DIRT TO DESK:
MACROBOTANICAL ANALYSES FROM FORT ST. JOSEPH (20BE23)
AND THE LYNE SITE (20BE10)

MASTER’S THESIS

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ABSTRACT

Fort St. Joseph, a seventeenth- to eighteenth-century archaeological site in southwestern Michigan, and the adjacent Lyne site provide a recent and ongoing example of historical archaeology posing questions about the notion of culture contact during French colonialism. Effective research questions, increasingly systematic procedures, and a balance between historical and archaeological material have served to solidify and situate the Fort St. Joseph Archaeological Project’s contributions to anthropology. Archaeobotanical data analysis of the 2007 flotation remains from Fort St. Joseph (20BE23) and the Lyne site (20BE10), coupled with the 2002 macrobotanical findings from Fort St. Joseph, provides the project with better understanding of the food consumption patterns of both Native and Colonial occupants of the two sites. Archaeobotanical data from these and other colonial era sites shed light on processes of dietary acculturation and the strengths and weaknesses of the archaeological record of subsistence from Historic sites. Prior notions of unidirectional acculturative forces and Indigenous agency are discussed, along with shifts to the inclusion of non-Native plant resources by either Native or Colonial groups. Macrobotanical results for the two sites are viewed against expectations provided by world systems theory and acculturation theory.
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INTRODUCTION

Fort St. Joseph (20BE23) is located in Niles, Michigan, on the banks of the St. Joseph River. Due to its strategic locale along the St. Joseph, this French fort became a valuable cultural center for French and Native relations during the contact-period fur trade. It was also a center of Euro-American expansion, and was subsequently occupied by French, British, Spanish, and ultimately American forces (Nassaney 2008a, 2008d; Nassaney and Brandao 2006; Nassaney et al. 2002-2004, 2003, 2007; also see Peyser 1992). Fieldwork has been conducted at this seventeenth- to eighteenth-century French Colonial archaeological site since 1998. Dr. Michael S. Nassaney leads the Western Michigan University field school and The Fort St. Joseph Archaeological Project at Fort St. Joseph, where excavation has been carried out over various summers since 2002 (Nassaney et al. 2002-2004; Nassaney 2008a). Also under investigation is the Lyne site (20BE10) positioned along the wooded terrace overlooking Fort St. Joseph, which has yielded both Native and eighteenth-century archaeological remains (Nassaney et al. 2003; Nassaney 2008c). Fieldwork in Niles focuses on recovering information about the fort’s inhabitants, their everyday lives, and the relationships between occupants and Native populations. Illuminating these relationships will further an understanding of the
distinctive Colonial role the French played during the contact period (see Nassaney et al. 2003; Nassaney 2008a, 2008d).

The nature and make-up of this riverine fort community presented in the documentary record is one of extensive French and Native interaction and can be augmented by archaeological remains, including those of plants. These archaeobotanical remains were once largely ignored by archaeologists. However, techniques employed in the retrieval and processing of archaeological soils have greatly improved the ability to recover archaeobotanical materials, especially macroremains (those large enough to be identified under low magnification, such as seeds and charcoal). Application of these methods at the Lyne site and Fort St. Joseph has yielded macrobotanical data from the 2002 (Cremin and Nassaney 2003) and 2007 excavation seasons (reported here), which provide useful information on the use of plants at these two sites. Macrobotanical data from Fort St. Joseph and the Lyne site are assumed to reflect materials represented by a multi-ethnic fort community with adjacent satellite processing areas, as might be expected during seventeenth- to eighteenth-century French Colonial occupation periods (Nassaney 2008a, 2008d).

Previous expectations that acculturation was unidirectional in Colonial communities do not seem to hold in light of the archaeobotanical record from these sites and other contact-period North American sites. Archaeobotanical evidence instead indicates a two-way exchange of knowledge between Native people and French Colonialists. My aim is to support this argument by providing a preliminary assessment of the contributions of Old World and New World plants to the diet of people associated
with this French frontier outpost. I present a synthesis of plant use for the two associated sites in order to give a sense of what economic plants were being used at Fort St. Joseph and where effective research might lead in the future. I examine the results against expectations provided by world systems and acculturation theory and also discuss evidence of diet from approximately eight other sites in North America where both imported and local foods were used.
HISTORICAL BACKGROUND AND ENVIRONMENTAL SETTING

HISTORICAL BACKGROUND

The key motivations of the French in North America were the fur trade and exploration. Their activities in the lower St. Joseph River Valley were major contributors to the expansion of Colonial endeavors in the region (Nassaney 2008a, 2008d; Heldman 1999). During the seventeenth and eighteenth centuries, as the French continued to expand the fur trade, their actions affected the relationships they bore with Native groups, at times altering identities and practices alike (Nassaney 2008d). Intermarriage between the French and their Native allies was fairly common practice by the eighteenth century (Brandao and Nassaney 2006), and Nassaney (2008d, 2008a) notes that identity boundaries were oftentimes “fluid,” suggesting that genetic and cultural exchange between Colonial and Native groups was ongoing and occurred in both directions. Unlike the English, who clearly distinguished themselves from the colonized Native Americans, the French approached their interactions with Native groups showing them “considerable courtesy and respect” (Nassaney 2008d:5) through gifts, services, and trade, no doubt to promote a more stable Native-Colonial relationship (Brandao and Nassaney 2006).
In the vicinity of Fort St. Joseph, local groups included the Miami and Potawatomi peoples who occupied southwestern Michigan and the St. Joseph River Valley at the time of French arrival in Michigan, as well as prior to the contact period (Cremin 1999; Fitting and Cleland 1969; O’Gorman and Lovis 2006). O’Gorman and Lovis (2006) note that Native groups such as the Potawatomi descended from the Chippewa and Ottawa in the north and came to the Great Lakes area around Lake Michigan’s southern banks toward the latter portion of Michigan’s prehistory (O’Gorman and Lovis 2006:21; also see Bollwerk 2006). Native groups in southwestern Michigan are believed to have utilized economic subsistence strategies of hunting, gathering, fishing, and farming (Cremin 1999), seasonally varying their practices according to availability. Cremin (1999) discusses the economic strategies of Native groups in the region as growing modest fields of tobacco, beans, corn, and squash in fertile soil from the surrounding rivers along with hunting beaver, elk, deer, and black bear (Cremin 1999:265). Euro-American groups, such as the French, would have encountered Native inhabitants who were closely adapted to the varied environment of the southern Lake Michigan basin (Cremin 1999; Fitting and Cleland 1969).

Fur trade, missions, and fort occupations were important tools of French colonialism as the seventeenth century passed into the eighteenth. After Jesuits were given land in 1686 to erect a mission outside of present-day Niles, Michigan, the French built what came to be known as Fort St. Joseph (1691-1781) to provide a military and commerce post in the St. Joseph River Valley (Nassaney 2008a, 2008d; also see Peyser 1992). The fort was established to provide protection for the nearby mission, yet it
lacked the substantial soldier base needed to present a strong military presence in the region (Nassaney 2008a:300). Despite this fact, Fort St. Joseph’s ideal positioning along the St. Joseph River enabled French Colonialists to exercise control over the St. Joseph River Valley and surrounding areas, with the fort acting as a center for commerce as well as religious and military endeavors (Nassaney 2008a:297).

Fort St. Joseph’s placement on the St. Joseph River put it in a strategic location close to the portage of the St. Joseph and Kankakee rivers (Nassaney et al. 2002-2004) (Figure 1). This provided a water route connection from Lake Michigan further into the Illinois Country, extending the East to West terrestrial Great Sauk Trail already joining Lake Michigan and Lake Erie (Nassaney et al. 2002-2004:311). This location served as a central point for the French to engage in many forms of interaction and trade with Native Americans, Europeans, and Colonial powers (Nassaney et al. 2002-2004:311). Although the fort did not become a strong military force for the French, it did provide a strategic link in French Colonial communication and the fur trade throughout the Great Lakes (Nassaney et al. 2003:109).

Social identities, especially those of absent or underrepresented peoples in the historical records, as well as the interactions and interrelationships of the people who lived in and around Fort St. Joseph, are a major focus of research at the site. In speaking of the make-up of the inhabitants of the fort, Nassaney (2008a) contends that archaeological and historical sources indicate a multi-ethnic, Native-French community with strong interrelationships between the groups (Nassaney 2008a:304). As the survey and excavation at Fort St. Joseph passes the ten year mark, glimpses into the actual nature
of day to day exchanges between Native Americans and French Colonialists—devoid of the stereotypes and biases often inherent in one-source histories—are beginning to appear. Besides the recent insight into the social nature and cross-cultural interaction that seems to have been taking place at Fort St. Joseph, Nassaney (2008a) elaborates that archaeological evidence can provide insight into the nature of changing identity boundaries that possibly occurred between the French and their Native counterparts (Nassaney 2008a:315). This, in turn, has implications regarding the subtleties and variability present in Native-Colonial communities that are becoming evident in contact-period studies.

**ECOLOGICAL AND ENVIRONMENTAL SETTING**

Michigan has great ecological and environmental diversity (Brashler et al. 2000; Fitting and Cleland 1969). Riverine landscapes in Michigan are the result of deglaciation in the near past, and because these geologic features were shaped by receding glacial activity, the area’s drainage systems usually exhibit low gradients and are not severely incised (Brashler et al. 2000:543). The southwest region of the state, notably the area pertinent to the archaeology of Fort St. Joseph, is abundant with drainage basins and rivers reminiscent of the St. Joseph (Brashler et al. 2000:543).

Forest distribution in Michigan is characterized by a meeting between the southernmost portion of the coniferous forests of the Canadian Biotic Province and the northernmost point of the deciduous forests of the Carolinian Biotic Province (Brashler et al. 2000; Fitting and Cleland 1969; Holman and Holman 2003). Fort St. Joseph and the
Lyne site are situated in the Carolinian Biotic Province, which is characterized by oak-hickory hardwood forests, beech-maple forests, and a diverse array of animals—cottontail rabbit, white-tailed deer, elk, turkey, and raccoon (Brashler et al. 2000:546, 552; Kapp 1999; also see above passage on Potawatomi subsistence). Subsistence resources would have been varied and widespread in the area, with a plentiful array of plant life along with local faunal and aquatic food sources (Brashler et al. 2000:552). Old World and New World cultigens both had limitations for cultivation in different areas of Michigan, but Brashler et al. (2000) state that the Carolinian Biotic Province had good potential for growing native crops (Brashler et al. 2000:546).

The site of Fort St. Joseph sits along a riverbank, and this has posed several issues in the location and maintenance of archaeological excavation and preservation. Besides nineteenth-century farming practices, the Fort St. Joseph site landscape has been most affected by constant flooding from the river and high water table levels (Claussen et al. 2007; Cremin and Nassaney 2003; Nassaney 2008a; Nassaney et al. 2002-2004, 2007). An implemented well-point drainage system (Figure 2) alleviated problematic wet-site conditions by draining the saturated area and leaching the soil, but close to twenty to thirty centimeters of dense, tough alluvium remains. This has made initial excavation in units time consuming (Nassaney et al. 2002-2004, 2007; also see Cremin and Nassaney 2003).

The Lyne site ecological/environmental setting contrasts with the riverine habitat of Fort St. Joseph. Nearly two hundred meters southwest from the banks of the fort site, the Lyne site resides on a wooded terrace in drier, sandy loam soils. Archaeology at the
Lyne site has produced Native material from the pre-French occupation coupled with artifacts resembling the nineteenth-century farmstead that later occupied the terrace (Nassaney 2008b, 2008c; Nassaney et al. 2003). The sandy loam soil has revealed some eighteenth-century French artifacts—such as an iron projectile point, a hand-wrought nail, and an intact silver-plated brass brooch. Also uncovered at the Lyne site are a series of pits containing wood charcoal and carbonized corn remains presumed to be fuel for probable smudge pits—excavated depressions in the ground that were used for burning material in order to tan animal hides (Nassaney 2008b).
THEORETICAL PERSPECTIVES AND METHODS

PERSPECTIVES REDEFINED IN THE CONTACT PERIOD

Traditionally, perspectives on the period after contact in North America have been colored by Colonial accounts that supplied the historical sources many scholars relied upon. More recent historical and archaeological endeavors have shifted attention from Euro-centric or Euro-American accounts of contact to focusing on the numerous strategies that evidence suggests Native groups utilized in response to contact-period interactions (Bollwerk 2006:117). Bollwerk (2006), for example, notes that earlier views of contact presented oversimplified scenarios of Native responses to Colonial powers. Often, arguments portrayed either complete aversion to European influences, culture, and resources, leading to decline and removal of Indigenous groups, or the total assimilation of European practices and economies leaving their traditional life-ways behind in an effort to subsist in new contact situations.

Historical archaeologists and anthropologists alike have more recently rejected the Eurocentric view of Native groups as passive in the face of European contact (Bollwerk 2006; Nassaney 2008a; Silliman 2005). Contemporary views on the nature of acculturation pressures have included considerable action on the part of the colonized groups at hand, demonstrating through the evidence that Native groups exercised
selective behavior in their incorporation of non-Native resources and practices (Bollwerk 2006:119). In turn, these types of assessments shift the overall ideology of the Native-Colonial relationship, requiring historical archaeologists to take a much longer “peer into the pool” when assessing the archaeological material remains at Colonial and Indigenous sites along with the available historical documentation. Situations thought to be remnant of a hierarchical dichotomy between the colonizer and the colonized, with acculturative forces moving in only one direction, are revealed as a gradual spectrum of variability among groups (see Deagan 1996; Lightfoot and Martinez 1995; Nassaney 2008a; Pavao-Zuckerman 2007; Stein 2002).

Stein (2002) demonstrates this somewhat revisionary context in which to study interaction. He evaluates the need for less “unidirectional models of interaction” and other biases that might narrow our view of the activities actually taking place in these contact circumstances (also see Lightfoot and Martinez 1995). Without perpetuating a long discussion, Stein (2002) recaps two long-standing frameworks for studying interaction during culture contact, both considered to be unidirectional in nature: world systems theory and acculturation theory. World systems theory emphasizes the core-periphery relationship, in which Europeans control a system of dominance over the mechanisms and means of subsistence, exchange, and political structure in the society (Stein 2002:904; Lightfoot and Martinez 1995; see Wallerstein 1974, for the classic example; also see Hopkins and Wallerstein 1982). Stein (2002) believes these preconceived notions inherent in world systems theory greatly reduce the role of active agency in all aspects of Native group societies in response to contact-period scenarios
(Stein 2002:904; also Lightfoot and Martinez 1995). This concept has undergone revision over the years, maturing from its formative context, but it still falls short in taking account of Indigenous agency and the role of the periphery in contact-period interactions (Stein 2002:905).

Acculturative forces have been noted, historically, as moving in one direction—generally from Colonial to Native, from core to periphery. “Recipient” groups are thought to be prone to acceptance of the non-Native cultural practices and aspects of a given “donor” society (Lightfoot and Martinez 1995; Stein 2002; also see Cusick 1998). This action usually results in the gradual assimilation of the less-powerful peripheries to the culture of the dominant core. In assuming that the presence of the Colonial dominant core is omnipotent and “absolute,” archaeologists and anthropologists adhering to the classic acculturation model have often attributed the quantity of non-Native artifacts in archaeological contexts associated with Native groups as strong evidence of acculturation in a measurable sense (Stein 2002:905). This poses obvious issues for the acceptance of alternative relationships that may have been a part of the Native-Colonial “contact-cultures,” issues that archaeologists currently discern from remains—often archaeobotanical and faunal—found at many Colonial sites (Deagan 1996; Lightfoot and Martinez 1995; Stein 2002). Stein (2002) goes on to mention archaeologists’ shift toward ideas on social identity, agency, and practice in determining the complex nature of these contact-oriented, interactive societies. Scholars have begun applying theory stressing the importance of Native agency and the mutual relationship between Native and Colonial
groups when assessing the changing social environments present during the contact period (Stein 2002:905).

Contradicting models of unidirectional influence, current research on the subject of the contact period indicates variable responses during Native-Colonial interaction. Many authors have shown more subtle complexities inherent in the relationships that occurred in these Colonial encounter settings during periods up until the mid to late nineteenth century, when removal of Native groups came to a head (Bollwerk 2006; Gremillion 1993, 1995, 2002; Lightfoot et al. 1998; Nassaney 2008a, 2008d; Pavao-Zuckerman 2007; Ruhl 1993; Scarry 1985; Schurr 2006; Schurr et al. 2006; Wagner 2006). For example, evidence of dietary change by the gradual inclusion of unfamiliar plant resources can signify adaptation in the face of an altered environment—one including both Native and Colonial communities. Shifts in subsistence practices can indicate group strategies to ensure continued existence or the preservation of dwindling traditional aspects of culture. The gradual addition of new practices or resources could present evidence of a more subtle adaptive adjustment of each group to the other in an effort to persist without radical shifts in traditional patterns of behavior in the initial period of contact.

Archaeological and archaeobotanical evidence from the community at Fort St. Joseph suggests a unique Native-French Colonial relationship that does not seem to exhibit markers consistent with world systems and acculturation theory discussed above. Increased investigation of historical documentation, faunal remains, and archaeobotanical remains continue to enlighten archaeologists on the subject of Native and Colonial sites,
including Fort St. Joseph and the Lyne site. Setting this particular fort community’s macrobotanical results alongside evidence from other North American archaeological sites will also serve to show that in some ways archaeological data challenge unidirectional, core-periphery models of interaction.

**ARCHAEOBOTANICAL METHODS**

Current analysis of the 2007 Fort St. Joseph flotation samples has focused on three probable smudge pit features from the Lyne site—16, 17, and 19—and the continued exploration of features 10 and 14, two fireplaces from Fort St. Joseph initially excavated in 2006 (Claussen et al. 2007). Current research also includes material from Cremin and Nassaney’s (2003) article presenting archaeobotanical information from the 2002 Fort St. Joseph field season. Earlier research and analysis done at Fort St. Joseph and the Lyne site were done without flotation, which limited the recovery of more perishable and small-scale remains. These cannot be compared directly to the 2007 data set.

Initially, Cremin and Nassaney (2003) sought the implementation of a systematic recovery plan for plant remains using both flotation and wet screening (Cremin and Nassaney 2003:3). Samples were taken from NE and SW portions of units, as well as feature contexts, for each 10 cm level (up to 25 liters) for processing using wet screening and manual flotation techniques. Effective macrobotanical recovery was possible through 1/8 inch mesh water screening (Table 1), but 1/16 inch mesh screen manual flotation procedures through “tub agitation” did not yield any substantial results (Cremin
and Nassaney 2003:4). Small-scale archaeobotanical remains require equally small screen sizes and delicate handling in order to facilitate successful separation from excavated soils (Pearsall 1989). Proper flotation techniques that utilize screen sizes less than 1/8 in. enable the recovery of relevant macrobotanicals that otherwise could be lost in the process of wet screening through 1/8 in. screen. Although the manual flotation process was unsuccessful during the 2002 excavation at Fort St. Joseph, pertinent archaeobotanical data was obtained from material captured in 1/8 in. mesh.

During the 2007 excavations at Fort St. Joseph and the Lyne site, flotation samples were acquired in the field from all feature contexts and from each 10 cm level. The samples were later processed off-site. Flotation recovery was conducted from 10 liter samples using a Dausman Technical Services Flote-Tech Model A flotation system (R.J. Dausman Technical Services, Inc. 2009). This system uses mechanized water agitation to break up sediments and free archaeological remains from the soils. The 1.0 millimeter coarse fraction screen and 0.285 millimeter fine fraction screen caught macroremains as they separated out from the soils and either floated to the surface or sank to the bottom in the coarse screen. Students processing in the Western Michigan University (WMU) lab ran the machine twice in many circumstances, producing three fractions—light fraction, near float, and heavy fraction—in an effort to skim off as much macrobotanical material as possible. Initial sorting of the 2007 flotation samples was then performed by WMU students during Autumn Semester of 2007. Several full samples—such as ones associated with Feature 16 (20BE10)—were sorted, along with
some of the near float portions of many samples. All sorted samples were inventoried and provided to the author for analysis.

Sorting of all remaining heavy fraction samples from 2007 took place during the 2008 excavation season. Under the author’s supervision, field school participants size-graded > 2 millimeter portions of heavy fraction remains from each remaining unsorted sample using USGS graded geologic sieves. Students then inspected heavy fraction material under table-top lamp magnifiers on glass surfaces for sorting. All light fraction and near float as well as < 2 millimeter heavy fraction portions of sample were all retained for the remainder of processing and identification at The Ohio State University (OSU).

In Fall Quarter of 2008, all samples from the 2007 field season at Fort St. Joseph and the Lyne site, processed and unprocessed, were transported to OSU for further analysis. An emphasis on standard systematic macrobotanical analysis procedure was employed in the size-grading, sorting, and identification of samples taken from features at both sites (Pearsall 1989; Gremillion 2008). Gilson U.S.A. Standard Test Sieves (4 mm - 0.5 mm) were used to size-grade samples from features 17 and 19 from the Lyne site, as well as material associated with Feature 10 and Feature 14 from Fort St. Joseph. Carbonized macrobotanicals from feature contexts were the focus of the analysis performed at OSU (see Hally 1981; Pennington and Weber 2004), although at least one other non-feature sample was scanned for macrobotanicals without any significant finds. All macrobotanical remains were identified with a Leica Z30V Zoom 2000 binocular microscope with a magnification range of 7 to 30x. Specimens greater than 2 millimeters
in size were fully sorted and identification was attempted to the fullest extent possible (Pearsall 1989; Silbernagel 1998; Gremillion 2008). Remains greater than 0.5 millimeters in size were scanned for seeds and macrobotanicals not seen in the larger size-grade (Pearsall 1989; Gremillion 2008).

Total counts were estimated for both identified and unidentified remains by including whole seeds, halves, and significant fragments in each count. Recognizable minerals, rocks, and residue (less than 0.5 mm) were excluded from counts and weights in the analysis. Wood charcoal identified from all feature samples was recorded as total weight. Analysis of 2007 Lyne site features, which had a high abundance of corn cob remains, included corn cob sections, corn cob fragments, cupules, and cupule fragments by weight. Percentages for wood charcoal, corn cob remains, and other macroremains, such as seeds, were omitted due to the absence of original sample weights for previously processed 2007 macrobotanicals by WMU. In addition to the OSU comparative seed collection, keys and manuals used in the identification of macrobotanical remains include: Martin and Barkley (1961), Montgomery (1977), and the USDA Forest Service (1974). Seeds were identified to species whenever possible and to genus when species identification was inconclusive (Pearsall 1989; Silbernagel et al. 1998). Identification of macrobotanicals at the greater than 0.5 millimeter size-grade proved difficult, possibly due to high temperature carbonization of specimens (see Pearsall 1989; Pennington and Weber 2004), most notably among feature context samples from the Lyne site.
RESULTS

In order to assess the archaeobotanical potential of the Fort St. Joseph Archaeological Project’s endeavors to date, result tables were compiled for a discussion of flotation data from the 2007 field season excavations (Table 2) coupled with a summary of macrobotanicals recovered during 2002 field work at Fort St. Joseph (Table 1) (originally reported in Cremin and Nassaney 2003). The sampling of feature contexts and their subsequent results provided an effective macrobotanical representation for the fort site and the Lyne site.

Due to the high concentrations of corn remains in the 2002 Feature 3 pit at Fort St. Joseph and the probable 2007 smudge pits discovered at the Lyne site, weights were used instead of counts. Quantified values for wood charcoal in the 2002 features were not presented in Cremin and Nassaney (2003), although the authors discuss the percentages and make-up of materials. For example, they report that analyzed wood charcoal made up about 70% (by count) and 80% (by weight) of all carbonized plant remains (Cremin and Nassaney 2003:5). Wood identification revealed concentrations of maple, oak, hickory, ash, willow or cottonwood, American beech, pine, American hornbeam, and possibly tulip tree (yellow poplar) (Cremin and Nassaney 2003:6).
Carbonized corn remains from 2002 (Table 1) were noted in Feature 3 (a probable smudge pit) and Feature 6 (a stone hearth) (Cremin and Nassaney 2003). Intact corncob specimens mainly displayed an eight-rowed configuration, much like corncob examples in corn holes at the Moccasin Bluff site (circa A.D. 1400-1600) located approximately 16 kilometers from Fort St. Joseph (Cremin and Nassaney 2003; Ford 1973; also see Cremin 1999). Feature 3 more closely resembles the Moccasin Bluff corn holes in dimension than the 2007 Lyne site pit features. Corn kernels retrieved from Feature 6 resembled kernels documented at French Colonial Old Mobile near Structure 3 (Cremin and Nassaney 2003; Gremillion 2002), and their morphology was described as being indicative of Eastern Complex corn (Cremin and Nassaney 2003). Eastern Complex corn was utilized by Native groups prior to contact in eastern North America (Cremin and Nassaney 2003; Ford 1973) and is characterized by a large eight-rowed corncob with wider cupules and kernels, both displaying a more crescent-shape (Ford 1973:190). The remaining kernels came from Feature 3 and appeared morphologically similar to the specimens found in Feature 6 but were about half the size. Cremin and Nassaney (2003) assessed these 23 smaller kernels associated with Feature 3 as being immature and burned along with the cob (Cremin and Nassaney 2003). This inference fits well with the interpretation of these features as “smudge pits” (Cremin and Nassaney 2003:11).

Smudge pits, as described by Binford (1967), consist of excavated features generally similar in terms of their small size and shape, with a specific composition of corncobs and wood remains. Binford (1967) notes the presence of gray-colored loam soil, an abundance of carbonized material, and sometimes oxidized soil in one portion of
the pit (Binford 1967:3). He (1967) suggests the carbonized plant material would have produced extensive amounts of smoke, and, through ethnographic analogy, postulates that these pits would have been ideal for the tanning of animal hides (Binford 1967; also see Ford 1973). These pits tend to lack other plant remains, such as corn kernels or other food resources, as these are not suitable for smudging fuel to create smoke.

The Lyne site features—16, 17, and 19—are similar to Feature 3 at Fort St. Joseph but are somewhat deeper with a greater concentration of corn remains (Table 2). Several carbonized corncob sections from the Lyne site pits were sent out for radiocarbon dating in early spring of 2008, yielding contemporaneous dates to Fort St. Joseph occupation (Nassaney 2008b) [These specimens were excluded from total weights]. Nassaney (2008b) cites these dates as supporting a likely temporal association between the two sites (Nassaney 2008b:3).

Carbonized seeds identified in the 2002 Fort St. Joseph analysis (Cremin and Nassaney 2003) consisted of 27 grape seeds, three cherry stones, and one seed or fruit each of sumac, pawpaw, and peach (Table 1). Most of these materials came from Features 2, 3, 5, 6, and 7, except for three grape seeds and the single sumac seed, which were found in two unit level samples. The peach stone in Feature 2, a fireplace, represents a significant specimen because the peach is not native to the New World (Gremillion 1987). Cremin and Nassaney (2003) note that peach at the fort could suggest the onset of orchard cultivation in the St. Joseph River Valley (Cremin and Nassaney 2003:8). Yet, other explanations for the presence and dispersal of peach are through trade and also the sometimes weed-like nature of the fruit (Gremillion 1987, 1993; see
below for more on dispersal). Peach pits have also been recovered in southwestern Illinois at Colonial Chartres Village and around Detroit dating to eighteenth-century French occupation (Cremin and Nassaney 2003). Remaining notable specimens found during 2002 investigations included two squash rind fragments and three acorn meat fragments, the squash identified from a unit level sample and the acorn meats from Feature 3, a probable smudge pit.

Few carbonized seeds were identified from 2007 feature contexts (Table 2). Most notably, a single specimen of possible wheat, *Triticum* sp., was present in a sample near Feature 14, a probable fireplace (Claussen et al. 2007). Wheat has not been previously associated with other Fort St. Joseph features, and its presence, if confirmed, indicates that non-native cereals were grown or processed there. At least two larger carbonized corn kernel specimens from Feature 17 at the Lyne site and one from Feature 14 at Fort St. Joseph were identified and resemble those from Cremin and Nassaney (2003) and the site of French Colonial Old Mobile (Gremillion 2002). The remaining 30 or so kernels resemble the majority of 2002 specimens, again indicating the probability that these half-size kernels remained on corncobs as they were discarded for smudging fuel (Cremin and Nassaney 2003; Gremillion 1986).

Other pertinent macrobotanicals present among the Lyne site and Fort St. Joseph features provide examples of New World plants utilized in the contact-period community. Several sizable specimens of probable hazelnut shell, *Corylus* sp., and meat fragments identified from Feature 17 and Feature 19 samples are new additions to remains associated with the sites (Table 2). Along with the 38 hazelnut examples, three raspberry
or blackberry seeds, *Rubus* sp., and one single cocklebur specimen, *Xanthium strumarium*, provide new examples of macrobotanical presence previously absent from Fort St. Joseph and the Lyne site excavated soils. Five additional raspberry or blackberry seeds and fragments and one possible black walnut shell fragment from Feature 14 were some of the Native wild plant resources recovered alongside maize cultigens. All of these finds may be a result of effective flotation procedure and the recovery of more perishable carbonized macrobotanicals (Pearsall 1989; Yarnell 1982), at least in the case of the *Rubus* specimens—many of which crumbled during identification. Aside from these Native plants and the possible wheat introduction at the fort site, wood charcoal made up the remaining macrobotanical material in Feature 14 and associated with Feature 10 from Fort St. Joseph (Table 2).

A considerable number of unknown specimens were present in the greater than five millimeter size category (Table 2). Several of these unidentified remains from 2007 are carbonized spheroidal specimens of varying sizes, although no identified match was found during the analysis. A number of oblong seeds approximately 1 mm (in length or diameter) could only be identified as possible Poaceae (Grass family). These unidentified macrobotanicals were in part the result of highly carbonized, fragmentary, and dirty specimens at > 0.5 mm.

*Plant Remains at Fort St. Joseph and the Lyne Site*

All of the plant remains recovered to date from Fort St. Joseph and the Lyne site have some value as human food, except cocklebur, a wetland invasive weed (USDA
A majority of the plant species are native to North America, with only a few possible Old World introductions—peach and (tentatively) wheat. Indigenous and non-Native economic plants found at both sites fare well in human-disturbed environments, with many of the New World resources having prior history as food plants in the Eastern Woodlands (Scarry 2003).

Many of the identified nut shell and meat, such as acorn and possible black walnut, would have occurred in the varied hardwood forests of the Carolinian Biotic Province. These would have been collected for food and other economic uses, as well as hazelnut, which grows in thickets as a shrub preferring edges and clearings of the forest, inhabiting various human-disturbed areas (Scarry 2003:65). Nuts have varying fat, protein, and carbohydrate contents, and would have been effective subsistence resources for the fort inhabitants. Hazelnut, in particular, grows abundantly in eastern North America and represents an effective energy source. Still, all of these nut species were highly important, long-time resources utilized in the area by local groups and suggest a reliance on Native wild plant foods by fort occupants—Native and Colonial (Scarry 2003).

Corn remains from the two sites can be seen as a product of the smudge pit contexts they are associated with, and although there has been debate over the extent of corn cultivation in the southwestern Michigan area (Brashler et al.; Cremin 1999; Fitting and Cleland 1969), the presence of maize at Fort St. Joseph and the Lyne site clearly indicates that it was an economic plant (Brandao and Nassaney 2006; Nassaney 2007). The high quantity of corncob fuel in the smudge pits and varying size of corn kernels
may also indicate the dietary use of maize in the fort community either through agriculture or trade (Cremin and Nassaney 2003; Nassaney 2007).

With the exception of the peach, seeds of fleshy fruits present in the macrobotanical assemblage at Fort St. Joseph and the Lyne site represent native plants. Originating in Asia, peach appears as a Spanish introduction to the southeastern areas of North America prior to the seventeenth century (Gremillion 1993). Native groups along the coast, and later further inland, accepted the new resource since it adapted well to the local climate (Guremilion 1993). Gremillion (1987) notes the ability of peach to break away from the cultivated field, partially due to its weed-like nature, and that this may have assisted in the possible independent dispersal of peach aside from actual Native-Colonial interaction (Gremillion 1987:146). This weed-like nature of peach could have contributed to its continued dispersal, along with the transportation of seeds for trade via local and regional exchange networks (Gremillion 1993:16). Conditions in counties of southwestern Michigan bordering the city of Niles to the north still appear to support the growing of peach today (USDA NRCS 2009).

Grape, cherry, pawpaw, raspberry or blackberry, and sumac were used by Native groups of the Eastern Woodlands and grew in the disturbed habitats that would have been a result of human activity at the fort and the general riverine environment (Scarry 2003). Fruits were obtained to supplement staple foods high in carbohydrates, fats, and proteins. Scarry (2003) notes that important vitamins and minerals were supplied through utilizing fruits as adjunct dietary resources in Native subsistence (Scarry 2003:69). Gathered fruit at the sites could have been eaten raw, dried and stored, or used as ingredients in soups
and stews. The diverse economic value of these food items, as well as others, for fort occupants cannot fully be appreciated at present, and specific knowledge that can be attained through in situ processing contexts could serve to increase our understanding of food usage in the fort community.

The possibility of wheat presence in the archaeobotanical record at the fort poses further questions about the nature of Native and non-Native plant resources among the French, as well as the relative importance of foraging and farming. Nassaney (2007) notes the historical documentation of individuals traveling from the St. Joseph River Valley to Detroit in order to procure wheat (Nassaney 2007:6), showing that the fort community sought to incorporate wheat in their subsistence as a valued food resource. The French Colonial Cahokia Wedge site also demonstrates a small representation of wheat suggesting the use of such grain for food through cultivation and trade (Gums 1988; Lopinot 1988). With the identification of wheat at other French Colonial sites in North America, Waselkov (1997) comments that through the evidence there is an increased opportunity to assess the autonomy of French Colonial communities in the contact period (Waselkov 1997:22).
DISCUSSION

Comparison of the Analyses with Theoretical Expectations

World systems theory suggests a core-periphery relationship between Colonial and Native groups where the Euro-American core exhibits control and dominance over the Native periphery (Stein 2002:904; Lightfoot and Martinez 1995; see Wallerstein 1974). The expectation is that archaeobotanical remains should largely reflect the dominant core’s Old World plant resources since the emphasis in the Native-Colonial relationship is weighted heavily from core to periphery. Results of the macrobotanical analyses from Fort St. Joseph and the Lyne site do not reflect this scenario. Archaeobotanical remains from the sites consisted of primarily Native plants including corn, raspberry or blackberry, hazelnut, and possible black walnut. These data contradict the assumption that the Colonial core in the fort community controlled a system of dominance over the means of subsistence, for example.

The expectations of acculturation theory for the fort community is that acculturative forces would be acting in one direction—from the French as donors to the Native groups as recipients. The suggested outcome should appear in the macrobotanical remains as a high representation of non-Native plant species with few Native plant examples, as recipients should be assimilating to the donor culture. Again, this is not the
case presented by the Fort St. Joseph and Lyne site results. Instead, my analyses confirm only two Old World plant specimens recovered from the sites—one peach stone and a single tentative wheat example—amidst an abundance of New World, Native plants. This clearly does not reflect acculturation theory expectations of a large quantity of non-Native resources in the archaeobotanical record. Quite the contrary, the results more closely depict a community where mainly Native subsistence resources are relied upon by the Native-Colonial group.

**Historical Archaeology, Forts, and Villages**

Colonial forts, Native villages, and satellite occupation areas are the archaeological sources most important for the study of colonial-period interactions, providing a wealth of data on the practices and interactions that took place between Native and Colonial groups. Preservation of archaeobotanical (see Table 3) and faunal remains have provided glimpses into the economic subsistence activities of both peoples, illuminating the subtleties that one-sided, one-source historical documentation have left out (Cremin and Nassaney 2003; Gremillion 1993, 1995, 2002; Gums 1988; Lopinot 1988; Martin 1988; Nassaney 2008a; Pavao-Zuckerman 2007; Ruhl 1993, 1997; Scarry 1985; Schurr et al. 2006). These remains, and other archaeological materials recovered at contact-period sites, reveal Native-Colonial communities that relied on different dynamics than presented in the historical literature and through unidirectional acculturation theory. There are many similar historical archaeological sites in North
America, and a brief survey of some of the most notable forts, villages, and satellite occupations can give a supplemental interpretation of the material from Fort St. Joseph.

Archaeological work done in the southeastern United States at the Fusihatchee village in west-central Alabama and the Fredricks site in the North Carolina Piedmont has informed a great deal upon current understanding of Native-Colonial subsistence practices during contact (Gremillion 1993, 1995; Pavao-Zuckerman 2007). These two sites provide insight on the level and nature of Native adherence to Euro-American subsistence practices and resources. Pavao-Zuckerman (2007) states about the Creek village of Fusihatchee that even though Native groups endured drastic alterations during initial contact, their subsistence practices remained fairly intact and stable (Pavao-Zuckerman 2007:5). The author is referring to the continued adherence to Native practices and general subsistence patterns, with only the additives of the production of certain European commodities for trade, such as furs and deerskins, and the introduction of a few non-Native cultigens.

Gremillion (1993, 1995) bolsters Pavao-Zuckerman’s (2007) discussion with her presentation of archaeobotanical analyses of Creek and Occaneechi subsistence from the Fusihatchee village and the Fredricks site. Botanical evidence from Fusihatchee (Table 3) shows an introduction of the European cultigens of peach and cowpea, or black-eyed pea, and the Fredricks site mirrors these finds closely with remains of peach and watermelon from the Old World. Gremillion (1993) also agrees that during the seventeenth and eighteenth centuries, Native groups did not stray too far from their native subsistence practices, save a few economically sound introductions (Gremillion 1993).
Pavao-Zuckerman (2007) reiterates the gradual and selective nature of Native incorporation of Euro-American resource bases. She further argues that this process continued for almost three centuries before Colonial pressure began to dismantle Native traditional subsistence practices (Pavao-Zuckerman 2007:5).

At the site of Fort Mitchell in Alabama, plant utilization during the early nineteenth century portrays a blending of Native subsistence resources with Euro-American cultigens that were proven successful in North America. Stickler (2004) shows the use of peach alongside the numerous Native economic plants—maize, nuts, fleshy fruits, and chenopod. This, too, mimics the eighteenth-century findings at Fusihatchee, the Fredricks site, and Fort St. Joseph. Just a few states away along the Gulf coast, Gremillion (2002) again notes the singular presence of peach as a European introduction at the site of Old Mobile in the early eighteenth century. The absence of other Old World cultigens is likely due to their unsuitability for local climates (see Gremillion 2002; Ruhl 1997; Scarry 1985).

Similar issues are apparent from the archaeobotanical data in the La Florida area occupied by the Spanish, which includes numerous sites such as St. Augustine (Ruhl 1993, 1997; Scarry 1985). Spanish Colonialists found it difficult to cultivate their traditional foods of oranges and wheat, leaving them to adopt Native subsistence means until the mid eighteenth century (Ruhl 1997). At St. Augustine, Scarry (1985) demonstrates the presence of a few European plant resources, namely peach, watermelon, and common pea, which appear to have taken root faster than other food staples brought by the colonists. Both authors agree that the formative period in La Florida was marked
by a different dynamic between Native and Colonial groups than can be discerned by the historical record alone, considering the notable documentation of orange imports but the absence of supporting archaeobotanical evidence (see Table 3).

Botanical and faunal evidence from excavations at the eighteenth-century French Colonial Cahokia Wedge site in the American Bottom provides another example of scant non-Native resource introduction intermingled with Native subsistence items, similar to Fort St. Joseph and the Lyne site (Gum 1988; Lopinot 1988; Martin 1988). Along with Native cultigens and wild plants found at the Wedge site, some remnants of wheat and possible apple were recovered. These archaeobotanical data, coupled with faunal remains suggesting traditional white-tailed deer hunting, show that in this case the French were adapting to a more Native diet, with only a few European resources. This way of life is similar to that seen at the multi-ethnic French Colonial community at the site of Fort St. Joseph (see Brandao and Nassaney 2006; Cremin and Nassaney 2009; Gum 1988; Lopinot 1988; Martin 1988; Nassaney 2008a, 2008d; Nassaney et al. 2002-2004; Nassaney et al. 2003).

Lastly, Lightfoot, Martinez, and Schiff (1998) present an interesting outlier for this discussion of eastern North America with the site of Fort Ross in northern California. The archaeological excavation of the Russian colony at Fort Ross displays interesting evidence of pluralistic community settings, similar to those seen at French fort sites like Fort St. Joseph. The authors interpret the spatial patterning of archaeological remains to indicate ethnic diversity (Lightfoot et al. 1998).
These archaeological examples illustrate the subtle complexities inherent in Native-Colonial relationships during contact-period interactions between the sixteenth to the nineteenth centuries (Bollwerk 2006; Cremin and Nassaney 2003; Gremillion 1993, 1995, 2002; Gums 1988; Lightfoot and Martinez 1995; Lightfoot et al. 1998; Lopinot 1988; Martin 1988; Nassaney 2008a, 2008d; Nassaney et al. 2007; Pavao-Zuckerman 2007; Ruhl 1993, 1997; Scarry 1985; Schurr et. al 2006). What were once taken as seemingly straight-forward unidirectional, one-source Native-Colonial encounters, cohabitations, and contact-period situations are now being approached from a broader anthropological perspective in historical archaeology. Previous biases are now being corrected with the help of archaeological data. For example, preserving traditional subsistence and cultural practices suggests an active effort on the part of Native groups to adapt to conquest and deal with Colonial pressures. Also, integration of New World and Old World resources in contact-period environments suggests some blending of Native and European cultures. The material and archaeobotanical evidence indicate that dietary acculturation occurred in both directions. Rather than being passive subjects on the edge of the larger “world system,” Native peoples in North America both contributed and received practical knowledge about plant use in contact with Europeans.
CONCLUSIONS

The 2007 flotation samples and 2002 macrobotanical data (Cremin and Nassaney 2003) from Fort St. Joseph and the Lyne site provide greater insight into the use of plant resources and practices among participants in the fort community. Flotation-derived data from the 2007 excavations most probably enabled the preservation of more perishable archaeobotanical specimens—such as possible wheat (*Triticum* sp.), cocklebur (*Xanthium strumarium*), and raspberry or blackberry (*Rubus* sp.). This possible representation of wheat at Fort St. Joseph presents the only Old World plant specimen recovered to date besides the peach.

New smudge pit features from the Lyne site pose questions as to their similarity to, or differences from, Feature 3 (smudge pit) at Fort St. Joseph. These upper terrace smudge pits could be evidence of later efforts to tan animal hides at the Lyne site—perhaps a more effective attempt with deeper pits and increased fuel content. It is also possible that the Lyne site pits were an earlier example of off-site hide-smoking efforts on the terrace before less intrusive hide-tanning methods were developed within the fort area. The presence of so much maize in these features suggests that this was an important dietary item in the fort community, even though the cobs were also used as fuel.
This analysis has examined plant use at the fort community represented by Fort St. Joseph and the Lyne site, and compared it to several other Native-Colonial sites present in North America. The results suggest a pattern of slow integration of Old World plants into an established system of New World plants and cultigens. Archaeobotanical material consists of few non-Native plants amidst numerous Native plants, demonstrating reliance on Native subsistence resources in Native-Colonial communities. The results of these analyses do not coincide with expectations provided by either world systems or acculturation theory. Intermarriage documented at the fort, which was known to be frequent in French occupations with Native groups during the contact period (Brandao and Nassaney 2006; Nassaney 2008a), could have contributed to some dietary acculturation from Native to non-Native (Gremillion 2002). These data do not support a strictly unidirectional account of interaction and acculturation, but rather indicate a dynamic in which Native and Colonial interaction and cultural exchange occurred in both directions.
REFERENCES

Binford, Lewis R.

Bollwerk, Elizabeth

Brandao, Jose Antonio, and Michael S. Nassaney

Brashler, Janet G., Elizabeth B. Garland, Margaret B. Holman, William A. Lovis, and Susan R. Martin

Claussen, Erin, Meghan Cook, Amanda Brooks, and Michael Nassaney

Cremin, William M.

Cremin, William M., and Michael S. Nassaney
Cusick, James G.

Deagan, Kathleen

Fitting, James E., and Charles E. Cleland

Ford, Richard I.

Gremillion, Kristen J.

Gums, Bonnie

Hally, David J.
Heldman, Donald P.

Holman, J. Alan, and Margaret B. Holman

Kapp, Ronald O.

Lightfoot, Kent G., and Antoinette Martinez

Lightfoot, Kent G., Antoinette Martinez, and Ann M. Schiff

Lopinot, Neal H.

Martin, Alexander C. and William D. Barkley

Martin, Terrance J.

Minnis, Paul E.
Montgomery, F. H.  

Nassaney, Michael S.  
2008b *Western Michigan University Archaeological Field School Course Pack.*  

Nassaney, Michael S., William M. Cremin, and Daniel P. Lynch  

Nassaney, Michael S., William M. Cremin, Renee Kurtzweil, and Jose Antonio Brandao  

Nassaney, Michael S., Jose Antonio Brandao, William M. Cremin, and Brock A. Giordano  

O’Gorman, Jodie A., and William A. Lovis  

Pavao-Zuckerman, Barnet  

Pearsall, Deborah M.  

Pennington, Heather L., and Steven A. Weber  
Peyser, Joseph L. (trans. and ed.)

Popper, Virginia S., and Christine A. Hastorf

Renfrew, Jane M.

R.J. Dausman Technical Services, Inc.

Ruhl, Donna L.

Scarry, C. Margaret

Schurr, Mark R.

Schurr, Mark R., Terrance J. Martin, and Ben W. Secunda

Silbernagel, Janet, Susan R. Martin, David B. Landon, and Margaret R. Gale
Silliman, Stephen  

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USDA, NRCS  

Wagner, Mark J.  

Wallerstein, Immanuel  

Waselkov, Gregory A.  

Yarnell, Richard A.  
APPENDIX OF FIGURES AND TABLES
Figure 1. Map of southwestern Michigan and the western Great Lakes region showing the locations of Fort St. Joseph and other contemporaneous sites (from Nassaney et al. 2002-2004:310).
Figure 2. Plan view showing the 2002 excavation units and feature locations surrounded by the well-point drainage system (from Nassaney et al. 2002-2004:314).
Table 1. Summary of the 2002 Fort St. Joseph macrobotanical results compiled from Cremin and Nassaney (2003).

<table>
<thead>
<tr>
<th>Context</th>
<th>Provenience and Depth</th>
<th>Corn Cob, Related Fragments</th>
<th>Corn Kernel (Zea mays)</th>
<th>Grape Seed, Fragments (Vitis vinifera)</th>
<th>Samue Seed (Ribes glabrum)</th>
<th>Squash Rind (Cucurbita pepo)</th>
<th>Black Cherry Stones (Prunus serotina)</th>
<th>Pawpaw Seed (Asimina triloba)</th>
<th>Peach Pit (Prunus persica)</th>
<th>Acorn Meal Fragments (Quercus spp.)</th>
<th>Monocot Stem Fragments (prob. grass family)</th>
<th>Dicot Stem (Dicotyledoneae)</th>
<th>Total</th>
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<td></td>
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<td>50-60 cmBD</td>
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<td>Feature 8</td>
<td>N37 E20</td>
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Table 2. Fort St. Joseph and the Lyne site macrobotanical results from 2007.

<table>
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<tr>
<th>Context</th>
<th>Provenience and Depth</th>
<th>Wood Charcoal</th>
<th>Corn Cob, Cupule, Related Fragments</th>
<th>Corn Kernel &amp; Fragments (Zea mays)</th>
<th>Wheat? (Triticum sp.)</th>
<th>Hazel Nut Shell/Meat (Corylus sp.)</th>
<th>Cocklebur (Cirsium arvense)</th>
<th>Raspberry or Blackberry (Rubus sp.)</th>
<th>Nutshell (possibly Black Walnut?)</th>
<th>Unknown/Unidentified *</th>
<th>Total</th>
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<tr>
<td>Feature 10 association, 20BE23</td>
<td>N32 E13 45-54 cmBD</td>
<td>1.84 g</td>
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<td>Feature 16, 20BE10</td>
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<td>343.08 g</td>
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<td><strong>431.30 g</strong></td>
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<td><strong>1</strong></td>
<td><strong>8</strong></td>
<td><strong>1</strong></td>
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<td><strong>144</strong></td>
<td><strong>229</strong></td>
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</tbody>
</table>

This table is utilized to demonstrate general results for 2007 feature contexts.

* Large Unknown/Unidentified counts due to highly carbonized, fragmentary, and unrecognizable specimens, many at > .5mm size.
Table 3. Summary of non-Native plant remains present at sites in eastern North America.