suggesting that some abandoned fields remained abandoned and were allowed to continue to develop into hardwood forests. At Site A the percentage of oak rises and pine decreases (Bowes and Trigg 2012).

Site	Volume of Soil Floated (L)	Total Number of Charred Wood	Species Richness
Wingo's	222	2186	7
North Hill	108.5	1072	16
Quarter	508	317	4

Table 1: Sample Sizes of Charred Wood at Comparative Sites.

This drastic change in the fuel wood available to the enslaved population at Poplar Forest occurs in the beginning of the 19th century. The availability of good fuel wood in abundance suggests that the people in the early years of tobacco cultivation had their pick of wood for fuel, both due to the continued abundance of hardwood forests and all the timber produced in field clearance for tobacco. The marked drop in oak, hickory, and other good fuel woods in the early 19th century suggests that much of the landscape was cleared and pines were growing in the abandoned areas left in fallow.

In addition to charred wood evidence the large amount of weedy seeds present in the macrobotanical assemblages speak to the disturbed environments surrounding the quarters. At Wingo's weedy seeds, including goosefoot, knotweed, purslane, and wild grasses, are present in all of the samples (100% ubiquitous). Weedy plants that typically grow in cleared or disturbed areas dominate this part of the seed assemblage. The ubiquity of weedy species is not as high as at Wingo's. Weedy species are 48% ubiquitous from all the Phase 1 at the North Hill (1770s-mid-1780s) deposits. From Phase 2 (1790s-1810s) deposits, weedy species are only 25% ubiquitous. At the Quarter site, weedy species are 33% ubiquitous. Considering that the recovery rate at the Quarter site is very poor, it is not possible to tell definitively if these ubiquity differences relate to actual environmental changes. The presence of weedy species at all of these sites, however, does suggest that areas around the sites were disturbed.

Additionally, pollen data from Poplar Forest illustrates the disturbed nature of the environment during the 18th and 19th century as a result of the massive land clearance efforts, crop planting, and organizing of the plantation landscape undertaken by Jefferson

(Jacobucci 2009; Jacobucci and Trigg 2012). This trend of extensive landscape alteration continued into the early 19th century with the rise in wheat as a major cash crop in Piedmont Virginia.

In 1790 Jefferson wrote to one of his overseers of his desire to "[go] into that culture [of wheat] as much as you think practicable. In Albemarle, I presume we may lay aside tobacco entirely; and in Bedford [Poplar Forest], the more we can lay it aside the happier I shall be" (Betts 1944:152). Records indicate that, by 1789/1790, wheat from Poplar Forest was sold in markets in Richmond. While tobacco cultivation continued in Piedmont Virginia, and at Poplar Forest, into the early 19th century (Betts 1944:464-467; Proebsting 2012), wheat grew in importance during that period. By the 19th century, Jefferson, and other planters, focused primarily on wheat cultivation, growing tobacco only when the market was favorable (Morgan 1998). Wheat cultivation slowly changed the way plantations functioned.

While historians have studied these agricultural and landscape changes at length, they have focused on the switch from tobacco to wheat as an economic decision (Morgan 1998) and as a practical decision necessitated by decreasing availability of quality tobacco land throughout Virginia (Walsh 1993). Other scholars have discussed the changing agricultural practices from the perspective of its impact on the slave trade and slavery (Morgan and Nicholls 1989; Walsh 1993, 2001). Providing a gender based perspective on this change, Morgan (1998:170-188) argues that switching from tobacco agriculture to wheat changed the labor dynamics from a system of small gangs of mixed gender enslaved African Americans working on essentially equal grounds to a system of largely gender segregated labor with women performing the less skilled, more menial tasks while men were given more skilled tasks.

Wheat cultivation, even more than tobacco, has been associated with the depletion and erosion of soils in Virginia (Morgan 1998; Walsh 1993). While many people note that tobacco cultivation is extremely damaging to soil quality, the process of long fallows utilized by Virginia planters was not inherently detrimental to soils. Fields were cultivated for tobacco for 6 to 8 years before the fields were left in fallow for up to 20 years, allowing the soil to replenish itself. Hoe planting did not typically lead to extensive soil erosion (Walsh 1993). Wheat cultivation, however, with its extensive use of plowing, quickly eroded soils, especially in the Piedmont. At Poplar Forest, evidence of this erosion can be seen in several deep erosion gullies identified at the North Hill site and Site B (Proebsting 2012:51-52). These deep furrows into the subsoil were filled with organic material and trash in the 19th century. Their presence at several locations around Poplar Forest shows how rapidly intense agricultural endeavors, both tobacco and wheat, in the Piedmont damaged the soils.

Jefferson records his efforts to optimize crop planting at all his plantations, including wheat within a complex system of crop rotation in order to replenish soil nutrients (Betts 1944). While diversifying crops worked to reduce soil damage, it also served to make plantations more stable economically and to make them more self-sustainable. In the 19th century there was a shift in mentality from perceiving a plantation as a place for producing large amounts of cash crops to a farm, designed to produce an income but also provide for itself.

Using the Changing Landscape

Major agricultural changes at Poplar Forest would have had a profound impact on the daily lives of the enslaved peoples at Poplar Forest. The large amounts of land clearance necessary for tobacco and wheat cultivation initially provided ample high quality fuel wood. By the 19th century, however, this high quality fuel wood may have been no longer available, and the macrobotanical evidence suggests that access to mature hardwood forests was limited. These changes would have impacted daily activities of the enslaved population, as they adapted to new work routines and sought food and fuel resources in new areas. Plant use at each of the 18th and 19th century sites at Poplar Forest shows a great deal of similarity. This suggests that, in spite of the rather intense environment changes occurring around the plantation, the enslaved African Americans living at Poplar Forest improvised, made do, and continued to create a distinct, diverse foodways tradition. Changes in foodways over time throughout these sites can illustrate how people living at Poplar Forest may have adapted in order to provide food for themselves as their environment changed. This analysis discusses species richness, ubiquities, and ratios of different potential food sources to show how the populations at these sites used plants in different ways.

Due to its recovery problems, the Quarter site is only selectively considered in this analysis. This analysis also primarily discusses deposits associated with potential domestic use, primarily subfloor pits, when possible. At the Wingo's site remains recovered from ER 285 and from 281J and K, which were likely deposited during the use of the structure. From the North Hill one subfloor pit (1546) was analyzed as part of phase 1 (1770s-mid-1780s). Additionally the lower layers of erosion gully fill are believed to be deposited during the first phase of occupation at North Hill (lower layers of ER1738, 1739, 1741, 1742, 1743, 1745, 1800, and 1801). Phase 2 at the North Hill includes upper layers of erosion gully fill and an exterior pit (ER1476), but as the phase 2 deposits are interpreted as more related to yard deposits the recovery may not be as balanced as the deeper deposits. As a result phase 2 is typically separated from the North Hill phase 1 analyses. From the Quarter two possible subfloor pits (ER 829 and 1247) and a floor surface (1206C) are analyzed when possible. Botanical materials from Site A came exclusively from a subfloor pit ER 2352/4. All of these deposits provide the best possible illustration of plant use while the site was in use, rather than potential inclusions in the botanical record through natural processes, as seen in the upper layers of ER 281.

Macrobotanical evidence shows that wheat was cultivated at Poplar Forest prior to its adoption as a major cash crop (Heath 2012:111-112; Raymer 1996, 2003). Wheat kernels have been recovered from all the sites analyzed for macrobotanicals, indicating that wheat was utilized within the slave quarters throughout the history of Poplar Forest likely as a provisioned food source. The importance of wheat over time, however, changed drastically in the 19th century.

Using ubiquity of wheat, it is possible to see this changing trend in the importance of wheat. Ubiquity measures the number of samples or contexts in which a certain taxon is present (Popper 1988:60-61). It is used to measure the relative importance of that taxon and how this varies from site to site. At Poplar Forest, the ubiquity of *Triticum* *aestivum* decreases over time (Figure 13). At Wingo's, wheat is 58% ubiquitous site wide. For all the features dating to phase one (1770s to 1790s) at the North Hill, the ubiquity was 55%. The ubiquity of wheat in Phase 2 at the North Hill is only 12.5%, but that may be the result of the type of deposits rather than an actual change in use. At the Quarter, *Triticum aestivum* was 33% ubiquitous. The low ubiquity of wheat in the early 19th century, as seen at the Quarter, is also seen later in the century at Site A, which has a ubiquity of 27%.

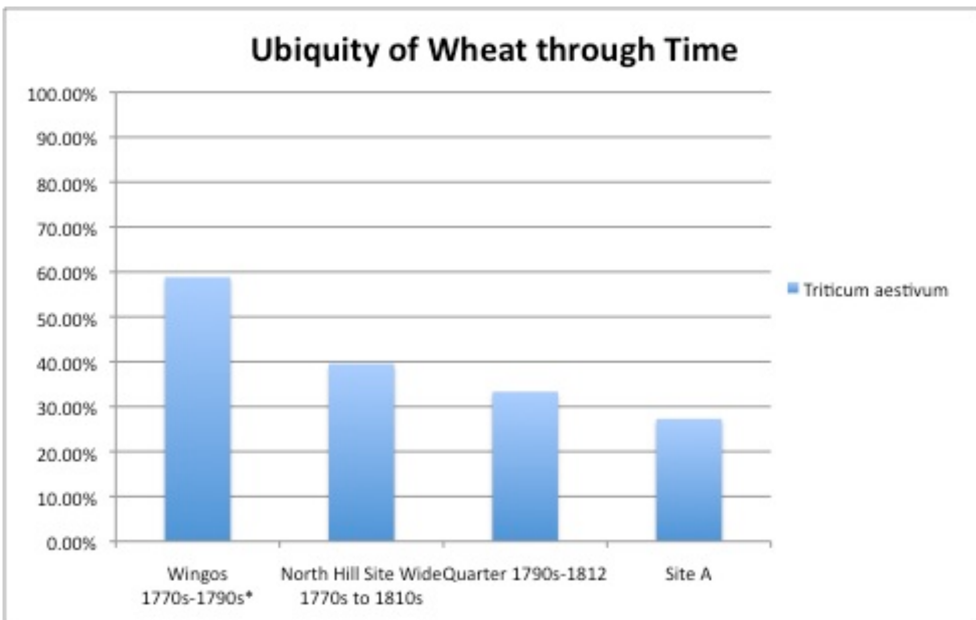

Figure 13: Ubiquity of *Triticum aestivum* through time at Poplar Forest.

The ubiquity analysis of these sites might suggest that the importance of wheat at the quarters decreased through time. Historical documents suggest that wheat was provisioned to slaves occasionally (Morgan 1998:134). The consistent presence of wheat at Poplar Forest suggests that it was always consumed at the plantation (Bowes and Trigg 2012; Raymer 1996, 2003). Its decrease in ubiquity at the Quarter and later sites like Site A suggests that it was no longer consumed in the same quantities as at Wingo's or the North Hill. This change corresponds temporally with the beginning of sale of wheat crops at Poplar Forest in 1790 (Heath 2012:112).

The discrepancy between the ubiquity of wheat at the quarter sites and the production of wheat may be explained by a lack of consumption at these sites. While production was increasing, most of the wheat grown and produced was sold in markets rather than consumed on site. Bowes considers this difference a result of management styles among planters (Bowes and Trigg 2012). Overseers and planters made decisions such as what grains and how much grains to provision to the enslaved populations (Bowes and Trigg 2012; Morgan 1998; Samford 1996: 96-97). Jefferson and his overseer may have chosen to sell most of the wheat produced rather than provision it as grain to the enslaved African Americans or the way wheat was provisioned changed (from whole wheat kernels to more flour).

At all of the Poplar Forest sites studied, rachis fragments (the portion of the wheat plant that held the kernel to the stalk) were either not present or extremely rare. At Wingo's, North Hill, and the Quarter, no rachis fragments were recovered. At Site A, only one rachis fragment was identified. The presence of rachis or chaff fragments at a site is typically used to suggest production or processing of wheat at a site. Their apparent scarcity at Poplar Forest suggests that wheat was almost exclusively provisioned to the enslaved African Americans, instead of them potentially growing it around the quarter.

This difference in ubiquity might also reflect the use of flour rather than raw wheat grains at the quarter sites. Flour is difficult to identify in the macrobotanical record. If wheat was initially provisioned as raw grains earlier in the plantation's history and then over time, flour became more commonly provisioned, the amount of wheat grains at the site would be lower at later sites. This change in ubiquity could also reflect a change in wheat processing, from within the home to outside of it in a larger scale as wheat production became more important.

We have already seen how the shift to wheat as a cash crop actually decreased its use as a food to enslaved people or perhaps changed the way it was used, provisioned, or processed. Other grains were considered more important as a food source for enslaved African Americans. One major consistency throughout all the different sites is the importance of maize. The ubiquity of maize at each of the Jefferson period sites, Wingo's, North Hill, and the Quarter, is consistently high in occupation contexts. In the North Hill subfloor pit and Wingo's subfloor pit maize kernels have a ubiquity of 100%. Site wide at the Quarter maize kernels are 100% ubiquitous and in the subfloor pits at Site A maize kernels have a ubiquity of 54%. Maize was a crop commonly provisioned to enslaved African Americans throughout the New World. While originally a New World domesticate, maize was well known both in Europe and in Africa by the early 17^{th}

century and was quickly incorporated into subsistence strategies all over the world and would have been familiar to 18th-century enslaved Africans and African American populations (Carney and Rosomoff 2009). In Virginia, planters provisioned maize to their slaves (Bowes and Trigg 2012; McKee 1999; Morgan 1998). It was also a crop commonly gardened by enslaved populations (Franklin 2001; Samford 1996).

The presence of whole maize kernels suggests that the enslaved African Americans were not just provisioned corn meal but were processing corn themselves, perhaps even growing it themselves. The ubiquity of maize cupules is also high for all the sites. They are 100% ubiquitous in the occupation layers of Wingo's. In the Phase 1 deposits at the North Hill cupules are 81% ubiquitous. Even in the Phase 2 deposits, with poorer recovery and more diffuse yard deposits, cupules are 50% ubiquitous. At the Quarter cupules are 66% ubiquitous. This continuity in cupule and kernel ubiquity suggests that maize production and processing was a consistently important part of life at these quarters over time.

Other grains, including wheat, rye, oats, millet, and sorghum, were also present at many of the sites although they are not as common as wheat and maize as food grains. Oats, and rye are European cereal grains; in the New World, these grains were often grown on the plantation as provisioning grains and some would have been used as animal fodder as well (Carney and Rosomoff 2009; Covey and Eisnach 2009). Various millet species were cultivated throughout the Old World. Enslaved populations in the New World commonly cultivated sorghum, a grain of African origin, for additional food in their gardens (Carney and Rosomoff 2009). None of these various grains figured greatly as a cash crop at Poplar Forest. Their similar ubiquities at each site suggests that they remained in use consistently through time in the gardens of the enslaved African Americans themselves, or as wild plants encouraged to grow around the quarters.

The use of local gardens as a source of supplementary food for enslaved populations does not just include grains. Plants like beans, such as the common bean and cowpeas, pumpkins, and sunflower have been identified at all the quarters at Poplar Forest (Bowes and Trigg 2012; Raymer 1996, 2003; Trigg and Henderson 2012). The species richness of gardened plants for all the sites is relatively consistent, suggesting that gardened plants at Wingo's, North Hill, the Quarter, and Site A were consistently utilized. While the actual counts of these types of plants are low, this likely reflects the use of gardened plants in ways that does not facilitate them being charred. Gardened crops such as sweet potatoes, beans, and vegetables provided important diversity in diet (Franklin 2001; Samford 1996). Many of the plants commonly gardened by enslaved people in Virginia in the late 18th and into the 19th century were sold in markets for extra income, in addition to being consumed by the enslaved African Americans (Hall and Yentsch 2007; Heath 2000; Yentsch 1994).

The species richness of taxa was used by Bowes to determine the changing importance of provisioned food in the diets of enslaved people at Poplar Forest (Bowes 2009; Bowes and Trigg 2012). Species richness calculations from the four sites have shown that the different recovery technique used at the Quarter site has influenced its macrobotanical assemblage, specifically biasing it against smaller seed material, and therefore it is excluded from this analysis. For this analysis, those botanical remains of edible plants recovered are divided into three categories: provisioned crops, gardened crops, and wild plants. These categories were used by Bowes previously for analyses at Poplar Forest but have also been used by other macrobotanical analyses (Bowes and Trigg 2012; Mrozowski et al. 2008; Raymer 1996, 2003).

Her research, combined with the botanicals from the Wingo's site, shows that three of the four sites analyzed, Wingo's, North Hill, and Site A, are similar (Figure 14). Not only does this illustrate that at these sites there was similar access to provisioned crops like wheat, maize, and other domestic grains but it also shows that the people at these three sites had similar access to other food resources.

Wingo's and North Hill were both occupied in the 1770s through the 1790s. Site A, however, was occupied in the mid to late 19th century (Heath 2012). The similarities in the species richness from each of these sites suggest that the inhabitants had access to similar kinds of food plants. This continuity in access to various food resources suggests that, despite large-scale environmental and plantation management changes, the enslaved populations at Poplar Forest had access to numerous food sources throughout the late 18th and 19th century.

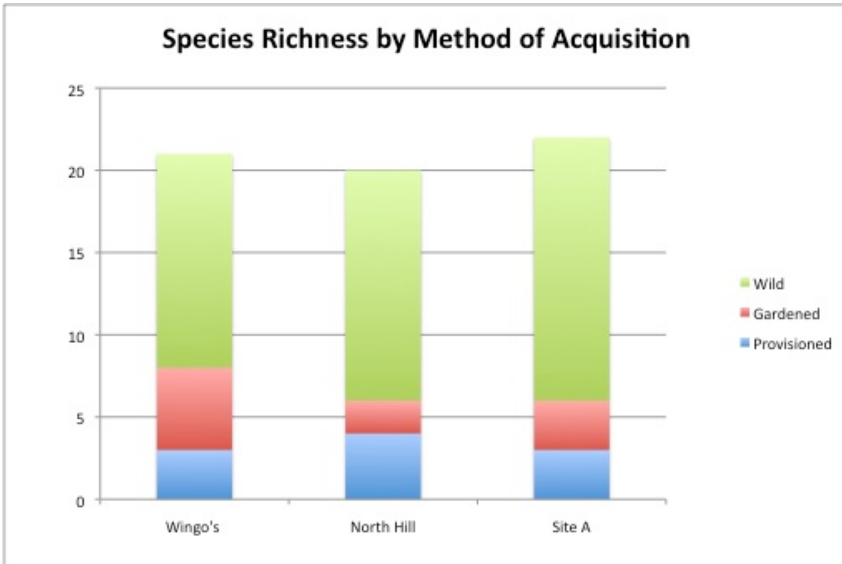

Figure 14: Species Richness of edible plants at Wingo's (1770s-1790s), North Hill (1770s-1810s), and Site A (1840-1860s).

Seeds from plants from all over the plantation landscape were recovered from each of the three sites. Each site contains numerous species of wild plants both weedy species that could have been collected in nearby fields and wild fruit and nut species from forests and forest margins. The cultivated grains recovered from North Hill, Wingo's, and Site A include primarily wheat and maize but there were also small amounts of rye, oats, and sorghum identified from these sites.

Edible wild plants dominate the botanical assemblages from the Wingo's site, as well as the assemblages from North Hill and Site A. The species richness of different strategies of subsistence shows that wild edible species make up at least half and often an even larger percentage of the species recovered from all three of these sites. Wingo's and the North Hill site have similar numbers of edible species recovered from occupation filled subfloor pit contexts (ER 285 and 1546 respectively). From Site A the species richness within the subfloor pit was much higher than Wingo's and North Hill. A site wide comparison, however, shows that each of the sites have similar species richness.

While the higher amounts of species and high counts of edible wild plants does not necessarily indicated that they were the most important part of diet, the high numbers does suggest that each of these groups sought diverse foods, especially wild foods, from throughout the plantation landscape. These high proportions suggest that the people at all these sites actively sought wild food throughout the plantation. According to ex-slave narratives collected by the WPA in the 1930s, using wild, gathered resources was extremely common (Covey and Eisnach 2009; Perdue et al. 1976). At Wingo's and the other two sites nutshell and wild fruits, which would have been collected in the forests and forest margins, were recovered in small amounts. Wild weeds, such as those typically found in fields and waste places (areas that likely existed near the quarters), are found in higher numbers than those of trees and shrubs. This suggests that the plants that were nearby and convenient food options, such as weeds, may have been utilized more than plants that may have been in a different part of the plantation.

The use of these resources, however, may have varied from site to site. The ubiquity of edible weeds and wild plants at the Wingo's site, in contexts associated with the use of the structure, is 70%. In comparison, the North Hill site has a ubiquity of 57% for edible weeds and plants in occupation contexts. This suggests that, at the Wingo's site, edible wild plants may have been of more importance than at the North Hill site. Variability in the ubiquities of these types of plants indicates that at the different sites the inhabitants may have relied more heavily on some types of plants as food sources than others. These differences may be related to the changing landscape around Poplar Forest. They may also have to do with individual choices by enslaved people seeking food to supplement the food provisioned to them.

The variability of wild plants versus cultivated plants shows how different populations at Poplar Forest may have used the resources within the plantation landscape, beyond just consuming those food crops provisioned to them. The fuel wood data throughout the history of Poplar Forest has shown how changes in the environment around the plantation impacted the available fuel wood and how the enslaved population used whatever fuel was available in the surrounding landscape, whether that was high quality oaks and hickories or lesser quality pine. The large amounts of wild edible plants recovered at Wingo's and the other sites around Poplar Forest clearly indicate that all the groups were utilizing the wild resources at their disposal. The high ubiquity of maize at all of the sites regardless of the time period speaks to it consistent popularity in enslaved African American diet and foodways.

What is clear about the foodways of enslaved people at Poplar Forest is that they were able to take the food they had, whether that was just cornmeal and greens or meat and potatoes, and make meals that former slaves looked back on with fondness. The control exercised by planters in provisioning food created scarcity and hardship; meat was not common and provisioned foods tended to be monotonous (Covey and Eisnach 2009; Hall and Yentsch 2007). In terms of the their daily experiences with food, enslaved African Americans labored in their gardens and foraged in the fields and forests in what little free time they had (oftentimes by night) and managed to create distinct, enduring foodways that to this day have a profound impact of the food culture of the South.

CHAPTER VII

CONCLUSION

The rapid settlement and development of the Piedmont for tobacco agriculture followed by the subsequent transition to wheat cash cropping lead to significant changes of the Piedmont landscape. Forests were cut down; fields eroded due to intensive agriculture. More importantly planters brought hundreds and thousands of new people into the Piedmont. This new population of African and African American slaves brought with them food traditions and knowledge of plants as potential food and medicine. Within this changing landscape (altered by their own labors), they had to provide for themselves and their families. They learned to live off these new lands while still cooking food familiar and fulfilling (Hall and Yentsch 2007; McKee 1999).

The macrobotanical data from several sites at Poplar Forest illustrates the significant changes that occurred on the plantation during the late 18th and early 19th century. The combination of historical data suggesting when Jefferson began switching from tobacco to wheat with the data recovered from quarter sites at Poplar Forest show the shift in agricultural cash cropping from tobacco to wheat. The macrobotanical data shows that associated with this agricultural change is a seemingly counter intuitive drop in the presence of wheat. With more wheat production on the farm there appears to be less at the slave quarters. Whether wheat is consumed less or consumed in a different way (as flour), the change in provisioning and economic strategies is important. While historical evidence speaks to the switch from tobacco to wheat in terms of its agricultural significance, the archaeobotanical evidence shows how these changes would have affected the lives of the enslaved people at Poplar Forest

Additionally, the environmental changes associated with these agricultural practices are also reflected in charred wood data. Rather than merely illustrating these already documented trends the botanical data illustrates the lived experiences of the enslaved people living at Poplar Forest. Changing in proportions of hardwoods to softwoods through time at Poplar Forest show how ecological succession played a role in the availability of fuel woods to enslaved foragers. Specifically, as forests were cleared for new fields in the late 18th century hardwoods were in abundance for people at Wingo's and, partly, at the North Hill Site. Over time, however, the hardwoods were depleted and by the time people were living at the Quarter site most of the available fuel wood appears to be pine. The prevalence of pine suggests that near the Quarter some of those cleared fields were already progressing through stages of ecological succession, with pine forests preceding hardwoods. This charred wood data speaks not only to what fuel woods were available to the slaves but also to the significant and rapid environmental changes taking place in Piedmont.

It is within these changing landscapes—shifting forests, new crops in the fields, development of new market towns, and construction by Jefferson of a plantation core and retirement home in the 19th century—that enslaved people at Poplar Forest sought to provide for themselves. Bringing with them food traditions from elsewhere in Virginia and even from Africa these people used the plant resources of this changing landscape to cook their food, cure their illnesses, and warm their homes.

Macrobotanical evidence from Poplar Forest illustrates that the environment in the Piedmont in the 19th century was drastically changing. Despite all these environmental changes and changes in the provisions from planters, slaves in the Piedmont managed to provide food for themselves and their families from all over the plantation. The foodways of enslaved Africans and African Americans at Poplar Forest is both extremely diverse and consistent. They acquired food from all over the plantation landscape (from fruits, berries and nuts to beans, greens, and grains). This variety of food counters many preconceived notions about the monotonous diet of enslaved people. This trend in variety, more than many had believed, is echoed in several studies of slave faunal assemblages as well (Crader 1996; Franklin 2001; Samford 1996).

The consistency of the foodways, in spite of massive environmental changes, I believe speaks to the beginning of a foodways tradition that would eventually come to define food throughout the South, food of slaves, freedmen, and whites alike. There is neither one "African/African American" identity nor one homogeneous "African/African American" cuisine (Franklin 2001; Zafar 1999). Groups of enslaved Africans and African Americans throughout the South, however, managed to take the resources available to them, whether those were provisioned European grains, gardened African crops, or wild plants from the New World, and create a diverse style of cooking that, in many ways, still exists 200 years later. Many dishes described by former slaves are still familiar elements of foodways in the South.

The analysis of macrobotanicals in relation to the changing landscapes is especially important because it provides evidence of these landscapes from the perspectives of the slaves and how they perceived and utilized landscapes. This study has shown that within a plantation landscape, in many way established by white planters, slaves used the landscape to make it their own and use it to their benefit. In the words of Ywone Edwards,

> slaves fashioned their own landscape…they did not bend, at all times, to the message of inferiority…the slave landscape, which was formed within informal and mostly hidden aspects of the planters' formal landscape… (Edwards 1998:253).

It is this landscape that the macrobotanicals from Poplar Forest illustrate. The people who made Poplar Forest what it was were not passive inhabitants of an imposed world but people who saw the world around them for its possibilities. From the food they collected and grew, they created a complex food tradition whose affects can even be seen today in modern Southern cooking.

APPENDIX 1
SAMPLE CONTEXTS, FLOTATION SAMPLE VOLUMES, AND LIGHT FRACTION WEIGHTS

Feature/Level	Samples	Total Samples	Total Volume (L)	Total Weight (g)
281C	81, 82, 83, 84	4	10	138.53
281D	5, 6, 7, 8, 9, 10, 11,12	8	20.25	161.68
281E	1, 2, 3, 4	4	10	88.02
281F	85, 86, 87, 88	4	10	163.5
281G	26, 27, 28, 29, 30	5	11	102.83
281H	89, 90, 91, 92	4	10	109.5
281J	57, 58, 59, 60	4	10	14.22
281K	93, 94, 95, 96	4	10	90.86
Total		37	91.25	869.14

Feature/Level	Samples	Total Samples	Total Volume (L)	Total Weight (g)
285C	53, 54, 55, 56, 70	5	12	69.67
285D	61, 62, 63, 64, 65	5	10.75	76.99
285E	42, 43, 44, 45, 46, 47, 48, 49, 51, 52	10	24.5	269.19
285F	66, 67, 68, 69	4	10	117.9
285G	22, 23, 24, 25	4	10	41.48
285H	77, 78, 79, 80	4	10	237.63
285J	31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41	11	21	93.13
285K	13, 14, 15, 16, 17, 18, 19, 20, 21	9	22.5	195.35
285L	71, 72, 73, 74	4	10	29.15
Total		56	130.75	1130.49
Total		93	222	1999.63

APPENDIX 2
PLANTATION CROP COUNTS BY LAYER

Feature/Level	Volume (L)	*Nicotiana tabacum*	*Linum* sp.
281C	10	0	0
281D	20.25	0	0
281E	10	0	0
281F	10	0	0
281G	11	0	0
281H	10	0	1
281J	10	0	0
281K	10	1	1
Totals	91.25	1	2
285C	12	0	0
285D	10.75	0	0
285E	24.5	0	0
285F	10	0	0
285G	10	0	0
285H	10	0	0
285J	21	0	0
285K	22.5	0	0
285L	10	0	0
Totals	130.75	0	0

APPENDIX 3

EDIBLE CROP COUNTS BY LAYER

		Zea mays					*Prunus persica*		
Feature/Level	Volume (L)	Cupules	Kernel	*Triticum* sp.	*Secale* sp.	Cerealia	Count	Weight (g)	*Pyrus* sp.
281C	10	0	0	0	0	0	4	0.42	0
281D	20.25	2	1	1	1	1	24	2.29	0
281E	10	0	3	3	1	0	26	3.71	0
281F	10	4	1	6	0	0	44	6.77	0
281G	11	1	2	1	1	0	17	4.74	0
281H	10	1	0	11	2	0	76	10.62	0
281J	10	9	0	9	1	0	14	1.28	0
281K	10	4	0	1	0	0	0	0	0
Totals	91.25	21	7	32	6	1	205	29.83	0
285C	12	16	3	0	0	0	26	2.14	0
285D	10.75	9	3	0	0	0	1	0.05	0
285E	24.5	50	4	1	0	0	1	0.21	1
285F	10	23	7	0	0	0	0	0	0
285G	10	2	0	1	0	0	0	0	0
285H	10	7	2	0	0	0	10	0.71	0
285J	21	4	0	0	0	0	1	0.02	0
285K	22.5	3	2	1	0	0	0	0	0
285L	10	2	1	0	0	0	0	0	0
Totals	130.75	116	22	3	0	0	39	3.13	1

APPENDIX 4

GARDENED CROP COUNTS BY LAYER

	Volume (L)	*Cucurbita maxima*	Cucurbitaceae Rind	*Phaseolus* sp.	*Vigna* sp.
281C	10	0	0	0	0
281D	20.25	0	0	0	0
281E	10	0	8	0	0
281F	10	0	0	0	0
281G	11	0	0	0	0
281H	10	1	0	0	0
281J	10	0	0	0	0
281K	10	0	0	0	0
Totals	91.25	1	8	0	0
285C	12	0	0	0	1
285D	10.75	0	0	0	0
285E	24.5	0	0	3	0
285F	10	0	0	0	2
285G	10	0	0	0	0
285H	10	0	0	1	0
285J	21	0	0	0	0
285K	22.5	0	0	0	0
285L	10	0	0	0	0
Totals	130.75	0	0	4	3

APPENDIX 5

WILD FRUIT COUNTS BY LAYER

Feature/Level	Volume (L)	*Rubus* sp.	*Vaccinium* sp.	*Vitis* sp.	*Rhus* sp.	*Gleditsia triancanthos*
281C	10	0	0	0	0	0
281D	20.25	2	0	0	0	0
281E	10	0	0	0	0	0
281F	10	0	0	0	0	0
281G	11	0	0	0	0	0
281H	10	0	0	0	0	0
281J	10	0	0	0	0	0
281K	10	0	0	0	0	0
Totals	91.25	2	0	0	0	0
285C	12	0	0	0	0	0
285D	10.75	0	0	0	3	0
285E	24.5	0	0	0	7	1
285F	10	0	1	1	3	0
285G	10	0	1	0	0	0
285H	10	0	2	0	0	0
285J	21	0	1	0	0	0
285K	22.5	0	0	0	0	0
285L	10	0	1	0	0	0
Totals	130.75	0	6	1	13	1

APPENDIX 6
WILD EDIBLE WEEDS/GRASSES COUNTS BY LAYER

Feature/ Level	Volume (L)	*Rumex crispus*	*Rumex* sp.	*Polygonum* sp.	*Chenopodium* sp.	*Portulaca* sp.	c.f. *Salvia*	*Mentha* sp.	*Panicum* sp.
281C	10	1	0	0	1	0	0	0	2
281D	20.25	0	0	24	7	1	0	0	11
281E	10	0	0	8	14	2	0	0	26
281F	10	2	0	16	4	2	1	0	14
281G	11	1	0	16	4	5	0	0	19
281H	10	0	5	33	42	6	0	1	5
281J	10	0	0	0	5	0	0	0	1
281K	10	0	0	0	5	0	0	0	0
Totals	91.25	4	5	97	82	16	1	1	78
285C	12	0	1	1	5	0	0	0	0
285D	10.75	0	1	1	5	0	0	0	0
285E	24.5	0	0	0	2	1	0	0	0
285F	10	0	0	0	0	0	0	0	0
285G	10	0	0	1	0	0	0	0	0
285H	10	0	0	1	0	0	0	0	0
285J	21	0	0	0	0	0	0	0	0
285K	22.5	0	0	0	1	0	0	0	0
285L	10	0	0	0	0	0	0	0	0
Totals	130.75	0	2	4	13	1	0	0	0

APPENDIX 7

NUTSHELL COUNTS BY LAYER

		Quercus sp.		*Castanea* sp.		*Carya* sp.		*Juglans nigra*		Juglandaceae	
Feature/Level	Volume (L)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)
281C	10	0	0	0	0	0	0	0	0	0	0
281D	20.25	0	0	0	0	0	0	0	0	51	2.27
281E	10	0	0	0	0	0	0	0	0	42	1.31
281F	10	2	0.05	0	0	0	0	0	0	13	0.3
281G	11	0	0	1	0.05	0	0	0	0	38	0.77
281H	10	0	0	0	0	0	0	5	0.27	4	0.11
281J	10	0	0	0	0	0	0	2	0.06	3	0.15
281K	10	0	0	0	0	0	0	0	0	0	0
Totals	91.25	2	0.05	1	0.05	0	0	7	0.33	151	4.91
285C	12	0	0	0	0	0	0	1	0.11	0	0
285D	10.75	0	0	0	0	0	0	0	0	0	0
285E	24.5	0	0	0	0	0	0	0	0	1	<0.01
285F	10	0	0	0	0	0	0	0	0	6	0.06
285G	10	0	0	0	0	1	0.04	0	0	2	0.03
285H	10	0	0	0	0	0	0	0	0	0	0
285J	21	0	0	0	0	0	0	0	0	0	0
285K	22.5	0	0	0	0	0	0	0	0	0	0
285L	10	0	0	0	0	0	0	0	0	0	0
Totals	130.75	0	0	0	0	1	0.04	1	0.11	9	0.09

APPENDIX 8
NON-ECONOMIC PLANTS COUNTS BY LAYER

Feature/Level	Volume (L)	Poaceae	*Eleusine indica*	*Lathyrus* sp.	*Trifolium* sp.	c.f. *Spergula*	*Oxalis stricta*
281C	10	47	0	0	0	0	2
281D	20.25	551	0	0	0	0	1
281E	10	589	0	0	0	0	1
281F	10	476	0	0	0	0	0
281G	11	769	0	0	0	0	1
281H	10	733	0	0	0	1	0
281J	10	143	0	0	0	0	0
281K	10	14	0	0	0	0	0
Totals	91.25	3322	0	0	0	1	5
285C	12	1	0	0	1	0	0
285D	10.75	3	2	1	0	0	0
285E	24.5	8	0	0	0	0	0
285F	10	0	0	0	0	0	0
285G	10	0	0	0	0	0	0
285H	10	7	0	0	0	0	0
285J	21	2	0	0	0	0	0
285K	22.5	1	0	0	0	0	0
285L	10	1	0	0	0	0	0
Totals	130.75	23	2	1	1	0	0

APPENDIX 9

CHARRED WOOD COUNTS AND WEIGHTS BY LAYER (I)

		Quercus sp.		*Castanea* sp.		*Carya* sp.		*Gymnocladus dioicus*	
Feature/Level	Volume (L)	Count	Weight	Count	Weight	Count	Weight	Count	Weight
281C	10	37	3.54	0	0	0	0	0	0
281D	20.25	111	3.35	1	0.13	2	0.09	4	0.07
281E	10	92	5.87	0	0	0	0	1	0.001
281F	10	96	9.15	0	0	0	0	0	0
281G	11	110	6.82	0	0	0	0	0	0
281H	10	80	6.74	0	0	0	0	7	0.25
281J	10	32	0.74	0	0	3	0.06	0	0
281K	10	59	2.33	0	0	2	0.1	1	0.05
Totals	91.25	617	38.54	1	0.13	7	0.25	13	0.371
285C	12	79	3.16	0	0	3	0.14	0	0
285D	10.75	88	6.32	0	0	10	0.63	0	0
285E	24.5	161	9.56	0	0	11	0.77	1	0.04
285F	10	57	3.91	0	0	3	0.68	2	0.15
285G	10	34	1.4	0	0	2	0.16	46	1.63
285H	10	58	3.02	0	0	3	0.26	15	0.58
285J	21	157	5.76	0	0	13	0.23	0	0
285K	22.5	124	4.43	0	0	8	0.19	2	0.04
285L	10	14	0.2	0	0	0	0	0	0
Totals	130.75	772	37.76	0	0	53	3.06	66	2.44

APPENDIX 10
CHARRED WOOD COUNTS AND WEIGHTS BY LAYER (II)

		Acer sp.		*Liriodrendron tulipfer*a		*Pinus* sp.	
Feature/Level	Volume (L)	Count	Weight	Count	Weight	Count	Weight
281C	10	0	0	0	0	0	0
281D	20.25	0	0	0	0	0	0
281E	10	0	0	0	0	1	0.001
281F	10	0	0	0	0	0	0
281G	11	0	0	0	0	0	0
281H	10	0	0	0	0	0	0
281J	10	0	0	0	0	0	0
281K	10	1	0.05	0	0	4	0.09
Totals	91.25	1	0.05	0	0	5	0.091
285C	12	0	0	0	0	0	0
285D	10.75	0	0	0	0	1	0.04
285E	24.5	0	0	0	0	1	0.03
285F	10	0	0	0	0	0	0
285G	10	2	0.05	0	0	0	0
285H	10	1	0.001	0	0	0	0
285J	21	1	0.001	0	0	2	0.02
285K	22.5	2	0.02	1	0.04	0	0
285L	10	0	0	0	0	0	0
Totals	130.75	6	0.072	1	0.04	4	0.09

APPENDIX 11

CHARRED WOOD COUNTS AND WEIGHTS BY LAYER (III)

		Ring-Porous		Diffuse-Porous		Hardwood	
Feature/Level	Volume (L)	Count	Weight	Count	Weight	Count	Weight
281C	10	13	0.071	1	0.001	2	0.001
281D	20.25	45	0.48	26	0.53	5	0.03
281E	10	15	0.3	3	0.02	0	0
281F	10	3	0.11	1	0.05	0	0
281G	11	15	0.22	0	0	0	0
281H	10	12	0.22	0	0	1	0.01
281J	10	55	0.44	0	0	8	0.01
281K	10	32	0.48	0	0	1	0.002
Totals	91.25	190	2.321	31	0.601	17	0.053
285C	12	15	0.19	3	0.3	0	0
285D	10.75	26	1.13	0	0	0	0
285E	24.5	74	3.08	2	0.1	0	0
285F	10	13	0.79	0	0	0	0
285G	10	16	0.45	0	0	0	0
285H	10	17	0.88	0	0	5	0.2
285J	21	97	1.26	1	0.001	4	0.08
285K	22.5	83	1.88	0	0	4	0.07
285L	10	41	0.2	0	0	7	0.011
Totals	130.75	382	9.86	6	0.401	20	0.361

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