The “isolated find” concept and its consequences in public archaeology

By

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The term “isolated find” has frequently been taken as a disposable artifact category in cultural resource management (CRM). Efforts were made to empirically demonstrate the fallacy of this concept and its use, using modified field sampling strategies, the inclusion of fine screen artifact analysis, and statistical analyses. Six sites containing prehistoric occupations on Camp McCain National Guard base in Grenada County, Mississippi were reinvestigated using these methods; their datasets were expanded in terms of site size, density, function, and temporal association, which may change their eligibility status for the National Register of Historic Places (NRHP). Fieldwork and classification based solutions are offered to account for biases introduced by current standard methods of sampling and site delineation during Phase I archaeological survey.

DEDICATION

This thesis is dedicated to the memory of Dr. Robert C. Dunnell.

ACKNOWLEDGEMENTS

Drs. Evan Peacock, Janet Rafferty, Nicholas Herrmann are thanked for their assistance and direction throughout the course of this work and for their mutual collaboration efforts on this thesis committee. Jeffrey Alvey and Keith Baca, along with everyone serving on their crew over the years on Camp McCain should be remembered here for their exemplary survey coverage of Camp McCain: you all do public archaeology a great service by raising the standard of survey quality. The 2013 archaeological survey field school students at MSU deserves recognition for performing the fieldwork that generated the data reported here, and for hauling very large and important containers of dirt through the woods so that it could be analyzed for small pieces of stone. Thanks are also due to Brad Pinnix, Camp McCain's environmental officer, for scheduling, allowing access to remote areas, and for setting up water screening at the base's truck washing facility. Thanks are owed to Rita McCarty, the Mississippi National Guard Archaeologist, for allowing this work to be conducted on the base.

Finally, last but certainly not least, I would like to thank Emily and Nico Morton for their love and encouragement.

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CHAPTER I

THE PROBLEM

The term “isolated find” is often used in arguments against the significance of on- or near-surface artifact finds in cultural resource management (CRM). This is problematic, as “isolated find” (1) often refers to an undefined artifact category that may be conceptualized implicitly, inconsistently, or not at all; and (2) could be a result of the inadequacy of established survey methods in locating and properly delineating relatively small, sparse artifact assemblages. Find areas on Camp McCain National Guard base in Mississippi have been reinvestigated to test the hypothesis that sampling larger amounts of space at a tighter interval with the inclusion of fine-screening will tend to reveal more artifacts where artifacts have previously been found in relatively diffuse aggregation. The results of the present work suggest that—when investigated further than what is typical for Phase I Survey—“isolated finds” are empirically variable to such a degree that the term should be regarded as practically inapplicable for CRM. If this is the case, this work should modify regulatory fieldwork standards for the benefit of both the public and the varied and growing research directions in the discipline of archaeology. Finally, a systematic strategy for the treatment and management of finds similar to those investigated here is suggested.

CHAPTER II

SIGNIFICANCE AND THE PRINCIPLE OF REPRESENTATIVENESS

The National Park Service defines historic significance as a given property's importance in terms of history, archaeology, and/or culture within a defined geographic area (National Park Service 1997a:3). Significance is the concept on which most cultural resource management decisions depend (Dunnell 1984:63). Usually, archaeological properties are assessed for historical significance in terms of National Register Criterion D (36 CFR 60.4): the potential to yield information important in prehistory or history (National Park Service 1997a:3). Such information may be relevant for virtually any time period, and "importance" may be defined in accordance with the aims of the researcher (Dunnell 1984:63; Little et al. 2000:28). If significance is determined by archaeological imagination, then there is no end to the potential questions that may be asked with regard to any artifact(s), which seems to make all artifact assemblages, occupations, or "sites" significant (McGimsey 1972:116; Peacock and Rafferty 2007:121).

Significance decisions usually dictate what is worthy of sampling (Dunnell 1984:70). In contrast, a comprehensive, standardized principle of adequate sampling would preserve the archaeological record in a form amenable to both conservation and analysis. The problem is that archaeological theories, methods, and techniques change through time relatively rapidly, and research questions change to accommodate technological and academic progress (Little et al. 2000:29, 31; Peacock et al. 2008:69).

The "Principle of Representativeness" has been offered to compensate for biases introduced by the varying, often divergent interests of the academically-trained professionals who oversee CRM projects as well as changing theoretical standards and technological capabilities (Peacock 1996b; Peacock et al. 2008:69-70; Peacock and Rafferty 2007).

The principle is executed by either leaving archaeological deposits of all kinds relatively untouched or by recovering as much as is physically possible at as many observational scales as is conceptually and practically possible. This is in accordance with the "conservation ethic" of cultural resource management advanced by Lipe (1974) and Dunnell (1984:64, 65), which underscores the non-renewable character of cultural resources as well as the public interest in conservation embodied by laws governing cultural resources. If the artifact—rather than the "site"—is taken as the basic archaeological unit of time, space, and form (Dunnell 1992:33-34; Dunnell and Dancey 1983:272; Plog et al. 1978:612), the result is the recognition of a more-or-less continuous distribution of materials (Dunnell 1992:34; Dunnell and Dancey 1983:272), which allows all the variable densities of artifact clusters at all scales to be potentially informative and valuable. This is an ideal stance for preserving as much of a variety of archaeological data as is possible for future use (Peacock and Rafferty 2007:128; Peacock et al. 2008:69).

Representative sampling may be conducted under two frameworks: humanistic and scientific (Dunnell 1984:65-66). Humanistic concerns likely generate the most widespread public interest with regard to cultural resources. If the symbolic value of cultural resources provides the primary drive for conservationist legislation, then the

public interest may be best served by a professional orientation toward a scientific framework that empirically and systematically seeks to explain and conserve evidence of the variability and change of human material culture through time. This is because the two value systems perpetuate and lend support to one another: scientific values—when employed properly—result in a larger quantity of data classes that clarify the phenomena for which the public finds value, ideally increasing the public's understanding of human change through time and increasing public interest in archaeological science. Particularistic interests, such as historic sites and earthwork complexes, for instance, can be fully accommodated by this perspective. Attention paid to both the humanistic and scientific import of cultural resources is meant to ameliorate bias, which is characteristically endemic to the archaeological process (Plog et al. 1978:608).

The idea of the implicit supremacy of vertically and/or horizontally dense artifact clusters is a particularly glaring example of archaeological bias. These clusters are virtually always preferred for Phases II and III work (Anderson and Smith 2003:319, Table 5.3), to the exclusion of relatively diffuse clusters that seem to lack subsurface features (the extreme example of which would be “isolated finds”). The conceptual separation of “site” and “feature” may be a question of scale: if a feature is a non-portable artifact with discrete boundaries (Dunnell 1971), an artifact concentration could be construed as a feature at the scale of assemblage if it could be demonstrated to have distinct boundaries (Peacock et al. 2008:68; Peacock and Rafferty 2007:119; Plog et al. 1978:609-610). It should be noted that on/near surface artifact clusters, like some subsurface features, very often have indistinct or diffuse boundaries (see Dancey 1974:99), and that the subsurface feature class also tends to be burdened with poorly

defined subclasses, as do surface assemblages (although, all archaeological assemblages—features and many surface concentrations alike—often are cohesive units of deposition that form as a result of human behavior in a given place through a given unit of time, i.e., occupations [Dunnell 1992]). These semantic issues highlight ways in which abstract classes and their definitions (or lack thereof) condition our perceptions and treatment of phenomena.

CHAPTER III

SURFACE DEPOSITS AND THE IMPLICIT SUPERIORITY OF EXCAVATION OVER SURVEY

It may be argued that the National Park Service's definition of historic integrity is as poorly conceptualized as it is widely used. It may be considered to convey a kind of "authenticity" regarding a cultural resource's identity, which is embodied by the physical survival of all or part of that resource as it was during its time of use. The Park Service provides seven qualities of a property—location, design, setting, materials, workmanship, feeling, and association—that should be present in order to establish integrity (National Park Service 1997a:4). All are not required to be present in order to affirm a cultural resource's potential to yield information, and there is no specific quantity or combination of these qualities that are necessary and sufficient to conclude whether or not a property retains integrity (National Park Service 1997a).

This situation is complicated further by the fact that "integrity" is an idea, while what is often construed as its opposite--"disturbance"--is a real world phenomenon, via which the depositional record of archaeological site formation is obscured by subsequent physical processes. Thus, archaeological assemblages are often considered to be lacking in integrity when they appear to be disturbed, even though historic integrity cannot be quantified. In spite of its unsystematic treatment, the integrity concept seems operationally flexible to a degree that should allow for a diversity of resource conditions

to potentially qualify for further investigation; its applicability is limited by what is preserved in the record and by the imagination of the archaeologist.

When what is unknown is more glaring to the observer than what is known, as is the case with extremely diffuse assemblages such as "isolated finds", one might expect that archaeologists would use their freedom to pursue what seems mysterious. Such is often not the case. A perusal of the gray literature would strongly suggest to readers that a substantial number of CRM archaeologists tend to disregard situations when conventional recovery methods yield a minimum of data and information. Artifacts found in the plowzone are often casualties of this tendency. The wording of Criterion D readily allows for assemblages to be disregarded when they seem to contain a minimal amount of relevant information (such as is often assumed for those found in the plowzone).

As much of the archaeological record in the United States has been at least partially disturbed by plowing (Dunnell and Simek 1995:305), it seems reasonable to assume that a great deal of what is relegated to the "isolated find" category is recovered from the plowzone. Artifacts from the plowzone were originally deposited on the ground surface, were then subject to burial via bioturbation, and subsequently have been moved downward or upward slightly by plow action (Dunnell and Dancey 1983:269; Dunnell and Simek 1995:305). Plowing is a site formation process that obscures near-surface vertical data (King 2004), so artifacts recovered from plowzones may be considered to be surface data appropriate for explanation in 2-dimensional space (see also Dunnell and Dancey 1983:269).

Due to the popular belief that near-surface artifacts have minimal information potential, regional surface survey in CRM has traditionally been used to locate large,

dense artifact concentrations deemed potentially eligible on the basis of size, depth, artifact density, and the likelihood of subsurface features or "intact" midden (Dunnell and Dancey 1983:268). As such, its primary use has been to locate areas to be excavated, although verifiable patterning does remain observable in surface data (Dancey 1974:100), which are better suited than excavation for regional- scale archaeological hypothesis testing (Dunnell and Dancey 1983:269). Surface assemblages are subject to disturbance, but this does not make them useless, just as bioturbation does not completely subtract the information potential of subsurface remains (Dunnell and Dancey 1983:269-270). These observations suggest that "isolated finds" could exhibit verifiable, informative patterning if investigated further than what is typical of regional Phase I surveys.

Apparent isolates and low-density clusters found during siteless survey have generated meaningful information. Dunnell (1988) recorded isolates during a longitudinal research project concerning the effects of repeated plowing of fields in southeast Missouri where sites are known to occur. Objects conforming to Dunnell's working definition of "isolate" were primarily located on landforms higher than those containing denser artifact clusters; this allowed for the advancement of a hypothesis suggesting lithic tool loss during the exploitation of resources in vertically higher microenvironments (Dunnell 1988:31-33). Dancey (1974) found a similar situation while recording low-density clusters on landforms in central Washington. He describes saddles and alluvial areas near coulees as traditionally low-probability landforms (Dancey 1974:109, 111). Lithic tools found on saddles were hypothesized to be a result of loss during upland hunting; spokeshaves and retouch flakes recovered on the alluvial surface near the coulee

boundary were thought to potentially be from the maintenance of bone or antler tools used for digging starchy root plants.

The perception of isolation could be due to factors that do not pertain to past human behavior: such was the case with site 23DU272 (Dunnell 1988), where plowing and precipitation occurring between field seasons altered site boundaries to encompass artifacts that had previously been interpreted as isolated (Dunnell 1988:32). From this observation, it seems reasonable to assume that sampling strategy and analysis unit definitions could also structure what is taken as "isolated", the consequences of which would be more serious in areas necessitating shovel testing, due to limited surface visibility (see below).

In their study of surface survey in the western United States, Plog et al. (1978) mention a glaring consequence of the bias in favor of supposedly excavation-worthy sites. They note that pre-ceramic, mobile groups tended to leave low-density archaeological traces (Plog et al. 1978:611-612). They also note that definitions of "site" tend to be largely based on size and density or by the presence of what is readily visible in their study region, such as above-ground structures (Plog et al. 1978:610). Operating in this manner renders an overwhelmingly large section of regional prehistory invisible, in that characteristically diffuse pre-ceramic occupations are often deemed too ephemeral to warrant attention. As an example, Plog et al. note two surveys of similar intensity in the Southwest that occurred in similar topographic and vegetation areas. Considerably fewer of the sites recovered in Chaco Canyon National Monument property were considered pre-ceramic than those found in New Mexico's Star Lake area. Plog et al. suggest that this is due to a relative lack of above-ground architectural features in the Star Lake area

when compared with Chaco Canyon (Plog et al. 1978:610). Although above-ground prehistoric architecture in the Southeast, aside from mounds, is virtually non-existent, various types of subsurface features, large site size, and/or high artifact density present a nearly identical situation. Artifact clusters without these attributes are rarely, if ever, investigated beyond what is typical for survey.

CHAPTER IV

SHOVEL-TESTING ON VEGETATED SURFACES

In the study area (see below) and places like it, most of the ground surface is obscured by vegetation, which necessitates using the shovel-test sampling method. Artifact concentrations are typically located using a 30-meter sampling interval, with 30 meters being a common interval in the southeastern United States. As might be expected, there is considerable potential for concentrations to be missed, especially if they occupy less than 30 meters of space (Kintigh 1988:690; Peacock 1996a:63). Standard survey methods are biased against small concentrations, particularly when artifact density is low and/or there is a high degree of clustering (Cain 2012; Nance and Ball 1986:457, 471). Peacock has noted a tendency for relatively small concentrations to be missed during shovel-test surveys in the North Central Hills physiographic region in Mississippi (Peacock 1996a:71). There is also a notable potential for standard 30 centimeter shovel-test units to yield negative results within the boundaries of an artifact concentration (Peacock 1996a:64), which also may depend on artifact density as well as test unit size (Kintigh 1988:691).

Site delineation on vegetated surfaces in the southeastern United States typically involves a cruciform pattern of 30 centimeter shovel-tests at 10 meter intervals. In a review of Louisiana and National Forest archaeological databases, Cain (2012:210-213) noted that 193 of the finds reported in the National Forest database for the Winn Ranger

District would be considered isolated by Louisiana's state standards (see below). While so-called “isolates” are not recorded outside of National Forest property in Louisiana, data from both databases show that 75.6 percent of recorded finds in that state would be too sparse to be protected by definition (Cain 2012:212). Had these 193 finds been delineated at a tighter interval, more artifacts may have been found, resulting in “site” status under state standards. Although, as stated above, all archaeological data may well be considered useful for providing information at some scale, fieldwork conducted by Cain (2012:215-217) suggests that more artifacts may be found by reducing the delineation interval to 5 meters when 10 meter intervals reveal too few artifacts for finds to receive Smithsonian trinomial numbers. It follows that obtaining an even larger sample from vegetated areas—such as that employed by the fieldwork reported below—will show a tendency to produce more data and possibly a clearer resolution of intra-site patterning.

These issues suggest that the “isolated find” problem is particularly serious with regard to shovel-test surveys. Survey methods should be continually tested (Nance and Ball 1989; Peacock 1996a:65) for their ability to produce representative samples of archaeological phenomena (Peacock 1996a:76; Dunnell and Dancey 1983:279). To do otherwise has been referred to as “methodological anarchy” (Guderjan 1983:141). Due to the seriousness of this issue, the present study will focus exclusively on “isolates” found during shovel-test survey.

CHAPTER V

THE "SITE" DELUSION

Although there are multiple definitions of archaeological "site", there are no explicit necessary and sufficient criteria with regard to what makes a given phenomenon or group of phenomena eligible for membership in the "site" class. Even so, the term is used widely and liberally, particularly in CRM, where it is often used as a unit of sampling or provenience (Dunnell 1992). Attempts at solving this problem have resulted in the formulation of a succinct definition of "site", in which it is, simply, a place where artifacts are found (see Dunnell 1992). Although this definition seems to break the "site" idea down to its most basic components, it highlights the insolubility of the problem, rather than closing the case. For instance, if no qualifiers for artifact scale or dimensions of "place" are offered, the entire planet could be construed as one site, as well as an incalculable number of sites upon and within other sites. Thus, not only is "site" a non-concept that is operationally treated as a distinct entity, its use results in the proliferation of potentially misleading information. Its continued use is somewhat understandable, as both archaeologists and cultural resource managers need to depict the varying densities and locations of artifacts. In CRM situations, considering sites to be arbitrarily bounded units of space (Rafferty 2008:102-103) for convenience and communication may be justifiable, as long as it is remembered that a "site" is an ideational construct, while occupations are phenomena discernable at various scales of observation; multiple

occupations may be located at one “site”, a “site” may represent only one occupation, or one occupation may be represented at multiple sites (in cases where sampling error may have failed to delineate the entire occupation).

As all archaeological variability is potentially informative, using the artifact as the basic unit of archaeological fieldwork would be more amenable to the Principle of Representativeness, which would benefit understanding artifacts that may appear to be in relative isolation due to low density and/or spatial separation (Dunnell 1992:33). The complete retention of all artifactual material is not possible; the Principle of Representativeness should be upheld by creating classifications of artifacts at various scales, and then taking representative samples that reflect variability of systematically defined and mutually exclusive artifact classes. Intuitive treatment of what is considered potentially significant, such as is done in some of the standard methods outlined in the section below, cannot reliably capture artifact variability across the landscape. Their use creates a map of management decisions rather than reflecting prehistoric human behavior. While the subject of representative artifact classes is vital to the improvement of cultural resource management, the specifics of class construction and operation are not the focus of this thesis.

CHAPTER VI

STATE DEFINITIONS OF "SITE" AND "ISOLATED FIND"

A random sample of state archaeological survey standards was obtained by assigning each state a number based on its position in alphabetical sequence and randomly choosing a number between 1 (Alabama) and 50 (Wyoming). The survey standards obtained suggest that, in the unlikely event that the "isolated find" concept is explicitly defined, there will be as many definitions as there are state agencies. Of the 18 state survey standards reviewed (a 36% sample of all U.S. states), 9 of the documents either make no mention of "isolated finds" (Missouri State Historic Preservation Office n.d.; New Hampshire Division of Historical Resources 2004; Illinois Historic Preservation Agency 2013; Sims 1999; South Dakota State Historic Preservation Office 2005) or do not define the term explicitly (Kansas State Historical Society 2010; Nebraska State Historic Preservation Office 2006; New Jersey Historic Preservation Office 2004; Pennsylvania Historical and Museum Commission 2008, 2012) (Table 1).

Although "isolated find" is not mentioned in Mississippi's survey guidelines (Sims 1999), current practice is that trinomial site numbers for prehistoric sites are not issued unless a site contains at least three non-diagnostic artifacts (i.e., debitage) or at least one diagnostic (David Abbott, personal communication 2015). Sites are not allowed to be considered for potential eligibility unless they receive a trinomial, making this a de facto definition for "isolated find".

Table 1 Various conceptual treatments of "Isolated Find"

Does not Mention	Inexplicit Definition
Missouri	Kansas
New Hampshire	Nebraska
Illinois	New Jersey
Mississippi	Pennsylvania
South Dakota	

In states where "isolated find" is not defined, the term may be used to justify special treatment for artifact finds that may be perceived as sparse or lacking in data potential. In Nebraska, a series of qualifiers are given for the retention of seemingly isolated phenomena so as to not "overload the state accounting system with information of minimal anthropological/archaeological value" (Nebraska State Historic Preservation Office 2006, my emphasis), in spite of the fact that one cannot be certain as to what "minimal" is in these situations without some inter-site comparison as well as a solid justification that the sample taken during the Phase I investigation is representative of human activity at the find location. New Jersey survey guidelines suggest that single artifacts found in test units may indicate "low-density sites" (New Jersey Historic Preservation Office 2004), which necessitates digging more and/or larger test units in an attempt to find more artifacts. This is commendable, but without an explicit definition of isolation, the decision to use this method is subjectively based, and thus consistency cannot be controlled. In Pennsylvania, designating isolation is also subjective, but efforts are made to obtain a larger sample by reducing the sampling interval to 2.5 meters; isolated diagnostics are recorded in Pennsylvania without the requirement of further sampling, although they are not given state site numbers (Pennsylvania Historical and Museum Commission 2008, 2012). Find locales in Kansas that are perceived as isolates

may be mentioned in reports without further sampling if there seems to be potential for additional artifacts, although they are not treated as sites (Kansas State Historical Society 2010).

In states where “isolated find” is defined, there is a significant degree of variability in the definitions. Vermont's guidelines define an isolate as a lost or discarded object with no association with a “site” (Vermont State Historic Preservation Office 2002), which is doubly problematic, as (1) Vermont has no explicit definition of the term “site”, and (2) there is no explicit method mentioned for establishing association with whatever is determined to be a site. Other states specify a specific number of artifacts in a given amount of space as a condition for site status (and by extension, for “isolated find”) (Georgia Council of Professional Archaeologists 2013; Louisiana Office of Cultural Development 2013; State Historical Society of North Dakota 2013). This is the case for Georgia, but they also allow for more subjective thinking by granting “site” status to isolates that have the quality of uniqueness (Georgia Council of Professional Archaeologists 2013). New Mexico defines an isolate as a single or a “few” artifacts that are greater than 50 years old without clear association to what the state defines as a site (New Mexico Historic Preservation Division 2005). As is the case with Vermont, there is no explicit method provided for determining association. Virginia conditionally considers single artifact finds to be “sites”; they are thought to represent one episode of discard, which will allow for “site” status if it can be argued to be “culturally meaningful” (Virginia Department of Historic Resources 2010).

Conditions for relegation to the “isolate” category may be determined by a state's definition of “site”, a term which is also inconsistently defined but ubiquitous in both

academic and CRM archaeology. In spite of this, some states still use no explicit definition of "site" in their archaeological guidelines (Table 2). Vermont provides no definition of the term, although their guidelines refer to "sites" as entities that are investigated for significance (Vermont State Historic Preservation Office 2002). New Hampshire also does not use a formal definition of "site" (New Hampshire Division of Historical Resources 2004). Illinois and South Dakota do not define "site", but their state guidelines treat them exactly the same as does Vermont (Illinois Historic Preservation Agency 2013; South Dakota State Historic Preservation Office 2005).

Some states do provide definitions of "site" (Table 2). A few in the reviewed sample use variously phrased versions of "a place where artifacts are found" (Dunnell 1992; New Jersey Historic Preservation Office 2004; New Mexico Historic Preservation Division 2005; Sims 1999:2; West Virginia State Historic Preservation Office n.d.). Other states provide qualifiers with regard to artifact type, the number of artifacts found in a given area of space, and/or the chronological age of the deposits (Georgia Council of Professional Archaeologists n.d.; Kansas State Historical Society 2010; Louisiana Office of Cultural Development n.d.; Pennsylvania Historical and Museum Commission 2008, 2012; State Historical Society of North Dakota 2013; Virginia Department of Historic Resources 2010). Nebraska stands out, as their guidelines dictate that "sites" are delineated via common sense: "What constitutes adequate spatial segregation between artifactual material in order to designate a site or multiple sites is not specifically defined here beyond the exercise of common sense" (Nebraska State Historic Preservation Office 2006:22, my emphasis). Furthermore, sites may be combined due to spatial similarity or "for reasons of research/management simplicity" (Nebraska State Historic Preservation

Office 2006:22). Nebraska's standards highlight a dependency on the trained expertise of individuals, which is undoubtedly important, although the absence of established protocols will likely lead to biases in archaeological data between individuals.

Table 2 Ways that sites are defined by states in this study.

Place where artifacts are found	Qualifying statements (artifact type, number of artifacts, age)	No Definition
New Jersey	Georgia	Vermont
New Mexico	Kansas	New Hampshire
Mississippi	Louisiana	Illinois
West Virginia	Pennsylvania	South Dakota
	North Dakota	
	Virginia	

The above paragraphs highlight a great deal of variability in the definitions and treatment of the terms "site" and "isolated find", the consequence of which is interstate inconsistency in what is allowed to be destroyed without considering the role of classification. This will likely result in a "patchy" archaeological record/landscape for the continental United States, irrespective of physiographic trends that transcend state borders. The Principle of Representativeness might be the antidote for what seems to be widespread subjectivity and multiple conditional statements leading to unjustified disregard for or discard of archaeological data. Acceptance of the artifact—rather than the "site"—as the fundamental analytical unit in archaeology might result in a more consistently reported distribution of prehistoric material culture across the landscape. Archaeological find classes and their definitions currently determine what is considered in state-level reviews. One of the goals of this thesis involves examining the effects of this practice on archaeological reporting and the effects classes such as "site" and

"isolated find" have on the preservation of the archaeological record, specifically, whether they reflect occupations or archaeological sampling decisions.

CHAPTER VII

STUDY AREA

Camp McCain National Guard Base is located in Grenada County, MS (Figure 1) and in the North Central Hills physiographic province, which is characterized by rugged uplands and sandy to silty soils. The base's hills are dissected by tributaries of Batupan Bogue creek, a tributary of the Yalobusha River (Figure 2). Prehistoric lithic artifacts recovered on base are made of Citronelle gravel chert, Kosciusko quartzite, Tallahatta quartzite, or Fort Payne chert; other than Citronelle gravel and Kosciusko quartzite, all the rest of these stone types are non-local and have been brought into the area from varying distances. Most occupations within or in the vicinity of Camp McCain have been diagnostically dated to the Late Archaic, Woodland, and 19th-20th century Historic periods, with a minority of Early and Middle Archaic and Mississippian occupations expressed (Alvey 2007, 2008; Alvey and Baca 2009).

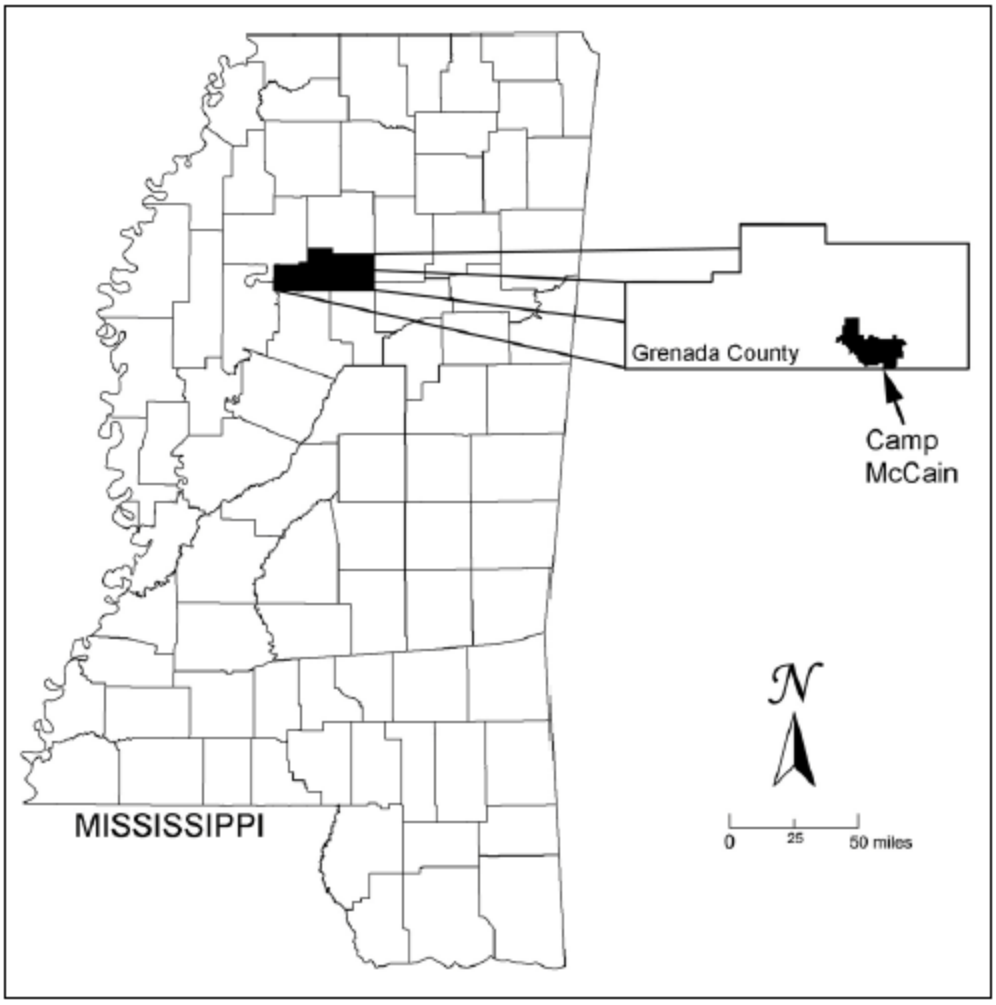

Figure 1 Map of Mississippi showing the location of Camp McCain in Grenada County (Alvey and Baca 2009:4, Figure 1)

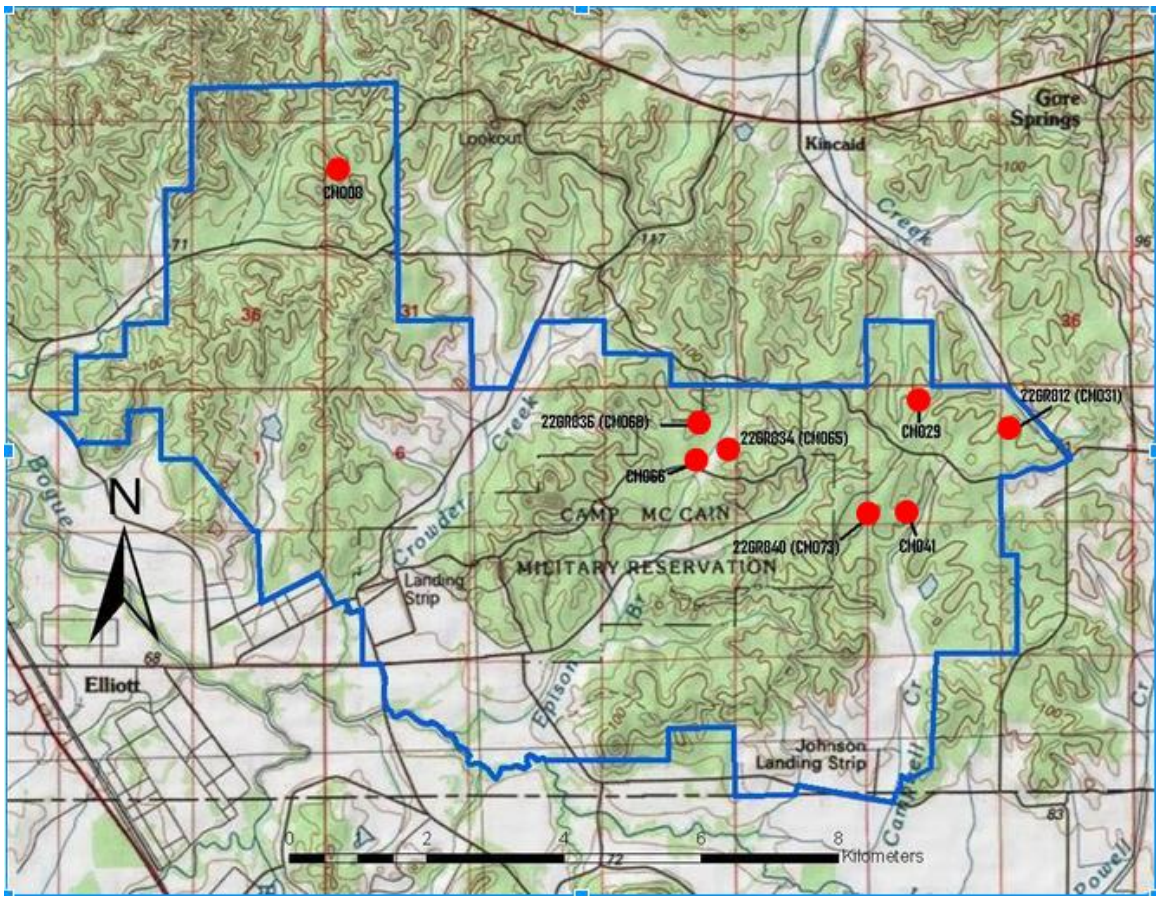

Figure 2 USGS quad map of sampled find areas on Camp McCain that were selected for reinvestigation.

Previous Investigations on Camp McCain

Most survey conducted on the base prior to recent work by Mississippi State resulted in fewer reported finds than might be expected for the amount of land covered. In 1986 and 1992, archaeologists from the Mobile District of the U.S. Army Corps of Engineers surveyed a total of 12,500 acres, in which only 15 sites were recorded (Alvey 2007:18). When compared to a total of 55 sites recorded in 2,330 acres during Mississippi State's 2009 field season, the difference is striking. Two badly disturbed sites located during Mississippi State's 2007 field season were in an area that had been

previously cleared for logging after a survey by Brockington and Associates personnel in 2001 (Alvey and Baca 2009:19).

Mississippi State personnel have conducted four seasons of survey at Camp McCain, during the period from 2007-2013. Jeffrey Alvey, Keith Baca, and their crews are responsible for high quality survey coverage, evident in the large number of small, diffuse clusters and apparent isolates found on the base. As is standard in Mississippi, vegetated areas were sampled at an approximate 30 meter interval with shovel-tests ca. 30 centimeters in both diameter and depth (unless subsoil was encountered prior to reaching a depth of 30 centimeters). Soil from these tests was screened through 1/4" hardware cloth. Sites were delineated in a cruciform pattern at an interval of 10 or 5 meters, depending on landform size and slope. Sites were bounded by either landform interruption or two consecutive negative shovel-tests (Alvey 2007, 2008; Alvey and Baca 2009).

Analysis conducted in the completion of this thesis for artifacts larger than or equal to 1/4 inch follows the methods and techniques used by Alvey and Baca (Alvey 2007, 2008; Alvey and Baca 2009). Prehistoric ceramics were analyzed based on mutually exclusive attributes of temper and surface finish. Bifaces were analyzed based on the established typology for the state (McGahey 2000). Lithic debitage was analyzed in two ways: raw material, flake portion, and amount of cortex were recorded; then, in assemblages with at least 10 proximal and/or complete flakes, reduction stage was inferred using a paradigmatic classification based on the number of platform facets and the number of dorsal flake scars. This latter part of the debitage analysis scheme was meant to help better understand site function and occupational duration:

"Once classified in such a manner, debitage should yield clues as to site function and occupational duration. For example, one might expect to find large amounts of all types of debitage at a long-term habitation site, whereas at a short-term hunting camp one might expect to find mostly late stage (e.g., biface thinning) flakes in low numbers" (Alvey and Baca 2009:24).

CHAPTER VIII

METHODS

At every stage of this thesis, methods were constructed to empirically illustrate the inapplicability of the isolated find concept in a way that facilitated as much comparability as possible with Alvey and Baca's previous work on Camp McCain. Work more intense than standard survey methods of site location and delineation is required to generate hypothesis regarding intra- and inter-site pattering (Anderson and Smith 2003:129). Sites chosen for reinvestigation were subjected to a two-stage modification of standard Phase I field delineation protocol, which typically involves a cruciform pattern of 30 centimeter, round shovel tests. Larger volumes of sediment from 50cm x 50cm test units, placed at 5 meter intervals, were dry screened through ¼" mesh and water screened through 1/16" mesh. These methods allowed for the potential recovery of more information, including, but not necessarily limited to, (1) increased opportunities for encountering artifacts greater than ¼"; (2) increased opportunities for encountering artifacts less than ¼"; both (1) and (2) aid in (3) a better depiction of cluster dimensions; (4) the recovery of information pertaining to site function and/or chronology; and (5) opportunities to observe intra-site patterning not visible in typical Phase I survey delineation.

The inclusion of water screening in this fieldwork is a particularly unusual practice for survey delineation, largely due to obvious practical constraints. The method's

use here is not intended to advocate for its adoption into Phase I survey, but to show the fallacy of disregarding classes such as “isolated find” when, as typically defined or described, they represent a relative lack of archaeological knowledge. As shown below, even when recovered in a geometric cruciform, as opposed to a grid, distinct intra-site patterns emerge that (1) make it obvious that, even in cases when only one artifact was originally found, most “isolated” artifacts cannot conform to the most stringent definition of “isolation”, and (2) occupations embodied in diffuse clusters such as these cannot be discussed as if their attributes are completely known after standard Phase I recovery, thus making a determination of significance at that stage untenable without further investigation or practical changes to make Phase I recovery more intensive.

Peacock (2004) demonstrated that microdebitage analysis is a useful tool for investigating internal site structure. At site 22Cs828 in northern Mississippi, microdebitage clustered with macroartifacts in one area of the site, which he noted as support for the hypothesis that the site represented spatially concentrated, short-term use (Peacock 2004:14, 17). However, microartifacts were also found in spatial disassociation from macroartifacts in other parts of the site, which suggested sampling error or possible dispersal by wind during knapping. In any case, had sub-1/4” debitage not been sampled and analyzed, site 22Cs828 would have had a different shape, size, and internal structure (Peacock 2004:14, 17), and inter-site comparisons would less informed (Peacock 2004:18).

Site Selection

Alvey and Baca's work on Camp McCain (Alvey 2007, 2008; Alvey and Baca 2009) has resulted in the location of numerous relatively light density prehistoric

occupations; for the purpose of this study, “isolated find” refers to assemblages containing less than or equal to 4 artifacts. This results in a sample that arguably represents the wide range of various SHPOs' treatment of relatively small, diffuse artifact concentrations in a way that is manageable with respect to practical research constraints. As they present a special visibility problem (see above), only finds originally located via shovel-testing have been considered. Solely Historic occupations were excluded. Out of 19 occupations from the 2007-2009 field seasons that contained fewer than or equal to 4 artifacts, 8 finds were randomly chosen:

1. CM008 – One single, complete Citronelle chert flake located on an upland ridge (Alvey 2007:44-45)
2. CM029 – One “blocky” piece of shattered siltstone found on a narrow, steep finger ridge (Alvey and Baca 2009:34-35)
3. CM031 (22GR812) – Two square nails and one grog-tempered plain potsherd found on a ridge crest just above a drop-off, suggesting distinct Woodland and Late 19th century occupations (Alvey and Baca 2009:37-38)
4. CM041 – One distal portion of a Citronelle chert flake, located at the end of a ridge spur just above a stream bottom (Alvey and Baca 2009:59-60)
5. CM065 (22GR834) – Four Citronelle flakes—3 complete, 1 distal—found on a ridge spur (Alvey and Baca 2009:100-101)
6. CM66 – One piece of Citronelle chert debitage found on the edge of a low-lying bluff (Alvey and Baca 2009:103-104)

7. CM068 (22GR836) – One eroded, sand-tempered potsherd, which may indicate a Woodland occupation; located on a narrow ridge spur (Alvey and Baca 2009:108-109)
8. CM073 – One piece of Citronelle debitage located on a wide ridge (Alvey and Baca 2009:118-119)

Field and Laboratory Methods

Fieldwork was performed in May and June of 2013 by Mississippi State University's archaeological field school, as directed by Drs. Evan Peacock and Janet Rafferty. The sites described above were relocated using UTM coordinates, 7.5' contour maps, field photos, and site descriptions; the location of the initial positive shovel-test was approximated as closely as possible, and a 50cm x 50cm unit was placed adjacent to it so that previously excavated shovel-tests would not be included in subsequent units; 50cm x 50cm square shovel test pits were then dug to subsoil. As artifacts tend to vertically translocate in the upland soils of the North Central Hills physiographic province (Peacock and Fant 2002), depth was not recorded, and soil horizons were not treated as provenience units within the STP's. Each 50 cm x 50 cm unit was named for its northeast corner. Test pits fell at an interval of 5 meters in a cruciform pattern determined either by cardinal directions or by landform orientation; concentrations were bounded arbitrarily by 4 test pits that appeared negative in the 1/4" screen or by prohibitive breaks in the landform; sediment was screened through 1/4" hardware cloth. What passed through this was water-screened through 1/16" fine mesh using Camp McCain's truck-washing facility. Except for water screening, these methods were

designed to be an elaboration on standard cruciform delineation that might easily be adopted by CRM professionals.

As noted above, laboratory methods for 1/4" artifacts followed Alvey (2007, 2008) and Alvey and Baca (2009). Contents from fine screening were floated to remove large amounts of non-artifactual organic material. The heavy fraction was then sorted. Although the original plan was to separate fine screen artifacts by artifact type, the only objects that could be determined as artifactual with certainty were debitage pieces (see Peacock 2004:16). Fine screen counts were recorded by 50 cm x 50 cm unit. Ambiguous artifacts were minimal; they were retained, but are not included in the analyses below.

Price (2012:14-17) has noted sub-1/4" debitage's potential for changing sites' functions through time; delineating areas of distinct intra-site activity; informing on site formation processes; and providing data pertinent to Minimum Analytical Nodule Analysis (MANA). If most debitage produced from stone tool reduction is smaller than ¼" (Price 2012:19-20), it follows that advancing hypotheses regarding site function and intra-site patterning should at least be partially informed by artifacts of this size class.

Bray-Curtis Ordination, Cluster Analysis, and Mantel Test

Inter-site variability was examined to demonstrate the consequences of the unwarranted misuse of the "isolated find" concept. To do this, it seemed ideal to compare the 6 sites investigated here with what has already been recovered on Camp McCain. Disregarding, rather than reinvestigating, what is interpreted as "isolated" is expected to have some measurable bearing on archaeological data at a regional scale. The sites investigated here were compared with others found during surveys on Camp McCain at the scale of the settlement pattern using ordination and cluster analysis. Counts of

debitage, potsherds, bifaces, and sandstone tools were plotted in order to visualize and infer similarities regarding site function. Mantel tests were calculated to support inferences regarding observed changes from original work to the present work.

Ordination is a statistical method in which data points in multidimensional mathematical space are presented on a plot or graph, the axes of which represent variable dimensions that have been reduced to two or three for visualization. Although the condensation of multiple dimensions of variability into two or three causes some degree of information loss, relationships and variability in the chosen dimensions represented by the data points are results of real differences and similarities of recorded observations (Beals 1984:2; Legendre and Legendre 1983:171, 267; Pielou 1977:332).

The Bray-Curtis ordination method, also known as "polar ordination", has been widely used in the ecological study of plant communities (Beals 1984, Ludwig 1988, Palmer 2015). It was first formulated to study upland forests in Wisconsin (Bray and Curtis 1957). According to Beals (1984:18), the method consists of first calculating a distance matrix, then selecting endpoints that determine axis direction and structure the relationship among other sample points (see also Ludwig 1988:211). In plant ecology, this ordination method is used to examine the relationships between sample locations based on an abundance attribute (Ludwig 1988:212); in this case, archaeological sites found during the first three survey seasons on Camp McCain were compared based on quantities of potsherds, debitage, bifaces, and sandstone tools (Table 3). These data points' positions in relation to one another on the graph are meant to illustrate possible similarities and differences in site function. Chi-square was used as a distance measure; this method gives a higher weight to less abundant entities. The Bray-Curtis original

method was used for endpoint selection: the first endpoint has the highest sum of distances with the other sites, and the second endpoint has the highest distance from the first endpoint (McCune and Mefford 1999).

Table 3 Data used for Bray-Curtis ordination and Cluster Analysis. Sites reinvestigated in this thesis are in bold.

	Ceramics	Bifaces	Debitage	Sandstone tools
22GR809 (CM025)	34	0	4	0
CM028	0	0	1	0
22GR812 (CM031)	**22**	**0**	**1**	**0**
CM033	0	0	1	0
22GR813 (CM034)	0	0	1	0
22GR814 (CM036)	0	1	2	1
22GR815 (CM037)	0	0	5	1
CM041	**0**	**0**	**3**	**0**
CM043	0	0	1	0
22GR820 (CM048)	10	1	0	0
CM049	0	0	1	0
22GR821 (CM050)	0	1	0	0
22GR822 (CM051)	0	1	0	0
22GR823 (CM052)	0	0	2	0
22GR826 (CM056)	0	0	1	0
22GR831 (CM062)	5	0	0	0
22GR832 (CM063)	0	2	25	0
22GR833 (CM064)	0	2	40	0
22GR834 (CM065)	**1**	**1**	**15**	**0**
CM066	**0**	**0**	**3**	**0**
22GR835 (CM067)	8	0	7	0
22GR836 (CM068)	**106**	**0**	**20**	**0**
CM071	2	0	46	2
22GR840 (CM073)	**0**	**2**	**6**	**0**
22GR842 (CM075)	0	1	0	0
22GR843 (CM076)	0	0	1	0
22GR844 (CM077)	0	0	2	0
22GR786 (CM001)	1	2	43	1
22GR787 (CM002)	2	3	41	0
22GR788 (CM003)	0	1	8	0
22GR789 (CM004)	0	1	2	0

Table 3 (continued)

22GR789 (CM005)	0	0	3	0
22GR791 (CM006)	2	0	4	0
22GR792 (CM007)	0	0	15	0
22GR793 (CM009)	0	3	40	0
22GR794 (CM010)	0	1	5	0
22GR795 (CM011)	0	0	16	0
CM012	0	0	1	0
22GR800 (CM014)	0	0	5	0
22GR801 (CM015)	0	0	8	0
CM017	0	1	0	0
22GR802 (CM018)	0	0	6	0
22GR803 (CM019)	0	0	2	0
22GR804 (CM020)	0	0	2	0
22GR805 (CM021)	5	0	3	0
22GR806 (CM024)	0	5	53	0

A Mantel test was performed in PC-ORD 4 to test the similarity between the sites found on Camp McCain from 2007 to 2009 before and after work performed during the completion of this thesis. Mantel tests test for significant correlation between two matrices, using the Pearson product-moment coefficient. Correlation values will range from -1 to 1; values less than zero indicate a negative correlation, values greater than zero indicate a positive correlation, and a value of 0 indicates no correlation (McCune and Mefford 1999). Chi-square was used as a distance measure.

These data were explored further using cluster analysis. Clustering and ordination may be considered complementary methods that can potentially clarify one another (Legendre and Legendre 1983:171, 268). Cluster analysis visually groups entities based on similarity. Anderson and Smith (2003:324, 327-329) used cluster analysis to compare sites on the U.S. Army's Fort Polk in western Louisiana, in which they found that

apparently homogenous sites containing only lithics actually expressed a notable amount of intersite variability. The same dataset described above was used to construct the cluster dendrogram. Chi-square was used again as a distance measure. Groups were linked using Ward's Method, which has been recommended for general purposes and for its tendency to minimize distortion (McCune and Mefford 1999).

Phi Analysis

Phi analysis was performed using IBM SPSS 20. Phi analyses were conducted to measure the association between Fine screen debitage and macroartifacts, in an effort to provide some support for inductive visual inspections. Phi analysis is a version of Pearson's product-moment correlation, in which association is measured between the presence and absence of two nominal variables. A 2 x 2 contingency table is constructed, and the frequencies in each of the four intersections between the presence and absence of two variables are calculated. Phi values will range from -1 to 1; values less than zero indicate a negative association, values greater than zero indicate a positive association, and a value of 0 indicates no association (Elliot and Woodward 2006:148; Simon 2015; Thomas 1983:419-423). Chi-square was used to determine the significance of the phi association at the 0.01 level. In situations where intersected frequency values were relatively low, a Fisher's exact test was used instead of chi-square.

CHAPTER IX

SITE DESCRIPTIONS

22GR812

Site 22GR812 was originally discovered by shovel testing a ridgetop just west of Redgrass Creek (Figures 3 and 4). Artifacts were found in two shovel tests placed on the east side of a logging road running on a northeast/southwest axis. Six negative shovel tests were excavated. The site was considered ineligible based on the sparse artifact content (see below), although the authors note good soil preservation (Alvey and Baca 2009:37). Soils appeared to have remained in good condition at the time of reinvestigation in 2013 (Figures 5 and 6).

Figure 3 Photograph of site 22GR812. View to the southwest.

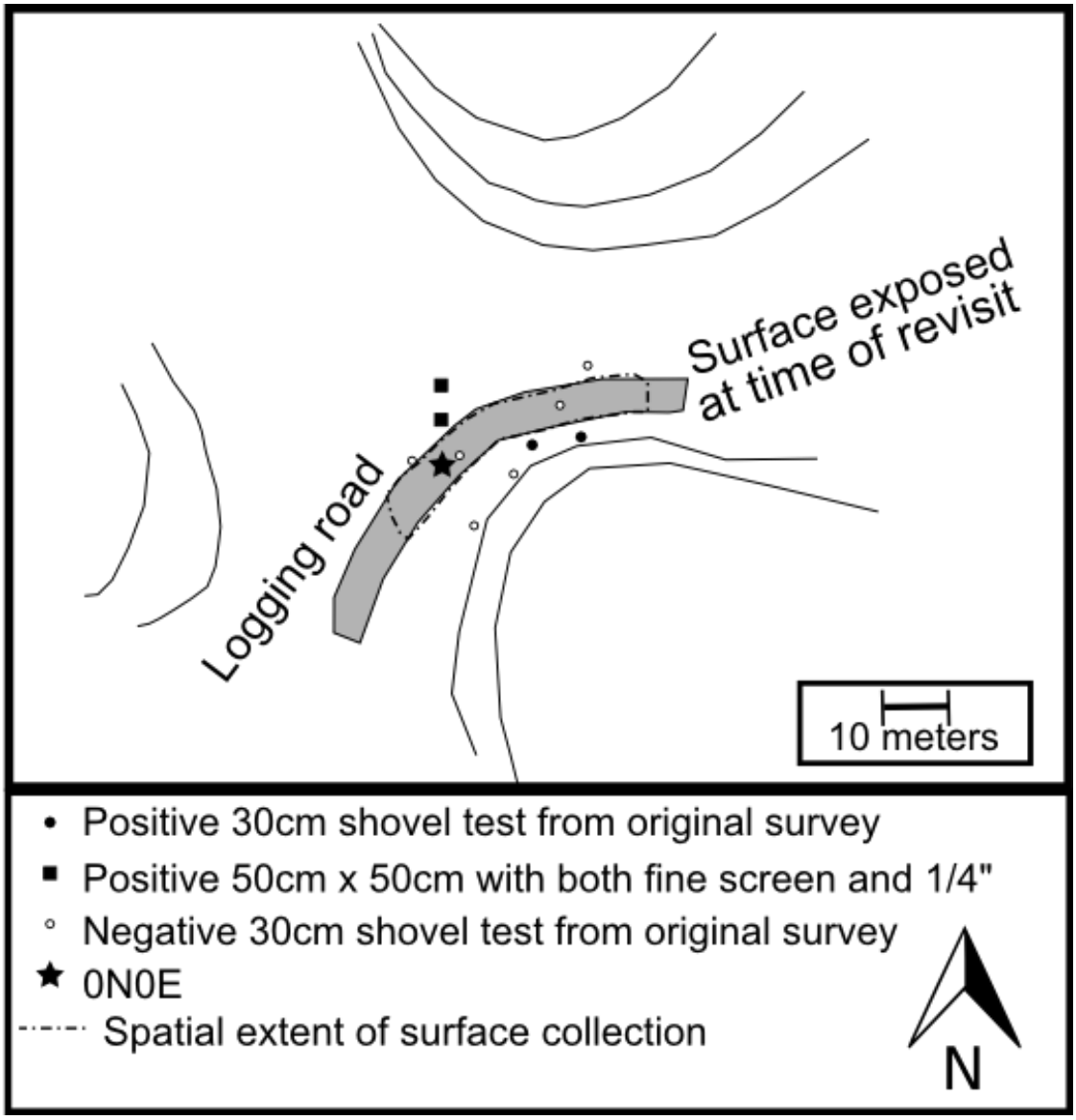

Figure 4 Map of site 22GR812

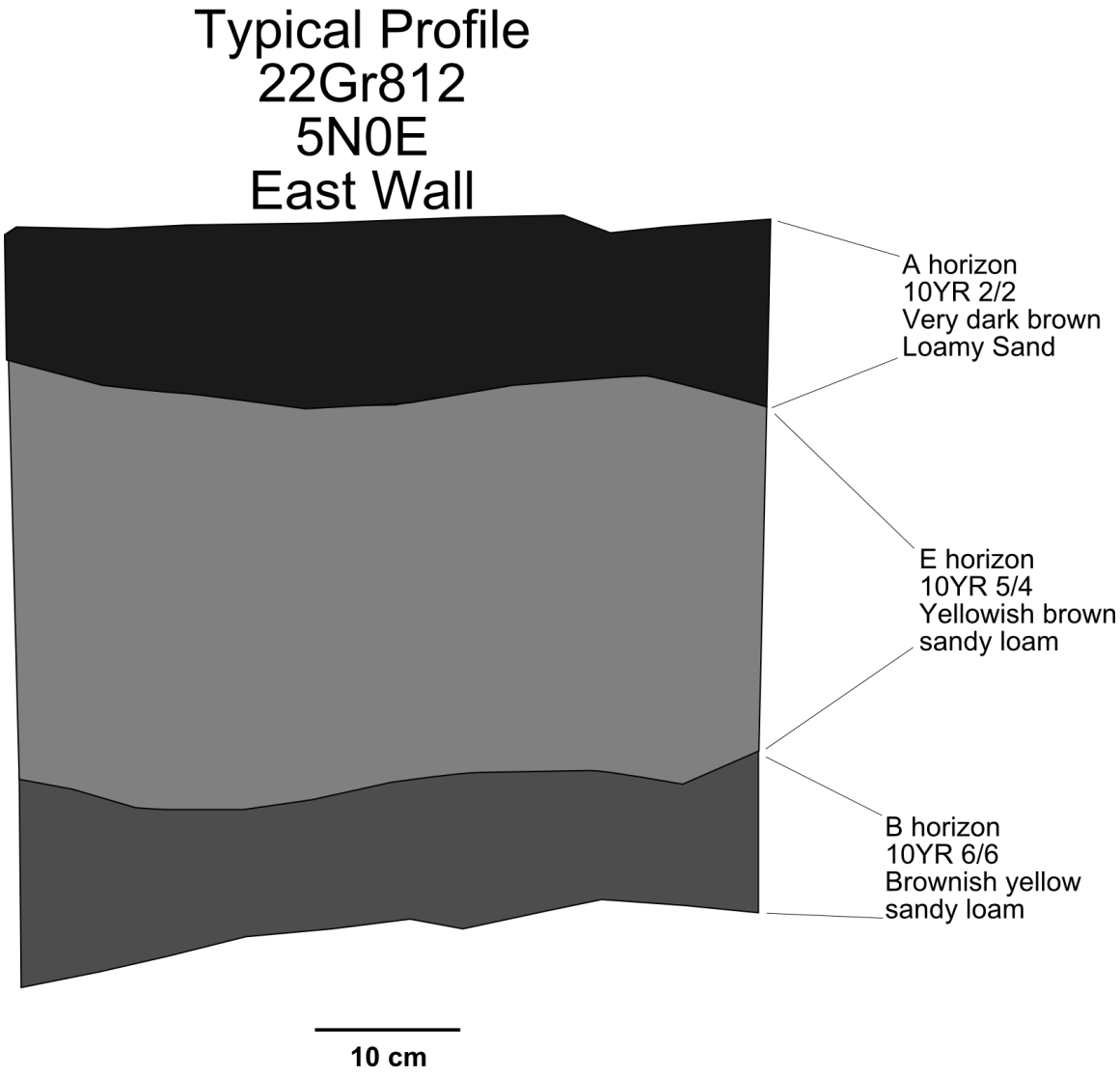

Figure 5 Representative soil profile from 22GR812

Figure 6 Photograph of unit 5N0E at site 22GR812.

Artifacts from Phase I

The only artifacts recovered during the Phase I were one grog-tempered plain potsherd and two square nails, which characterized the assemblage as representative of at least two distinct occupations: one of the Woodland period and another of the late 19th century (Alvey and Baca 2009:37-38).

Artifacts from Revisit

¼" and Surface

On returning to the site in 2013, the logging road described above had been reopened, exposing the ground surface. A controlled surface collection was conducted (Figure 7) within the boundaries of the exposed road, in which recovered sherds were

assigned cardinal coordinates based on their distances from a datum (Figure 7; Table 4). There was only room to excavate two 50 cm x 50 cm units, as most of the flat part of the landform was in the exposed logging road (Figure 8). One sherd was also found in one of the two STP's excavated here (Table 5). These ceramics appear to be exclusively sand-tempered, with most surfaces being either plain or eroded. One sand-tempered sherd appeared to have been fabric-marked, which has been attributed to the Early Woodland period (Phillips et al. 2003 [1951]:145).

Figure 7 Flagged concentration of potsherds in logging road at 22GR812.

One distal flake of gravel chert was recovered in an STP (Tables 5 and 6).

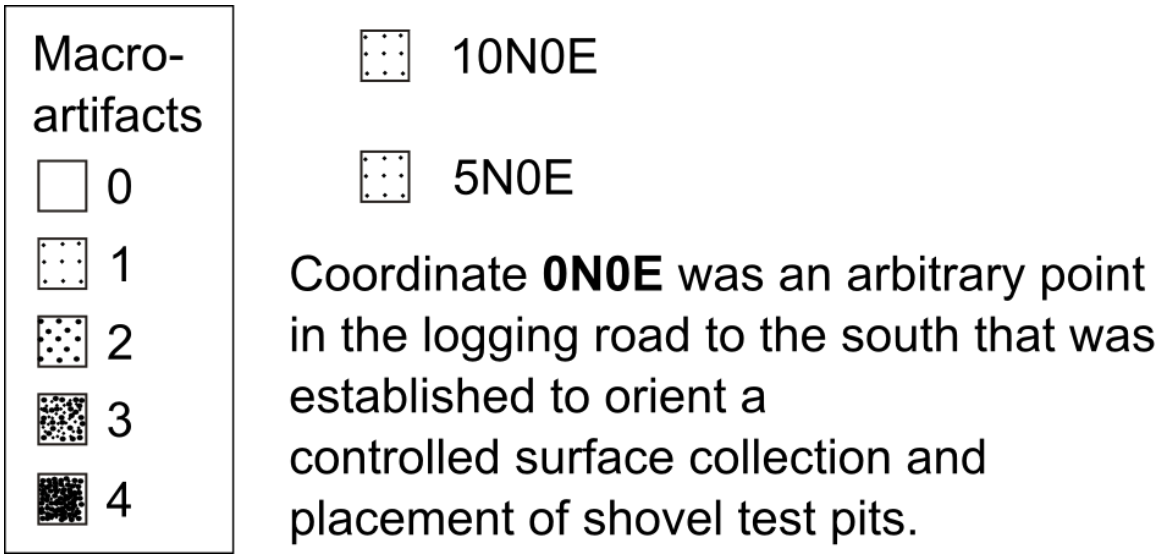

Figure 8 Map of macroartifacts from 50 cm x 50 cm units at 22GR812.

Table 4 22GR812 Potsherds from General and Controlled Surface Collections

Provenience	Temper	Surface
0.85E0.82S	SAND	PLAIN
0.9W0.84N	SAND	PLAIN
10.2E0.3S	SAND	PLAIN
14.1E6.4N	SAND	PLAIN
16.2E1.9N	SAND	PLAIN
17.5E0.2N	SAND	PLAIN
23.5E0.3S	SAND	ERODED
3.2E6.6S	SAND	ERODED
3.3E0.91S	SAND	FABRIC MARKED
31E2S	SAND	ERODED
3E0.65S	SAND	ERODED
7.3W0.33N	SAND	ERODED
7.5E1.5N	SAND	PLAIN
7.6W1.2N	SAND	PLAIN
9.8W1.3S	SAND	PLAIN
9.9E2.3N	SAND	ERODED
GSC	SAND	PLAIN
GSC	SAND	PLAIN
GSC	SAND	ERODED
GSC	SAND	ERODED
Total surface artifacts: 21		

Table 5 Macroartifacts from 50 cm x 50 cm units at 22GR812.

Provenience	Artifact type	Count
5N0E	debitage	1
10N0E	potsherd: Sand-eroded	1
Total: 2		

Table 6 Tabulation of debitage from 22GR812.

Raw Material	**1.27 cm**	**.64cm**	**Total**
Heat treated Chert	0	1	**1**
Total	0	1	**1**
Portion			
Complete	0	0	**0**
Proximal	0	0	**0**
Medial	0	0	**0**
Distal	0	1	**1**
Shatter	0	1	**0**
Total	**0**	**0**	**1**
Cortex			
100%	0	0	**0**
99%-50%	0	0	**0**
49%-1%	0	0	**0**
0%	0	1	**1**
Total	**0**	**1**	**1**

Fine Screen

Debitage was recovered in the fine screen from both of the STP's excavated at 22GR812 (Figure 9). Fine screen from unit 10N0E contained only 3 pieces of debitage, while 15 pieces of debitage were recovered from 5N0E (Table 7).

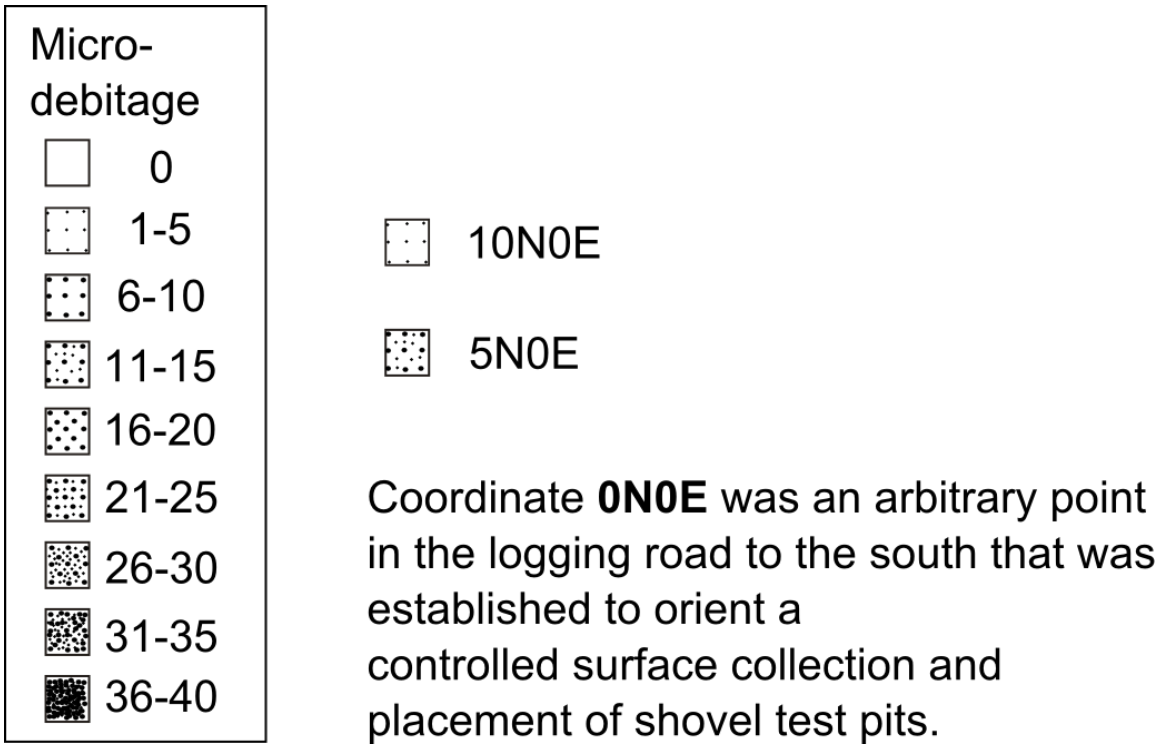

Figure 9 Map of Fine screen debitage from 50 cm x 50 cm units at 22GR812.

Table 7 Fine screen debitage from 22GR812

Provenience	Artifact type	Count
5N0E	debitage	15
10n0e	debitage	3
Total: 18		

Revisit Summary

Site 22GR812 originally consisted of two east-west oriented, positive shovel tests located about 5 meters south of the logging road that was exposed between 2009 and 2013. Spatially, 22GR812 was expanded after revisiting. The CSC in the exposed logging road extended the site boundary approximately 15 meters to the east and about 40 meters

to the south. Both ¼" and fine screen artifacts from the two 50 cm x 50 cm units did not extend the boundary any further than the extent of the CSC area.

Chronology was refined somewhat by a sand-tempered fabric-marked sherd, which, in the Yazoo River drainage, is indicative of an Early Woodland Tchula Period occupation (Phillips et al. 2003 [1951]:145). A much larger assemblage of ceramics was recovered from 22GR812 on revisiting. Many--but not all--of the Tchula sites in the Yazoo River drainage are relatively small with sparse artifact contents (Peacock 1997:245; Peacock 2015:185). The small spatial sizes and light densities reported by Peacock may be due to a lack of opportunities for open ground surface artifact recovery at the Tchula sites he reported, which were all investigated using standard shovel test survey methods (Peacock 1997:244; Peacock 2015:185). Without revisiting and without the luck of encountering the re-opened logging road, this opportunity for the use of a unique recovery method at an Early Woodland site in the Yazoo drainage would not have occurred.

The quantity of microflakes (15) recovered from unit 5N0E is somewhat surprising, considering that only 1 flake was encountered in this unit's 1/4" screen. Tchula sites in Peacock's study had minimal, if any, lithics (Peacock 1997:244). As mentioned above, Peacock's sites were recovered via standard shovel testing, which requires only ¼" mesh. The same situation holds for artifacts from the ¼" screen at 22GR812. However, the fine screen debitage at 22GR812 could suggest that (1) pressure flaking, to the near exclusion of other stone tool reduction behaviors, was dominant at Tchula sites, and/or (2) tools brought from elsewhere were being used and rejuvenated at this location. Further and more in-depth investigation at Tchula sites might refute this

assertion. Testing these hypotheses is not the subject of this thesis, but they could not have been generated had fine screening not been used.

CM041

Site CM041 (Figures 10 and 11) was discovered by shovel testing a ridge spur to the west of an unnamed stream bottom. One piece of debitage was found in a positive shovel test. Eleven negative shovel tests were dug. The site was disturbed by a logging trail running along the top of the ridge (Alvey and Baca 2009:59). Logging had severely impacted the soils at CM041 by the time it was recorded in 2009; this was consistent with what was observed during this project (Figures 12 and 13). Site CM041 was considered to be ineligible for inclusion on the National Register due to the eroded state of the landform. After returning in 2013, the site had been even more disturbed by continued logging, which allowed for some artifact recovery on the surface.

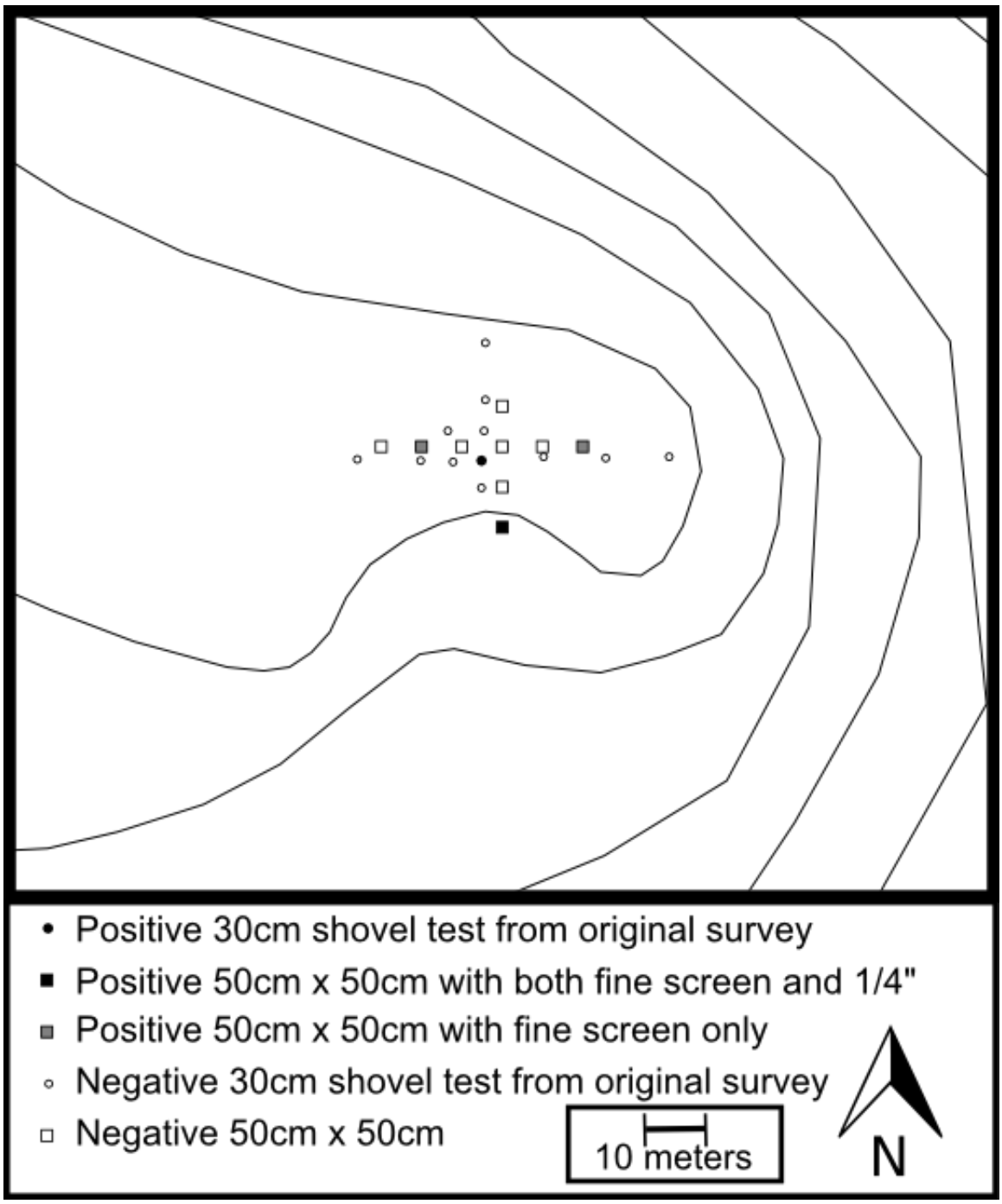

Figure 10 Map of site CM041

Figure 11 Fieldwork underway at CM041

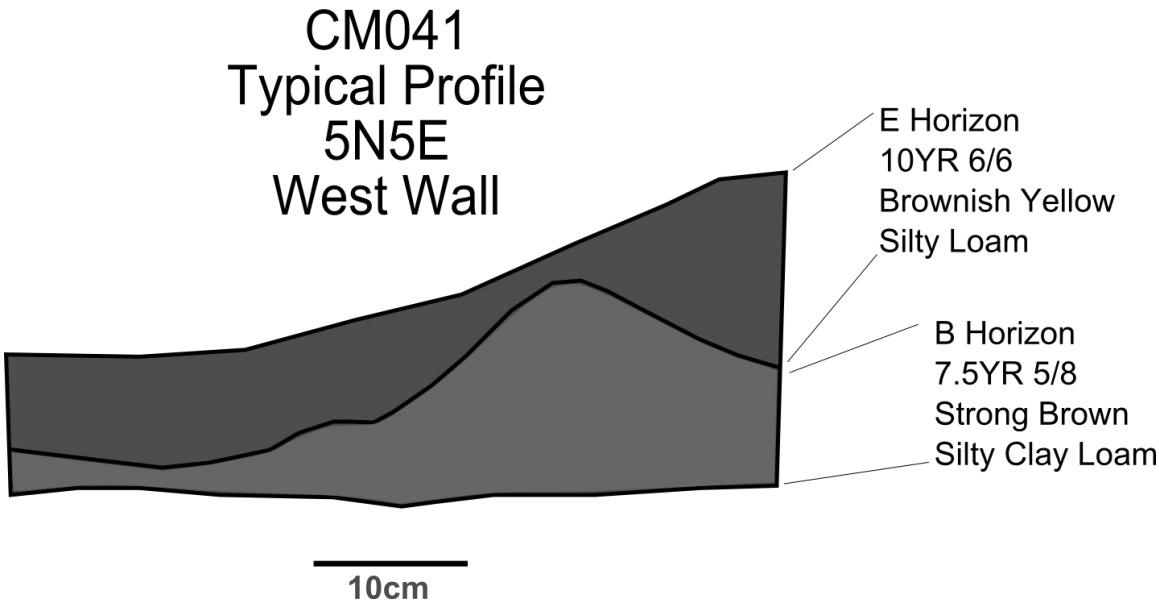

Figure 12 Representative soil profile from CM041

Figure 13 Photograph of unit 5S5E at site CM041. View to the west.

Artifacts from Phase I

The only artifact recovered in the Phase I investigation was one distal portion of a Citronelle chert flake (Alvey and Baca 2009:59-60).

Artifacts from Revisit

¼" and Surface

Two more pieces of debitage were found: one on the exposed ground surface just south of unit 5S5E and one in unit 10S5E (Figure 14; Tables 8 and 9). A historic occupation was also found: curved glass and slate were found in units 0N5E and 0N10E, respectively, and a piece of whiteware was found on the surface.

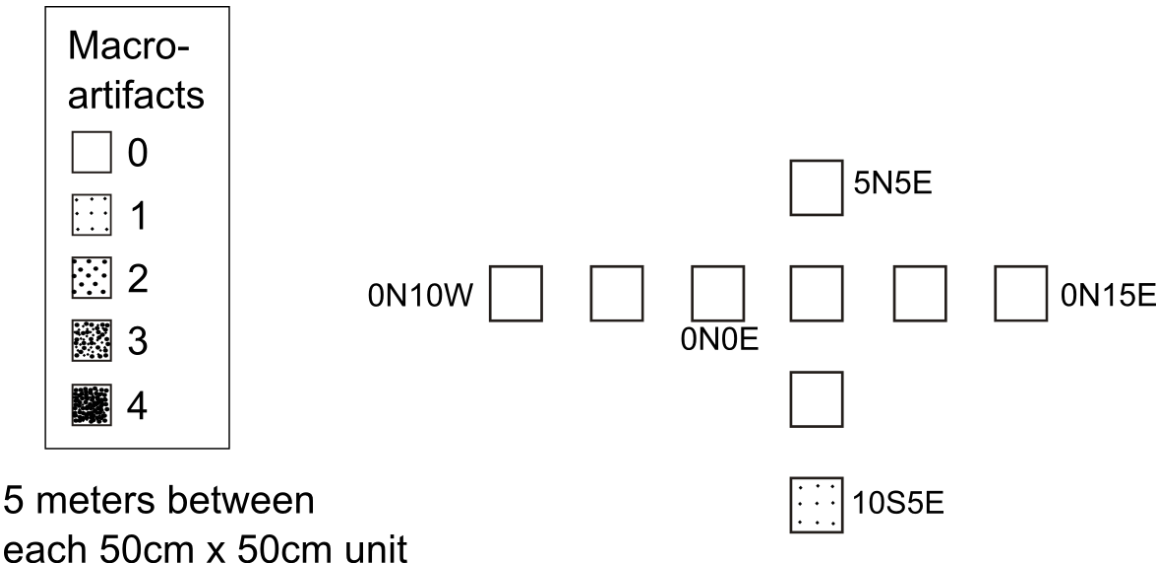

Figure 14 Map of macroartifacts from CM041

Table 8 Macroartifacts from 50 cm x 50 cm units and GSC at CM041

Provenience	Artifact type	Count
10s5e	debitage	1
GSC	debitage	1
Total: 2		

Table 9 Tabulation of debitage from CM041

Raw Material	1.27 cm	.64cm	Total
Heat treated Chert	0	2	**2**
Total	**0**	**2**	**2**
Portion			
Complete	0	0	**0**
Proximal	0	0	**0**
Medial	0	1	**1**
Distal	0	0	**0**
Shatter	0	1	**1**
Total	**0**	**2**	**2**
Cortex			
100%	0	0	**0**
99%-50%	0	1	**1**
49%-1%	0	0	**0**
0%	0	1	**1**
Total	**0**	**2**	**2**

Fine Screen

Fine screen from units 0N15E and 0N5W both contained one piece of debitage, and 14 pieces of debitage were found in the fine screen from unit 10S5E (Figure 15, Table 10).

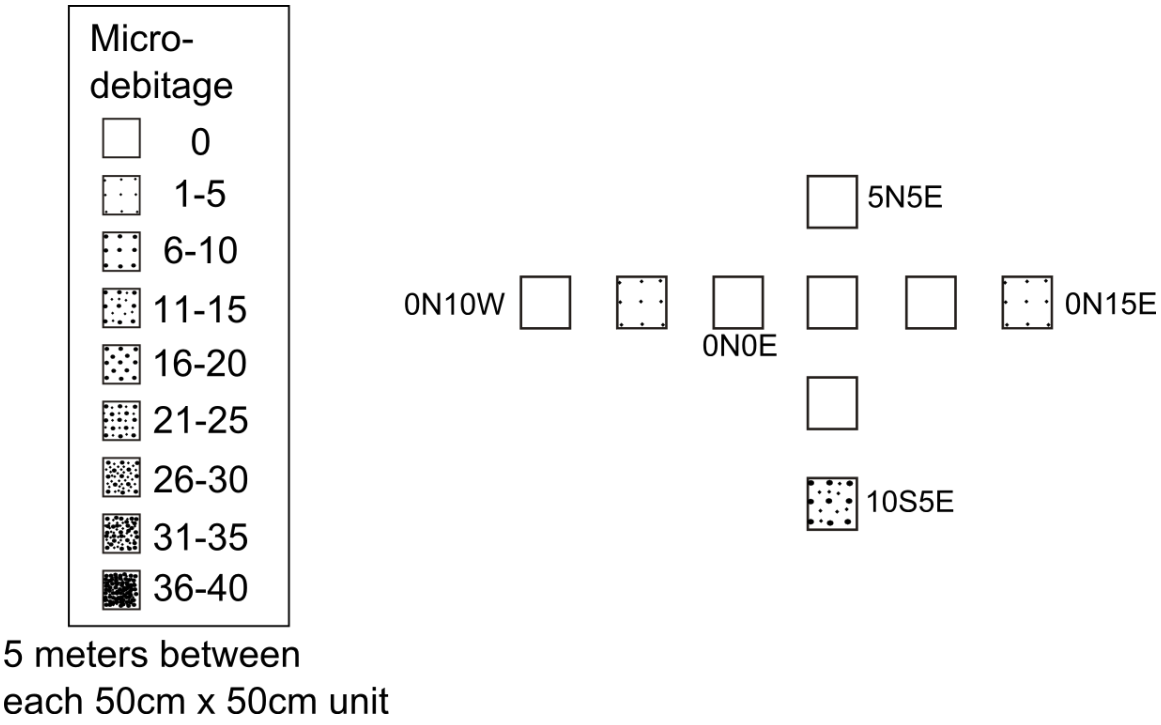

Figure 15 Map of fine screen debitage at CM041

Table 10 Fine screen debitage from CM041

Provenience	Artifact type	Count
0N15E	debitage	1
0N5W	debitage	1
10S5E	debitage	14
Total: 16		

Revisit Summary

Site CM041 was originally represented by only one positive 30 cm shovel test. Screening through ¼" mesh in 50 cm x 50 cm units expanded the southern site extent by 10 meters. Fine screen debitage recovered from fine screening expanded CM041 10 meters to the east and to the west.

While debitage from the surface and in the 1/4" was still in relatively small numbers, the relatively large amount of debitage (14) in the fine screen from unit 10S0E is noteworthy. This could mean that materials cluster tightly further to the south and become more diffuse to the north, where most of the excavation occurred. Intra-site patterning could have been destroyed by logging disturbance. As with unit 5N0E from 22GR812, only one flake was recovered in the 1/4" screen from unit 10S0E at this site.

22GR834

Site 22GR834 (Figures 16 and 17) was discovered by shovel testing a gently sloping ridge spur with gullies on the northern and southern slopes (Alvey and Baca 2009:99). No significant disturbances since the site's discovery appear to have occurred; 3 cm of dark brown (10YR 3/3) silt loam was observed during shovel testing (Figures 18 and 19). Four lithic artifacts, one of which is a non-diagnostic biface fragment, were originally found in three positive shovel tests. Ten negative shovel tests were dug at that time (Figure 16). The site was classified as potentially eligible, as it was thought to be a well preserved example of short duration prehistoric occupations with exclusively lithic artifact contents (Alvey and Baca 2009:99-100).

Figure 16 Fieldwork underway at 22GR834

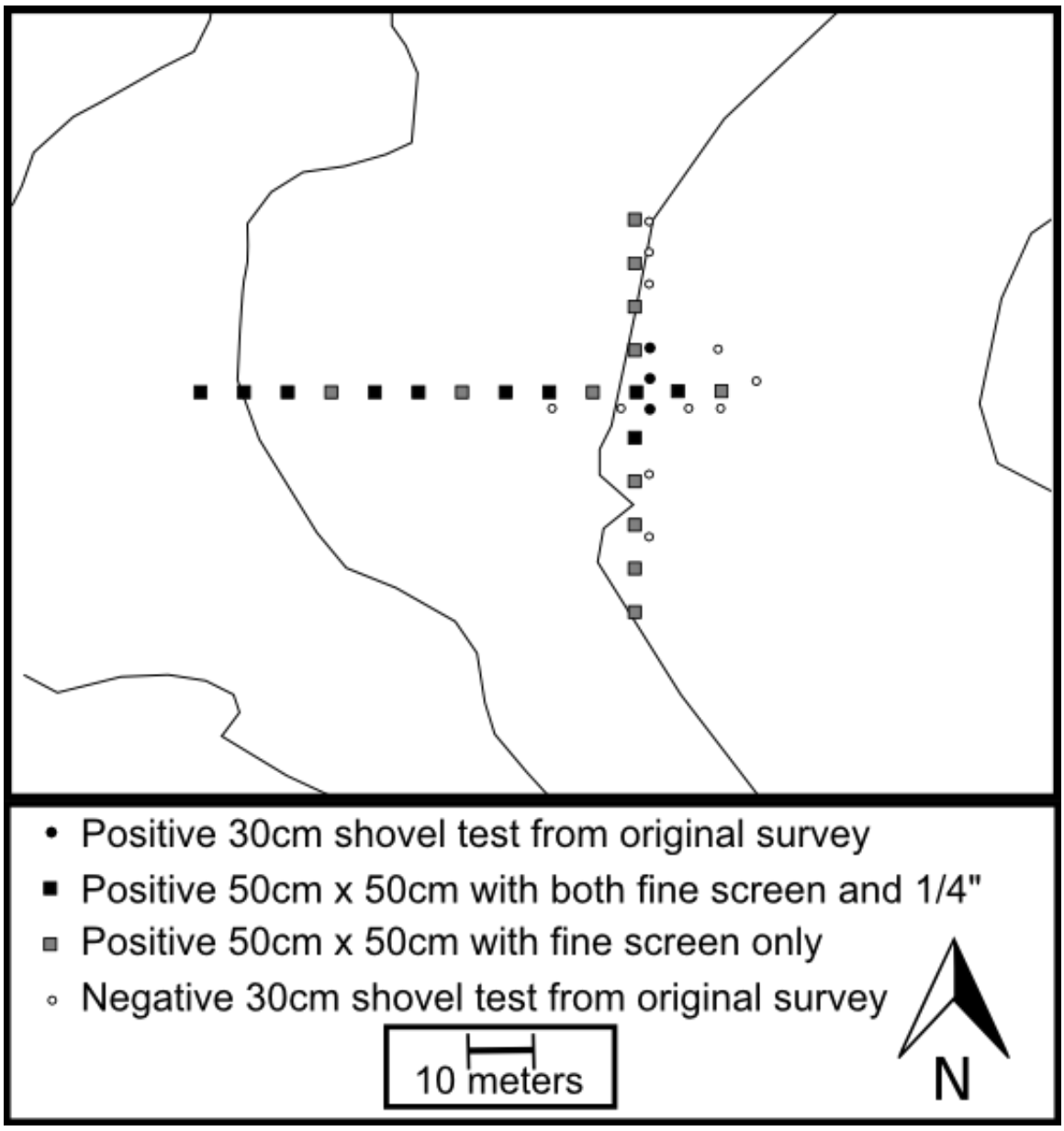

Figure 17 Map of site 22GR834

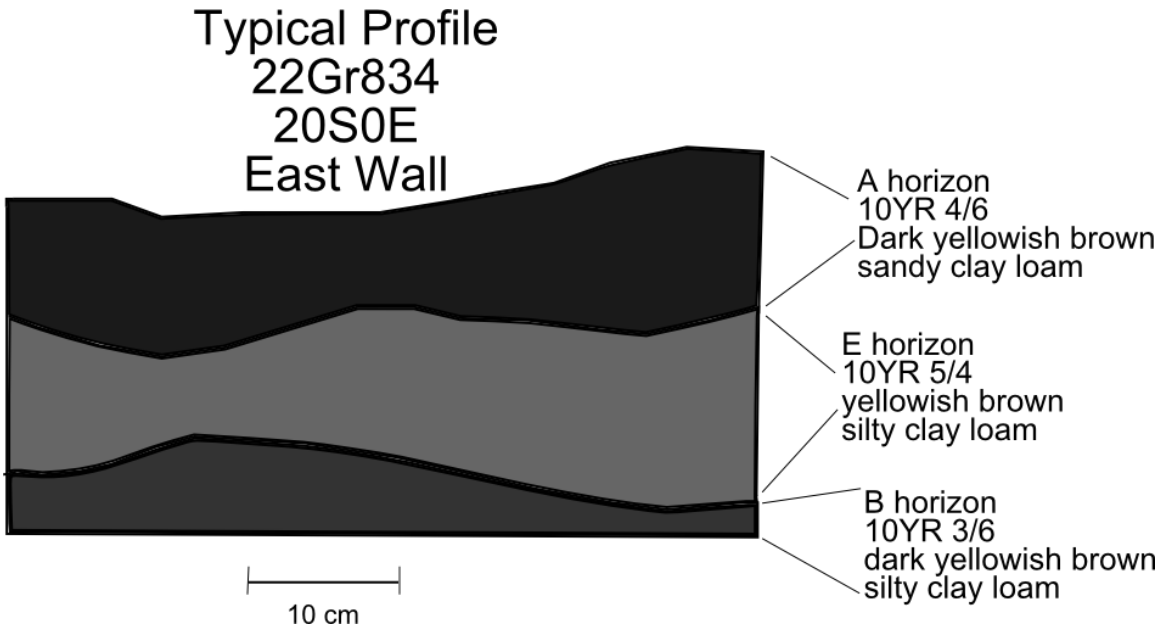

Figure 18 Representative soil profile from 22GR834

Figure 19 Photograph of unit 20S0E at 22GR834. View to the east.

Artifacts from Phase I

The assemblage recovered during the Phase I included one broken, non-diagnostic biface fragment as well as three complete and one distal Citronelle chert flakes (Alvey and Baca 2009:99-100).

Artifacts from Revisit

¼"

Artifacts from the 1/4" mesh were distributed in relatively small numbers fairly evenly across the east-west transect of the cruciform (Figure 20). The number of artifacts found in the 1/4" screen did not exceed 2 in any of the units (Table 11). Total pieces of debitage from the 1/4" totaled 13 for the entire site (not including the 3 from the original Phase I) (Table 12). Proximal and complete flakes indicate primarily late-stage reduction (Table 13). An eroded grog-tempered potsherd was recovered in unit 0N45W, and an eroded sand-tempered potsherd was found in unit 15N0E (Table 11).

Other objects from the 1/4" screen include 2 sandstone, one siltstone, and one petrified wood fragments exhibiting no certain signs of modification.

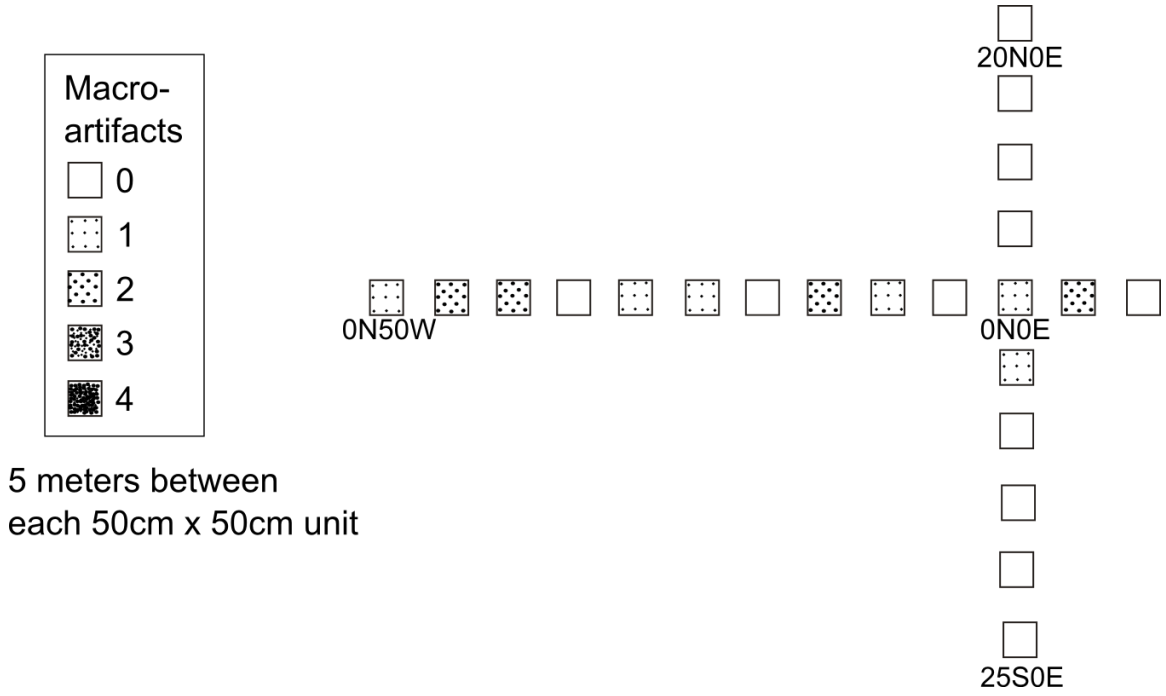

Figure 20 Map of macroartifacts at 22GR834

Table 11 ¼" artifacts from 22GR834

Provenience	Artifact type	Count
15N0E	Potsherd: sand eroded	1
0N0E	Debitage	1
5S0E	Sandstone, Possibly modified	1
0N5E	Debitage	2
0N10W	Debitage	1
0N15W	Debitage	2
0N25W	Debitage	1
0N30W	Debitage	1
0N40W	Debitage	2
0N45W	Debitage	1
0N45W	Potsherd: grog-eroded	1
0N50W	Debitage	1
Total debitage: 12		
Total potsherds: 2		
Total sandstone: 1		

Table 12 Tabulation of debitage from 22GR834.

Raw Material	**1.27 cm**	**.64cm**	**Total**
Citronelle Chert	0	10	**10**
Fort Payne Chert	0	1	**1**
White chert	0	1	**1**
Total	**0**	**12**	**12**
Portion			
Complete	0	5	**5**
Proximal	0	5	**5**
Medial	0	1	**1**
Distal	0	1	**1**
Shatter			
Total	**0**	**12**	**12**
Cortex			
100%	0	0	**0**
99%-50%	0	2	**2**
49%-1%	0	3	**3**
0%	0	7	**7**
Total		**12**	**12**

Table 13 Paradigmatic classification of the flake assemblage at 22GR834.

	Platform Facets			
Dorsal Scars	0	1	2	3 or >
0	-	-	-	-
1	-	-	-	1
2	-	-	1	1
3 or >	-	-	1	6

Fine Screen

Relatively large numbers of debitage were found in the fine screen throughout most of the site (Figure 21; Table 14). Although debitage from the fine screen was present in every unit, there do appear to be concentrations and paucities in various areas. Debitage concentrates around the center of the cruciform with the largest quantities

occurring in 0N0E (n=38) and in the next units to the east (n=38) and south (n=37). Debitage quantities are comparable to the center in units 0N30W (n=35) and 0N35W (n=36) (Figure 21). Fine screen debitage counts appear to drop significantly south of the center of the cruciform, beginning with unit 10S0E. Counts drop somewhat below average north of the center, but not as drastically as in the southern arm. To the west, counts are below average in the two units from the center, increasing in 0N15W, and dropping drastically in 0N20W (n=5).

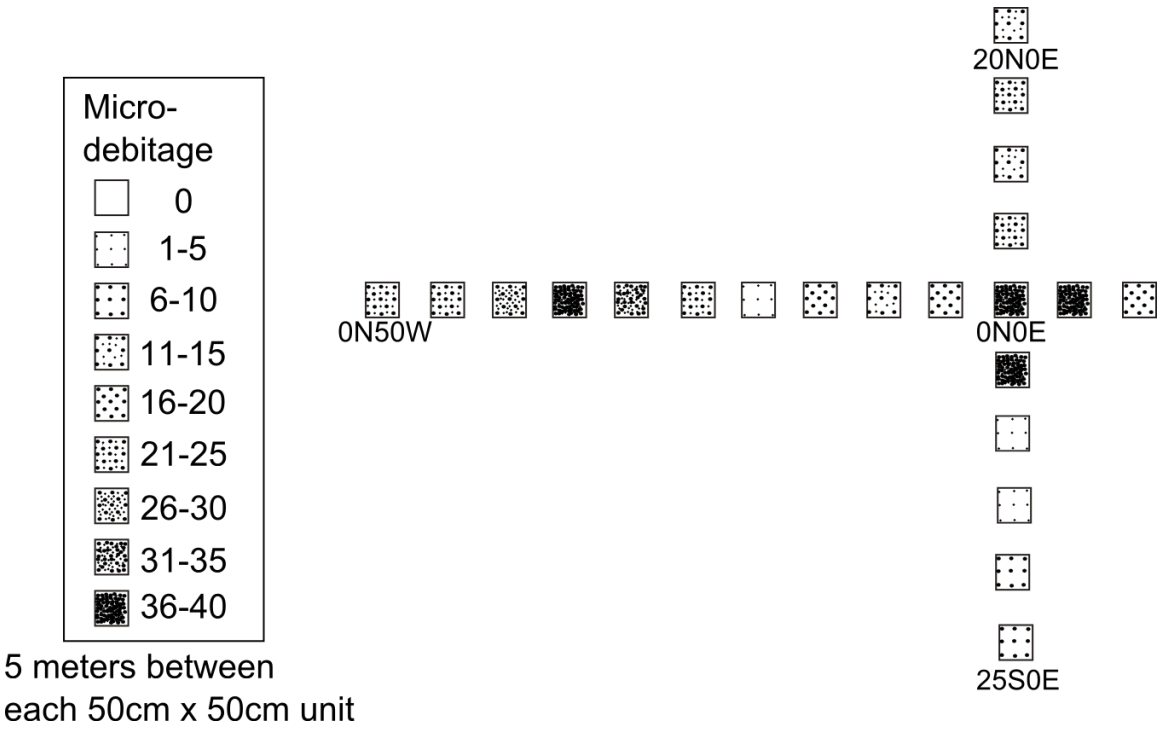

Figure 21 Map of fine screen debitage at 22GR834

Table 14 Fine screen debitage from 22GR834

Provenience	Artifact type	Count
0N0E	Debitage	38
5N0E	Debitage	22
15N0E	Debitage	24
20N0E	Debitage	13
10S0E	Debitage	5
15S0E	Debitage	2
25S0E	Debitage	6
0N10W	Debitage	12
0N35W	Debitage	36
0N25W	Debitage	23
20S0E	Debitage	6
0N40W	Debitage	28
0N30W	Debitage	35
0N45W	Debitage	24
5S0E	Debitage	37
0N5W	Debitage	16
10N0E	Debitage	13
0N10E	Debitage	17
0N20W	Debitage	5
0N5E	Debitage	38
0N50W	Debitage	21
0N15W	Debitage	20
Total: 441		

Revisit Summary

Site 22GR834 originally was recorded via a north-south oriented line of 20 cm shovel tests with 10 meters of space between them. Artifacts found in the ¼" mesh in the 50 cm x 50 cm units excavated during the revisit extended the site 10 meters to the east and 50 meters to the west (Figures 16 and 20). Including debitage recovered from the fine screen extended 22GR834 a total of 20 meters to the east as well as 15 meters to the north

and 25 meters to the south (Figures 16 and 21). As all units were positive in the fine screen, these measurements indicate a minimum possible size estimate.

Resampling 22GR834 resulted in the recovery of two prehistoric ceramic fragments, which represent a general Woodland period occupation. Debitage from the fine screen revealed previously unknown concentrations of artifacts that are somewhat, but not entirely, associated with artifacts recovered from the 1/4" mesh. While the highest fine screen debitage counts appear to be associated with 1/4" finds (Figures 20 and 21), some units that are positive exclusively in the fine screen have debitage counts that are relatively high, such as 0N35W and the four units north of 0N0E. Fine screen debitage counts in the northern and southern arms of the cruciform are obviously different: half of the units in the northern arm have above average fine screen debitage counts, and all but one unit in the southern arm has counts that are among the lowest in the entire site. Complete and proximal flakes recovered from the ¼" mesh all appeared to be from late-stage reduction, which--combined with the high counts of fine screen debitage--might suggest that maintenance of complete tools and/or the finishing of near-complete late-stage preforms were occurring here.

Alvey and Baca recommended this site as potentially eligible in part due to its good soil preservation (2009:99-100; see above); the same phenomenon was observed during this fieldwork. If this means that disturbance at 22GR834 is minimal, it seems reasonable to assume that fine screen debitage counts indicate spatial patterns of prehistoric human behavior, i.e., distinct feature-scale phenomena (see discussion in above sections). This being the case, human activity appears to decrease in intensity as elevation proceeds rapidly downward to the north and south of ridge. Activity is most

intense in the center of the cruciform and 30 to 40 meters to the west. These observations may suggest the presence of multiple occupation areas at 22GR834, which could not have been hypothesized without data collected from reinvestigation.

This site is noted as having a 10-meter diameter in the Phase I report (Alvey and Baca 2009:99). The recovery methods used in this investigation increased sites site to 60 meters east-west and 45 meters north-south, giving it a total minimum area of 2700 square meters. Had this site not been chosen for re-sampling, the artifact concentration toward the western end of the cruciform would not have been discovered. Also, the relatively small concentrations of fine screen debitage in the northern and southern arms of the cruciform, presumably indicating decreased activity or shorter duration occupation areas, would have remained unknown, and the potsherds attributed to the Woodland period would not have been recovered. The debitage concentration west of the cruciform center indicates that further investigation of this site would be beneficial.

CM066

Shovel testing on the edge of a low-lying bluff resulted in the recording of CM066 (Figures 22 and 23) during Phase I survey (Alvey and Baca 2009:102-103). Only one artifact was recovered. Alvey and Baca (2009:102) note the well-preserved state; which they attribute to the site's position at the edge of a bluff, which would have made it less likely to have been impacted by logging activity (unlike the surrounding area to the south and west). As of 2013, the soil profile still indicated good preservation (Figures 24 and 25).

Figure 22 Fieldwork underway at CM066

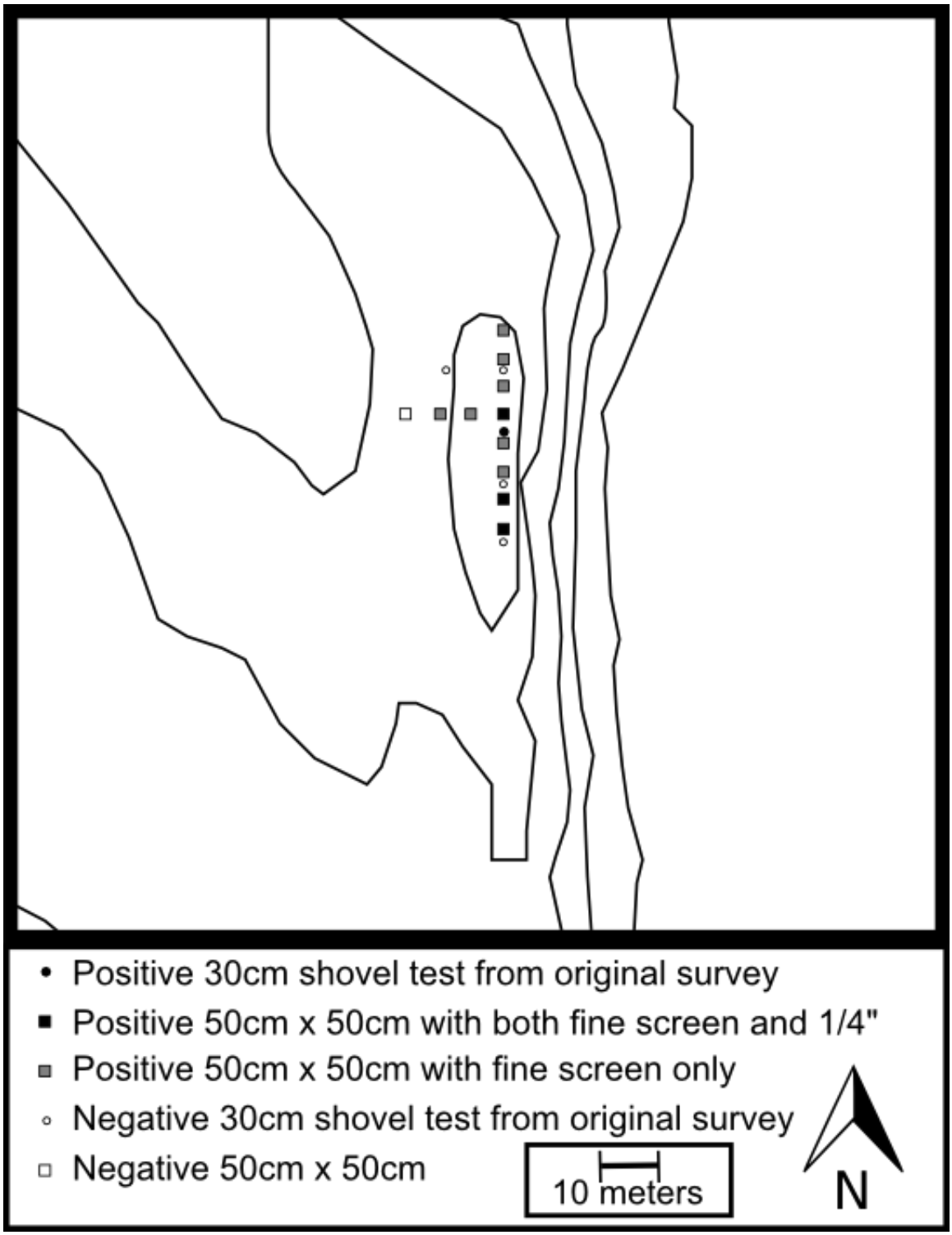

Figure 23 Map of site CM066

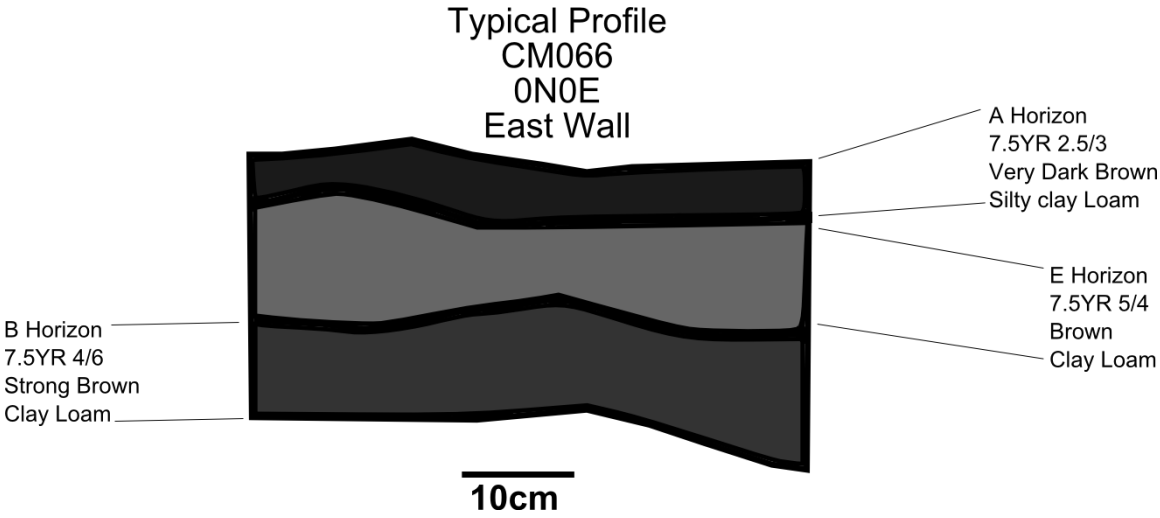

Figure 24 Representative soil profile from CM066

Figure 25 Photograph of unit 0N0E at site CM066. View to the east.

Artifacts from Phase I

The only artifact recovered during Phase I survey was a piece of Citronelle chert shatter.

Artifacts from Revisit

¼"

Two pieces of debitage--one in Unit 0N0E and one in Unit 15S0E--and a piece of fired clay from Unit 20S0E were the only artifacts recovered from the 1/4" screen (Figure 26; Tables 15 and 16).

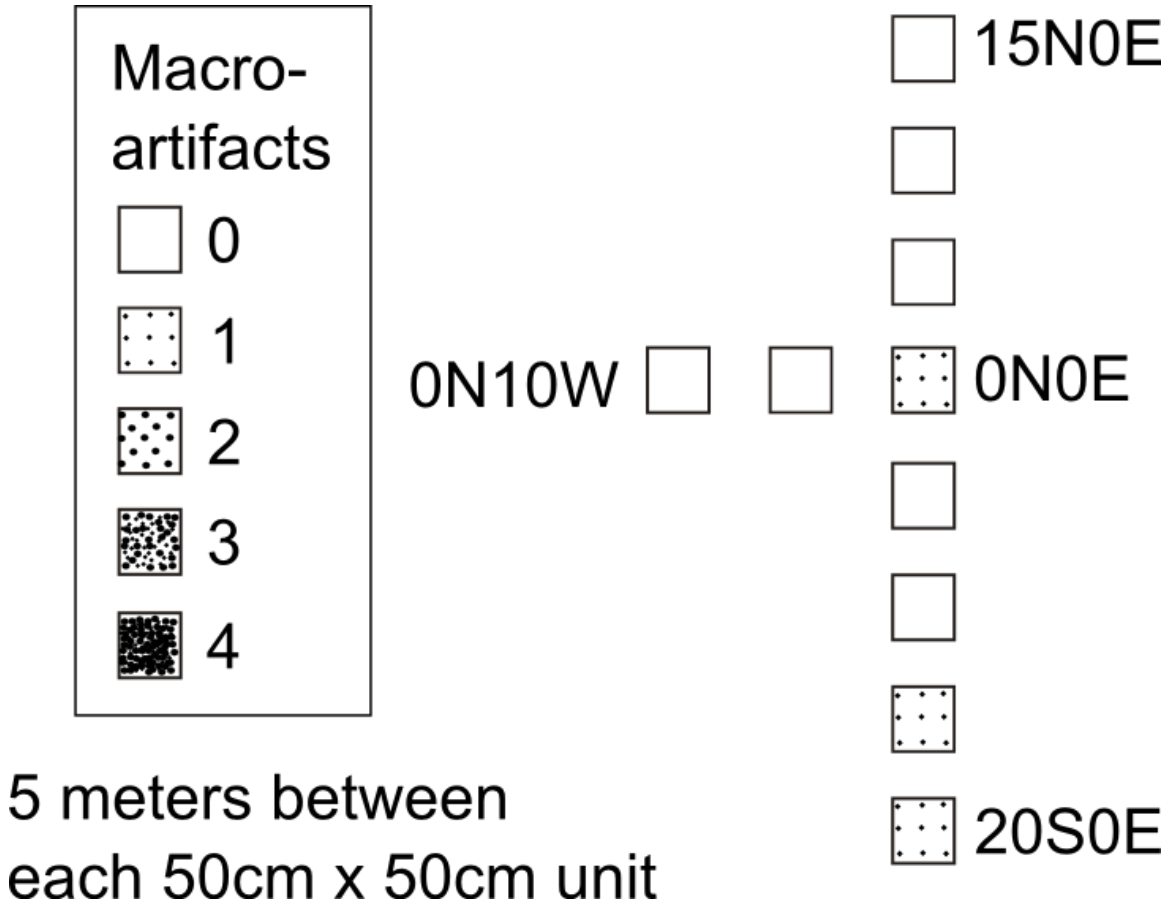

Figure 26 Map of macroartifacts at CM066

Table 15 Macroartifacts from CM066

Provenience	Artifact type	Count
20S0E	Fired clay	1
15S0E	Debitage	1
0N0E	Debitage	1
Total fired clay: 1		
Total debitage: 2		

Table 16 Tabulation of debitage from CM066

Raw Material	**1.27 cm**	**.64cm**	**Total**
Heat treated Chert	0	2	**2**
Total	**0**	**2**	**2**
Portion			
Complete	0	0	**0**
Proximal	0	1	**1**
Medial	0	1	**1**
Distal	0	0	**0**
Shatter	0	0	**0**
Total	**0**	**2**	**2**
Cortex			
100%	0	0	**0**
99%-50%	0	0	**0**
49%-1%	0	0	**0**
0%	0	2	**2**
Total	**0**	**2**	**2**

Fine Screen

The largest quantity of fine screen debitage was concentrated in unit 0N0E. Fine screen debitage counts remain relatively high in the next two units to the south, dropping lower in unit 15S0E, and climbing to a higher quantity again in unit 20S0E (Figure 27, Table 17). Except for unit 0N10W, all other units contained at least one piece of fine screen debitage, although counts were noticeably lower north and west of 0N0E. Unit 0N10W was the only unit with neither fine screen debitage nor ¼" artifacts.

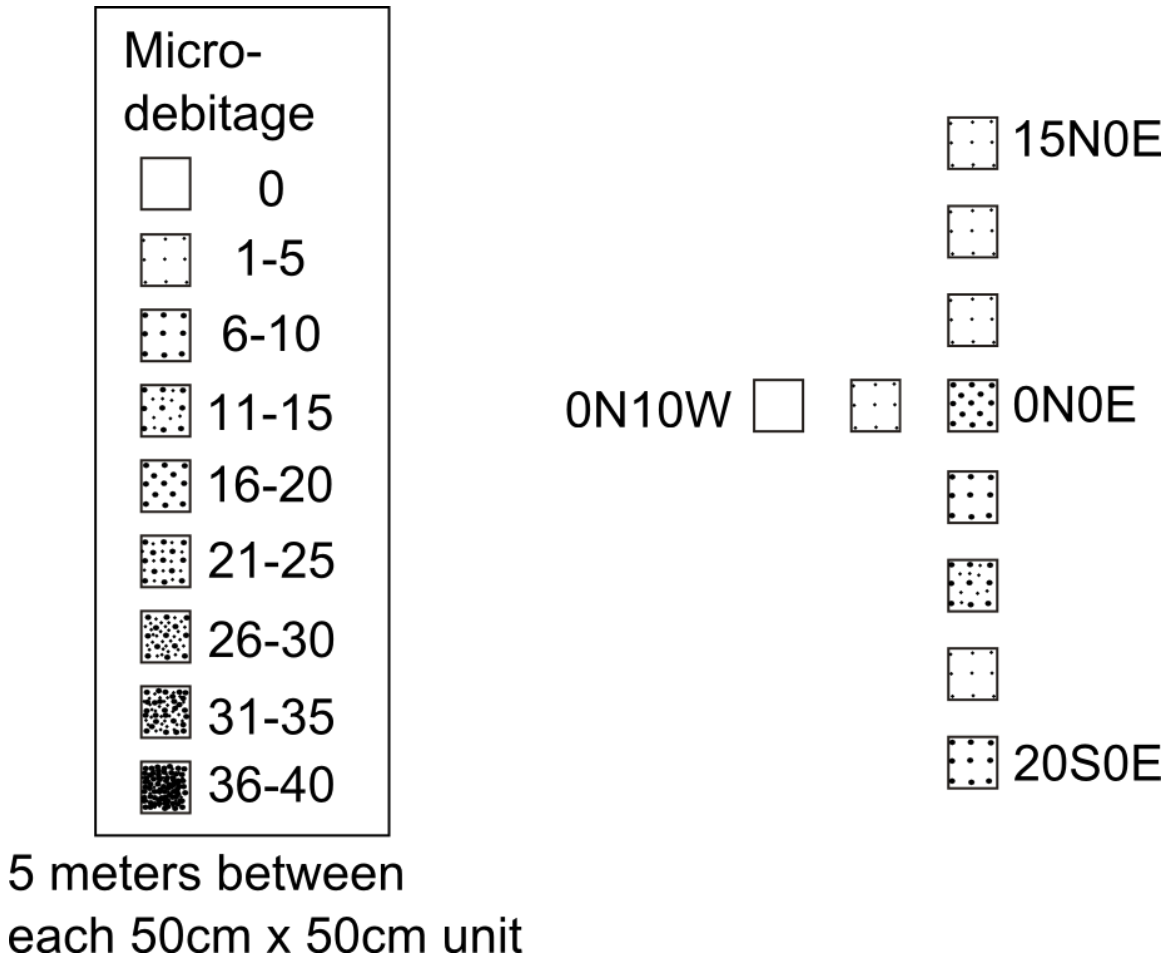

Figure 27 Map of fine screen debitage at CM066

Table 17 Fine screen debitage from CM066.

Provenience	Artifact type	Count
0N0E	Debitage	20
0N5W	Debitage	2
5S0E	Debitage	6
10S0E	Debitage	12
15S0E	Debitage	2
20S0E	Debitage	8
5N0E	Debitage	1
10N0E	Debitage	1
15N0E	Debitage	3
Total: 55		

Revisit Summary

Revisiting this site does seem to indicate that this occupation is relatively small in size and quantity, even when compared to other sites in this study where only one artifact was recovered in one shovel test during the Phase I survey. Artifacts from this investigation in the ¼" mesh extended the site 5 meters to the north and 20 meters to the south. The inclusion of debitage from the fine screen increased the northern by 15 meters as well as 10 meters east of unit 0N0E. The northernmost and southernmost units were both positive in the fine screen, so these measurements represent minimum estimates of site size.

Re-sampling has provided a clearer picture of CM066: as with 22GR834, this site was noted as showing minimal disturbance in the soil profile, which may indicate that artifact recovery represents concentrations of prehistoric human activity. If this is the case, artifacts seem to be concentrated at the edge of the bluff, and if the units to the west are an indicator of east-west site width, activity was minimal to the west of the bluff edge. Over time, cultural materials may have eroded into the floodplain to the east. If the fine screen debitage may be taken as a relative indicator of human activity, including this site in the sample allows it to be compared to others in terms of artifact density, which may be a means for investigating occupational intensity (Peacock 2004:1).

22GR836

Site 22GR836 (Figures 28 and 29) was initially found while shovel-testing a ridge spur to the west of an unnamed creek. The landform was noted as having been disturbed by gullies and an overgrown logging road on the ridge crest. Six shovel tests were dug, and only one of these was positive. Although the soil profile may seem to indicate

otherwise (Figures 30 and 31), the light color of what was recorded as A horizon suggests that this is probably a relatively thick E horizon, which shows that soils at 22GR836 are moderately well preserved.

Figure 28 Fieldwork underway at 22GR836

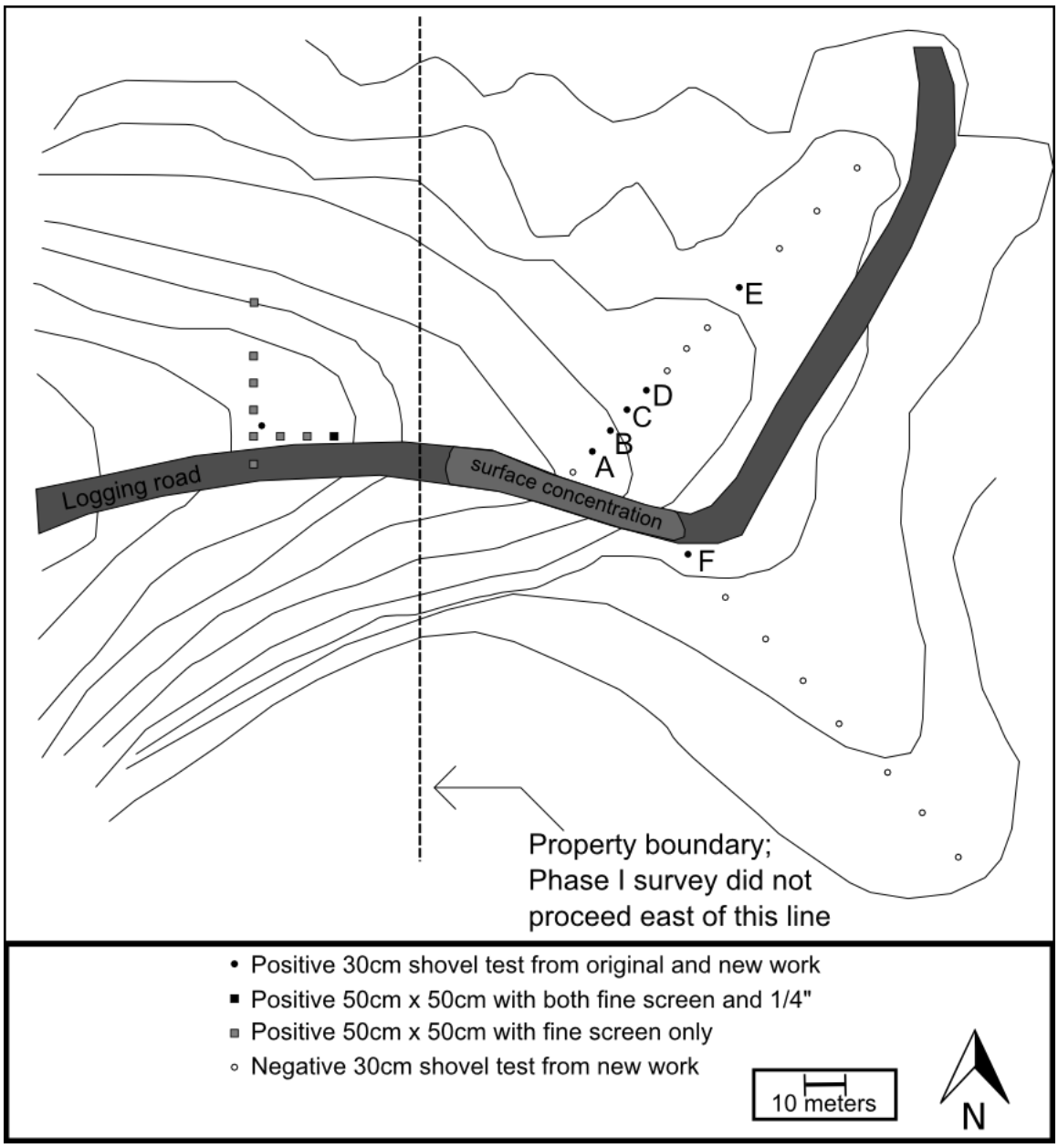

Figure 29 Map of site 22GR836

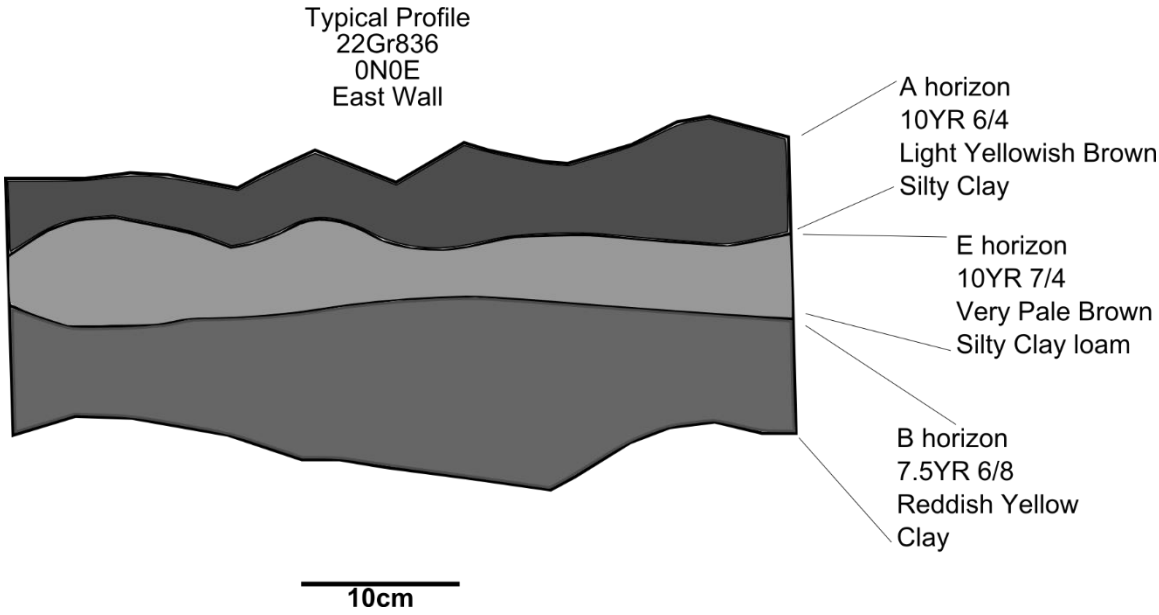

Figure 30 Representative soil profile from 22GR836

Figure 31 Photograph of unit 5N0E at site 22GR836. View to the east.

Artifacts from Phase I

The only artifact found during the Phase I survey was a sand-tempered eroded potsherd.

Artifacts from Revisit

¼" and GSC

As at site 22GR812, the reopening of an overgrown logging road after the Phase I survey exposed artifacts (Figure 32) that significantly expanded the original dataset. A potsherd and a non-diagnostic bifacial drill tip--found in unit 5S15E--were the only artifacts recovered from the ¼" in any of the 50 cm x 50 cm units (Figure 33; Table 18). Most of the non-fine screen artifacts were recovered from the reopened logging road and in 30 cm round shovel tests dug by Keith Baca and his crew, who were in the process of conducting the final season of Phase I survey on Camp McCain while this thesis fieldwork was underway. In the GSC area, a total of 91 potsherds and 15 pieces of debitage were recovered (Tables 18 and 19). A lithic artifact interpreted to be a tested pebble was also found. Six out of a total of twenty 30 cm shovel tests were positive. Shovel tests were oriented on a northeastern transect north of the GSC area and on a southeastern transect to the south of the GSC area (Figure 29). Artifacts recovered from shovel tests included 4 pieces of debitage, 7 potsherds, and 1 fragment of curved glass. A total of 19 pieces of debitage were recovered (Table 21); proximal and complete flakes recovered here indicate primarily late-stage reduction (Table 22).

Figure 32 Photograph of flagged potsherd on logging road surface at 22GR836

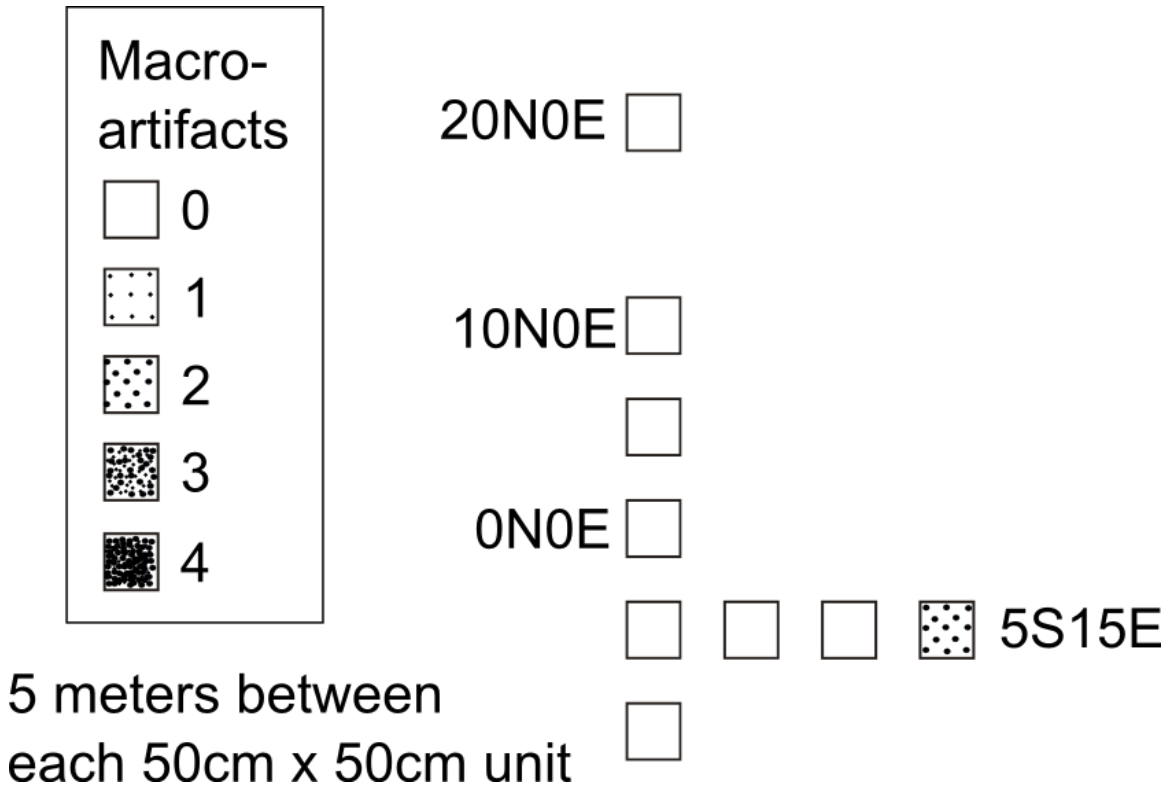

Figure 33 Map of macroartifacts from 50 cm x 50 cm units at 22GR836

Table 18 Macroartifacts from 50 cm x 50 cm units at 22GR836

Provenience	Artifact type	Count
5S15E	Potsherd: sand-eroded	1
5S15E	Biface: non-diagnostic drill tip	1

Table 19 Potsherds from GSC at 22GR836

Temper-Surface	Count
Bone plain	1
Sand plain	13
Sand eroded	26
Grog plain	24
Grog eroded	27
Total: 91	

Table 20 Lithics from GSC at 22GR836

Artifact Type	Count
Tested pebble	1
Debitage	15

Table 21 *Tabulation of debitage from 22GR836.*

Raw Material	**1.27 cm**	**.64cm**	**Total**
Citronelle Chert	5	7	**12**
Fort Payne Chert	1	1	**2**
Heat treated Chert	0	4	**4**
Siltstone	0	1	**1**
Total	**6**	**13**	**19**
Portion			
Complete	1	1	**2**
Proximal	4	4	**8**
Medial	0	0	**0**
Distal	0	3	**3**
Shatter	1	5	**6**
Total	**6**	**13**	**19**
Cortex			
100%	0	1	**1**
99%-50%	1	3	**4**
49%-1%	5	6	**11**
0%	0	3	**3**
Total	**6**	**13**	**19**

Table 22 Paradigmatic classification of the flake assemblage at 22GR836

	Platform Facets			
Dorsal Scars	0	1	2	3 or >
0	-	-	-	-
1	-	-	-	2
2	-	1	1	1
3 or >	-	1	1	3

Fine Screen

Debitage recovered from fine screen was present in all of the 50cm x 50cm units, except for unit 5S15E (Figure 34; Table 23). Although unit 5S15E contained no fine screen debitage, small fired clay objects that may be sherds were kept (a sherd was recovered in the ¼" from this unit; see above [Figure 33]).

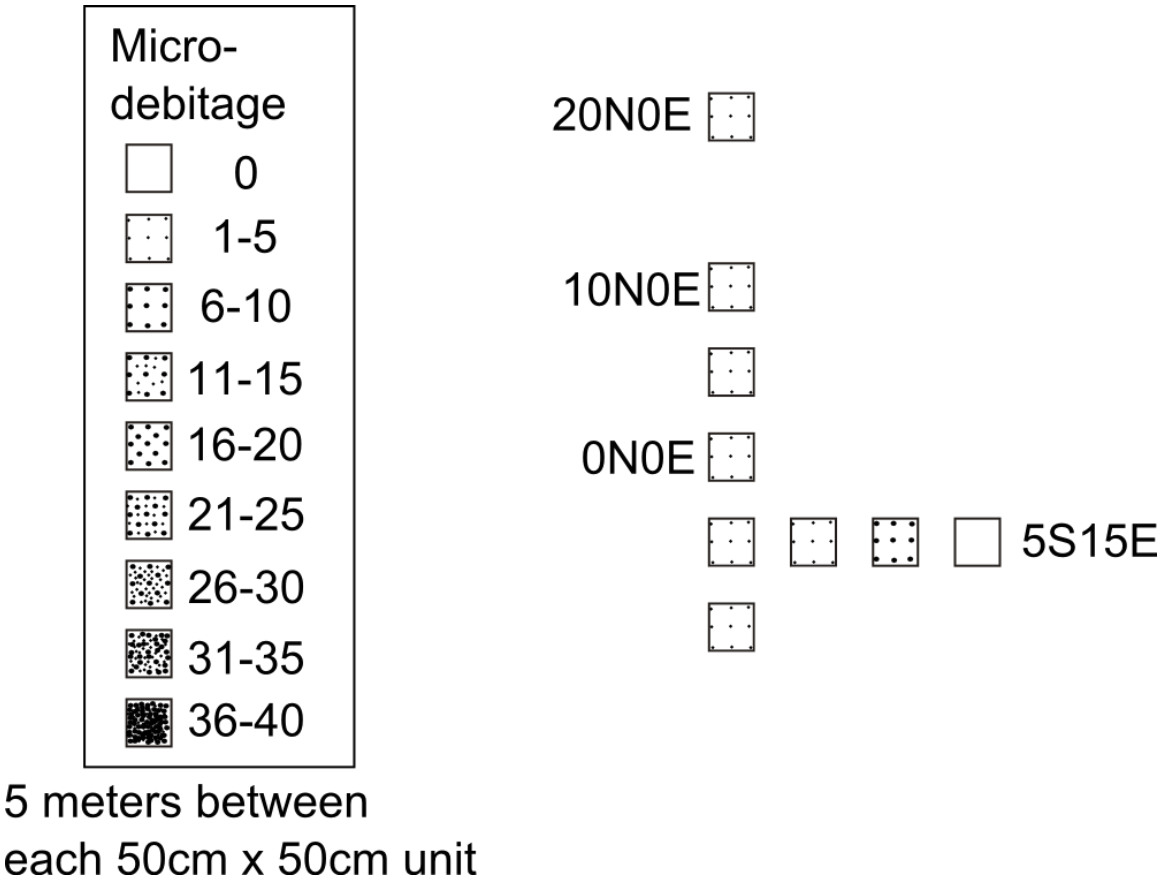

Figure 34 Map of fine screen debitage at 22GR836

Table 23 Fine screen debitage from 22GR836

Provenience	Artifact type	Count
0N0E	Debitage	2
5N0E	Debitage	3
10N0E	Debitage	2
5S0E	Debitage	1
10S0E	Debitage	2
5S10E	Debitage	8
5S5E	Debitage	2
20N0E	Debitage	3
Total: 23		

Revisit Summary

Treatment of what was originally interpreted as a property boundary during the Phase I survey (Figure 29) was the primary factor pertaining to increased site size during this investigation. Had it been known during the Phase I that the portion of the landform on the other side of this boundary was accessible, a larger sample of artifacts may have been obtained, although the surface of the logging road was still vegetated and obscured in 2009. The 50 cm x 50 cm units that contained artifacts, however, were all dug west of this supposed boundary, so it remains possible that a different sampling strategy during survey delineation could have allowed for a larger artifact sample, although the densest concentration of artifacts--recovered east of the boundary in 2013 via GSC--may not have been discovered.

Artifacts from the ¼" found during this thesis fieldwork extended the site 15 meters to the east. Debitage from the fine screen extended the site 15 meters toward the south and into the logging road, as well as 25 meters to the north. The shovel tests that were dug in 2013 by Baca and his crew extended the site boundary north and east of the

surface concentration in the logging road, approximately 130 meters northeast of the positive shovel test from 2009.

Ceramics were the most abundant artifact type recovered from 22GR836. Most of the sherds had either plain or eroded surfaces and were tempered with either sand or grog, which suggests a generalized Woodland period chronological placement. One sherd appeared to have been tempered with bone. Bone tempering in the region has been chronologically associated with the later portions of the Middle Woodland Period and, to a lesser degree, with the Late Woodland Period (Jenkins 1981:157; 16, Figure 1). Had this site not been revisited, this somewhat uncommon artifact would not have been found, and its temporal association would not be attributed to this site. While a general Woodland occupation was already suggested by the original artifact found during the Phase I, the significantly expanded dataset shows the relative intensity of this occupation at 22GR836. The GSC area also extended the known boundary of the site further to the east. Complete and proximal flakes recovered from the ¼" mesh all appeared to be from late-stage reduction, which might suggest that finishing of near-complete, late-stage preforms was occurring here.

22GR840

Site 22GR840 (Figures 35 and 36) was given a state site number due to the presence of a depression interpreted to potentially be a historic-period sunken grave, in addition to a single prehistoric artifact. The site is located on a wide landform with gently sloping sides. Eight negative shovel tests were dug. Alvey and Baca (2009:118) note only two soil horizons at 22GR840, and this is consistent with what was observed in 2013 (Figures 37 and 38).

Figure 35 Fieldwork underway at 22GR840

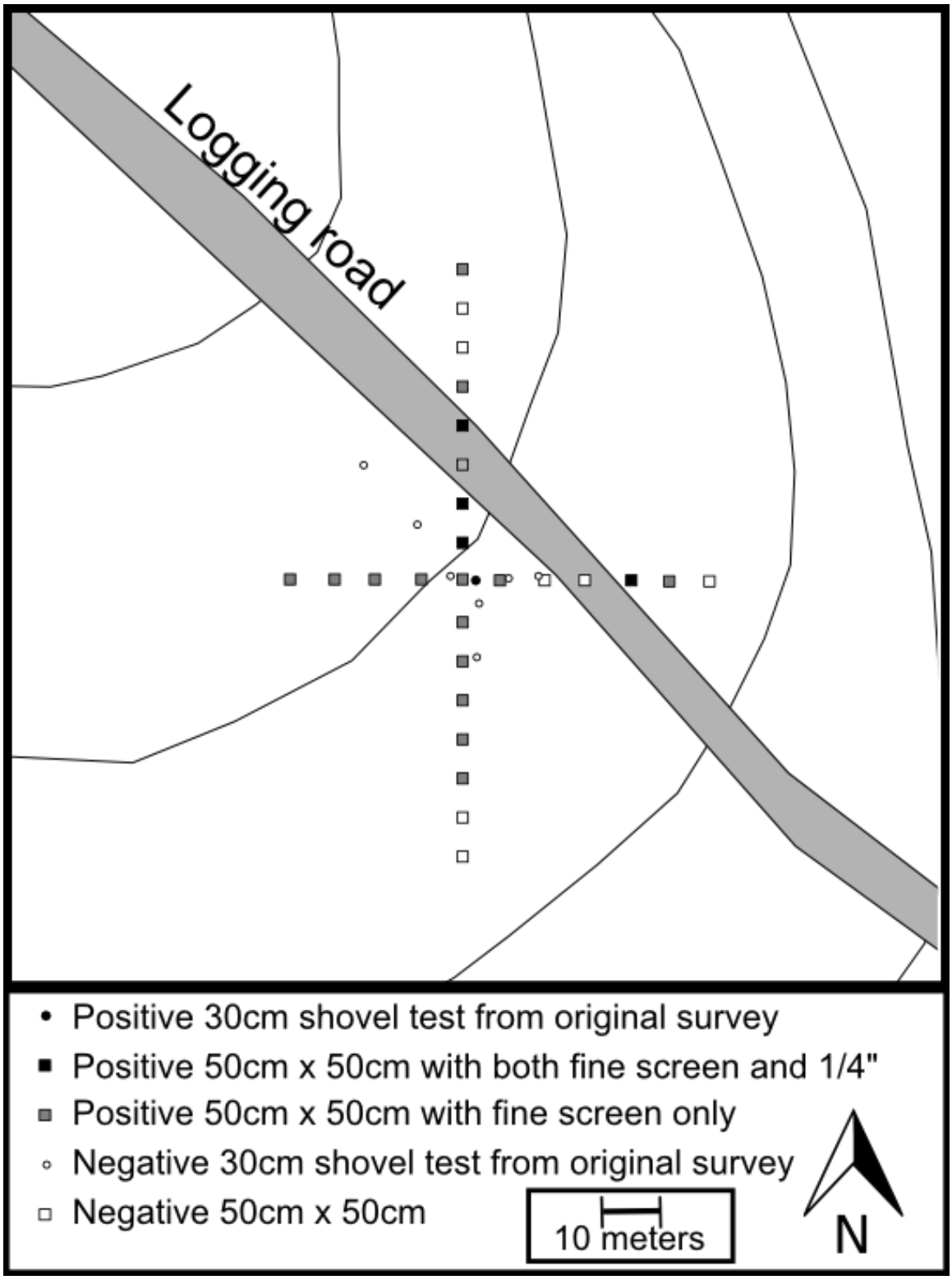

Figure 36 Map of site 22GR834

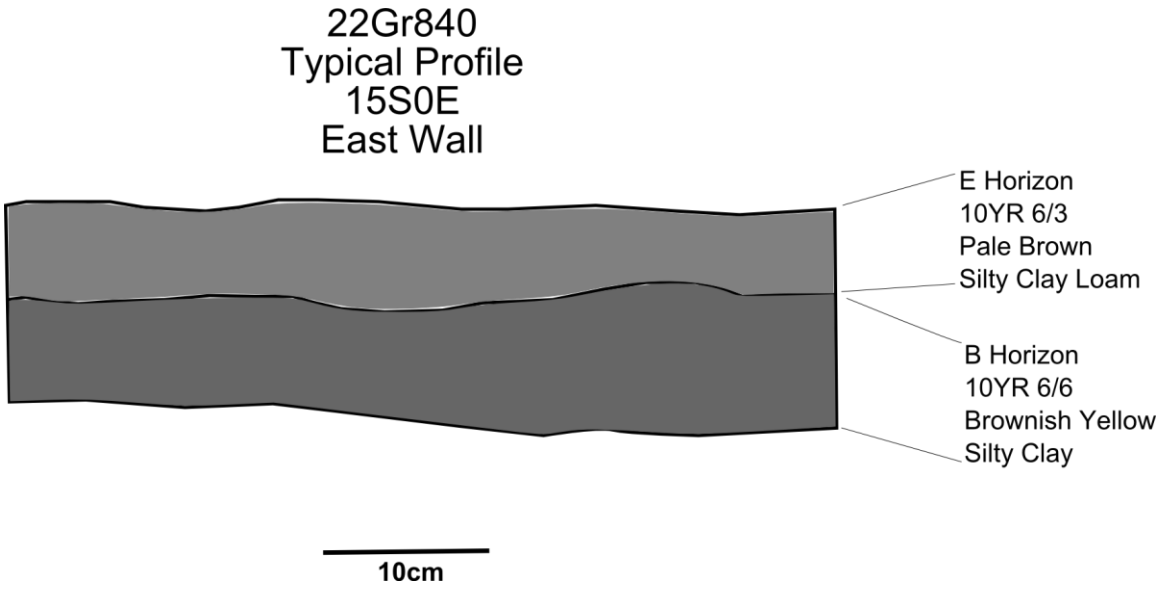

Figure 37 Representative soil profile from 22GR840

Figure 38 Photograph of unit 15S0E at 22GR840. View to the east.

Artifacts from Phase I

Shovel-testing in the vicinity of the depression resulted in the discovery of a chert flake.

Artifacts from Revisit

¼"

Two biface fragments, one of which appears to be diagnostic, and five pieces of debitage were found in the northern cruciform transect (Figure 39, Tables 24 and 25). One piece of debitage was found in the eastern arm of the cruciform. Two pieces of sandstone were found in unit 15S0E, but these cannot be confirmed as having been modified.

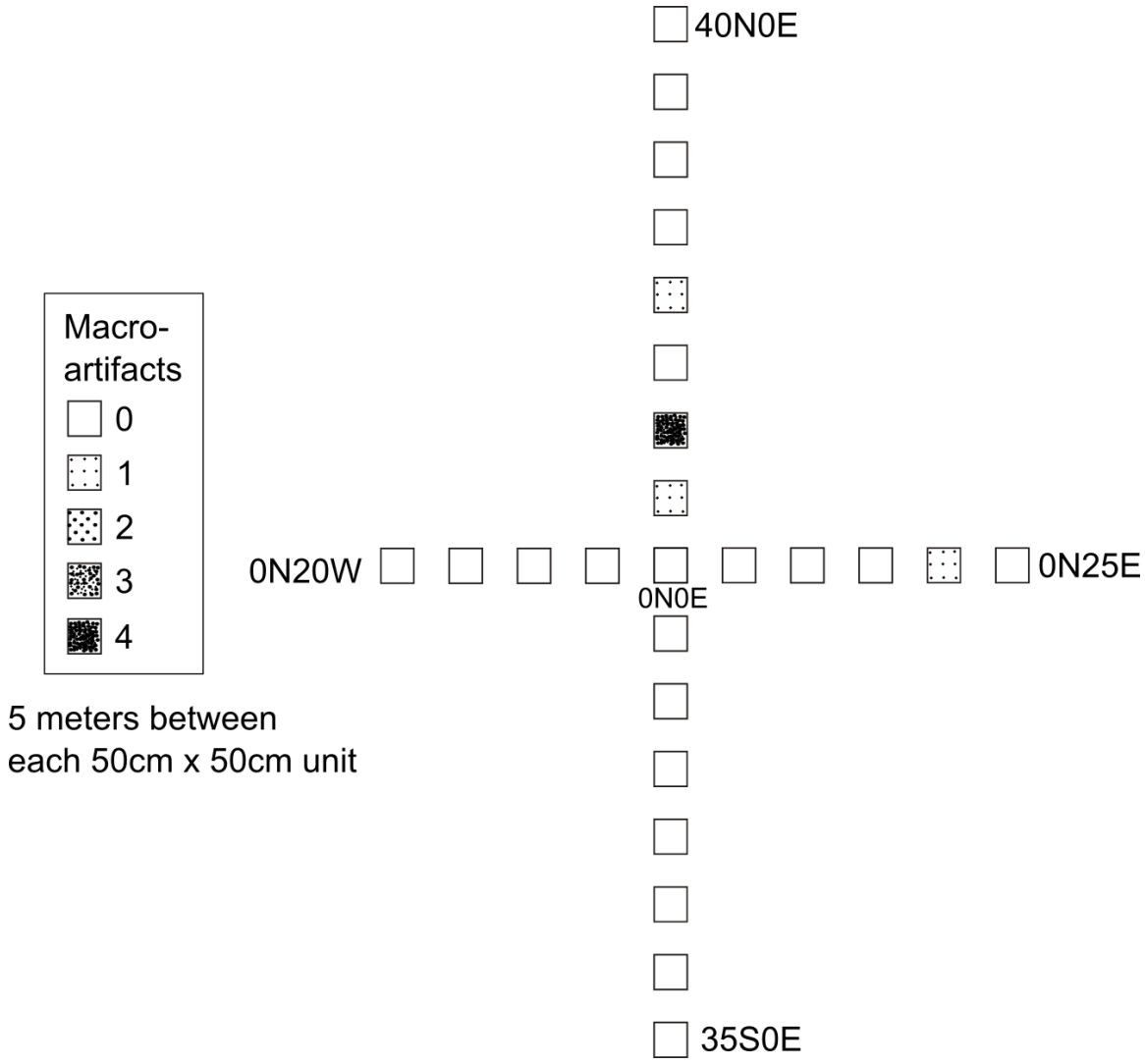

Figure 39 Map of macroartifacts at 22GR840.

Table 24 Macroartifacts from 22GR840

Provenience	Artifact type	Count	Type
10N0E	Debitage	3	NA
10N0E	Biface fragment	1	Gulf Formational-Middle Woodland Stem
5N0E	Debitage	1	NA
0N20E	Debitage	1	NA
20N0E	Biface fragment	1	Distal fragment

Table 24 (continued)

Total debitage: 5
Total biface fragments: 2

Table 25 Tabulation of debitage from 22GR840

Raw Material	**1.27 cm**	**.64cm**	**Total**
Tallahatta Quartzite	1		**1**
Citronelle Chert	2	1	**3**
Kosiusko Quartzite		1	**1**
Total	**3**	**2**	**5**
Portion			
Complete	1	1	**2**
Proximal			
Medial	1	1	**2**
Distal			
Shatter	1		**1**
Total	**3**	**2**	**5**
Cortex			
100%			
99%-50%	1		**1**
49%-1%			
0%	2	2	**4**
Total	**3**	**2**	**5**

Fine Screen

Debitage found in the fine screen spatially expanded the site in four directions from the initial positive shovel test. Except for unit 20N0E, which contains 15 flakes (Figure 40, Table 26), debitage counts in all directions tend to taper off as they extend away from the center. Higher fine screen debitage counts to seem to be localized in the vicinity of 0N0E, which may suggest that 22GR840 consists of a single occupation or more than one occupation with substantial overlap. More--and possibly larger--test units, ideally placed on a grid pattern, could help to test this hypothesis.

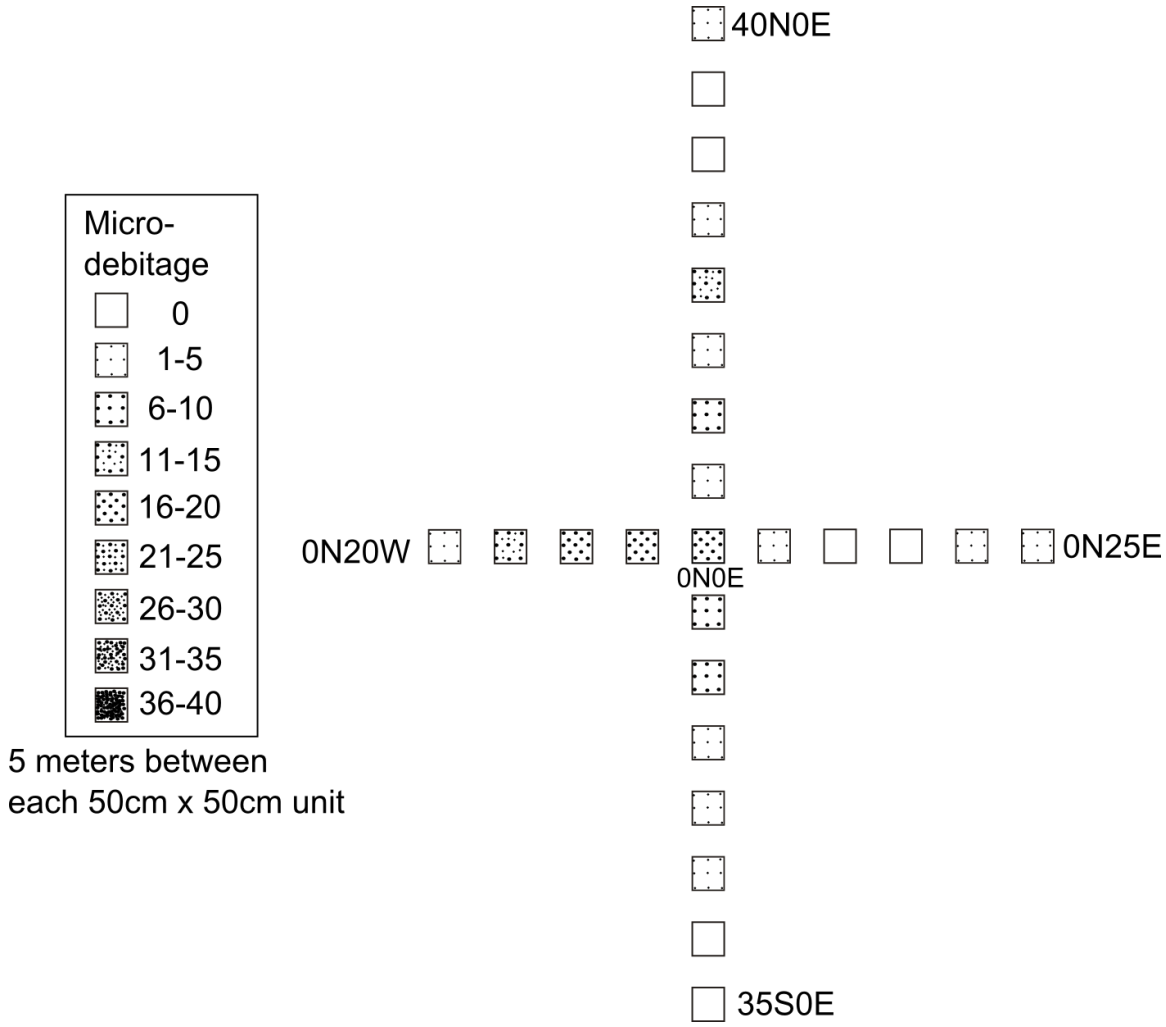

Figure 40 Map of fine screen debitage at 22GR840

Table 26 Fine screen debitage from 22GR840

Provenience	Artifact type	Count
0N0E	Debitage	16
5N0E	Debitage	5
10N0E	Debitage	6
15N0E	Debitage	2
20N0E	Debitage	15
5S0E	Debitage	9
10S0E	Debitage	8
15S0E	Debitage	3
40N0E	Debitage	2
25S0E	Debitage	3
0N5W	Debitage	18
0N10W	Debitage	17
0N15W	Debitage	14
0N20W	Debitage	3
15S0E	Debitage	1
0N20E	Debitage	1
25N0E	Debitage	2
0N5S	Debitage	3
0N25E	Debitage	1
Total: 129		

Revisit Summary

The prehistoric presence at 22GR840 was originally thought to consist of only one chert flake found in a shovel test. Artifacts found in the ¼" mesh extend the original site extent 20 meters to the north and 20 meters to the east. Debitage from the fine screen extends site further, up to 40 meters to the north, 20 meters to the west, 25 meters to the east, and 25 meters to the south. The fine screen debitage did not allow for negative units toward the west, north, or east, so it is possible that there may be more cultural materials in these directions. Although the southern cruciform arm ends in two units that were negative in the fine screen, the northernmost unit in the northern arm of the cruciform

was positive with two units south of it that were negative in the fine screen; thus, there may be more artifacts south of the southernmost units.

One of the biface fragments found here appears to be a Gulf Formational-Middle Woodland point stem, although it is very thin (3.3mm) for what may be typical for this time period in Mississippi (McGahey 2000); the other biface is a non-diagnostic distal fragment. Artifacts recovered from the revisit to 22GR840 have the potential to address questions pertaining to site function. If the absence of pottery is not due to sampling error, these artifacts may represent a post-Archaic, non-habitation site. Alvey and Baca (2009:119) mention the relative lack of disturbance at this site, as evidenced in the soil profile. This being the case, it seems likely that the concentrations of fine screen debitage accurately represent prehistoric human activity. As noted above, relatively high counts of fine screen debitage appear to concentrate near the center of the recovery cruciform. Had this site not been in the reinvestigation sample, its prehistoric dataset would not have been expanded beyond a single piece of chert debitage.

CM008 and CM029

Sites CM008 and CM029 were ultimately excluded from this analysis due to the dubious artifactuality of the sandstone and siltstone objects recovered there. These two supposed sites were subjected to the same recovery methods and laboratory analysis as the other six. Although some of the sandstone and siltstone objects found in the ¼" and in the fine screen were *potentially* artifactual to varying degrees, modification could not be determined with certainty for any objects from CM008 and CM029. The chert flake recovered from CM008 had already been sent to be curated away from MSU at the time of this writing, so it was not inspected. Many of the sandstone fragments from CM008

were small, flat, and bright red, all of which are factors contributing to a significant chance for a false positive. Sandstone fragments from CM029 were relatively fine-grained. Some of the breakage patterns did appear to be conchoidal, but the lack of any clear patterning on any of the few potentially artifactual objects, coupled with a complete lack of any certain artifacts, suggested that CM029 should be excluded also. At the time of this writing, CM008 still officially represents a single artifact find.

In the original survey, site CM008 was delineated by placing 12 shovel tests in a cruciform pattern around the shovel test that was thought to contain the artifact (Figure 41). No other artifacts were reported (Alvey 2007:44-45). Soils were reported as being well preserved. Six 50 cm x 50 cm shovel test pits were placed on this ridgetop during the present work. Large amounts of coarse-grained sandstone were recovered from the 1/4" mesh, but neither they nor the small sandstone fragments examined from the fine mesh showed any certain signs of human modification.

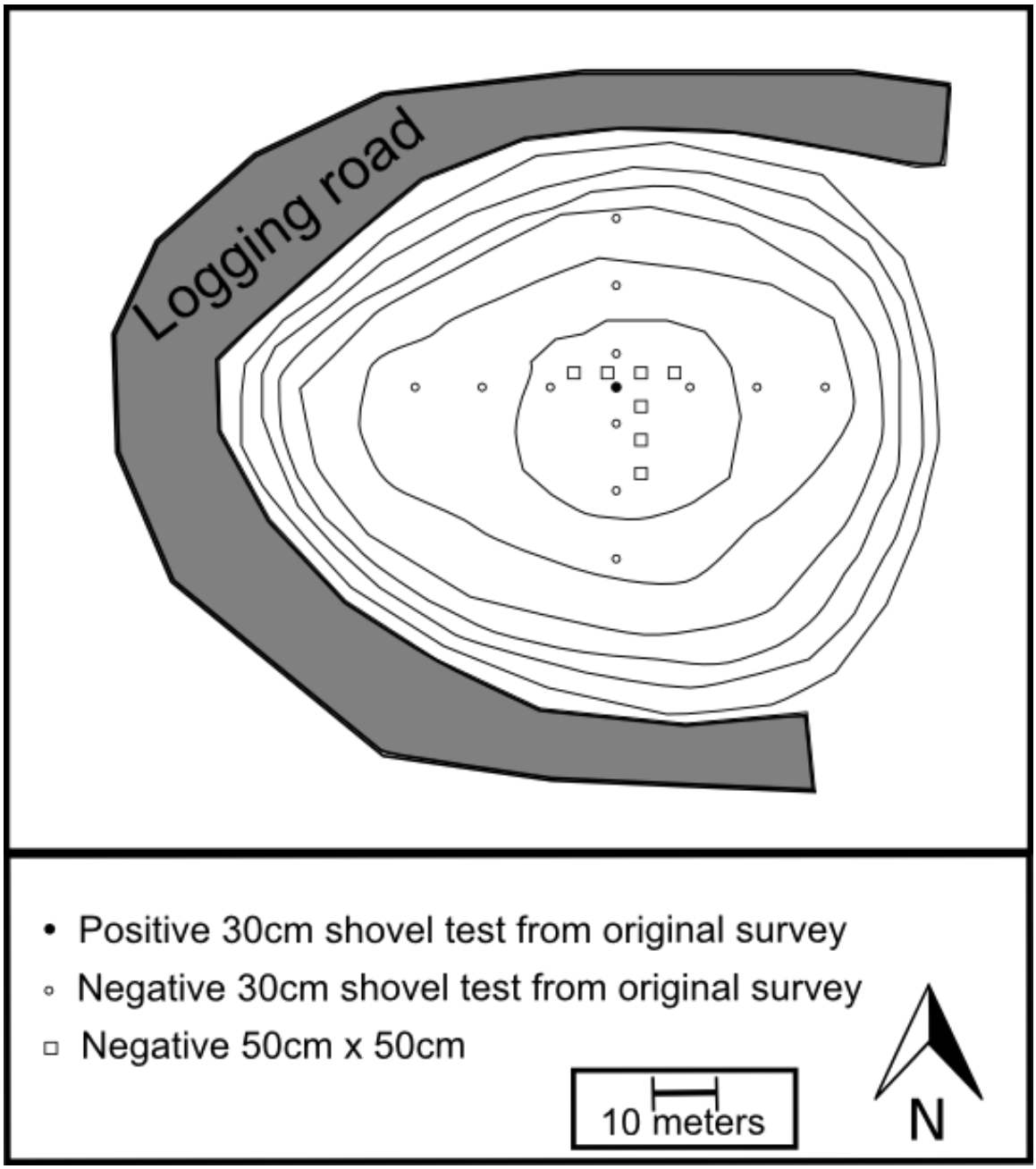

Figure 41 Map of CM008

The shovel test containing the purported siltstone artifact at CM029 was located on a very narrow ridge that only allowed for one delineation line (Figure 42), due to steep slopes to the northwest and southeast (Alvey and Baca 2009:34). Four negative shovel

tests were dug here during the original survey. During the completion of the present work, a single line of 10 50 cm x 50 cm shovel test pits was excavated on the narrow ridge. The siltstone recovered here was fine grained, and many possible siltstone artifacts were observed in both the 1/4" mesh and in the fine screen, but none of these could be determined to be definite artifacts.

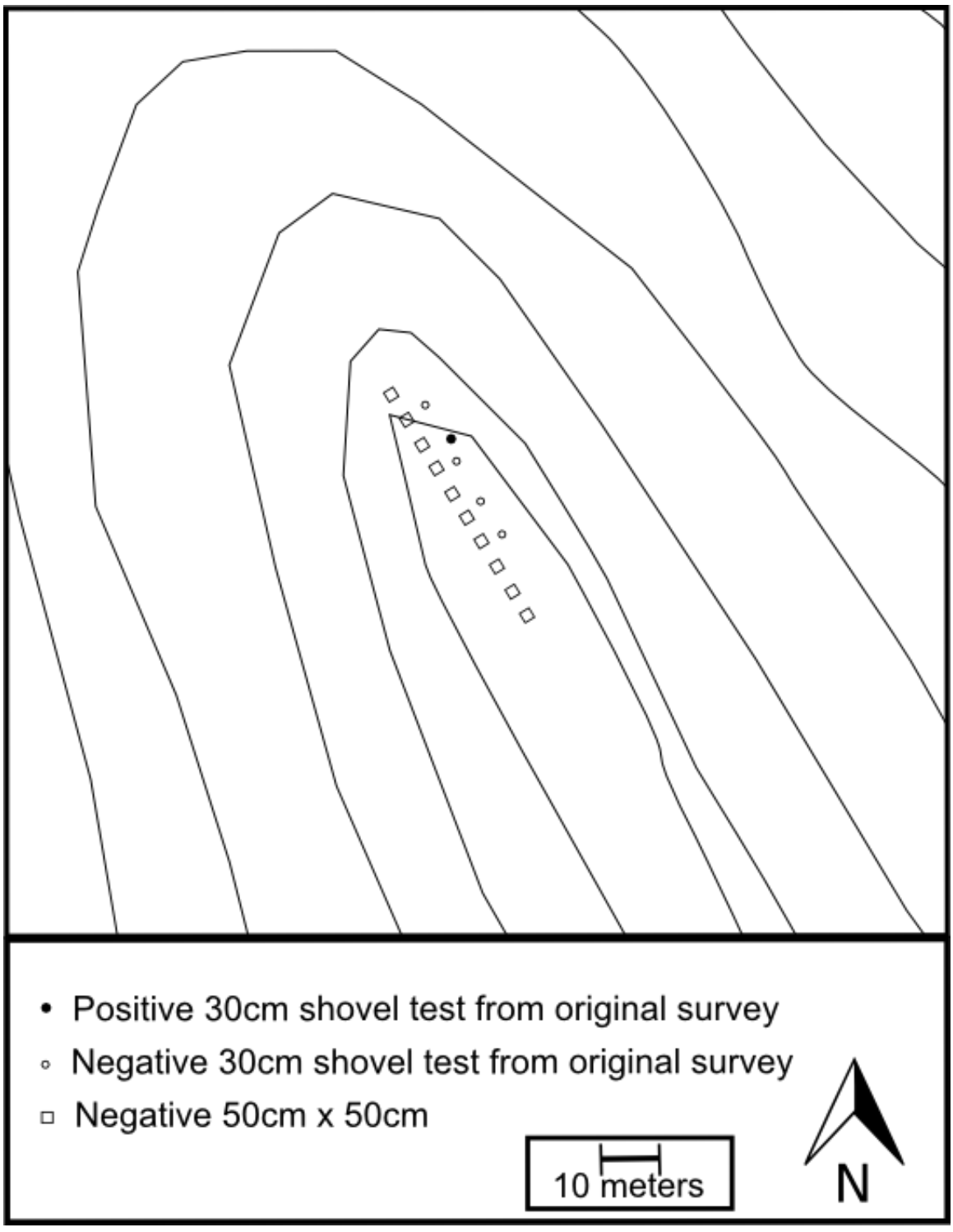

Figure 42 Map of CM029

The unusually thorough recovery and analysis methods for diffuse finds such as these gives the impression that if any artifacts were present on the small landforms where CM008 and CM029 are located, they would likely have been found. In the future, false positives could be prevented by not retaining sandstone or siltstone in the absence of any certain modifications with a relatively high degree of spatial separation from any other objects determined to be artifactual. These are suggestions that may be formally tested elsewhere. Because 100% coverage is a myth, potential for the presence of undiscovered artifacts remains for find areas CM008 and CM029.

CHAPTER X

RESULTS

The present work expanded the dataset in multiple dimensions at six study sites, including site size, artifact density, hypothetical site function, and temporal association. Site size and artifact density were substantially increased by the inclusion of fine-screening (Tables 27 and 28). The recovery of a greater diversity of artifact types allowed for some suggestions of site function. Chronology was refined at four out of the six sites (Table 29). Inter-site variability is examined by using ordination and cluster analysis in PC-ORD 4.

Site Size

The two-dimensional size of these six artifact clusters was altered dramatically by the present work (Table 27). Two things should be noted at this point: (1) when only one shovel test contained a prehistoric artifact in the original survey, one square meter is arbitrarily assigned to site size; and (2) area is calculated based on the dimensions of the cruciform recovery pattern, which always includes a varying amount of un-sampled space. Using only the results of the ¼" mesh recovery from the 50 cm x 50 cm units, increases in site size from the Phase I results ranged from 400% to 39,900%. The fine screen results from the 50 cm x 50 cm units produced increases from the ¼" results that range from 100% to 1,650%; in this instance, site 22GR812 showed no increase, as the

available space between the landform edge and the logging road only allowed for the placement of two 50 cm x 50 cm units. Ultimately, both the ¼" mesh and fine screen results produced size increases from the Phase I results that range from 400% to 292,400%. Special circumstances allowed for surface collections at 22GR812 and 22GR836 (see above section on site descriptions); this allowed for a 199,900% increase in size from Phase I results at 22GR812, and a 682,400% increase in size from Phase I results at 22GR836.

Table 27 Minimum increases in size for sites in this study

	CM041	22GR834	CM066	22GR840	22GR836	22GR812
Original area (sq. M.)	1	30	1	1	1	1
1/4" only (sq. M.)	50	275	20	400	75	5
1/4" and micro (sq. M.)	100	2700	350	2925	450	5
1/4", micro, gsc and, if applicable, extra shovel tests (sq. M.)					6825	2000
% increase from Phase I to 1/4" 50cm x 50cm	4,900	817	1,900	39,900	7,400	400
% Increase from 1/4" 50cm x 50cm to 1/4" and micro 50cm x 50cm	100	882	1,650	631	500	0
% increase from Phase I to 1/4" and micro 50cm x 50cm	9,900	8,900	34,900	292,400	44,900	400
% increase from Phase I to 1/4" and micro 50cm x 50cm; gsc; and/or additional shovel tests					682,400	199,900

Artifact Density

As expected, artifact density was also changed by this investigation (Table 29). If the ¼" 50 cm x 50 cm results are taken separately from the fine screen, density drops for all but one site. The expanded cruciform strategy did result in more macroartifacts at all sites, but the increased volume of sampled space reduced density. Site 22GR836 is the exception; although only one artifact was recovered in the ¼" screen from the 50 cm x 50 cm units, the additional 30 cm round shovel tests dug by Keith Baca and his survey crew at the time of this investigation increased density by 51.2% from the original survey results (see Figure 32, Table 18). This trend is reversed with the addition of the fine screen results; this sampling method increased artifact density at all sites. It should be noted that this method of quantifying density is not entirely meaningful with regard to sites 22GR812 and 22GR836; as most of their respective assemblages were recovered via CSC and GSC, the number of artifacts per unit volume does not accurately depict artifact density for these sites.

Table 28 Changes in artifact density for sites in this study

Artifacts per unit volume	CM041	22GR834	CM066	22GR840	22GR836	22GR812
	Phase I					
Total excavated volume (L)	126.00	136.50	84.00	94.50	63.00	84.00
Total artifacts	1	4	1	1	1	1
Artfacts per liter ratio	0.0079	0.0293	0.0119	0.0106	0.0159	0.0119
	1/4" 50cm x 50cm					
Total excavated volume (L)	347.50	846.50	445.00	889.00	500.00	170.00
Total artifacts	1	15	3	7	12	2
Artfacts per liter ratio	0.0029	0.0177	0.0067	0.0079	0.0240	0.0118
% increase in density from Phase I	-63.74%	-39.53%	-43.37%	-25.59%	51.20%	-1.18%
	1/4" and fine screen 50cm x 50cm					
Total excavated volume (L)	347.50	846.50	445.00	889.00	500.00	170.00
Total artifacts	18	456	58	136	35	20
Artfacts per liter ratio	0.05	0.54	0.13	0.15	0.07	0.12
% increase in density from Phase I	552.66%	1738.28%	994.83%	1345.67%	341.00%	888.24%
% Increase in density from 1/4" only	1700.00 %	2940.00%	1833.33%	1842.86%	191.67%	900.00%

Hypothetical Site Function

Artifacts recovered in this investigation, along with some recovered in the initial survey, have allowed for inferences regarding site function to be offered. Although the only prehistoric artifact found at 22GR812 during the Phase I was a single potsherd, the suggestion that this site represents a habitation has been further strengthened by the recovery of an additional 22 potsherds. The relative lack of macrodebitage compared to fine screen debitage at 22GR812 suggests that maintenance, as opposed to initial manufacture, was a prominent behavior with regard to lithic tools.

At 22GR834, the relatively large quantity of fine screen debitage, the dominance of late-stage macrodebitage, the minimal presence of cortex on macrodebitage, and the recovery of a broken biface during the Phase I survey suggest that the maintenance of complete and/or the finishing of near-complete tools was the primary behavior regarding lithics here. The presence of two potsherds suggest that habitation also occurred here.

Site 22GR840 represents a case similar to that of 22GR834: although macrodebitage had a comparably minimal presence, fine screen debitage did figure prominently in the assemblage, and two broken tools were recovered during the revisit. Although no pottery was recovered, one of the broken bifaces was stylistically dated to a period in which people did make pottery, which suggests that 22GR840 may represent a non-habitation area used by pottery-making people.

Similar to 22GR812, the assemblage at 22GR836 consists mostly of potsherds, although there is a somewhat greater diversity of artifacts at 22GR836 than at 22GR812. Fine screen debitage at 22GR836 was not as abundant compared to what was recovered at other sites in this investigation. Although most of the proximal and complete flakes from 22GR836 have attributes suggesting relatively late-stage reduction, the amount of cortex found on all macrodebitage tends to vary. The presence of what appears to be a tested pebble could suggest that 22GR836 represents an area that is at least partially used for initial lithic tool manufacture, although this suggestion is tenuous in the absence of more preforms and/or tested pebbles. This inconsistent picture of the lithic situation could be due to three different methods of recovery being employed in three different areas of the site: 50 cm x 50 cm units were dug to the west, GSC was conducted in the middle, and 30 cm round shovel tests were dug in the eastern part of the site. Also, the GSC could

be biased in favor of earlier-stage debitage, which tends to be larger and more visible on the ground surface, while a variety of debitage sizes greater than ¼" will be caught in shovel tests. The presence of large amounts of pottery strongly suggests that this area was used for habitation, but more work would be needed to suggest anything further.

Work at sites CM041 and CM066 resulted in the recovery of only micro- and macrodebitage. Macrodebitage quantities at these sites were too small to construct paradigms for inferring reduction stage. These results could represent sampling bias, or these two sites could be examples of relatively short-duration occupations that may have been used during some form of resource extraction.

It must be stressed that these comments regarding site function are inferences, and, as such, should be treated as hypotheses to be tested by further fieldwork and analysis, rather than final calls regarding site type.

Temporal Association

Four of the six sites reinvestigated for this thesis have had their temporal associations refined (Table 29). The single plain grog-tempered potsherd found during the Phase I survey already allowed a general Woodland assignment for 22GR812, which was bolstered by an additional 20 plain and eroded sand-tempered sherds; one sand-tempered fabric-marked sherd was found in the CSC at 22GR812, allowing for assignment to the Early Woodland Tchula Period (Phillips et al. 2003 [1951]:145). Similarly, the recovery of a plain bone-tempered sherd allowed 22GR836 to be refined from general Woodland to Middle Woodland (Jenkins 1981:157). Two eroded potsherds--one sand-tempered and one grog-tempered--allowed the previously characterized "unknown aboriginal" site 22GR834 a general Woodland assignment. Site 22GR840 was

also considered unknown aboriginal prior to investigation; the recovery of a contracting projectile point stem allowed this site to be assigned to a potential range from Gulf Formational to the Middle Woodland period. No diagnostic artifacts were recovered during the reinvestigation of sites CM041 and CM066.

Table 29 Temporal associations of sites investigated during the present study.

	Phase I	This Investigation
22GR812	General Woodland	Early Woodland
CM041	Unknown Aboriginal	Unknown Aboriginal
CM066	Unknown Aboriginal	Unknown Aboriginal
22GR834	Unknown Aboriginal	General Woodland
22GR836	General Woodland	Middle Woodland
22GR840	Unknown Aboriginal	Gulf Formational-Middle Woodland

Phi Analysis

Due to the spotty coverage characteristic of the cruciform sampling strategy, as well as the relative lack of artifacts other than debitage from the 50 cm x 50 cm units, the phi analyses did not return particularly strong results. Phi scores could not be calculated for sites 22GR812, 22GR834, and 22GR836; this is due to a lack of variability in the fine screen debitage dimension, which was present in every unit at all three sites.

Site CM041 returned a moderately weak, positive association score (phi=0.5) for macroartifacts and fine screen debitage. Three of the cells had frequency values that were less than five (Table 30), so the Fisher's exact test is used in place of chi-square. The Fisher's value is 0.333, which indicates that the relatively weak association returned by the phi calculation is not significant at the 0.01 level.

Table 30 Crosstabulation of macroartifacts vs. fine screen debitage at CM041.

		Fine screen debitage		
		No	Yes	Total
Macroartifacts	No	**6**	**2**	**8**
	Yes	**0**	**1**	**1**
Total		**6**	**3**	**9**

Site CM066 (Table 31) returned a weak association score (phi=0.194) for macroartifacts and fine screen debitage. A Fisher's exact test was used instead of chi-square, as three cells had frequency values less than five; the Fisher's test returned a score of 1, which indicates that this weak association is not statistically significant at the 0.01 level.

Table 31 Crosstabulation of macroartifacts vs. fine screen debitage at CM066.

		Fine screen debitage		
		No	Yes	Total
Macroartifacts	No	**1**	**7**	**8**
	Yes	**0**	**3**	**3**
Total		**1**	**10**	**11**

A phi analysis of macroartifacts and fine screen debitage at 22GR840 (Table 32) returned a weak association score (phi=0.259). Two of the cells had frequency values that were less than five, so the Fisher's exact test was used instead of chi-square; the Fisher's test returned a value of 0.546, which indicates that this weak association is not statistically significant at the 0.01 level.

Table 32 Crosstabulation of macroartifacts vs. fine screen debitage at 22GR840

		Fine screen debitage		
		No	Yes	Total
Macroartifacts	No	**7**	**15**	**22**
	Yes	**0**	**4**	**4**
Total		**7**	**19**	**26**

Ordination, Mantel Test, and Cluster Analysis

Bray-Curtis ordination results for the post-revisit fieldwork are shown in Figure 41. Sites from the 2007, 2008 and 2009 Phase I surveys at Camp McCain are represented by dots. Sites from these field seasons were chosen because (1) report preparation and fieldwork were not complete for the 2012 and 2013 filed seasons during the writing of this thesis and (2) they contain prehistoric occupations.

The sites' relative positions on the graph represent variability and similarity in terms of counts of potsherds, bifaces, debitage, and sandstone tools (fine screen artifacts were not included in this analysis). Similar assemblages are taken to represent functionally similar kinds of occupations (based on recovered artifacts), although it should be remembered that recovery methods that are currently standard for Phase I delineation are not likely to fully capture depositional reality. To some extent, similarity and difference may also be a reflection of recovery methods.

Many sites overlap to such a degree that they seem to represent identical types of occupations. The four sites separated the most from any others in the lower left part of the graph (Figure 43) contain only one biface to the exclusion of any other artifact type. The 20 overlapping sites listed in the right part of the graph all contain at least one piece of debitage to the exclusion of any other artifact type.

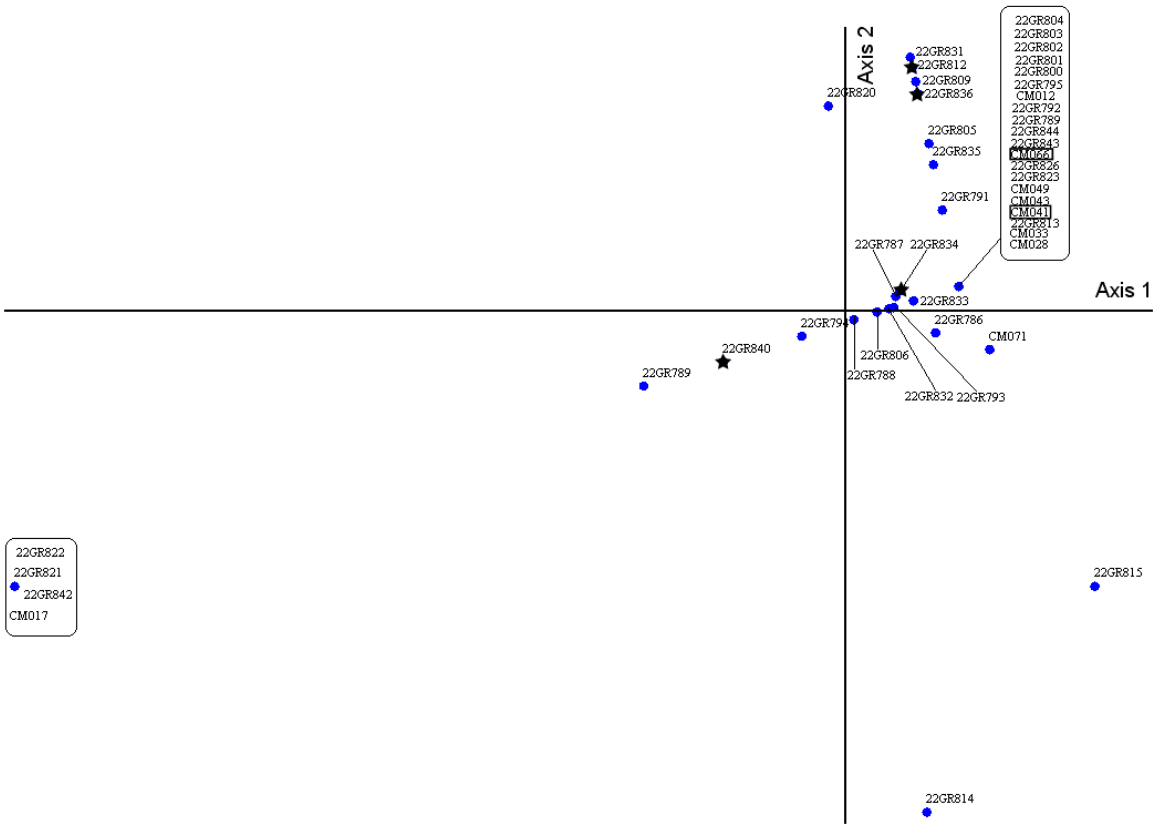

Figure 43 Bray-Curtis ordination of sites from the present study and others containing prehistoric artifacts from the 2007, 2008, and 2009 Phase I field seasons at Camp McCain.

Current study sites are indicated by stars or, if they are members of a superimposed group, by rectangles around their respective site numbers.

Other sites occur closely together on the graph: sites 22GR832, 22GR793, 22GR787, 22GR834, 22GR806, and 22GR833 are all fairly closely associated near the center of the graph (Figures 43 and 45). These six sites contain minimal, if any, ceramics; 1-3 bifaces; 5-53 pieces of debitage; and no sandstone tools. In the cluster dendrogram (Figures 44 and 45), the six sites that are closest together on the ordination graph form one cluster. Sites 22GR788 and 22GR794 form their own cluster that connects to the previous cluster of six. Sites 22GR788 and 22GR794 have assemblages similar to the

other six except for a relatively low ratio of debitage to bifaces, which, if the relative abundance of debitage is an indicator of occupation span, may represent functionally similar but shorter duration occupations. It is possible that these eight sites may represent primarily pre-ceramic occupations: out of the four that contained diagnostic bifaces, all were dated--at least partly--to the Archaic period. Site 22Gr787 contained both a Late Archaic biface and two plain sand-tempered potsherds; it is unknown whether the point and the sherds represent overlapping or spatially distinct occupations, as the site had been disturbed down to clay subsoil by logging activity (Alvey 2007:29). There is also a chance that the sites with non-diagnostic bifaces and no sherds represent non-habitation, post-Archaic (Woodland and/or Mississippian) occupations. All of this is based on the assumption that these data have not been skewed or biased by sampling error, which is not tenable, due in part to the sites in this group having been recovered by different methods (shovel testing and GSC) as well as the biases inherent in these recovery methods (see discussions above). However, functional and chronological data such as these could be taken as attributes for the classification of occupations, which could ultimately inform representative occupation sampling and decisions pertaining to significance and NRHP eligibility.

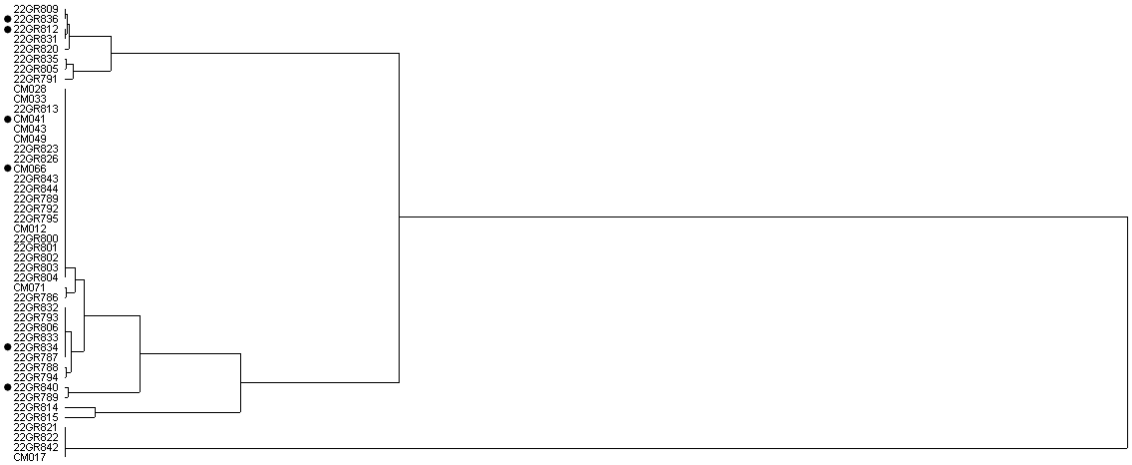

Figure 44 Cluster dendrogram of sites from the present study and others containing prehistoric artifacts from the 2007, 2008, and 2009 Phase I field seasons at Camp McCain.

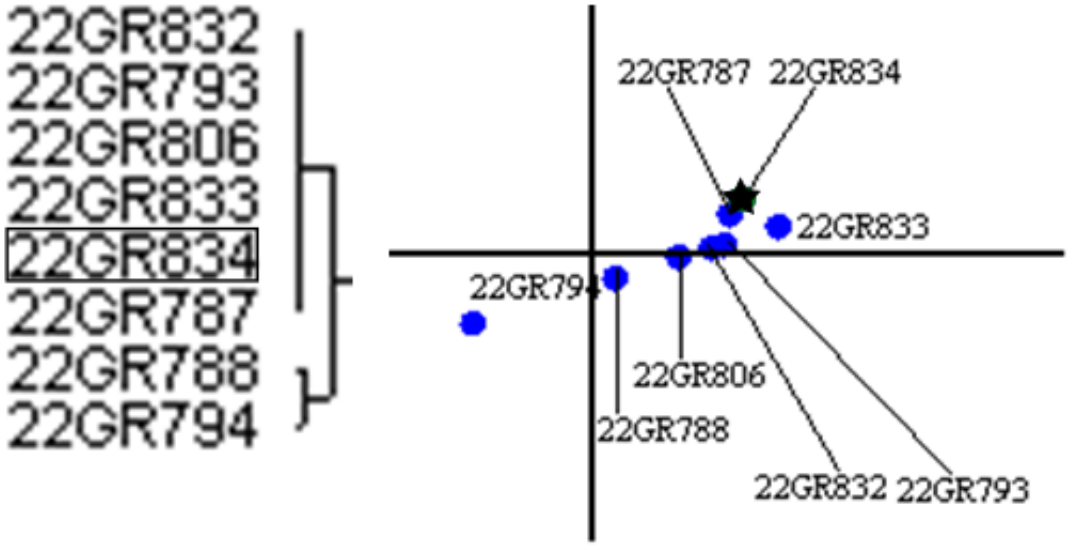

Figure 45 Portion of cluster dendrogram and Bray-Curtis ordination plot of similar sites.

The site reinvestigated during this study is represented by a star in the plot and encased in a rectangle in the dendrogram.

Sites 22GR809, 22GR812, 22GR831, 22GR836, 22GR805, 22GR835, and 22GR791 are closely associated along Axis 1 but somewhat separated along Axis 2 (Figures 43 and 46). The reasons behind these six sites' association on the graph are not entirely clear. It could be that Axis 1 represents bifaces and sandstone tools to a relatively large degree, as all are fairly closely associated along Axis 1, which accounts for 64.73% of variability, and all six contain neither bifaces nor sandstone tools. Counts of debitage and potsherds among these vertically and diagonally associated six sites tend to vary, although most of them have a much higher ratio of ceramics to other artifacts. It may also be relevant to note here that the axis along which these sites are separated the most (Axis 2) represents only 19.6% of the total variation. These sites' positions in relation to one another in the cluster dendrogram are noteworthy (Figures 44 and 46): sites 22Gr809 and 22GR836 form a cluster, and sites 22GR812 and 22Gr831 form another cluster; both of these clusters combine into a larger cluster, which is connected to 22Gr820. Site 22Gr820 is spatially separated from these on the Bray-Curtis graph, which may be due to the appearance of a single biface. These five sites form a larger cluster with the remaining three (22Gr835, 22Gr805, and 22Gr791). Sites 22Gr835 and 22Gr805 form their own sub-cluster in distinction with 22Gr791; unlike the other two, site 22Gr791 has a smaller ratio of ceramics to debitage. In any case, although the number of ceramics recovered from each of these sites varies, all do contain pottery, which is suggestive of habitation (Rafferty 1985:133-134).

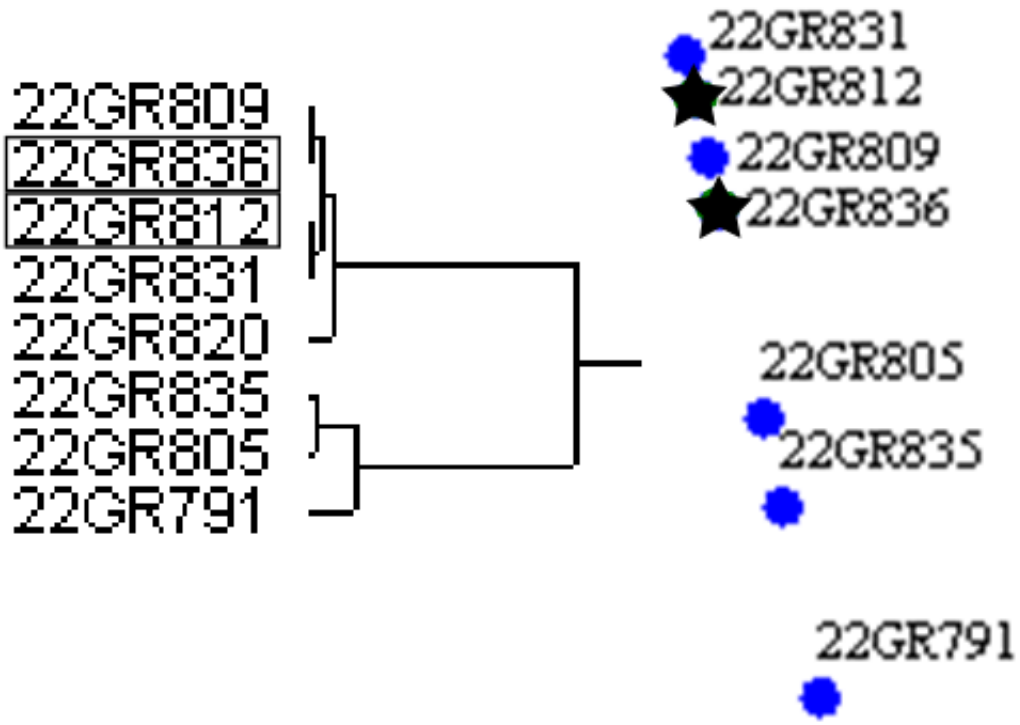

Figure 46 Cluster dendrogram and Bray-Curtis plot for sites with minimal bifaces and no sandstone tools.

The sites reinvestigated during this study are represented by stars in the plot and are encased in rectangles in the dendrogram.

Figure 47 represents Bray-Curtis ordination results for the same sites as they were prior to the reinvestigation of some as a result of this thesis. The sites containing one biface and nothing else still overlap, although they're in the extreme upper left rather than the lower left. There is still an overlapping collection of sites containing only debitage, but there are 21 instead of 20. This is due to 22GR840's original recovery containing only one piece of debitage; its artifact contents were expanded after reinvestigation. Sites 22GR812 and 22GR836 overlap with 22GR831; prior to reinvestigation, all three of these sites contained only ceramics. Between their discovery during the Phase I and the current

fieldwork, logging roads with surfaces previously obscured by leaf litter had been reopened, which allowed for the recovery of many more artifacts (especially potsherds).

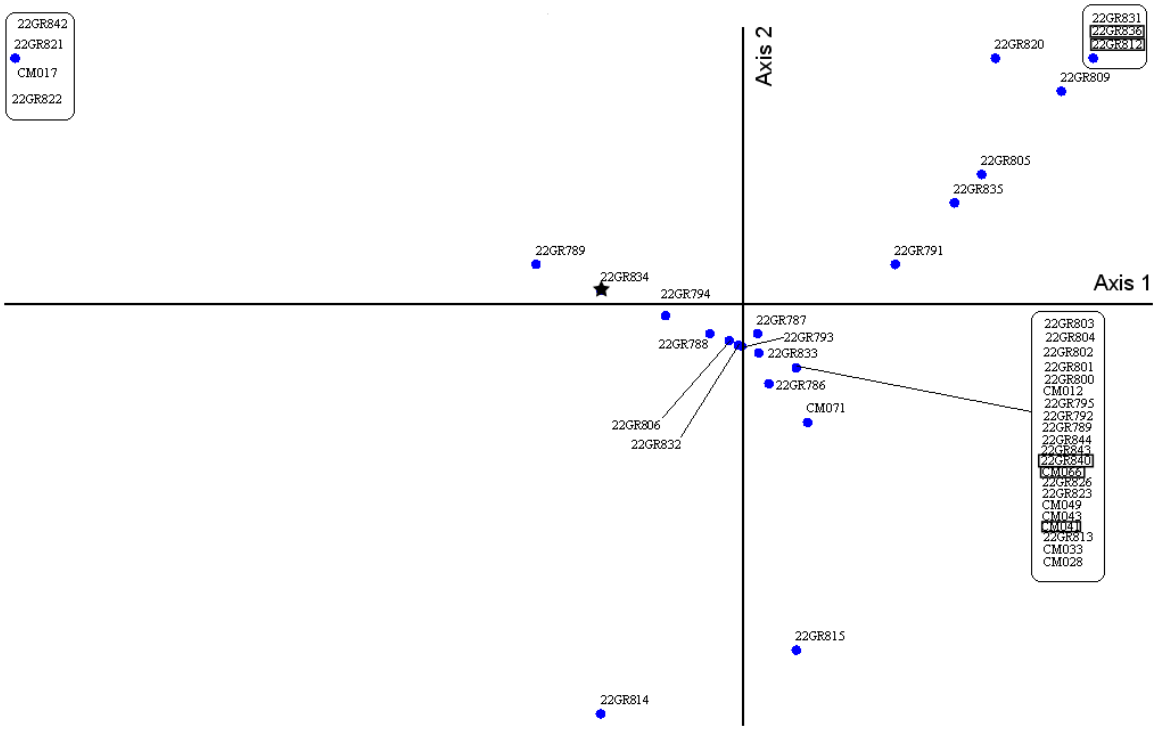

Figure 47 Bray-Curtis ordination of sites from the present study and others containing prehistoric artifacts from the 2007, 2008, and 2009 field seasons without expanded dataset for the six in the present study.

Current study sites are indicated by stars or, if they are members of a superimposed group, by rectangles around their respective site numbers.

A Mantel test was used to correlate the data presented in Table 3 with a counterpart data table containing only the original artifact counts as they were recorded prior to the present work. Distance matrices of chi-square distances were correlated. In spite of the obvious differences observed in the ordination plots (Figures 43 and 47), the Mantel test returned an *r* value of 0.96, indicating a strong positive correlation between

the two matrices. The Mantel test's t-value is 8.5074, and its p-value is 0.00000000. It is assumed that, if it were logistically possible to recover more artifacts from a larger sample of sites, this correlation would be significantly weaker.

CHAPTER XI

TENTATIVE NATIONAL REGISTER ELIGIBILITY

One of the goals of this study was to assess NRHP eligibility, based on additional survey data. While final determinations will be provided in a forthcoming technical report, tentative determinations will be provided and discussed. All 6 sites are evaluated in terms of NRHP eligibility Criterion D: the potential to yield important information (National Park Service 1997b:21-24).

Site 22GR812 was originally considered ineligible, as it was represented by only one single artifact. Reinvestigation increased both site size and density, and temporal association was refined. There is also a possibility that further testing involving fine screening and sub-1/4" artifact analysis could test hypotheses regarding site function at upland Tchula sites in the North Central hills. In spite of these possibilities, disturbance may be an issue: 22GR812 is located on a narrow landform, most of which has been disturbed to subsoil by a logging road, although soil preservation indicated that disturbance was minimal in the few areas amenable to test unit placement. Although much of the site may likely be destroyed, important data could potentially be recovered in a few areas of the landform, and these areas are so few that comprehensive recovery might be relatively inexpensive. For these reasons, 22GR812's tentative eligibility status may be considered to be unknown at this time.

Site CM066 was considered ineligible due to artifact scarcity in the 2009 Phase I survey report. Reinvestigation resulted in the recovery of very few artifacts in the ¼" screen, but the presence of concentrated areas of fine screen debitage, as well as good soil preservation, suggests that disturbance is minimal on this small landform. Further subsurface testing at a tighter interval could reveal more distinct patterns in sub-1/4" size artifacts for interpreting site function, as well as temporally diagnostic artifacts. Also, if disturbance is minimal, there is a chance that at least one subsurface feature containing physically or chemically datable materials could be present. For these reasons, CM066 will be tentatively considered eligible for inclusion on the NRHP.

Site CM041 was determined to be ineligible for the NRHP after its discovery during the 2009 Phase I survey due to artifact scarcity (single find) and a high degree of disturbance from logging activity. Although more artifacts were recovered during the course of this investigation, the disturbance appeared to have gotten worse as of the summer of 2013. As with CM066, prehistoric chronology was not refined by any newly recovered artifacts, but--CM066--artifacts remained relatively scarce. The poor state of preservation at CM041 indicates that any potential to test hypotheses at CM041 has been removed along with its landform's topsoil. This unfortunate situation suggests that CM041 may be tentatively considered ineligible for inclusion on the NRHP. This determination is based on the current criteria for establishing eligibility; ideally, this site could be classified based on its state of preservation, size, and artifact density, and it or another site in its class could be reinvestigated to get a better understanding of the effects of disturbance on the data potential of this site class in the region.

Site 22GR834 is the only site of the 6 reported here that was originally considered potentially eligible for the NRHP. Due in part to the landform's good soil preservation, it was thought that the site could inform on how small sites containing only lithics might function in the settlement patterns of the region (Alvey and Baca 2009:100). Site size and artifact density were both increased by the present work at 22GR834, and temporal association was refined (see above). While some possible patterning was observed in the distribution of concentrations of fine screen debitage across the landform, the cruciform pattern of test units at a 5 m interval does not appear to have adequately captured data in a way that is amenable to conclusively testing hypotheses. More work could better delineate what appears to be a pattern of debitage concentrations, their role on this landform, and whether or not they are real products of prehistoric human behavior or conceptual consequences of contemporary human bias. For these reasons, 22GR834 will be tentatively considered to be eligible for inclusion on the NRHP.

Site 22GR836 was originally thought to be ineligible due to artifact scarcity, as only a single sand-tempered eroded potsherd was recovered there. The logging road that was reopened between 2009 and 2013; the shovel tests dug by Keith Baca's survey crew; and the 50 cm x 50 cm units all allowed for the recovery of hundreds more artifacts greater than ¼" in size. Fine screen debitage does appear to be underrepresented when compared to fine screen recovery at other relatively large sites in this study. Further work at this site could be developed to investigate whether this is due to the placement of fine screen sampling on only one confined part of a relatively large landform or to prehistoric human behavior and site function. Further fine screen sampling would serve either of these hypotheses. Although the logging road was disturbed down to subsoil, soil was well

preserved in areas where subsurface sampling was conducted. As its current state represents the potential to test further important hypotheses, 22GR834 will tentatively be considered eligible for inclusion on the NRHP.

The only prehistoric artifact originally found at 22GR840 was a chert flake. Additionally, a depression that was thought to be a possible sunken grave was found (Alvey and Baca 2009:117-119). It was originally considered ineligible due to artifact scarcity. Reinvestigation revealed hundreds of pieces of debitage in the fine screen, as well as two biface fragments in the ¼" mesh, one of which indicates a potential occupation range from the Gulf Formational period to the Middle Woodland period. Further recovery of ¼' and fine screen debitage outside of the cruciform pattern of units could reveal activity areas and allow for hypotheses regarding site function to be tested. Soils at this site are moderately well preserved, indicating some disturbance, but not so much that valuable information potential is obscured. These considerations have informed the decision to tentatively consider 22GR840 eligible for inclusion on the NRHP.

CHAPTER XII

CONCLUSION

After further investigation, the sites investigated in this thesis, which meet the definition of "isolated find" in many states, appear to represent a range of variability in the character of occupations, ages of occupations, kinds of artifacts present, and number of artifacts encountered (rather than representing a pseudo-class of phenomena that can be casually disregarded). Common sense suggests that human interaction with the environment rarely results in the deposition of only one object; the apparent existence of artifacts in isolation at the six sites reported here has been demonstrated to be the result of error in standard methods of sampling. Obtaining larger samples has revealed more variability along the dimensions of site size, temporal association, artifact density, and the number of artifact types represented. If the situation on Camp McCain is representative of the "isolated find" problem in a general sense, the rampant discard of "isolated finds" is resulting in the loss of data valuable to all theoretical persuasions of prehistoric archaeology.

The present work is thought to be a necessary means for CRM professionals to gain perspective on whether "isolated finds" are historically significant or virtually insignificant archaeological noise. The terms of Criterion D are vague and subjective, so archaeological perspectives in terms of significance (in its formal definition) on the six sites investigated here would likely be somewhat diverse. However, they probably would

not be discarded outright, as some do contain a diversity of artifact types, some of which are temporally diagnostic, and they have already been noted as having relatively undisturbed soil profiles; such was the case with 22GR834, which was recommended as potentially eligible in the Phase I report (Alvey and Baca 2009:100). The Bray-Curtis ordination and cluster analysis suggest that these six sites exhibit considerable variability when analyzed with other sites found during Phase I survey at Camp McCain. However, the situation illustrated by comparing Figures 43 and 47 suggests that further investigations can alter the way sites are depicted on scatterplots, which makes any patterns observed in these diagrams somewhat questionable.

Once the data recovered during this project were put into density maps, the results strongly suggested the presence of some intra-site patterning, particularly in the cases of sites 22GR834 and 22GR840. At 22GR834, a visual inspection of the macroartifact and fine screen debitage density maps suggests that the highest concentrations of fine screen debitage are associated with units containing macroartifacts, and units containing no macroartifacts are associated with units in which microartifacts are less abundant. In spite of this, a phi analysis for association returned a score of that suggested that there is no association (see above).

Visually, 22GR840 seems to represent a similar situation, although it may not appear to be quite as distinct. Regardless of whether or not the fine screen debitage is spatially associated with the very few macroartifacts recovered at 22GR840, microartifacts do appear to be clustered on and just south and west of 0N0E. A phi analysis suggested a relatively low association between macroartifacts and fine screen

debitage at 22GR834 (phi=0.21); this association was not statistically significant at the 0.01 level.

Macroartifacts at CM066 were too sparse to allow for a visual association between macroartifacts and fine screen debitage. A phi analysis returned a low association score that was not statistically significant at the 0.01 level. Fine screen debitage does appear to cluster in higher numbers in the vicinity of 0N0E, but it is unclear how meaningful this apparent pattern may be, due to the relative lack of units dug at CM066. Further sampling at this site could return more meaningful intra-site patterns. It seems likely that this would be the case, as soil horizons at this site suggest that it is relatively undisturbed. Fine screen debitage analysis suggests that more materials may be recovered further to the north, south, and west; no negatives were encountered in the fine screen debitage to the north and south, and only one was encountered to the west.

Patterning at CM041 appears even less distinct than what is observed at CM066. The most salient phenomenon is the association of the highest quantity of fine screen debitage with the only unit containing a macroartifact, which is likely the cause of the relatively high phi association score at this site. Although a moderate association was returned by a phi analysis (the highest for any of these sites), it was not statistically significant at the 0.01 level. As was the case with CM066, sampling units are too few to make strong assertions regarding patterning.

Sites 22GR836 and 22GR812 do not show any obvious patterning, largely due to their recovery being unique among the rest of the sites in this sample. A phi analysis was attempted for the 50 cm x 50 cm units at these sites, but their phi scores were 0, suggesting random distributions of fine screen debitage and macroartifacts.

There appears to be ample reasoning for further work at 22GR836 to clarify the picture there; investigating the area north of the surface concentration and between the 50 cm x 50 cm units and the 30 cm round shovel tests might return patterned data that would allow for the delineation of potentially distinct occupations. The case here could be repeated in unsampled areas at 22GR834, 22GR840, and CM066: a controlled surface collection could be conducted in the wooded areas after turning with a hand-operated tiller. Also, microartifact samples taken on a grid could provide further data for occupation analysis and site function interpretation. If concentrations of daub, fired clay, and/or fire-altered stone are encountered, 1 m x 1 m units could be excavated in an effort to capture subsurface features that may contain potentially datable carbon samples. Efforts could also be made to establish site boundaries, since fine screen debitage analysis suggested that artifacts may be recovered further in all directions at 22GR834 and to the north and west at 22GR840 (Figures 21 and 40).

Encountering a subsurface feature could be very helpful at a site like CM066: if this site represents a short-duration resource extraction occupation containing minimal, if any, diagnostic artifacts, a feature containing carbonized nutshells and/or heat-treated stone for thermoluminescence dating would provide a temporal anchor for something that is routinely treated as a disposable "site type". Other, similar sites could be investigated in an effort to recover chronometric data to clarify these sites' role in regional settlement patterns.

It is not clear whether or not further work is feasible for site 22GR812, as the relatively narrow landform on which it is located has mostly been disturbed by a logging road. There may be some flat areas between the edge of the road and the sharp downward

slope on the edge of the ridge where more 50 cm x 50 cm units could be placed. Rainfall may have revealed more artifacts on the surface of the logging road. Repeated use of the same sampling strategy, rather than an expanded sampling strategy, may be the best possible means of returning an expanded dataset at 22GR812.

While further work at CM041 may return more artifacts, the heavily disturbed state of the site suggests this may not be worthwhile. Disturbance was noted in the Phase I report (Alvey and Baca 2009:59), and this situation appeared to be more severe on returning in the summer of 2013. That being the case, fine screen debitage recovery suggested that more artifacts may be located further to the east and south (Figure 15). It may be possible that further work could reveal undisturbed parts of the site, although it could be argued that this is not a likely enough scenario to justify the procurement of additional funds, personnel, and time.

Efforts were made to conduct occupation analyses using methods previously formulated by Rafferty (Rafferty 2008:102-107; Rafferty et al. 2011:61-62). Due to the way proveniencing was structured, coupled with the absence of more than one diagnostic artifact type at any of these sites, it is not possible to delineate more than one occupation at this time. If further investigations were possible, the use of controlled surface collections might result in data amenable to the spatial delineation of occupations, and 1 m x 1 m units with vertical control and/or the recovery of more diagnostics could allow for temporal delineation of occupations, especially if an adequate diversity of diagnostic artifacts are recovered for object or frequency seriations to be made.

It is unfortunate that the most informative part of the sampling strategy used in this investigation--fine screen analysis--may be prohibitively costly for use during Phase

I survey. This was the most labor-intensive aspect of this investigation in all of its aspects: large, cumbersome containers of heavy soil had to be transported from sites in wooded areas, some of which were over a mile from their destination. Once transported to the laboratory, many hours were expended removing non-artifactual organic matter from the heavy fraction, and an even more substantial amount of time was spent sorting debitage from the heavy fraction, including that of the two false positives (CM008 and CM029) mentioned above.

Experimental studies suggest that the overwhelming majority of flakes produced during pressure flaking are smaller than 1/4". A lack of recovery at this scale will produce inaccurate estimations of tool use and site function, as a significant portion of late-stage tool reduction will not be reported (Price 2012:24). There is also greater potential for the recovery of non-local materials with smaller sized debitage (Price 2012:21, 26), presumably due to their arrival at a non-local site as preforms with most primary and secondary flakes removed. For these reasons, it seems prudent to discuss a manageable strategy for sampling for sub-1/4" artifacts at the level of Phase I survey.

Microartifact sampling could be structured in a way that could reveal intra-site patterning at the Phase I level of investigation without drastically increasing the work-load in both the field and the laboratory. Instead of transporting and processing the full volume of all units or shovel tests, smaller core samples could be taken systematically on a cruciform or grid interval. Their numbers may be smaller than what was recovered here, but relative densities of microartifacts would likely be such that patterns would be visible after much lower expenditure of time, money, and calories (see Price 2012:21).

Similar advances have been made in the area of in-field phosphate testing during archaeological survey (Rypkema et al. 2006); while attempting to locate historic sites in rural Virginia, Rypkema et al. formulated methods for phosphate testing across the landscape by taking samples from shovel tests and processing them at each unit (Rypkema et al. 2006:1864). When relatively high phosphates were encountered, these areas were "delineated" as if they were sites, in order to produce maps of relative phosphate soil contents. While it may not be feasible to analyze microartifacts in the field during archaeological survey, it may be possible to systematically procure on-site sediment samples of a size and quantity that is readily transportable in a backpack. These samples could then be processed relatively quickly in a laboratory, using the processing methods outlined above in Chapter VIII.

Site delineation on a grid, rather than a cruciform, appears to be a more effective way to establish more detailed site dimensions and acquire an informative sample of artifacts. Preliminary results of a study by Alvey (2014, personal communication) show that expanding a 10 meter interval cruciform of 30 cm shovel tests into a 10 meter interval grid may reveal a greater diversity of artifact types that can allow for chronological assignment and formulation of hypotheses regarding site function. This also increases opportunities for the location of subsurface features that may contain physically and/or chemically dateable materials. Proveniencing on a grid may also allow for occupation analysis. The amount of extra time and money this practice would require may be negligible, especially in cases where data recovery is such that Phase II testing is rendered unnecessary, allowing archaeologists to make eligibility statements with Phase I-level data. If this practice were made standard and enforced by management entities,

individual CRM companies would not be at a disadvantage due to this “extra” work, as the time and money requirements of the grid pattern would be factored into all companies’ project bids.

As a result of the resampling conducted in the completion of this thesis, CM066 and CM041 will be given state trinomial site numbers. All of these six sites will be considered "sites", in accordance with the standards used in the state of Mississippi. Although their work is exemplary, all but one of these six sites were considered ineligible in the Phase I reports (Alvey 2007, Alvey 2008, Alvey and Baca 2009). This is in no way due to negligence on the part of Alvey and Baca; their use of standard methods resulted in the location and delineation of prehistoric sites that may have been otherwise missed or ignored. Rather, this situation seems to highlight the insufficient nature of standard sampling and delineation methods to reveal data that can inform on potential eligibility in the absence of extremely large and/or dense artifact clusters. The suggestions for further work described above are intended to ameliorate the sampling problem inherent to archaeology. Due to the nature of archaeological phenomena, sampling problems are not completely soluble--we inevitably take samples of samples. This makes widespread familiarity with the Principle of Representativeness a crucial necessity for public archaeology.

Using the Principle of Representatives does not require the retention of all archaeological phenomena, which is neither possible nor necessary. It involves the classification of archaeological phenomena at all scales of investigation. For instance, artifacts that appear to be in isolation from larger clusters could be classified according to artifact type, landform association, or any other potentially relevant attribute(s). A sample

of this class of small, diffuse, and/or "isolated" artifact or "site" could be selected for reinvestigation, at which point new data would allow for more detailed classes to be created. At this point, sites may be justifiably allowed to be destroyed if it can be demonstrated that (1) representative samples of their attributes have been recovered for future analysis, and (2) they are sufficiently redundant in the regional settlement pattern to allow for relatively harmless discard. As it is currently used, the "isolated find" label is not adequate to justify a lack of informative archaeological data, especially when used in shovel test survey, which, by definition, is used in cases where visibility is a problem. Conducting cultural resource management in this way is not fair to the taxpayer, or to fellow archaeologists, both of whom ultimately benefit from well-reasoned methods of archaeological sampling.

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