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A Macrobotanical Analysis of Native American Maize Agriculture at the Smith's Point Site

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A MACROBOTANICAL ANALYSIS OF NATIVE AMERICAN MAIZE AGRICULTURE AT THE SMITH'S POINT SITE

A Thesis Presented

by

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ABSTRACT

A MACROBOTANICAL ANALYSIS OF NATIVE AMERICAN MAIZE AGRICULTURE AT THE SMITH'S POINT SITE

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The Smith's Point site was a seasonally inhabited Native American encampment in Yarmouth, Massachusetts occupied from the Middle Woodland through the early Colonial periods. Excavations at the site in the early 1990s yielded the remains of a multi-component site including both an agricultural field and an adjacent living area. The macrobotanical remains from the agricultural and living area features were examined for this thesis project in order to investigate subsistence practices at the site. The findings show that Native Americans actively shaped these ecological niches for purposes such as maintaining and improving their subsistence base. These landscape management activities included field burning and maize agriculture.

Beginning with 16th and 17th century European settler's and explorer's written accounts of New England, the "New World" has often been described as a pristine wilderness in which Native Americans play a passive role. In fact, as the Smith's Point site macrobotanical data indicate, Native Americans were actively and perpetually altering their ecosystems. Therefore, I conclude that past landscapes at the site were not pristine wilderness but rather culturally constructed niches.

These macrobotanical data also lend insights into social dynamics at the site, specifically women's roles in shaping these landscapes. As women were the primary inhabitants, farmers, wild plant managers, and shellfishers at the site, their cumulative niche-construction activities not only nourished the community but also made a measurable impact upon the landscape and indicate horticultural innovation over time. The social dimension of this thesis research is particularly valuable because it dovetails well with previous Smith's Point site investigations of gender relations, individual agency, and the landscape.

Lastly, the use of radiocarbon dating on charred maize and bayberry remains from the agricultural field helped to pinpoint landscape management events at the site. The results suggest a Middle Woodland landscape-clearing event that enriched soil fertility and promoted wild edible plant growth. Agricultural remains dating to the 17th century A.D. suggest inhabitants expanded subsistence practices at Smith's Point over time, adding agriculture to their well-established seasonal round.

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CHAPTER 1

INTRODUCTION

In July 1524, European explorer Giovanni da Verrazano visited Cape Cod and wrote of the Native Americans who lived there: "their food, as far as we could judge by several visits to their dwellings, is obtained by hunting and fishing, and certain fruits, which are a sort of root of *spontaneous growth*" (in Winship 1968:21, emphasis added). The notion that edible plant resources utilized by Native New Englanders were the result of "spontaneous growth" rather than the result of intentional plant management and niche construction practices was common among 16th and 17th century European explorers and settlers in the region (see Winship 1968; Wood 1977). Bragdon (1996:15-16) writes that European authors did not understand the full extent of Native American subsistence and niche construction practices in Early Colonial New England because their cultural expectations about land use, land ownership, agriculture, and subsistence practices clashed with the landscapes they observed in New England. For instance, European explorers and settlers expected to find land management practices in the New World akin to those of Europe, such as the use of fields, fences, and permanent settlements (Bragdon 1996; Cronon 1983). Where there was an absence of these European-style land management practices in New England, European observers described the landscape as unmanaged and naturally abundant in resources (Bragdon 1996; Calloway 1997). However, Native American managed landscapes were characterized by different criteria, such as a “patchwork” of areas in differing stages of re-growth (Cronon 1983) that created environmental niches favorable to hunting, farming and foraging, and European writers often did not credit Native Americans for actively shaping these landscapes. Alternatively, some researchers have argued that the role of Native Americans in creating the Late Woodland-Early Colonial landscape in New England was consciously downplayed or omitted from 16th and 17th century European documentary accounts as means of pro-colonial rhetoric (Bragdon 1996; Calloway 1997).

Regardless of the intentions behind 16th and 17th century accounts of the New England landscape, these written descriptions paint a picture of wilderness and effortless abundance in New England (Krech 1999). Yet, implicit in historical accounts of “pristine” nature in New England during the 16th and 17th centuries is the notion that prior to European exploration in the area Native American groups had no noticeable impact on their ecosystems (a period spanning many millennia). According to historian Krech (1999), this concept of a pre-Colonial “Ecological Indian” population that lived “as one” with the environment is oversimplified and inaccurate. Krech (1999:75) asks,

> How can America be simultaneously paradise seemingly untouched by human hands and…inhabited by people who, prior to the arrival of Europeans, exploited lands and animals in order to live, cut down forests for fuel and arable land, and perhaps oversalinated fields and helped animals to an early demise?

Clearly the dichotomies of landscape management presented in the documentary literature (pre-colonial/colonial, natural/cultural, pristine/managed, passive/active) are inadequate for exploring Native American subsistence practices in the Northeast.

With this research project I reject the use of these dichotomies as a means to explore the complexities of the landscape European explorers and settlers encountered during the Early Colonial period in New England. Using archaeological data, this analysis demonstrates that these landscapes were not pristine wilderness, but culturally constructed niches. In contrast to the 16th and 17th century written accounts, my findings show that Native Americans actively shaped these ecological niches for purposes such as maintaining and improving their subsistence base. More specifically, I use macrobotanical remains from the Smith's Point site as a case study in order to investigate ecosystem management on a micro scale—that of Native American seasonal subsistence practices at a coastal Cape Cod encampment during the Woodland and Early Colonial periods. These data also lend insights into social dynamics at the site, specifically women's roles in shaping these landscapes. This dimension is particularly valuable because it dovetails well with previous Smith's Point site investigations of gender relations, individual agency, and the landscape.

Site Overview

The Smith's Point site is a seasonally inhabited site on the southern coast of Cape Cod, Massachusetts that was host to a number of different Native American subsistence activities such as fishing, farming, and foraging for wild edible plants from the Middle Woodland up through the 17th century. An agricultural field excavated at the site is one of the only Early Colonial Native farming features ever recovered in New England (Mrozowski 1993:2). As a result, this thesis presents one of the first macrobotanical studies of maize agriculture in Early Colonial period New England to assess remains from farming features. In this way, my research provides a new perspective on the debates over Native American maize agriculture in southern New England. Through an analysis of the charred seed remains from both agricultural and living area features at the site, I address the following questions: How were Native American occupants of the site manipulating the environment to increase food supplies? More specifically, what wild and domesticated plants did they utilize on the site, and what do the presence of these plants indicate about their diet and subsistence practices? Were residents of the site enriching their fields with midden soils or by burning overgrowth? Lastly, does analysis of the corn hill macrobotanical remains resolve chronological questions about the site's two field areas?

Structure of Thesis

In Chapter Two, I provide a thematic overview of the documentary record and current scholarly research relating to southern New England Native farmers and Native American agricultural practices. I begin with a presentation of the 16th and 17th century European explorer and colonist written accounts of Native American plant-based foods and subsistence practices in topical sections. I follow the documentary overview with a discussion of recent contributions from historians and archaeologists concerning the same topics, exploring scholarly debates and contrasting interpretations of the available archaeological data. It is upon these sources that I draw to provide context, comparison, and contrast to this macrobotanical analysis at the Smith's Point site.

Chapter Three provides site-level description of the Smith's Point site archaeological project. This site background includes detailed information about the archaeological excavations, including descriptions of the features I examined for this research project. In Chapter Four, I outline my thesis research project. I begin with an overview of the soil sampling and processing procedure. I then describe the methods used for this assessment of the charred botanical remains from these soil samples. I conclude the chapter with a discussion of results from the macrobotanical assessment and data analysis.

In the interpretation and conclusion (Chapter Five), I draw upon the documentary, scholarly, and archaeological site material discussed in previous chapters to formulate interpretations from the macrobotanical analysis results. Using Malpiedi's and Howlett's site research as a comparison, I discuss the larger social implications of the results in terms of landscape management, individual agency, and gender at the Smith's Point site. In the conclusion, I return to the notion of the "Ecological Indian." I compare the documentary descriptions of pristine wilderness with the archaeological interpretations of seasonal subsistence activities at the Smith's Point site to conclude that Native Americans in New England during the Woodland and Early Colonial periods played an active role in shaping their ecosystems to maintain and increase food yields.

CHAPTER 2

HISTORICAL AND ARCHAEOLOGICAL CONTEXT

Two types of sources exist that deal with the Native people of southern New England during the Late Woodland and Early Colonial periods: 16^{th} and 17^{th} century European accounts, and modern scholarly research. In this chapter, I provide a brief overview of European accounts of Native New England. I then discuss the ways in which recent archaeological and ethnographic research complements, contradicts, and reinterprets these early accounts.

Historical European Sources

During the 16^{th} and 17^{th} centuries, European interest in the New World, fueled by a desire to locate economically valuable resources, sparked European investors to sponsor the exploration and settlement of North America (Allen 1992:500). These explorers cataloged resources valued by Europeans, and noted details about coastal areas such as climate, perceived soil fertility, flora and fauna, and current inhabitants, that would be useful in deciding where to set up exportation outposts on the continent (Allen 1992:500). Several of these European explorers visited coastal New England near the Smith's Point site during their voyages (Mrozowski 1994). Beginning in the 17^{th} century, Europeans began establishing settlements in southern New England. The early written accounts by these European settlers were aimed at encouraging further settlement and investment in the New World projects (Heath 1963:xi,xv).

As with any historical documents, these sources cannot be used uncritically. Eager to please their benefactors with tales of abundance and fertility in pristine condition, European writers in the New World may have exaggerated or falsified some of their observations (Heath 1963:xv). In addition, many explorers and colonists may not have had the time or the expertise to represent a complete and accurate account of Native seasonal land-use practices in their writing (see Vaughn in Wood 1977:7). However, despite their inaccuracies, these first-hand accounts may provide insight into the Smith's Point landscape during this period and the ways in which residents of the site utilized and manipulated its flora for food.

Site Layout

Several European written accounts of Native American seasonal farming encampments like Smith's Point describe details about site layout. The most commonly cited detail about the Native farm site landscape is that agricultural fields were adjacent to circular house structures called "wetus". The earliest account comes from 16th-century explorer Giovanni da Verrazano, who sailed the coast of New England, spending 15 days among the Native people of Narragansett Bay, south of Smith's Pont, in 1524 (Mrozowski 1993:10). He noted of their land that it was "adapted to cultivation of every kind" and nearby, "their dwellings, which are of a circular form, [are] about ten or twelve paces in circumference" (Verrazano cited in Winship 1968:18). British explorer Martin Pring noted the same in 1603 and wrote, "passing up a River we saw certaine Cottages together…and not farre off we beheld their Gardens and one among the rest of an Acre of ground" (Pring cited in Winship 1968:58-59). Samuel de Champlain visited Cape Cod in several voyages during 1605 and 1606 and kept detailed written and visual descriptions of his observations (Winship 1968:85). Among these observations are the following: "we found the place very spacious…entirely surrounded by little houses, around each one of which there as much land as the occupant needed for his support" (Champlain cited in Winship 1968:86-87). Champlain's map of Nauset Harbor on Cape Cod (Figure 1) illustrates how he saw and interpreted the local Native American farming landscape.

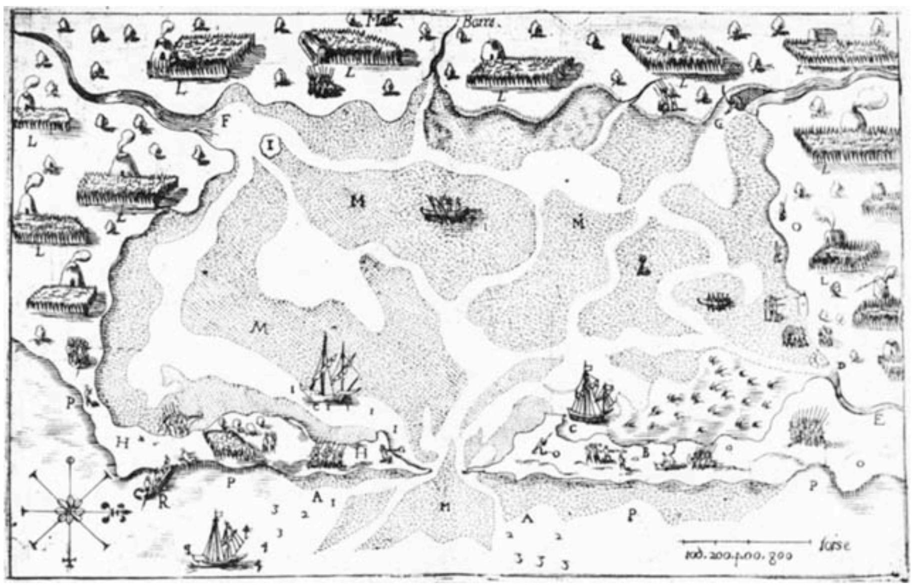

Figure 1. "Malle Barre," Samuel de Champlain's 1612 engraving of Nauset Harbor on Cape Cod depicting Native American agricultural fields and wetus. (Courtesy of the John Carter Brown Library, Brown University).

Farming Techniques

In addition to the landscape of Native American farm sites, farming techniques received attention from European observers in the 17th century. First, these writers noted that, unlike the European tradition, Native farmers did not use draft animals to plow and fertilize their fields. In *Good Newes from New England*, Edward Winslow mentions what he sees as the labor-intensive nature of Native farming, specifying that planting, weeding, and harvesting tasks are performed by hand (Winslow 1996:63).

A second detail of Native farming noted in the written documents is that tilling and weeding were performed using wood and shell tools. Samuel de Champlain mentions the use of "wooden spades" by Native farmers in 1605 and 1606 (Winship 1968: 87-88). In *New Englands Prospect*, William Wood describes how the Native people of southern New England use clamshells to "scrape up" the ground in their fields to keep these fields, "so clear with their clamshell hoes as if it were a garden rather than a corn field" (1977:96,113). Roger Williams also describes this practice among the Native farmers of southern New England. In *A Key into the Language of America*, Williams writes, "the Indian Women to this day…doe use their naturall Howes of Shells and Wood" (1973:171).

Finally, European explorers and colonists described how Native farmers formed their fields in numerous mounded hills, in which they planted their maize kernels. For example, in *Mourt's Relation*, the men note that Native farmers grow maize "on heaps", or mounds, in their fields (Heath 1963:79). William Wood (1977:89) also notes how Europeans learned from Native American farmers in southern New England "fit measure for hills" in their maize fields, as well as planting, weeding, and harvesting these crops by hand.

Crops and Wild Edibles

European explorers and colonists during the 16th and 17th centuries often noted the crops grown by Native farmers in their fields, as well as the wild edibles growing nearby. Giovanni da Verrazano notes that Native Americans in Narragansett Bay were growing "pulse", as well as "apples, plumbs, filberts, and many other fruits" (Verrazano in Winship 1968:18-19). Although Verrazzano's use of the word "pulse" is indistinct, researchers have argued that he was most likely describing maize or bean crops (Largy and Morenon 2008:77; Mrozowski 1993:11). Later in the document, he paints a contrasting picture of the Cape Cod area: “we saw no signs of cultivation; the land apparently sterile and unfit for growing of fruit or grain of any kind” (Verrazano in Winship 1968:21).

Although John Brereton (Winship 1968: 48-49) notes “Tobacco, excellent sweet and strong” as well as “Vines in more plenty than in France” during the Bartholomew Gosnold and Bartholomew Gilbert expedition to southern New England in 1602, he does not explicitly state whether these crops were growing in agricultural fields. In his tally he also includes walnut, hazelnut, and cherry trees, as well as groundnuts, several varieties of berries, and wild peas (Winship 1968: 48-49). The cherry trees Brereton described were likely a wild species native to North America such as the black cherry (*Prunus serotina*) and not the introduced sour cherry (*Prunus cerasus*).

Unlike Verrazano and Brereton whose descriptions of Native farming in southern New England are ambiguous, explorers Martin Pring and Samuel de Champlain clearly describe polycropped agricultural fields in the area during the period of 1603-1606. Pring notes the following crops in his account: “Tobacco, Pompions, Cowcumbers, and such like; and some of the people had Maiz or *Indian* Wheate among them. In the folds we found wild Pease, Strawberries…Gooseberries, [Raspberries]…and other wild fruits” (Pring in Winship 1968: 58-59, emphasis in original). Champlain describes similar crops in the fields near Nauset Harbor on Cape Cod:

> …we entered a field planted with Indian corn…we saw many Brazilian beans, and many squashes of various sizes, very good for eating; some tobacco, and roots which they cultivate, the latter having the taste of an artichoke (Champlain in Winship 1968:87).

The roots Champlain identifies here are Jerusalem artichokes (*Helianthus tuberosus*), and indicate that weedy plants were encouraged in fields alongside crops such as maize and beans.

European colonists such as Edward Winslow, William Wood, and the authors of *Mourt's Relation* all state that maize was a primary and prevalent crop for Native farmers in southern New England during the 17^{th} century. As Winslow (1996:68) notes, "the chiefest grain is Indian mays, or Guinea wheat." The early Pilgrim explorations of Native agricultural fields on Cape Cod are detailed in *Mourt's Relation*, and which included the following entry: "we went on further and found new stubble, of which they had gotten corn this year, and many walnut trees full of nuts, and great store of strawberries, and some vines" (Heath 1963:21). Additional plants grown or gathered nearby include beans and acorns, which the group found stored in a pit close to the field (Heath 1963:26,34).

Williams also provides details about which crops and wild plants Native people used for food in the 17^{th} century. His list includes "chesnutts", "akornes", and "walnuts", cherries, berries, wild grapes, violet leaves, "corne", "beanes" and squash (1973:168-172).

Use of Fertilizer

In many cases European descriptions of Native farming focus primarily on the crops grown and, as a result, provide little detail on the farmers themselves or the techniques they were using. However, two main fertilization strategies do appear in the documentary record during the 17th century. The first strategy is the use of ash as fertilizer. Champlain describes this process in his account of Native farming on Cape Cod. He writes, "There were also several fields entirely uncultivated, the land being allowed to remain fallow. When they wished to plant it, they set fire to the weeds, and then work it over with their wooden spades" (Champlain in Winship 1968:87-88).

A second fertilizer, which first appears in the colonial accounts of Native farming techniques, is fish. In *Mourt's Relation*, the colonists write that, "according to the manner of the Indians, we manuered our [agricultural fields] with herrings" (Heath 1963:82). Winslow (1996:68) also describes the widespread use of fish fertilizer by both Native American and European farmers in southern New England, where the supply of fish was sufficient. However, he also notes that "in some places, where [fish] cannot be taken with ease in such abundance, the Indians set four years together without [fish fertilizer], and have as good corn or better than we have that set with them (Winslow 1996:68). It is unclear from this statement whether the farmer was using another type of fertilizer or not and what actions the farmer would take toward the field after the four fertile farming years. Wood, in *New Englands Prospect*, also mentions the use of fish fertilizer as a means of increasing yields of maize and extending the productivity of the fields, and he notes that this technique was not unknown to English farmers in the Old World (Wood 1977:39).

Storage and Use of Plants as Food

The European documentary sources describe southern New England Native farmers during the 17th century growing and gathering a surplus of plants that they would dry and store for later months. The storage technique described in the written record is to place dried plants in baskets, which are then buried in pits near the agricultural fields and sometimes secured with heavy rocks or logs. In *Mourt's Relation*, the colonists describe excavating such a storage pit, "there was also a heap of sand…which we digged up, and in it we found a little old basket full of fair Indian corn, and digged further and found a fine great new basket full of very fair corn of this year, some some thirty-six goodly ears of corn," and later, "digged and found more corn, viz. 2 or 3 baskets full of Indian wheat [maize], and a bag of beans, with a good many of fair wheat ears…a little further we found two baskets full of parched acorns hid in the ground" (Heathy 1963:21,26,34). Wood also includes a long description of the use of such storage pits in *New Englands Prospect*:

> Their corn being ripe they gather it, and drying it hard in the sun convey it to their barnes, which be great holes digged in the ground in the form of a brass pot, sealed with rinds of trees, where in they put their corn…But our hogs having found a way to unhinge their barn doors and rob their gardeners, [Native farmers]…roll the bodies of trees over their holes to prevent these pioneers (Wood 1977:113).

European colonists sometimes had occasion also to write about the ways in which southern New England Native peoples incorporated these plants into their diets. For example, the men of *Mourt's Relation* write about Native American food including "a kind of bread called by them maizium" made of maize, along with fish and "boiled musty acorns" (Heath 1963:62). Winslow (1996:35) also describes being served maize by his Native American neighbors: "I caused a woman to bruise some corn, and take flour from it, and set it over the grit, or broken corn, in a pipkin." However, the most extensive descriptions of Native American diet in southern New England during the Early Colonial period come from William Wood. He wrote,

> In wintertime they have all manner of fouls of the water and of the land, and beasts of the land and water, pond-fish, with [catmint or catnip] and other roots, Indian beans, and clams. In the summer they have all manner of seafish, with all sorts of berries…They seldom or never make bread of their Indian corn, but seeth it whole like beans, eating 3 or 4 corns with a mouthful of fish or flesh, sometimes eating meat first and corns after, filling up the chinks with their broth (Wood 1977:86).

Wood (1977: 87) also writes about Native consumption of squash and pumpkin when the plants are in season, which he called "their best bread", and "nocake," a traveling food made out of powdered maize and water. Williams, too, notes the use of "No'Kehich", which he called a "readie very wholesome food" (1973:100).

Archaeological Sources

Within the last fifty years, archaeologists and historians have made many contributions to understandings of Native American subsistence practices in southern New England during the Woodland and Early Colonial periods. Through the study of archaeological sites and material, these researchers have been able to compare and contrast their data to the documentary record in order to create richer interpretations of the past. In this section, I provide a brief overview of recent archaeological and historical contributions on this topic.

Northeast Agriculture and Maize Adoption

Prior to the adoption of maize agriculture, Native groups in North America were "low-level food producers" (Hanselka 2010); their subsistence practices existed somewhere between the categories of foraging and agriculture. Low-level food producers practiced plant husbandry, and successfully domesticated a number of indigenous plants, while also relying heavily upon wild edible plant resources (Hanselka 2010; Smith 1992). Domesticated taxa common among low-level food producers include gourd/squash, goosefoot, sumpweed, maygrass, knotweed, little barley and sunflower, and are often collectively referred to as the "Eastern Agricultural Complex" (McConaughy 2008:9). Key to the low-level food production strategy was the ability to maintain a seasonally-mobile, hunter-gatherer lifestyle while cultivating these crops (Hanselka 2010).

Maize was domesticated in Mesoamerica and was first introduced in the American Southwest between 3000 and 4000 years ago (Ford 1978). Archaeological evidence indicates that the addition of maize agriculture to Native American subsistence practices occurred over several thousand years in North America, combining with—and in some places supplanting—the older indigenous-crop-based horticultural practices of these regions (Smith 1992). Maize adoption was not a radical shift for most native groups but rather an "accelerated expansion of a long-established annual cycle of plant husbandry" (Smith 1992:113). This gradual shift from low-level food production to an increasing reliance on domesticated plants and agricultural activity is often referred to as the "Era of Incipient Agriculture" (MacNeish 1964).

Many scholarly articles on southern New England Native farming during the Late Woodland and Early Colonial periods have focused on determining when maize agriculture became common among local Native people (for example, Ceci 1990a; Chilton 1999, 2005; Largy and Morenon 2008; Little 2002; Mrozowski 1993). Despite these efforts, there has been little agreement among archaeologists and historians about the proper chronology for maize adoption.

Although maize remains from the lower Hudson River region have dated to 1000 A.D. (Little 2002:116), many archaeologists have suggested that widespread participation in maize agriculture in southern New England began much later. Determining when maize agriculture was adopted in the area is difficult because few pre-Colonial agricultural features have been excavated in New England (Chilton 1999:157; Mrozowski 1993:10). As a result, archaeologists rely on the presence of maize remains at a site to indicate past agricultural activity in the area (e.g., Largy and Morenon 2008; Little 2002). Radiocarbon dating from sites yielding charred agricultural crop remains provides the basis for many of the chronological estimates for maize adoption in New England (Ceci 1990; Chilton 1999; Largy and Morenon 2008; Little 2002; Mrozowski 1993, 1994). However, even radiocarbon dates cannot always provide a clear-cut technique for determining farming adoption in the Northeast. Little (2002) has called into question the accuracy of radiocarbon dating related site material, arguing that the common practice of dating charcoal and shell associated with maize remains may yield dates varying by hundreds of years from the maize itself.

Other archaeologists rely primarily on the documentary record to indicate the emergence of maize agriculture (e.g., Chilton 1999, 2005). European explorer and colonist accounts of Native farming during the 16th and 17th centuries establish that by the Early Colonial period, Native farming in southern New England was commonplace (Winship 1968). While the documentary record provides details about the prevalence of maize agriculture in the Early-Colonial period, it cannot pinpoint the earliest use of maize agriculture in the region.

The exact timeframe for maize adoption continues to be debated among archaeologists in the Northeast. Maize remains are rarely recovered from pre-Colonial sites in New England compared to that elsewhere in North America (Chilton 2008), which is a point of contention among archaeologists in the region. Although some researchers use this fact as evidence for maize adoption in the Colonial period (Chilton 1999, 2005), others argue that the absence of maize remains signals a lack of archaeological preservation rather than an absence of pre-Colonial maize agriculture in New England (Largy and Morenon 2008; Little 2002). Despite their disagreements over the exact date of maize adoption in New England, most researchers agree that many Native people in southern New England began farming between 1200 A.D. and 1600 A.D. (Bragdon 1996; Dunford and O'Brien 1997; Largy and Morenon 2008; Little 2002; Little and Schoeninger 1995; Mrozowski 1993).

Diet

The archaeological recovery of food remains at southern New England Late Woodland-Early Colonial period sites has lead to a number of studies on Native diet, including research of plant remains from these sites (Bendremer and Thomas 2008; Bernstein 1990; Chilton 1999, 2005, 2008; Largy and Morenon 2008; Little 2002; Little and Schoeninger 1995; Mrozowski 1993, 1994). Research on archaeological plant remains has identified plants included in Native diet and has also examined the role of plant resources in Native American subsistence strategies during this period.

The three agricultural crops that appear most frequently in the Late Woodland and Early Colonial period sites assemblages in the Northeast are maize, beans and, to a lesser extent, squash (Bendremer and Thomas 2008; Chilton 1999; Hart 2008; Largy and Morenon 2008; Little 2002; Mrozowski 1993, 1994). Often collectively called the "Three Sisters", maize, beans, and squash plants held—and continue to hold—great cultural significance for many local Native groups (Bendremer and Thomas 2008; Hart 2008; Little 2002). According to ethnohistorical accounts, these three crops were often inter-planted in agricultural fields (Bragdon 1996; Winship 1968). Some archaeologists have interpreted the presence of remains from maize along with beans or squash as evidence in support of this polycropping farming technique (e.g., Hart 2008; Little 2002). Recent research on the "Three Sisters" suggests that these crops, when grown together, would both increase yields and preserve soil fertility as compared to mono-cropping (Mt. Pleasant 2006:532-533). In addition to the agricultural benefits of "Three Sisters", when eaten together, these plants provide a diet of complementary and nutritionally important vitamins and minerals (Mt. Pleasant 2006:535).

Agricultural remains such as maize and beans are frequently recovered from Late Woodland and Early Colonial period sites in New England (Bendremer and Thomas 2008; Chilton 1999; Hart 2008; Largy and Morenon 2008; Little 2002; Mrozowski 1993, 1994). Such discoveries have led many scholars to consider the role of farming in Native American subsistence strategies. Most researchers agree that Native Americans in southern New England during the Woodland and Early Colonial periods had a varied diet that included agricultural and wild plants as well as animals (Bernstein 1990; Chilton 2005, 2008; Dunford and O'Brien 1997; Little and Schoeninger 1995; Mrozowski 1993; Mrozowski and Bragdon n.d.; Stein 2008).

Archaeologists studying Native American diet in Woodland and Early Colonial period New England have identified a number of wild plants commonly utilized as food among these indigenous groups (for example, Bendremer 1999; Bernstein 1999; Trigg and Bowes 2007). Bendremer (1999) and Bernstein's (1999) research combine paleoethnobotanical data from 62 sites in the greater New England region to create a clearer picture of these wild subsistence resources (Table 1). Archaeologically visible wild plant species include nuts (hickory, chestnut, hazelnut, walnut, and oak), fruits (bunchberry, strawberry, huckleberry, partridgeberry, plum/wild cherry, American plum, chokecherry, currant, sumac, blackberry/raspberry, elderberry, blueberry, cranberry, and grape), tubers (groundnut and Jerusalem artichoke), and weedy seed plants (goosefoot), among others (Bendremer 1999; Bernstein 1999; Trigg and Bowes 2007).

Table 1. Wild edible plant taxa identified in Woodland and Early Colonial period Native sites in New England.[*]

Scientific Name	Common Name
Amaranthus sp.	Pigweed
Apios apios	Groundnut
Carya sp.	Hickory
Castanea dentata	Chestnut
Chenopodium sp.	Goosefoot
Cornus canadensis	Bunchberry
Corylus sp.	Hazelnut
Crataegus sp.	Hawthorne
Crateagus tomentosa	Whitehorn Haws
Cyperus sp.	Sedge
Fagus grandfolia	Beechnut
Fragaria uesca americana	Strawberry
Galium sp.	Bedstraw
Gaylussacia sp.	Huckleberry
Helianthus tuberosa	Jerusalem Artichoke
Hordeum sp.	Little Barley
Impatiens sp.	Jewelweed
Juglans sp.	Walnut/Butternut
Juglans cinerea	Butternut
Juglans nigra	Black Walnut
Mitchella repens	Partridgeberry
Phytolacca sp.	Pokeweed
Polygonatum sp.	Solomon's Seal
Polygonum sp.	Smartweed
Prunus sp.	Plum/Wild Cherry
Prunus americana	American Plum
Prunus virginiana	Chokecherry
Quercus sp.	Oak
Ribes floridum	Black Currant
Ribes rubrum	Red Currant
Rhus sp.	Sumac
Rubus sp.	Raspberry/Blackberry
Sambucus sp.	Elderberry
Scirpus sp.	Bullrush
Solanum sp.	Nightshade
Vaccinium sp.	Blueberry
Vaccinium macrocarpon	Cranberry
Vitis sp.	Grape
Zizania aquatica	Wild Rice

*After Bernstein (1999) and Bendremer (1999).

Bragdon's (1996:83) archaeological research suggests that hunting, fishing, and gathering also remained primary to the Native American diet during the Late Woodland and Early Colonial periods. Similarly, Chilton (2008:54) describes maize agriculture as a supplement to, not a staple of, the hunting and gathering subsistence practices of Native New Englanders during this period. Carbon and nitrogen isotope tests on human remains from Late Woodland Nantucket bolster this interpretation, revealing that more than 50 percent of the local diet came from hunting and fishing, while only a small portion came from maize (Little and Schoeninger 1995). Therefore, while descriptions of Native American agriculture occupy a large portion of the European documentary accounts from the 16th and 17th centuries, archaeological and historical research suggests that agricultural foods played a relatively small role in overall subsistence strategies for Native Americans during this period (Bragdon 1996:37; Heath 1963; Winship 1968; Wood 1977). These studies situate Native Americans in New England within the Era of Incipient agriculture during the Late Woodland-Early Colonial period (Hanselka 2010). More than low-level food producers, these groups were beginning to incorporate maize agriculture into their subsistence strategies. However, like many other incipient agriculturalists throughout North America (Smith 1992), their adoption of maize agriculture did not severely alter their mobile hunter-fisher-gatherer subsistence strategies.

Mobility

According to Bragdon (1996:83), current research suggests that adding agriculture into their subsistence strategies did not change the overall seasonal mobility of Native groups in southern New England. Instead, these people were most likely "mobile farmers" (Chilton 2005:143-144), inhabiting agricultural lands during the growing season and moving to a different location during the rest of the year. The "mobile farmer" interpretation fits well with several 16th and 17th century historical accounts of Native American agricultural practices (see Heath 1963; Wood 1977).

Due to their reliance on hunting and gathering for part of their subsistence, Native American groups in southern New England during the Late Woodland-Early Colonial Period had to move their settlements seasonally to areas high in these resources (Cronon 1983). In the late spring through early fall months, small family groups moved toward cooler coastal areas (Cronon 1983; Dunford and O'Brien 1997; Williams 1973;). At these summer encampments, subsistence practices centered on hunting, fishing, foraging, and farming (Bendremer 1999; Cronon 1983). While these occupation areas provided a "home base" for its residents, men routinely hunted and fished abroad often for days at a time, while women remained nearby to gather wild edible plants, to farm, and to gather shellfish and lobster (Bragdon 1996; Howlett 2002). Each family group may have rotated among two or more summer encampment sites, allowing them to distribute their subsistence activities over a larger area (Cronon 1983; Hanselka 2010; Williams 1973). At the end of the summer and into the fall, women at the encampments harvested and dried food such a maize, beans, and nuts, placing them in baskets in grass-lined storage pits near their summer living areas (Bendremer et al. 1991; Bragdon 1996; Cronon 1983). After the harvest and through the winter months, the family groups moved away from the coast into warmer inland valley areas where they joined larger community settlements (Williams 1973; Bendremer 1999; Dunford and O'Brien 1997). Subsistence practices at winter encampments primarily focused on hunting and the consumption of the plant food stored during the summer and fall (Bendremer 1999; Cronon 1983).

Some archaeologists have suggested that inhabitants of coastal sites such as Smith's Point may have been more sedentary than inland groups because their diet was primarily based on nearby marine resources that were available year-round (Bragdon 1996:59; Mrozowski and Bragdon n.d.). However, archaeological evidence such as low artifact densities, indicating short duration inhabitations, and abundant, overlapping postholes, suggesting the periodic reuse of these sites to erect temporary wetu house structures, indicates that seasonal mobility was still an important practice among coastal Native American groups during the Late Woodland and Early Contact periods (Chilton 2005:145; Mrozowski 1993, 1994).

Farming Techniques

Another aspect of recent scholarly investigations about Native farming in New England during the Late Woodland and Early Colonial periods is farming techniques. These investigations have focused on three aspects of Native American farming: field organization, field fertility, and wild plant management.

As one of the few archeological sites in New England with Late Woodland-Early Colonial period agricultural features, Smith's Point is an asset for researchers interested in Native American farming techniques such as field organization (Mrozowski 1994). For example, the Smith's Point data provide information about the layout of agricultural fields that can be compared to the historical documentation on the topic. Excavation and remote sensing at the site indicated an agricultural field roughly 24 x 37 m (888 square meters) adjacent to a small living area (Mrozowski 1994:56), not dissimilar to the agricultural landscape illustrated in Champlain's 1613 map of nearby Nauset Harbor (Figure 1). However, the agricultural field at Smith's Point is much smaller than the fields described by Verrazzano in 1524 (Mrozowski and Bragdon n.d.:4-5). This discontinuity in the documentary and archaeological evidence may be a result of varying agricultural strategies within southern New England during the 16th and 17th centuries or inaccurate reporting on the part of some European explorers (Mrozowski and Bragdon n.d.:5).

The Smith's Point site planting hill features have also been useful for research of farming techniques in Early Colonial period southern New England. Planting mounds, or "corn hills," are frequently mentioned in the documentary record, as is the use of wooden or shell hoes (Heath 1963:79; Winship 1968:87-88; Wood 1977:89, 96, 113). Currie's micromorphological analysis of the agricultural fields at Smith's Point revealed that farmers were hoeing topsoil into planting mounds instead of seasonally plowing their fields (Currie 1994, 1999). The mounding technique helped to build up nutrient-rich soil in the mounds that would increase the fertility of the agricultural fields (Currie 1994, 1999).

In her research of modern-day corn hill farming, Mt. Pleasant (2006) has shown that the corn hill technique has many advantages over plowing. For example, plowing exposes large portions of a field to the air resulting in a loss of organic matter whereas mounding results in less exposure and therefore more fertile soils (Mt. Pleasant 2006:532). Also, mounding mitigates against the soil erosion common with plowing because it does not disturb as many plants that root the soil in place in the fields (Mt. Pleasant 2006:533). Therefore, recent research into the corn hill technique has confirmed ethnohistoric accounts of its practice among Native New Englanders and has also explored the agricultural benefits of this farming style.

The question of how Native farmers in southern New England prepared their fields for planting has been widely debated among archaeologists and historians. In fact, the documentary record is also conflicting and incomplete on this topic. For example, some European observers write that Native farmers did not enrich their agricultural fields at all (see Heath 1963; Winship 1968; Winslow 1996), whereas other observers described techniques such as field rotation, burning, and fish fertilizer among Native farmers (Ceci 1990b:40; Chilton 2008).

Burning is often cited among archaeologists and historians as a Native American fertilization technique during the Late Woodland and Early Colonial Periods (Bragdon 1996; Chilton 2005; Dunford and O'Brien 1997; Mrozowski 1994). In this technique, ground cover on fields is burned off prior to planting; creating nutrient-rich ash that increases the soil's fertility (Ceci 1990a, 1990b; Mrozowski and Bragdon n.d.). This technique could be combined with field rotation, where a field depleted of nutrients is left fallow for several seasons to replenish its nutrients (Bragdon 1996; Dunford and O'Brien 1997; Mrozowski 1993).

Another potential fertilization technique among Late Woodland and Early Colonial Period Native people in southern New England is the use of fish fertilizer. According to the "First Thanksgiving" legend, Tisquantum (Squanto), a Wampanoag Indian, saved the Pilgrims from starvation by showing them how to fertilize their maize crops with fish (Ceci 1990b, Mrozowski 1994:57). However, in 1975, Lynn Ceci argued that Squanto was not demonstrating a Native American practice, but was instead demonstrating a technique he had learned in England (Ceci 1975). Ceci (1990a) also calculated that fertilizing fields with fish would have required a great output of energy and a large number of fish, making the technique impractical for many farmers. Regardless of whether the practice was originally Native American or European, archaeologists and historians have argued that some Native farmers were using fish fertilizer during the 17th, and possibly also the 16th century (see Mrozowski 1993, 1994:57-58). Bragdon (1996:89) notes that, "while fish fertilizer might have been impractical in inland locations, it was perfectly feasible on the…Cape, where annual herring runs brought tons of fish literally to the doorstep of Native farmers."

Finally, wild plant management among Native American groups spans many thousands of years in North America, predating maize agriculture (Ford 1978). Native farmers in southern New England would have also been encouraging the growth of wild edible plants as part of their subsistence practices (Bragdon 1996:15-16, Bernstein 1990; Cronon 1983). As Hanselka (2010:in press) notes, "It is doubtful that people…made a strong distinction between domesticated and wild plant foods, but instead recognized that various resources required differing degrees of investment." By creating ecological niches (Smith 2009) that favored the growth of wild edible plant, Native groups encouraged the growth of these taxa. For example, because many wild edible plants such as goosefoot, blackberry/raspberry, bedstraw, and bayberry are early successional species that prefer open, disturbed landscapes, Native burning of landscapes would create niches favorable to the growth of these plants (Cronon 1983; Bragdon 1996:15-16,122; Gucker 2005; Hauser 2006; Smith 2009).

Summary Conclusions

The European documentary sources as well as recent scholarly research on the topic of Late Woodland-Early Colonial period Native farmers provide a body of information with which to compare my thesis research. However, these sources often present conflicting accounts of the past. For example, the historical documents and scholarly research present a spectrum of different strategies for maintaining the fertility of an agricultural field from not fertilizing at all to the labor-intensive use of fish as fertilizer. Through the analysis of the macrobotanical remains at the Smith's Point site, I will explore how these observations and interpretations correspond with or diverge from the practices of the Native American inhabitants of the Smith's Point site during the Late Woodland and Early Colonial periods.

CHAPTER 3

THE SMITH'S POINT SITE

The Smith's Point site is located on a small Cape Cod peninsula in Yarmouth, Massachusetts, that extends out into Lewis Bay (Figure 2). In this chapter, I provide an overview of the Smith's Point archaeological project and its archaeological features.

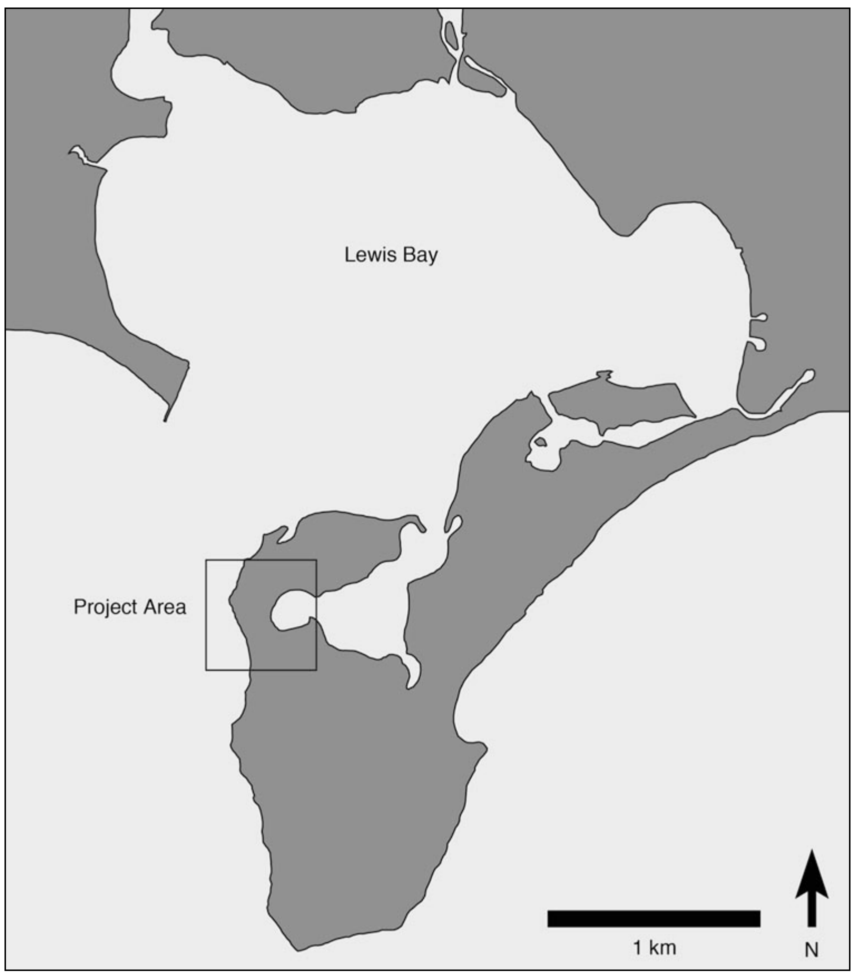

Figure 2. Map of Smith's Point site area.

Archaeological investigations at the Smith's Point site began in 1990 by the Public Archaeology Laboratory, Inc. (PAL) as part of a cultural resource management survey (PAL 1991:1). During 1990 and 1991, the PAL field crew excavated 74 50-x-50 cm test pits and 23 1-x-1 m excavation units across the site (PAL 1991:2). The cultural material and features recovered indicated a multi-component site with occupation areas spanning from the Transitional Archaic Period (3,600-2,500 B. P.) to the Early Colonial Period (450-300 B. P.) (PAL 1991:6). Material dating to the Late Woodland period (1000-450 B. P.) was widespread across the site and was related in two areas with early 17th century European-manufactured goods such as white clay pipe stem fragments and tin-enameled earthenware (Mrozowski 1994:1; PAL 1991:6).

A large shell midden was uncovered during excavation surrounding a glacial erratic on the site. This midden contained artifacts dating to the Late Woodland period, as well as remains from a variety of different shellfish (Mrozowski 1994:48; PAL 1991:5). Radiocarbon testing of sample of charcoal and shell from the midden produced dates of 860 ± 70 B. P. (BETA 44991) and 930 ± 60 B. P. (BETA 44990), respectively (Mrozowski 1994:48). These radiocarbon dates are consistent with a Late Woodland deposition.

A small mound was also uncovered during the cultural resource management survey, which was interpreted as a possible planting mound or "corn hill" (PAL 1991:4). Nearby post hole features may be the remnants of a "crow's nest" structure that, according to ethnohistorical accounts (Harriott 1972:68, Williams 1973:163), would have been erected in a Native American agricultural field (Mrozowski 1994:48).

Excavation continued at Smith's Point during the summer of 1991 with a combined team of archaeologists from PAL and the University of Massachusetts Boston. The goal of this fieldwork was to expand excavation of the Late Woodland-Early Colonial Period components of the site. The previous discovery of a corn hill feature on part of the site suggested that expanded excavation in the area might reveal remains of an agricultural field (Mrozowski 1994:48). Small 1 x 1 m excavation units would not provide enough horizontal coverage to identify a field of corn hills, so an open-area excavation strategy was implemented for the 1991 University of Massachusetts Boston field season. Two 6 x 6 m units were excavated over this area in 5 cm arbitrary levels within stratigraphic layers (Mrozowski 1994:48-49). Rows of approximately 40 hill features were uncovered in these units, ranging in size from 70 to 90 cm in diameter and spaced roughly 1 m apart (Figure 3, Mrozowski 1994:49; Mrozowski and Bragdon, n.d.:8). A 100 percent sample of 20 of the corn hill features was removed for later macrobotanical analysis (Mrozowski and Bragdon n.d.:8). Additional exploratory trenches were added in order to determine the overall size of the agricultural field area (Mrozowski 1994:49). Based on these excavations, the agricultural field size was estimated to be approximately 12 x 12 m (144 square meters) (Mrozowski 1994:49).

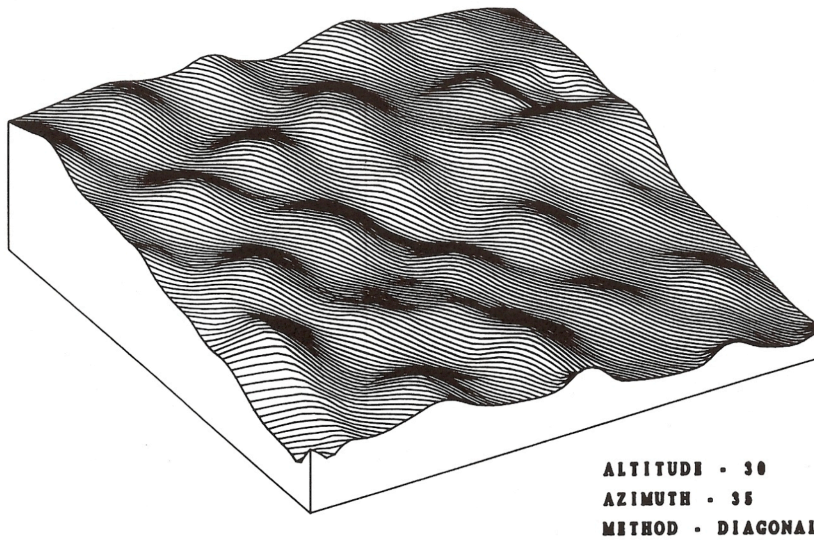

Figure 3. A three-dimensional contour map of one 6 x 6 meter unit at the Smith's Point site showing corn hill distribution. (Courtesy of Fiske Center, University of Massachusetts Boston).

Excavation was also expanded in the area where previous excavation had identified a large shell midden during the 1991 season. Fifteen soil samples were taken from the midden (Feature 29) for macrobotanical analysis.

Prior to the 1992 field season at the Smith's Point site, staff of the Barnstable Office of the United States Department of Agriculture, Soil Conservation Service conducted ground penetrating radar (GPR) investigations on the Late Woodland-Early Colonial Period component of the site (Mrozowski 1994:49). The GPR results indicated a second area of hills to the north of the previously excavated field (Mrozowski 1994:50). Excavating this second field area of the Smith's Point site became a focus of the 1992 field school in environmental archaeology conducted by students and faculty from the University of Massachusetts Boston (Figure 4, Mrozowski 1994:49). Approximate 20 additional corn hills were uncovered in two 6-x-6 m units during the field school. The

GPR data along with the locations of the excavated corn hills increases the estimated extent of the agricultural field to 24 x 37 m (888 square meters) (Mrozowski 1994:56).

During the field season, epoxy resin was applied to two bisected corn hills and valleys from the site in order to create thin section for micromorphological analysis (Currie 1994:65). Soil samples were also collected from each new feature, including the corn hills, post holes, and soil stains, for macrobotanical analysis.

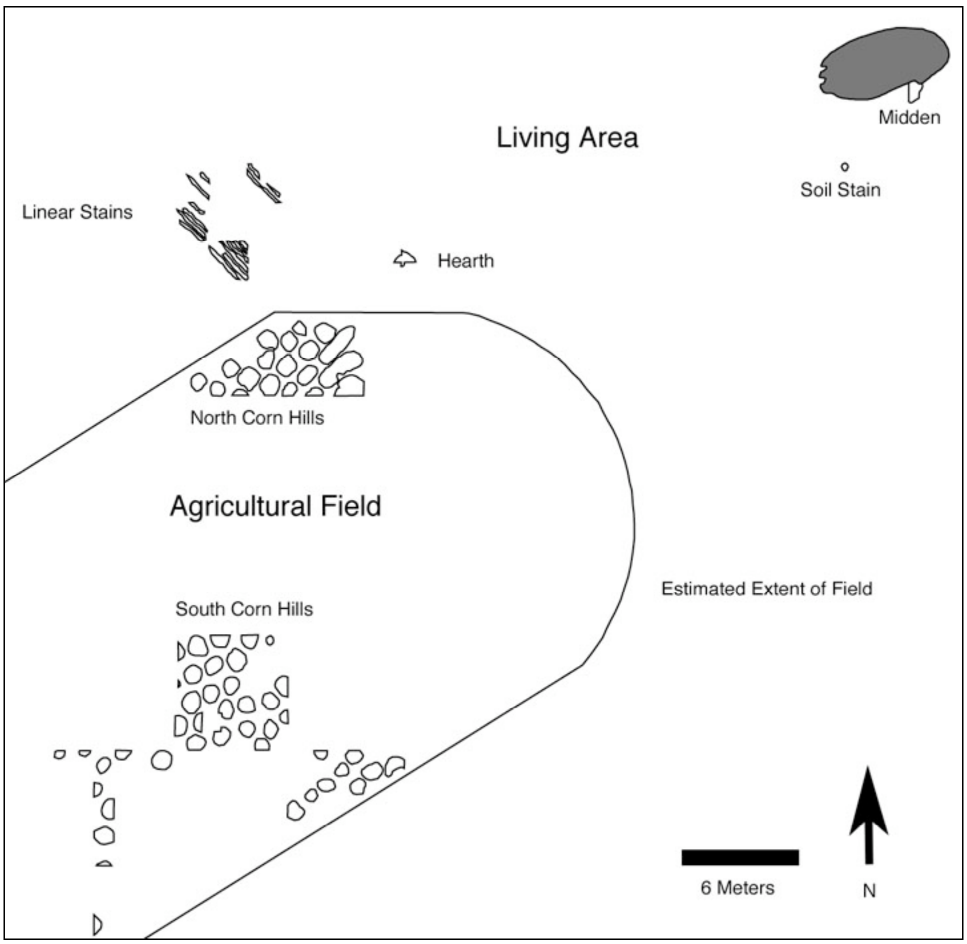

Figure 4. Site plan of Smith's Point excavations.

The temporal relationship between the northern and southern portions of the agricultural field is unclear. Initially, it was believed that both field areas might be part of the same farming event (Mrozowski and Bragdon n.d.:8). However, Douglas Currie's soil micromophological analysis of corn hills from both areas of the site problematizes this interpretation. In his thesis, Currie notes that the hill features from the southern portion of the site had a slightly different morphology than the northern corn hills. The southern corn hills were more eroded and lacked the underlying features and datable artifacts found in the northern hills (Currie 1999:12). Therefore, it is most likely that the field area expanded northward over time, making the northern corn hills more recent than the southern corn hills (Mrozowski and Bragdon n.d.:8).

Several other features uncovered during the 1992 field season bolster the interpretation for an agricultural field expanding northward. Two sets of post holes were uncovered near the northern corn hills, one set partially underneath the hills and the other set adjacent to the existing field and spatially related to European-manufactured items on the site (Mrozowski 1994:50-51). These post holes—spaced in ovular rings—may represent the sites of wetus, the portable house structures common among the Native people of southern New England during the Late Woodland-Early Colonial Period (Figure 5, Mrozowski 1994:50; Mrozowski and Bragdon n.d.:8). European explorers and colonists in the 16th and 17th centuries noted that Native farmers placed their wetus next to their agricultural fields (e.g., Heath 1968:79; Champlain in Winship 1968:87; Verrazano in Winship 1968:18-19). Therefore, the shifting orientation of these wetus suggests a corresponding northward shift of the agricultural field.

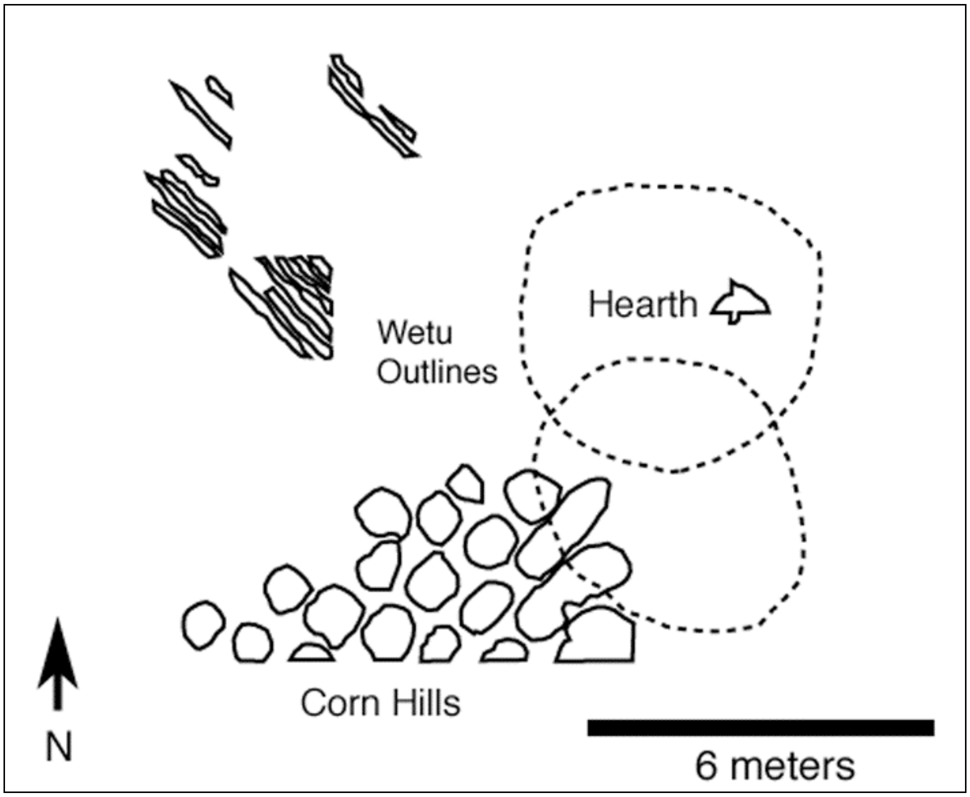

Figure 5. Plan map marking corn hill features and wetu locations.

Due to their proximity to the corn hill features, a hearth, a series of small (10 to 15 cm diameter) and large (30 cm diameter) post holes, a grouping of linear stains, and numerous shallow depressions (5 cm deep) and soil smears (1-3 cm deep) are interpreted as evidence of structures and activity areas associated with the field (Mrozowski 1994:50). Charcoal from the hearth feature (Feature 87) produced a radiocarbon date of 750 ± 50 years B. P. (BETA 62931), which is consistent with a Late Woodland occupation (Mrozowski 1994:50).

Just northeast of the corn hills is a series of linear stains, the purpose of which remains unclear. The stains may also be the remnants of wooden boards used to dry food for storage (Mrozowski 1993:40, 1994:51), a practice that is noted in some ethnohistorical accounts of Native farming in the area. Another interpretation is that the stains represent a technique for farming crops such as tobacco that may not have been grown in mounded fields (Mrozowski 1994:51).

A large storage pit was also excavated during the 1992 field season at the Smith's Point site (Mrozowski 1994:50). The storage pit resembled storage pits recovered on other Native American sites in southern New England (Bendremer et al. 1991) as well as those mentioned in ethnohistorical accounts (Heath 1963:21, 26, 34; Wood 1977:113). Although a macrobotanical analysis of the storage pit contents yielded no charred plant remains, such storage pits likely held food plants gathered or grown in agricultural fields such as nuts, maize, beans, and goosefoot (Bendremer 1999; Bendremer et al. 1991; Heath 1963:21,26,34).

Overall, both the artifact densities and the micromorphology of the corn hill features points to short-term, seasonal occupations of the Smith's Point site (Mrozowski 1994:50). Seasonal use of the site has resulted in stratigraphic blurring, as artifacts from the Late Woodland and Early Colonial periods appear together over a majority of the site (Mrozowski 1994). The lack of stratigraphic resolution between Late Woodland and Early Colonial period occupations of the site has made it difficult to pinpoint the exact age of the agricultural field features at Smith's Point (Howlett 2002:53).

CHAPTER 4

ANALYSIS AND RESULTS

Soil Sampling and Processing

During the 1991 and 1992 field seasons at Smith's Point, half of each excavated feature was removed in 5 cm arbitrary levels for macrobotanical soil sampling. These samples varied in size from approximately .5 L to 10 L or more. Selected soil samples were floated and scanned during the 1991-1992 field seasons for a preliminary assessment of macrobotanical remains from the site. Flotation of the remaining soil samples has been ongoing since 1992, and currently an estimated 75% of the samples from the site have been processed for macrobotanical remains.

Sample Selection

This thesis research focuses on nine features from the Smith's Point site (Figure 6). Using the macrobotanical remains from the 1992 preliminary assessment project I identified three features with charred organic material preservation appropriate for a macrobotanical analysis. These features are Feature 29 (shell midden), Feature 39 (circular soil stain with shell fragments), and Feature 87 (hearth). Each of these features is located north of the agricultural area at the site, and has been interpreted as part of a living area associated with the seasonal subsistence activities at the site (Mrozowski 1994:50; Mrozowski and Bragdon n.d.). Three corn hill features from the northern field (Features 253, 254, an 255) and three corn hill features from the southern field area

(Features 23, 56, and 59) were also selected in order to study agricultural techniques across the site.

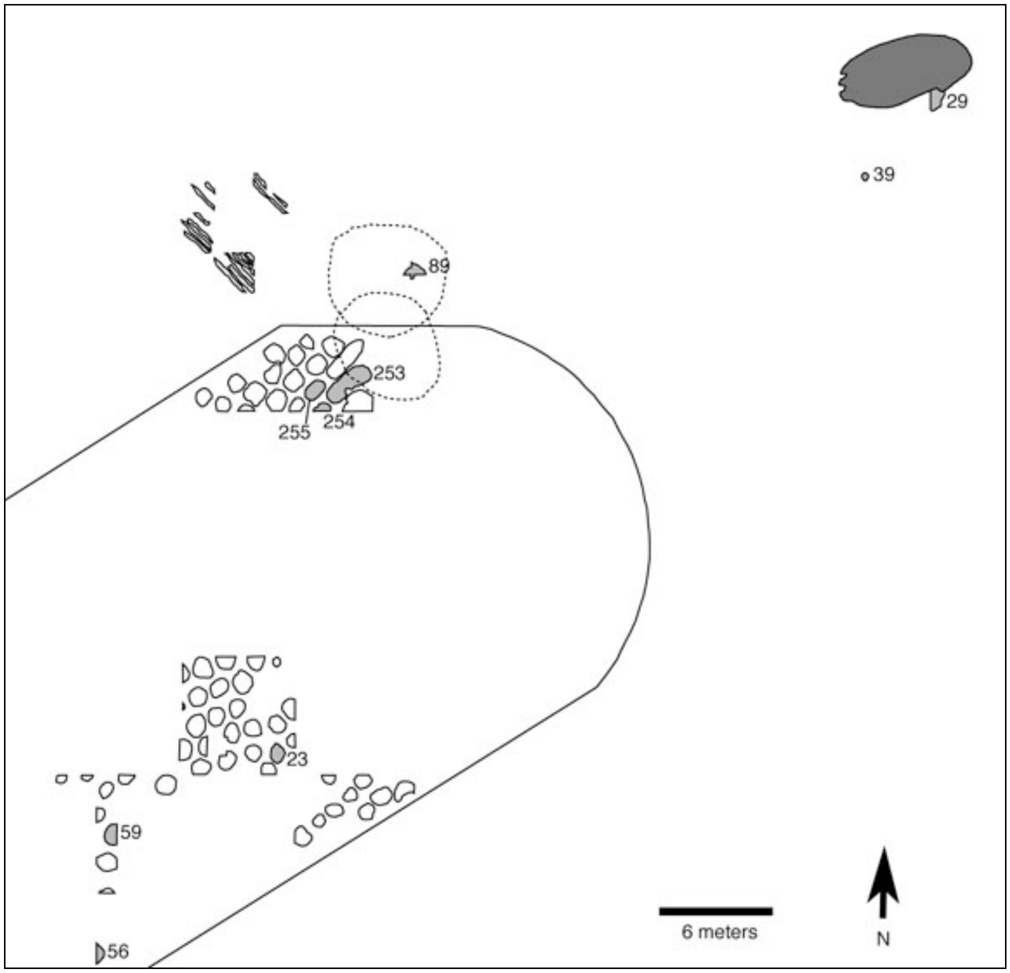

Figure 6. Plan map of thesis features.

Macrobotanical Analysis

In total, 119 4L bags of soil from 53 soil samples were scanned for this project (Table 2). The morphological variations among the thesis features in conjunction with the strategy of sampling entire features (or entire feature bisections) for macrobotanical testing, resulted in variation of number of soil samples, bags, and volumes of soil scanned for each feature.

Table 2. List of soil samples analyzed for macrobotanical project.

Feature	Sample #	Number of Bags Scanned	Estimated Volume
29			
	68	2	7.5
	77	1	3.75
	78	2	7.5
	79	2	7.5
	82	1	1.6
	83	2	3.35
	88	1	3.95
	195	2	7.5
	196	2	7.5
	197	1	3.75
	198	1	3.75
		Total:	**57.65**
87			
	480	5	18.45
		Total:	**18.45**
39			
	146	2	5.25
	182	1	3.75
	183	1	3.75
	184	1	3.75
	185	1	3.75
	186	1	3.75
	187	1	3.75
	188	1	3.75
	209	1	3.75
	212	1	3.75
	213	1	3.75
	214	1	3.75
	215	1	3.75
		Total:	**50.25**
23			
	154	4	15
	155	1	3.75
	158	4	18.5
	174	5	18.75
	176	2	7.5
	189	1	3.75
	190	1	3.75
	191	1	3.75
	192	6	22.5
	219	4	17.5
		Total:	**114.75**
59			
	251	2	7.5
	252	2	7.5
	253	11	41.25
	254	10	37.5
		Total:	**93.75**
56			
	225	1	3.75
	226	1	3.75
	227	1	3.75
	228	1	3.75
	229	2	7.5
		Total:	**22.5**
253			
	438	1	4.75
		Total:	**4.75**
254			
	431	2	7.5
	432	1	3.75
	437	4	15
	439	1	3.75
		Total:	**30**
255			
	433	1	3.75
	434	3	11.25
	435	7	26.25
	436	3	11.25
		Total:	**52.5**

Additionally, the exact volume of soil is unknown for a majority of these bags because these data were inconsistently recorded prior to soil flotation. However, I have estimated the volume measurements for all soil samples based on the existing volume data. All soil samples from the site were contained in 4 L bags that were filled with approximately 3.75 L of soil. Therefore, for each bag of unknown volume, I have estimated the volume at 3.75 L per bag. For example, if a soil sample contained 5 bags of unknown volume, I estimated the volume at 18.75 L (5 x 3.75 L). Using this formula, the total volume of soil analyzed for this project can be estimated just fewer than 450 L (Table 3). The estimated total feature volumes range from 4.75 L in Feature 253 to 114.75 L in Feature 23.

Table 3. Estimated soil volume analyzed for each feature.

Feature #	Known Volume	Estimated Volume (3.75 L/bag)	Total Feature Volume
23	17.25	97.50	114.75
29	8.90	48.75	57.65
39	1.50	48.75	50.25
56		22.50	22.50
59		93.75	93.75
87	3.45	15.00	18.45
253	4.75		4.75
254		30.00	30.00
255		52.50	52.50
		Total:	**444.60**

Each sample was weighed and scanned for macrobotanical remains under a low-powered microscope. Charred seeds were removed and identified to the lowest possible taxonomic level using a macrobotanical comparative collection and seed identification manuals by Montgomery (1977) and Martin and Barkley (1961). Data on charred seed type, portion (whole or fragment) and quantity were recorded, and the seeds were placed into labeled micro-centrifuge tubes by taxon. Charred macrobotanical remains for which no taxonomic identification could be determined were measured, drawn, and assigned a temporary "Type" number. Macrobotanical remains that were too fragmented or lacked diagnostic characteristics were labeled as "unidentified." The presence or absence of charred wood and artifacts, as well as any other distinguishing features of each soil sample was also noted. These data were recorded in a relational database to facilitate sample comparison and analysis.

In addition to the seed identification, three samples of charred botanical material were removed for accelerator mass spectrometry (AMS) radiocarbon dating at the BETA Analytic laboratories in Florida. These samples were 40 mg of bayberry seeds (*Myrica pensylvanica*) from corn hill feature 59 (Figure 7), a 10 mg maize cupule (dimensions 7.21mm x 2.86 mm) from corn hill feature 23 (Figure 8), and a 1 mg maize cupule (dimensions 2.52 mm x 1.77 mm) from corn hill feature 255 (Figure 9).

Previous radiocarbon samples taken from features associated with the agricultural activity at the site, such as the midden (Feature 29) and the hearth (Feature 87), yielded dates spanning two ranges: circa 1,100-1,150 A.D. and 1,600-1,675 A.D. (Mrozowski and Bragdon n.d.:14). The purpose of radiocarbon dating charred remains from the corn hills 59, 23, and 255 was to determine if the hill dates closely to either of these date ranges.

Figure 7. AMS radiocarbon dating sample of bayberry (Myrica pensylvanica) from corn hill Feature 59.

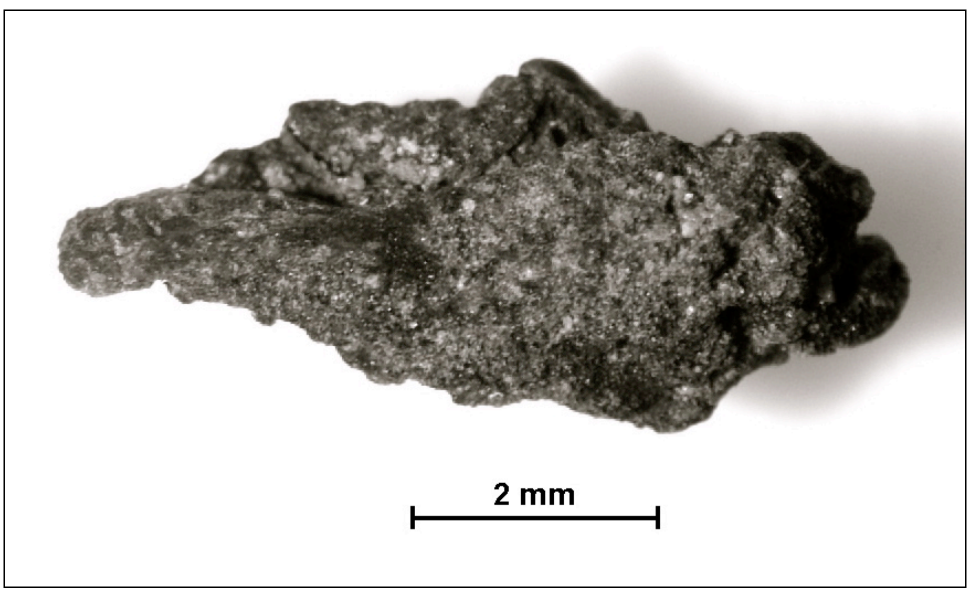

Figure 8. AMS radiocarbon dating sample of a maize (Zea mays) cupule from corn hill Feature 23.

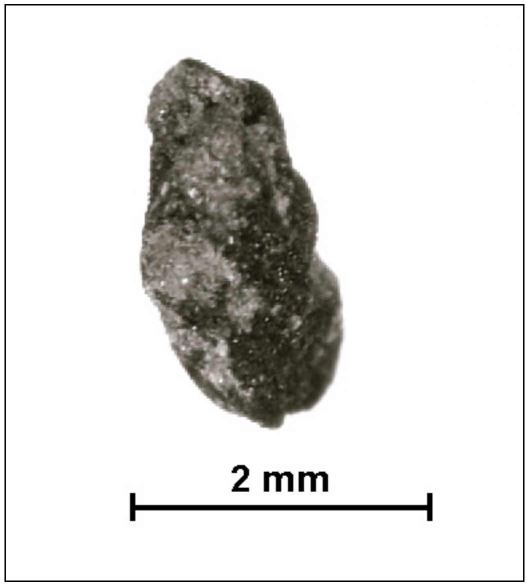

Figure 9. AMS radiocarbon dating sample of a maize (Zea mays) cupule from corn hill Feature 255.

Results

Charred botanical remains were recovered from all samples scanned for this research project. In total, these remains include 24 identifiable taxa (Table 4), as well as nutshell, nutmeat, plant tissue, and charred wood remains. The charred plant remains include 13 maize cupules, 1 maize kernel fragment, 89 nutshell fragments (hazelnut, hickory, shagbark hickory, walnut family, and undetermined), 1 nutmeat fragment, 1251 whole/fragment fruit seeds and pits (blackberry/raspberry, blueberry, black cherry, common winterberry, wild grape, huckleberry, northern bayberry, and sumac), and 105 whole/fragment non-domesticated plant seeds (Atlantic white cedar, beach pea, bedstraw, blackgum, dogwood, goosefoot family, goosefoot, knotweed, sedge family, speedwell, and violet) (Table 5). Additionally, 2 fragments of parenchymatous tissue and 1 fragment of unidentified plant tissue were recovered from the features. The charred plant tissue fragments were not taxonomically identified due to their small size. Some of the charred seed remains were large enough for identification, but lacked diagnostic characteristics (e.g. due to erosion) necessary for taxonomic categorization. Ten whole/fragment seeds fall into this category (Type 2, Type 10, Type 15, and Type 32). Many of the recovered charred botanical remains were too fragmented to identify, resulting in 230 unidentified seed fragments and plant remains.

Table 4: List of identified taxa.

Scientific Name	Common Name
CROPS	
Zea mays	Maize
NUTS	
Carya sp.	Hickory
Carya ovata	Shagbark Hickory
Corylus sp.	Hazelnut
Juglandaceae	Walnut Family
FRUIT	
Gaylussacia sp.	Huckleberry
Ilex verticillata	Common Winterberry
Myrica pensylvanica	Northern Bayberry
Prunus serotina	Black Cherry
Rhus sp.	Sumac
Rubus sp.	Blackberry/Raspberry
Vaccinium sp.	Blueberry
Vitis sp.	Wild Grape
OTHER SEEDS	
Chamaecyparis thyoides	Atlantic White Cedar
Chenopodiaceae	Goosefoot Family
Chenopodium sp.	Goosefoot
Cornus sp.	Dogwood
Cyperaceae	Sedge Family
Galium sp.	Bedstraw
Lathyrus japonicus	Beach Pea
Nyssa sylvatica	Blackgum
Polygonum sp.	Knotweed
Veronica sp.	Speedwell
Viola sp.	Violet

Table 5. Total charred plant remains[*] by feature.

Scientific Name	Common Name	23 Corn Hill South	56 Corn Hill South	59 Corn Hill South	253 Corn Hill North	254 Corn Hill North	255 Corn Hill North	29 Midden	39 Soil Stain	87 Hearth
CROPS										
Zea mays cupule	Maize	8		2			1	2		
cf. *Zea mays* kernel	Maize	1								
NUTS										
Carya sp.	Hickory	2						2	2	11
Carya ovata	Shagbark Hickory									2
Corylus sp.	Hazelnut					19		5		
c.f. *Corylus* sp.	Hazelnut							1		
Juglandaceae	Walnut Family							4		
Nut Meat								1		
Nutshell		5		11	3	8		7		7
FRUITS										
Gaylussacia sp.	Huckleberry									1
Ilex verticillata	Common Winterberry			1				1		
Myrica pensylvanica	Northern Bayberry	79	22	27	165	270	517	31	23	38
cf. *Myrica* sp.	Bayberry					1				
Prunus serotina	Black Cherry		1							
Rhus sp.	Sumac	4		9	3	11	14			
Rubus sp.	Blackberry/Raspberry	1		1	2	4	6	5	2	4
Vaccinium sp.	Blueberry					1				
c.f. *Vaccinium* sp.	Blueberry						1			
Vitis sp.	Wild Grape						1	5		

Scientific Name	Common Name	23 Corn Hill South	56 Corn Hill South	59 Corn Hill South	253 Corn Hill North	254 Corn Hill North	255 Corn Hill North	29 Midden	39 Soil Stain	87 Hearth
OTHER SEEDS										
Chamaecyparis thyoides	Atlantic White Cedar					1				
Chenopodiaceae	Goosefoot Family						1			
Chenopodium sp.	Goosefoot	6	10	3	1		2	17		
Cornus sp.	Dogwood	1						7		1
Cyperaceae	Sedge Family						1	1		
Galium sp.	Bedstraw	3	1	2		2	4	20	1	12
c.f. *Galium* sp.	Bedstraw							1		
Lathyrus japonicus	Beach Pea									1
Nyssa sylvatica	Blackgum							1		
Polygonum sp.	Knotweed							1		
Veronica sp.	Speedwell									1
Viola sp.	Violet			1		1	1			
PLANT MISC.										
Parenchymatous tissue								2		
Plant Tissue		1								
UNIDENTIFIED		27	1	21	2	53	19	67	14	26
Type 2										2
Type 10						1	1	1		
Type 15						3				
Type 32								1		1

*Charred wood was not counted for these totals. Totals include count of fragments and whole charred seeds.

For residents of the Smith's Point site, many of these wild and domesticated taxa would have played a role in their overall food consumption and medicinal practices.

Agricultural Crops

Maize is the only agricultural crop recovered from the site features. Maize has been a continual source of food for Native American communities in the Northeast from as early as the Woodland period. These kernels could be eaten fresh (Willoughby 1906), roasted over a fire (Bendremer and Thomas 2008), or dried and ground into cornmeal (Bragdon 1996). European documentary accounts also describe the preparation of maize kernels in stews; "they seethe it whole like beans" (Wood 1977:86).

Wild Food Plants

At least 4 different edible nut taxa are present in the botanical remains from the Smith's Point site: hickory, shagbark hickory, hazelnut, and walnut family. The nutmeat of these plants could have been eaten fresh (Bragdon 1996). However, some historical documents also describe dried nuts ground into meal, or boiled in stews (Bragdon 1996). Nuts were also processed to extract oil, as noted by Williams, "of these Wallnuts they make excellent oyle good for many uses" (1973:168).

Charred remains of 7 edible fruit taxa were identified in the site features: bayberry, blueberry, black cherry, huckleberry, wild grape, raspberry/blackberry and sumac. These fruits may have been eaten raw or dried for later consumption (Moerman 1998). Fresh berries were also sometimes ground with cornmeal in order to make bread (Williams 1973). The fruit from the dogwood tree may also have been eaten Smith's Point inhabitants (Moerman 1998). In addition to its berries, which could be used for seasoning, the dried leaves of the bayberry plant may have been used in stews (Hauser

2006). Sumac fruits were also steeped in water to make beverages (Bernstein 1999; Trigg and Bowes 2007).

Several other edible taxa were recovered from the macrobotanical remains. These include beach pea, goosefoot, and knotweed. Whether the pods of the beach pea plant were eaten by Late Woodland-Early Colonial period Native people in the Northeast is unclear due to the belief that the seeds were poisonous; however, the stalks of the plant were a known springtime food for some local Native groups (Moerman 1998). Both goosefoot and knotweed have been utilized by Native Americans for millennia (McConaughy 2008), and exist as both wild and domesticated species in many areas of North America (McConaughy 2008). These species appear in coastal archaeological sites in New England, but only as wild species (Bendremer 1999; Bernstein 1999). Goosefoot and knotweed comprise two of the taxa of the Eastern Agricultural Complex, a group of native plants that were cultivated in North America prior to the adoption of intensive maize agriculture (McConaughy 2008; Smith 1992). Considered by archaeologists to be "economically important" plants for Woodland period Native groups (Knapp 2002; Sidell 2008), goosefoot and knotweed at the site could have provided an important source of food and medicine for its residents (Moerman 1998).

Medicinal Plants

The Smith's Point site residents may also have been utilizing plants at the site for medicinal purposes. Of the identified taxa, 20 were historically used as medicine by Native Americans in the Northeast. These taxa are: Altantic white cedar, bayberry, beach pea, bedstraw, blackgum, blueberry, black cherry, dogwood, goosefoot, wild grape, hazelnut, huckleberry, knotweed, maize, raspberry/blackberry, shagbark hickory, speedwell, sumac, violet, and winterberry (Moerman 1998). Fruit, leaves, roots and bark from these plants was used to alleviate symptoms of a number of common ailments, both physical and spiritual (Moerman 1998). As one example, the leaves of either the blackberry or sumac plant could be steeped in boiling water and drunk to lessen stomach ailments (Rabito-Wyppensenwah 1993).

Domestic Uses of Plants

The only seed remains recovered from the soil samples that were not known for food consumption or its medicinal value were identified to the sedge family. However, these plants may indicate other domestic uses of plants at the site. For instance, these sedges may have been used as raw material for weaving storage baskets and mats (Willoughby 1906). Wood describes the use of similar plants in 17th century New England, "in the summer they gather flags of which they make mats for houses, and hemp and rushes, with dyeing stuff of which they make curious baskets…these baskets be of all size from a quart to a quarter, in which they carry their luggage" (1977:144).

Seasonality of Taxa

Taken as a whole, the identifiable charred plant material from the thesis features represents plants that produce edible food during the spring, summer and fall seasons (Table 6). All of the plants are in season in the July and August months, whereas none of the identified plants are in season during the months of December, January or February. Based on the seasonality of the identified taxa, it is likely that Smith's Point's residents were occupying the site, and subsequently charring material through land-clearing burns, food preparation, or waste disposal, during the late-spring through early-fall seasons. These results coincide well with archaeological, historical, and documentary descriptions of coastal occupation areas as warm-weather encampments for seasonally mobile Late Woodland-Early Colonial Native New Englanders (For example, Cronon 1983; Bendremer 1999; Bragdon 1996; Williams 1973)

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Table 6. Seasonality of identified taxa.

Common Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Crops												
Maize[1,2]					x	x	x	x	x	x		
Nuts												
Hazelnut[3]							x	x	x	x		
Hickory[3]						x	x	x	x	x	x	
Shagbark Hickory[3]						x	x	x	x	x	x	
Fruits												
Blackberry/Raspberry[4,5]					x	x	x	x				
Blueberry[5]						x	x	x				
Cherry[4]			x	x	x	x	x	x				
Common Winterberry[3]						x	x	x	x	x	x	
Grape[4]			x	x	x	x	x	x				
Huckleberry[5]						x	x	x				
Northern Bayberry[6]						x	x	x	x	x		
Sumac[4]			x	x	x	x	x	x				
Other Seeds												
Beach Pea[3]			x	x	x	x	x	x				
Bedstraw[3]					x	x	x	x				
Blackgum[3]			x	x	x	x	x	x				
Dogwood[3]			x	x	x	x	x	x				
Goosefoot[4]						x	x	x	x	x	x	
Knotweed[3]			x	x	x	x	x	x				
Sedge[4]			x	x	x				x	x	x	
Speedwell[3]							x	x	x	x	x	
Violet[3]			x	x	x	x	x	x				

[1]Bragdon 1996; [2]Williams 1973; [3]USDA 2010; [4]Rieth 2002; [5]Trigg and Bowes 2007; [6]Hauser 2006

Statistical Analysis

I use two statistical methods to analyze the macrobotanical data from the Smith's Point features: species richness and ubiquity. Species richness measures the number of different taxa in each feature. This method enables me to compare the diversity of charred seed taxa among the features at the Smith's Point site. With this information, I can begin to interpret the cultural and natural causes for similarity or variation in taxonomic diversity. For example, I compare the richness of the agricultural field and midden features to see if they share a similar number of taxa. If their total taxa are similar, it may indicate that the farmers at the site were using midden soil as fertilizer on the fields, thereby incorporating charred food remains from the midden into the planting features.

I also use the ubiquity analysis technique to compare the charred botanical remains from the site features. Archaeological preservation of plant remains is contingent upon a number of cultural and non-cultural factors (Popper 1988:53). Therefore, the raw totals for each taxon within a feature may not accurately represent the frequencies of these plants in the past and should not be directly compared (Popper 1988:60-61). An alternative method for quantifying archaeobotanical data is ubiquity analysis. This technique disregards frequency and, instead, examines the number of samples in which the taxon was present within a group of samples (Popper 1988:60-61). The resulting percentages may provide a basis for more accurate cross-sample comparison (Popper 1988:61). For this analysis, I quantify how each of the selected taxa is distributed throughout a feature. This information may support interpretations of deposition at the site. For example, if a charred plant species were found in all levels of a corn hill feature

(100 percent ubiquity), this ubiquity may indicate that the species had been present in the soil prior to the formation of the planting features.

Species Richness

The total number of identifiable charred seed taxa was calculated for each feature (Table 7). Unidentified seeds, plant parts, and nutshell were not factored into the species richness count because they represent an undetermined number of taxa. The feature with the highest number of taxa identified was the midden (Feature 29) with 16 different species. The hearth (Feature 87) also exhibited a high species richness compared to the other features with a total of 11 different species. Two of the northern corn hills, Features 254 and 255, had high taxa totals of 10 and 12, respectively. The southern corn hills (Features 23, 56, and 59) as well as the remaining northern corn hill (Feature 253) all had 8 or less total taxa. Feature 39, the soil stain, had comparatively low species richness. Only 4 taxa were recovered from the soil stain feature. The diet of Smith's Point residents included a variety of different plant species, as is indicated by the high species richness of both the midden and hearth features. The higher frequency of charred plant remains in these two features compared to the other features at the site may be a result of their use as food waste disposal sites for the occupation area, and also because food became charred in the hearth, making it more likely to preserve than uncharred remains elsewhere at the site. As noted above, a similarity in species richness between the midden and the agricultural features would support the interpretation of midden soil enrichment in the fields. Although corn hill Features 255 and 254 have similar species richness totals to the midden, the overall species richness of the agricultural features does not match the midden feature. Therefore, the species richness does not indicate the use of midden soils as fertilizer.

Table 7. Number of identifiable charred seed taxa in each feature.

Species Richness

Feature	Description	Number of Taxa
29	Midden	16
255	North Corn Hill	12
87	Hearth	11
254	North Corn Hill	10
23	South Corn Hill	8
59	South Corn Hill	8
253	North Corn Hill	4
56	South Corn Hill	4
39	Soil Stain	4

Ubiquity Values

Ubiquity analysis was conducted for five taxa recovered from the Smith's Point samples: bayberry, bedstraw, blackberry/raspberry, goosefoot and maize. These plants were chosen for ubiquity analysis because they represent a broad spectrum of plant resources at the site. Bayberry is a large component of the contemporary coastal plant community on Cape Cod and, like bedstraw, it is a naturally-occurring weedy plant. Blackberry/raspberry is a wild edible plant that could either have grown naturally near the site or could have been deliberately gathered. Similarly, goosefoot could have been gathered near the site or actively encouraged in the agricultural field as crop. Lastly, maize was chosen because it was deliberately grown as a crop in the agricultural fields.

For each feature, the presence or absence of these taxa was noted in each sample. When a feature had more than one sample from the same stratigraphic level, the samples were counted as one. Charred plant remains from the 1991-1992 preliminary assessment project combined portions of several samples from each feature. Due to the sample mixing present in the preliminary assessment samples they were not used for the ubiquity analysis. Feature 56, a southern corn hill, had only mixed samples and was, therefore, also omitted from this analysis.

Ubiquity values for bayberry displays the clearest patterning of the five taxa studied (Table 8). The ubiquity of bayberry was 100% for every feature except the midden (Feature 29), which has a 75% presence. This suggests bayberry plants were growing evenly across the agricultural and living areas of the site. The lower percent presence of bayberry in the midden may indicate a different depositional pattern in this feature compared to the other site features.

Table 8. Ubiquity (percent presence) of charred bayberry seeds (Myrica pensylvanica) in each feature.

Ubiquity Analysis of Myrica sp.

Feature #	Description	Percentage
23	South Corn Hill	100
39	Soil Stain	100
59	South Corn Hill	100
87	Hearth	100
253	North Corn Hill	100
254	North Corn Hill	100
255	North Corn Hill	100
29	Midden	75

Analysis of ubiquity of bedstraw (Table 9) and blackberry/raspberry (Table 10) in the features yielded similar results over the site. In both taxa, a 100% presence was noted in the two southern corn hills (Feature 23 and 59) and in the hearth (Feature 87). Additionally the soil stain (Feature 39) and a northern corn hill (Feature 253) had 100% ubiquity for bedstraw and blackberry/raspberry, respectively. The midden (Feature 29) had the second largest ubiquity for bedstraw at 63% presence. The northern corn hills (Features 253-255) displayed a wide range of ubiquity values from 50% to 0% presence of bedstraw. A northern corn hill (Feature 254) had the second largest ubiquity for blackberry/raspberry at 50% presence. The midden (Feature 29) and a northern corn hill (Feature 255) shared the third highest ubiquity of blackberry/raspberry with 25% presence. The soil stain had 0% ubiquity for blackberry/raspberry. These ubiquity values suggest that, like bayberry, bedstraw and blackberry/raspberry plants were spread across the site. However, unlike bayberry, bedstraw and blackberry/raspberry ubiquity levels fluctuate widely and may indicate the natural patterning and human use of these plants in the past. For example, if these bushy plants grew in patches across the agricultural field, burn-off of this material may, correspondingly, result in patchy areas of higher and lower seed remains. In a ubiquity comparison of percent presence of plants across the site, non-agricultural crops may be expected to present a somewhat random distribution.

Table 9. Ubiquity (percent presence) of charred bedstraw seeds (Galium sp.) in each feature.

Ubiquity Analysis of Galium sp.

Feature #	Description	Percentage
23	South Corn Hill	100
39	Soil Stain	100
59	South Corn Hill	100
87	Hearth	100
29	Midden	63
254	North Corn Hill	50
255	North Corn Hill	25
253	North Corn Hill	0

Table 10. Ubiquity (percent presence) of charred blackberry/raspberry (Rubus sp.) in each feature.

Ubiquity Analysis of Rubus sp.

Feature #	Description	Percentage
23	South Corn Hill	100
59	South Corn Hill	100
87	Hearth	100
253	North Corn Hill	100
254	North Corn Hill	50
29	Midden	25
255	North Corn Hill	25
39	Soil Stain	0

The ubiquity values of goosefoot offer a slightly different percent presence than bedstraw and blackberry/raspberry (Table 11). Of the 5 highest ubiquity values for goosefoot, 4 were corn hill features (Feature 59, Feature 253, Feature 23, and Feature 255). Two of these corn hill features (Feature 59 and Feature 253) have a 100% presence of charred goosefoot. Feature 23 and Feature 255 both have a ubiquity value of 50%. The midden (Feature 29) also has a 50% presence of goosefoot remains. The hearth (Feature 87), soil stain (Feature 29), and a northern corn hill (Feature 254) features yielded no goosefoot. Like the ubiquity values of bedstraw and blackberry/raspberry, the fluctuations of goosefoot ubiquity among the corn hills may suggest the plant's uneven distribution within the agricultural field at the time of charring. However, it is also significant that the presence of goosefoot solely in agricultural and midden features at the site closely matches the presence of maize in these features. Goosefoot may have been managed, and therefore preserved by charring, in the agricultural fields in a similar way as maize. This may indicate Native farmers encouraged goosefoot as a wild food crop in their agricultural fields.

Table 11. Ubiquity (percent presence of charred goosefoot (Chenopodium sp.) in each feature.

Ubiquity Analysis of Chenopodium sp.

Feature #	Description	Percentage
59	South Corn Hill	100
253	North Corn Hill	100
23	South Corn Hill	50
255	North Corn Hill	50
29	Midden	50
39	Soil Stain	0
87	Hearth	0
254	North Corn Hill	0

Maize ubiquity (Table 12) was highest in the southern corn hills with 100% presence for southern corn hill features 23 and 59. Both the midden (Feature 29) and a northern corn hill (Feature 255) had a much lower percent presence of 13% and 25%, respectively. The hearth (Feature 87), soil stain (Feature 39), and northern corn hills (Feature 253 and 254) all had a maize ubiquity value of 0%. Based on ethnohistorical, archaeological, and soil micromorphological evidence, it is clear that the Smith's Point site contained a large maize agricultural field. However, at least two of the corn hill features (253 and 254) yielded no charred maize remains. As stated above, a number of cultural and non-cultural elements factor into archaeological plant preservation (Popper 1988). For example, if maize plants were not consistently charred in the agricultural field (due to seasonal burning) or in the hearth (as part of food processing), these remains would not preserve in the soil.

Table 12. Ubiquity (percent presence) of maize (Zea mays) in each feature.

Ubiquity Analysis of Zea mays

Feature #	Description	Percentage
23	South Corn Hill	100
59	South Corn Hill	100
255	North Corn Hill	25
29	Midden	13
39	Soil Stain	0
87	Hearth	0
253	North Corn Hill	0
254	North Corn Hill	0

Agricultural Field

Six corn hill features were analyzed for macrobotanical remains as part of this thesis project (Figure 6). Three of these corn hills (Feature 23, 56, and 59), sampled during the 1991 field season, were excavated in the southern portion of the agricultural field. The remaining three corn hills (Feature 253, 254, and 255), from the 1992 field season, were excavated in the northern portion of the agricultural field. Taken together, these features contain 19 identifiable plant taxa. A majority of these taxa grow wild on Cape Cod (Leahy et al. 1996; Sorrie et al. 2000), and may have been gathered for consumption on the site. Edible wild plant remains from the agricultural area include berries (black cherry, blackberry/raspberry, blueberry, and wild grape), nuts (hickory, hazelnut, and walnut), as well as other food plants (goosefoot-*Chenopodium* sp.) (Bernstein 1990:340).

Maize, the only agricultural crop recovered from the corn hills, was identified in half of the agricultural field samples (Feature 23, 59, and 255). The number of maize cupules and kernels was lower than expected for the agricultural area if the field had been repeatedly burned. In total only 11 maize cupule fragments and 1 kernel fragment was recovered from these features. In comparison, at the Morgan Site, a Late Woodland site in Connecticut, over 100 fragments of charred maize were recovered from a single pit feature (Lavin 1988:17). Although no agricultural field was recovered at the Morgan Site, the discovery of farming tools and a broad distribution of maize remains across the site has led archaeologists to interpret the site as a farming area (Lavin 1988:17-18).

The presence of goosefoot in 5 of the 6 corn hill features (Feature 23, 56, 59, 253, and 255) is also noteworthy. Domesticated goosefoot (*Chenopodium berlandieri)* was an important food source for many Native American groups prior to the adoption of maize agriculture and played a continued role in subsistence practices through the Woodland period (Johannessen 1993; Knapp 2002; McConaughy 2008; Sidell 2008; Yarnell 1993). Although the goosefoot at the Smith's Point site was likely not domesticated (Sidell 2008), it could have been planted or encouraged to grow in the agricultural field and surrounding area as a wild edible resource. At the least, the activities associated with human activities at the site, such as agriculture and fishing, would have encouraged this plant since it thrives under disturbed conditions. Although Currie's micromorphology analysis concluded that the northern and southern portions of the agricultural field exhibit slightly different morphologies (Currie 1999:12) the macrobotanical analysis of both sets of corn hill features yielded similar plant remains. The northern corn hills had slightly higher species richness as compared with the southern corn hills, however, with 16 versus 11 total taxa represented.

Living Area

Three of the features analyzed for this research project came from an area of the site adjacent to the agricultural field that has been interpreted as a living area for the seasonal encampment (Mrozowski 1994:50). These features include a shell midden (Feature 29), a soil stain (Feature 39), and a hearth (Feature 87). Unlike the corn hill features, the macrobotanical remains recovered from these three features are not homogeneous. These variations in charred plant material composition may result from their different functions in the living area.

Although maize was grown adjacent to the living area, relatively little charred remains are present in the living area features. The midden is the only living area feature in which maize was identified. Furthermore, the ubiquity of maize in the midden is only 13%, which is fairly low compared to corn hill features 23, 59, and 255 that had maize ubiquities of 25-100%.

Of the three features, the midden has the greatest taxonomic variety, with 16 different plant types identified. With few exceptions, the taxa recovered from Feature 29 overlap with those identified from the agricultural area. Three additional taxa were found only in the midden samples (walnut family-Juglandaceae, blackgum-*Nyssa sylvatica*, and knotweed-*Polygonum* sp.) as well as the only nutmeat and parenchymatous plant tissue remains.

The hearth also ranked high in species richness, containing 11 identifiable taxa. Of these taxa, three were unique to Feature 87: huckleberry (*Gaylussacia* sp.), beach pea (*Lathyrus japonicus*), and speedwell (*Veronica* sp.), all of which are edible plants (Peterson 1977:122,128,220). In contrast, the soil stain had the lowest species richness across the site with only 4 identifiable taxa. These taxa are hickory, bedstraw, bayberry, and blackberry/raspberry. All of these taxa are also found in both the hearth and midden, and are common among the agricultural features at the site.

Radiocarbon Results

The AMS radiocarbon dates of bayberry from corn hill feature 59 yielded a date far earlier than expected. The choice to radiocarbon date charred bayberry seeds was based upon the interpretation that the remains in the corn hills were the result of either the farmers' use of midden soils as fertilizer, or their practice of burning overgrowth on fields prior to planting—both of which would have incorporated charred seeds into the corn hills that could be used as a proxy for dating the agricultural activity at the site. Based on previous radiocarbon dates from features associated with the agricultural field (Mrozowski and Bragdon n.d.:14), the date was expected to fall somewhere between circa 1100-1150 A.D. or 1600-1675 A.D. Instead, the sample dated to 1440 ± 40 years BP, with a calibrated radiocarbon date of 550-600 A.D. (Appendix, BETA 275053). Therefore, it is most likely that the charred bayberry remains recovered from the corn hill features predated maize agriculture on the site. These older macrobotanical remains may have been latent in the soil for centuries before being incorporated into the corn hills when Smith's Point's farmers hoed the bayberry-containing topsoil into planting mounds. Although this new interpretation rules out the use of the bayberry AMS date as a proxy for the date of the site's corn hill features, it may indicate a pre-agricultural occupation and use of the site for a fishing and shellfish collection. As I discuss in detail in the interpretation, the broad spectrum of bayberry at the site suggests a burn-off event that may have been associated with site preparation for this pre-agricultural occupation.

Additional radiocarbon dating of maize from the corn hill features was necessary to fine-tune the chronology of the agricultural activity at the site. Maize remains are a clear byproduct of farming, and therefore provide a more accurate estimate of when Smith's Point's Native inhabitants were participating in maize agriculture.

The sample from Feature 23, a corn hill in the southern area of the agricultural field yielded a radiocarbon date of 260 ± 40 B.P., with calibrated date ranges of 1520-1590 A.D., 1620-1670 A.D., 1770-1800 A.D., and 1940-1950 A.D. (Appendix, BETA 227591). Similarly, the maize sample from feature 255, a corn hill in the northern area of the agricultural field yielded a radiocarbon date of 210 ± 40 B.P., with calibrated date ranges of 1640-1690 A.D., 1730-1810 A.D., and 1920-1950 A.D. (Appendix, BETA 227592). These results firmly place the agricultural activity at the site within the Early Colonial period.

Although the calibrated radiocarbon dates provide several widespread dates for these two samples, these data combined with the 17th-century material culture recovered in association with the field (Mrozowski 1994:1; PAL 1991:6) and the previous radiocarbon dates of 1600-1675 A.D. from the site (Mrozowski and Bragdon n.d.:14), strongly suggest the agricultural activity at the site occurred in the 17th century. The conventional and calibrated dates for the feature 23 and feature 255 maize samples intercept at 1650 A.D. and1660 A.D., respectively, further supporting this interpretation (BETA 227591; BETA 227592).

CHAPTER 5

INTERPRETATIONS AND CONCLUSIONS

As Dunford and O'Brien note in their book *Secrets in the Sand*, "when the Pilgrims first stepped upon the shores of Cape Cod Bay in the cold, forbidding November of 1620, they found not a New World but an old one–an ancient landscape that bore traces of 10,000 years of human endeavor" (1997:25). The Smith's Point site on Cape Cod is one of these ancient landscapes, where "traces" of human occupation ranging from the Archaic Period to the present intermingle, overlay, and overlap one another, providing clues into the lives of past inhabitants. This chapter situates the macrobotanical research results within the broader context of the documentary resources and archaeological research in order to interpret how Smith's Point residents manipulated local environments and constructed new ecological "niches" (Smith 2009) for the purpose of subsistence. Through the interpretation of macrobotanical remains from the site I examine the role of agricultural and gathered plants in the diet of residents at Smith's Point during the Woodland and Early Colonial periods. The study of charred plant remains from the Smith's Point site provides a new avenue for exploring the lives and subsistence practices of Native American groups in New England "between the lines" of documentary sources.

Interpretations

Plant Communities on Cape Cod

The Smith's Point site occupies a small area on the southern coast of Cape Cod in Yarmouth, Massachusetts. Coastal Cape Cod is host to diverse plant communities, particularly because the topography provides for a range of niches to co-exist in a small area (Carlozzi et al. 1976). For example, among the coastal sand dunes different plant communities occupy the shoreline, the front and back slopes of the dunes, and the down slope areas (Carlozzi et al. 1976:17-18). Most of the plant remains recovered from the Smith's Point site correspond well with modern-day plant communities of coastal dune areas and the border areas between dunes and wooded areas (Figure 10). Of the charred plant remains identified for this research project, common dune taxa include sedge, bedstraw, huckleberry, beach pea, bayberry, black cherry, blueberry, and violet (Carlozzi et al. 1976:18,65; Backus and Polloni 2009; Hauser 2006; Tiner 1987:113; Woods Hole Research Center 2010). Border zone taxa —plants inhabiting the area between dunes and forests—include hickory, Atlantic white cedar, dogwood, winterberry, blackgum, sumac, blackberry/raspberry, and wild grape (Carlozzi et al. 1976:65; Backus and Polloni 2009; Jorgensen 1978:225-229, 272; Trigg et al. 2007).

Figure 10. Typical sand dune plant communities on the Cape Cod seashore.

Cultural Use of Fire

The correlation between the charred plant remains recovered from the Smith's Point site and common coastal Cape Cod plant communities suggests that these remains represent at least one landscape burn-off event at the site. The use of burning as a technique for land clearance, hunting, farming and foraging by Woodland and Early Colonial period Native American groups in southern New England is noted in European documentary accounts and in recent historical and archaeological literature (e.g., Bragdon 1996; Chilton 2005; Cronon 1983; Dunford and O'Brien 1997; Mrozowski 1994; Champlain in Winship 1968:87-88).

Determining definitively whether past burning events are human-induced or a result of weather conditions, such as lightning, is very difficult. However, Patterson and Sassaman (1988) provide two arguments in support of a Native American source for past burning in New England during the Woodland and Early Colonial periods that bolster the interpretation of cultural burning at Smith's Point. First, they note that in southern New

England, lightning fires are rare (Patterson and Sassaman 1988). Natural fire ignition requires a dry climate, an availability of surface fuels, and lightning (Allen 2002; Baker 2002; Patterson and Sassaman 1988). However, the moist climate of New England reduces the environmental conditions necessary for ignition, resulting in a much lower number of lightning strikes in the region compared to other areas of the United States (Patterson and Sassaman 1988:112). Although exposed coastal areas such as the dune and edge habitat at the Smith's Point site are drier and therefore more conducive to lightning fire than other areas of New England, recent data from Cape Cod indicate that this type of fire is uncommon (Patterson and Sassaman 1988). For example, no recent fire activity during a ten-year period was caused by lightning fires on the nearby Cape Cod National Seashore, as compared to 112 human-induced fires (Patterson and Sassaman 1988:112-113).

Second, Patterson and Sassaman (1988) suggest that there is a correlation between pre-Colonial Native American occupation sites and charred plant remains. Based on their review of 11 pollen and charcoal analyses from Early Colonial and pre-Colonial sites in New England, they suggest that, "fires were most common in areas where, on the basis of archeological site distribution, Indian populations were greatest" (Patterson and Sassaman 1998:113). Therefore, they make an argument that Native American groups in New England set fires as part of their subsistence strategies, and that this pattern of cultural burning is evident in the geographic relationship between charred plant remains and past Native American occupation areas (Patterson and Sassaman 1998). Other researchers have also suggested a link between charcoal from wetland cores near archaeological sites and Native American burning activities (e.g., Clark and Royall 1995;

Jacobucci 2006; Parshall and Foster 2002). Together, the pollen and charcoal data sets indicate that past fire events correspond with increases in edible and economically important plant species that may have been planted, encouraged, and utilized by Native American in the area (Burden et al. 1986; Clark and Royall 1995; Jacobucci 2006; Jacobucci et al. 2007; Johnson 2003).

The Smith's Point site burning events closely match the conditions indicating cultural burning events. First, archaeological remains from the site spanning the Transitional Archaic period through the Early Colonial period attest to the site's continual use as a seasonal fishing and foraging site (Mrozowski 1994:1; PAL 1991:6). Many archaeological and historical sources note the Native American use of burning in seasonal encampment areas to increase the productivity of farming, foraging, and hunting during the Woodland and Early Colonial periods (e.g., Bragdon 1996; Chilton 2005; Cronon 1983; Dunford and O'Brien 1997; Mrozowski 1994; Champlain in Winship 1968:87-88). Therefore, it is likely that the inhabitants of the Smith's Point site were also using fire as a niche-creation technique during both the Woodland and Early Colonial period occupations. Additionally, while lightning fires burn indiscriminately, uncharred 17^{th}-century artifacts and shell from the living area of the site may indicate that this area of the site was not burned (PAL 1991). Therefore, it is possible that the field area was selectively burned by Native American inhabitants and represents cultural burning at the site. Ultimately, regardless of whether past burning events were the result of lightning or human action, fire at the site would likely have caused ecosystem changes that would have been beneficial for its Native American inhabitants. Burn off at Smith's Point would have increased the availability of food resources at the site (Hauser 2006; Smith 2009), thereby making the area more favorable for seasonal occupation.

One specific example of past burning at Smith's Point comes from the charred bayberry remains from both the agricultural field and living areas. The high ubiquity of charred bayberry seeds in every feature supports the interpretation of past burning. Due to its dominance in several ecological niches on Smith's Point, landscape burning would likely result in widespread charred remains of this plant (Hauser 2006). The Middle-Woodland site clearing indicated by the broad-spectrum bayberry remains in the feature samples may represent the beginning of seasonal Native American occupation at the site. Based on the radiocarbon analysis of these bayberry remains, a probable date for this occupation is the 7th century A.D. (BETA 275053). During this pre-agricultural occupation, the Smith's Point site's proximity to marine resources such a fish and shellfish would have been the primary aim of subsistence practices at the site. This interpretation is supported by Malpiedi's (2006) research of the faunal material from the Smith's Point site. Her results indicate that marine resource extraction was an important subsistence practice from the Woodland through the Early Colonial period at the site (Malpiedi 2006). During the Early Colonial agricultural period occupation of the site, the charred bayberry seeds still present in the soil from the previous site-clearance event were incorporated into the corn hills, midden, hearth, and soil stain, as the soil was moved and reshaped during the formation and use of these features.

An agricultural burning event may also explain why the majority of macrobotanical remains from the agricultural field at the Smith's Point site closely match wild plant communities of coastal Cape Cod ecosystems. Two types of agriculture-related burning were used by Native American farmers of southern New England during the Late Woodland and Early Colonial periods: burning for land clearance and burning for field maintenance (Bendremer 1999; Ceci 1990a, 1990b; Cronon 1983; Mrozowski and Bragdon n.d.; Patterson and Sassaman 1988). When Native American farmers set fire to land to clear it for planting, whole plant communities of bushes, shrubs, weeds, and grasses were burned (Bendremer 1999). Such a burning event could result in charred seed remains in soil that, like the bayberry remains, were hoed up into the planting hills and incorporated into the feature samples. The ubiquity analyses for bedstraw and blackberry/raspberry fluctuate among the corn hill features of the agricultural field. Unlike the bayberry, bedstraw and blackberry/raspberry grow in small patches in sand dune ecosystems (Gucker 2005). Therefore, as noted above, the variation in ubiquity for bedstraw and blackberry/raspberry among the corn hill features may relate to the distribution of these plants on the site prior to burning.

Although burning for land maintenance is described by European explorers and colonists during the 16th and 17th centuries (Champlain in Winship 1968:87-88), and is often cited by archaeologists and historians as a fertilization technique common among Native farmers of southern New England (Bragdon 1996; Ceci 1990a, 1990b; Chilton 2005; Cronon 1983 Dunford and O'Brien 1997; Mrozowski 1994; Mrozowski and Bragdon n.d.), there is little evidence in the agricultural field macrobotanical remains from Smith's Point to support this practice. As noted in the results chapter, there were few cultigen remains recovered from the agricultural field. Although it is difficult to base an argument solely on negative evidence, I hypothesize that, based on the low quantity of macrobotanical remains from the corn hill features and the paucity of agricultural crop remains and weedy plants expected to have been encouraged in the fields in the assemblage, annual burning for land maintenance is unlikely at the Smith's Point site. The charred plant remains recovered from the agricultural area are more likely the result of a single burning event or the occasional use of burning for land maintenance at the site.

Wild Edible Plant Use

Native American burning techniques served the additional purpose of encouraging and enhancing wild edible plant growth in and around the Smith's Point site. Many wild edible species are adapted to quickly colonize cleared landscapes such as burned fields (Hauser 2006). Specifically, species such as bayberry, blueberry, and huckleberry are often the first to be established in areas cleared by fire on Cape Cod (Hauser 2006). Smith (2009:176) notes that "understory shrubs that produced edible fruits such as raspberry, blueberry, cranberry, service berry, and huckleberry were recorded as commonly present in overgrown fields" where clearance activities have created "open, sunny forest edge and clearing habitat." Several European explorers and colonists also noted the abundance of wild fruits and nuts near Native American agricultural fields in southern New England. For example in 1643, Roger Williams wrote that, "in some places where the Natives have planted, I have many time seen as many [berries] as would fill a good ship" (Williams 1873:168, see also Heath 1963; Winship 1968).

The majority (75%) of identified taxa from the features at the Smith's Point site fall within the category of wild edible plants. These remains include several taxa of nuts (hickory, hazelnut, walnut), berries (winterberry, blackberry/raspberry, wild grape), and other wild edible plants (goosefoot, beach pea, bayberry), in the hearth and midden at Smith's Point. Many researchers have emphasized the continued importance of wild edible plants in Native American diets through the Late Woodland and Early Colonial periods (Bragdon 1996; Bendremer and Thomas 2008; Bernstein 1990; Cronon 1983; Dunford and O'Brien 1997; Little and Schoeninger 1995; Mrozowski and Bragdon n.d.; Stein 2008; Trigg et al. 2007). Bragdon (1996:112) notes that, "the collection and use of wild plants among southern New England people were activities rich in folk knowledge and tradition." In addition, documentary sources describe the Native American use of wild plants as food during the Late Woodland and Early Colonial periods (e.g., Wood 1977; Heath 1963). For example, Wood (1977:86) wrote that New England Native people ate "all sorts of berries" in the summertime, and the authors of *Mourt's Relation* (Heath 1963: 34) described stores of "parched acorns" they found at Native American farm sites on Cape Cod. The wild edible plants recovered from the Smith's Point site's Early Colonial period features indicate that maize agriculture did not replace earlier subsistence practices, but was, instead, added to a growing suite of subsistence practices at the site that included fishing, gathering, and farming.

Agricultural Field

The morphology of the mound features from the Smith's Point site closely matches 16th and 17th century European descriptions of Native American agricultural fields in New England. The Native American practice of planting maize and other crops in mounded fields is noted in several documentary sources (Champlain in Grant 1967:62; Heath 1963:79; Mrozowski 1993; Wood 1977:89). For example, in 1605, Champlain notes of these farmers that, "planting three or four kernels in one place, they then heap up about it a quantity of earth with shells” (Champlain in Grant 1967:62). Currie’s micromorphological analysis of the Smith’s Point site mounds also supports the interpretation of this area as an agricultural field. This research revealed that topsoil was mounded and reworked into planting hills (Currie 1999:37). Each of the hills includes a deep central soil matrix that Currie interprets as a planting hole within the mound (1999:37). The archaeological data from the macrobotanical remains of 6 mound features in the agricultural field supports the interpretation that these planting hills were used to grow maize. Charred remains of maize cupules and kernels were identified from 3 of the 6 corn hills from the site, both from the northern and southern portions of the field. These maize remains may have been charred in the field during a land-clearing burn, or they may have been charred during food preparation at the adjacent living area, discarded in a midden, and then reincorporated into the field when midden soil was used to enrich the field as fertilizer.

The AMS radiocarbon results of the maize cupule remains from the northern and southern portions of the agricultural field provide similar dates for the farming activities at the site (see Appendix). The sample from the southern corn hill (Feature 23) was collected from an area of the overall agricultural field that, based on the erosion of the corn mounds, Currie (1999) had interpreted as older than the northern area. The Feature 23 sample provided a radiocarbon calibration intercept date of A.D. 1650 (BETA 227591). The sample from a “newer” northern corn hill (Feature 255) yielded a calibrated intercept date of A.D. 1660 (BETA 227592). Combined with the archaeological evidence of overlapping agricultural and living area features (Mrozowski 1994), the radiocarbon results suggest that the agricultural field was a single, large field that shifted northward over time as it was seasonally re-used. Although the 2 sigma calibrated radiocarbon dates provide a series of potential date ranges for the maize remains, the 17th century date ranges closely match both the material culture recovered from the site and the radiocarbon dates of associated site features (Mrozowski 1994; Mrozowski and Bragdon:n.d.; PAL 1991). Therefore, the maize agricultural activity at the site likely also occurred in the 17th century.

Living Area

Adjacent to the agricultural area is the living area at the Smith's Point site. Marked by numerous post holes and ephemeral soil stain features (Mrozowski 1994:50), this area was the heart of the Late Woodland-Early Colonial period encampments at the site. At least two different oval arrangements of post holes represent areas where Native American inhabitants erected wetu houses (Mrozowski 1994:50; Mrozowski and Bragdon n.d.:8), and both the hearth and midden components of the area represent food preparation and disposal activities in the living area (Mrozowski 1994:50). For the research of the living area, I examined the macrobotanical remains from midden, hearth, and soil stain features.

The soil stain had the least species richness of all of the site features with only 4 identifiable taxa. These taxa (hickory, bedstraw, bayberry, and blackberry/raspberry) are all common components of natural Cape Cod plant communities (Sorrie et al. 2000; Leahy et al. 1996). Therefore, like the remains of wild plant material in the agricultural field, the charred seed remains from the soil stain are most likely the result of field burning at the site.

Macrobotanical remains from the hearth and midden represent a different facet of Native American plant use at the site. Unlike the other features that reveal aspects of Native land management and agriculture, the hearth and midden features provide details about the inhabitants' use of plants as food. In the living area, the hearth would have been used to cook food over a fire. Some plant material that became charred during cooking was incorporated into the hearth area. In total, 11 identifiable charred seed taxa were recovered from the hearth. Nuts (hickory), berries (huckleberry, blackberry/raspberry), and other wild edibles (beach pea, bayberry, speedwell) comprise 78% of the identifiable taxa from the hearth. Three of these taxa were not present in the agricultural field remains (huckleberry, beach pea, and speedwell); these plants may represent foraging activity in other areas of the peninsula. The macrobotanical remains from the hearth indicate the continued role of locally available wild plants in the diets of Smith's Point inhabitants even as they began to incorporate agricultural into their subsistence practices.

The midden feature in the living area at Smith's Point is rich with many categories of food waste, including bone, shell, and plant remains (Malpiedi 2006; Mrozowski 1993, 1994; Mrozowski and Bragdon n.d.). As with the hearth remains, plant-based food that was charred and discarded in the midden provides information about the diet of the site's Native American inhabitants. With 16 identifiable taxa, the midden has the greatest species richness across the site. These taxa include berries (winterberry, blackberry/raspberry, wild grape), nuts (hickory, hazelnut, walnut), other wild edibles (goosefoot, knotweed, bayberry), and maize. As with the hearth remains, the charred seeds from the midden represent a continuation of pre-agricultural foraging practice. The remains of maize in the midden indicate that cultigens were being incorporated into the larger subsistence base by the Late Woodland-Early Colonial period. Together with the shell and bone recovered from the midden, the macrobotanical remains from the hearth and midden closely match the varied diet described in the documentary records and archaeological research about southern New England Native groups during this period (Bendremer and Thomas 2008; Bragdon 1996; Cronon 1983; Little and Schoeninger 1995; Mrozowski 1993, 1994; Mrozowski and Bragdon n.d.; Stein 2008; Wood 1977).

These macrobotanical results do not rule out the use of midden soils as fertilizer in the agricultural field. Decomposed midden material would enrich the field with nutrients, prolonging its agricultural fertility (Little 2002; Mrozowski and Bragdon n.d.:22). If midden soils were spread across the agricultural field, both the corn hill and the midden features should share similar charred plant taxa. Of the 16 taxa recovered from the midden feature, 11 (69%) were also present in at least one of the 6 corn hill features. In addition, the corn hills contain fish and shellfish remains, (Currie 1999:31; Malpiedi 2006; Mrozowski 1994:58) which may also have been incorporated into the hills through midden soil enrichment. However, the presence of these charred plant taxa is more likely the result of land clearance through burning than the use of midden soil as fertilizer. For example, the close correlation of the charred plant assemblages in the corn hill features with naturally occurring plant communities in the area. Currie's micromorphological analysis also supports this conclusion. His results show that shell and fish remains were concentrated in the center of the corn hill features, and had a linear orientation (1999:35). From this, he concluded that the remains were most likely a primary deposition (such as the planting of a fish with the crop seeds), and not a secondary deposition (such as midden soil enrichment) (Currie 1999:35).

Site Seasonality

Based on the assessment of taxa seasonality, I determined that the identified plant materials from the agricultural and living features were seasonally available during the spring, summer, and fall months. According to documentary, archaeological, and historical accounts of seasonal mobility in New England (For example, Cronon 1983; Bendremer 1999; Bragdon 1996; Williams 1973), a coastal, agricultural occupation area such as Smith's Point would have served as an annual warm-weather encampment for a small family group beginning in late spring and continuing until after the fall harvest. A number of subsistence activities may have contributed to the charring of plant material during the seasonal occupation of the Smith's Point site during the Woodland and Early-Colonial periods, including field burning to encourage wild edible plants, to increase forage for game animals, and to enrich agricultural fields with ash, as well as food and medicinal plants discarded in the fire or burned during food preparation. Therefore, the seasonality of the charred plant taxa from the Smith's Point site supports the interpretation that the site was used as a summer encampment for a seasonally mobile Native American group during this period. Previous analysis of faunal material from the site also supports this interpretation (Malpiedi 2006). In her thesis research, Malpiedi (2006) identified the remains of several different fish taxa across the agricultural and living areas of the site, all of which were available in the area only during the spring and summer months.

Summary Conclusions

Macrobotanical data from agricultural and living area features at the Smith's Point site indicate that Native Americans during the Woodland and Early Colonial periods were altering natural patterns of vegetation in the area in order to clear land and increase the availability of edible wild and cultivated plants. These subsistence-related environmental manipulations included field burning and hill-based agriculture. The use of burning to alter entire plant communities is apparent in the macrobotanical assemblage recovered from the agricultural field and the soil stain feature. This fire-use strategy was likely employed both to clear land to create living areas and agricultural fields and to encourage the growth of wild edible plant populations at the site. The small amount of charred seed remains—especially cultigens such as maize—in the agricultural field features suggests that Smith's Point's farmers were not burning annually to clear land prior to planting. Although pioneer species such as bayberry and bedstraw may take up to 3 years after burning to produce fruit (Gucker 2005; Hauser 2006) and may, therefore, be underrepresented in remains of a seasonally-burned field, annual burn-off of agricultural remains would result in a much higher rate of charred maize and especially weedy plants such as chenopodium in the corn hills than is evident in the macrobotanical record.

Nonetheless, the Native farmers at Smith's Point may have been using techniques other than burning to prolong the fertility of their agricultural fields. The mounded planting technique evident at the Smith's Point site, when compared to Early Colonial period European-style plowing techniques, has been proven more successful at maintaining soil nutrients, moisture, and nitrogen-fixing wild plants (such as bayberry and beach pea) that mitigate fertility loss in agricultural fields (Mt. Pleasant 2006:532-533). There is also some evidence to suggest that midden soils, fish, or shellfish, were added to the planting hills to enrich the planting hills with nutrients (see Currie 1999:35; Malpiedi 2006).

Charred maize remains from the field and the midden support the interpretation that the planting hills were used for maize agriculture. European documentary accounts from the 16th and 17th centuries commonly describe a polycropping planting technique, where Native farmers plant maize with other crops, such as beans and squash, in their agricultural fields (Bragdon 1996; Winship 1968). However, due to the specific conditions required for preservation of archaeological plant remains (see Popper 1988:54-58), it is unclear whether the absence of cultigens such as beans and squash in the Smith's Point site macrobotanical assemblage accurately indicates maize monocropping at the site.

Finally, the macrobotanical remains recovered from the midden and the hearth suggest that the Early Colonial period occupants of the site had a diet of both wild and cultivated plants. These plants included berries, nuts, and maize, among other plants. Smith's Point residents also utilized the nearby fish and shellfish as a source of subsistence (Malpiedi 2006). In fact, the charred bayberry remains across the site suggest that Native people began utilizing the Smith's Point site primarily because of its access to marine resources and only later added maize agriculture to their subsistence practices. This varied diet is consonant with other archaeological research of incipient agriculturalists in coastal Northeast areas (Bendremer and Thomas 2008; Bernstein 1990;

Chilton 1999, 2005, 2008; Hanselka 2010; Largy and Morenon 2008; Little 2002; Little and Schoeninger 1995; Mrozowski 1993, 1994; Mrozowski and Bragdon n.d.).

Results

Altogether, archaeological research on the Smith's Point site has explored the well-preserved, Late-Woodland-Early Colonial period occupation area as a base for hunting, fishing, shellfishing, farming and foraging. The Smith's Point site represents "the type of settlement so often depicted in ethnohistorical accounts, but so rarely found in the archaeological record anywhere in New England" (PAL 1991:6-7). I begin this section by examining two other archaeological research projects on the Smith's Point site: Malpiedi's faunal analysis and Howlett's lithic analysis. I discuss where my research fits in with these studies and also how this macrobotanical data contributes to the larger social questions posed in these projects. Next, I explore how this coastal Cape Cod site compares with other sites in the Northeast, using Ceci's (1990c) research of Late Woodland "villages" as a case study. I conclude by reflecting upon both the use of documentary sources in archaeological research of Woodland and Early Colonial period New England and the implications of my research for scholarly debates over issues regarding Native American subsistence practices during this period.

Previous Research on Smith's Point

In 2006, Malpiedi conducted a study of the faunal material from the Smith's Point site occupation area. For this project, she analyzed faunal material from living area features such as the hearth and midden as well as the faunal material recovered from the agricultural field and other associated Late Woodland features. Her main finding regarded seasonality of the faunal material at the site. The Smith's Point faunal assemblage consisted of fish that were only locally available during the spring and summer months (Malpiedi 2006). These data support the interpretation of the site as a seasonal, warm-weather encampment (Malpiedi 2006).

A notable aspect of Malpiedi's (2006) research is her emphasis on the role of the environment in creating patterns of mobility and subsistence among Native American groups in southern New England. For example, she writes that, "environmental factors played an integral role in the *development* of cultures in Southern New England" (Malpiedi 2006:1, emphasis added). Malpiedi (2006) concludes that environmental factors determined the mobility patterns of Native American groups in southern New England. Areas with unpredictable resources caused Native groups to become increasingly sedentary and adopt agriculture as a means of creating a more stable subsistence base (Malpiedi 2006:12). In coastal areas where fish and shellfish were a predictable source of food, Malpiedi (2006:12) argues that coastal residents had less of a need for agriculture and were, as a result, more mobile. Such an environmental model leaves many questions unanswered. For example, how does a researcher account for variation in subsistence practices and mobility among Native groups inhabiting sites with similar environments? Additionally, how does a researcher interpret a Native American group's changing mobility and subsistence practices during periods of environmental stability?

Some archaeologists have argued that this environmental model, in which Native American groups "adapt" to their ecosystems, implies that these groups play passive roles in these ecosystems, merely reacting to the conditions around them in their effort to obtain resources necessary for their subsistence (e.g., Howlett 2002). Watson and

Kennedy (1991) pose a similar critique of the discourse about horticultural development in the Northeast. They argue against the "co-evolution" model that:

> Highlights gradualness; the built-in mechanisms adduced carry plants and people smoothly and imperceptibly from hunting-gathering-foraging to systematic harvesting to at least part-time food production with little or not effort on anyone's part (Watson and Kennedy 1991:262).

Similar to the environmental model described by Malpiedi (2006), the co-evolutionary model implies that the Native American groups involved in plant resource management play essentially a passive role in this process. As Watson and Kennedy note, in the co-evolutionary model, "the plants virtually domesticate themselves" (1991:262). In response to this model, Watson and Kennedy propose that Native American farmers were, "capable not only of conscious action, but also of innovation" (1991:269). In other words, Watson and Kennedy challenge researchers to move beyond an identification of the results of human/ecosystem interactions (such as cultigens), and move toward a consideration of the people whose day-to-day actions contributed to these results. This new focus enables researchers to consider Native American people during the Woodland and Early Colonial periods as active participants in niche construction and subsistence activities.

Yet, how does this concept of Native American-as-ecological-agent fit in with the paleoethnobotanical data from Smith's Point? In the introduction, I discuss the notion of the "Ecological Indian" (Krech 1999). Implicit in the 16th and 17th century European descriptions of New England's Early Colonial "pristine" wilderness and "spontaneous" abundance of resources was the notion that Native Americans had little impact on and did little to alter their ecosystems (Bragdon 1996; Calloway 1997; Cronon 1983; Krech 1999). However, the paleoethnobotanical data indicate that residents of the Smith's Point site were altering the landscape in many ways. For example the charred plant material from the agricultural area at the site are likely the remains of burning events that would have resulted in conditions favorable for subsistence activities. Specifically, landscape burning was used to increase wild edible plant resources, forage for game animals, and to enrich agricultural fields with nutrient-rich ash (Bragdon 1996; Ceci 1990a, 1990b; Chilton 2005; Cronon 1983 Dunford and O'Brien 1997; Mrozowski 1994; Mrozowski and Bragdon n.d.). Therefore, the Native American inhabitants of the site were likely using controlled burning to consciously create an environment suitable for gathering, hunting, and farming.

The agricultural field is another area of landscape alteration at the site. In this area, Native farmers reshaped the topography to form planting mounds (Currie 1999; Mrozowski 1994). Additionally, through planting and weeding, these residents controlled the plants that grew in this area of the site, selecting for wild and domesticated edible or medicinal plants and removing other plant species (Hanselka 2010). The archaeological data indicate that these landscape alteration and maintenance practices served to create ecological niches on the site that were favorable to Native American subsistence practices. Therefore, I conclude that, in contrast to 16^{th} and 17^{th} century European characterizations of Native Americans as passive "Ecological Indians," Smith's Point's inhabitants were actively altering their ecosystems as part of their subsistence practices.

Howlett's (2002) research on the lithic material from Smith's Point uses this class of archaeological material to consider gender relations and gendered landscapes at the site. In this study, Howlett examined stone tools and lithic debitage from both the living area and the agricultural field, using this material to consider raw material procurement and manufacturing strategies at the site (2002:73). The majority of the lithic material from the site was comprised of "women's tools" and local source materials, both characteristic of female tool use during the Woodland and Early Colonial periods (Howlett 2002:71). Howlett's analysis of lithic artifact distribution across the occupation area identified clusters of material associated with female tool use in agricultural and shellfish processing areas at the site in contrast to distributions in the living area of the site, which had evidence of both male and female tool use and manufacture (Howlett 2002:71). She concludes that, "gender may have had a major impact" on the lithic component of the archaeological record at the site (Howlett 2002:71).

Howlett's thesis (2002) combines 16th and 17th European explorer and settler accounts of Native American seasonal subsistence activities and gender roles with an analysis of archaeological remains in order to investigate social relations at the site. She notes that while people of different ages and genders inhabited the site, the lithic remains support the ethnohistorical observation that farming and shellfish processing were primarily the role of women (Howlett 2002). If the edible plant collection, encouragement, and cultivation is, indeed, primarily the realm of Native American women in southern New England during the Woodland and Early Colonial periods, then my thesis research may also provide insight into the activities of women at the Smith's Point site.

The role of Native American women as farmers in southern New England was often described in historical descriptions (see Bragdon 1996; Howlett 2002; Watson and

Kennedy 1991). For example, in 1643, Roger Williams (1973:170) wrote, "the women set or plant, weede, and hill, and gather and barne all the corne, and Fruites of the field." Historians and archaeologists widely accept this notion of a gendered division of labor in southern New England, whereby Native American women are associated with the agricultural activities in Late Woodland and Early Colonial period. However, as Watson and Kennedy (1991) note, despite the strong connection between edible plant management and women's work in the past, archaeologists have not consistently considered the implication of plant use research for interpretations of gender relations in the past. The Smith's Point macrobotanical remains indicate not only a culturally managed landscape, but also one that was changing over time. Charred bayberry from the site suggest that beginning in the Middle Woodland period, the Native inhabitants used fire to clear the land and create a base for fishing, shellfishing, and foraging. Over time, these residents added farming and wild edible plant management to their suite of subsistence activities. This subsistence system expansion is indicated by the presence of agricultural plants such as maize, chenopodium, and knotweed remains, alongside other wild edible plants remains in the agricultural and living area features at the site dating to the Early Colonial period.

If women were the "chief protagonists" in plant-based subsistence practices, then the macrobotanical remains may indicate gendered activities at the site (Watson and Kennedy 1991:261). First, as discussed above, the macrobotanical remains, combined with the presence of corn hill features at the site, indicates that Smith's Point's inhabitants actively shaped the ecosystem to maintain and increase access to food sources such as plants, fish, and shellfish. Women, whose daily activities included managing and harvesting wild edible plant resources, and "planting, reaping, collecting, and processing" (Watson and Kennedy 1991:258) agricultural plants, played an important role in the subsistence-based niche construction activities at the site. This role should not be underestimated. As Waston and Kennedy point out (1991:266), maize "together with pumpkins, squashes, sunflowers, and a long list of other cultigens, planted, tended, harvested, and processed by the women agriculturalists supported many thousands of people each year for hundreds of years."

Second, there is evidence of changing subsistence practices over time at the Smith's Point site. As the primary agriculturalists at the site, Smith's Point's women farmers changed the landscape of the site during the Early Colonial period with the addition of an agricultural field. Combining the ethnohistoric record of Native American women's roles during the Early Colonial period with the archaeobotanical remains from the site highlights both gendered subsistence activities and the impact of these activities on past ecosystems. Documentary records note that tasks such as agriculture, wild edible plant harvesting, and the preparation of food was primarily women's work (see Bragdon 1996; Classen 1991; Howlett 2002; Watson and Kennedy 1991). The macrobotanical data from the Smith's Point site suggests that all of these activities took place at the site and contributed to the overall diet its residents. Therefore, I conclude that women played an important role in managing, harvesting, and preparing food at the site. On an ecological level, women's subsistence activities at the site, indicated by the macrobotanical analyses, actively and intentionally altered the ecosystem in order to maintain and increase food resources at Smith's Point.

Site Comparison

In "Radiocarbon Dating 'Village' Sites in Coastal New York: Settlement Pattern Change in the Middle to Late Woodland," Lynn Ceci (1990c) presents an assessment of macrobotanical remains that provides a useful comparison to these thesis results. Ceci's research focuses on five Woodland period sites located in coastal New York (1990c). Similar to the Smith's Point site occupation area, Ceci's sites are small, seasonal, warm-weather encampments that exhibit features, such as stratigraphic "smearing" and overlapping posthole features, suggesting repeated site re-use (Ceci 1990c:21). Through radiocarbon testing of archaeological remains from these five site, Ceci attempts to explore the "traditional paradigm" of sedentism and the adoption of agriculture in the Northeast (1990c:2). This paradigm holds that "sedentism increased in the Late Woodland (c.a. A.D. 1000-1600) after maize or some maize-marine food combination improved subsistence so as to sustain large populations year-round" (1990c:2). The lack of maize remains at Late Woodland sites in the Northeast problematizes this paradigm and provides the impetus for Ceci's investigation (Ceci 1990c).

Based on her analysis, Ceci concludes that the movement toward sedentism began before the adoption of maize agriculture (Ceci 1990c:19). Together with other archaeological data from Woodland period Northeast, Ceci's results offer "little support for the development of sedentism based on [maize]" (1990c:19). Instead, the data from the five coastal New York sites suggest that during the Middle and Late Woodland, seasonal inhabitants of these sites began shifting "free-wandering" to "restricted-wandering," while still maintaining a seasonal round (Ceci 1990c:21). This interpretation of gradual shifts in sedentism was based on a number of lines of evidence, including food remains. Faunal and macrobotanical remains from the project sites suggested that these Native American inhabitants were "mapping on" an increasing number of terrestrial and marine species over time (Ceci 1990c:21). Importantly, Ceci also concludes that Native American groups in coastal areas adopted maize agriculture later than other areas in the Northeast. She suggests that the late adoption of maize agriculture among coastal groups in New York may be due to ready access to alternative sources of food on the coast, such as fish and shellfish, and also due to the lack of arable land in coastal areas (Ceci 1990c:73). In contrast to the "traditional paradigm" of sedentism and the adoption of agriculture in the Northeast, Ceci advocates for region-specific models of subsistence system change that take into account "ecological, economic, demographic, social and ideational factors" (1990c:73).

Many of Ceci's conclusions about mobility and subsistence practices in coastal New York parallel my interpretations of the activities that shaped the archaeological landscape at Smith's Point. First, Ceci rejects the notion that the adoption of maize agriculture shifted Woodland period Native American groups into sedentary lifeways. Instead, she uses her results to advocate for an interpretation of gradual transition for these Native American groups from "free-wandering" to "restricted-wandering" mobility, a period during which these groups added more time-intensive plant foods to their subsistence base (Ceci 1990c:21). Similarly, the macrobotanical data from Smith's Point suggest that Native American inhabitants of the site shifted from "low-level food production" and marine resource collection in the Middle Woodland period to "incipient agriculture" in the Late Woodland and Early Colonial period with the addition of maize agriculture to their subsistence practices (Hanselka 2010). Although the adoption of maize agriculture by Native American groups at Smith's Point would likely have restricted their "wandering," the seasonality of both the charred macrobotanical remains and the faunal remains (Malpiedi 2006) suggest that the occupants were still practicing seasonal mobility during this time period. Additionally, like the results from Ceci's sites on coastal New York, there is evidence from the Smith's Point site macrobotanical and faunal remains that agricultural plants such as maize were incorporated into the well-established subsistence base without supplanting it (Ceci 1990c:21; Malpiedi 2006). The paleoethnobotanical data suggest that residents of the site incorporated a wide variety of plant resources into their diets including both wild edible plants and cultigens. Finally, Ceci notes that the adoption of maize agriculture occurred relatively late at coastal New York sites. The radiocarbon results from the Smith's Point site also indicate a late adoption for maize agriculture at this coastal Massachusetts site.

While there are many similarities among the New York sites in Ceci's analysis and the Smith's Point site, there are also points of divergence. For example, Ceci suggests that trade in wampum with other Native American groups and, later, trade in wampum and furs with Europeans increased the sedentism of Native American populations in coastal New York (Ceci 1990c:23). In contrast, there is little evidence at Smith's Point of wampum production, fur trade, or decreased mobility as a result of trade networks at the site. As a whole, however, the similarities among these sites hold broader significance for archaeologists and historians for two main reasons. First, the results of the Smith's Point macrobotanical analysis lends additional weight to Ceci's (1990c) critique of the well-accepted agriculture and mobility paradigm in the Northeast. Second, these data provide more accurate depictions of long-term shifts toward sedentism and the agricultural adoption in the coastal Northeast during the Woodland and Early Colonial period. This information may be helpful for researchers trying to situate their own research on subsistence practices into a broader temporal and regional context.

Concluding Remarks

Archaeologists and historians researching the Woodland and Early Colonial periods in New England rely heavily upon 16th and 17th European documentary descriptions for details about Native American life. The European explorer and settler accounts from Early Colonial New England provide, on one hand, a notion of pristine wilderness and the "Ecological Indian," and on the other hand, detailed descriptions of Native American subsistence practices, cultural landscapes, and gender relations. My thesis research provides an opportunity to explore how well the historical record reflects they way Smith's Point's inhabitants lived at this site.

In Chapter 2, I discus the reoccurring themes in 16th and 17th century historical documents describing Native farming in New England. On the whole, descriptions of field size, layout, planting season, crops, techniques of field preparation and maintenance, and diet were remarkably accurate to the archaeological remains from the Smith's Point site. For example, Champlain's 1612 map of Native American agricultural fields and adjacent living areas on the coast of Nauset Harbor on Cape Cod (Figure 1), bears a close spatial resemblance to the layout of the occupation area at Smith's Point. The analysis of the macrobotanical remains from the site suggests other similarities with these historical documents. First, European accounts of Native agricultural fields describe the widespread cultivation of maize (e.g. Williams 1973; Winship 1968; Wood 1977). Charred maize remains recovered from the agricultural field and in the living area indicate that Smith's

Point's Native farmers were also growing maize. Also, edible plant remains recovered from the hearth and midden features at the site, likely plants the Native American residents used as food and medicine such as wild cherries, blackberries and raspberries, maize and nuts, matched European descriptions of Native plant foods (Heath 1963; Winship 1968; Wood 1977).

In contrast to the continuity between the ethnohistoric record and the archaeological remains from the Smith's Point site, this macrobotanical research contradicts the notion of "pristine wilderness" and the "Ecological Indian" implicit in many 16th and 17th century European descriptions of resources in the New World (Krech 1999). The macrobotanical data from the Smith's Point site indicate that Native Americans were altering the ecosystem to create ecological niches that supported their subsistence practices. For example, controlled landscape burning at the site likely encouraged the growth of wild edible plant species such as bayberry and blackberry raspberry, increased forage for game animals (Cronon 1983), and enriched agricultural fields with nutrient-rich ash. Additionally, the radiocarbon results from the charred bayberry and maize remains in the agricultural field features suggests that Native American niche construction activities occurred for centuries at the site. The landscape that European explorers and settlers observed during the Early Colonial period was not pristine, but was, rather, a "patchwork" (Cronon 1983) of niches that Native Americans in New England created, in part, to maintain and increase their subsistence bases.

This thesis research may also clarify ethnohistoric accounts of field fertility maintenance in Early Colonial New England. The written records describe Native Americans using annual controlled burns or fish fertilizer to enrich their seasonal agricultural fields (e.g., Heath 1963; Winslow 1996; Winship 1968). The charred plant remains recovered from the corn hill features at Smith's Point suggest that landscape burning did occur at the site, however the small quantity of charred material may indicate that this practice of enriching fields with ash was not an annual occurrence. Descriptions of land management techniques vary widely among the documentary sources in large part because agricultural activities varied among the Native American groups European explorers and settlers observed (Bragdon 1996; Cronon 1983). At the Smith's Point site, primary deposits of fish remains (see Currie 1999) and charred maize remains in the corn hills may indicate that Native farmers at the site used landscape burning and fish fertilizer to enrich the soil. However, although these practices may have been used at the site, they may not have been used as often as the written record suggests. Based on the macrobotanical data from the agricultural field, it is likely that these land management techniques were used less frequently, or on an as-needed basis at the site.

In addition to the ethnohistorical themes, trends in archaeological and historical research form the background for this thesis research. The macrobotanical data and interpretations add nuance to this body of scholarly research of maize intensification and mobility among Native Americans in the Northeast. As detailed above, there has been a lot of debate among archaeologists and historians over the exact period during which maize was adopted by Native American groups in New England (e.g., Bragdon 1996; Dunford and O'Brien 1997; Largy and Morenon 2008; Little 2002; Little and Schoeninger 1995; Mrozowski 1993). Although this research does not provide an estimate for maize adoption in the region, the radiocarbon dates on maize from the agricultural field do suggest that maize agriculture was a part of subsistence practices in coastal Cape Cod by the mid-17th century. These 17th century dates for maize agriculture correspond both with ethnohistoric accounts and with dates from other New England sites yielding maize remains.

Furthermore, the macrobotanical remains from the Smith's Point site span the Middle Woodland to the Early Colonial period. During this period, seasonal Native American inhabitants shifted their subsistence practices from "low-level food production," such as fishing, shellfishing, foraging, and wild edible plant management, to "incipient agriculture," maintenance of earlier practices with the addition of maize agriculture (Hanselka 2010). The shift toward sedentism and agricultural production indicated by the macrobotanical remains at Smith's Point is very similar to changes in subsistence practices among coastal Native American groups in New York during the same periods (Ceci 1990c). Both the Smith's Point site results and Ceci's site results diverge from the commonly held paradigm that Native Americans in the Northeast shifted from mobile hunter-gatherer to sedentary agriculturalist as a result of the adoption of maize agriculture (Ceci 1990c) and provide evidence for a need for more flexible models of agricultural adoption and seasonal mobility in the region.

The archaeological data also speak back to scholarly descriptions of the seasonal round in Woodland and Early Colonial Native American communities in New England. In both archaeological and historical research, the Native American seasonal round is described as a movement beginning in the spring to cooler, coastal areas with subsistence practices such as hunting, fishing, shellfishing, foraging, and farming (Bragdon 1996; Cronon 1983). After the fall harvest, these groups would move to warmer, inland areas with a subsistence base of hunting, gathering, and preserved plant foods such as dried maize (Bragdon 1996; Cronon 1983). The seasonality analysis of the macrobotanical remains from Smith's Point indicates that these plants were available during the late spring through early fall seasons. Malpiedi's (2006) analysis of faunal material seasonality from the site yielded similar results. These results suggest that the site was occupied primarily during the spring and summer. Therefore, similar to scholarly descriptions of mobility among Woodland and Early Colonial period Native American groups, it is likely that the Smith's Point's inhabitants were a seasonally-mobile group that incorporated maize agriculture into their traditional seasonal round.

Too often the shift from Late Woodland to Early Colonial land use in New England is over-simplified through dichotomous thinking about the past. Common dichotomies between pre- and post-European "contact" present the Late Woodland world as natural, passive, Native, pristine, and wild and the Early Colonial world as cultural, active, European, degraded, and tamed (Calloway 1997:10; Cronon 1983; Krech 1999:101). In this paper I use the macrobotanical remains from Smith's Point to problematize the use of such dichotomies in the interpretation of Native American subsistence systems and land management practices in the past. The use of the pristine/degraded dichotomy to compare these two time periods ignores the realities of past landscapes. The macrobotanical data suggest that Smith's Point's Native inhabitants were not "Ecological Indians," but rather were continually reshaping the landscape to create ecological niches in order to maintain and increase their subsistence base. Additionally the subsistence practices that European explorers and settlers observed during the 16th and 17th centuries were the continuation of long-held land management practices. Charred plant material from the agricultural and living area indicates that the

Native inhabitants of the Smith's Point site had been clearing land and utilizing plants for food from as early as the Middle Woodland period.

This research contributes new information to the multi-scalar analysis of life at Smith's Point during the Woodland and Early Colonial periods and presents a platform for consideration of social issues in the past. In the discussion, I show how two of these social issues: agency and gender can be applied to macrobotanical data. Using the concepts put forth by Watkins and Kennedy (1991), I argue against the notion that 17^{th} century New England was a pristine wilderness. The macrobotanical data suggest that Native Americans at the site were actively and intentionally involved in creating an ecosystem conducive to their subsistence activities—activities such as creating and maintaining an agricultural field. Also, I use Howlett's research on Smith's Point as a point of entry into considerations of gender relations at the site. As Native American women were often primarily responsible for farming and wild edible plant management during this period (Bragdon 1996; Howlett 2002; Watson and Kennedy 1991), researchers may gain insight into considering the impact of gender on past ecosystems. I note that, based on the macrobotanical remains of farming and foraging activities, women at the Smith's Point site were likely making a significant impact on the landscape through their subsistence activities.

This analysis of Smith's Point macrobotanical remains provides insight into the ways in which Native American groups in the Northeast shifted their subsistence and associated niche construction activities during the Woodland and Early Colonial periods. From the first archaeologically-visible burn-off event in the Middle Woodland, Native inhabitants of Smith's Point altered the landscape in order to clear land for habitation, resource collection, and to encourage wild edible plant growth. Later, as Smith's Point residents become "mobile farmers" (Chilton 2005:142-143) with the addition of maize-based agriculture into the subsistence base, they created a new agricultural landscape and living area that preserved the botanical remains of these activities. Through this research, I have sought to contribute to scholarly debates about Native American life during the Late Woodland and Early Colonial periods and to present a more nuanced perspective of diet, subsistence activities, the landscape, and gender at the Smith's Point site.

APPENDIX

AMS RADIOCARBON RESULTS

Bayberry Sample, Feature 59

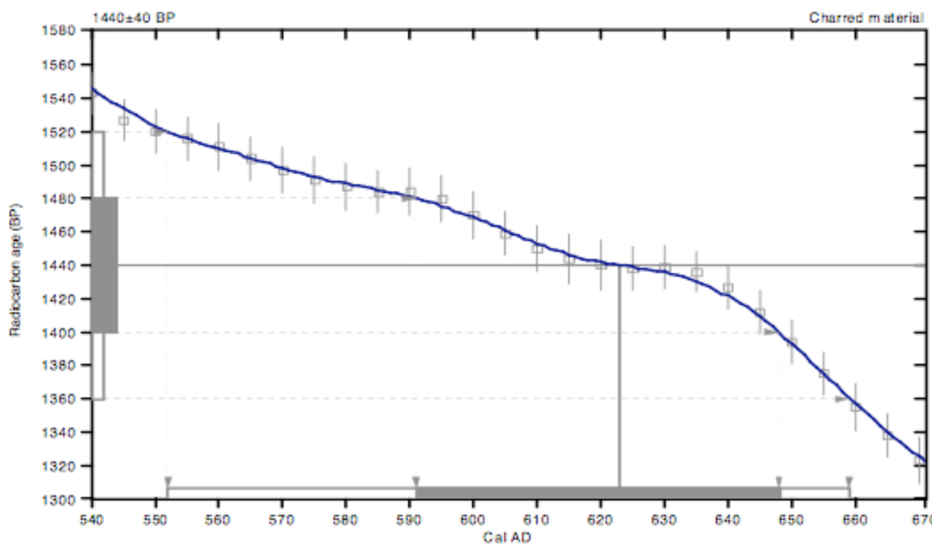
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-26.3:lab. mult=1)

Laboratory number:	**Beta-275053**
Conventional radiocarbon age:	**1440±40 BP**
2 Sigma calibrated result: (95% probability)	**Cal AD 550 to 660 (Cal BP 1400 to 1290)**

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal AD 620 (Cal BP 1330)
1 Sigma calibrated result: (68% probability)	Cal AD 590 to 650 (Cal BP 1360 to 1300)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

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Maize Cupule Sample, Feature 23

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-10.1:lab. mult=1)

Laboratory number: **Beta-277591**

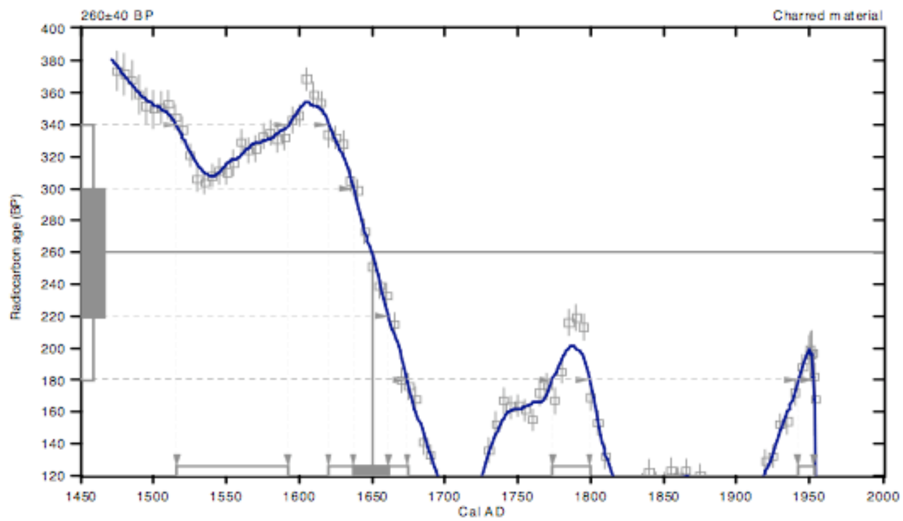
Conventional radiocarbon age: **260±40 BP**

2 Sigma calibrated results: (95% probability) **Cal AD 1520 to 1590 (Cal BP 430 to 360) and Cal AD 1620 to 1670 (Cal BP 330 to 280) and Cal AD 1770 to 1800 (Cal BP 180 to 150) and Cal AD 1940 to 1950 (Cal BP 10 to 0)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1650 (Cal BP 300)

1 Sigma calibrated result: (68% probability) Cal AD 1640 to 1660 (Cal BP 310 to 290)



References:

Database used
INTCAL04
Calibration Database
INTCAL04 Radiocarbon Age Calibration
IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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Maize Cupule Sample, Feature 255

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=N/A:lab. mult=1)

Laboratory number: **Beta-277592**

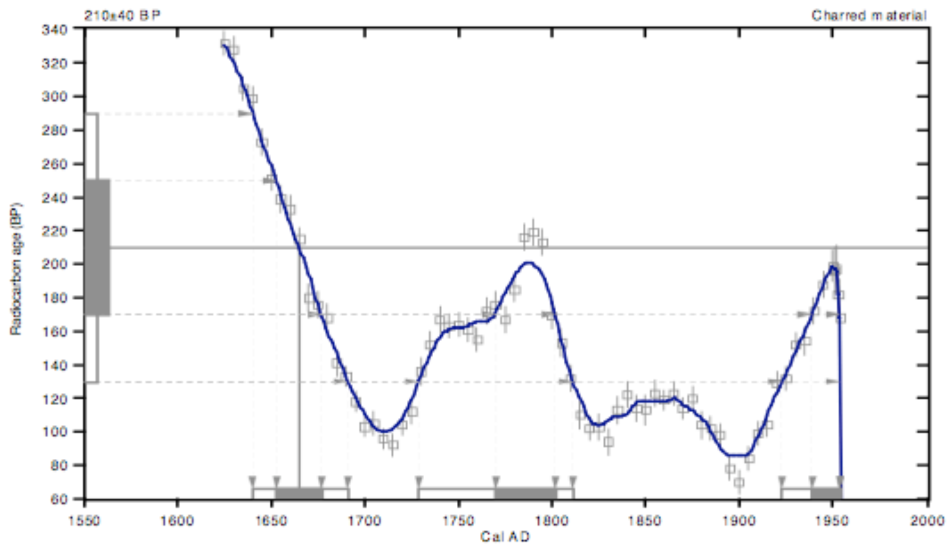
Conventional radiocarbon age: **210±40 BP**

2 Sigma calibrated results: (95% probability)
Cal AD 1640 to 1690 (Cal BP 310 to 260) and
Cal AD 1730 to 1810 (Cal BP 220 to 140) and
Cal AD 1920 to 1950 (Cal BP 30 to 0)

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1660 (Cal BP 280)

1 Sigma calibrated results: (68% probability)
Cal AD 1650 to 1680 (Cal BP 300 to 270) and
Cal AD 1770 to 1800 (Cal BP 180 to 150) and
Cal AD 1940 to 1950 (Cal BP 10 to 0)



References:

Database used
INTCAL04

Calibration Database
INTCAL04 Radiocarbon Age Calibration
IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics
A Simplified Approach to Calibrating C14 Dates
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