Department of Energy

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DEC 2 4 2013

PPPO-03-2088012-14

Dr. David Snyder
Archaeology Reviews Manager
Ohio Historic Preservation Office
1982 Velma Avenue
Columbus, Ohio 43211

Dear Dr. Snyder:

TRANSMITTAL OF A REPORT ON PREHISTORIC ARCHAEOLOGICAL COMPONENTS IDENTIFIED AT HISTORIC-ERA SITES AT THE PORTSMOUTH GASEOUS DIFFUSION PLANT

Enclosed for your information is the report titled *"Pre-Historic Archaeological Components Identified at Six Historic-Era Farmstead Sites (33Pk185, 33Pk203, 33Pk206, 33Pk 211, 33Pk217 and 33Pk218) Within the Portsmouth Gaseous Diffusion Plant, Pike County Ohio" (RSI/PORTS247).*

This report summarizes the prehistoric-era archaeological components found while conducting Phase II archaeological investigations on six historic-era farmstead sites (33Pk185, 33Pk203, 33Pk206, 33Pk211, 33Pk217, and 33Pk218) at the Portsmouth Gaseous Diffusion Plant (PORTS), in Pike County, Ohio and presents the results for your information. The co-location of these temporally separate features is merely coincidental though it does show that some settings, such as those with proximity to water or with broad viewsheds, are desirable over time.

Archaeological survey reports of the individual farmsteads and the prehistoric sites discussed in this report have been submitted to the Ohio Historic Preservation Office. Each of the individual reports is referenced in the reference section of the enclosed report.

A copy of the subject report is enclosed and an electronic copy can be obtained at the Environmental Information Center by contacting 740-289-8898 or at eic@wems-llc.com. Additionally, an electronic copy can be found at http://www.pppo.energy.gov/nhpa.html.

If you have any questions, please contact Amy Lawson of my staff at (740) 897-2112.

Sincerely,

Dr. Vincent Adams
Portsmouth Site Director
Portsmouth/Paducah Project Office

Enclosure:

Pre-Historic Archaeological Components Identified at Six Historic-Era Farmstead Sites (33Pk185, 33Pk203, 33Pk206, 33Pk 211, 33Pk217 and 33Pk218) Within the Portsmouth Gaseous Diffusion Plant, Pike County Ohio (RSI/PORTS247)

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RSI/PORTS 247

OVAI Contract Report #2013-06

PREHISTORIC ARCHAEOLOGICAL COMPONENTS IDENTIFIED AT SIX HISTORIC-ERA FARMSTEAD SITES (33PK185, 33PK203, 33PK206, 33PK211, 33PK217, & 33PK218) WITHIN THE PORTSMOUTH GASEOUS DIFFUSION PLANT, PIKE COUNTY, OHIO.

By

Albert M. Pecora, Ph.D.

and

Jarrod Burks, Ph.D.

May 30, 2013

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RSI/PORTS 247

OVAI Contract Report #2013-06

PREHISTORIC ARCHAEOLOGICAL COMPONENTS IDENTIFIED AT SIX HISTORIC-ERA FARMSTEAD SITES (33PK185, 33PK203, 33PK206, 33PK211, 33PK217, & 33PK218) WITHIN THE PORTSMOUTH GASEOUS DIFFUSION PLANT, PIKE COUNTY, OHIO.

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May 30, 2013

Management Summary

This report summarizes the prehistoric archaeological components found while conducting Phase II archaeological investigations on six historic-era farmstead sites (33Pk185, 33Pk203, 33Pk206, 33Pk211, 33Pk217, and 33Pk218) at the Portsmouth Gaseous Diffusion Plant (PORTS), in Pike County, Ohio (Pecora and Burks 2012). The historic-era farmstead Phase II fieldwork, which consisted of 5-meter interval shovel testing and limited 1x1 meter hand excavation to investigate farmstead features, recovered evidence of prehistoric occupations that occurred at these locations thousands of years before the nineteenth and twentieth century farmstead occupations. This evidence is represented by relatively small quantities of lithic artifacts and fire-cracked rock (FCR). Because the initial Phase II effort was designed to investigate the historic-era components of these sites, the Department of Energy (DOE) agreed to conduct additional work designed to address the prehistoric components identified at two farmsteads (33Pk203 and 33Pk217). This report presents the prehistoric Phase II survey results from these two sites, and also summarizes the prehistoric components identified at and the other four farmstead sites with prehistoric components (33Pk185, 33Pk206, 33Pk211, and 33Pk218).

The prehistoric components of sites 33Pk203 and 33Pk217 were selected for additional investigation because they are concentrated near the outer margins of the historic-era cultural resources and away from the major impacts of the farmstead activities. Of the six sites, the prehistoric components at 33Pk203 and 33Pk217 were thought to have the greatest archaeological potential. The purposes of the additional field work and this report were to evaluate the contents, condition, and age of the prehistoric archaeological components contained within these sites and to determine if they have the potential to yield information that is important to our understanding of prehistoric settlement practices in the Scioto River Valley. This was accomplished by performing magnetometer surveys to detect subsurface archaeological features and by collecting additional artifacts through shovel test and 1x1 meter unit excavations within the prehistoric artifact concentrations. The ultimate objective was to determine if sites 33Pk185, 33Pk203, 33Pk206, 33Pk211, 33Pk217, and 33Pk218 contain prehistoric components that are eligible for inclusion into the National Register of Historic Places (NRHP).

Despite the recovery of sizeable quantities of FCR, a by-product of prehistoric thermal feature use, no subsurface archaeological features were identified at 33Pk203 or 33Pk217. This implies that the features used to create the FCR have been destroyed, probably by historic-era plowing and other farmstead activities, or they have been thoroughly obscured by historic-era deposits or activities. All six sites produced lithic artifacts, including tools and debris. The few projectile points recovered resemble temporally defined types that date to the Early Archaic (33Pk203), Late Archaic (33Pk203, 33Pk211, and 33Pk218), and Early Woodland (33Pk203) periods. No temporally diagnostic artifacts were found at sites 33Pk185, 33Pk206, or 33Pk217.

Although it is likely that additional work at all six sites would recover additional artifacts with functional and temporal attributes, it is unlikely that such efforts would identify any major intact archaeological features. As a group, none of these sites appear to stand out in terms of having potential to yield important information that would contribute significantly to our understanding of prehistoric era Native American use of the uplands overlooking the Scioto River. Lacking such potential, we recommend that the prehistoric components of site 33Pk185, 33Pk203, 33Pk206, 33Pk211, 33Pk217, and 33Pk218 are not eligible for inclusion into the National Register of Historic Places (NRHP). No further work is recommended at these sites.

Table of Contents

List of Tables

List of Figures

1. INTRODUCTION

In 2010 and 2011, Ohio Valley Archaeology, Inc. conducted Phase II archaeological investigations on six historic-era farmstead sites (33Pk185, 33Pk203, 33Pk206, 33Pk211, 33Pk217, and 33Pk218) at the Portsmouth Gaseous Diffusion Plant (PORTS), in Pike County, Ohio (Pecora and Burks 2012a). During the course of the Phase II surveys, it was found that all six farmstead sites also contain prehistoric-era Native American components (Figures 1.1-1.2). Since the initial Phase II effort was designed to investigate the historic-era components of all six of these sites, the U.S. Department of Energy (DOE) agreed to conduct additional work designed to address the prehistoric components identified at two farmsteads (33Pk203 and 33Pk217). Although this report presents the prehistoric Phase II survey results from these two sites, it also summarizes the prehistoric components identified at 33Pk185, 33Pk206, 33Pk211, and 33Pk218 which have been separately documented as well. The purposes of this study are to evaluate the contents, condition, and age of the prehistoric archaeological components contained within these sites and to determine if they have the potential to yield information that is important to our understanding of prehistoric settlement practices in the Scioto River Valley. The ultimate objective is to determine if they are eligible for inclusion into the National Register of Historic Places (NRHP).

Table 1.1 lists all known archaeological sites within PORTS that contain prehistoric archaeological components (n=53). Most are standalone prehistoric sites (meaning they are not collocated with historic-era sites), 15 are collocated with historic-era farmstead sites (including the six considered in this report), and two are located within or adjacent to historic-era cemetery sites. The collocation of prehistoric archaeological sites with historic-era archaeological sites is historical happenstance. These prehistoric and historic-era people and their occupations (sites) are temporally, culturally, and behaviorally unrelated, but their archaeological remains just happen to be in the same places.

Before the arrival of Euro-Americans, the Ohio region was occupied over the course of nearly 14,000 years by various Native American groups. Given the span of human activity in this area, nearly every landform in Ohio has been occupied or otherwise used in some fashion by Native American peoples. All of this human activity over the millennia has resulted in the formation of what archaeologists define to be archaeological sites. An archaeological site can be as simple as a single isolated artifact or as complex as a large Fort Ancient village site with millions of artifacts. Throughout most of Ohio’s prehistory, the occupants of this land were mobile hunter-gather people who rarely stayed in one location for more than a few weeks or months, a behavior that resulted in the creation of many small archaeological sites on various landforms spread across the landscape. The prehistoric sites considered in this report probably resulted from these short term occupations by hunter-gatherer groups. By the time Euro-Americans began to settle Ohio at the dawn of the nineteenth century, the landscape was littered with the archaeological remains created by the earlier prehistoric occupants of the land. When nineteenth century Americans selected the best ground on which to build and establish their farmsteads, which were usually composed (at least) of a farm house, barn and other outbuildings, it would have been nearly impossible to select a setting that was not previously affected to some extent by earlier prehistoric activity. As a result, historic-era farmstead sites are frequently collocated with prehistoric archaeological sites.

Table 1.1. List of archaeological sites with prehistoric components within PORTS.

OAI	Historic-era Site Collocation	Prehistoric Site Type	Temporal Affiliation	Landform	Reference
33Pk184	Davis Farmstead	Isolated find	Unassigned prehistoric	Hill/ridgetop	Klinge and Mustain 2011
*33Pk185	South Shyville Farmstead	Lithic scatter	Unassigned prehistoric	Hill/ridgetop	Pecora and Burks 2012a
33Pk186	n/a	Lithic scatter	Unassigned prehistoric	Hill/ridgetop	Schweikart et al. 1997
33Pk189	Mount Gilead Cemetery PIK-206-09	Isolated find	Unassigned prehistoric	Hill/ridgetop	
33Pk193	The Iron Wheel Farmstead	Isolated find	Unassigned prehistoric	Hill/ridgetop	Klinge and Mustain 2011
33Pk194	The North Shyville Farmstead	Isolated find	Early Woodland	Hill/ridgetop	
33Pk195	The Beaver Road Farmstead	Isolated find	Unassigned prehistoric	Hill/ridgetop	
33Pk197	The Dutch Run Road Farmstead	Isolated find	Unassigned prehistoric	Hill/ridgetop	
33Pk198	n/a	Isolated find	Unassigned prehistoric	Terrace	Schweikart et al. 1997
*33Pk203	Ruby Hollow Farmstead	Lithic scatter	Early Archaic; Late Archaic; Early Woodland	Terrace	Pecora and Burks 2012a
33Pk204	n/a	Isolated find	Unassigned prehistoric	Hill/ridgetop	Schweikart et al. 1997
33Pk205	n/a	Isolated find	Unassigned prehistoric	Hill/ridgetop	
*33Pk206	Terrace Farmstead	Lithic scatter	Unassigned prehistoric	Terrace	
33Pk207	n/a	Isolated find	Unassigned prehistoric	Terrace	
33Pk208	n/a	Isolated find	Unassigned prehistoric	Hill/ridgetop	
33Pk210	n/a	Lithic scatter	Unassigned prehistoric	Hill/ridgetop	Schweikart et al. 1997; Hazel 2003
*33Pk211	Bamboo Farmstead	Lithic scatter	Middle-Late Archaic	Hill/ridgetop	Pecora and Burks 2012a
33Pk213	The Log Pen Farmstead	Isolated find	Unassigned prehistoric	Toe ridge	Klinge 2009
*33Pk217	Stockdale Road Dairy	Lithic scatter	Unassigned prehistoric	Terrace	Pecora and Burks 2012a
*33Pk218	Cornett Farmstead	Lithic scatter	Late Archaic	Toe ridge	
33Pk317	Mechling House	Lithic scatter	Late Archaic	Hill/ridgetop	Pecora and Burks 2012b
33Pk318	Mechling Farmstead	Lithic scatter	Unassigned prehistoric	Ridgetop Saddle	
33Pk323	Moore School	Isolated find	Unassigned prehistoric	Stream bottom	Mustain and Klinge 2012
33Pk324	Map Location 50 Farmstead	Isolated find	Unassigned prehistoric	Hill/ridgetop	
33Pk339	n/a	Isolated find	Unassigned prehistoric	Floodplain	Mustain 2012
33Pk341	n/a	Isolated find	Unassigned prehistoric	Terrace	
33Pk342	n/a	Isolated find	Unassigned prehistoric	Terrace	
33Pk343	n/a	Isolated find	Unassigned prehistoric	Bluff edge	
33Pk346	n/a	Lithic scatter	Unassigned prehistoric	Hill/ridgetop	Pecora 2012a
33Pk347	n/a	Lithic scatter	Late Prehistoric; Middle-Late Archaic	Hill	Pecora 2012a; Pecora and Burks 2013a
33Pk348	n/a	Lithic scatter	Early Woodland; Late Archaic-Early	Hill	

OAI	Historic-era Site Collocation	Prehistoric Site Type	Temporal Affiliation	Landform	Reference
			Woodland; Late Archaic		
33Pk349	n/a	Lithic scatter	Unassigned prehistoric	Hill/ridgetop	Pecora 2012a
33Pk350	n/a	Isolated find	Unassigned prehistoric	Hill/ridgetop	
33Pk351	n/a	Lithic scatter	Unassigned prehistoric	Hill/ridgetop	
33Pk352	n/a	Lithic scatter	Unassigned prehistoric	Hill/ridgetop	
33Pk354	n/a	Isolated find	Unassigned prehistoric	Toe ridge	Garrard and Burden 2012
33Pk357	n/a	Isolated find	Unassigned prehistoric	Toe ridge	
33Pk358	n/a	Isolated find	Unassigned prehistoric	Ridge spur	
33Pk359	n/a	Lithic scatter	Unassigned prehistoric	Hill/ridgetop	
33Pk361	n/a	Isolated find	Unassigned prehistoric	Hill/ridgetop	
33Pk365	n/a	Isolated find	Unassigned prehistoric	Hill/ridgetop	Norr 2012
33Pk366	n/a	Isolated find	Unassigned prehistoric	Hill/ridgetop	
33Pk367	n/a	Lithic scatter	Unassigned prehistoric	Hill/ridgetop	
33Pk368	n/a	Isolated find	Unassigned prehistoric	Hill/ridgetop	
33Pk370	n/a	Lithic scatter	Unassigned prehistoric	Hill/ridgetop	Pecora 2012b
33Pk371	n/a	Lithic scatter	Late Woodland; Early Woodland; Late Archaic-Early Woodland; Early Archaic	Hill	Pecora 2012b; Pecora and Burks 2013a
33Pk372	n/a	Lithic scatter	Late Prehistoric; Early Woodland; Late Archaic	Hill	
33Pk373	n/a	Isolated find	Late Archaic-Early Woodland	Toe ridge	
33Pk376	n/a	Lithic scatter	Unassigned prehistoric	Hill/ridgetop	
33Pk377	n/a	Isolated find	Unassigned prehistoric	Toe ridge	
33Pk378	n/a	Isolated find	Unassigned prehistoric	Toe ridge	
33Pk383	n/a	Lithic scatter	Unassigned prehistoric	Bluff edge	
33Pk384	n/a	Isolated find	Unassigned prehistoric	Hill/ridgetop	

*Sites addressed in current report

This report contains 12 sections, including Section 1, the introduction. Section 2 presents a historical context based on more than a century of archaeological research in Ohio and the Ohio Valley region, while Section 3 is a discussion of various archaeological terms and concepts. Sections 2 and 3 provide the foundation for describing and interpreting the prehistoric archaeological resources examined in this study. Section 4 summarizes the archaeological field methods used in this study and Section 5 presents the geophysical survey used in an attempt to located sub-surface archaeological features, such as prehistoric earth ovens. Sections 6-11 summarize the prehistoric components within each of the six PORTS farmstead sites and Section 12 summarizes the combined results.

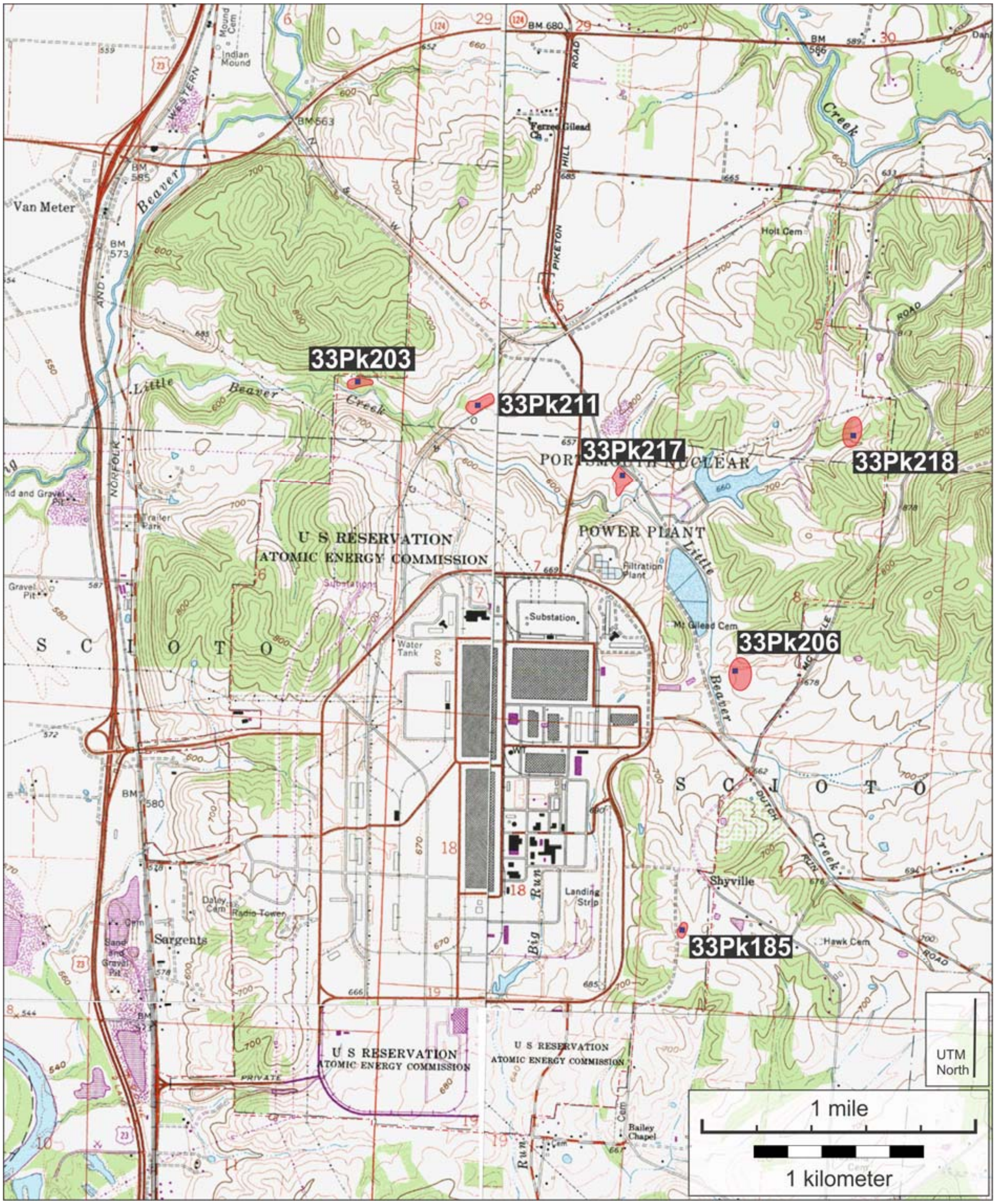

Figure 1.1. Modern USGS topographic map showing the locations of sites 33Pk185, 33Pk203, 33Pk206, 33Pk211, 33Pk217, and 33Pk218.

Figure 1.2. Modern aerial photograph showing the locations of sites 33Pk185, 33Pk203, 33Pk206, 33Pk211, 33Pk217, and 33Pk218.

2. HISTORICAL CONTEXT

Archaeology is the study of past human behavior through the excavation and analysis of preserved cultural remains—that is, features (e.g., hearths, earth ovens, storage pits, and structural post molds) and artifacts (e.g., flint flakes, fire-cracked rock, pottery sherds). Paramount to archaeological research is time and space. The archaeological work reported here, pays close attention to details related to archaeological time and space which is especially important for sorting out the age and location of the various Native American occupations found at the sites investigated.

Spatial context is critical to all archaeological research and is the foundation of the systematic survey, excavation, and mapping methods used by modern archaeologists. Artifacts found out of context, such as in a cigar box in an attic, offer little value to archaeological research. To study past human behavior, archaeologists pay special attention to the spatial arrangement of objects and debris (e.g., artifacts), features, and sites (a site is a concentration of artifacts and features).

Temporal context is equally important. Once the spatial context of archaeological features and artifacts is established, it is essential to determine their age. In archaeological contexts, age is typically determined using radiometric dating (e.g., radiocarbon dating) and temporally diagnostic artifacts. Radiometric dating relies on the radioactive decay of carbon to determine age. Carbonized (i.e., burned) organic remains, such as wood or nutshell charcoal, found in prehistoric features typically are used to obtain radiometric dates. Radiometric dates measure the age of the organic material and, by association, the age of the context (e.g., feature) in which it is found. Archaeologists also use certain artifact types as temporal indicators. For example, the shapes (and technological attributes) of chipped stone projectile points slowly changed through time and therefore can be used as indicators of broad time periods. The Brewerton and Matanzas projectile point types, just as one example, have been radiocarbon dated consistently to around 2980-1723 B.C. and 3700-2000 B.C., respectively, in the eastern United States (Justice 1987). However, a large assemblage of similar artifacts from site 33At982 in Athens County, Ohio were found in association with nine radiometric dates that bracket 4000 B.C. (Pecora and Burks 2006). With this additional, regionally specific information, it is reasonable to suggest that in southern Ohio the Matanzas and Brewerton types date to about 4000-1723 B.C. Projectile points are not the only temporally diagnostic artifacts. Various pottery types, defined by their temper, paste, thickness, vessel and rim shape, and surface treatment, are also useful temporal markers. The widespread use of pottery in Ohio did not occur until after 1500 B.C., so the presence of pottery at an archaeological site reveals that it likely was occupied after this time; other pottery attributes may narrow the age down to an even more specific time period.

The term "temporal component" is typically used by archaeologists to refer to the different periods of time represented at archaeological sites. For example, the six sites examined in this study are historic-era farmsteads that were established in the middle to late nineteenth middle twentieth century, but all were also occupied by various prehistoric groups. Hence, these farmstead sites contain two general temporal components (prehistoric and historic-era). Aside from the historic-era temporal components, any one site may contain more than one prehistoric component.

Figure 2.1 is a schematic diagram that illustrates a timeline of Ohio's past. During the last 100-plus years of research in Ohio, archaeologists have established and refined five general temporal periods: Paleoindian, Archaic, Woodland, Late Prehistoric, and Historic-era. The Archaic and Woodland periods each contain three subperiods each: Early, Middle, and Late. Figure 2.1 also lists several "archaeological culture groups/terms" that refer to unique suites of cultural attributes. For example, Glacial Kame and Maple Creek refer to two distinct cultural taxa—a suite of archaeologically visible and defined cultural traits—that occur in the Late Archaic period and have been identified in Ohio. Likewise, the Adena, Hopewell, and Intrusive Mound/Jack's Reef taxa correspond with specific behavioral practices during the Early, Middle, and Late Woodland Periods.

It is very common for archaeological sites to contain more than one prehistoric temporal component. For example, a site with Early Archaic and Late Archaic period temporal components is one where archaeologists documented radiometric dates and/or temporally diagnostic artifacts that date from between 8000 and 5000 B.C. (Early Archaic) and 3000-1000 B.C. (Late Archaic). Often, however, prehistoric sites are recorded as unassigned prehistoric sites, meaning no temporal information was identified or documented for these locations. The presence or absence of temporal data from an archaeology site is usually a reflection of the amount of archaeological work that has been performed at the site—more work usually leads to the discovery of temporally diagnostic artifacts or charcoal that can be used in radiocarbon dating. Forty-three of the PORTS prehistoric sites listed in Table 1.1 are temporally unassigned prehistoric sites (their ages have yet to be determined). Temporal information has been found (i.e., temporally diagnostic artifacts) or determined (i.e., through radiocarbon dating) at 10 sites. The following text summarizes the time periods outlined in Figure 2.1 and provides context for the prehistoric archaeological sites at PORTS.

2.1. PALEOINDIAN PERIOD

Human occupation of Ohio spans at least 12,000-14,000 years, beginning with the arrival of Paleoindian groups in the Ohio region as the last of the glaciers receded northward around 14,000 years ago. Distinctive lanceolate and fluted lanceolate shaped projectile points characterize Paleoindian archaeological deposits. Artifacts representative of this period tend to be fairly homogeneous in shape throughout North America, and many specimens have been collected in the Ohio region (e.g., see Prufer and Baby 1963).

While Paleoindian people in the Middle Ohio Valley region are well known for their hunting prowess and the large ice-age animals that they harvested, they also relied heavily on gathering plant resources (Tankersley 1996). Archaeological deposits containing the remains of Pleistocene mega-fauna in association with Paleoindian artifacts are not uncommon in the western and arctic regions of North America, but in Ohio they are quite rare (cf. Fisher et. al 1994; Lepper 1988; McDonald 1994; Redmond and Tankersley 2005). Technological similarities in the Paleoindian tools found in Ohio and those found elsewhere in the eastern U.S. suggest that similar subsistence strategies were followed across vast regions.

Prufer and Baby (1963) advanced a Paleoindian settlement pattern model in Ohio based on the distribution of fluted, lanceolate projectile points. Following up on this, Seeman and Prufer (1982) expanded this study with a much larger sample of projectile points and concluded that these earlier hunters focused on large game animals. Lepper (1986), however, suggests that these earlier hunter-gathers occupied a more generalized niche—one not so focused on big game hunting.

The current Ohio Archaeological Inventory (OAI) lists only five sites in Pike County with Paleoindian temporal components. None of the PORTS sites contain Paleoindian artifacts or radiometric dates.

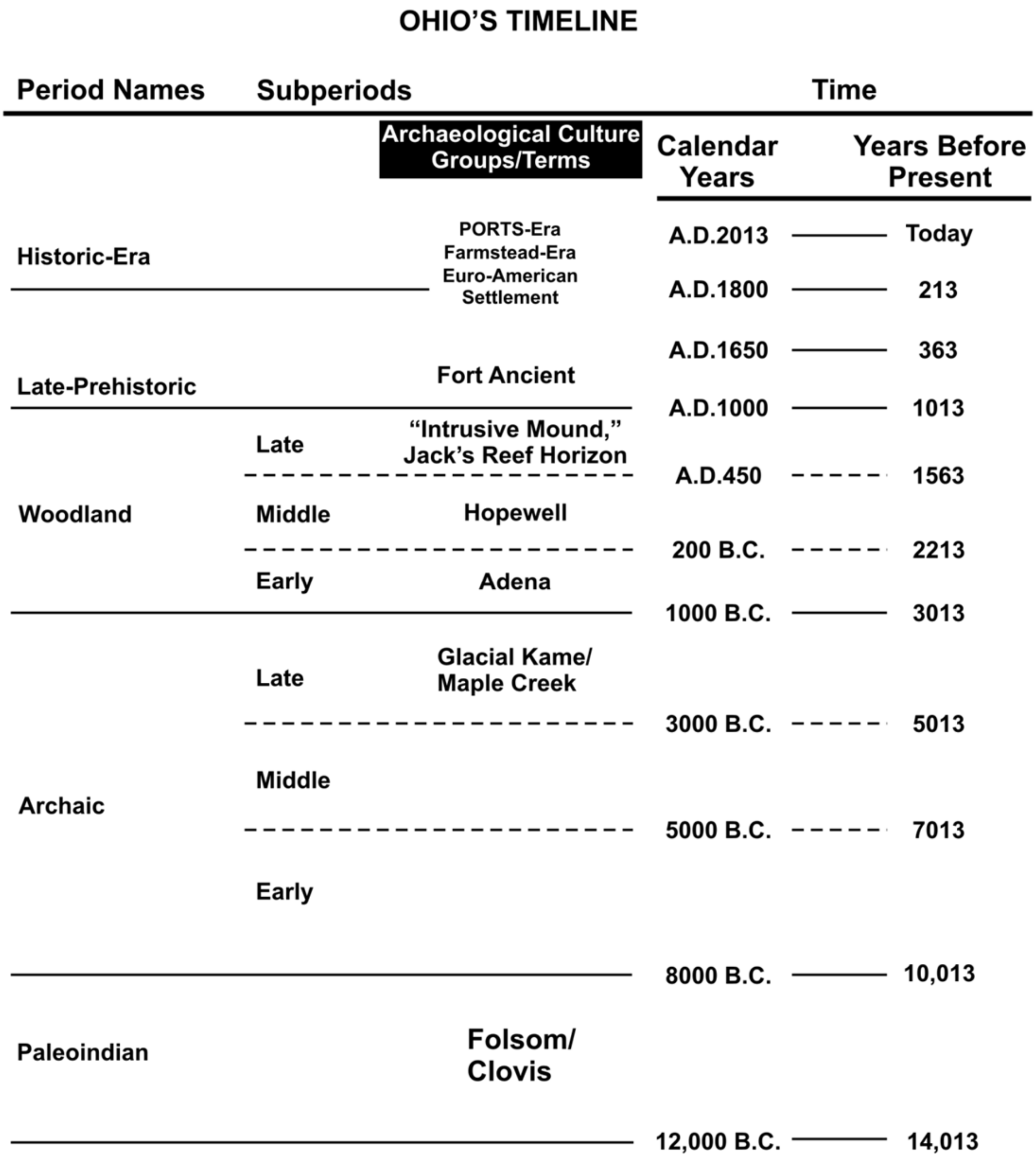

Figure 2.1. Schematic representation of Ohio's historical timeline (modified from Burks 2010).

2.2. ARCHAIC PERIOD

Early Archaic

The Early Archaic period temporal sequence for the Ohio Valley is defined, in part, by the deeply stratified St. Albans site on the Kanawha River in West Virginia (Broyles 1971). Broyles' (1971) excavations at St. Albans resulted in the identification of a stratified geologic sequence in which each stratum contained distinct projectile point forms. The temporal sequence of projectile point types from the lower to upper strata includes the following types: Charleston, Kirk, MacCorkle, St. Albans, LeCroy, and Kanawha. Additional sites in the region with artifacts in association with radiocarbon dates appear to substantiate the St. Albans sequence. These projectile point forms are widely distributed and extend from the southern Mississippi River Valley to southern Canada—essentially corresponding to the extent of the Eastern Deciduous Forest (Chapman 1977). The similarities in projectile points throughout this vast region may reflect homogenous adaptations to similar environments and/or social or cultural homogeny. However, they may also reflect a widespread exchange of ideas and objects between different cultural groups.

It is generally thought that Early Archaic populations were highly mobile and dispersed hunter-gatherer groups (Blank 1970). The population at this time was rather low and was probably made up of small extended family groups or bands composed of several related men, women, and children (as well as dogs). As mobile hunter-gatherers, these groups would have moved from place to place, bringing along their belongings. They settled for short periods of time (perhaps a few weeks) to exploit various resources, such as game, plant foods, and raw materials. In this way these groups mapped themselves onto the landscape, being present at the right place at the right time to harvest seasonally available foods and raw materials.

Several models for Early Archaic settlement have been developed for the American southeast (e.g., Amick and Carr 1996; Anderson and Hanson 1989; Johnson 1989a, 1989b; Morse 1975; Schiffer 1975). Morse (1975) argues that Dalton populations in the lower Mississippi Valley (Arkansas) were virtually sedentary and occupied distinct territories within major drainages. In contrast, Schiffer (1975) argued that this same population alternated seasonally between a residentially mobile system (moving the entire group from place to place) during the summer and autumn months, and a logistically mobile system (the group is stationary, but individuals/groups head out to collect nearby resources) during the winter and spring months. Anderson and Hanson (1989) postulate a similar Early Archaic settlement organization pattern for the East Coast. This settlement model approximates Caldwell's (1958) fission-fusion settlement pattern, in which populations were dispersed in small residential groups throughout part of the year but came together at larger base camps during other parts of the year.

Other researchers contend that Early Archaic populations were considerably more mobile and occupied a more residential-type pattern. Jeffries (1988) argues that the absence of features, burials, and midden at sites such as Longworth Gick near Louisville, Kentucky, St. Albans in West Virginia, Modoc and Koster in Illinois, and Rose Island and Icehouse Bottom in Tennessee indicates that Early Archaic populations in these regions were composed of small, mobile bands that occupied large territories. Numerous rock shelter and open ridgetop sites in Eastern Kentucky support this model. Most of these are thought to be camps occupied to exploit seasonal resources, such as acorns and hickory nuts. Johnson (1989a, 1989b) suggests a similar settlement pattern in the Southeast, based on lithic technology data.

Stafford (1994) observed a shift in land use during the Early and Middle Archaic in southwestern Indiana. Based on the spatial patterning of temporally diagnostic bifaces (projectile points), Stafford suggests that Early Archaic bifaces tend to be found farther from the major drainages than bifaces from the later Archaic periods. He interprets this change as a shift in settlement organization. Early Archaic artifact patterning suggests a mobility strategy that involved fine grained patch-to-patch movement through multiple basins in highly mobile, forager-like fashion (patches are places where a particular resource, such as hickory nuts, is readily available). Within this system, Early Archaic groups moved to resources on an encounter basis—from a stand of nut trees to a winter yard full of deer.

According to the Ohio Archaeological Inventory (OAI), only eight percent (n=25) of the sites recorded in Pike County have defined Early Archaic components. Two sites with Early Archaic components have been documented within PORTS. Site 33Pk371 produced two projectile points that resemble Early Archaic point types (Pecora and Burks 2013a). One is a nearly complete side-notched form that resembles types within the Large Side Notched Cluster and the other is the distal portion of a serrated point that resembles types within the Kirk Cluster. Likewise, site 33Pk203, which is summarized in the current report, produced a side notched point with serrated blade edges. This specimen resembles types within the early Archaic Kirk Cluster.

Middle Archaic

The Middle Archaic (5000-3000 B.C.) is less well defined in the Ohio Valley than any other time period. It is generally understood that by the end of the Middle Archaic, climatic conditions in the Ohio Valley were similar to those of modern times. Although toolkits are similar to those from the Early Archaic, there is a trend towards regional diversity through time in the Middle Archaic. A significant increase and widespread occurrence of ground stone artifacts, which are thought to be indicative of plant food processing technologies, indicates that a broader range of resources was exploited during this time—or at least a broader range of durable tools was being used. This may be an indication of the increase in the degree to which these resources (those requiring the ground stone tools) were being used. Wood working tools, such as adzes, and atlatl weights increase in popularity during the Middle Archaic and indicate the continuing development of both hunting and non-hunting oriented technologies. Manos, mortars and pestles, and pitted nutting stones become very common, indicating an increased use of plant foods, or at least a development in the technology used to exploit these resources.

Projectile point forms appear to change slightly and a variety of side notched forms become more common, including side-notched projectile point types of the Raddatz Cluster, Matanzas Cluster, Stanley, and Big Sandy II (Justice 1987). Middle Archaic settlement is probably very similar to that of the Early Archaic, with a gradual trend toward territorial restrictions, more substantial archaeological sites due to increased occupation redundancy, and an increase in centralized burial or mortuary-related sites towards the end of the period. In southwestern Ohio the majority of Middle Archaic sites are found on terraces and floodplains of stream valleys (Genheimer 1980).

By the latter portion of the Middle Archaic, in some regions of the Eastern Woodlands, sites become large with substantial middens, large pit features, diverse lithic and bone tool assemblages, exotic goods, and human and dog burials. These sites are thought to have resulted from the reoccupation of the same locations more regularly on an annual basis (Brown and

Vierra 1983; Smith 1986). Large, "base camp"-like sites that date to the Middle Archaic are located in northwest Tennessee (Eva), the Carolina Piedmont, and Illinois (Modoc and Koster) (Jeffries 1988; Smith 1986; Steponaitis 1986). Excluding site 33At982 in Athens County, Ohio, no Middle Archaic base camp-like sites have been excavated in Ohio (Pecora and Burks 2006). In fact, this lack of Middle Archaic sites in Ohio has led some to suggest that the Ohio area was depopulated during this period (Purtill 2009).

The closest study of Middle Archaic settlement to Ohio comes from southwestern Indiana. Using the distribution of side notched projectile points, Stafford (1994) recognized a shift from a fine grained patch-to-patch, forager system with frequent residential moves during the Early Archaic to a coarse-grained collector-like system with valley floor base camp occupations during the Middle Archaic. Although this type of settlement shift may have occurred here in central Ohio, no studies of this sort have been conducted to date and sufficient data on Middle Archaic sites does not exist yet.

One very important late Middle Archaic site (33At982) has been documented in southern Ohio, in Athens County, along the Hocking River near its confluence with the Ohio River (Pecora and Burks 2006). The Phase III work at site 33At982 resulted in the discovery of an unplowed midden with associated features (hearths and earth-ovens) and an artifact assemblage dating to circa 4000 B.C., based on nine radiometric dates from feature and midden contexts. This site is interpreted to be a residential base camp at which numerous tools, including a whole suite of Matanzas/Brewerton Cluster projectile points, were discarded. The circa 4000 B.C. component at 33At982 is unique in that no other examples of this time period have been documented in Ohio. All other reported radiometric dates from this period are associated with isolated features located within larger sites or rockshelters dating to later periods. The projectile point assemblage from 33At982 is particularly important because the nine associated radiometric dates definitively date the Matanzas/Brewerton Cluster to 4000 B.C. in Ohio. Site 33At982 may also be an example of the valley floor base camp anticipated by Stafford (1994) in southwestern Indiana. In fact, site 33At982 may be analogous to the large late Middle Archaic base camps in northwest Tennessee, the Carolina Piedmont, and Illinois (Jeffries 1988; Smith 1986; Steponaitis 1986).

According to the Ohio Archaeological Inventory (OAI), only three percent (n=9) of the sites recorded in Pike County have defined Middle Archaic components. No Middle Archaic temporal components have been documented in PORTS. Sites 33Pk347 and 33Pk203, however, produced a small notched projectile point type that resembles the Matanzas/Brewerton types. Since the Matanzas type is well documented in a late Middle Archaic-early Late Archaic context in Ohio (Pecora and Burks 2006), it is possible that sites 33Pk203 and 33Pk347 may have been occupied during this time period.

Late Archaic

Many notable technological changes are known to have taken place during the Late Archaic period (3,000-1,000 B.C.). Stone toolkits from Late Archaic period sites across the Midwest show an increase in the variety of stemmed and notched projectile points, suggesting that populations have settled into their local regions and there is less inter-region contact. Ground stone artifacts, thought to be plant food processing tools, are common, with an increase in the presence of stone bowls. This period is also known for deposits containing a range of "exotic" material, which indicates the development of regional trade during this period. Late

Archaic diets remain similar to those of the earlier periods but an increased use of plant foods, aquatic resources, and native cultigens is evident. The end of the Late Archaic period also sees the earliest production of pottery in Ohio and the beginnings of mound construction.

An important and influential model of Late Archaic settlement patterns is Winters' (1969) model for the Riverton Culture in the Wabash Valley of Illinois/Indiana. This model states that the Late Archaic settlement system was oriented around seasonal movement within a restricted area. Seasonal movement in this fashion is not alien to the earlier Archaic and Paleoindian periods. During the Late Archaic, however, territory size becomes smaller and more restricted due to population growth and social circumscription—more neighbors packed onto the landscape meant less room for groups to roam during their seasonal rounds. According to Winters, summer occupations were centered on base camps. During the spring and fall, settlements were oriented around smaller, transient camps. Changing and limited resource availability during spring and fall dictated the transient nature of the camps. Cold season winter-time occupations were large, substantial settlements. All three seasonal settlement types are linked to small, ancillary hunting, gathering, and bivouac camps.

Late Archaic settlement systems differ from those of the Early Archaic because of the large winter sites of the Late Archaic, which tend to be massive archaeological deposits containing an abundance of debris, huge pit features, hearths, and even storage facilities. Restricted territory also had an impact on settlement and resulted in a settlement pattern that was different form Early Archaic settlements. Due to territory restrictions, Late Archaic people may have frequently returned to certain locations, again creating more substantial archaeological deposits. The burial complex associated with the Glacial Kame in central Ohio (Converse 1980) and Late Archaic phenomena in other areas (e.g., Red Ochre, Old Copper) also suggests the presence of regionally-specific cultural traditions and well-defined territories.

Site locations along terraces suggest that during the spring and summer aquatic and plant resources in river valleys were heavily utilized, while during the fall and winter the uplands were focused upon for nut harvesting (e.g., hickory and walnut) and wild game hunting (Genheimer 1980; Vickery 1980). Vickery (1980) has suggested that two types of settlements occurred during this period in southern Ohio, the local base camp affiliated with a restricted territory and larger scale camps indicative of the use of regional resources. These sites fall within the taxonomic unit Maple Creek Phase, which Vickery developed for the Late Archaic in southern Ohio—especially along the Ohio River. During the Maple Creek Phase, larger base camps were located along river terraces.

An example of this kind of site, the large Late Archaic base camp, is site 33Ms29. This large Late Archaic Maple Creek phase site was interpreted as an aggregated base camp by Keener and Pecora (2003) based on large scale geophysical survey, shovel testing, and targeted feature excavation. Numerous subsurface pit features and post holes were identified by geophysical survey and limited excavation. Merom-like points were found associated with the site and are commonly found with Maple Creek sites located along valley floors. Maple Creek sites found in the uplands are typically smaller in size and less complex (Vickery, personal communication 2003).

At the other end of the state, in the Lake Erie Basin, Prufer and Long (1986) propose two Late Archaic site types for Northeastern Ohio: (1) Large base camps on higher ground along major stream valleys, and (2) small encampments, many of which are located on glacial knolls overlooking lakes, ponds, and swamps. A similar pattern is probably present in central Ohio, with small encampments in the interfluvial areas, and larger base camps along the floodplains of the Scioto, Olentangy, Licking, Hocking (upper), and Muskingum (upper) rivers.

Terminal Late Archaic period pottery has been found at a number of sites in southern Ohio, demonstrating that this innovation in container production got an early start in Ohio. Recently, Pecora and Burks (2005) obtained some of the oldest radiocarbon dates for pottery in Ohio when they recovered pottery in two features dating to 3980±60 BP and 3290±120 BP. Dates as early as 2400 B.C. are exceptionally rare, but there are numerous examples from across south and central Ohio of pottery dating between 1500 B.C. and 1000 B.C.

According to the current Ohio Archaeological Inventory (OAI), more sites within Pike County contain Late Archaic components (n=51, 17%) than any other time period. Within PORTS, Late Archaic temporal components have been documented from at least five sites (33Pk203, 33Pk347, 33Pk348, 33Pk371, and 33Pk372). Six of the twelve radiocarbon dates procured from sites 33Pk347, 33Pk348, 33Pk371, and 33Pk372 date to this period or straddle the end of the Late Archaic and beginning of the Early Woodland periods (Pecora and Burks 2013a). The 33Pk203 Late Archaic period component is indicated by a projectile point that resembles the Lamoka type.

2.3. WOODLAND PERIOD

Early Woodland

The Early Woodland Period (1,000 B.C. to 200 B.C.) represents a continuation and elaboration of cultural manifestations developed in the Late Archaic, most visibly in the area of the treatment of the dead. In fact, the Early Woodland is set apart from the Archaic by the intensification of mortuary practices with the construction of burial mounds and extensive exchange networks for burial/ritual goods, use of ceramic vessels, and the use of indigenous or non-indigenous domesticated cultigens such as chenopodium and sunflower (Dragoo 1976). The fluorescence in the use of pottery is important because it suggests a greater reliance on food processing (cooking) and storage (e.g., for small seeds), and may indicate a greater emphasis on the gathering and processing (i.e., cooking) of plant foods versus hunting. This change in subsistence practices marks a shift towards the development of cultivation, which by the end of the Woodland period becomes intensive corn agriculture. While pottery first appears in the region well before 1000 B.C., finding it on archaeological sites dating to between 1000 and 200 B.C. is fairly commonplace in today's research. In central Ohio, this early pottery is plain surfaced, thick, and grit tempered and typically vessels have moderately narrow to very narrow (essentially subconoidal), flat bases (e.g., Dominion Thick type [Cramer 1989]). Other contemporaneous, thick pottery types in the Middle Ohio Valley, such as Fayette Thick, have a wide range of surface treatments (e.g., cord marking and fingernail impressions) and tempers (Clay 1992; Seeman 1992). The Adena cultural manifestation, characterized by large burial mounds, small circular earthen enclosures, the widespread use of small amounts (relative to later Hopewell practices) of exotic raw materials like mica and copper, and a subsistence strategy more focused on the use of cultigens than previously, does not begin until about 450 B.C. (Seeman 1986).

Early Woodland settlements, especially after 450 B.C., are small, one- to two-house sites with cooking pits and trash dumping areas generally located on the low terraces and floodplains of stream valleys. Most work on sites from this time period in Ohio has been done in the Muskingum Valley (Carskadden 1992; Carskadden and Gregg 1974) and other nearby areas in west-central Ohio (e.g., Bush 1975; Schweikart 2008). Evidence of substantial, circular structures has been found at several sites, suggesting that they were inhabited for large portions of the year, if not year around. Projectile points found at Early Woodland sites are generally large ovate-based or stemmed varieties (Justice 1987) that were hafted to spears/darts. The mortuary complex of the Adena was focused on the construction and use of conical mounds as vertical cemeteries—some mounds were over 60 feet in height. Most Adena mounds were constructed in isolation, but some were accompanied by surrounding earthen enclosures and/or other small mounds. Burial mounds are typically found along high terrace or bluff edges overlooking stream valleys, as is common in the Hocking Valley (Waldron and Abrams 1999). However, Adena mounds are also found on or near floodplains in small creek valleys, as is the case in the Deer Creek Valley in northern Ross County and southwestern Pickaway County. Examples of large Early Woodland mounds include the Sentinel Mound (Harrison County), the Miamisburg Mound (Montgomery County), the Adena Mound (Ross County), and the Conus Mound (Washington County). Pike County boasts several large mounds that likely are Adena constructions, including the Vulgamore Mound and the Van Meter mounds located just west of PORTS (see Burks 2011). Burials are often, but not always, placed in log-lined crypts in the center of the mound floors. Some of the log-lined burials contain exotic goods such as high quality flint projectile points, copper bead necklaces and bracelets, and slate and ground stone items. In many cases mounds contain the remains of multiple crypts, though some Adena mounds lack crypts altogether (Hays 1994).

The current Ohio Archaeological Inventory (OAI) lists 33 (11%) sites with Early Woodland components in Pike County. Within PORTS, Early Woodland temporal components have been documented at four sites (33Pk203, 33Pk348, 33Pk371, and 33Pk372). At sites 33Pk348, 33Pk371, and 33Pk372 the Early Woodland period is represented by radiometric dates, thick grit tempered pottery, and a micro-drill technology that may be uniquely Early Woodland (Pecora and Burks 2013a). Six of the 12 radiocarbon dates from 33Pk348, 33Pk371, and 33Pk372 date to this period or straddle the end of the Late Archaic and beginning of the Early Woodland. The 33Pk203 Early Woodland component is represented by a recycled projectile point that resembles an Early Woodland Stemmed Cluster Type.

Middle Woodland

The Middle Woodland Period (200 B.C. to A.D. 400) is best known for its Hopewell cultural manifestation and the large earthworks built during this time in central and southern Ohio. Middle Woodland subsistence strategies continued to rely heavily on food supplies obtained from hunting and gathering (e.g., nut varieties, deer, berries, fish, seeds, and small mammals). There is, however, an apparent greater reliance on cultigens such as chenopodium, sunflower, and maygrass, known as the Eastern Agricultural Complex (EAC) (Wymer 1996). Corn was also present during this period but only in very small quantities at just a few sites. It was not even a minor part of the Middle Woodland diet.

The settlement patterns of the Middle Woodland period appear to center around small, permanently occupied (i.e., year around) “hamlets” that have been found within 1-5 kilometers of the earthwork complexes and also far from the earthworks in upland settings (Dancey and Pacheco 1997; Pacheco 1996; Pacheco et al. 2005, 2009a, 2009b). Prufer’s (1965) work on the

McGraw site led him to postulate that Middle Woodland communities consisted of small, permanently occupied farming hamlets (each hamlet represented by one or two households) that were tied to a ceremonial and burial area. Pacheco (1988, 1993, 1996, 1997) and Dancey and Pacheco (1997) later expanded upon Prufer's research and proposed four correlates that should be evident at Middle Woodland habitation, or hamlet sites:

1. Hamlets are relatively small in size, usually covering no more than 1 ha. The size distribution of hamlets is distinctly uninodal;
2. The surface structure of hamlets is characterized by high density areas of artifacts resulting from formal refuse disposal. Household garbage dumps appear as sharply defined single peak (uninodal) concentrations when mapped;
3. Hamlet artifact assemblages contain functionally equivalent generated tool kits necessary to maintain the day-to-day existence of the domestic unit. These assemblages will contain both the products and by-products of the manufacturing and maintenance of the tool kits; and
4. Hamlets are locally dispersed in the general vicinity of ceremonial centers. Clusters of hamlets form communities associated with particular centers/burial mounds (Pacheco 1997: 43-44).

Dancey and Pacheco (1997) advocate a dispersed sedentary community model for Ohio Hopewell hamlets along drainage systems. Related communities are viewed as peer polities, and related polities make up regional traditions.

A number of researchers disagree with the Dispersed Sedentary Community model and try to argue that the Hopewell moved around the landscape, living in seasonal encampments (e.g., Yerkes 1988, 1990, 1994). In addition, the proponents of the mobile Hopewell model argue that the ceremonial centers were occupied by, or bordered by, temporary settlements, such as the Hale site near the Newark Earthworks (Lepper and Yerkes 1997: 187-188). The presence of temporary encampments immediately adjacent to Hopewell ceremonial centers does not actually support or refute either model of Hopewell settlement patterns as both positions suggest the presence of intermittently occupied camps near the earthworks. Recent work around Hopewell Mound Group (Burks and Pederson 2006) and the Hopeton Works (Burks and Gagliano 2009), for example, has documented the presence of short-term camps in the vicinity of large earthwork centers.

Although the Hopewell settlement debate is still evolving, excavations at such notable sites as Jennison Guard (Blosser 1996), Murphy (Dancey 1991, 1992), Twin Mounds (Fisher 1969, 1970; Hawkins 1996), Strait (Burks 2004), and Brown's Bottom (Pacheco et al. 2005, 2009a, 2009b) have found that Hopewell settlements are located in large and small stream valleys. Secondary encampments have been found in the uplands, indicating exploitation of seasonal plant (e.g., nuts) or animal (e.g., deer) resources (Pacheco 1988).

At least two Hopewell settlements have been found and documented in the PORTS area in the last two decades. The archaeology work conducted in preparation for the construction of an exit ramp off U.S. Route 23 at Route 32/124 identified several Hopewell structures that appear to be part of a small Hopewell settlement (33Pk153) (Church and Erickson 1995). Although structures were found, the excavations were not extensive enough to locate cooking pits and other features that may be associated with this occupation. Recent survey and site assessment work in Pike County in the vicinity of the Rt. 23/32 interchange, identified another Hopewell occupation. Systematic shovel testing revealed four artifact clusters and magnetic survey identified numerous pit features, three of which were excavated. Charcoal samples from all three excavated pit features produced middle-late Hopewell-era dates and mica (a common material used by the Hopewell) was found in two of the pits. It is possible that many more Hopewell settlements are present in the Scioto River floodplains south of Piketon.

The Middle Woodland period (i.e., Hopewell) is also distinct from the Early Woodland with the development of extensive and elaborate geometric earthwork complexes. Most archaeological work on the Hopewell has been conducted at these earthwork sites and associated mounds (e.g., Shetrone 1926). Some of the more notable Middle Woodland complexes include Hopewell Mound Group, Mound City Group, High Bank Works, Newark, Seip, Harness, Stubbs, and Marietta. Near PORTS, the Seal Township Works and the Piketon Graded Way (Burks 2011; Squier and Davis 1848) are two of the most prominent earthwork complexes in Pike County. Hilltop enclosures tend to be more common in the southwest Ohio area and are exemplified by such sites as Fort Ancient, Pollock, Fort Hill, and Miami Fort. From work done at the above sites, and many others, it is clear that at least some individuals in Hopewell communities participated in elaborate, and "expensive," mortuary-ceremonial activities. Some of these mortuary activities involved the consumption (e.g., through burning or burial) of large amounts of exotic grave goods, suggesting the Hopewell had well established trade connections or some other long distance acquisition mechanism (e.g., questing).

The content of Middle Woodland period artifact assemblages depends on the kinds of sites from which the artifacts are recovered. Exotic trade goods are generally concentrated in mortuary sites, while utilitarian artifacts such as ceramics and lithic debris are concentrated at hamlets or encampments. Middle Woodland ceramics are typically manufactured with grit temper and possess cordmarked or plain exterior surfaces. Some ceramics are decorated with stamped, punctuated, or zoned designs, with a few rare items containing iconography (Greber and Ruhl 1989). Domestic Hopewell vessels generally have thinner walls than their Early Woodland antecedents, and they are typically globular to subconoidal in form. Lithic artifacts include bladelets, polyhedral cores, expanding base projectile points (e.g., Snyder type and other Lowe Cluster types [Justice 1987]), drills, and a variety of ground stone tools. Besides their use of many varieties of local flint, the Hopewell also used many other kinds of raw materials in the fashioning of mortuary and ceremonial objects, including chlorite and mica from the southern Appalachians; marine shell and alligator and sharks' teeth from the Gulf Coast; obsidian from the Yellowstone area in the Rocky Mountains; copper from the Great Lakes; silver from Ontario; meteoric iron; and non-local, fine quality flint from North Dakota (Knife River) and southeast Indiana (Harrison County [Indiana Hornstone] flint). Other items made from non-local or local material include platform pipes, copper axes/adzes and rectangular plates, copper and silver-covered earspools, pendants and necklaces of large predatory animal canine teeth, and leaf shaped flint cache blades (Griffin 1978; Seeman 1979).

The current Ohio Archaeological Inventory (OAI) lists 36 (12%) sites with Middle Woodland period components in Pike County. None of the sites within the PORTS boundary, however, produced radiometric dates or artifacts that date to this period.

Late Woodland

The Late Woodland period (A.D. 400/500 to A.D. 1000) marks a distinctive change in some cultural traditions in the Middle Ohio Valley and a continuation of others. The large ceremonial earthwork centers of the Hopewell, and much of the conspicuous consumption of exotic raw materials, were abandoned at about A.D. 400 to A.D. 500. Other Middle Woodland period traits, such as the intensive cultivation of EAC plants and the use of Lowe Cluster projectile points, carried on. Distinct, subregional expressions of certain ceramic attributes, and perhaps cultural characteristics, also appear during this period, such as Cole, Newtown, and Peters (Baby and Potter 1965; Prufer and McKenzie 1966). Ceramic assemblages in southern and central Ohio are typically cordmarked, and commonly tempered with either chert or limestone (e.g., Peters and Chesser series). Most cordmarking goes up to, and on top of, the vessel lip. Later in the Late Woodland rims are thickened and some are castellated. Projectile points go through a major metamorphosis as they transition from spear points (Lowe Cluster types) to thin, notched arrow points (Raccoon notched and Jack's Reef), to small, triangular arrow points (Justice 1987). Ground stone tools, in particular celts, are common. There is also an increase of representative bone tool artifacts (e.g., awls, punches, etc.) during this period.

Seeman and Dancey (2000) partition the Late Woodland into early (A.D. 400-650) and late (A.D. 650-900) phases. Early Late Woodland sites typically contain a few bladelets from failing bladelet production industries, Lowe Cluster projectile points, large quantities of extra-local lithic material, and Newtown Cordmarked (southwestern/central Ohio), Childers Cordmarked (south-central Ohio), and Watson Cordmarked pottery (southeastern/eastern Ohio). The late Late Woodland is defined by assemblages containing a variety of cordwrapped-stick impressed ceramics and Levanna or Jack's Reef projectile points. The material culture of the Late Woodland as a whole includes well developed lithic, pottery, bone, and fiber technologies. Subsistence focused heavily on nuts, cultigens, and game hunting. Fish and shellfish are poorly represented at Late Woodland sites, though not many Late Woodland period settlements, especially late Late Woodland, have been excavated.

Settlement patterns in the Late Woodland period see populations begin to coalesce into more densely packed communities/villages typically along or next to river/stream valleys. This process of community nucleation may have begun as early as the third century A.D. in some areas of the region (Burks 2004). During this period, native plant cultigens and hunting provided most of the dietary needs. Late Woodland settlements frequently have dense midden deposits with abundant quantities of fire-cracked rock. These FCR middens are frequently associated with large earth ovens, some of which exceed 7.8' (2.4 m) in diameter (Seeman and Dancey 2000). However, by about A.D. 800, the large, nucleated villages of central and southern Ohio were vacated and the Late Woodland populations took up a more dispersed settlement pattern (Church 1987). Unfortunately, very few sites have been documented for the late Late Woodland period. Thus it is not really known yet what happens just before the advent of corn agriculture, which does not become important until the very end of the Late Woodland period, after A.D. 950.

The current Ohio Archaeological Inventory (OAI) lists 16 (5%) sites with Late Woodland components in Pike County. One radiocarbon sample from a feature excavated at site 33Pk371 produced a Late Woodland period date (Pecora and Burks 2013a).

2.4. LATE PREHISTORIC PERIOD

Just before the end of the first millennium A.D., something quite remarkable began to happen in Ohio and all across much of what today is the eastern United States—a process that has even come to define many aspects of modern American culture: corn agriculture. Corn was introduced into the Ohio Valley as early as the Middle Woodland period. It made its way here, with the help of people and trade, all the way from the highlands of Mexico. Along the way many generations of selective planting caused the corn plant to change, from 4000-5000 years ago a plant called *teosinte* that produced very small ears to, around A.D. 800-900, something more like what we know today.

It was that last change in the corn plant, just before A.D. 1000, that fueled quite a revolution in Ohio. This new corn plant could withstand a shorter growing season, cooler temperatures, and less rain than its earlier ancestors; and it produced a large yield as compared to plants in the past. One estimate puts that yield at 35-45 bushels per acre in southwestern Ohio (Cowan 1987). This boom in corn production fueled a revolution in settlement organization. Starting at about A.D. 1000, during the Late Prehistoric period (A.D. 1000-1650), southern Ohio comes to be dominated by peoples belonging to what archaeologists now call the Fort Ancient culture (Griffin 1943). Many Fort Ancient people lived in large circular villages (with hundreds of occupants) surrounded by a stockade. Most such villages had an open plaza at their centers, and some contained low burial mounds along the edge of the plaza. But not all Fort Ancient people lived in large villages. Smaller settlements of just a few houses are known, including single family farmsteads.

Along with this change in subsistence and settlement pattern came a marked evolution (or revolution) in pottery technology—the numbers of cooking pots made, used, and broken at Fort Ancient sites vastly increased over their use during the Woodland period. Furthermore, Fort Ancient cooking pots experienced a major change in construction technique. Unlike the crumbled up stone temper used by their Woodland period forbearers, the Fort Ancient used burned and ground up mussel shell to produce very strong, heat resistant cooking vessels.

Other Fort Ancient technologies are also readily identifiable on archaeology sites. The Fort Ancient used the bow and arrow and produced small flint triangular arrow points that are near ubiquitous across Ohio. They dug deep storage pits for storing all of the corn produced during the warm months. And they built fairly large (5-10 meters across), rectilinear houses, some of which even had wall posts set in trenches.

While the Fort Ancient built many of their villages and smaller settlements in the floodplains of major rivers and streams, near their fields of corn, or on nearby bluff tops at the edges of the valleys, they also ventured into the uplands to access other kinds of resources. It is not uncommon to find stray Fort Ancient arrow points on ridge tops in topographic settings like those found at PORTS. Rockshelters also commonly contain copious amounts of Fort Ancient material deposited by groups on resource gathering forays (e.g., Pitner 2000). No doubt the Fort Ancient were hunting deer, bear, raccoon, and other forest animals in these settings—their villages are littered with the bones of these animals. They also likely harvested nut crops in the uplands and gathered many other kinds of plants, they focused very heavily on corn, they did not totally give up some of the earlier plant food types heavily used during the Woodland period.

Unlike their neighbors to the far west, the Mississippians, the Fort Ancient do not seem to have had a complex, multi-level political organization. While there is some evidence for social stratification, lacking are the elaborately appointed burials of the elite that are found in Late Prehistoric period villages and towns along the Mississippi River. In fact, most Fort Ancient people were buried in graves right outside their houses, along the edge of the plaza. Nor did the Fort Ancient have large platform mounds on top of which priestly chiefs lived. Unlike the Mississippians, the Fort Ancient political system was based more on achieved status. Though certainly seated in familial relations and clan ties, those who were leaders in villages were not necessarily given such status at birth (e.g., Pollack and Henderson 2000).

By the late 1500s and early 1600s, strange and exotic objects and materials began to appear in Fort Ancient villages, signaling much change to come and the beginning of what archaeologists refer to as the Protohistoric period. Scraps of brass and copper fashioned into arrow points and tinkle cones, beads made of colorful glass, and even objects of iron, all indicate down-the-line contact with Europeans (Drooker and Cowan 2001). Not long thereafter, in the late 1600s and early 1700s, population migration, aggressive groups from the Northeast, and European diseases all worked to turn Ohio into a much depopulated land. Groups like the Shawnee, Miami, Delaware, Wyandott, and many others eventually re-filled some of Ohio (the Shawnee in particular are known to have lived in the Scioto Valley [e.g., Tanner 1987]), but by then their way of life had changed much from pre-contact times, looking much less like Fort Ancient and much more like the Euroamerican pioneers who would, in the mid-late 1700s, begin to push Native Americans out of Ohio.

The current Ohio Archaeological Inventory (OAI) lists 18 (6%) sites with Late Prehistoric components in Pike County. The Piketon area is an archaeological void when it comes to identified Late Prehistoric period villages and other kinds of sites. The nearest well-documented Fort Ancient village is the Feurt Village site (33Sc6), located 13.5 miles south of PORTS along U.S. Route 23 and just north of Portsmouth. North of Feurt Village, near the south edge of Lucasville, is another Fort Ancient village known as the Schisler Village site (33Sc9), though this site is less well documented. To the north of PORTS, no major villages south of the Richmondale area (e.g., the Morrison Village site [Prufer and Anders 1967]) have been documented. The floodplains of the Scioto River above and below Piketon are ideal settings in which to find Fort Ancient village sites and it would be expected that there are at least several undocumented villages in this area. Two sites within PORTS (33Pk347 and 33Pk372) were found to contain a Late Prehistoric period temporal component (Pecora and Burks 2013a). At 33Pk347, the Late Prehistoric period is represented by a radiocarbon date from the thirteenth century A.D. and a single projectile point that resembles the Fort Ancient Hamilton Incurvate type, while at site 33Pk372 one of the radiocarbon dates (13^{th}-14^{th} century A.D.) indicates that the site was likely occupied by a small group during the Late Prehistoric period.

There is little information available for the PORTS area concerning the period from 1650 to the 1790s, when Euroamericans began flooding into the Scioto Valley. This period in Ohio is referred to as the Protohistoric period. Several individuals are known to have traveled through the area and written journals during their travels, including Christopher Gist in 1750, William Trent in 1752, and the Reverend David Jones in 1772-1773 (see Foster 1996 for excerpts of these journals). Since both Gist and Trent were visiting the Shawnee towns at the mouth of the Scioto and traveled back and forth to Pickawillany, a Miami town with an English trading fort near modern day Piqua, Ohio, it is likely that many other Euroamericans also were traveling around southern Ohio in the early-mid 1700s.

Several historic maps (e.g., the Mitchell 1755 map, the Pownall 1776 map, and the Hutchins 1777 Map [all shown in Smith 1977]) show the famous Scioto Trail (a Native American trail) running north-south along the Scioto River and passing by the west side of PORTS, but only two Native American villages are shown in the lower Scioto Valley. A Delaware village of as many as twenty families (Smith 1977), that of Wanduchales, is present on the Mitchell 1755 map and reappears on the Pownall 1776 and Hutchins 1777 maps. It is unknown if the village was still there in 1777 or if Hutchins had simply copied over its location from the earlier maps. Smith (1977), likely informed by Christopher Gist's journal, suggests that Wanduchales' (or Windaughalah) town, also known as the Lower Delaware Town, was founded as early as 1738 and was located on the east side of the Scioto River in Clay Township, Scioto County—at least 12 miles south of PORTS. The only other Native American village or town to appear on any maps of the lower Scioto Valley (i.e., below Chillicothe) is Hurricane Tom's town, which is shown on the west side of the Scioto River, opposite its confluence with Salt Creek and near what today is the small town of Higby. Many Shawnee villages are known from the Portsmouth area and around Chillicothe, but none have been recorded near Piketon or PORTS.

3. ARCHAEOLOGICAL TERMS AND CONCEPTS

As was discussed above, archaeology attempts to reconstruct past human behavior by studying the spatial and temporal arrangement of artifacts, features, and archaeological sites. An archaeological site is defined as a place where evidence of past human activity has been preserved, and it is essentially a concentration of features and artifacts. Excluding the famous mounds and earthworks, which are generally thought to be mortuary and ceremonial sites, most of Ohio's prehistoric archaeological sites are domestic locations where people lived out their daily lives, carrying out a variety of food and resource procurement activities.

Through most of the course of prehistory, Ohio's residents were highly mobile hunter-gatherers, especially during the Paleoindian and Archaic periods. It was not until after approximately 200 B.C. that Ohio's residents started to settle down and become somewhat or completely sedentary. Before living in permanent settlements, earlier hunter-gatherers usually lived in small extended family groups that moved themselves and their residences over the landscape in search of seasonally available resources. Residential sites, places where people ate, slept, reared children, and carried out other social activities, were rarely occupied for more than a few weeks or months. This settlement pattern persisted through most of Ohio's prehistory, but by the Late Archaic period these small multiple family groups appear to have coalesced into large residential groups during certain seasons. Annual group coalescence is evident during the late Middle and Late Archaic periods and probably occurred in the winter season when food resources, especially plant resources, were scarce. By coalescing into larger groups in the winter, the various family groups would have been able to share stored food resources that were collected and preserved during summer and autumn months, and pool labor resources for exploiting migrating water fowl, aquatic resources, and deer yards or winter deer concentration areas. Residential sites might be termed residential base camps for the earlier mobile hunter-gatherers or hamlets and villages for the more sedentary peoples during the later periods. Once people became sedentary and began to live in hamlets during the Early and Middle Woodland periods or villages during the early Late Woodland period, horticulture and agriculture became an increasingly important part of food production. Like their earlier counterparts, however, hunting and gathering remained important to those living in the Middle-Late Woodland.

Prehistoric peoples engaged in a multitude of activities over the landscape beyond their residential sites. Whether residentially mobile or sedentary, people had needs for various resources that were not locally available. Both food and non-food resources are not evenly distributed over the landscape and the procurement of these resources would have required specialized procurement forays by a subset of people from the settlements. For example, a group of hunters might leave the residential base camp, hamlet, or village for a few days or weeks to hunt deer. This would require the establishment of a short-term camp site at a location away from the residential base. During the hunt, the group might find a crop of hickory nuts and report this information back to the residential base. This information might then draw out another subset of the group to exploit the nut crop. A nut gathering foray might require less than a day of work, but it likely would result in the creation of a staging area for nut processing.

Regardless of the settlement system, daily human activities result in the formation of archaeological sites. The construction of wooden post-supported shelters or houses, cooking and storage facilities, and other kinds of archaeological features, as well as the manufacture and use of tools and clothing, the preparation and consumption of food, and the many other activities people engaged in would have left behind some kind of archaeological signature. When found by archaeologists, locations containing such archaeological signatures are defined as archaeological sites.

Most of the material remains left by Ohio's prehistoric occupants have been lost to decay. Wood architecture and utensils, animal skin bags and bark containers, clothing made of hides or woven fabrics, for examples, decay rapidly in most archaeological contexts. Archaeological sites are frequently represented by only the most durable items made of stone. Lithic debris and fire-cracked rock (FCR) are the most abundant artifact types found at prehistoric archaeological sites in Ohio. Lithic debris consists of flint flakes or slivers of flint that were created during the manufacture, use, and maintenance of stone tools such as spear points. FCR is created by heating rock, usually sandstone or igneous rock, to be used for food processing and cooking, as well as for thermal comfort. The exposure of hot igneous rocks to cooler air or water causes them to spall and crack, leaving very distinctive fracture patterns that make it easy to identify the rocks as FCR. In the PORTS area, sandstone was used when igneous rocks were not available. Fire-cracked sandstone is more difficult than igneous rocks to identify as FCR, but the burned sandstone is frequently reddened and charred.

Other durable, though less abundant, artifacts that are found at Ohio's archaeological sites include pottery and a variety of stone tools, some chipped and others ground stone. Pottery, however, was not widely used until about 1500-1000 B.C. Elaborate objects and ornamentation made from various material types, such as shell, bone, copper, and pipestone, for example, are extremely rare at domestic sites and are usually confined to mortuary contexts.

Lithic debris and FCR are important indicators for the presence of an archaeological site. These are the things that archaeologists typically seek out when conducting a survey to look for and define archaeological sites. Concentrations of these artifact types over the landscape define archaeological sites, and smaller concentrations within sites define activity areas and/or refuse disposal areas. The archaeological field methods used during Phase I surveys are primarily designed to locate sites with fairly substantial quantities of these artifacts located in discrete areas of space. When archaeological surveys fail to locate any artifacts or sites, there usually are at least two reasons why. First, there may in fact be no archaeological remains present—prehistoric people did not live within the area surveyed. The second possibility is that prehistoric people did live within the Phase I survey area but did not engage in activities that resulted in the deposition or preservation of the types of things that are detectable in archaeological surveys. In other words, most of the items left behind decomposed over time or were deposited in such low frequencies that they are not detectable using traditional and accepted archaeological survey methods. The physical constraints of stone tool manufacture and use/maintenance (as defined below in this report) do not necessarily permit the deposition of archaeologically detectable (i.e., visible) quantities of debris.

The Phase II survey methods used in this study focused on specific archaeological sites and, in part, were designed to define artifact distribution patterns and sample the artifact contents of a site. Whereas Phase I surveys focus on the broader landscape and frequently use a 15-meter shovel test interval to locate archaeological sites, the current Phase II survey excavated shovel tests on a five-meter grid within the previously defined limits of known archaeological sites. For obvious reasons, the closer shovel test interval improves site coverage and improves the potential for collecting a representative sample of a site's artifact contents.

The prehistoric components examined in this study were originally identified based on the Phase I recovery of lithic artifacts and FCR. Had the prehistoric inhabitants of these locations not engaged in the earlier stages of stone tool manufacture (Primary Reduction) or if they had not discarded appreciable quantities of FCR from the repeated use of thermal features, these sites would not be detectable with the shovel testing technique used in the Phase I and II surveys.

The following sections examine how fire-cracked rock and lithic artifacts were created in the past and how they accumulated in archaeologically detectable sites. Understanding these processes of site formation is important for determining the appropriate methods needed to locate and study these kinds of archaeology sites.

3.1. THE FORMATION OF LITHIC ASSEMBLAGES

Figure 3.1 depicts an idealized stone tool manufacture, use, and maintenance sequence for a single spear point, which is the most common formal chipped stone tool type found in the Ohio Valley. This process—the lithic reduction process—is the source of the lithic debris found in archaeological sites. How this process was organized has a direct impact on the quantity of debris that is deposited within archaeological sites (Pecora 2002). This sequence is a reductive process that involves chipping away flint flakes (waste material) to shape and repair tools. The process begins with the selection of a piece of raw flint (nodule/core) and ends with the discard of an exhausted projectile point that is too small or irregular to continue reworking. The schematic in Figure 3.1 also makes a distinction between *primary, secondary, and tertiary reduction*. *Primary reduction* is defined as the process of manufacturing a "new" tool. *Secondary reduction* is defined as the process during which a tool is used and repaired or maintained. *Tertiary reduction* occurs when a broken or exhausted tool is converted (recycled) into another tool type. Archaeological evidence demonstrates that broken and exhausted projectile points were frequently recycled into drills, borers, scrapers, and cutting tools. Assuming that a projectile moves through a sequence like that shown in Figure 3.1, making it all the way to the exhausted tool, none of the intermediate stages would ever end up in the archaeological record. Archaeological evidence, however, reveals that individual reduction sequences were interrupted or terminated at various points in the process due to reduction errors, discard, and loss. This results in a diverse range of artifact forms in the archaeological record.

This dynamic process of making and rejuvenating stone tools such as projectile points affects the characteristics of archaeological assemblages. For example, there is usually a spatial disconnect between the stone procurement site and the residential base. When stone is procured from a quarry site some distance away from a residential base, most of the early stages of reduction would have been performed at the quarry site to prepare the stone to be transported as flake blanks, biface blanks, or preforms. Removing much of the excess waste material from the raw stone at the quarry site would have made it easier to transport more useful stone and would have led to less future waste material as it was used at other locations on the landscape. Once the stoneworkers had returned to the base camp or residential site, the reduction process could resume and blanks or preforms would be converted into "new" tools. In some cases, blanks and preforms were stored or cached for trade or use at a later time. Finding caches in the archaeological record is relatively rare because few were forgotten and lost. The reduction process might also have been terminated or aborted at various stages due to unintentional manufacturing errors, resulting in the deposition of blank and preform fragments in the archaeological record.

The secondary reduction process is more complex. Although certain types of tools would have been used at the residential base camp, projectile points were used elsewhere on hunting excursions. During use, projectile points would have been dulled or damaged, and in many cases would have been lost. Secondary reduction is terminated as a result of loss or discard due to excessive damage, but minor breakage or damage, as depicted in Figure 3.1, could have been fixed through maintenance and rejuvenation. Retrieved projectile points would have been returned to the hunting camp or base camp for repair. In areas where raw material was scarce, severely damaged projectile points would have been recycled into other tool forms. For instance, hunters at a deer kill site would have the need for butchering tools. Broken projectile points would have been a potential stone source for the manufacture of such butchering tools, in a tertiary reduction process. The scarcity of new raw stone has the effect of creating a diverse range of tool forms because tool rejuvenation (secondary reduction) and tool recycling (tertiary reduction) occur at a higher rate (Pecora 2002).

In summary, the lithic reduction sequence depicted in Figure 3.1 was probably never completely achieved at a single location. The initial parts of the primary reduction process would have taken place at or near a quarry source, whereas consecutive portions of the primary reduction process may have occurred at either the base camp or hunting camp, or at multiple base camps or hunting camps. Most important to remember is that the lithic reduction sequence occurred in segments at different locations and this partitioning of the reduction sequence had a major effect on the quantity of debris produced at those locations. Most lithic debris is generated during primary reduction (new tool manufacture) and only negligible quantities of debris are generated during secondary (tool use and maintenance) and tertiary (recycling) reduction. Because of this, it is very difficult for archaeologists to identify sites where only secondary and tertiary reduction occurred.

3.1.2. Lithic Technology Terms and Definitions

The analysis of the PORTS prehistoric site lithic assemblages makes use of various terms that are associated with specific artifacts and the reduction sequence described above. These terms refer to objects with morphological and technological attributes that are diagnostic of certain stages within the reduction process.

Core

A flint core is the parent material from which flakes are detached. The objective is to produce flakes of sufficient size and shape to be used as blanks for tool manufacture. The core reduction process also creates a large amount of flaking debris, or refuse. Primary Decortication, Secondary Decortication, and Interior flakes are the debris categories associated with this process. The cores in PORTS assemblages tend to be small nodules that were procured from glacial deposits that would have been available in gravel deposits in the floodplains of the Scioto River and its tributaries. In this analysis, cores are frequently referred to as Nodule Cores.

Blank

A blank is a piece of flint material that would have been converted into a tool. In some cases, an intended blank may be a tabular piece of flint of a sufficient size and shape for an intended tool. Frequently, however, blanks are flakes or spalls derived from cores. Such blanks are sometimes minimally altered to form expedient flake tools or Modified Flake tools. Others may be converted into biface blanks, which are intended for further reduction as presented in the biface reduction process described above. Debris created from initiating the biface reduction process consists of Alternate (Alt) flakes and Edge Preparation (Edge-Prep) flakes, and these flakes often have cortex.

Biface Blank

A biface blank is a blank that has been fully or nearly fully flaked on both sides, forming a symmetrical or nearly symmetrical object. These are created during the percussion biface thinning process, which creates debris referred to as Early Biface Thinning (EBT) and Late Biface Thinning (LBT) flakes. As the biface is worked through the thinning process, it is altered from being relatively thick and irregular (Early Stage Biface Blank) to relatively thin and symmetrical (Late Stage Biface Blank). Ideally, such bifaces would not enter the archaeological record, but they frequently break and are discarded. All of the biface blanks found at PORTS are fragments, suggesting they are the broken pieces of production failures.

Preform

A preform is a late stage biface blank that has been made thinner and more symmetrical with a pressure thinning reduction technique, which allows for greater control and detail. A preform resembles a finished bifacial tool, usually a projectile point, but lacks the hafting element (that part of the projectile that is attached to the spear or arrow shaft), such as a stemmed

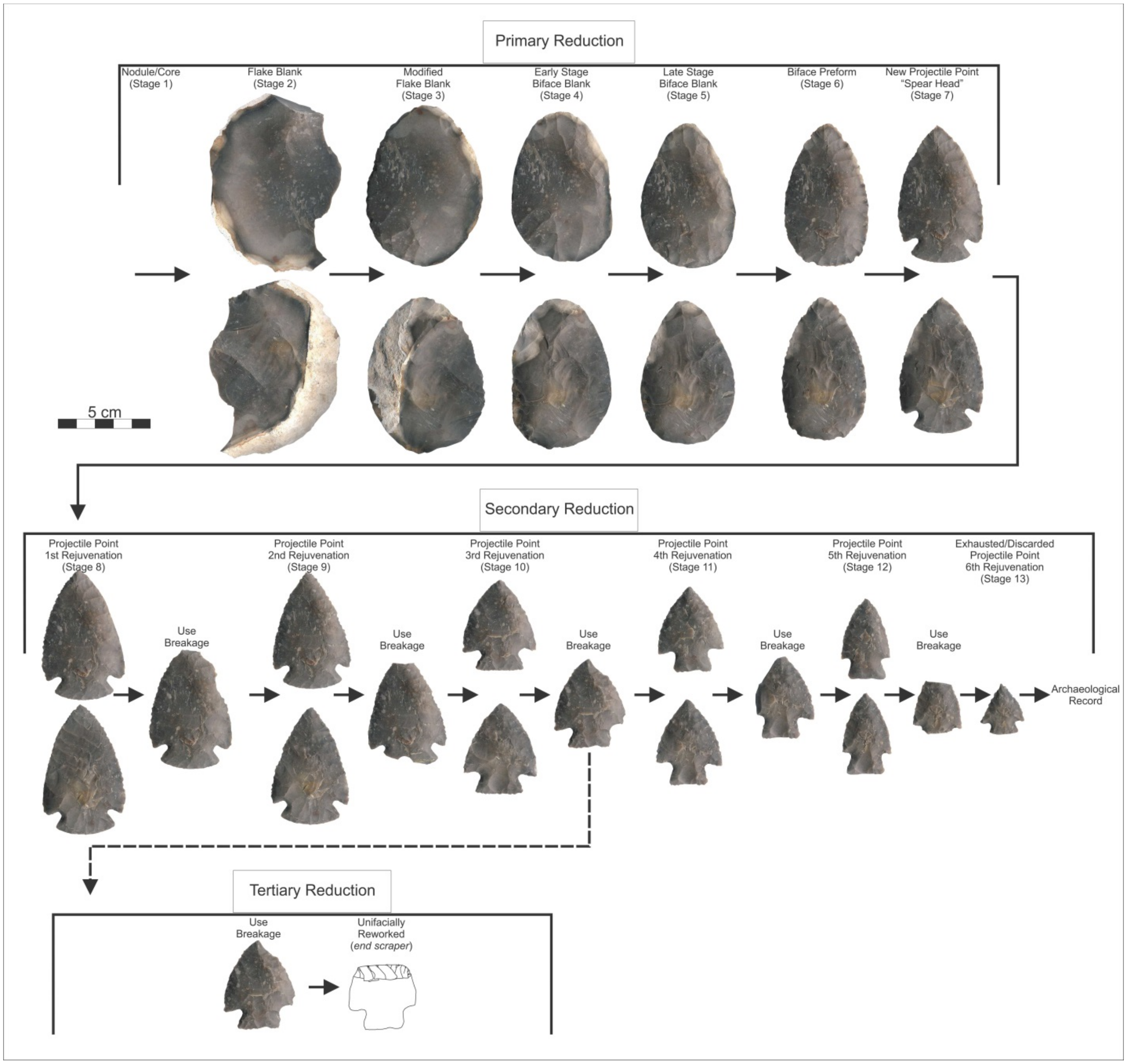

Figure 3.1. Illustration of replicated lithic tool manufacture, use, and maintenance sequence (Pecora and Burks 2013a).

or notched base. Unlike projectile points, which are usually heavily reworked (through the Secondary Reduction process), preforms tend to be thinner relative to their width. When fragmentary, which is how preforms usually enter into the archaeological record, they are often difficult to distinguish from projectile point fragments. Debris generated from the production of preforms is referred to as Pressure flake debris. Pressure flakes are usually under-represented in archaeological assemblages that were collected with the use of ¼-inch screening because they tend to be small and fragmentary. Pressure flakes are also produced in much lower frequencies per object than percussion biface thinning debris or core reduction debris.

Projectile Point

The term projectile point is used to refer to spear points, dart points, and arrow points. All three are the most common formal chipped stone tool types used in prehistoric Ohio, and their production and use is the source of most of the lithic debris and objects found at archaeology sites. The bow-and-arrow was not introduced into the Ohio region until around A.D. 700 (Late Woodland). Before this period, spear and dart points represent the primary weapon systems. Most projectile points found in archaeological sites have undergone multiple maintenance episodes (Secondary Reduction) and no longer retain their primary formal or functional characteristics. Though not represented in the PORTS assemblages, prehistoric stone tool users frequently recycled exhausted projectile points and converted them into other tool types (Tertiary Reduction). Maintenance and recycling debris tend to be very small and fragmentary, and they are underrepresented in archaeological assemblages.

Modified Flake Tool

A modified flake tool is a flint flake that has been modified along one or more of its edges. These are generally thought to be expedient flake tools that were derived from flaking debris created during the core reduction process. The modification is small micro-flaking that was created with slight pressure. The purpose of the modification was to create a dulled or smooth backing opposite the sharp and unmodified edge of the flake. This makes the object easier to hold (or haft) while using it to cut.

Uniface

Unifaces or unifacial tools are similar to modified flake tools but have more pronounced and steep flaking on at least one edge. These tools are generally thought to be a type of scraping tool. It is not uncommon to find exhausted projectile points that have been recycled into a unifacially modified bifacial tool (*tertiary reduction*). Such artifacts are often referred to as hafted end-scrapers.

Biface

The term biface refers to any number of bifacially worked stone objects, many of which are defined above. These objects have flaking scars on two faces or sides and bifacial margins. Several of the PORTS assemblages contain artifacts that were classified as biface fragments. These are too fragmented to assign to any of the defined types. They could be fragments of biface blanks, preforms, projectile points, or some other type of bifacial tool.

Flake

A flake is piece of flint, usually flat, that has been removed from another, larger piece of flint. The fracture properties of flint (i.e., conchoidal fracture) are exactly the same as those we see in glass, though glass fractures are smoother because glass is finer-grained than flint. Chipped stone tool manufacture is a process that induces controlled breakage to create desired tool shapes. The process detaches flakes or slivers of flint with a percussive hammer or pressure device. Most of the flakes found in the archaeological record are debris from the reduction process. But in some cases the flakes are the desired product, as with Core Reduction, where the goal is to systematically detach flake blanks that can be used for flake tools or blanks for bifacial tool manufacture. Since most flake blanks were converted into other objects, they are rarely found at archaeological sites.

Formed Artifact

Formed artifacts are defined as stone objects that were either used as tools or objects that were the precursors of tools. A precursor to a tool may include a core, blank, or preform. Tools are actual implements, such as flake tools, drills, projectile points, cupstones/nutting stones, celts, and pitted stones. Archaeologists' interpretations of tool function are based largely on inferences stemming from object shape. The actual function of some items, such as the nutting stones, pitted stones, and chipped/ground hoes in several of the PORTS assemblages, is not well established.

3.2. FIRE-CRACKED ROCK

Fire-cracked rock (FCR) is defined as any rock that appears cracked, spalled, or otherwise modified by heat. Classic FCR is typically characterized by rounded river cobbles (sedimentary, metamorphic, and igneous) that exhibit very pronounced, angular fracture edges. Sedimentary rock, such as sandstone, does not always crack in distinctive ways like granitic igneous rock. Instead, sandstone often deteriorates and crumbles from heat, with less obvious spalling and cracking—though it frequently turns reddish in color with heating.

Hot stones were used for both heating and cooking. The simplest use of rock for heating and cooking is to line hearths with large stones and cobbles. The rock absorbs and retains the heat of the fire, and it continues to radiate heat long after the fire has gone out. Although repeated heating and cooling will cause the rock to spall and crack, rapid cooling tends to produce the most classic FCR fracture patterns, with jagged edges. Hot rocks also were heated in hearths and moved to pits where they provided the heat in making an earth oven. Similarly, hot rocks were placed in shallow pits beneath sleeping platforms (e.g., where they acted as heat radiators) or other parts of the domicile or activity areas. Stone boiling is another classic use of heated rock that creates FCR. Stones were first heated in a surface hearth and then they were picked up and dropped into a container of liquid to bring it to a boil. The rapid temperature changes in the rock during stone boiling causes it to fracture into jagged pieces. FCR was probably recycled and used repeatedly until it was too small for efficient thermal transfer. One way to test this is to compare the size of FCR in features (if in primary contexts) with FCR in midden or plowzone contexts. Midden FCR is more likely to have been discarded, and thus smaller, whereas FCR that lines the bottoms of hearths and earth ovens, especially if it has not been recycled, is more likely to be larger than the preferred minimum size for heating stones.

FCR is an important indicator for the presence of archaeological sites. Unlike naturally occurring flint, which is found only in discrete areas of Ohio, suitable rock for thermal use is nearly ubiquitous throughout the state. Most of Ohio's river beds are loaded with igneous cobbles and chunks of local sandstone and limestone bedrock. Potential thermal rock is also readily available in the uplands, including in the glaciated regions. It appears that igneous and metamorphic rocks were preferred over sedimentary rocks, namely because they have excellent thermal qualities that allow them to be heated to extremely high temperatures and retain heat for long periods of time without structural failure. Sedimentary rocks, such as sandstone and limestone, have much poorer thermal qualities, but they were frequently used in places where better quality stone was not available. Because sandstone and limestone quickly crumble away when excessively heated, FCR made of these stone types is often difficult to identify.

3.3. OTHER ARTIFACTS

While fire-cracked rock and lithic artifacts contribute to the bulk of what archaeologists find on residential domestic sites, archaeological sites frequently contain other artifacts: groundstone implements, pottery, animal bone, botanical remains, and other items. Groundstone implements were commonly made beginning in the Middle Archaic period. They may include adzes, axes, celts, and hoes, as well as pestles and nutting stones. Groundstone tool manufacturing varied depending on the raw material and the intended end product. Often, the process began with a chipped out biface which was then finished by grinding and polishing. Hammerstones, used to manufacture chipped stone tools, crack nuts, or generally pound other materials, are usually unmodified stone cobbles that become pitted and facetted, revealing the tell-tale signs of their use.

There are a wide range of decorative objects made of stone, usually slate or sandstone, that are not often included in the tool category. Gorgets and other kinds of pendants come in many shapes and sizes (though typically flat and rectangular) and often have holes drilled through them. Their exact functions are unknown, but it is likely that they were worn in some manner. They are often found accompanying burials or in/under burial mounds. Bannerstones and birdstones are more three-dimensional in shape, also often have drilled holes (at least in the bannerstones), and may be related to Middle-Late Archaic period spear throwing technology. Beginning in the Early Woodland period, pipes of a variety of types (e.g., tubular, platform, and elbow) were made from stone (pipestone, sandstone, steatite, and limestone), as were beads, though the latter are more commonly made from shell, bone, or copper.

Food remains, such as plant seeds and nutshell, squash rinds, and bone, are rarely preserved in the archaeological record, especially in upland settings, except under rare conditions. The most common preservation condition for plant remains is carbonization through heat. Carbonized botanical remains can be easily recovered by passing soil samples through a water flotation device. Bone may be calcined (burned), and is sometimes preserved in this state. Soils that contain certain substances that bring down the soil pH, such as calcium carbonate, can often preserve raw bone (i.e., unburned). Late Prehistoric period Fort Ancient sites are well known for their excellent bone preservation, which results from the large numbers of mussel shells (made of calcium carbonate) deposited with the bone.

Pottery was not used by Ohio's early inhabitants until the latter part of the Late Archaic period, and it became common by the beginning of the Early Woodland period (1000-200 B.C.). Prehistoric pottery in Ohio was manufactured using a low-fire technique, so it us usually soft and fragile. When preserved in pit features and unplowed middens, pottery sherds are often much larger and better preserved than those found in plowed contexts. Because of the large amounts of grit used for temper, the oldest pottery in Ohio does not preserve well and the fragments found at archaeology sites are often small (usually no more than an inch across). But later sites, especially dating to the Late Prehistoric period when shell was used for temper, can produce tens of thousands of pottery sherds.

3.4. ARCHAEOLOGICAL FEATURES

This report uses the terms “feature” and “archaeological feature” interchangeably. A simple definition for this term is a hole or pit in the ground that was created by the occupants of a site. These pits are filled in or become filled in and their distinct, darker fill make them easy (usually) to identify during an excavation. Archaeologists seek-out features because they are often rich in artifacts and usually contain carbonized plant remains that can be used to study subsistence or for radiocarbon dating. Often times, features were created to serve a specific function, such as storage or baking, but after their primary use they were cleaned out and then served as trash receptacles—making it hard to determine their initial intended function. Other features, however, retain the structure related to their primary functions. Common feature types include earth ovens, storage pits, and post molds. Prehistoric hunter-gatherers no doubt constructed and used cooking hearths, as well. Most hearths were shallow features and unfortunately most have been destroyed by cultivation in the last 200 years.

Earth ovens are one of the more commonly found feature types at archaeology sites in Ohio because they are easy to identify and are large—usually over a meter in diameter and as deep. Archaeological evidence suggests that wood fires were placed in the bottoms of these pits. Stone was then placed into the fire and, once hot, the stone served as the heat source as the fire died down. This cooking technique is somewhat analogous to a modern wood-fired pizza oven, where the interior dome is heated and then is the source of the actual cooking heat. Once heated and filled with food to be cooked, the earth ovens were then covered with earth and left for the prescribed amount of cooking time. Earth oven like features, with hot rock, might also have been used for indoor heating devices, which no doubt would have been important during the colder months. However, it is rare to find full-sized earth ovens inside prehistoric structures.

Post molds are another common feature type found on prehistoric archaeological sites in Ohio. These are simply the remains of a hole where a wooden post was set. Posts were used for house or shelter construction as well as for racks for storage, cooking, and hide processing. Larger posts were sometimes used to construct palisades around villages during the later parts of Ohio’s prehistory, and they served to mark significant places, such as the center of a village or an important sight line.

Storage pits are a final common feature type found at Ohio archaeology sites. These pits are typically associated with sedentary agricultural groups and first begin to appear at Middle Woodland period sites. Storage pits are often large and some are bell shaped, with flaring sides. Archaeological evidence shows that storage pits were often lined with bark, leaves, grasses and/or woven matting.

4. ARCHAEOLOGICAL SURVEY METHODS

All six sites were subjected to extensive fieldwork designed to investigate their historic-era farmstead components. This work included systematic shovel testing at 5-meter intervals for the purposes of better defining site boundaries (horizontal extent) and, more importantly, to sample the historic-era artifact middens and to gather information about the distribution of artifacts contained within the middens. The shovel testing was supplemented with ground penetrating radar (GPR) surveys that were used in an attempt to locate sub-ground historic features such as filled-in wells, cisterns, privies, foundations, and cellars. Larger scale excavation units, in the form of 1x1 meter units, were used to investigate foundation remains, privy shafts, and selected GPR anomalies. The resulting exaction efforts resulted in the recovery of prehistoric artifacts from all six farmstead sites.

Because the original Phase II survey work was designed to assess the historic components of these sites, it was not adequate for addressing the inadvertently discovered prehistoric components at each site. The prehistoric components at two of the sites, 33Pk203 (Ruby Hollow Farmstead) and 33Pk217 (Stockdale Road Dairy), were considered to have the greatest archaeological potential because these sites produced relatively large prehistoric artifact assemblages and, more importantly, because the prehistoric artifact deposits were found to be concentrated on the outer margins of the farmsteads, away from the areas that would have been directly affected by the construction and use of farmstead buildings and other structures. In other words, it was thought that the 33Pk203 and 33Pk217 prehistoric components would be in the best physical condition compared with the other four farmsteads.

For these reasons, additional fieldwork was performed to further investigate the prehistoric components of 33Pk203 and 33Pk217. The primary goals of this additional work was to: (1) increase the size of the prehistoric artifact assemblage beyond what was found during the initial fieldwork; (2) locate, excavate, and document archaeological features; and (3) obtain temporal data through radiometric dates and temporally diagnostic artifacts. The presence of archaeological features and recovery of temporal data from good archaeological contexts would provide a foundation for assessing the physical integrity of these sites and, ultimately, their eligibility for the National Register of Historic Places (NRHP).

The additional prehistoric component-focused fieldwork on sites 33Pk203 and 33Pk217 included:

1. A magnetometer (geophysical) survey of up to 6-8 20x20 meter blocks within and adjacent to the prehistoric artifact concentrations found within each site. The purpose of the magnetometer survey was to identify sub-surface archaeological features such as earth ovens or other types of pit features;
2. Excavation of 5 1x1 units in high artifact density areas (as determined from the results of the shovel tests excavated during the farmstead investigation). The purpose of this was to enhance the prehistoric artifact assemblages from each site;
3. Excavation of 2-3 magnetic anomalies and the excavation of features, if found;
4. Archaeobotanical analysis of 2-3 flotation samples collected from features, if found; and
5. Procurement of 1-2 radiocarbon dates in the event that features are found and carbon is available.

5. GEOPHYSICAL SURVEY METHODS

Short of excavating very large areas, a magnetic survey is the best technique for locating subsurface features at most prehistoric sites in Ohio. A type of magnetometer known as a fluxgate gradiometer was used to conduct the magnetic gradient survey at sites 33PK203 and 33PK217. Magnetometers are useful to archaeologists because they can detect two kinds of magnetization: thermoremanent magnetization and magnetic susceptibility (Clark 2000). When sediments and rocks are heated above a certain temperature, known as the ferromagnetic Curie temperature (ca. 500-700^{o}C; Lowrie 1997), their magnetization is in effect zeroed and realigned to the local magnetic field, producing a permanent *remanent magnetization*. Campfires and trash burning can produce more than enough heat to reach the Curie point. Upon cooling, magnetic minerals in the soil, such as magnetite and maghemite, recrystalize and are fixed with a common orientation toward magnetic north or some other strong magnetic signal that might be nearby. Intense heating can make an otherwise magnetically neutral (i.e., random) patch of ground highly magnetic by altering magnetic minerals and by producing magnetic ash (Linford and Canti 2001). Even sediments that have been disturbed, such as by sweeping, raking, plowing, or other kinds of earth moving can maintain at least some of their permanent magnetization, which is not reset until the sediments are once again heated above the Curie temperature. Objects and sediments that are permanently magnetic do not require an outside magnetic field to be magnetic, like those materials that are susceptible to magnetic fields.

Soils and ferromagnetic substances that have high *magnetic susceptibility* react when they are in the presence of a magnetic field, which on archaeological sites is the earth's own magnetic field. Certain soil horizons and components of soil, such as organic rich topsoil (A horizon), are generally more susceptible to induced magnetic fields than other soil horizons (Le Borgne 1955, 1960), such as Bt horizons. If a hole dug a few feet into the ground is backfilled with mixed up sediments, the backfilled hole will likely have a different magnetic susceptibility than the surrounding, intact soils—especially if the hole is filled with topsoil. Furthermore, the magnetic susceptibility of the surface soil at a site is known to increase when people live and work there for a length of time (Tite and Mullins 1971). While the mechanisms behind soil susceptibility enhancement are complex and not totally understood, bacteria that use and produce small magnetic particles are known to contribute to the process (Fassbinder et al. 1990), as well as burning and the amount of iron oxides present in the soil (Evans and Heller 2003; Graham 1974; von Friese 1984).

Today's magnetometers, many of which are fluxgate gradiometers like the Geoscan Research FM256™ system used at 33PK203 and 33PK217, are passive instruments (i.e., they do not create a magnetic field) that simultaneously detect both kinds of magnetism important at archaeology sites, remanent magnetism and magnetic susceptibility—though they cannot differentiate the two. Like all fluxgate gradiometers, the FM256™ contains two fluxgate sensors (50 cm apart) in a vertical gradiometric array—that is, the two sensors are arranged one atop the other. With this configuration, fluxgate gradiometers measure the change in the vertical component of the magnetic field surrounding the two sensors. The uppermost sensor detects the earth's background magnetic field, which in the Midwest U.S. region measures approximately 50,000-55,000 nanotesla and can vary as much as a few hundred nanotesla from morning to evening in one day (Breiner 1973). The lower sensor detects the earth's background magnetic field and changes to it caused by objects or soils on the surface or up to about two to three feet beneath the surface. Fired earth in prehistoric hearths and organic-rich soil in buried pits tend to concentrate the earth's magnetic field in measurable amounts of approximately 2-30 nanotesla while large iron objects or brick-filled features can measure in the hundreds or thousands of nanoteslas. Sandy soils or deep, highly organic soils like those found in floodplains can reduce the range of more subtle features to 1.5-10 nT. Once the instrument has taken readings simultaneously from each sensor, the instrument's onboard computer subtracts the reading of the top sensor (earth's varying background magnetism) from the reading of the bottom sensor (earth's varying background magnetism plus local magnetic variability), leaving—in principle—the local magnetic gradient caused by surface and buried archaeology or other phenomena. This number is then stored in the instrument's memory until retrieved for processing.

During the magnetic surveys at 33PK203 and 33PK217, the FM256™ was used to collect eight readings per meter along transects spaced 50 cm apart. The magnetic gradient data were then downloaded into Geoscan Research's Geoplot ™(ver. 3.00s) software for data processing. Such processing is fairly common and involves applying complex mathematical algorithms to the data in an effort to reduce background noise/clutter in the data and accentuate the potential, buried archaeological phenomena. Three processing algorithms were used in Geoplot™ to prepare the magnetic gradient datasets for presentation and analysis: zero mean traverse, interpolation, and low pass filter.

After processing, the data were exported from Geoplot™ into Surfer 8.0™, where a color scale and grid were added. The surfer images were then copied into CorelDRAW™ for integration with the site maps, interpretation, and final image production. Data processing does well in aiding interpretation and visualization; however, excessive processing can also produce false data anomalies. Even minimal data processing can produce undesired effects in the data when large and very strongly magnetic objects are present, such as large iron objects.

Interpreting Magnetic Gradient Results

The most important part of a magnetic survey, besides running the machine properly, is the interpretation of the data. There is a certain knack to interpreting magnetic gradient data at archaeology sites, and the general rules of interpretation vary between historic-era and prehistoric sites. Historic sites are usually covered in objects that are very magnetic and the signatures of these objects can dominate a dataset, obscuring the locations of important architecture and prehistoric features—this is why the Phase II work focused on sites 33PK203 and 33PK217, where the prehistoric components were most distinctive at the edges of the historic sites. Of course, the magnetic signatures of iron objects can also highlight the former locations of historic-era buildings since artifacts often occur in higher densities around buildings and within foundations. For example, Figure 5.1 shows the results of a fluxgate gradiometer survey around the John Rankin House, a standing brick structure built in 1828 at a farmstead on the bluff overlooking Ripley, Ohio. Dark areas are more magnetic while light areas are less magnetic. Relatively even gray tones represent areas with little magnetic variability. There are many anomalous magnetic areas, or *magnetic anomalies*, in the data around the house, and the dense concentration of anomalies off the northwest corner of the house marks the location of a buried summer kitchen foundation. The clusters of anomalies to the east of the house are related to a trash dump (with iron objects) in the bottom of a swale. Farther to the north is a rectangular pattern of anomalies indicating the location of a fence that once surrounded a barn. Picking out individual features in magnetic data at historic sites is difficult because it can be hard to differentiate the magnetic signature of a well, for example, from that of a large iron object, such as a fragment of a cast-iron stove. However, foundations and former building locations are often indicated by tight clusters of small anomalies, which make it sometimes possible to identify the general location of buildings in magnetic data—assuming that these buildings were built with nails and other magnetic hardware or they were the locus of iron-bearing trash disposal. Although it is possible to identify prehistoric features in magnetic data from historic sites, the kinds of magnetic anomalies must be closely scrutinized to determine which are related to historic objects/features and which might be prehistoric.

At prehistoric sites every small positive anomaly (i.e., small dark area in the data) might be an archaeological feature, but usually pit features can be identified in the data because they have a very distinctive magnetic signature that occurs within a consistent size range. Figure 5.2 is an example of a magnetic gradient survey at a prehistoric Native American site, in this case in Ross County, Ohio, about 20 miles upstream from PORTS. Excavations have shown that the many small circular anomalies are pit features, including earth ovens, which are the strongest anomalies, storage pits, fire hearths, and at least one burial. The two large linear anomalies arcing through the survey area from southwest to northeast are old stream channel scars that have since been filled in with flood deposits and prehistoric trash. Many of the lighter-colored areas along the stream channels and in small areas spread throughout the data have been shown to be sand near the surface—sand has very low magnetism and when it is plentiful it displaces the more magnetic topsoil.

Figure 5.1. Example of magnetic gradient data around a historic-era house/farmstead (from Burks 2006).

Of course, there are other things in the ground that can create magnetic data anomalies that look much like the magnetic signatures of prehistoric and historic features. Some of this equifinality, that is, when two or more objects that create a similar magnetic anomaly, can be overcome by knowing the peak magnetic amplitude and anomaly type for each anomaly of interest. For this reason such information for each anomaly of interest has been tabulated and is presented.

In most magnetic gradient data there are five kinds of potentially significant magnetic anomalies that can occur on archaeology sites: Monopolar Positive, Dipolar Simple, Dipolar Complex, Multi-Monopolar Positive, and Monopolar Positive/Dipolar Simple. It can be useful to classify a site's anomalies as this is one way to locate archaeological features of interest.

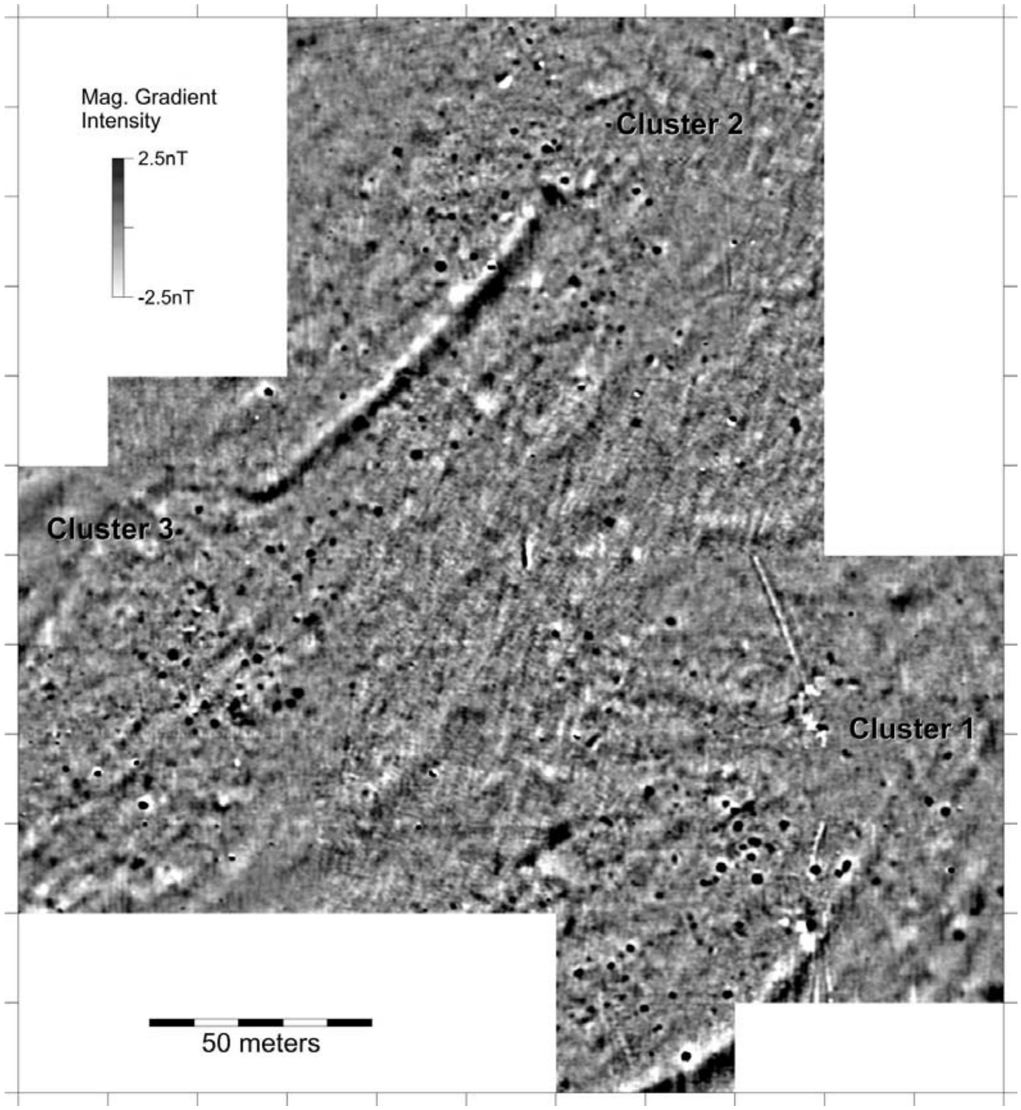

Figure 5.2. Example of magnetic gradient data from prehistoric Native American site, in this case the Brown's Bottom cluster of sites in Ross County, Ohio. Many of the small dark anomalies are archaeological features (see Pacheco et al. 2005, 2009a, 2009b for more on Brown's Bottom).

The shape, size, intensity, and polarity (positive or negative) of magnetic anomalies is determined by the characteristics of the anomaly's source (or target), including the target's (object or archaeological feature) shape, material composition, mass, orientation, and depth. An object or feature's anomaly shape can also be affected by the magnetic signatures of surrounding objects and features. And of course, anomaly shape and intensity is affected by where on the planet (especially latitude) the survey was conducted, which determines the inclination of the earth's magnetic field: approximately horizontal at the equator and vertical at the poles. Most targets of interest, such as pit features, hearths, wells, foundations, cellars, and the like, produce fairly consistent kinds of anomalies that are comparable all across the U.S. and at similar latitudes around the globe where soils are formed into alluvium and glacial tills. For example, in vertical gradiometer data (with 50-100 cm sensor separation) prehistoric pit features are almost always weakly magnetic (2-20 nT), positive monopolar anomalies. As a type of pit feature, historic cisterns, wells, and privies can also appear as somewhat stronger, positive monopolar anomalies. However, historic pits frequently contain large amounts (high mass) of highly magnetic materials, such as bricks and iron objects. If these materials are well represented, or are large in size, they can make the historic pit's magnetic signature look like that of a large bar magnet with north and south poles (i.e., dipolar). Given these consistencies between magnetic anomalies and their sources, the five anomaly classes used in this report serve to describe and summarize the magnetic survey results as well as provide an estimate for the kinds of targets found:

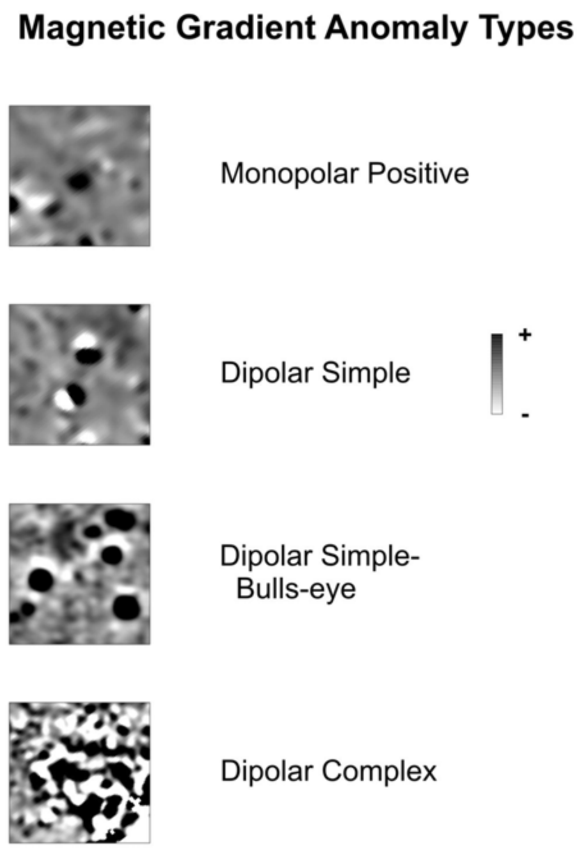

Figure 5.3. Magnetic gradient anomaly types.

<u>Monopolar Positive (MP)</u>- Anomalies in this class are localized, positive peaks in the magnetic gradient signature of the site. They appear as isolated dark gray to black areas in black and white data displays (Figure 5.3). Typically, these anomalies are created by localized areas of soil with increased magnetic susceptibility (e.g., pit features, large tree root casts). However, it is not uncommon for weakly magnetic or deeply buried objects with a dipolar magnetic signature (e.g., an iron object or a large magnetic rock) to be detected as positive or negative monopolar anomalies. If one of the poles of a dipolar anomaly is close to the surface (and close to the magnetometer) and the opposite pole is too far away to be detected (because it is too deep underground, for example), then objects that typically produce distinctive dipolar anomalies (iron objects) can be mistaken for those that typically produce monopolar anomalies (prehistoric pit features). Positive monopolar targets of interest, such as pit features, can produce peak intensities ranging from 1 nT to 200 nT, though only historic period features tend to be greater than 40 nT in intensity (unless highly magnetic rocks are present). Not all pit features, prehistoric or historic, produce positive monopolar anomalies. In fact, a small percentage of pit features can produce dipolar simple and dipolar complex anomalies, especially when intensely burned, *in situ* sediments and rocks are present within the feature. Thus, prehistoric earth ovens and hearths are sometimes dipolar anomalies. Historic-era pits filled with iron objects will also likely be dipolar.

<u>Dipolar Simple (DS)</u>- Dipolar anomalies are characterized by negative and positive peaks that are immediately adjacent to one another, making distinctive black and white anomalies in magnetic data (Figure 5.3). A simple dipolar anomaly has only one positive

and one negative peak. These peaks can be similar in size and intensity (e.g., +6/-5 nT) or highly asymmetrical (e.g., +57/-4 nT). Iron objects and magnetic rocks are the most common sources of dipolar anomalies on archaeology sites. In general, the larger (greater mass) the iron object, the more magnetic intensity (i.e., higher highs and lower lows) it will have and the more area its signature will affect. For example, most historic-era square nails, while highly magnetic, are so small that when buried in the plowzone or just below surface they are difficult to detect with a gradiometer during a typical survey, unless there are many nails bunched together. Conversely, a foot-long piece of half inch diameter iron rebar pounded down into the ground vertically (like a datum) is exceptionally magnetic and sometimes can be detected (as a large positive area surrounded by negative, or vice versa) from 2-3 meters away (i.e., making an anomaly 4-6 meters across). Steel well casings left in the ground are even more magnetic, and they can be detected from over 10 meters away even though the steel pipe is not visible at the surface. Exceptionally magnetic prehistoric features, such as hearths and intact earth ovens, can also produce dipolar simple anomalies. Frequently, the magnetic signature of these burned prehistoric features appears as an area of strong positive (up to 35-40 nT) surrounded by a weak negative ring—much like the signature of a bar magnet buried in the ground vertically. These are referred to here as the Dipolar Simple, Bull's-Eye type. However, the positive and negative components of the signature can also be side by side, which is common for shallow, burned features. With most dipolar simple anomalies in the northern hemisphere (because of the inclination of the earth's magnetic field), the target creating the anomaly is located below, but not directly, the center of the positive area of the anomaly.

Dipolar Complex (DC)- Complex dipolar anomalies have multiple negative and positive peaks of varying intensity that are clustered together (Figure 5.3). Typically, this class of anomaly is associated with burned areas or features/disturbed areas filled with magnetically mixed sediments and objects. In-filled historic foundations and cellars (as well as some back-filled trenches and excavation pits) produce dipolar complex anomalies because the mixed fill in these features is more or less magnetic than the surrounding soils and generally contains historic objects that are also magnetic. In fact, the example in Figure 5.3 is the foundation and remains of a summer kitchen). Areas of soil burned to different depths and/or temperatures can also produce this kind of complex anomaly (Linford and Canti 2001). Prehistoric structure floors, if intact, sometimes appear as dipolar complex anomalies. Lightning strikes are an important natural source of dipolar complex anomalies. Lightning strikes can generate very strong magnetic fields and high temperatures, changing the remanent magnetization of the materials they strike (Verrier and Rochette 2002). Classic lightning strike anomalies have a tentacled (positive and negative) appearance (Jones and Maki 2005) and they can range in size from two meters across to over ten meters. Extensive animal burrow systems, such as those of groundhogs, sometimes produce similar anomalies, as well, though not as large or intense as lightning strikes. Dipolar complex anomalies can have weak (+5/-5 nT) or very strong (+100/-100 nT, or more) magnetic gradient signatures.

Multi-Monopolar Positive (MMP)- Anomalies in this class are clusters or groups of positive monopoles, generally arranged in linear or arcing patterns, that are usually fairly weak (1-4 nT) in intensity. Most gradiometer datasets are full of dozens or hundreds of small, weakly positive anomalies—making it difficult to pick individual features out of the mass of anomalies. However, patterned groups of anomalies (MMPs) stand out from the other small anomalies. Architectural facilities such as prehistoric structures or historic fences can produce linear arrangements of small, weakly positive monopolar anomalies. This class of anomaly is rare in gradiometer data, especially in survey data collected along transects separated by more than 50 cm. Exceptionally large postholes (>30 cm in diameter), or those filled with burned sediment, can be more evident in magnetic data. Likewise, the magnetic signatures of two or more closely spaced postholes can combine to make a more obvious, and larger, anomaly.

<u>Monopolar Positive/Dipolar Simple (MP/DS)</u>- In some cases it is difficult to discern whether an anomaly is monopolar positive or just a portion of a dipolar simple anomaly. These anomalies are assigned to the MP/DS class. In essence, this class serves as an "unknown" category like those used in any type of analysis or classification scheme. Prehistoric pit features and iron objects can appear as this class of anomaly.

Every magnetic gradient dataset from an archaeological site contains hundreds or even thousands of magnetic anomalies, only few of which originate from a point-source archaeological feature (e.g., a pit feature). While the magnetic anomaly classes presented above do not cover all variability, they do attempt, at a general level, to begin the process of segregating and categorizing the magnetic signatures of potentially cultural anomalies. Though intended to be descriptive, these five classes do commonly correlate with certain kinds of archaeological and natural features found just below the surface. The magnetic data from sites 33PK203 and 33PK217 were examined for anomalies related to the five defined classes. Excavation locations were then determined based on the anomaly classification results.

6. 33PK185 PREHISTORIC COMPONENT

Site 33Pk185, the South Shyville Farmstead, is located on a broad ridgetop near the southeast corner of PORTS (Figures 1.1 and 1.2). The site was originally recorded during a Phase I survey by Schweikart et al. (1997) and was further investigated at the Phase II-level by Pecora and Burks (2012a). The South Shyville Farmstead once contained nine historic-era buildings based on what is visible on the 1938/39 and 1951 aerial photographs. The remains of a house foundation, a root cellar, a milking parlor, several wells, and a pump house were found during the Phase II survey (Figure 6.1). Information gleaned from the property deed records and artifact assemblage suggests that the South Shyville Farmstead was first established in the 1870s and was occupied through 1952.

The Phase II investigation involved systematic shovel testing on a 5-meter grid within the core of the site and shovel testing at a 10-meter interval around the perimeter of the core. Limited 1x1 m unit excavation was used to investigate the house and root cellar foundations and a subfloor pit-cellar located within the house foundation. In total, the Phase II investigation of the South Shyville Farmstead excavated 93.5 m^2 (0.5%) within the approximately 18,575 m^2 site area (Figure 6.1). Besides an abundance of historic-era artifacts deposited during the farmstead occupation, the Phase II investigation recovered 24 prehistoric artifacts (Table 6.1; Appendix B). The presence of these artifacts demonstrates that prehistoric Native Americans made use of this space well before the nineteenth century establishment of the South Shyville Farmstead.

Figure 6.2 illustrates the distribution of prehistoric artifacts within the South Shyville Farmstead. All are confined to the area of the house foundations. Because the artifacts and the house foundation are functionally, temporally, and culturally unrelated, the juxtaposition of these site elements is fortuitous.

Fire-cracked rock was the most prevalent prehistoric artifact type found at the site. The FCR reveals that the prehistoric occupants at 33Pk185 constructed and used thermal features, such as earth ovens and/or surface hearths, though none were found during the Phase II investigations. The three recovered pieces of lithic debris include a secondary decortication flake, an interior flake, and a piece of shatter. These artifact types represent the earliest stages of stone reduction and it is likely that all three were derived from cores. The presence of water-worn cortex on the secondary decortication flake suggests that the flint was procured from gravel deposits in the Scioto River floodplain.

Although this small assemblage demonstrates a prehistoric occupation at 33Pk185, no temporally diagnostic artifacts were recovered. With such limited evidence, it is impossible to determine when (see timeline in Figure 2.1) the prehistoric occupation(s) took place.

Table 6.1. 33Pk185 prehistoric artifact inventory.

Stone Type	**FCR**	**Formed Artifacts**	**Lithic Debris**	**Total**
Vanport	-	-	3	3
Sandstone	21	-	-	21
Total	**21**	**-**	**3**	**24**

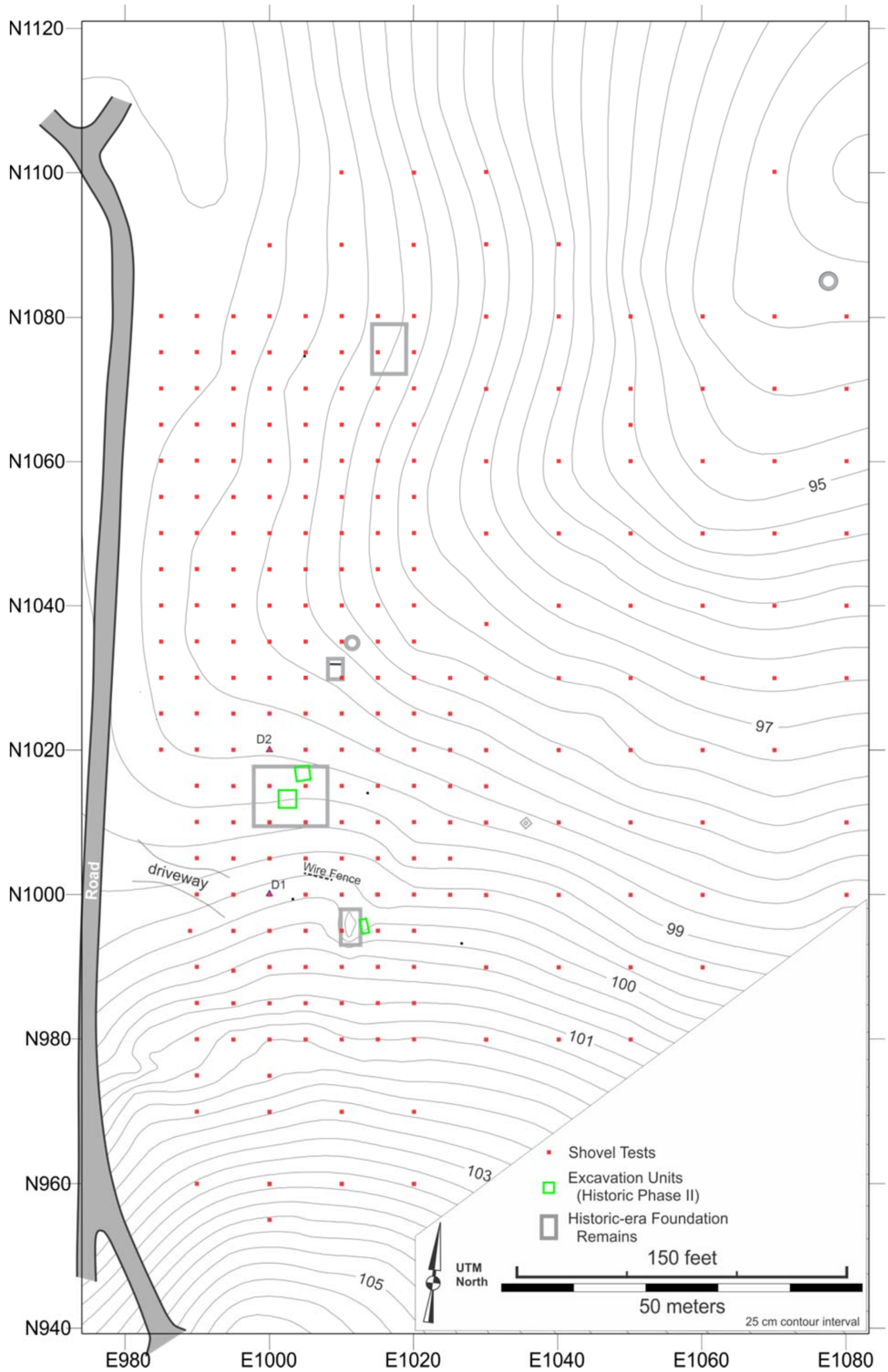

Figure 6.1. 33Pk185 site map showing Phase II fieldwork.

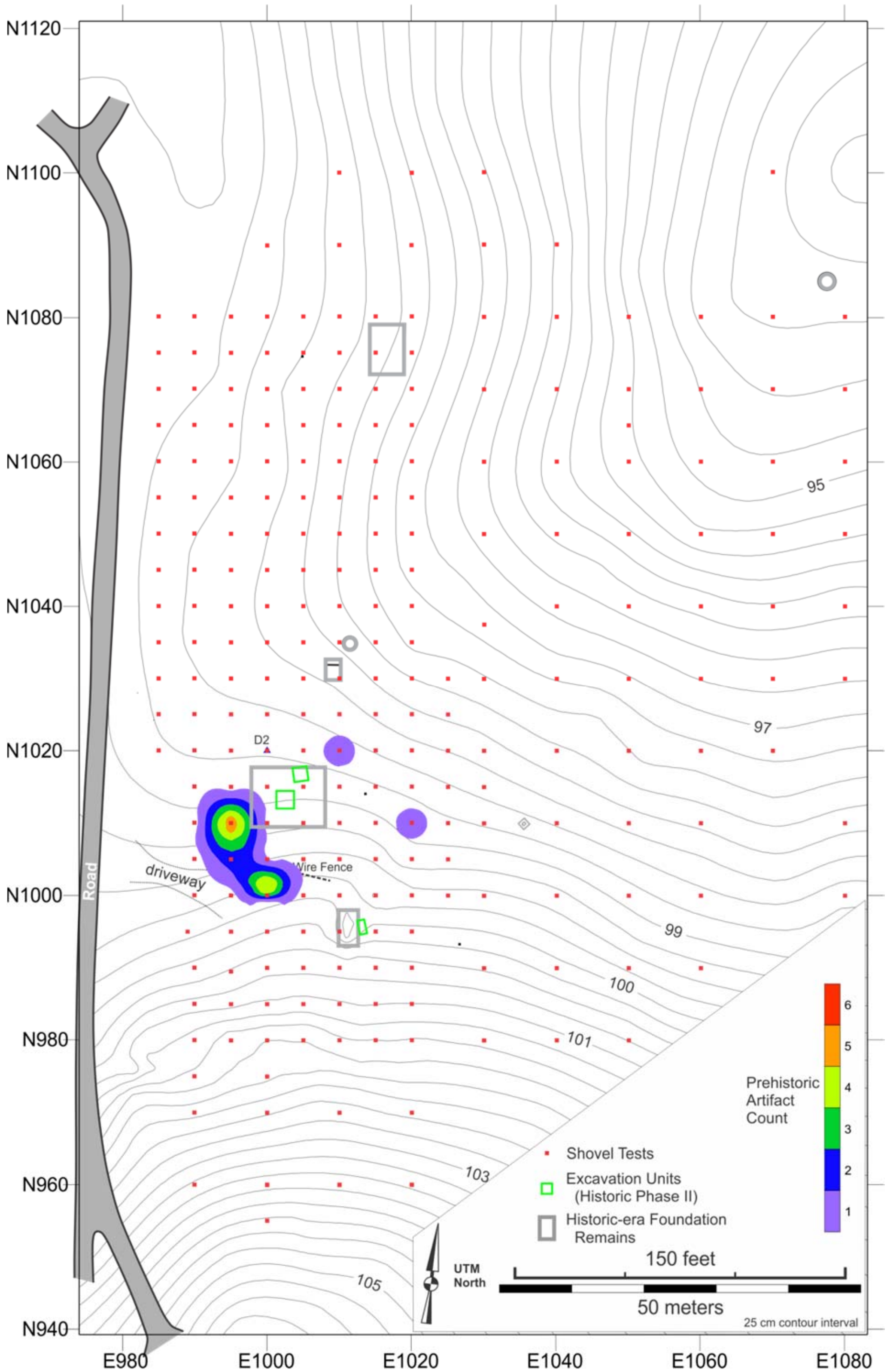

Figure 6.2. 33Pk185 site map showing prehistoric artifact distribution.

7. 33PK203 PREHISTORIC COMPONENT

Site 33Pk203, the Ruby Hollow Farmstead, is located on a narrow, but heavily dissected terrace along Little Beaver Creek in the northwestern corner of PORTS (Figures 1.1 and 1.2). The site was originally recorded by Schweikart et al. in 1997 and was further investigated at a Phase II level by Pecora and Burks (2012a). The Ruby Hollow Farmstead once contained at least nine historic-era buildings, including a house, several barns and other outbuildings. The Phase II survey identified a house foundation, two privy vaults, a milking parlor, two barn foundations, a garage foundation, two or three outbuilding foundations, and a pump house foundation (Figure 7.1). Information gleaned from the property deed records and artifact data suggests that the Ruby Hollow Farmstead may have been established as early as the 1850s and was occupied until 1953. The Phase II investigation for the historic-era farmstead component involved systematic shovel testing on a 5-meter grid covering the level areas of the site (Figure 7.1). In addition to the shovel testing, the Phase II work included the excavation of 1x1 meter units designed to investigate the house foundation, two privy vaults, and two ground-penetrating radar (GPR) anomalies in the house yard area. An abundance of historic-era artifacts were found during these investigations, as well as a moderate amount of prehistoric artifacts. Although prehistoric artifacts were present in most areas of the site, the eastern part of the site contained a higher-density cluster (Figure 7.2). The presence of prehistoric artifacts demonstrates that prehistoric Native Americans lived on this landform well before the nineteenth century farmstead occupation.

Additional fieldwork designed to further investigate the prehistoric component of 33Pk203 involved a magnetometer survey and the excavation of eight additional 1x1 meter units (Figure 7.1). The magnetometer survey covered 2319 m^2 and was used to identify the locations of potential prehistoric archaeological features not impacted or obscured by the Ruby Hollow Farmstead occupation. Figure 7.3 shows the results of the magnetic survey. Using the magnetic anomaly classification scheme outlined in Section 5, the results of the magnetic survey can be more closely examined. The lines of strong dipolar anomalies near the southern and western margins of the data are the remains of wire fences (no longer present above ground) related to the historic-era site occupation. These fences indicate the edges of land enclosed by the occupants of the Ruby Hollow Farmstead. There are a number of large, dipolar complex anomalies along the east edge of the data, near the Ruby Hollow Farmstead house and other outbuildings that are also likely related to the historic-era occupation of the site.

Eleven magnetic anomalies of potential interest were identified in the magnetic gradient data; they are numbered 18-28 and appear in Figure 7.4 (the magnetic anomaly numbers begin where the radar anomaly numbers left off). Details about each are presented in Table 7.1. These anomalies represent a range of possible feature types. Anomalies 24 and 26 may be historic-era in age, perhaps representing building locations. Anomalies 18-23, 25, and 27-28 are possible pit or posthole features. Based on their peak magnetic intensities (see Table 7.1), these could be either prehistoric or historic-era in age (historic-era features tend to produce more strongly magnetic anomalies). An Oakfield coring device, about 1-inch in diameter, was used to examine the soils associated with each anomaly; soils suggestive of possible feature fill were found at only two anomalies (Anomalies 18 and 21). Therefore, 1x1 meter excavation units were used to further examine these anomalies.

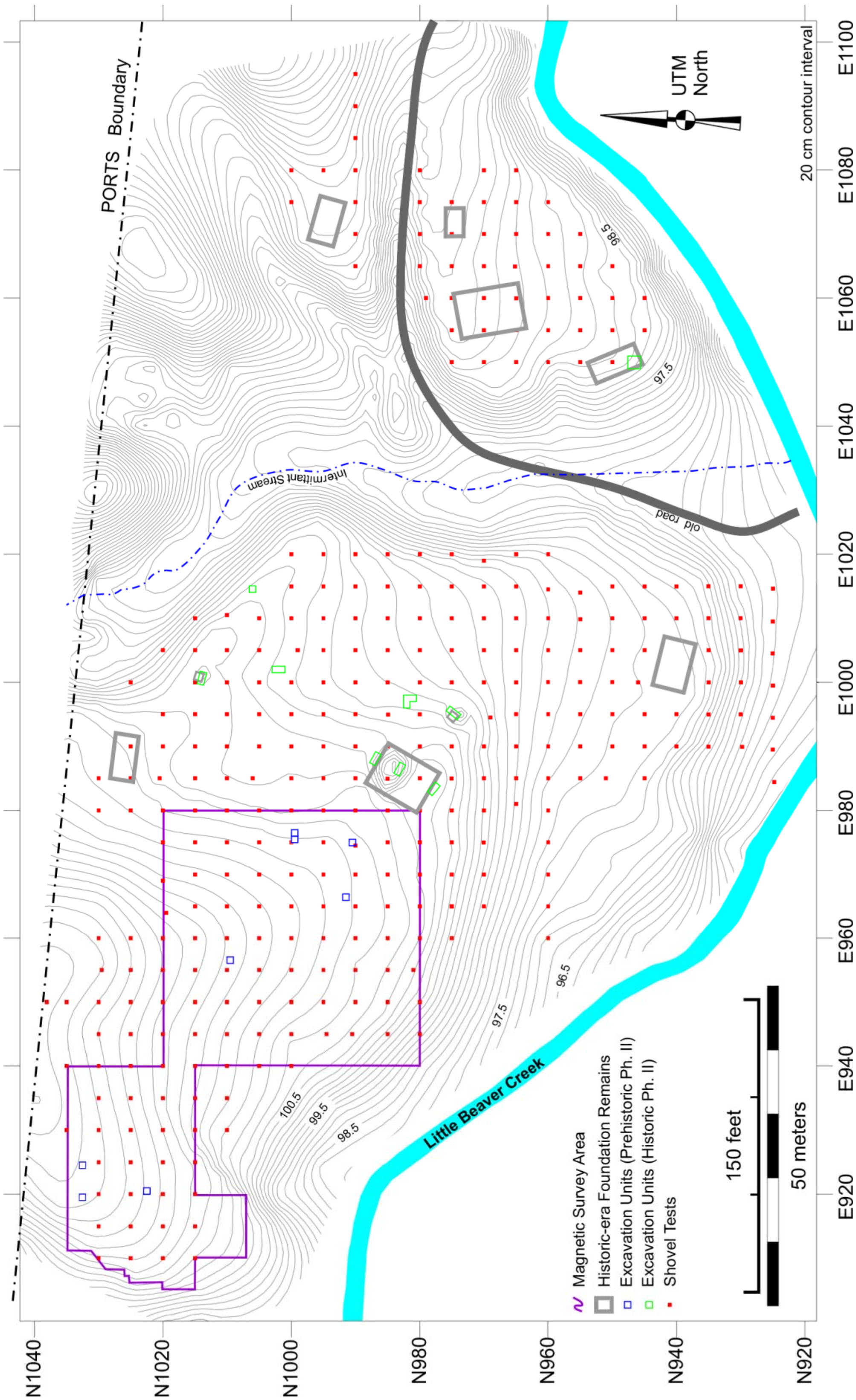

Figure 7.1. 33Pk203 site map showing Phase II fieldwork.

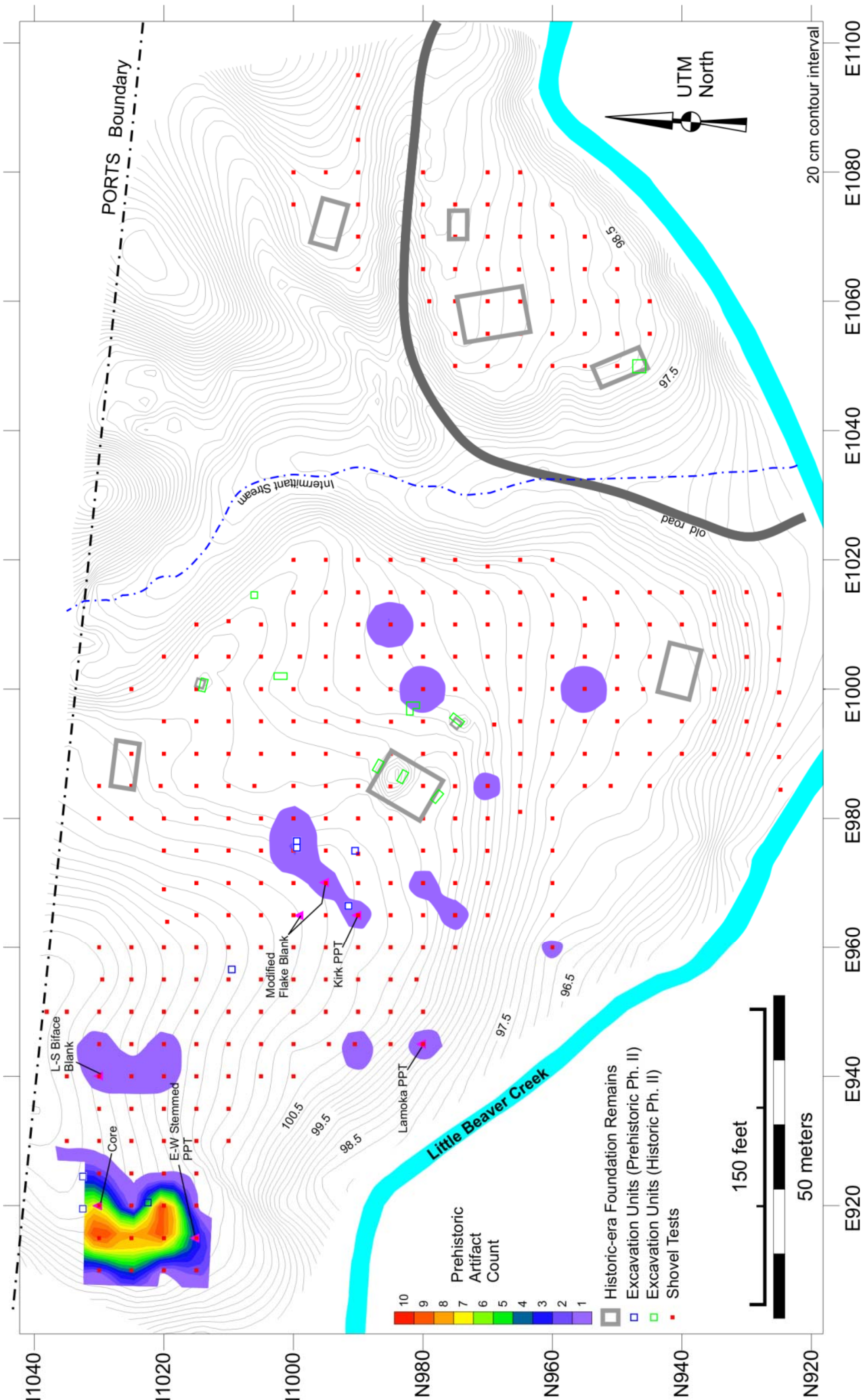

Figure 7.2. 33Pk203 site map showing prehistoric artifact distribution.

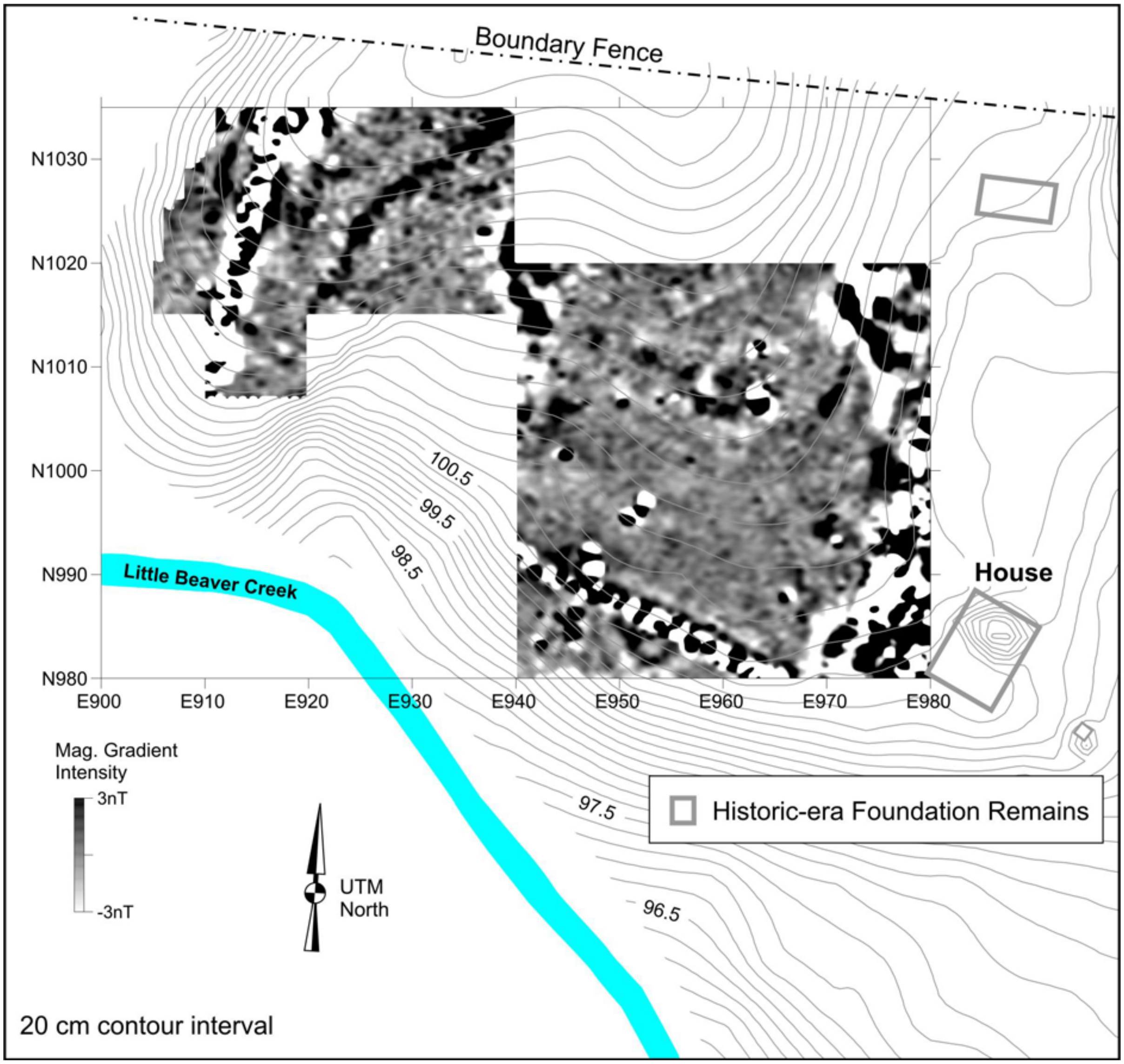

Figure 7.3. Magnetic gradient data from site 33Pk203.

Besides the three 1x1 meter units used to investigate two potential features identified from the magnetometer survey, another five 1x1 meter units were used to better sample artifact concentrations identified in the shovel test survey. The Phase II investigation (combined) resulted in the excavation of 110.25 m^2 (1%) of the approximately 10,000 m^2 site area that defines 33Pk203. This resulted in the recovery of 816 prehistoric artifacts (Table 7.2; Appendix C). No prehistoric features were identified—Anomaly 18 was determined to be an early historic-era midden containing early-mid nineteenth century ceramic sherds and no evidence of a feature was found at Anomaly 21.

The FCR found during the excavations, which is fairly abundant in this assemblage, consists mostly of sandstone, likely procured from Little Beaver Creek along the southern edge of the landform containing the site. Four pieces, however, are fragments of a water-worn, igneous-type rock that must have been procured from glacial gravel deposits in the Scioto River floodplain. This implies the prehistoric occupants of Ruby Hollow Farmstead transported some of the material used for cooking or heating a considerable distance. Regardless of the stone source, the presence of a sizable FCR assemblage shows that the prehistoric occupants of the Ruby Hollow Farmstead constructed and used thermal features, such as earth ovens and/or hearths.

The formed lithic artifacts in the Ruby Hollow Farmstead assemblage include a core fragment, two modified flake blanks, a late stage biface fragment, three projectile points, and a bifacial tool fragment made from Brassfield, Delaware, Upper Mercer, and unidentified flints, respectively (Figure 7.5; Appendix C). Appendix H provides the metric attributes for the formed artifact assemblage. The core fragment and two modified flake blanks represent the earliest stages of the stone reduction process. The core fragment was a source of large flake blanks that would have been converted into either flake tools or bifacial tools. In the process of being converted into bifacial tools, the edges of the flake blanks would have been modified

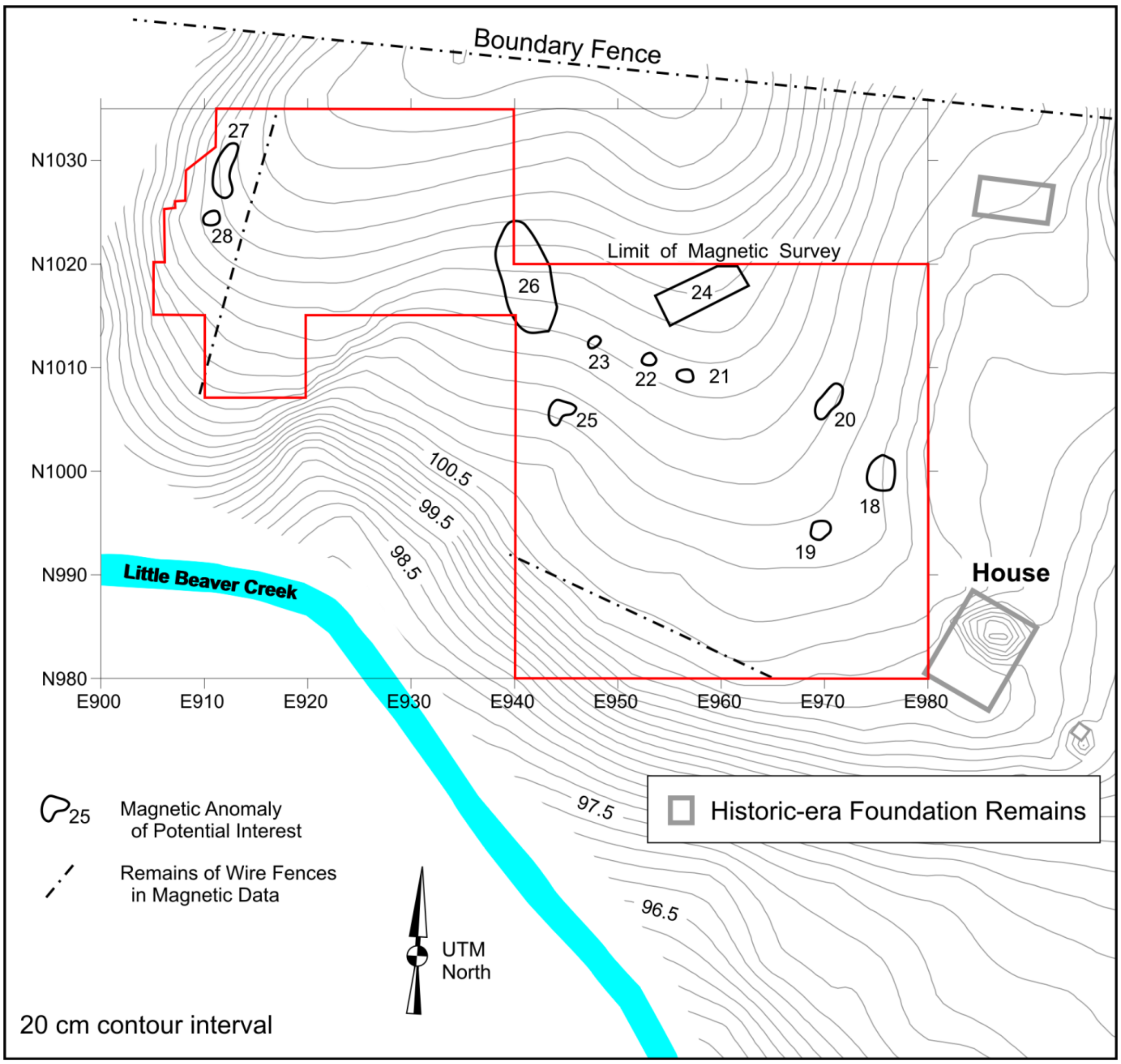

Figure 7.4. Magnetic anomalies of potential interest at 33Pk203.

Table 7.1. Magnetic gradient anomaly data for 33Pk203.

Anomaly #	Northing[a]	Easting	Peak Intensity (nT)[b]	Anomaly Class[c]	Probing Results
18	999.72	975.65	10.63	MP	Could be historic or prehistoric
19	994.26	969.69	6.69	MP	Possible pit feature
20	1006.69	970.30	10.60	MP	Possible pit feature
21	1009.41	956.66	5.84	MMP	Possible post
22	1010.93	952.92	8.13	MMP	Possible post
23	1012.34	947.67	5.22	MMP	Possible post
24	1017.5	958.28	--		Rectangular area, could be surface disturbance, location of small structure, or possible privy
25	1006.18	944.14	6.64	MP-D	Possible pit feature, or root or rodent disturbance
26	1015.68	941.41	33.10	DC	Possible burned area or pit with mixed fill
27	1028.20	911.61	21.35	MP	Possible iron object at south end, unknown linear feature at north
28	1024.26	910.70	10.43	MP	Possible pit feature or iron object

a – Northing and easting coordinates mark the center of the magnetic gradient anomaly and probing location.
b – Peak intensity recorded from magnetic gradient data after processing with Zero Mean Traverse.
c – MP=Monopolar Positive; MN=Monopolar Negative; DS=Dipolar Simple; DC=Dipolar Complex

to accommodate bifacial thinning. The Ruby Hollow Farmstead assemblage contains two artifacts that exhibit such modification, and these are classified as modified flake blanks. It is possible, however, that both served as modified flake tools and were never intended for further bifacial reduction (as illustrated in Figure 3.1).

The late stage biface fragment and the bifacial tool fragment are both small and fragmentary, and both likely are tool fragments (Figure 7.5). It is also possible that both are fragments of late stage biface blanks or preforms.

The three Ruby Hollow Farmstead projectile points resemble defined temporally diagnostic types associated with three different time periods. The Kirk Cluster point is corner-notched, has serrated blades, and is made from Upper Mercer flint (Figure 7.5). Projectile points of the Kirk Cluster have been documented in contexts that date to 7500-6900 B.C (Justice 1987). The presence of this artifact suggests that Ruby Hollow Farmstead may have been occupied first as far back as 9500-8900 years ago, during the Early Archaic period. The second Ruby Hollow Farmstead projectile point resembles the Lamoka type (Figure 7.5). This stemmed projectile point type has been found in contexts that date to 3500-2500 B.C. (Justice 1987), suggesting that Ruby Hollow Farmstead may have been occupied again approximately 5500-4500 years ago, during the Late Archaic period. The third projectile point, which has been recycled to serve as another tool type, resembles the basal portion of an Early Woodland Stemmed Cluster type (Justice 1987). Artifacts within this typological cluster have been found in archaeological contexts dating to 1000 B.C. to 200 B.C. The presence of this artifact suggests that Ruby Hollow Farmstead may have been occupied a third time between 3000 and 2200 years ago.

The Ruby Hollow Farmstead lithic debris assemblage is dominated by flint types that can be found in the gravel deposits in the Scioto River floodplain (Table 7.2; Appendix C). This is supported by the presence of water-worn cortex on nearly 20 percent of the debris. Nearly all is representative of the *primary reduction* stage and 27 percent is from core (pre-bifacial) reduction. A quarter (25%) of the debris was generated from the early and late stage percussion biface thinning process, for the creation of biface blanks, and 43 percent is classified as technologically non-diagnostic debris, meaning it does not exhibit attributes indicative of a particular reduction process. The remaining 5 percent of the assemblage is classified as pressure flakes and what appear to be biface tool rejuvenation flakes. Although the lithic debris assemblage consists mostly of debris from the *primary reduction* stage, the *secondary reduction* stage is represented by two projectile points and two other potential biface tools. The *tertiary reduction* stage also is represented by two biface tool rejuvenation flakes and the recycled stemmed projectile point. Thus, the full range of tool production, use, and rejuvenation is represented in the Ruby Hollow Farmstead lithic assemblage.

A small amount of the Ruby Hollow Farmstead lithic debris is burnt, meaning it has pot-lidding or cracking caused by exposure to high heat. This burning should not be confused with *heat-treatment*, which was a method for improving the workability of certain types of flint. Burning flint ruins its workability for the manufacture of stone tools. Instead, the burned flint objects may be a sign that the occupants of Ruby Hollow Farmstead were burning their refuse.

Table 7.2. 33Pk203 prehistoric artifact inventory.

Stone Type	**FRC**	**Formed Artifacts**	**Lithic Debris**	**Total**
Brassfield	-	1	28	29
Delaware	-	3	98	101
Paoli?	-	-	2	2
Upper Mercer	-	2	11	13
Vanport	-	-	24	24
Unidentified Black	-	-	13	13
Unidentified Gray	-	1	9	10
Unidentified	-	1	3	4
Igneous	4	-	-	4
Sand Stone	616	-	-	616
Total	**620**	**8**	**188**	**816**

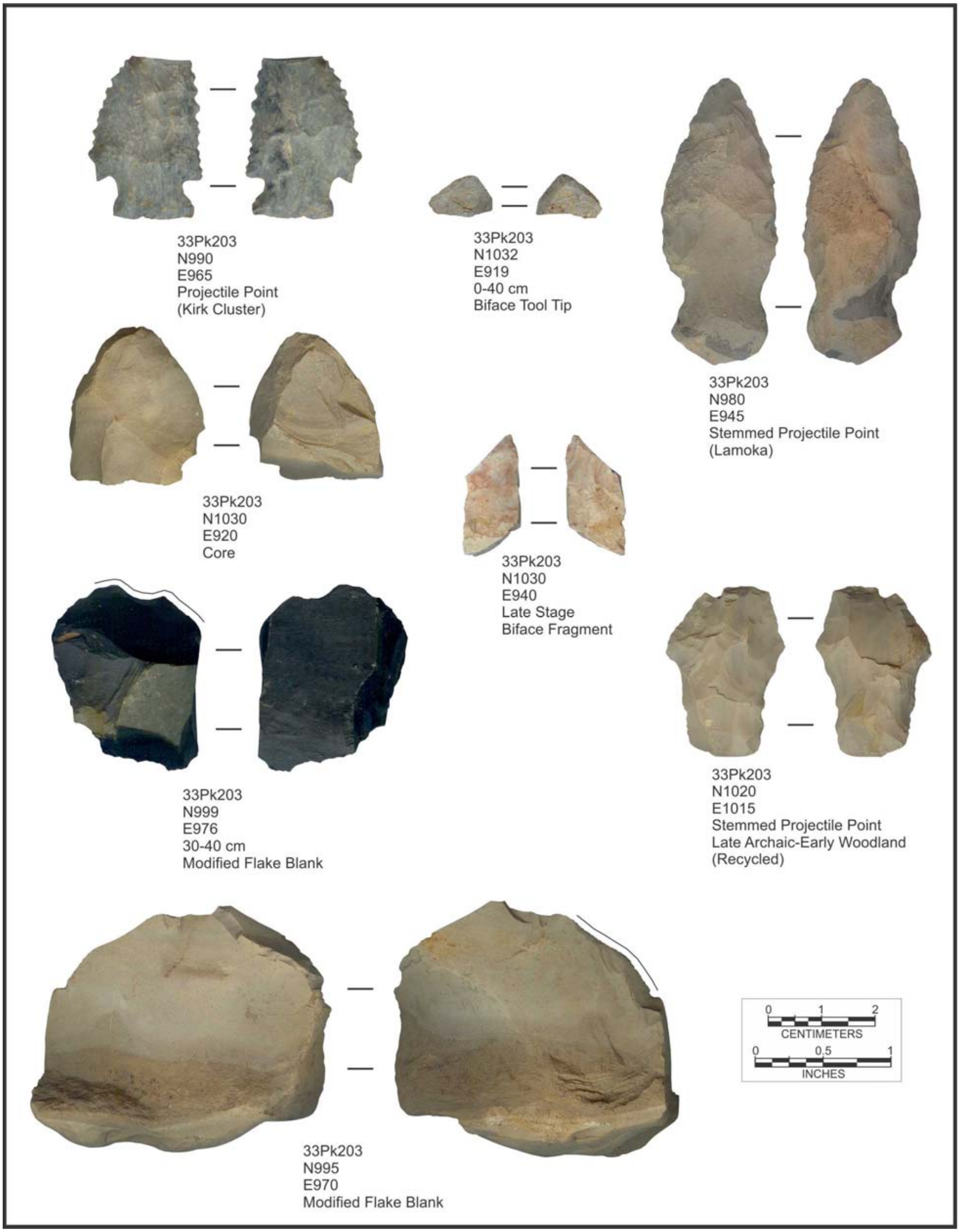

Figure 7.5. 33Pk203 prehistoric formed artifacts.

8. 33PK206 PREHISTORIC COMPONENT

Site 33Pk206, the Terrace Farmstead, is located in the eastern part of PORTS (Figures 1.1 and 1.2). The farmstead was originally recorded during the Phase I survey by Schweikart et al. (1997) and was further investigated at a Phase II level by Pecora and Burks (2012a). Terrace Farmstead once contained at least 11 historic-era buildings. The Phase II survey identified two house foundations, a dairy barn, and three outbuildings (Figure 8.1). Information gleaned from the property deed records and artifact data suggests that this farmstead may have been established as early as the 1860s and was occupied until 1952.

The Phase II investigation involved systematic shovel testing on a 5-meter grid within the core of the site and shovel tests at a 10-meter interval around the perimeter of the core (Figure 8.1). Besides the shovel testing, 1x1 meter units were also excavated to investigate the site's two house foundations and two GPR anomalies found in the yard area. The Phase II investigation of Terrace Farmstead resulted in 91.5 m^2 (0.7%) of excavation across the approximately 14,000 m^2 site area. Besides the recovery of a large quantity of historic-era artifacts that were deposited during the late nineteenth through middle twentieth century farmstead occupation, the Phase II investigation also recovered 30 prehistoric artifacts (Table 8.1; Appendix D). Although these artifacts were scattered across the site area with no major concentrations (Figure 8.2), they demonstrate that prehistoric Native Americans made use of this space well before the nineteenth century farmstead occupation. The age of such an occupation(s) cannot be inferred because no temporally diagnostic artifacts have been found at 33Pk206.

The prehistoric artifacts from 33Pk206 include eight pieces of FCR, one formed artifact, and 21 pieces of lithic debris (Table 8.1). Metrics for the formed artifact are provided in Appendix H. The small amount of FCR, all made from locally available sandstone, shows that thermal features were used at this site. The lithic artifacts tend to be made from local material that would have been available in the gravel deposits along the Scioto River floodplain. Water worn cortex, which is diagnostic of such gravel sources, was identified on artifacts made from Delaware, Upper Mercer, and Vanport flints in the 33Pk206 assemblage.

The single formed artifact from 33Pk206 is a projectile point blade mid-section made from what appears to be Upper Mercer flint (Figure 8.3). This artifact is too fragmentary to assign to a defined temporal type. The lithic debris assemblage represents the earlier stages of the *primary reduction* process and 57 percent is from core (non-bifacial) reduction. Twenty-four percent of the debris is classified as late biface thinning flakes, which are created from the final stages of the percussion thinning of biface blanks. The balance, 19 percent, consists of technologically non-diagnostic flake fragments and shatter.

Table 8.1. 33Pk206 prehistoric artifact inventory.

Material	FCR	Formed Artifacts	Lithic Debris	Total
Brassfield	-	-	1	1
Brush Creek	-	-	2	2
Delaware	-	-	10	10
Unidentified Gray	-	-	2	2
Upper Mercer	-	1	3	4
Vanport	-	-	3	3
Sandstone	8	-	-	8
Total	**8**	**1**	**21**	**30**

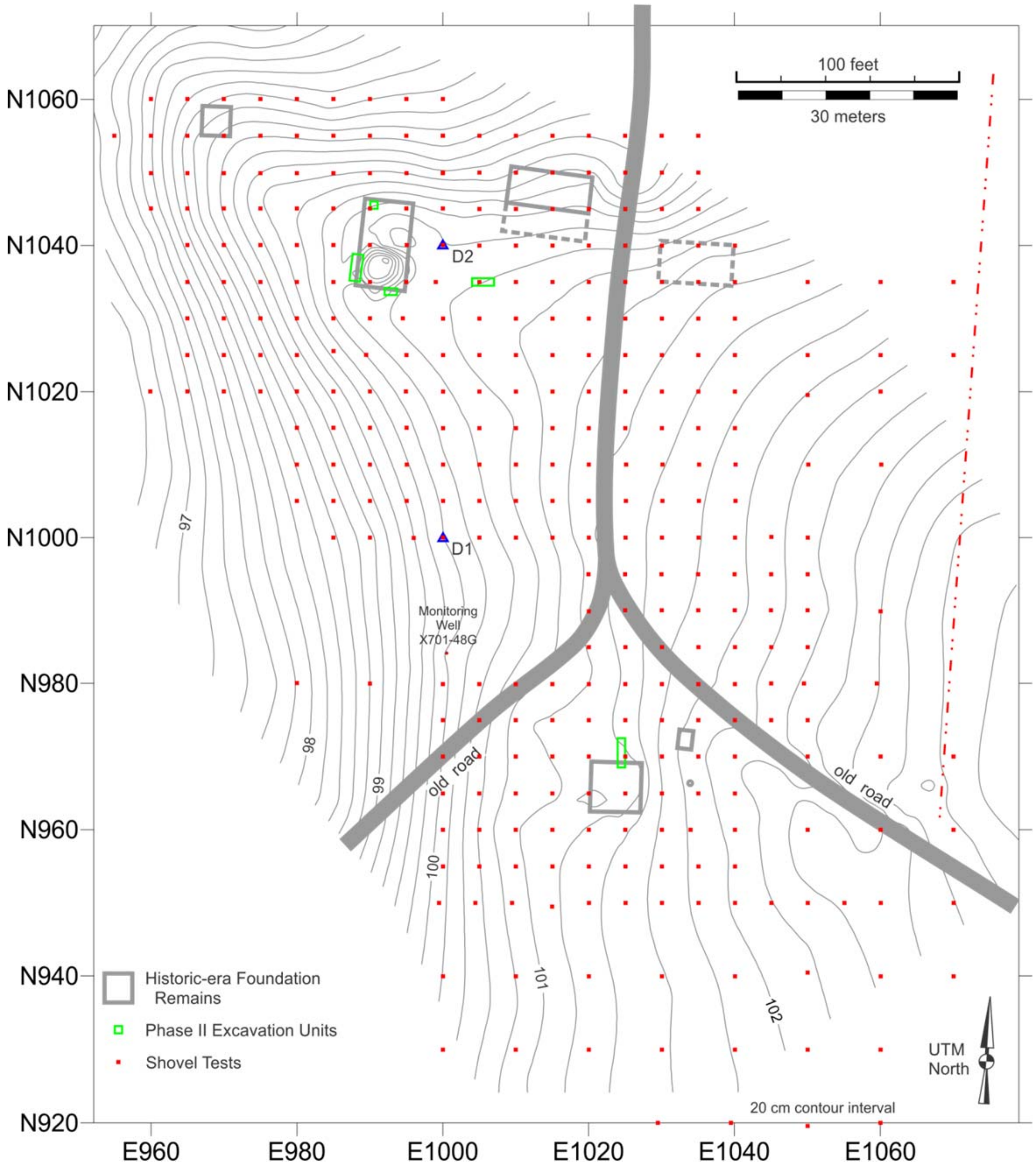

Figure 8.1. 33Pk206 site map showing Phase II fieldwork.

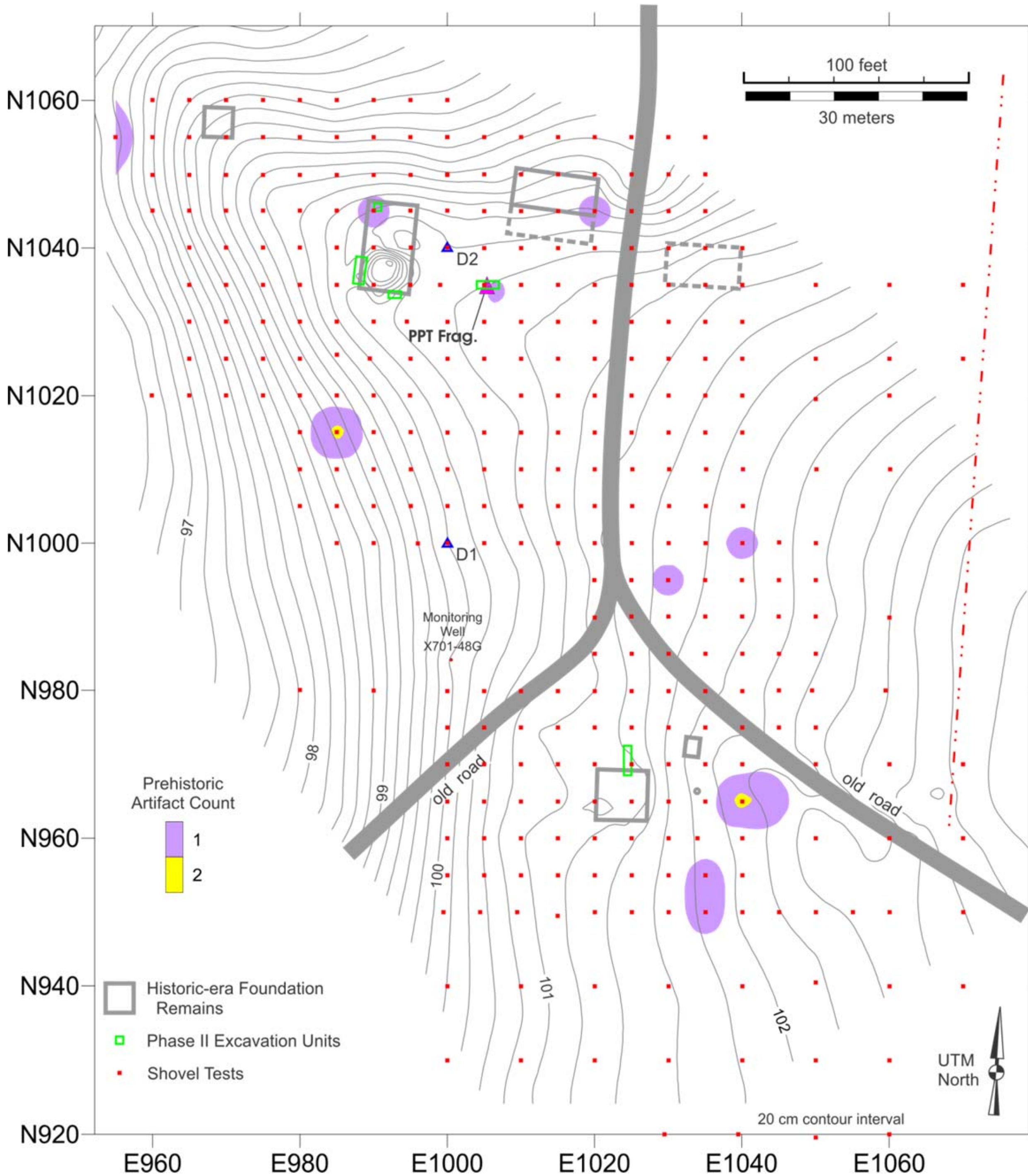

Figure 8.2. 33Pk206 site map showing prehistoric artifact distribution.

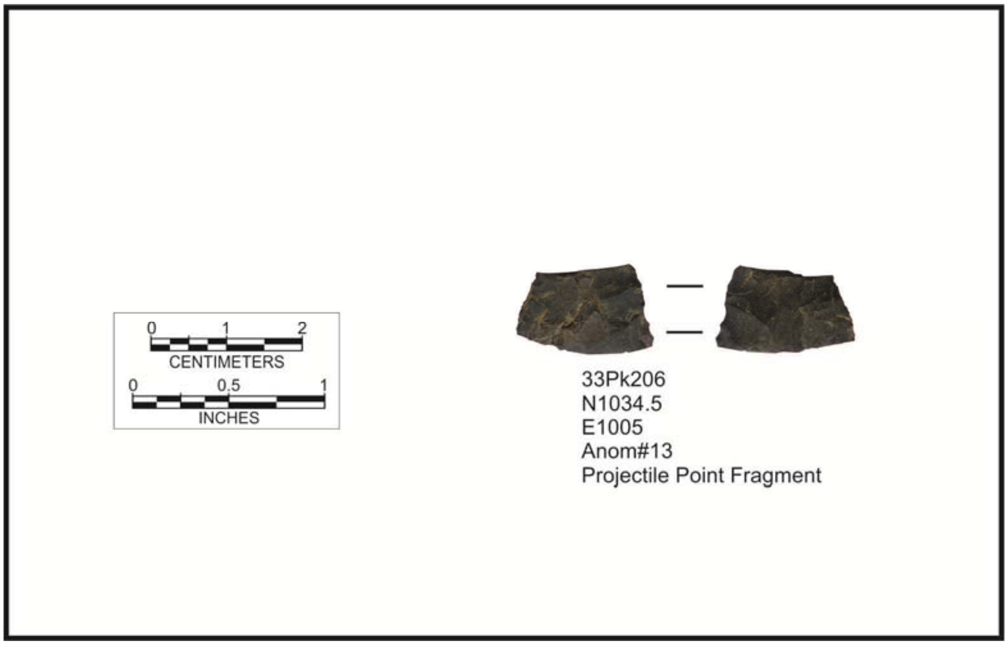

Figure 8.3. 33Pk206 prehistoric formed artifact.

9. 33PK211 PREHISTORIC COMPONENT

Site 33Pk211, the Bamboo Farmstead, is located on a broad ridge near the northwestern portion of PORTS, where it overlooks a small tributary of Little Beaver Creek running approximately 30-40 ft below the farmstead (Figures 1.1 and 1.2). This farmstead was originally recorded during a Phase I survey by Schweikart et al. (1997), and a Phase II investigation was recently completed by Pecora and Burks (2012a). Bamboo Farmstead once contained at least seven historic-era buildings, based on buildings visible in the 1938/39 and 1951 aerial photographs. The Phase II investigation found the foundation remains of seven structures, including one house, a possible second house, a probable summer kitchen, a large dairy barn with milking parlor, a barn, a shed/outbuilding, a garage, and a privy. Property deed records and artifact data suggest that the Bamboo Farmstead was established as early as the 1840s and was abandoned in 1953.

The Phase II investigation involved systematic shovel testing on a 5-meter grid within the core of the site and shovel tests at a 10-meter interval around the perimeter of the core (Figure 9.1). Besides the shovel testing, the Phase II included the excavation of a limited number of 1x1 meter units, which were positioned to investigate elements of the house foundation, a privy depression, and a sub-floor pit cellar identified within the house foundation. In total, the Phase II investigation of the Bamboo Farmstead opened up and screened 110.5 m^2 (0.6%) of the approximately 18,000 m^2 site area. Besides numerous historic-era artifacts from the late nineteenth to mid-twentieth century farmstead occupation, the Phase II excavation work also recovered 89 prehistoric artifacts (Table 9.1; Appendix E). These artifacts demonstrate that prehistoric Native Americans made use of this space well before the nineteenth century farmstead occupation.

The 33Pk211 prehistoric artifact assemblage consists of 74 pieces of FCR, two formed artifacts, and 13 pieces of lithic debris. Figure 9.2 illustrates the distribution of prehistoric artifacts, which are concentrated on the ridgetop south and east of the historic-era building foundations. The six flint types in the assemblage, including three unidentified varieties, resemble flints that would have been available in gravel deposits in the Scioto River floodplain. Two of the Delaware flint artifacts have water worn cortex typical of gravel-derived sources.

The lithic debris represents the *primary reduction* process, as illustrated in Figure 3.1. Forty-three percent of the debris was derived from core reduction (non-bifacial) and 29 percent resulted from biface thinning for the purposes of manufacturing biface blanks. Such biface blanks would have been converted into preforms which, in turn, would have become bifacial tools. The Bamboo Farmstead assemblage contains no evidence of preform or biface tool manufacture. The remaining lithic debris is classified as flake fragments and shatter, neither of which retains technological characteristics indicative of how they were created.

The relatively sizeable FCR assemblage at the Bamboo Farmstead shows that the prehistoric site occupants made use of thermal features, such as hearths and earth ovens.

The two formed artifacts in the lithic assemblage include a projectile point and what is classified as a drill fragment (Figure 9.3). Metrics for these artifacts are provided in Appendix H. Both objects are made from Delaware flint and both were found near one of the historic house foundations. The projectile point is a complete specimen that resembles the Matanzas Type (Justice 1987; Ritchie 1971). The Matanzas type has historically been dated consistently to around 2980-1723 B.C. and 3700-2000 B.C. in the eastern United States (Justice 1987). A large assemblage of similar artifacts, however, from site 33At982 in Athens County, Ohio, were found in association with nine radiometric dates that bracket 4000 B.C. (Pecora and Burks 2006). This implies that the Bamboo Farmstead may have been occupied as early as 6000 years ago during the temporal interface between the Middle and Late Archaic periods.

The Bamboo Farmstead drill fragment resembles the mid-section of a projectile point, but it is very narrow and thick like most drills. When complete specimens are found, they frequently have basal elements or stems that resemble those observed on projectile points—primarily because exhausted projectile points were laterally recycled (*tertiary reduction*) into drilling tools.

Table 9.1. 33Pk211 prehistoric artifact inventory.

Material	**FCR**	**Formed Artifacts**	**Lithic Debris**	**Total**
Brassfield	-	-	2	2
Delaware	-	2	6	8
Unidentified	-	-	1	1
Unidentified Black	-	-	1	1
Unidentified Gray	-	-	1	1
Upper Mercer	-	-	2	2
Sandstone	74	-	-	74
Total	**74**	**2**	**13**	**89**

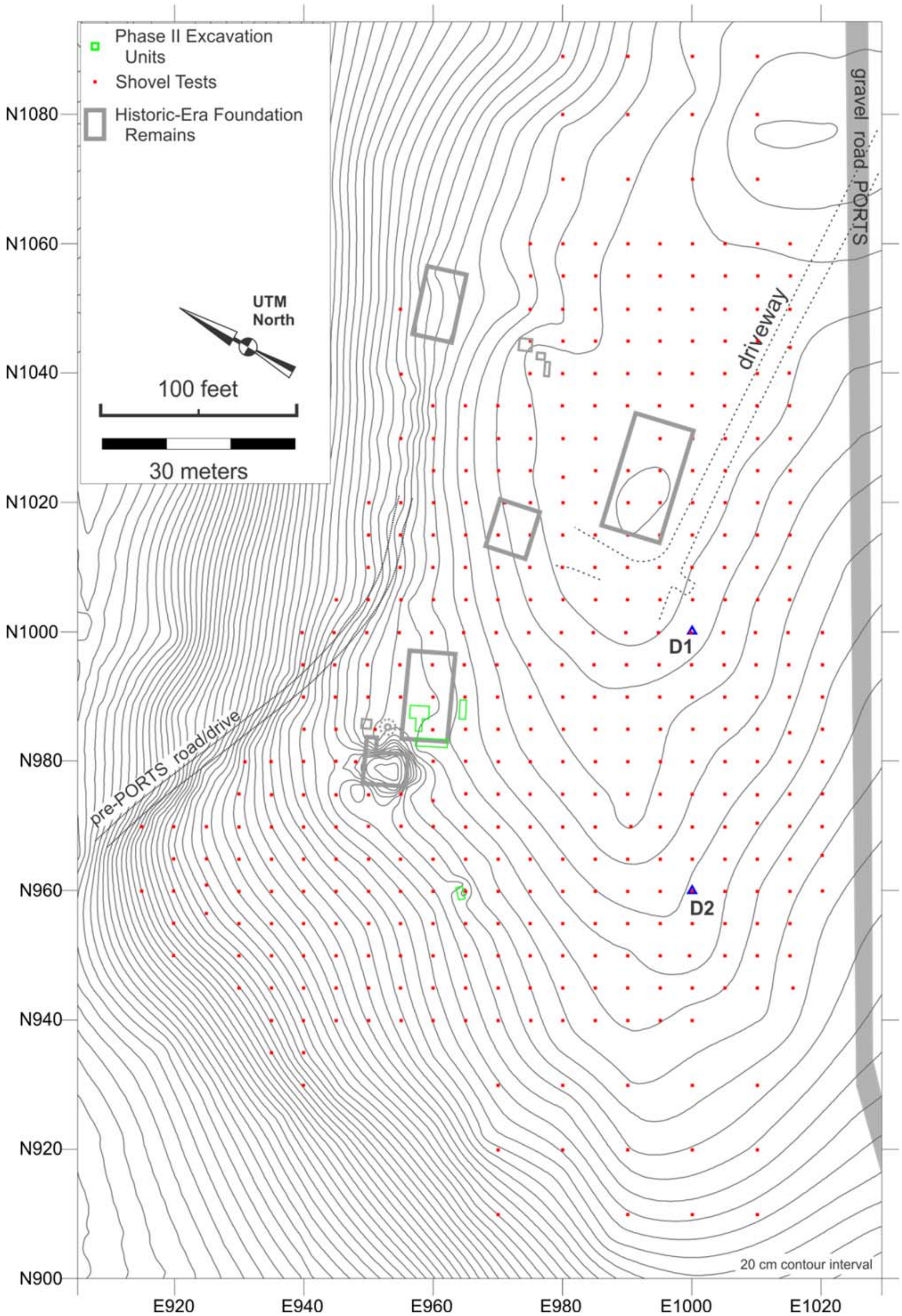

Figure 9.1. 33Pk211 site map showing Phase II fieldwork.

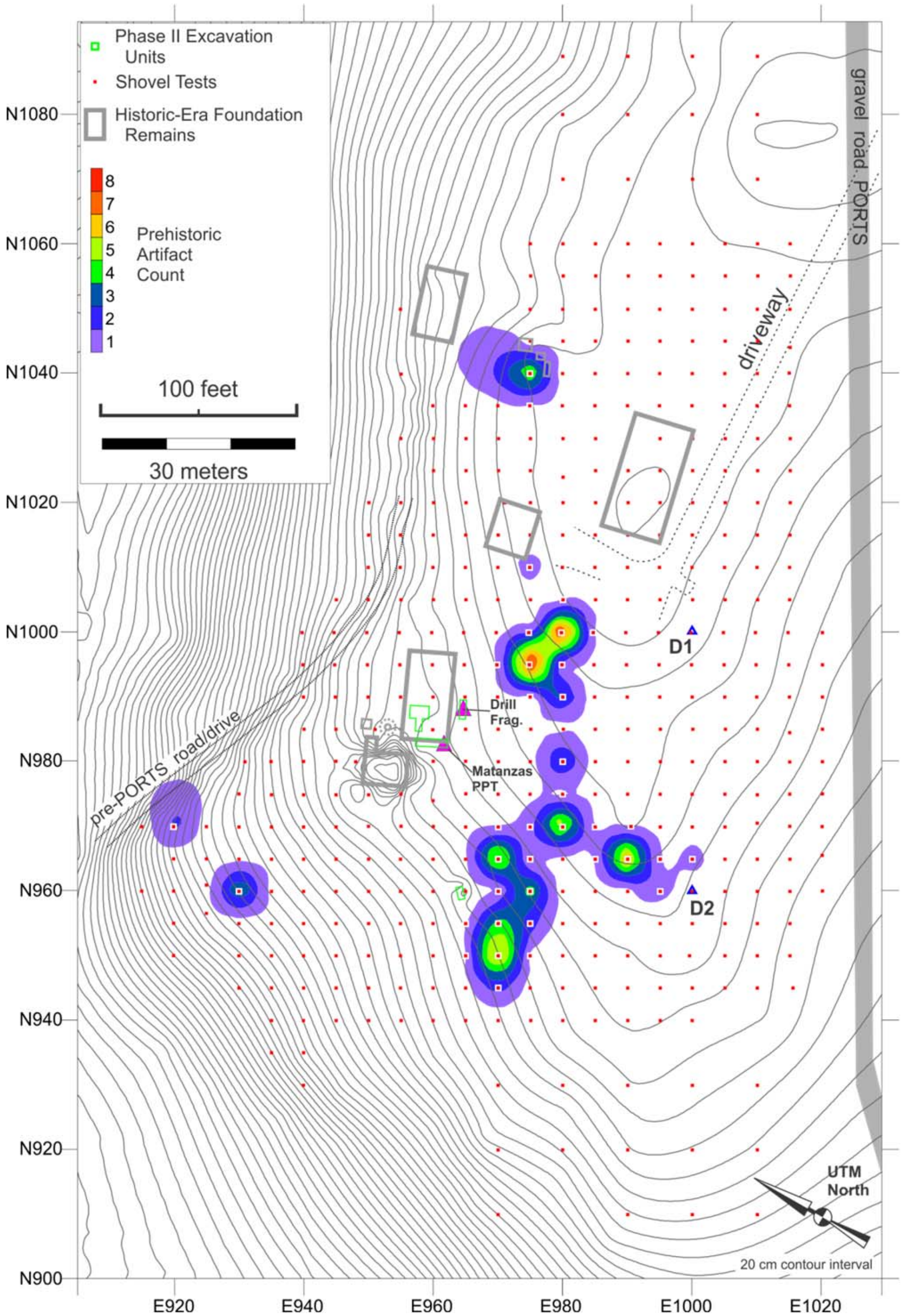

Figure 9.2. 33Pk211 site map showing prehistoric artifact distribution.

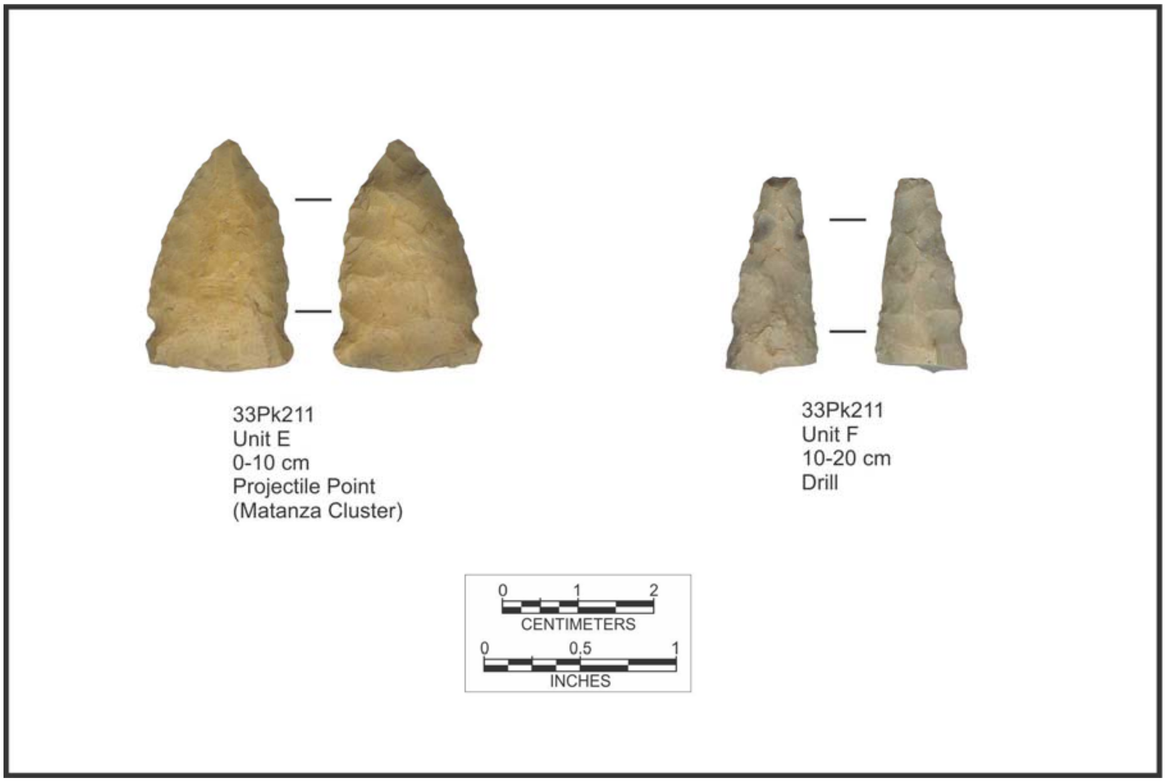

Figure 9.3. 33Pk211 prehistoric formed artifacts.

10. 33PK217 PREHISTORIC COMPONENT

Site 33Pk217, the Stockdale Road Dairy Farmstead, is located on a broad and relatively flat terrace overlooking Little Beaver Creek in the north-central part of PORTS (Figures 1.1 and 1.2). The eastern edge of the site is marked by a bluff overlooking the creek below. The farmstead site was originally documented during a Phase I survey by Schweikart et al. (1997), and it was further investigated at the Phase II level by Pecora and Burks (2012a). Stockdale Road Dairy Farmstead once contained at least nine-ten buildings, including two houses, a large dairy barn with milking parlor, and several other outbuildings. The Phase II survey identified two house foundations, the large barn with its milking parlor, two garage foundations, a small outbuilding foundation, a large cistern associated with the barn, and a pump house foundation with a well associated with the main house (Figure 10.1). Information gleaned from the property deed records and artifact data suggests that the Stockdale Road Dairy Farmstead may have been established as early as the 1830s and was occupied until 1952.

The Phase II investigation of the farmstead site involved systematic shovel testing on a 5-meter grid within the core of the site and shovel tests at a 10-meter interval around the perimeter of the core (Figure 10.1). A limited number of 1x1 meter units was used to investigate the main house foundation, a chimney base at the second house foundation, and two radar anomalies in the yard of the main house. Besides recovering an abundance of historic-era artifacts, a moderate scatter of prehistoric artifacts was also identified. The prehistoric artifacts were found in small amounts all across the site, including in the vicinity of the historic-era buildings, and there was a higher-density concentration at the site's eastern edge, adjacent to the bluff overlooking the creek (Figure 10.2).

Additional fieldwork designed to further investigate the prehistoric component of 33Pk217 involved a magnetometer survey and the excavation of nine additional 1x1 meter units. The magnetometer survey covered 2024 m^2 and was used to identify potential prehistoric archaeological features at the east edge of the site. Figure 10.3 shows the results of the magnetic gradient survey. Numerous large and strongly magnetic anomalies were found. The arcing linear anomalies at the west edge of the magnetic data are related to the gravel driveway that connects the large dairy barn to the road. These linear features could be gravel in the drive or they might be utility lines. To the east of the gravel drive are numerous large dipolar simple anomalies and several anomalies that could be prehistoric pit-type features. Figure 10.4 shows the eight anomalies that were singled out for coring. Details related to each are provided in Table 10.1. All of the anomalies in the Stockdale magnetic data are strongly magnetic and unusually large if they are related to prehistoric features. Of the eight anomalies thought to be of archaeological interest, four were considered to be possible pit features, though these seemed rather large and strongly magnetic to be prehistoric features. The remaining four anomalies are large and likely are related to historic-era activities, but they were included for coring in case they were associated with unexpected types of prehistoric features (e.g., house basins).

An Oakfield soil corer, about 1 inch in diameter, was used to core the eight magnetic anomalies of potential interest. At least five cores were taken, down to 80 cm below surface, at each anomaly location. No soil, charcoal, or burned earth commonly associated with prehistoric archaeological features was encountered in the cores. This suggests that the large magnetic anomalies at the Stockdale Road Dairy Farmstead are related to the historic-era occupation of the site. They are most likely related to surface fires (e.g., to burn brush cleared from fence lines),

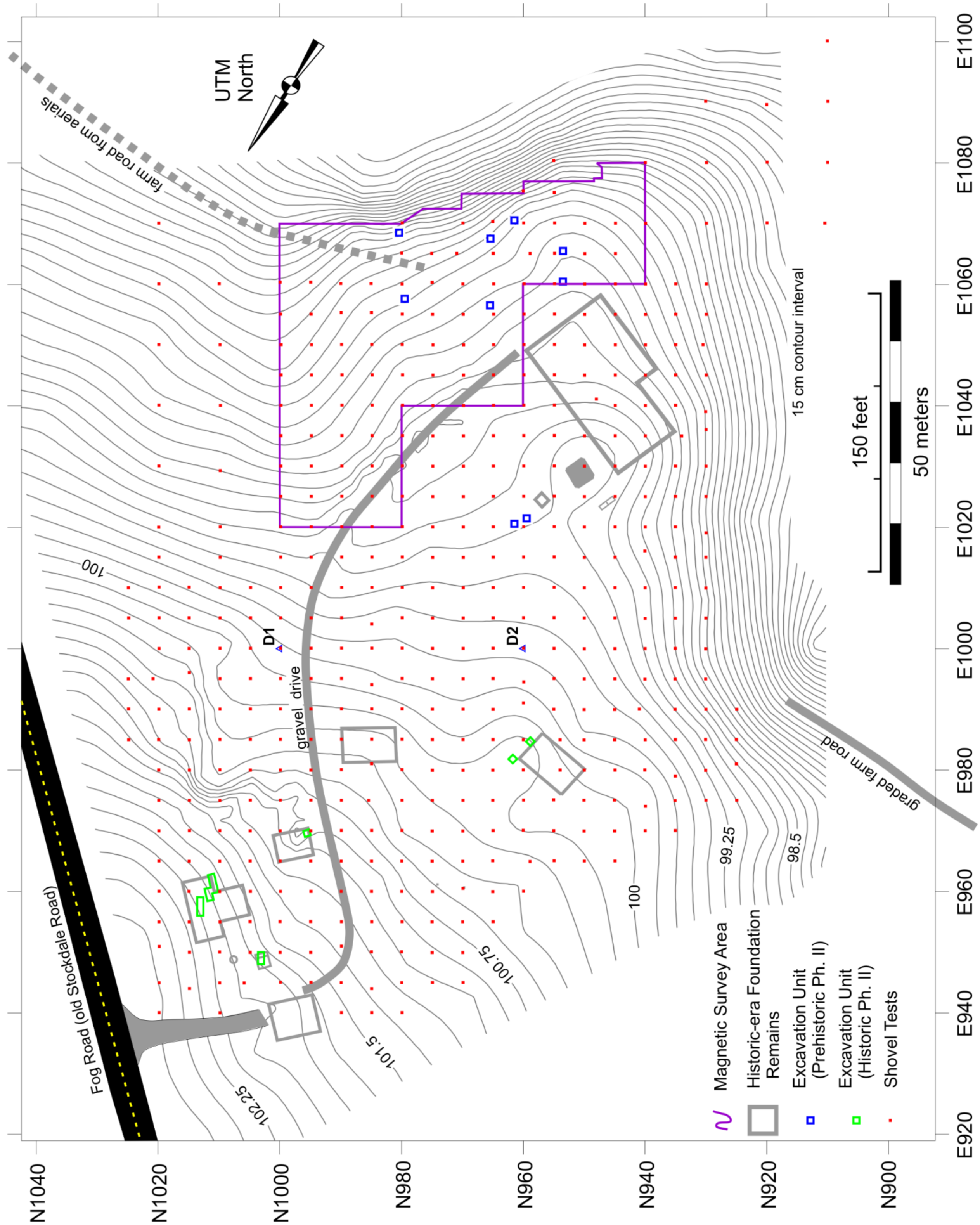

Figure 10.1. 33Pk217 site map showing Phase II fieldwork.

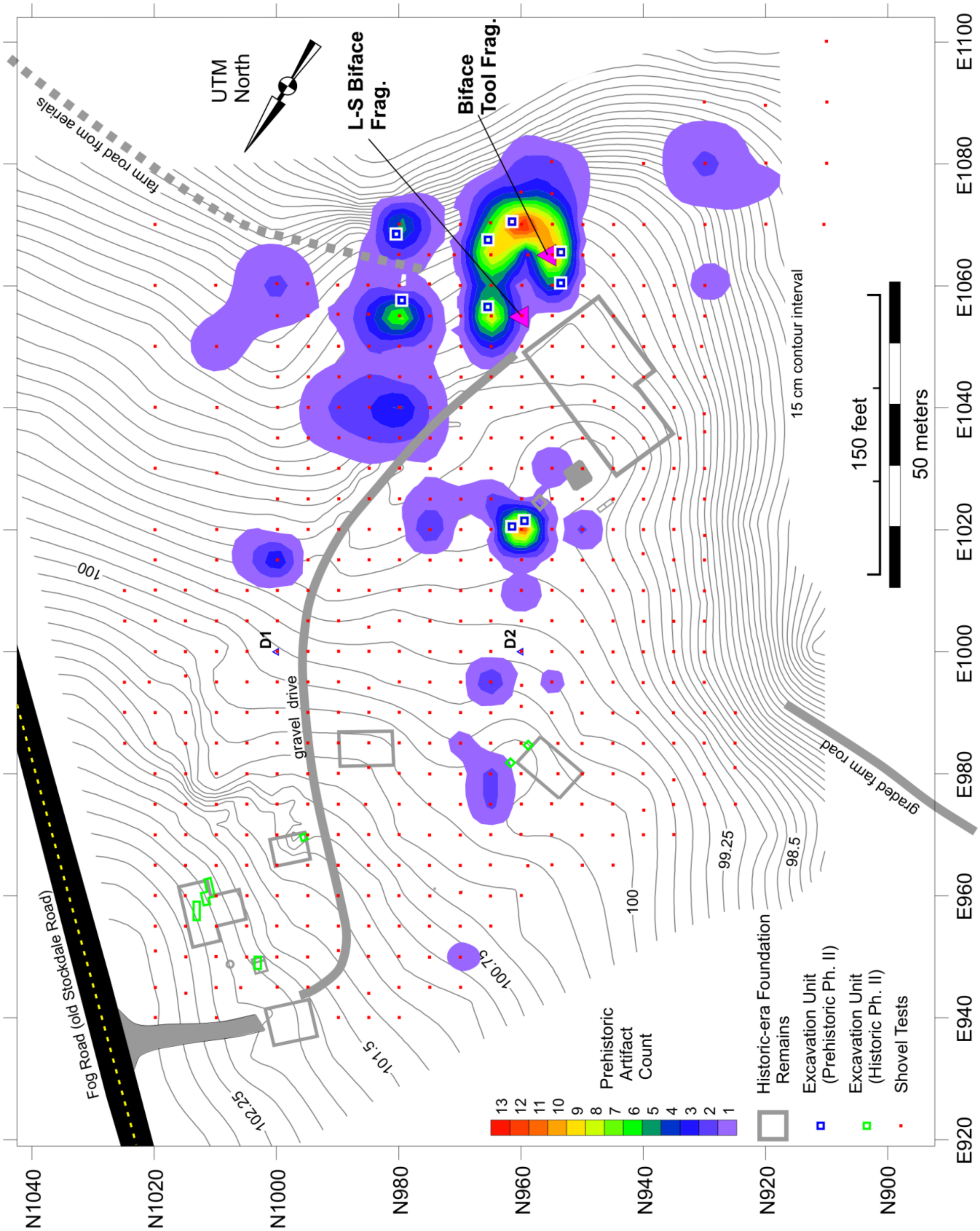

Figure 10.2. 33Pk217 site map showing prehistoric artifact distribution.

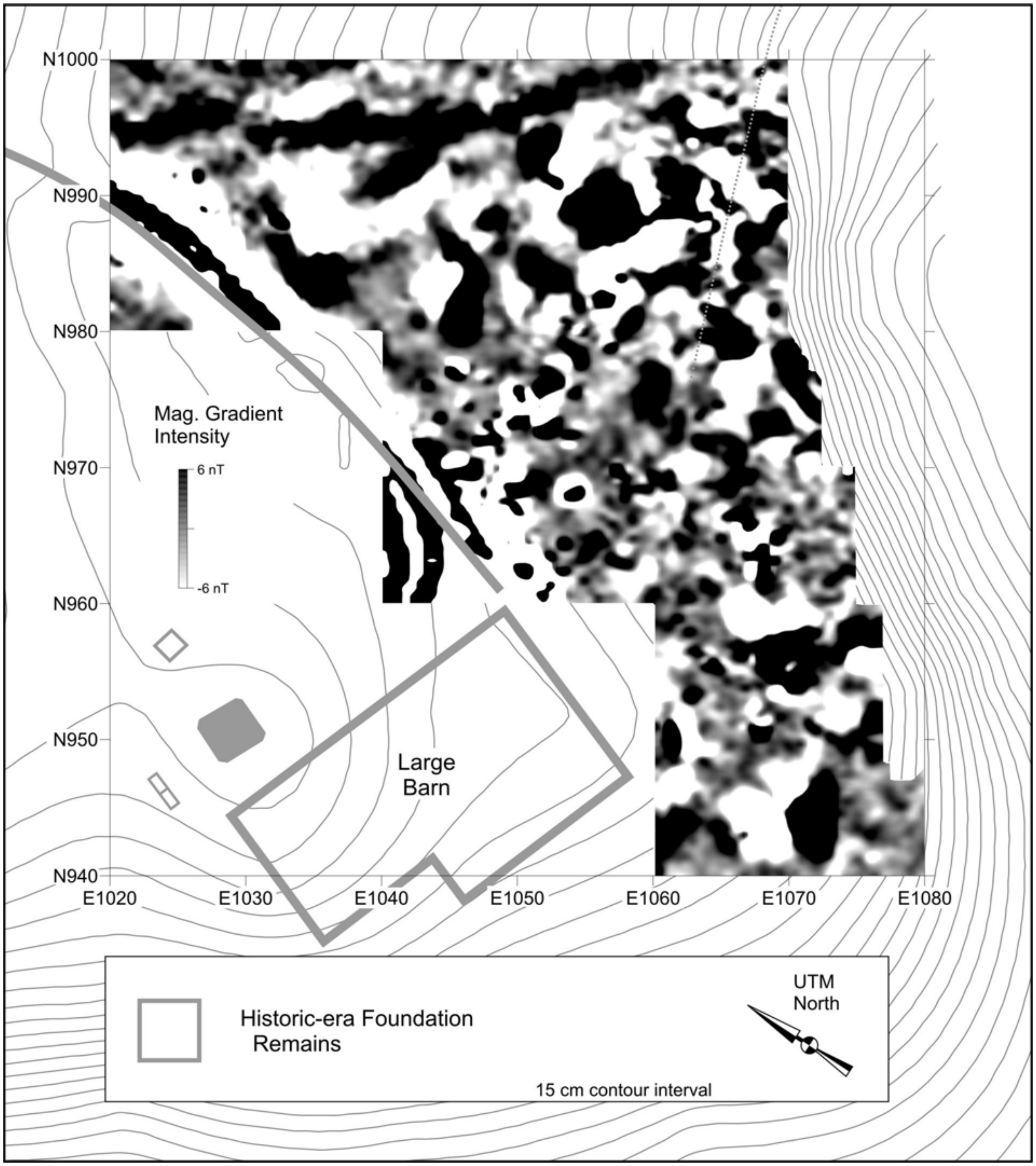

Figure 10.3. Magnetic gradient data from 33Pk217.

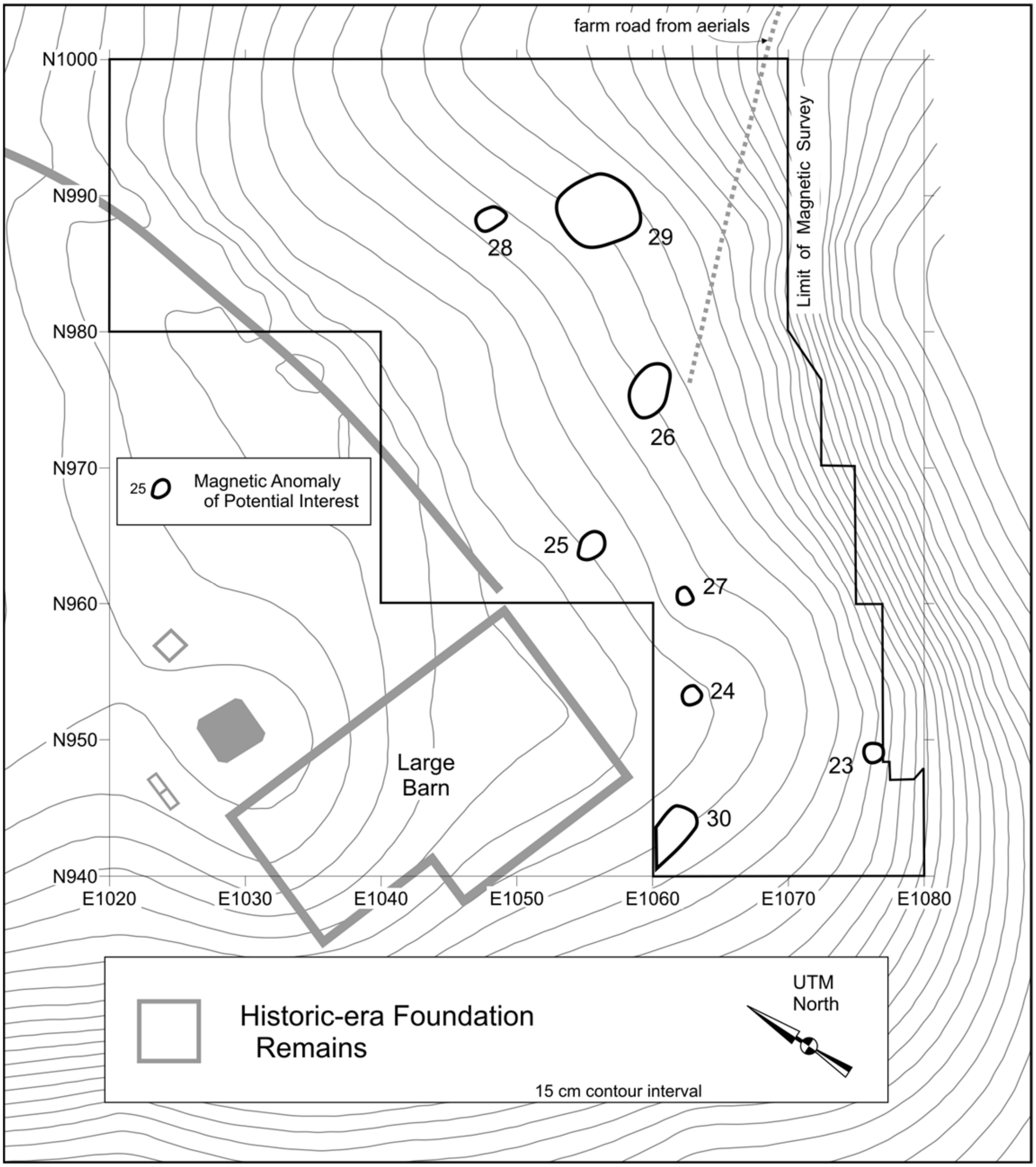

Figure 10.4. Magnetic anomalies of potential interest at 33Pk217.

Table 10.1. Magnetic gradient anomaly data for 33Pk217.

Anomaly #	Northing[a]	Easting	Peak Intensity (nT)[b]	Anomaly Class[c]	Probing Results
23	949.09	1076.36	15.6	MP	Possible iron/pit feature
24	953.33	1062.87	23.54	MP	Probable iron, but possible feature
25	964.39	1055.45	25.07	MP	Probable iron, but large and no dipole
26	975.75	1060	30.04	MP	Large anomaly, strong, too big for iron object, could be burned area?
27	960.45	1062.57	15.78	MP	Possible pit, probable iron
28	988.33	1048.18	22.94	MP/DS	Probable iron, possible pit/burned
29	988.93	1056.51	168	DC	Unusual large anomaly, iron present, probable fence parts, could be other large historic feature
30	943.48	1061.66	23.55	MP/DS	Could be large piece of iron

a – Northing and easting coordinates mark the center of the magnetic gradient anomaly and probing location.
b – Peak intensity recorded from magnetic gradient data after processing with Zero Mean Traverse.
c – MP=Monopolar Positive; MN=Monopolar Negative; DS=Dipolar Simple; DC=Dipolar Complex

ground disturbance activities involving the dumping of transported soil, and/or ground disturbance common to cattle lots (e.g., around feeding stations and in wallows). The lack of obvious prehistoric features in the magnetic data and coring does not preclude the possibility that such features are present at the Stockdale Road Dairy Farmstead. Rather, it shows that the magnetic signatures of historic-era activities have overprinted the site, making it near impossible to see any subtle magnetic anomalies commonly associated with prehistoric archaeological features.

The nine additional 1x1 meter units excavated as part of the prehistoric site Phase II at the Stockdale Road Dairy Farmstead were used to investigate potential features identified from the magnetometer survey (one 1x1 m unit at Anomaly 25) and to better sample artifact concentrations identified in the shovel test survey. The Phase II investigation (combined) resulted in the excavation of 132 m^2 (0.8%) of the approximately 16,000 m^2 site area that defines 33Pk217. This resulted in the recovery of 413 prehistoric artifacts (Table 10.2; Appendix F). No prehistoric archaeological features, however, were identified in the areas tested.

The prehistoric artifact assemblage includes 232 pieces of FCR, two formed artifacts, and 179 pieces of lithic debris. These artifacts show that prehistoric Native Americans occupied site 33Pk217 long before the Stockdale Road Dairy Farmstead occupation.

The FCR, which is somewhat abundant in this assemblage, is made exclusively of sandstone, which was likely procured from Little Beaver Creek along the southeastern edge of the site. With such a sizable FCR assemblage, it is likely that the prehistoric site occupants constructed and used thermal features, such as earth ovens and/or hearths. Unfortunately, the extensive magnetic disturbance caused by the historic occupation made it impossible to detect these thermal features in the magnetic survey.

The formed artifacts in the Stockdale Road Dairy Farmstead assemblage include a late stage biface blank fragment made from Brassfield flint and a bifacial tool fragment made from Vanport flint (Figure 10.5). Metric attributes for these objects are provided in Appendix H. No temporally diagnostic artifacts were recovered. The late stage biface blank fragment represents the middle part of the *primary reduction* stage and was probably discarded as a result of inadvertent breakage during the manufacturing process. Had the reduction process succeeded, this artifact would have been converted into a preform which, in turn, would have become a bifacial tool, such as a projectile point. The small biface tool fragment, which is made from Vanport flint, is probably a projectile point fragment that may have broken in use, rejuvenation (*secondary reduction*), or recycling (*tertiary reduction*).

Table 10.2. 33Pk217 prehistoric artifact inventory.

Stone Type	**FRC**	**Formed Artifacts**	**Lithic Debris**	**Total**
Brassfield	-	1	30	31
Brush Creek	-	-	4	4
Delaware	-	-	70	70
Paoli?	-	-	16	16
Unidentified Black	-	-	10	10
Unidentified Gray	-	-	1	1
Unidentified	-	-	10	10
Upper Mercer	-	-	15	15
Zaleski	-	-	1	1
Vanport	-	1	22	23
Sandstone	232	-	-	232
Total	**232**	**2**	**179**	**413**

The Stockdale Road Dairy Farmstead lithic debris assemblage is dominated by flint types that can be found in the gravel deposits in the Scioto River floodplain (Table 10.2; Appendix F). This is supported by the presence of water-worn cortex on nearly 16 percent of the debris. Nearly all of the lithic debris was generated during the *primary reduction* process and 31 percent is from core (pre-bifacial) reduction. Nearly a quarter (23%) of the debris was generated from the early and late stage percussion biface thinning process for the creation of biface blanks and 40 percent is classified as technologically non-diagnostic debris, meaning it does not exhibit attributes that are indicative of a particular reduction process. The balance, six percent, is classified as pressure flakes, which could have been created during the final stages of the *primary reduction* process or during the *secondary* and *tertiary* reduction processes.

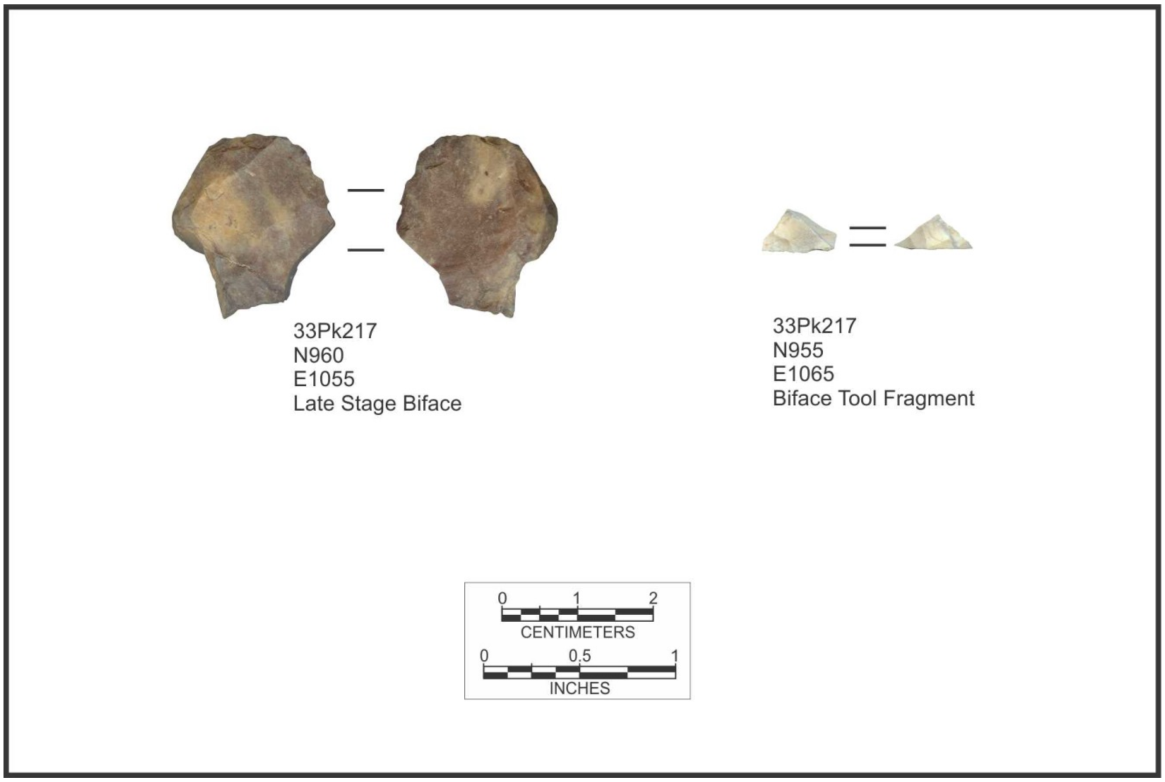

Figure 10.5. 33Pk217 prehistoric formed artifacts.

11. 33PK218 PREHISTORIC COMPONENT

Site 33Pk218, the Cornett Farmstead/House site, is located on a small flat area along the spin of a small dissected toe-ridge near the northeastern edge of PORTS (Figures 1.1 and 1.2). The farmstead site was originally documented during a Phase I survey by Schweikart et al. (1997) and was further investigated at a Phase II level by Pecora and Burks (2012a). The Cornett Farmstead/House site once contained five buildings based on what is visible on the 1938/39 and 1951 aerial photographs. The remains of a house foundation with an internal pit cellar, a root cellar, a well, a privy vault, and a retaining wall were found during the Phase II survey (Figure 11.1). Information gleaned from the property deed records and artifact assemblage suggests that the South Shyville Farmstead was first established around the turn of the twentieth century and was occupied through 1952.

The Phase II investigation involved systematic shovel testing on a 5-meter grid within the core of the site and on a 10-meter grid around the perimeter of the core (Figure 11.1). Besides the shovel testing, a limited number of 1x1 meter excavation units were used to investigate the house foundation, a privy vault, and three radar anomalies within and around the house foundation. In total, the Phase II investigation of the Cornett Farmstead/House site excavated and screened 110.5 m^2 (0.8%) within the approximately 14,000 m^2 site area. The Phase II survey resulted in the recovery of 72 prehistoric-era artifacts besides the numerous historic-era artifacts that were deposited at this location during the early twentieth century farmstead occupation (Table 11.1; Appendix G).

Figure 11.2 illustrates the distribution of prehistoric artifacts within 33Pk218. Most were found a few meters northwest of the house foundation in a concentration measuring about 15x20 meters. Artifacts were found in several other areas of the site to the north and south of the house, including one concentration with a flake tool located at the edge of the floodplain of the small creek that flows by the east side of the house. Because the prehistoric artifacts and the house foundation are functionally, temporally, and culturally unrelated, the juxtaposition of these site elements fortuitous—both the prehistoric and historic occupants of this site used the relatively flat ground overlooking the creek.

The prehistoric artifact assemblage consists of 57 fragments of FCR, 11 pieces of lithic debris, and four formed lithic artifacts. The somewhat sizeable FCR assemblage, which comes predominantly from the concentration to the northwest of the house, shows that thermal features were constructed and used by the prehistoric inhabitants of this site.

The small lithic debris assemblage includes an interior flake, three early and late biface thinning flakes, two pressure flakes, and five flake fragments and shatter. Most of the debris in this assemblage is made from flint types that would have been available in the gravel deposits located in the Scioto River floodplain. Two artifacts, however, resemble Paoli or Carter County Flint, which comes from Kentucky and must have been transported northward, through trade or direct acquisition, for use at Cornett.

The technological analysis of the lithic debris suggests that it was generated during the *primary reduction* process, though the pressure flakes may have been created from tool maintenance (*secondary reduction*) and/or tool recycling (*tertiary reduction*), as illustrated in Figure 3.1.

The four formed artifacts found at the Cornett Farmstead/House site are classified as a projectile point, a uniface, a modified flake tool, and a flint nodule (Figure 11.3). Metrics for these formed artifacts are provided in Appendix H. The projectile point, which is made from

Brassfield flint, is missing its base, but it retains the entire length of the lozenge-shaped, beveled blade. Without its base, the most diagnostic part of the projectile, it is difficult to compare this object to established types, but the object's blade somewhat resembles the blades of Lamoka type projectile points. Furthermore, it is similar to the complete specimen recovered from Ruby Hollow Farmstead. The Lamoka type has been found in contexts that date to 3500-2500 B.C. (Justice 1987). The presence of this artifact in this assemblage suggests that the Cornett Farmstead/House site may have been occupied approximately 5500-4500 years ago, during the Late Archaic period.

The uniface tool is a large Upper Mercer flint flake with edge modification (Figure 11.3). The flake would have been detached from a core and, had it not been modified into a tool, would have been classified as an interior flake. It is called a uniface because it has unidirectional flaking along one margin to form a steep or blunt edge. This flaking creates the working-edge of what is frequently interpreted to be a scraping tool for working hides and other materials.

The modified flake tool fragment is made from what appears to be Paoli flint (Figure 11.3). Like the uniface, it is an interior flake with flaking along one margin. Unlike the uniface, the flaking is very small and forms a much lower angle. Edges with this type of flaking are often interpreted to be working edges (i.e., the cutting edge). However, this kind of small, low-angle flaking is more likely meant to dull the edge, producing a *backing* that would have functioned in a similar way to the flat and dull back edge of a modern knife.

The flint nodule (not depicted in Figure 11.3) is made from Delaware flint with water-worn cortex. Outside of an archaeological site context, this object would not be classified as an artifact. It, however, must have been transported to 33Pk218 by the site's prehistoric inhabitants as a source of raw material for stone tool manufacture.

Table 11.1. 33Pk218 prehistoric artifact inventory.

Material	**FRC**	**Formed Artifacts**	**Lithic Debris**	**Total**
Brassfield		1		1
Delaware		1	2	3
Paoli?		1	1	2
Sandstone	57			57
Unidentified			1	1
Upper Mercer		1	2	3
Vanport			5	5
Total	**57**	**4**	**11**	**72**

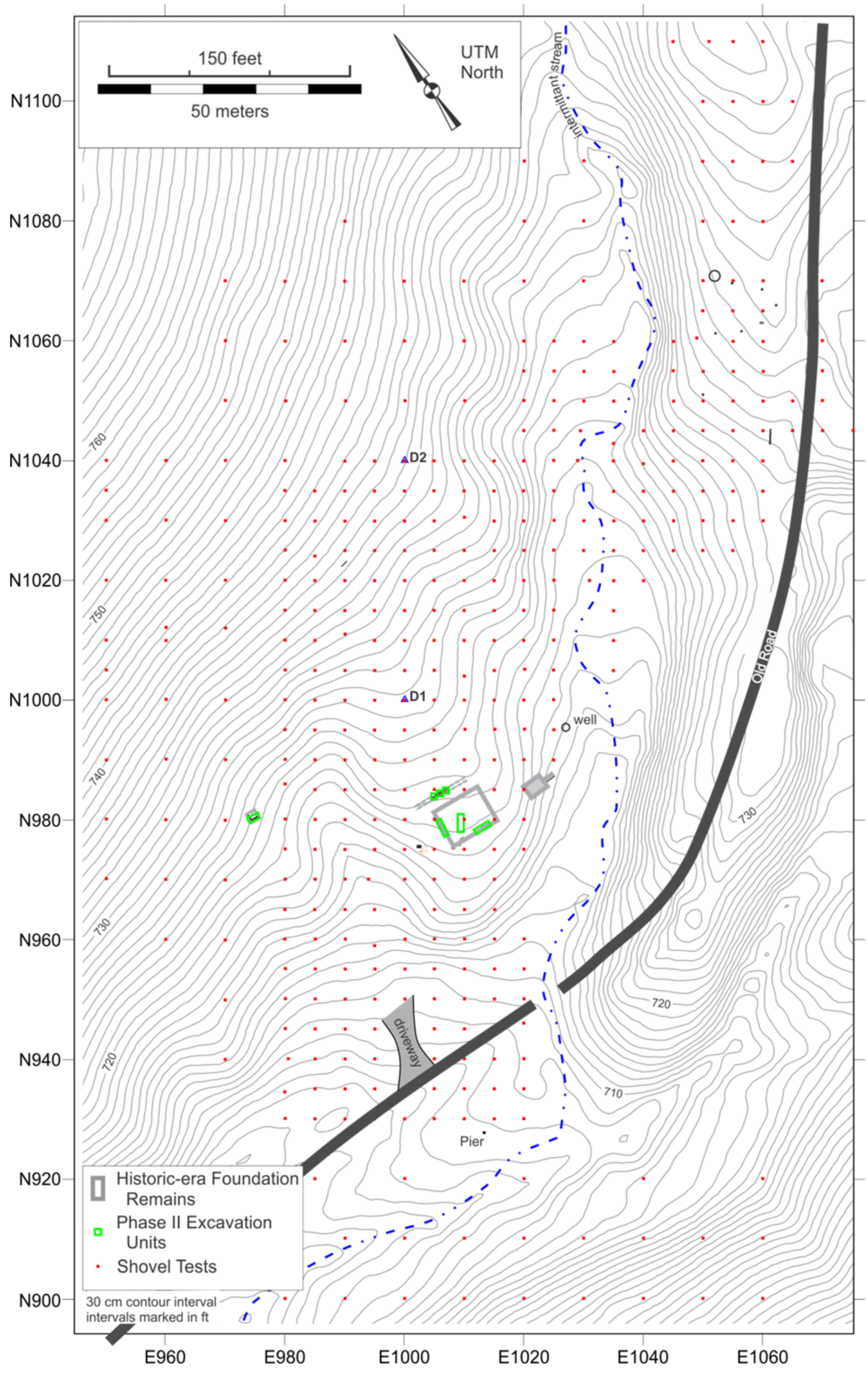

Figure 11.1. 33Pk218 site map showing Phase II fieldwork.

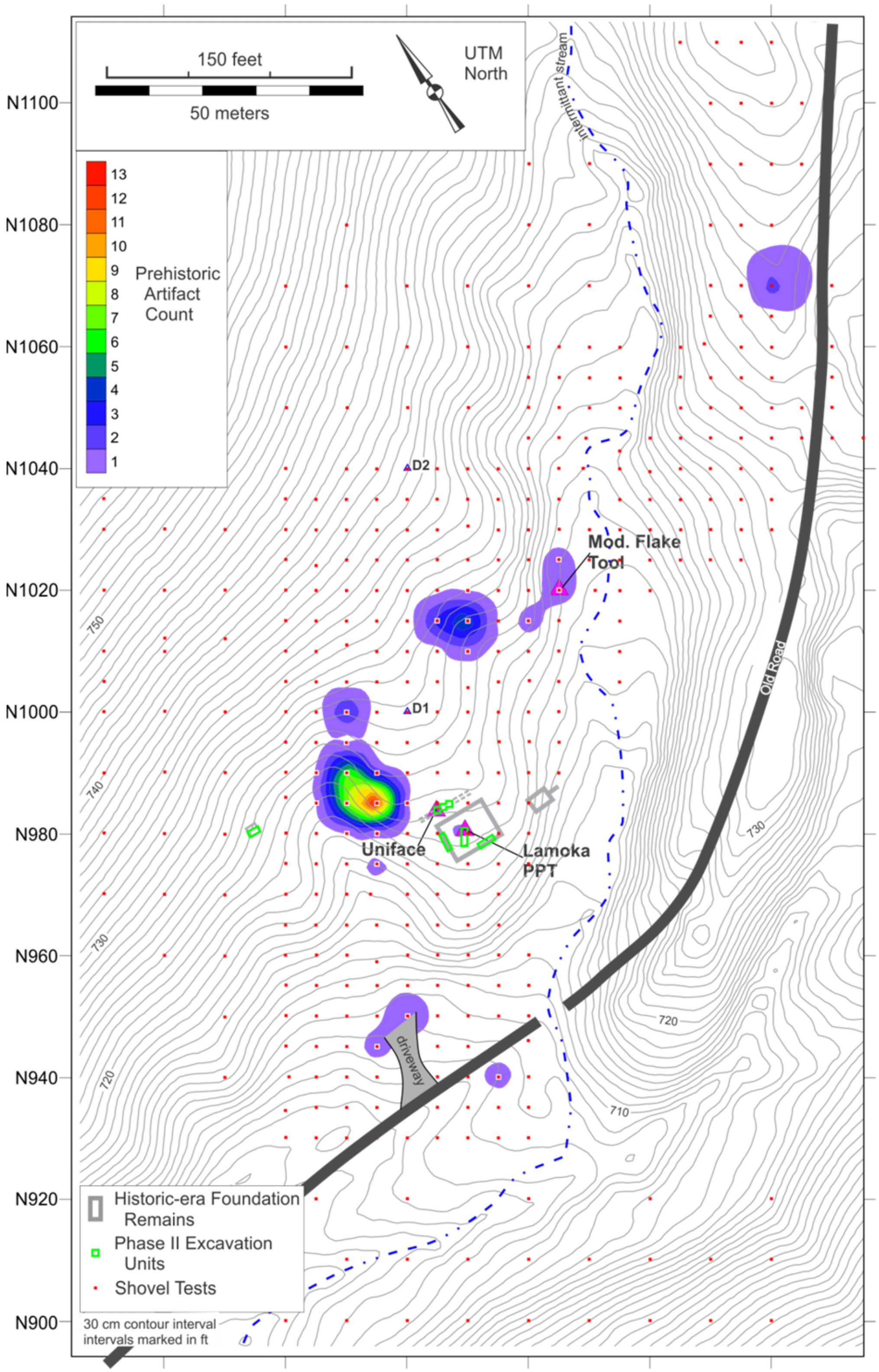

Figure 11.2. 33Pk218 site map showing prehistoric artifact distribution.

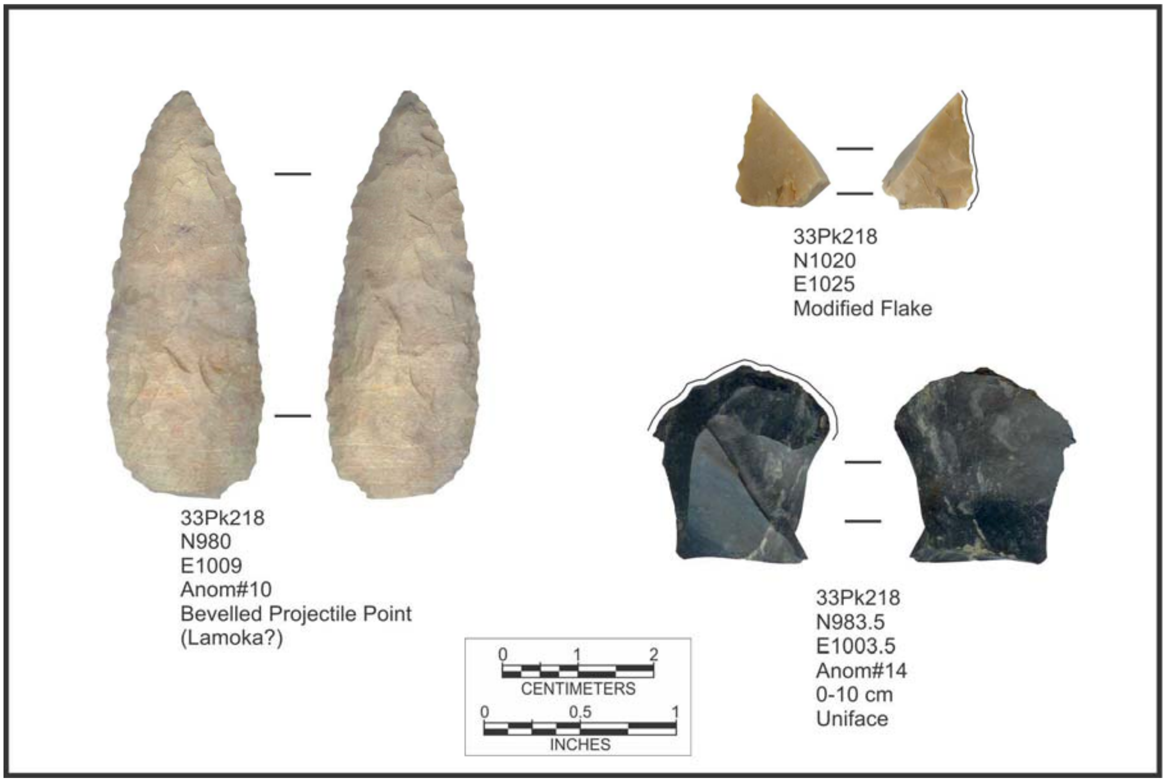

Figure 11.3. 33Pk218 prehistoric formed artifacts.

12. SUMMARY AND CONCLUSIONS

The prehistoric archaeological components considered in this report were found while conducting Phase II surveys at six PORTS historic-era farmstead sites (33Pk185, 33Pk203, 33Pk206, 33Pk211, 33Pk217, and 33Pk218) (Pecora and Burks 2012a). Investigations to identify historic-era archaeological resources at each site involved the excavation of shovel tests on a 5-meter grid and it was the shovel testing process that initially identified the prehistoric components at each site. Archival research and analyses of the historic-era artifact assemblages show that the farmstead sites were established in the middle to late nineteenth century and were occupied until the middle part of the twentieth century. These historic-era occupations resulted in the construction of farm houses, barns, outbuildings, fences, wells, and cisterns, and resulted in the deposition of large quantities of historic-era artifacts. The farmstead occupations also produced ground disturbances associated with the construction of buildings, landscaping, roadways, cultivation, pasturing, and other activities associated with farming life. Before the establishment of the farmsteads, the native trees and their root systems would have been removed, probably during the early part of the nineteenth century. After the farms were purchased by the United States government during the early 1950s, the farmstead buildings were razed and, excluding portions of many building foundations, the razed building materials were removed to an unknown location. The ground surfaces within each of the six sites show large tire ruts, bulldozer paths, and push-piles, which reveal that heavy machinery, must have been used during the razing process. It is clear that during the course of roughly 150 years, the landscapes containing these farmsteads have been greatly altered. Such ground alterations would have had some impact on earlier prehistoric archaeological resources contained within the bounds of the farmsteads, but good evidence of prehistoric occupations was still found, including tight clusters of prehistoric artifacts.

The identification of prehistoric components at each of the six historic-era farmsteads shows that each of the sites was previously occupied by one or more Native American groups. Based on the temporally diagnostic artifacts found with some of the prehistoric components, these prehistoric occupations likely occurred at a time when hunter-gatherer groups lived in southern Ohio. Evidence of their occupations, especially in topographic settings like those found at PORTS, can be very difficult to detect in archaeological surveys. The effects of the later historic-era farmstead activity on the prehistoric archaeological deposits complicates the detectability of these prehistoric sites as certain land modifications, such as deep plowing, will often completely remove prehistoric subsurface features. As is described above, features such as hearths, earth ovens, post-mold structure foundations, and storage pits, are important sources of archaeological information about domestic sites located in Ohio’s uplands. Features not only inform archaeologists about how prehistoric occupations were organized (site structure), but they also often contain dietary and temporal information in the form of carbonized plant remains and animal bone. These data sources enable archaeologists to infer (1) when sites were occupied, (2) what types of activities occurred during the occupation(s), and (3) what was made and consumed during the occupation(s).

Present at each of the six sites are prehistoric artifact middens—that is, accumulations of artifacts that built up on the surface during the site occupations. During the millennia since the sites were occupied, the artifacts in these middens have become part of the topsoil layer at each site. Middens are just as important archaeologically as subsurface features. They provide information about refuse disposal behavior and tool manufacture and use, the age of the site (in the form of temporally diagnostic artifacts), and other various activities. In fact, middens contain the majority of the artifacts deposited at any given site. Although they, too, can be damaged and disturbed by later historic-era farmstead activities, the artifacts contained in middens are seldom removed from a site (as is often the case with features, when they are plowed up), except when they are collected by relic hunters. To remove a site's artifacts in an appreciable way would require large-scale cutting and filling. Although all six farmsteads contain evidence of fairly substantial surface disturbance, there is no evidence of major earth removal at a scale that would have drastically impacted the middens at these six sites. Therefore, the prehistoric middens still present at these sites contain large numbers of artifacts, of which the objects reported here are just small samples. Importantly, discrete clusters of objects were found at all six sites, showing that these sites also still have some level of structural integrity within their middens.

Prehistoric upland sites, like those considered in this study, have the potential to contain information that is important to our understanding of prehistory. They are components of larger and more complex settlement systems used by Ohio's prehistoric inhabitants. Aside from those few archaeological sites that may retain evidence of unusual behavior or, perhaps, contain rarely found temporal components (e.g., Paleoindian or earlier), the presence of intact or relatively intact archaeological features (along with their associated artifact assemblages) is important for an upland domestic site to be considered archaeologically significant. It is from this perspective that the NRHP eligibility assessments are made for sites 33Pk185, 33Pk203, 33Pk206, 33Pk211, 33Pk217, and 33Pk218 in this study.

Table 12.1 summarizes the archaeological findings from all six sites and includes information about: (1) site size, (2) percentage of area excavated, (3) number of prehistoric artifacts recovered, (4) the average number of prehistoric artifacts recovered per shovel test, (5) the presence or absence of identified prehistoric archaeological features, (6) prehistoric temporal components identified, and (7) recommendation for or against NRHP eligibility. The site sizes range from 10,000 m^2 to more than 18,000 m^2, but these site areas refer to the amount of area surveyed to investigate the historic-era farmstead components. Thus, these site sizes are larger than the areas that contain the prehistoric artifacts. The artifact distribution maps, derived from systematic shovel test data and illustrated in Figures 6.2, 7.2, 8.2, 9.2, 10.2, 11.2, show that prehistoric artifacts were found widely scattered and in small numbers across each of the site areas. At sites 33Pk203 and 33Pk217, however, larger and denser concentrations of prehistoric artifacts were found on the outer margins of the historic-era components of the sites. This finding, in part, prompted the additional investigations to focus on the prehistoric components of sites 33Pk203 and 33Pk217. To aid in the location of subsurface prehistoric features, magnetic gradient data were collected in areas thought to contain few historic-era features and objects.

The number of prehistoric artifacts recovered from sites 33Pk185, 33Pk203, 33Pk206, 33Pk211, 33Pk217, and 33Pk218 ranges from as few as 24 from 33Pk185 to as many as 816 from 33Pk203 (Table 12.1). By far, 33Pk203 and 33Pk217 produced the largest assemblage. In part, this is because both sites were subjected to additional excavations that focused on the areas of the sites containing the highest densities of prehistoric artifacts. It is possible that comparably larger prehistoric artifact assemblages could have been recovered from the four other sites had similar additional excavations been conducted.

Table 12.1. Archaeological summary of sites 33Pk185, 33Pk203, 33Pk206, 33Pk211, 33Pk217, and 33Pk218.

Site No.	Site Size	Percentage of Area Excavated	Number of Prehistoric Artifacts	Average Number of Artifacts Per Shovel Test	Archaeological features Identified	Prehistoric Temporal Components	NRHP Eligible
33Pk185	18,575 m^2	0.5%	24	0.04	no	Prehistoric	no
33Pk203*	10,000 m^2	1.0%	816	0.25	**no	Early Archaic; Late Archaic; Early Woodland	no
33Pk206	14,000 m^2	0.7%	30	0.04	no	Prehistoric	no
33Pk211	18,000 m^2	0.6%	89	0.19	no	Middle-Late Archaic	no
33Pk217*	16,000 m^2	0.8%	413	0.35	**no	Prehistoric	no
33Pk218	14,000 m^2	0.8%	72	0.13	no	Late Archaic	no

* refers to sites where additional Phase II-level field work was conducted to further investigate prehistoric components. **refers to sites where magnetometer was used in an effort to detect archaeological features

The average number of prehistoric artifacts per shovel test is another way to measure the character of artifact density at these sites. Among the six sites presented in this report, this density measure ranges from 0.04 artifacts per shovel test at sites 33Pk185 and 33Pk206 to 0.35 artifacts per shovel test at 33Pk217. With similar shovel testing techniques used at all six sites (i.e., a 5-meter grid across the core of the site and a 10-meter grid around the periphery), these data independently show that sites 33Pk203 and 33Pk217 contain the largest quantity of prehistoric artifacts.

Because there is very little difference in how flint was used at these six locations, as all six lithic assemblages reflect opportunistic uses of locally available stone that would have been available in the Scioto River floodplain, it may be inferred that the lithic debris assemblage sizes are a reflection of the longevity of the prehistoric occupations at each site—longer occupations produced a larger number of artifacts in the site midden. Another factor is the number of occupations represented at each site, as assemblage size also may be an indication of the number of different occupations (sites with fewer objects may have been occupied fewer times). Of course, not all occupations involved the same kinds of flint knapping activities. Thus, a third plausible, and often overlooked, explanation is that some occupations did not involve the use or manipulation of much stone at the earlier reduction stages. More simply put, it may be that little or no primary reduction (tool manufacture), as is illustrated in Figure 3.1, occurred at those sites with small lithic debris assemblages, and yet they were occupied just as many times or for as long a duration as sites with numerous artifacts. One way to determine if this “reduction stage effect” is having a big impact on the formation of the archaeological assemblages related to a group of sites is to compare the relative amounts of primary versus secondary reduction debris in their assemblages. It is possible that sites with little primary reduction debris are rich in secondary (tool maintenance) and tertiary (tool recycling) debris. However, the debris from secondary and tertiary reduction is often very small and unrecoverable using standard archaeological methods (i.e., ¼-inch mesh screening). This scenario may help explain some of the variability among these six PORTS sites, and it can be observed in the formed artifact assemblage from a site, which tends to correspond with debris density. Sites containing manufacturing discards (core and blank fragments), which are parts of the primary reduction process, tend to be associated with higher debris density sites. Those sites with few manufacturing discards but more true tools, which represent *secondary* and *tertiary* reduction, tend to be associated with lower debris densities.

Excluding site 33Pk185, all sites produced formed lithic artifacts, that is, manufacturing discards and/or tools. Site 33Pk203 produced the largest formed artifact assemblage and is associated with the second highest debris density. This assemblage contains two core fragments and a modified flake blank fragment (*primary reduction*), a late stage biface (tool?) fragment, three projectile points, and a biface tool fragment. Most of the tools in the 33Pk203 assemblage would represent *secondary* reduction, but one has been recycled and represents *tertiary* reduction. Site 33Pk206 produced a single projectile point (*secondary reduction*) in association with the lowest debris densities observed among the six sites. Site 33Pk211 produced two tools including a projectile point (*secondary reduction*) and a drill fragment (*possibly representing tertiary reduction*) and no production discards. Lithic debris density at 33Pk211 is moderately low. Site 33Pk217 produced only two formed artifacts, including a late stage biface blank fragment (*primary reduction*) and a small bifacial tool fragment (*tertiary reduction*), despite having the largest debris assemblage. Site 33Pk218 produced three tools, including a projectile point, a uniface/scraper tool, and a modified flake tool, but no production discards. This reflects one of the larger of the six tool assemblage, despite the fact that 33Pk218 produced a small debris assemblage.

Another important artifact class to consider is fire-cracked rock. All six sites produced FCR, which is good evidence that the prehistoric residents at these sites made and used thermal features. Locally available sandstone was most often used in these thermal activities, and it could be gathered from the nearby side-slopes and small stream bottoms. In one instance, at site 33Pk203, a small amount of igneous rock was used in thermal features. The source of this material is not known, but several investigations of the adjacent Little Beaver Creek revealed no evidence of rock of this type. The closest likely source for igneous cobbles is the Scioto River floodplain, located several miles to the west. Why the occupants of 33Pk203 would expend the effort to acquire these igneous rocks from such a distance, when sandstone was readily available, is unknown. Perhaps these igneous rocks were purposefully transported from a previous occupation, because of their known thermal properties, or they were part of some larger toolkit that was transported from site to site. Regardless of the source, the presence of FCR at these sites is an important indicator for the potential presence of intact subsurface features.

Magnetometer surveys designed to identify potential prehistoric archaeological features at sites 33Pk203 and 33Pk217 identified numerous magnetic anomalies, but in spite of coring at each anomaly and larger scale excavations designed to further explore several anomalies, no subsurface prehistoric features were located at either site. This suggests that (1) there were never any subsurface features present at these sites and all of the FCR was produced in surface hearths/feature, (2) the subsurface features at these sites have been destroyed through plowing or other historic-era activity, and/or (3) the magnetic signatures of historic-era ground disturbances are masking the magnetic signatures of the prehistoric features.

Despite the lack of known prehistoric features and samples for radiometric dating, temporal data was obtained from three sites (33Pk203, 33Pk211, and 33Pk218) in the form of temporally diagnostic projectile points. These data suggest that the prehistoric archaeological record at site 33Pk203 was created during three distinct time periods: Early Archaic, Late

Archaic, and Early Woodland. The Early Archaic component is represented by a projectile point consistent with types in the Kirk Corner Notch Cluster, which have been dated to 7500-6900 B.C (Justice 1987). The Late Archaic component is represented by a projectile point that resembles the Lamoka type; and the Early Woodland component is represented by a recycled specimen that resembles types within the Early Woodland Stemmed Cluster. The Lamoka type dates to about 5500-4500 B.C. and the early Woodland Stemmed Cluster dates to the period 1000 B.C. to 200 B.C. (Justice 1987). Having the largest and most diverse formed artifact assemblage, it is not surprising that 33Pk203 was created by at least three distinct prehistoric occupations.

At least one temporal component is represented in the 33Pk211 assemblage. The Matanzas type point found there traditionally dates to the Late Archaic period (2980-1723 B.C. and 3700-2000 B.C), but it may date as far back as 4000 B.C. (Pecora and Burks 2006).

Site 33Pk218 produced the blade portion of what appears to be a Late Archaic Lamoka type point similar to what was recovered from 33Pk203. Unlike the 33Pk203 specimen, however, the 33Pk218 point has a heavily beveled blade.

The combined temporal data from 33Pk203, 33Pk211, and 33Pk218 demonstrates the PORTS landscape was occupied by hunter-gathers as far back as 9500 years ago and as recently as 3200 years ago. Several of the other PORTS prehistoric sites have produced radiometric dates and artifacts corresponding with these same time periods and as recent as about 400-500 years ago (see Pecora and Burks 2013a). The only temporal periods not represented amongst the PORTS prehistoric sites (those within the 3,777-acre reservation) are the Paleoindian and Middle Woodland periods, as well as possibly the Middle Archaic period. The lack of Middle Woodland period sites is somewhat surprising given the proximity of Middle Woodland period earthwork complexes to the southwest, west, and northwest of PORTS (see Burks 2011).

Based on data presented in this report, sites 33Pk185, 33Pk203, 33Pk206, 33Pk211, 33Pk217, and 33Pk218 do not appear to be individually eligible for inclusion into the National Register of Historic Places, under Criterion D. Of the six, sites 33Pk203 and 33Pk217 were thought to have the greatest archaeological potential based on their higher-density artifact clusters located away from the historic-era farmstead core areas. Despite attempts to locate archaeological features at these sites using a magnetometer survey, none were found. A similar field approach (shovel testing and magnetic gradient survey) used at four other PORTS sites (33Pk347, 33Pk348, 33Pk371, and 33Pk372) worked extremely well and identified numerous features of diverse types and temporal affiliations (Pecora and Burks 2013a). One potential explanation for the differences between the two groups of sites is that 33Pk347, 33Pk348, 33Pk371, and 33Pk372 are located far from known historic farmstead sites and in areas that have never been cultivated, which may have resulted in ideal site preservation conditions, whereas sites 33Pk185, 33Pk203, 33Pk206, 33Pk211, 33Pk217, and 33Pk218 have been adversely affected by historic-era plowing and other farmstead-related activities. Whatever the case may be, no further work is recommended for the prehistoric components of sites 33Pk185, 33Pk203, 33Pk206, 33Pk211, 33Pk217, and 33Pk218.

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14. APPENDIX A: ARTIFACT INVENTORY APPENDICES KEY

SS	Sandstone
Igneous	Igneous Stone
UM/Zal	Black Flint; Upper Mercer or Zaleski Flint
Unid	Unidentified Flint; various low grade cherts
Van	Vanport Flint; Flint Ridge Flint
Del	Delaware Flint
Brass	Brassfield Flint
Brush	Brush Creek Flint
Paoli	Possible Paoli Flint

FCR	Fire Cracked Rock; Thermal Stone; Burnt Stone
Mod Blank	Tabular Flint Nodule or Spall that has been bifacially modified
P.Point	Projectile Point
Mod. Flake	Modified Flake Tool
Frag	Fragment

Prim Decort	Primary Decortication Flake; 100% cortex on dorsal surface
Sec Decort	Secondary Decortication Flake; <100% cortex on dorsal surface
Int	Interior Flake; not bifacial
Bipolar	Flake with bipolar attributes
Edge Prep	Edge Preparation Flake
Alt	Alternate Flake
EBT	Early Percussion Biface Thinning Flake
LBT	Late Percussion Biface Thinning Flake
Pressure	Biface Thinning Pressure Flake
Notch	Biface Notching Flake
FF	Non-diagnostic Flake Fragment
SH	Flint Shatter
WW	Water Worn
cmbs	Centimeters below surface

15. APPENDIX B: 33PK185 PREHISTORIC ARTIFACT INVENTORY

N	E	Unit	cm bs	Stone	FCR	Sec Decort	Interior	Burnt Shatter	Total
Pit Cellar	NW1/4		20-30	Van			1		1
Pit Cellar	NW1/4		40-50	Van		1			1
1010	995	50x50		Van				1	1
Pit Cellar	NW 1/4	1x1	40-50	SS	1				1
Unit D		1x1	0-10	SS	3				3
1020	1010	50x50		SS	1				1
1005	995	50x50		SS	2				2
1010	1020	50x50		SS	1				1
1030	1030	1x1	0-30	SS	1				1
1000.5	1000	50x50		SS	7				7
1010	995	50x50		SS	5				5
Total					21	1	1	1	24

16. APPENDIX C: 33PK203 PREHISTORIC ARTIFACT INVENTORY

33Pk203 Lithic Debris

N	E	Unit	cm bs	Stone	Quarry Shatter WW	Primary Decort ww	Sec Decort ww	Interior	Primary Decort-Alt ww	Sec Decort Alt ww	Interior Alt	EBT	LBT	Biface Rejuvenation-Alternate Flake	Pressure Flake	Flake Fragment	Shatter	Burnt FF	Burnt Shatter	Total
945	1050	1x1	10-20	Del												1				1
946	1050	1x1	10-20	Del			1													1
946	1049	1x1	10-20	UM												1				1
960	959.5	50x50	0-30	Del		1														1
970	985	50x50	0-30	UM								1								1
975	965	50x50	0-30	Vanport										1						1
975	1055	50x50	0-30	Paoli?												1				1
980	970	50x50	0-30	Del									1							1
985	1010	50x50	0-30	UM															1	1
985	1010	50x50	0-30	Del							1									1
990	945	50x50	0-30	Brass												1				1
990	974.5	1x1	0-26	Brass									1							1
990	974.5	1x1	0-26	Del												1				1
990	974.5	1x1	0-26	Black								1						1		2
990	974.5	1x1	0-26	Vanport									1		1					2
990	974.5	1x1	0-26	Del				1					1							2
990	974.5	1x1	0-26	Del		2		1				1				2				6
990.5	945	50x50		Brass									1							1
991	996	1x1	0-23	Del		2							1		2	1				6
991	996	1x1	0-23	Gray												1				1
991	996	1x1	0-23	Del												1				1
999	975	1x1	0-30	Brass		1	1				1		2							5
999	975	1x1	0-28	UM									1							1
999	975	1x1	30-40	Del									1							1
999	975	1x1	0-30	UM								1								1
999	975	1x1	40-50	Unid															1	1
999	975	1x1	40-50	Del											1					1
999	975	1x1	40-50	Gray												2				2
999	975	1x1	0-28	gray												2				2
999	975	1x1	0-28	Brass													2			2
999	975	1x1	0-30	Black												1		1	1	3
999	975	1x1	0-30	Del			1	2								4				7
999	976	1x1	30-40	Del			1									1	1			3
999	976	1x1	0-30	Del				2					1							3
999	976	1x1	0-30	Del		1														1
999	976	1x1	0-30	Vanport													1			1
999	976	1x1	40-50	Black			1													1

33Pk203 Lithic Debris

N	E	Unit	cm bs	Stone	Quarry Shatter WW	Primary Decort ww	Sec Decort ww	Interior	Primary Decort-Alt ww	Sec Decort Alt ww	Interior Alt	EBT	LBT	Biface Rejuvenation-Alternate Flake	Pressure Flake	Flake Fragment	Shatter	Burnt FF	Burnt Shatter	Total
999	976	1x1	40-50	Del							1									1
999	976	1x1	0-30	Gray		1														1
999	976	1x1	0-30	Vanport									1							1
999	976	1x1	40-50	Gray												1			1	2
1000	975	50x50	0-20	Del			1									1				2
1001	1001.5	1x1	20-30	Vanport										1						1
1002	1001.5	1x1	10-20	Paoli?		1														1
1006	956	1x1	0-40	Del											1					1
1006	956	1x1	0-40	Brass												1	1			2
1009	956	1x1	0-40	Del			1									1				2
1009	956	1x1	0-40	Vanport									3			3				6
1009	956	1x1	0-40	Brass			1						1			2			2	6
1020	940	50x50	0-30	Gray			1													1
1020	945	50x50	0-30	Vanport									1							1
1020	985	50x50	0-30	Brass									1							1
1022	920	1x1	0-20	Brass												1				1
1022	920	1x1	0-20	Del			1										1			2
1022	920	1x1	0-20	Vanport								1	1							2
1022	920	1x1	0-20	Black												4				4
1025	940	50x50	0-30	UM									1							1
1030	920	50x50	0-20	Del												3				3
1030	910	50x50	0-30	Del		1														1
1030	915	50x50	0-30	Brass			1													1
1030	915	50x50	0-30	Vanport									1							1
1030	915	50x50	0-30	Del												1				1
1030	920	50x50	0-20	Vanport									2			1				3
1030	925	50x50	0-20	Del		1			1											2
1030	945	50x50	0-30	UM								1								1
1032	924	1x1	0-25	UM													1			1
1032	924	1x1	0-25	Del									1			1				2
1032	919	1x1	0-40	Unid	1													1		2
1032	919	1x1	0-40	UM								1				1				2
1032	924	1x1	0-25	Vanport												2				2
1032	919	1x1	0-40	Black												1		1	1	3
1032	919	1x1	0-40	Vanport									3							3
1032	919	1x1	0-40	Brass			1						1			1				3
1032	919	1x1	0-40	Brass									1			3				4
1032	919	1x1	0-40	Del		1	1	1				1	1			5				10
1032	919	1x1	0-40	Del	1	2	3	1	1		1	1	5			4	1	2		22

33Pk203 Lithic Debris																				
N	**E**	**Unit**	**cm bs**	**Stone**	**Quarry Shatter WW**	**Primary Decort ww**	**Sec Decort ww**	**Interior**	**Primary Decort-Alt ww**	**Sec Decort Alt ww**	**Interior Alt**	**EBT**	**LBT**	**Biface Rejuvenation-Alternate Flake**	**Pressure Flake**	**Flake Fragment**	**Shatter**	**Burnt FF**	**Burnt Shatter**	**Total**
1032	924	1x1	0-25	Del		1		1				1	1		3	2	1			10
Unit A		1x1	0-10	UM									1							1
Unit H		1x1	100-110	Del			1													1
Unit H		1x1	80-90	Del		1														1
Total					**2**	**16**	**17**	**9**	**2**		**4**	**10**	**37**	**2**	**8**	**59**	**9**	**6**	**7**	**188**

33Pk203 Formed Artifacts and FCR													
N	**E**	**Unit**	**cm bs**	**Stone**	**FRC**	**Core ww**	**Mod Flake Blank ww**	**Kirk PPT**	**Lamoka PPT**	**Early Woodland Stemmed PPT ww**	**LS Biface Fragment**	**Biface Tool Tip**	**Total**
955	1000	50x50	0-20	SS	2								2
980	945	50x50	0-20	Gray					1				1
980	1000	50x50	0-20	SS	1								1
980	1000	50x50	0-20	SS	1								1
990	974.5	1x1	0-26	Igneous	1								1
990	974.5	1x1	0-26	SS	6								6
990	974.5	1x1	0-26	SS	31								31
990	974.5	1x1	0-26	SS	85								85
990	974.5	1x1	0-26	SS	39								39
990	965	50x50	0-20	UM				1					1
991	966	1x1	0-23	SS	2								2
991	966	1x1	0-23	SS	10								10
995	970	50x50	0-20	Del			1						1
999	975	1x1	40-50	SS	10								10
999	975	1x1	30-40	SS	17								17
999	975	1x1	0-28	SS	17								17
999	975	1x1	0-30	SS	18								18
999	975	1x1	0-28	SS	36								36
999	976	1x1	40-50	SS	1								1
999	976	1x1	30-40	UM			1						1
999	976	1x1	0-30	SS	8								8

33Pk203 Formed Artifacts and FCR													
N	**E**	**Unit**	**cm bs**	**Stone**	**FRC**	**Core ww**	**Mod Flake Blank ww**	**Kirk PPT**	**Lamoka PPT**	**Early Woodland Stemmed PPT ww**	**LS Biface Fragment**	**Biface Tool Tip**	**Total**
999	976	1x1	30-40	SS	3								3
1000	980	50x50	0-20	SS	1								1
1009	956	1x1	0-40	SS	57								57
1015	910	50x50	0-20	SS	2								2
1015	915	50x50	0-20	SS	3								3
1020	985	50x50	0-20	Del						1			1
1020	920		0-20	SS	10								10
1020	985	50x50	0-20	SS	8								8
1022	920	1x1	0-20	SS	20								20
1025	910	50x50	0-20	SS	4								4
1025	915	50x50	0-20	SS	8								8
1030	915	50x50	0-20	Igneous	3								3
1030	915	50x50	0-20	SS	4								4
1030	920	50x50	0-20	Del		1							1
1030	940	50x50	0-20	Brass							1		1
1032	919	1x1	0-40	SS	124								124
1032	919	1x1	0-40	Unid								1	1
1032	924	1x1	0-25	SS	69								69
Unit A	-	1x1	10-20	SS	3								3
Unit A	-	1x1	0-10	SS	14								14
Unit B		1x1	0-20	SS	1								1
Unit G		1x1	10-20	SS	1								1
Total					**620**	**1**	**2**	**1**	**1**	**1**	**1**	**1**	**628**

17. APPENDIX D: 33PK206 PREHISTORIC ARTIFACT INVENTORY

N	E	Unit	cm bs	Stone	FCR	PPT Biface Mid	Prim Decort	Sec Decort	Quarry Shatter	Prim Decort Alt	Interior	LBT	Flake Frag	Total
950	1035	50x50	`	Gray							1			1
965	1040	50x50		SS	2									2
995	1030	50x50		Del				1						1
955	1035	50x50		Gray						1				1
968.5	1024	1x1	30-40	Brush								1		1
968.5	1024	1x1	30-40	Del									1	1
968.5	1024	1x1	40-50	Del								1		1
968.5	1024	1x1	40-50	UM								1		1
968.5	1024	1x1	40-50	Del				1			1			2
968.5	1024	1x1	80-90	Van								1		1
968.5	1024	1x1	60-70	Del			1				1			2
968.5	1024	1x1	60-70	Brush								1		1
969.5	1024	1x1	10-20	Del									1	1
969.5	1024	1x1	20-30	Del					1					1
1000	1040	50x50		Del									1	1
1015	985	50x50	0-24	SS	2									2
1034.5	1006	1x1	10-20	Van							1			1
1034.5	1005	1x1	10-20	UM		1								1
1034.5	1006	50x50	10-20	SS	1									1
1045	1020	50x50		Brass									1	1
1045	990	50x50	10-20	SS	1									1
1055	955	50x50		Van				1						1
Unit F		0.5x1	20-30	UM				1						1
Unit F		0.5x1	0-10	UM							1			1
Unit C		1x1	20-25	SS	2									2
Total					**8**	**1**	**1**	**4**	**1**	**1**	**5**	**5**	**4**	**30**

18. APPENDIX E: 33PK211 PREHISTORIC ARTIFACT INVENTORY

N	E	Unit	cm bs	Material	FCR	Drill	PPT	Sec Decort	Interior	EBT	LBT	FF	Shatter	Total
945	970	50x50	0-20	SS	2									2
950	970	50x50	0-20	SS	7									7
955	970	50x50	0-20	SS	4									4
955	975	50x50	0-20	SS	2									2
960	930	50x50	0-20	SS	4									4
960	975	50x50	0-20	SS	4									4
960	995	50x50	0-20	Del					1					1
965	970	50x50	0-20	SS	5									5
965	990	50x50	0-20	Del						1				1
965	990	50x50	0-20	SS	6									6
965	1000	50x50	0-20	black					1					1
965	970	50x50	0-20	Del				1						1
970	920	50x50	0-20	SS	2									2
970	975	50x50	0-20	SS	1									1
970	980	50x50	0-20	SS	6									6
980	980	50x50	0-20	SS	3									3
984.5	977	1x1	0-20	UM							1		1	2
986.5	977	1x1	20-30	Del							1			1
986.5	976	1x1	60-70	SS	1									1
986.5	976	1x1	80-90	SS	3									3
990	980	50x50	0-20	SS	3									3
995	975	50x50	0-20	SS	7									7
995	975	50x50	0-20	Del							1			1
995	975	50x50	0-20	Gray									1	1
1000	980	50x50	0-20	Del				1						1
1000	980	50x50	0-20	SS	8									8
1010	975	50x50	0-20	SS	1									1
1040	975	50x50	0-20	SS	5									5
Privy		1x1	70-80	Unid									1	1
Privy		1x1	50-60	Brass					1					1
Unit E		1x1	0-10	Del			1							1
Unit F		1x1	10-20	Del		1								1
Privy		1x1	70-80	Brass								1		1
Total					**74**	**1**	**1**	**2**	**3**	**1**	**3**	**1**	**3**	**89**

19. APPENDIX F: 33PK217 PREHISTORIC ARTIFACT INVENTORY

N	E	Unit	cm bs	Stone	FRC	LS Biface Fragment	Biface Tool Fragment	Primary Decort ww	Sec. Decort ww	Interior	Primary Decort-Alternate ww	Sec Decort- Alt ww	EBT	LBT	Pressure Flake	Flake Fragment	Burnt Flake Frag	Burnt Shatter	Shatter	Total
920	1079.5	50x50	0-20	Del								1								1
930	1060	50x50	0-20	Van						1										1
930	1080	50x50	0-20	Paoli?															1	1
930	1080	50x50	0-20	Brass										1						1
950	1020	50x50	0-20	UM					1											1
950	1020	50x50	0-20	black					1											1
953	1060	1x1	0-12	Del												1				1
953	1065	1x1	17-27	Unid						1										1
953	1065	1x1	17-27	Del					1					1	1					3
953	1065	1x1	17-27	black						1				1		`				2
953	1065	1x1	17-27	Unid												1	2	1		4
953	1065	1x1	0-17	Paoli?										2		1				3
953	1065	1x1	0-17	Del						3				1		1				5
953	1065	1x1	0-17	UM				1												1
953	1065	1x1	0-17	Van										1						1
953	1065	1x1	0-17	UM									1			1				2
953	1065	1x1	0-17	Del										1		1				2
953	1065	1x1	0-17	Brass						1										1
953	1065	1x1	17-27	SS	2															2
953	1065	1x1	0-17	SS	13															13
955	995	50x50	0-20	Brass					1											1
955	1030	50x50	0-20	UM															1	1
955	1030	50x50	0-20	SS	1															1
955	1060	50x50	0-20	Van										1						1
955	1060	50x50	0-20	SS	4															4
955	1065	50x50	0-20	Del						1						1				2
955	1065	50x50	0-20	Van			1													1
955	1065	50x50	0-20	Del									1			1				2
955	1065	50x50	0-20	SS	8															8
955	1070	50x50	0-20	Brass															1	1
955	1070	50x50	0-20	Paoli?										1						1
955	1070	50x50	0-20	Del												1				1
955	1070	50x50	0-20	Gray						1										1
955	1070	50x50	0-20	Del						1						1			1	3
955	1070	50x50	0-20	Paoli?										1						1
955	1070	50x50	0-20	SS	1															1
955	1075	50x50	0-20	SS	3															3
955	1080	50x50	0-20	Unid												1				1
955	1080	50x50	0-20	SS	1															1

N	E	Unit	cm bs	Stone	FRC	LS Biface Fragment	Biface Tool Fragment	Primary Decort ww	Sec. Decort ww	Interior	Primary Decort-Alternate ww	Sec Decort- Alt ww	EBT	LBT	Pressure Flake	Flake Fragment	Burnt Flake Frag	Burnt Shatter	Shatter	Total
959	1021	1x1	12-22	Brass						1										1
959	1021	1x1	0-12	Van												3				3
959	1021	1x1	0-12	Del										1		1				2
959	1021	1x1	0-12	Brass						1						1				2
959	1021	1x1	0-12	Del				1												1
959	1021	1x1	0-12	SS	13															13
960	1010	50x50	0-20	SS	2															2
960	1020	50x50	0-20	Del								1				1				2
960	1020	50x50	0-20	UM												1				1
960	1020	50x50	0-20	Paoli?					1							1				2
960	1020	50x50	0-20	Van											2					2
960	1020	50x50	0-20	Brass												1				1
960	1020	50x50	0-20	SS	6															6
960	1055	50x50	0-20	Brass		1														1
960	1065	50x50	0-20	Del												1				1
960	1065	50x50	0-20	SS	4															4
960	1070	50x50	0-20	Paoli?					1	1										2
960	1070	50x50	0-20	Del										1						1
960	1070	50x50	0-20	Brass					1											1
960	1070	50x50	0-20	UM											1					1
960	1070	50x50	0-20	Van									1	1	1					3
960	1070	50x50	0-20	SS	6															6
960	1075	50x50	0-20	Del									1							1
960	1075	50x50	0-20	UM												1				1
960	1075	50x50	0-20	SS	1															1
960	1080	50x50	0-20	SS	2															2
961	1020	1x1	0-20	black					1											1
961	1020	1x1	0-20	Paoli?														1		1
961	1020	1x1	0-20	SS	20															20
961	1070	1x1	0-20	Van					1	2										3
961	1070	1x1	0-20	Brass					1	2										3
961	1070	1x1	0-20	black					1											1
961	1070	1x1	0-20	Del					1					2		2				5
965	975	50x50	0-20	UM						1										1
965	975	50x50	0-20	Del						1										1
965	980	50x50	0-20	Paoli?							1									1
965	980	50x50	0-20	SS	1															1
965	995	50x50	0-20	SS	3															3
965	1025	50x50	0-20	SS	2															2
965	1050	50x50	0-20	Paoli?										1						1
965	1050	50x50	0-20	Del										1	1					2

N	E	Unit	cm bs	Stone	FRC	LS Biface Fragment	Biface Tool Fragment	Primary Decort ww	Sec. Decort ww	Interior	Primary Decort-Alternate ww	Sec Decort- Alt ww	EBT	LBT	Pressure Flake	Flake Fragment	Burnt Flake Frag	Burnt Shatter	Shatter	Total
965	1055	50x50	0-20	Paoli?										1						1
965	1055	50x50	0-20	UM													1			1
965	1055	50x50	0-20	Brush					1											1
965	1055	50x50	0-20	SS	7															7
965	1056	1x1	0-20	Del										1		1				2
965	1056	1x1	0-20	Brass					1			1								2
965	1056	1x1	0-20	Unid				1								3				4
965	1056	1x1	0-20	black										1						1
965	1056	1x1	0-20	Van						1						1	2			4
965	1056	1x1	0-20	black										1						1
965	1056	1x1	0-20	Del						1				1		1				3
965	1056	1x1	0-20	Brass												1				1
965	1056	1x1	0-20	Del						2										2
965	1056	1x1	0-20	black										1						1
965	1056	1x1	0-20	SS	9															9
965	1056	1x1	0-20	SS	37															37
965	1065	50x50	0-20	Del												1				1
965	1065	50x50	0-20	Brass						1										1
965	1065	50x50	0-20	Del												1				1
965	1065	50x50	0-20	UM										1						1
965	1065	50x50	0-20	Brass					1											1
965	1065	50x50	0-20	UM										1						1
965	1065	50x50	0-20	SS	4															4
965	1067	1x1	0-17	Unid				1											1	2
965	1067	1x1	0-17	Del						1					1	2	1			5
965	1067	1x1	0-17	Unid					1											1
965	1067	1x1	0-17	Brass					1							2	1			4
965	1067	1x1	0-17	Del				1							1					2
965	1067	1x1	0-17	Paoli?												1				1
965	1067	1x1	0-17	Van												1				1
965	1067	1x1	0-17	SS	28															28
965	1070	50x50	0-20	Del							1									1
965	1070	50x50	0-20	Del												1				1
965	1070	50x50	0-20	Brass														1		1
965	1070	50x50	0-20	Brass														1		1
965	1070	50x50	0-20	Del												1				1
965	1070	50x50	0-20	SS	1															1
970	950	50x50	0-20	Zal										1						1
970	985	50x50	0-20	SS	1															1
975	1020	50x50	0-20	SS	3															3
979	1057	1x1	0-13	Van															1	1

N	E	Unit	cm bs	Stone	FRC	LS Biface Fragment	Biface Tool Fragment	Primary Decort ww	Sec. Decort ww	Interior	Primary Decort- Alternate ww	Sec Decort- Alt ww	EBT	LBT	Pressure Flake	Flake Fragment	Burnt Flake Frag	Burnt Shatter	Shatter	Total
979	1057	1x1	0-13	Brass										1						1
979	1057	1x1	0-13	Del												1				1
979	1057	1x1	0-13	SS	7															7
980	1040	50x50	0-20	Del												1				1
980	1040	50x50	0-20	Brass												1				1
980	1040	50x50	0-20	Del												1				1
980	1040	50x50	0-20	brass										1						1
980	1045	50x50	0-20	Del												1				1
980	1050	50x50	0-20	SS	1															1
980	1055	50x50	0-20	Del										1		1				2
980	1055	50x50	0-20	Paoli?											1					1
980	1055	50x50	0-20	UM										1						1
980	1055	50x50	0-20	SS	4															4
980	1065	50x50	0-20	SS	2															2
980	1068	1x1	0-15	black					1	1										2
980	1068	1x1	0-15	Del										1						1
980	1068	1x1	15-30	Del															1	1
980	1068	1x1	0-15	Brass						1						2				3
980	1068	1x1	0-15	Del									1			1				2
980	1068	1x1	0-15	Del										1						1
980	1068	1x1	0-15	SS	7															7
980	1068	1x1	15-30	SS	6															6
980	1068	1x1	30-40	SS	6															6
980	1070	50x50	0-20	Van											1					1
980	1070	50x50	0-20	Van										1						1
980	1070	50x50	0-20	SS	4															4
990	1040	50x50	0-20	Del						1										1
990	1040	50x50	0-20	Del									1							1
1000	1015	50x50	0-20	SS	4															4
1000	1060	50x50	0-20	SS	2															2
1002.5	948	1x1	0-10	Del												1				1
1002.5	948	1x1	0-10	Del															1	1
1010	1050	50x50	0-20	UM												1				1
Unit A		1x1	0-10	Brass														1		1
Unit A		1x1	0-10	SS	1															1
Unit C		1x1	0-10	UM										1						1
Unit C		1x1	0-10	SS	5															5
Total					**232**	**1**	**1**	**5**	**18**	**28**	**2**	**3**	**6**	**35**	**10**	**52**	**7**	**5**	**8**	**413**

20. APPENDIX G: 33PK218 PREHISTORIC ARTIFACT INVENTORY

N	E	Unit	cm bs	Stone	FRC	Nodule	Uniface	Mod Flake Tool	PPt	Interior	EBT	LBT	Pressure	Flake Frag	Burnt FF	Total
940	1015	50x50	0-20	SS	1											1
945	995	50x50	0-20	Del		1										1
950	1000	50x50	0-20	SS	3											3
975	995	50x50	0-20	SS	1											1
979	1009	1x1	40-50	Paoli										1		1
979	1009	1x1	30-40	Del										1		1
979	1009	1x1	50-60	Van										1		1
980	1009	1x1	30-40	Brass					1							1
980	1009	1x1	30-40	Del									1			1
980	1009	1x1	30-40	Van							1					1
980	1009	1x1	30-40	UM								1				1
980	1009	1x1	30-40	Unid											1	1
980	1009	50x50	10-20	SS	1											1
983.5	1003.5	1x1	0-10	UM			1									1
985	990	50x50	0-20	SS	1											1
985	990	50x50	0-20	SS	6											6
985	995	50x50	0-20	SS	14											14
985.5	1005.5	1x1	20-30	Van										1		1
990	990	50x50	0-20	SS	7											7
990	995	50x50	0-20	Van								1				1
1000	990	50x50	0-20	SS	3											3
1010	1010	50x50	0-20	SS	1											1
1015	1005	50x50	0-20	SS	3											3
1015	1010	50x50	0-20	SS	5											5
1015	1020	50x50	0-20	SS	1											1
1020	1025	50x50	0-20	Paoli				1								1
1025	1025	50x50	0-20	Van									1			1
1070	1060	50x50	0-20	SS	2											2
Unit B		1x1	0-10	SS	1											1
Unit C		1x1	0-10	UM						1						1
Unit C		1x1	0-10	SS	7											7
Total					**57**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**4**	**1**	**72**

21. APPENDIX H: FORMED ARTIFACT METRICS

Site Number	Artifact	Max. Length (mm):	Max. Width (mm):	Max. Thick. (mm):	Neck Width (mm):	Neck Thick. (mm):	Stem Length (mm):	Stem Thick. (mm):	Blade Length (mm):	Blade Thick. (mm):	Basal Grinding (Y/N):	Weight (g):
33Pk203	Biface Tool Tip	7.6	12.5	4.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.3
33Pk203	Late Stage Biface Fragment	24.2	12.5	7.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.6
33Pk203	Core	27.0	26.8	12.4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9.1
33Pk203	Early Woodland Stemmed PPT	32.3	22.4	7.5	n/a	n/a	14.2	6.2	18.1	8.0	yes	5.2
33Pk203	Modified Flake Blank	38.4	27.0	13.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	15.5
33Pk203	Modified Flake Blank	53.8	45.0	19.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	38.1
33Pk203	Lamoka PPT	53.9	22.1	8.2	14.1	6.5	17.4	6.1	36.5	8.2	No	9.3
33Pk203	Kirk Cluster PPT	30.4	21.5	6.4	12.2	4.5	8.0	2.8	22.4	6.3	yes	4.6
33Pk206	Projectile point fragment	11.7	18.7	5.9	n/a	n/a	n/a	n/a	n/a	5.9	n/a	1.4
33Pk211	Matanzas Cluster PPT	31.0	19.7	7.3	16.9	5.0	5.9	4.4	25.1	7.2	yes	4.8
33Pk211	Drill	26.2	12.1	5.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.6
33Pk217	Late Stage Biface Fragment	24.6	21.8	7.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4.1
33Pk217	Biface Tool Fragment	10.4	6.0	4.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.2
33Pk218	Modified Flake	16.7	12.5	7.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.1
33Pk218	Uniface	26.6	24.2	7.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4.9
33Pk218	Lamoka PPT	54.3	20.9	9.0	n/a	n/a	n/a	n/a	54.3	20.9	no	9.0