Fall 2017

Household Chipped Stone Technology at South Cape (23CG8): A Mississippian Hinterland Site in Southeast Missouri

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HOUSEHOLD CHIPPED STONE TECHNOLOGY AT SOUTH CAPE (23CG8): A MISSISSIPPIAN HINTERLAND SITE IN SOUTHEAST MISSOURI

A Master's Thesis

Presented to

The Graduate College of

Missouri State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science, Applied Anthropology

By

Deseray Helton

December 2017

HOUSEHOLD CHIPPED STONE TECHNOLOGY AT SOUTH CAPE (23CG8): A MISSISSIPPIAN HINTERLAND SITE IN SOUTHEAST MISSOURI

Sociology and Anthropology

Missouri State University, December 2017

Master of Science

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ABSTRACT

Mississippian archaeology is characterized by a longstanding bias towards studying large, mound-bearing sites as opposed to small hinterland sites. Although this bias has diminished in recent decades, research on hinterland sites is still relatively uncommon. This study helps correct that bias through an analysis of flaked stone technological organization at South-Cape (23CG8), a Mississippian hinterland site in Cape Girardeau, Missouri. A sample of flaked stone artifacts from two house features at the site was analyzed. The results indicate that residents at South Cape generally acquired and consumed higher quantities of local lithic raw material than of supra-local lithic raw material. The results also suggest that flaked stone tool production was a regular component of household economies in this community. Variation between house features implies that at least in some cases, different households had measurably different tool stone acquisition strategies; this in turn suggests that there was meaningful variation among households in their roles in local and supra-local socioeconomic systems. More specifically, when referencing House 1 as a special use structure linked with women's activities, these differences may indicate gender bias in archaeological expectations regarding "special" places. These findings help show the research value of studying Mississippian hinterland sites in their own right, as well as in relation to the larger mound-bearing sites traditionally emphasized in Mississippian archaeology.

KEYWORDS: Mississippian, hinterlands, households, lithics, production, consumption

This abstract is approved as to form and content

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Dr. Elizabeth Sobel
Chairperson, Advisory Committee
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In the interest of academic freedom and the principle of free speech, approval of this thesis indicates the format is acceptable and meets the academic criteria for the discipline as determined by the faculty that constitute the thesis committee. The content and views expressed in this thesis are those of the student-scholar and are not endorsed by Missouri State University, its Graduate College, or its employees.

ACKNOWLEDGEMENTS

I would like to thank the following people for their support during the course of my graduate studies: Thank you to my parents and siblings for putting up with me while I wrote this. Thank you to Dr. Elizabeth Sobel, for guiding me throughout this entire process. I could not have asked for a more caring and devoted advisor and chair. Thank you to my other committee members, Dr. Scott Worman, Mr. Jack Ray, and Dr. Jennifer Bengtson, for your objective advice. Thank you to the Missouri Archaeological Society for selecting me for the Jesse Wrench Fellowship. Thank you to Dustin Thompson at the Center for Archaeological Research for assistance with making maps. Finally, thank you to my fellow graduate students Laura Bruns, Sarah Reid, Lexi Amos, Grace Gronniger, Stephen Dyle, Amy Huff, and Hollie Wright for helping me stay “sane” throughout this process.

I dedicate this thesis to my late grandfather Eugene Helton.

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CHAPTER 1. INTRODUCTION AND BACKGROUND

Introduction

This thesis addresses one general issue, and one site-specific issue, in Mississippian archaeology. The general issue concerns the longstanding bias towards large, mound-bearing sites. Studies of small, rural, Mississippian sites, commonly referred to as hinterland sites, did not begin in earnest until the 1970s and 1980s. These hinterland studies have proven productive, but are still outnumbered and overshadowed by research on large centers. Consequently, knowledge of domestic life among much of the Mississippian population remains more limited than it otherwise might be.

The second issue concerns the South Cape site, a “hinterland” site in Southeast Missouri. Archaeologists have worked at the site intermittently since the 1980s, excavating multiple house features and recovering thousands of flaked stone artifacts. Duncan Wilkie, who initiated excavations at South Cape, delivered conference presentations about the site in 1982 and 1983. A recent publication (Koldehoff and Brennan 2010) begins to investigate lithic technology at this site, and another recent publication (Bengtson 2017) examines infancy, motherhood, and gender at the South Cape site. Otherwise, rigorous analyses of the South Cape site have not been carried out and reported. As a result, despite the large excavated assemblage, this site has not contributed much to Mississippian archaeology.

The present study helps solve these problems through an analysis of flaked stone artifacts from the South Cape site. Building on previous research at the site and on lithic technological theory, I develop and test four hypotheses concerning household flaked

stone production and consumption at South Cape. As presented in more detail at the end of this chapter, these hypotheses concern variation within and between households in the production and consumption of chipped stone tools, with attention to variation in reduction expedience among local, non-local, and supra-local lithic raw material. The results contribute to our understanding of household production, consumption, and chipped stone technology at the South Cape site specifically, and in the Mississippian hinterland generally. The findings also point to the potential value of research on the South Cape site, and on other hinterland sites, for our understanding of gender dynamics and ritual spaces in Mississippian hinterland households and communities

Archaeology of the Mississippians

Scholars have used the term “Mississippian” in a number of ways, including to refer to a population, an era, and a culture. Most scholars use the term to refer to a class of large, ranked, chiefdom-level polities that lasted from as early as A.D. 800 to as late as the early historic period in eastern North America. Geographically, Mississippian societies extended from the Midwest to the Southeast regions of North America. The most notable centers and towns were in the Mississippi River valley, hence the overall label “Mississippian.”

Major themes in Mississippian archaeology include: emergence (Kelly 1990; O’Brien and Wood 1998; Smith 1990); settlement patterns (Chapman and Chapman 1984; Cobb and Butler 2002; Emerson 1997; Lewis, Stout and Wesson 1998; Kohn 2010; Pauketat 2003; Rogers 1995; Steere 2011; Steponaitis 1978); political and social organization (Blitz 1993; 1999; Pluckhahn 2010; Reese 1997; Sullivan 1995; Williams

1995); long-distance exchange (Emerson 2000; McAnany 1989; McSwain 1991; Miller 1989); mortuary traditions and symbolism (Brown 2007, 2010; Goldstein 1980; Sullivan and Mainfort 2010); and agriculture and ceramics (Pauketat 1989; Rice 2015; Shott 1996; Steponaitis, Blackman, and Neff 2011). Mississippian research has also addressed gender, status, and identity (Ambrose et al. 2003; Byers 2006; Hedman et al. 2002; Johnston 2010; Mehrer 1995); technological innovation (Fischbeck et al. 1989; Rice 2015; Steponaitis, Blackman, and Neff 2011); abandonment (Christensen 2010; Cobb and Butler 2002; Stephens 2010; Williams 1990); and links between Mississippian peoples and historic ethnic groups. Also, as discussed below, Mississippian archaeology is concerned with Mississippian hinterland sites and households.

Archaeology of Mississippian Hinterlands and Households

Mississippian Hinterland Sites. In Mississippian archaeology, the term hinterland has been used to refer to a region controlled by or under the influence of an urban zone or cultural center. Koldehoff similarly defines a hinterland as being "typically less densely populated than its center and it is the area from which resources are derived" (1989: 41). In reference to Mississippian "hinterlands", researchers also use a variety of other terms including "backwater," "rural," "frontier, or "margin" (Ahler et al. 2010). These terms are similar in that they all apparently refer to areas that did not contain large or dense human populations, and that were not regional or inter-regional centers of regional political, economic, or ritual activity. While I could use any of these terms to describe the South Cape site, I generally use the term "hinterland," because it seems most common in the relevant literature on Mississippian archaeology. Therefore, this usage

should not be taken as a critique or rejection of the other terms, which might also be used productively in studies like the present one.

The study of hinterland sites became an important component of Mississippian Archaeology in the 1970s. As Clay (2006) points out, changes in the structure of archaeological funding and archaeologists' adoption of contemporary survey strategies facilitated this change, pushing Mississippian archaeologists to expand the scope of their investigations beyond large mound centers.

Studies of Mississippian hinterlands have proven productive. However, hinterland studies are still outnumbered and overshadowed by research on large centers. Moreover, most studies that address hinterlands are concerned primarily with relationships between large centers and small hinterland settlements, rather than hinterland sites in their own right. Most of these studies focus on sociopolitical and economic relationships between mound centers and hinterlands (Byers 2006; Cobb 2002; Emerson 1997; Isminger 1996; Kelly 1990; Lewis, Stout and Wesson 1998; Mehrer 1995; O'Donnell 2014; Pauketat 2003; Reese 1997; Smith 1995; Steponaitis 1978; Williams 1995). Researchers have used a variety of methods to explore exchange networks and other relationships between large centers and small hinterland communities (Fischbeck et al. 1989; Rice 2015; Steponaitis, Blackman, and Neff 2011).

A few studies pay more attention to hinterland sites. For example, Mehrer and Collins (1995) look at hinterland households in relation to Cahokia, but also in terms of sociopolitical development over time within hinterland communities. Mehrer and Collins argue that hinterlands were influenced by a "local hierarchy" as much or more than larger outside influences. Elsewhere, Mehrer (1995) considers the evolution of rural households

as well as mound center households, and finds that both became more formally organized and complex over time. Likewise, Clay (2006) argues that we need to examine the evolution of complexity in hinterland communities, in the context of local settlement histories.

Households. Studies of Mississippian houses and households increased dramatically in the 1970s and 1980s as part of a broader archaeological interest in houses and households. Since then, studies of houses and households have become increasingly important in Mississippian archaeology. These household-level analyses have contributed to Mississippian archaeology, in part, by countering the longstanding bias towards the study of mounds, burial practices, political organization, and elites. Household-level analyses have brought attention to the houses, domestic life, and social dynamics of non-elites (Pluckhahn 2010). Despite these contributions, Mississippian household archaeology is constrained by a continued reliance on data from large mound-bearing settlements and a paucity of data from hinterland sites. A related problem is a general lack of rigorous household-level lithic analyses, despite a focus on lithics in other spheres of Mississippian archaeology. Below, I review the history and scope of Mississippian household archaeology, and discuss these constraints.

In Mississippian archaeology, the bias towards house features from large mound-bearing sites as opposed to small hinterland sites goes back to the Antiquarian period; house features from large mound-bearing sites were easier to find, more impressive, and produced the elite goods sought by museums and collectors. Attention to non-elite houses and households did not develop until the Processual period, in the 1960s. Archaeologists had begun to realize that "Mississippian sites like Moundville and Cahokia are the

exception, rather than the rule" (Williams 1995: 133). Nonetheless, the body of work concerning hinterland houses and households remains relatively small, and focused on the hinterlands of Cahokia as opposed to other Mississippian hinterland areas.

One theme in Mississippian household archaeology is variation in house architecture over time and space (Chapman 1984; Christensen 2010; Mehrer 1995; Mehrer and Collins 1995; Rogers 1995; Steere 2011; Stephens 2010; Sullivan 1995; Wilkie 1983). Many scholars attribute house variation to different environmental and sociopolitical pressures (Mehrer 1995). Scholars have identified temporal variation in house attributes such as shape, area, orientation, location of entrances, wall construction, and wall post size and spacing (Steere 2011). Likewise, researchers have explored variation in interior attributes including the partitioning of interior space, interior hearths, and interior burials (Sullivan 1995).

Several researchers argue that increased diversity among households, along with a growth in the social and political power of hinterland communities, generated a variety of interior arrangements (Hendon 1996; Rogers 1995). Scholars further argue that certain households became community leaders or "nodal" households (Mehrer 1995; Smith 1995; Steere 2011). Some scholars look closely at the relationship between household organization and gender roles, including gender specific production tasks (Bengtson 2017; Gougen 1994; Hendon 1996).

Some houses may have evolved into structures that served not only domestic roles but also ritual purposes. Elite or "ritual" structures are often assumed to be those that are bigger, exhibit higher quality construction, and contain special purpose items. However, Pluckhahn (2010) argues that this was not always the case, especially in hinterland sites.

He suggests that “ritual” structures in hinterland sites were often located within residential areas and, despite the presence of “elite” goods, display construction and organization typical of residential structures within the site (Pluckhahn 2010). Pluckhahn suggests that ritual objects and activities could be quite ordinary and therefore part of the “domestic” day-to-day lives of Mississippians.

A number of works examine the organization of Mississippian household production and consumption (Mehrer 1995; Pluckhahn 2010; Prentice 1985; Smith 1995; Steere 2011). Debated issues include whether household production was specialized or not, attached or independent, centralized or dispersed, and how much, if any, power the elite had over commoners in terms of their production and consumption (Pluckhahn 2010 pg. 343). Some researchers (Alt 1999; Pluckhahn 2010) suggest that these “either/or” debates are too simplistic, imposing distinctions that may not be analytically useful. They suggest that instead, we look at the range of variability in Mississippian household production and consumption. For example, archaeologists should correct for the traditional focus on elite household production, and question the longstanding assumption that elites control production and consumption in their own households as well as in lower status households. Thomas (2001) demonstrates the utility of a broader approach, generating new and thought-provoking results by structuring her analysis in terms of the gender division of household production labor, rather than “attached” versus “independent” production, or “specialized” versus “domestic” production.

Overall, it is clear that we need to consider a broader range of variables and possibilities in the study of Mississippian household production and consumption. To this end, Pluckhahn calls for higher resolution analyses involving attention to individual

house features, and rigorous analyses of variation among individual house features, rather than continue the trend of combining data from multiple house features to explore variation among sites and regions. This lower resolution approach that uses groupings of house feature data to explore variation among larger social units is important, but limiting, in the absence of attention to variation among individual house features. This need for more rigorous, house-specific analysis is displayed by extant work on Mississippian lithic technologies. Mississippian archaeology displays a general lack of rigorous household-level flaked stone production and consumption, despite a focus on lithics in other spheres of Mississippian archaeology (Andrefsky 1998, 2001; Ray 2007; Smith 1995; Stephens 2010). For example, extant household-level lithic analyses tend to center on tools, while little work has been done with debitage (e.g. Koldehoff and Brennan 2010). Of twenty publications dealing specifically with household archaeology, only two discuss lithics to any great extent (Mehrer 1995; Smith 1995). Mehrer looks broadly at different categories of lithics at rural sites near Cahokia to explore changes in settlement patterns in the Cahokia region (1995). Smith discusses the use-wear analysis of lithic tools and flakes to investigate activity areas in houses at small Mississippian sites (1995).

In sum, Mississippian archaeology is still characterized by relatively little attention to hinterland sites in their own right, and to houses and households at these sites. Of particular relevance to the present work is the need for detailed analyses of household flaked stone production and consumption, and how this varied among households, in the Mississippian hinterlands.

The present project addresses these problems through an analysis of flaked stone artifacts from two house features at the South Cape site (23CG8), a non-mound bearing site located in the Mississippian hinterland. Excavations of these house features have yielded hundreds of flaked stone artifacts, and the assemblage is therefore well suited for learning about hinterland household production and consumption. Data collected through the analysis of these artifacts are used to test four hypotheses concerning household chipped stone production and consumption at this site:

1. South Cape residents acquired and consumed both local and supra-local lithic raw material at the site. However, they regularly acquired and consumed higher quantities of local lithic raw material, relative to quantities of supra-local lithic raw material, at the site.

2. South Cape residents used local raw material relatively expediently. In contrast, they used supra-local lithic raw material less expediently (i.e., in a more curated manner). Among supra-local lithic raw materials, Mill Creek chert had a unique reduction trajectory, related to its importance in Mississippian hoe technology.

3. Flaked stone tool production regularly occurred at the household level in the Mississippian settlement at South Cape.

4. House 1 and House 3 had different positions within the local and supra-local socioeconomic systems. These differences affected different tool stone acquisition, reduction, and consumption patterns.

Thesis Organization

Chapter two summarizes the history of previous research and extant knowledge of the South Cape site. This summary shows the suitability of the South Cape assemblage for testing the four hypotheses (outlined above) about Mississippian hinterland households and lithic technology. Chapter three outlines the methods used in this study. The methodology included conducting archival research, consulting with tribes, accessing the South Cape archaeological collection, defining archaeological expectations

for testing the hypotheses, developing the archaeological sampling strategy, designing and completing artifact analysis, and analyzing the resulting data. Chapter four reports the results of the analyses carried out to test the four hypotheses. Chapter five discusses the implications of these results for our understanding of Mississippian hinterlands, households, and flaked stone technology, and for research on the South Cape site. In addition, Chapter five presents suggestions for future research that can further shed light on household production and consumption at hinterland sites, like South Cape, not associated with large mound centers.

CHAPTER 2. THE SOUTH CAPE SITE

South Cape (23CG8)

The South Cape site, also referred to as the Hunze-Evans site, is a fortified Mississippian village site located in the southern portion of Cape Girardeau, in Cape Girardeau County, Missouri (Figure 1). The site is located between the St. Francis Mountains to the west and the alluvial floodplains of the Mississippi River to the east. The site is approximately six and a half acres in size. Geographically, it is bounded on the south by the Cape LaCroix Creek, which lies 67 to 91 meters away from the south edge of the site. To the east, roughly 805 meters from the site, is the Mississippi River. Furthermore, the nearest mound center to the South Cape site is Kincaid Mounds in western Kentucky, which is an estimated twenty-four hours away when traveling on foot. Cahokia Mounds, in Illinois, is an estimated thirty-five hours away when moving by foot.

The South Cape site is remarkable in a number of ways. First, preservation is generally good, providing archaeologists with the opportunity to recover a broad array of information about its past inhabitants. Second, the site is located at the intersection of multiple environmental and ceramic-stylistic zones. Therefore, analysis of the material record at South Cape provides an unusual opportunity to learn about Mississippian communities in this area (Christensen 2010).

Aside from excavations by amateur archaeologists, three professional archaeologists have directed work at the site. Dr. Duncan Wilkie (1983) conducted the earliest professional excavations in the late 1970s and early 1980s (Figures 2 and 3). Wilkie's excavations focused on the northern half of the site as well as a cemetery to the

southeast. Wilkie suggested that a plaza was placed between these two areas, since such a layout is typical of Mississippian village sites. During his excavations, Wilkie discovered the remains of what appeared to be two definite and three probable house features. Wilkie and his colleagues conducted some of the most extensive excavations at the site, resulting in a large volume of materials that were sorted into over 50 boxes (Stephens 2010; Wilkie 1983). Wilkie did not publish any of his research but did report some of his findings at a meeting of the Society for American Archaeology (Wilkie 1983). One paper, *Shell Gorget in a Small Village Context*, centers on a scalloped triskele-style shell gorget found at the site in a structure called House 1, referred to in the current study as House Feature 1.

Radiocarbon dates provide information regarding chronology at the South Cape site. Wilkie submitted eight radiocarbon samples including corncobs, wood, and bone. Most of the radiocarbon samples (five out of eight) were recovered from within House Feature 1. The results suggest that House Feature 1 results from very late Mississippian occupations, between the late 1200s and late 1400s A.D. (Table 1). While there are no radiocarbon dates for House Feature 3, Brennan, in her 2007 field season summary and preliminary report, indicates that the majority of artifacts from the 2007 field season were excavated from this house feature and that these artifacts, with the exception of a very small quantity of Woodland ceramics, date to the Mississippian period (Table 2). While there is evidence of House Feature 3 being superimposed on other structural features none are indicated as being associated with the Woodland Time Period. Therefore, as the majority of artifacts from House Feature 3 date to the Mississippian time period (Brennan 2007) and House Feature 1 radiocarbon dates suggest a late Mississippian Period

occupation, I assume in this study that House Features 1 and 3 both date to the Late Mississippian Period, although they may not be contemporaneous. It is worth noting that if the House 1 radiocarbon dates are accurate, then occupation at South Cape outlasted that of Cahokia and Kincaid mounds, each of which declined before the 1400s A.D.

After a twenty-year hiatus, Dr. Tamira Brennan Christiansen began excavations in 2007 in the hope of developing a long-term research and preservation program. In three field seasons, a total of 94 square meters were excavated, including 30 features. These features included several domestic structures along with associated hearths and wall trenches, storage pits, a large post pit, individual postholes, a burial, and a potential palisade wall.

The most recent excavations, conducted by Dr. Jennifer Bengtson, took place during the summers of 2013-2015. During these excavations, Bengtson and the students involved in the field schools excavated a portion of a structure in the north section of the site. An excavation unit containing the palisade wall found during the previous excavations by Brennan was also relocated. Analysis of artifacts found during the three field schools is ongoing.

The three excavation projects provide evidence concerning spatial organization of the site. Wilkie (1983) and Christensen (2010) suggest that there is a functional division at the site. The southern portion of the site is referred to as a domestic area, while the northern part of the village that includes House Feature 1 is inferred to be a ritual or ceremonial precinct (Christensen 2010). Archaeological excavations have not uncovered a mound, although the presence of mounded architecture is possible given the evidence of fortification, intense settlement, and cultigens at South Cape.

Stephens (2010) provides the only in-depth analysis of South Cape ceramics. Her goal was to aid in determining a regional context and chronology for the South Cape site through ceramic analysis. She analyzed 16,716 ceramic sherds, including 15,841 body sherds and 875 rim sherds. She completed an attribute level analysis examining size, temper type, rim profile type, lip treatment, interior surface treatment, exterior surface treatment, vessel part, and vessel form. Through comparison with other Mississippian assemblages, she concluded that, stylistically, attributes of the South Cape ceramics are a mix between the Missouri Bootheel region and southern Illinois Black Bottom region styles. While not considered in the current work, a smaller study, conducted by myself, showcases the results of sherd counts for Units 10L/10N of House Feature 1, in all 132 ceramic sherds were analyzed (Table 2)

As stated above, multiple house features have been identified at the South Cape site, including House Features 1 (excavated by Wilke) and 3 (excavated by Brennan). However, only House Feature 1 has been studied in any detail (Figures 2, 3). House Feature 1 is located in the north part of the village. As shown in Figure 2, and listed in Table 3, eight excavation units included parts of House Feature 1. House Feature 1 consisted of a basin 7 m E-W, 5 m N-S, and at least 0.50 m deep. The basin had an area of 29.7 m^2. A clay hearth feature 80 cm in diameter was situated in the west central part of the basin. The basin circumference displays evidence of post construction, rather than the wall-trench construction characteristic of some Mississippian houses. Wilkie suggests House Feature 1 was relatively large, compared with other Mississippian houses in the region, and cites this large size as an indicator of the possible ritual significance of the structure (Wilkie 1983).

Besides uniqueness in location, architectural style, and size within South Cape, House Feature 1 is distinguished from other house features at the site in that it bears a strong representation of female activity, and more importantly, of female symbolism and ritual along with the strong influence of infancy and motherhood within the household and the wider community (Bengtson 2017; Wilkie 1983). The most overwhelming evidence for female symbolism and ritual within House Feature 1 comes from a Sikeston Negative Painted effigy of a mother nursing an infant. The shell scalloped triskele gorget, a symbol of evolution in social orientation/status in childbearing females and infants (Wilkie 1983), and high number of infant burials also lends support to the interpretation of House Feature 1 as a structure associated with female symbolism and ritual.

House Feature 3 is located in the south part of the site (Figures 4 and 5). As shown in Figure 5, five test units included parts of House Feature 3. Archaeologically, this house feature was represented by a wall trench and a basin measuring approximately 4 m N-S and 3 m E-W. House Feature 3 is superimposed on an unexcavated floor depression (Feature 5), possibly from an earlier house. House Feature 3 includes a flat bottomed pit feature (Feature 6), that had homogenous fill with few artifacts (Brennan 2007).

One previous study focuses on the South Cape flaked stone assemblage, which consists entirely of chert. This study is reported in Tamira Brennan and Brad Koldehoff's 2010 article *Exploring Mississippian Polity Interaction and Craft Specialization with Ozark Chipped-Stone Resources*. Brennan and Koldehoff examine raw material procurement patterns and flaked stone industries, and use the results to make inferences about polity interactions and craft specialization. Their analysis is based on

chipped stone artifact data from three sites: Cahokia in Illinois, Wickliffe Mounds in Kentucky, and South Cape in Missouri.

Their methods involved macroscopic analysis to classify each artifact according to chert raw material type. Artifacts were classified as either tools or debris based on morphology, use damage, and polish attributes. Each tool and piece of debitage was also classified into one of four Mississippian chipped stone industries: large biface, small biface, flake tool, and microlith.

Brennan and Koldehoff analyzed 5,308 chipped-stone artifacts from the South Cape site. This sample comes largely from Brennan's 2007 excavations of a Mississippian wall-trench at the site. Based on the analysis of this sample the authors offer several conclusions relevant to the proposed study:

- <u>Use of local cherts</u>: Most of the sample consists of two Devonian cherts (Bailey and Clear Creek) that occur within 10 km of the site (Figure 6). South Cape residents used Devonian chert mainly to produce projectile points and small, expedient tools for their own use. The South Cape community may have controlled access to and distribution of Devonian cherts, and hence these cherts may have symbolized the South Cape community.

- <u>Use of non-local cherts</u>: South Cape residents obtained non-local cherts mainly through exchange (Figures 7 and 8). These non-local cherts arrived in two forms: large bifaces (adzes, hoes, celts); and pieces in the early stages of reduction (cobbles, cores, large flakes) that they reduced to produce small expedient tools. These non-local cherts were obtained not simply to meet utilitarian needs, but also because they were symbolically associated with prestigious and powerful mound centers and elites.

- <u>Flaked stone tool manufacture regularly occurred at the household level</u>: Flaked stone tool manufacture was a form of household production.

Based on Brennan and Koldehoff (2010), Bengtson (2017), and Wilkie (1983), I have generated four hypotheses. While the preceding chapter lists these hypotheses, the

subsequent chapter presents the hypothesis in detail, and presents the methodology used in the remainder of this study to evaluate these hypotheses.

Chipped Stone Resources at the South Cape Site

The proximity of lithic raw material sources, and range of sizes and forms in which the stone naturally occurs at those sources, have implications for interpretations of archaeological remains composed of those raw materials. Consequently, the present study requires a consideration of the geographic distribution and physical characteristics of the lithic types present at the South Cape site.

Although it is impossible to identify every combination of available resources for the study site, I have identified the chipped-stone resources that are present in my sample from two house features at South Cape. As shown in Figure 6-9, with respect to geographic distribution, I have classified these raw materials into two main types—local and supra-local. The supra-local sources were further divided into two subtypes—exotic and non-local. These divisions are based on the proximity of each source to the South Cape site. I define local lithic raw materials as those occurring within 10 km of the study site, non-local raw materials as those between 10-100 km from the study site, and exotic raw materials are those more than 100 km from the study site. Source location data are derived from Ray (2007).

Below, I summarize the size range and morphological characteristics of naturally occurring nodules of these lithic types. Unless noted otherwise, all raw material descriptions outlined below were derived from Ray (2007).

Local. Below is a list of the local flaked stone types found in my study sample (Figure 6):

- Bailey chert occurs in small lenticular nodules, irregular or anastomosing nodules, and in continuous and discontinuous beds 5-40 centimeters thick.

- Lafayette chert and quartzite are redeposited paleo-gravels. Pebbles dominate the gravels but cobbles are not uncommon. Chert is the principle component at 86%. Most of the chert cobbles measure approximately 7 cm long, 5 cm wide, 3 cm thick or smaller. Typically the cobbles are subangular or subrounded, and sometimes rounded due to extensive alluvial corrosion. Quartzite is also generally rounded or oval and tend to be slightly larger than the chert cobbles.

Supra-Local (Non-Local). Below is a list of the supra-local (non-local) flaked stone types found in my study sample (Figure 7):

- Basalt, unlike the other resources, is not a sedimentary rock but an igneous rock. The most common forms in which basalt occurs (in the Ozarks) are intrusive dikes (formed by the cooling of molten magma in fissures and crevices) through older rhyolite and granite deposits. These dikes are generally vertical/near vertical to the host rock and may be thin or thick (0.05-1.50 m).

- Jefferson City chert occurs in: lenses measuring 1-10 cm thick, discontinuous and continuous beds up to 20 cm thick, brecciated zones up to 50 cm thick, large cryptomicrobial masses up to 70 cm thick, and in nodular form. The nodular form (sometimes referred to as "cabbage heads") may be lenticular or ellipsoidal (8 cm thick) or round measuring up to 25 cm in diameter . The quartzite occurs in thin continuous beds and discontinuous lenses (up to 10 cm thick). The quartzite is often intergraded with chert deposits.

- Kaolin chert occurs in nodular form, often in large concentrations in a clay residuum. The nodules are generally asymmetrical and range from lenticular to irregular forms.

- McNairy chert breccia occurs primarily in large residual or redeposited cobbles and boulders measuring up to 40 cm in diameter.

- Mill Creek chert occurs in large and lenticular nodules or slabs. Large slabs are typically 50-70 cm long, 20-30 cm wide, and 3-10 cm thick, although some range up to 20 cm thick. These unusual lenticular forms are well suited for the production of large bifacial tools. Hoes made from Mill Creek chert have long been recognized as digging tools that were widespread in the

American Bottom region surrounding Cahokia and beyond. These hoes are often believed to have mulitple layers of utility, one being used primarily as specialized, curated tools and a second use as cores for generating simple expedient tools (Hammerstedt and Hughes 2015). Researchers are also interested in looking at Mill Creek chert hoes in terms of their influence in Mississippian interregional and intraregional exchange systems (Butler and Cobb 2001; Cobb 1989; Thomas 2001). Cobb (1989:79) goes as far as to state in his 1989 work that "the ubiquity of hoes and hoe fragments made of this distinctive chert makes these artifacts almost as much a defining characteristic of Mississippian as such traditional criteria as wall trench structures and shell tempered pottery".

- Plattin chert generally occurs in thin discontinuous beds, in small anastomosing and irregular deposits and in small isolated round and ellipsoidal nodules (2-8 cm) thick. Large nodules up to 10-15 cm thick are found occasionally.

- Rubidoux chert occurs in beds of variable thickness (5-50 cm). The chert is made up of large irregular and small elliptical nodules. Rubidoux quartzite occurs primarily in thick and thin beds between approximately 5 and 40 cm in thickness, in discontinuous lenses, and rarely in nodular form.

- St. Louis chert (Cobden Variety): typically occurs in round and ellipsoidal nodules (sometimes referred to as "ball chert") approximately 5-30 cm in diameter, although much larger nodules up to 90 cm have been reported. This chert also occurs in lenticular and bedded forms, but the chert in these forms is generally lower in quality.

Supra-Local (Exotic). Below is a list of the supra-local (non-local) flaked stone types found in my study sample (Figure 8):

- Burlington chert in its generic form occurs in small to large rounded to elongated nodules up to 40 cm thick and in discontinuous and continuous beds 30 cm or more thick. Burlington chert is also highly fossiliferous.

- Dover chert's form is not discussed by Ray (2007), but the chert is from Stewart County, Tennessee and was widely traded throughout the Mississippian sphere.

Table 1. Radiocarbon Dates from South Cape (based on Wilke 1983). (DIC-DIC Corporation and Dicarb Radioisotope Company, USA) (H1-House Feature 1)

Sample	Assoc.	Radiocarbon Age BP	Calibrated Dates (A.D.) 1-sigma	Probability of Calibrated Date (1-sigma)	Calibrated Dates (A.D.) 2-sigma	Probability of Calibrated Date (2-sigma)
DIC-1885	H1	500 ± 45	1405-1445	1.000	1398-1465	0.861
DIC-1886	H1	480 ± 55	1400-1465	1.000	1387-1518	0.857
DIC-1887	H1	480 ± 45	1411-1449	1.000	1391-1489	0.941
DIC-1890	H1	460 ± 45	1415-1460	1.000	1397-1517	0.953
DIC-1891	H1	-430 ± 50	1423-1494	0.900	1411-1525	0.786
DIC-1892	Outside	650 ± 50	1284-1318	0.455	1275-1403	1.000
(Charcoal)	H1		1352-1390	0.545		
DIC-1892	Cemetery	640 ± 70	1285-1326	0.441	1262-1423	1.000
(Bone) *			1343-1394	0.559		
DIC-2195	Outside	350 ± 110	1448-1645	1.000	1395-1696	.0864
	H1					

Table 2. Results of House Feature 1 Ceramic Artifact Analysis from Units 10L/N

Level	Sherd Count
0 (not present)	6
1	87
2	19
3	17
4 (test pit)	2
9 (indeterminate)	1
Total	132

Table 3. House Feature 1 Excavation Units

Unit	Burials near unit edge	Burials in unit	Located within House 1 Entirely	Located on the boundary of House 1 and exterior
9L				X
9M		X		
10L			X	
10M	X		X	
10N	X			X
11L				X
11M	X			X
11N		X		X

Figure 1: Location of Cape Girardeau County (top) and South Cape Site 23CG8 (bottom)

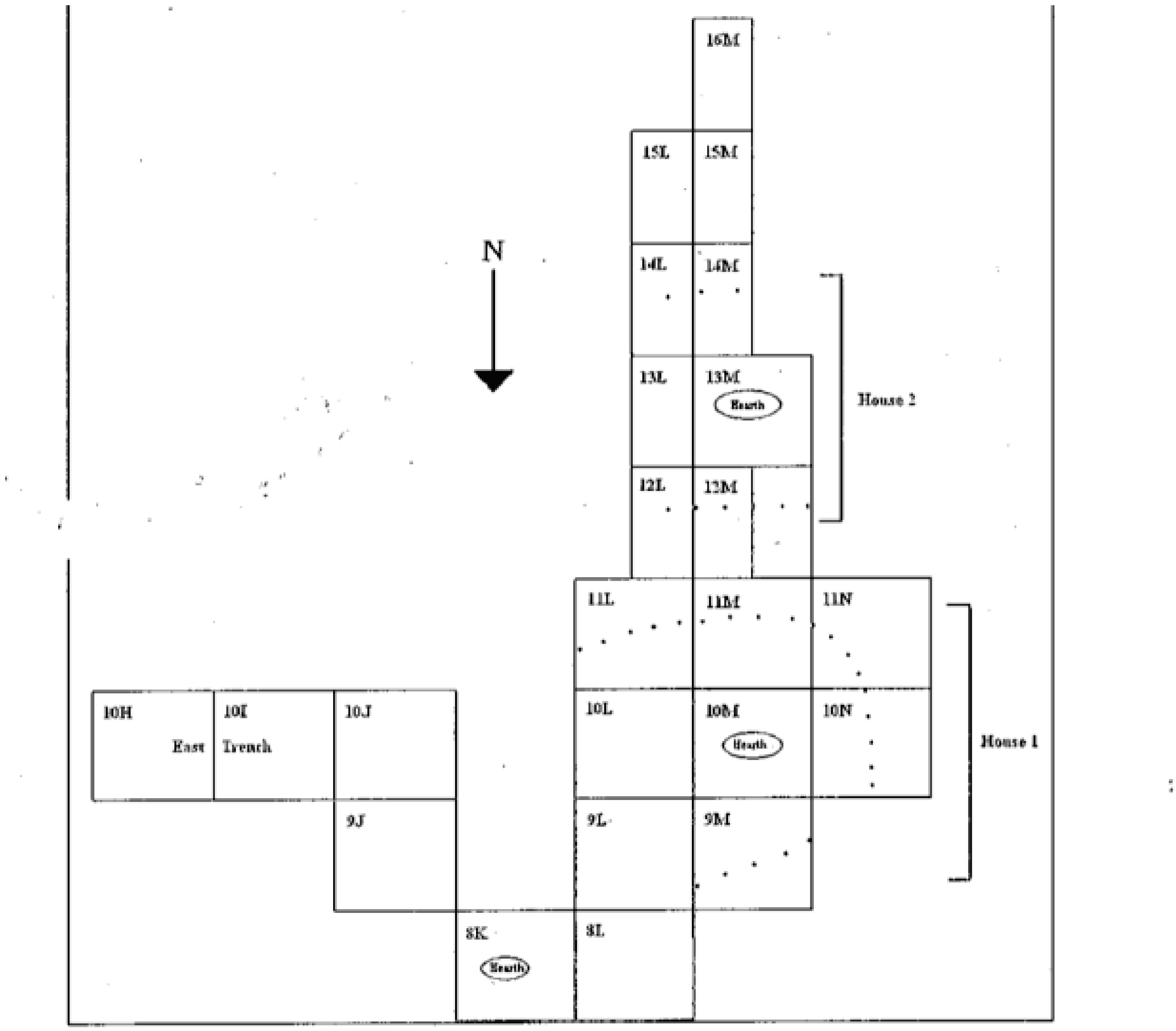

Figure 2: Layout of Wilkie's Excavation Units

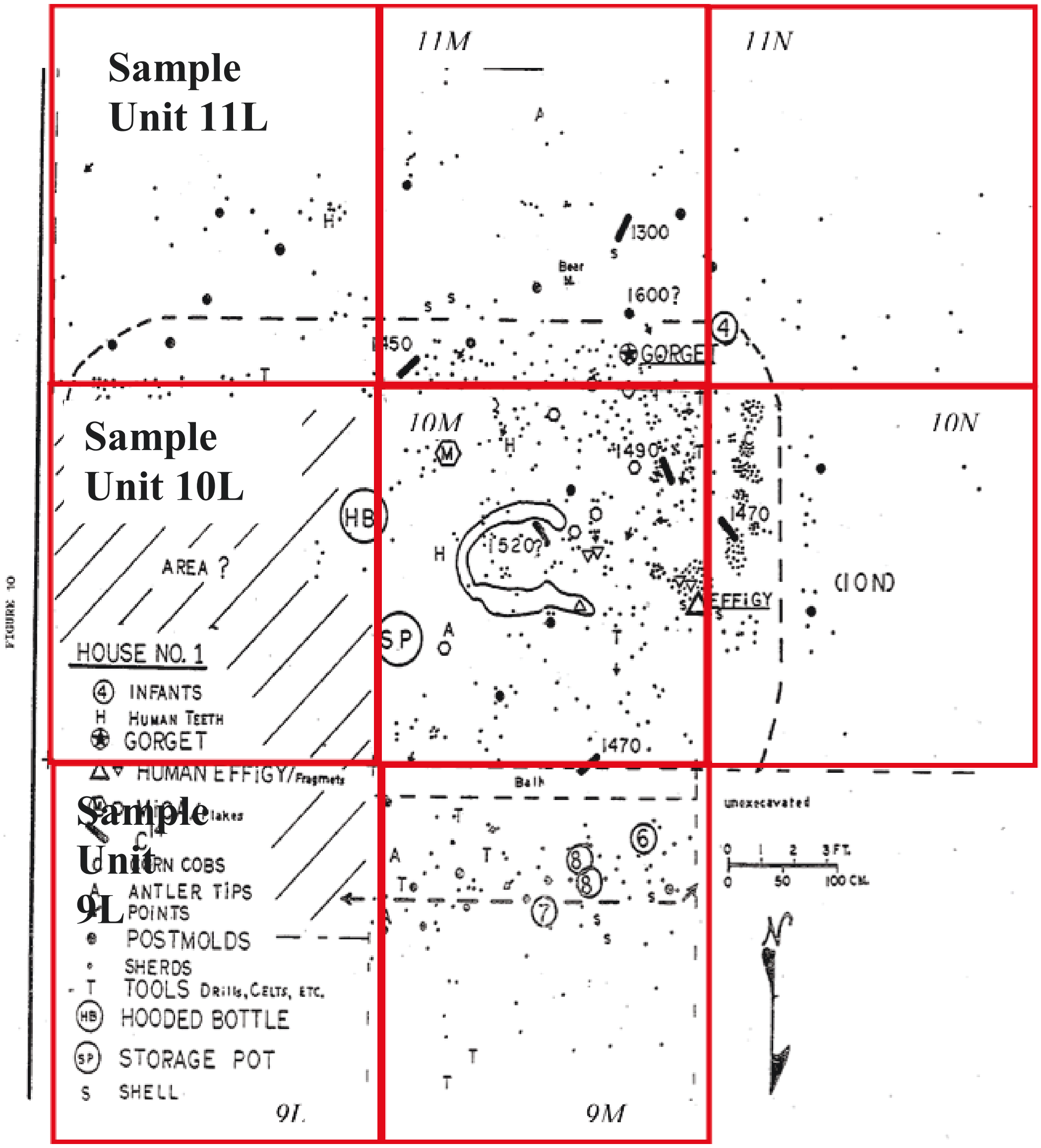

Figure 3: House 1 map (from Wilke 1983). Squares denote excavation units (5’ x 5’). The proposed sample units are 9L, 10L and 11L. Burial denoted by circled number: 4, 6, 7, 8(a), and 8(b). Note that 8a and 8b are not distinguished.

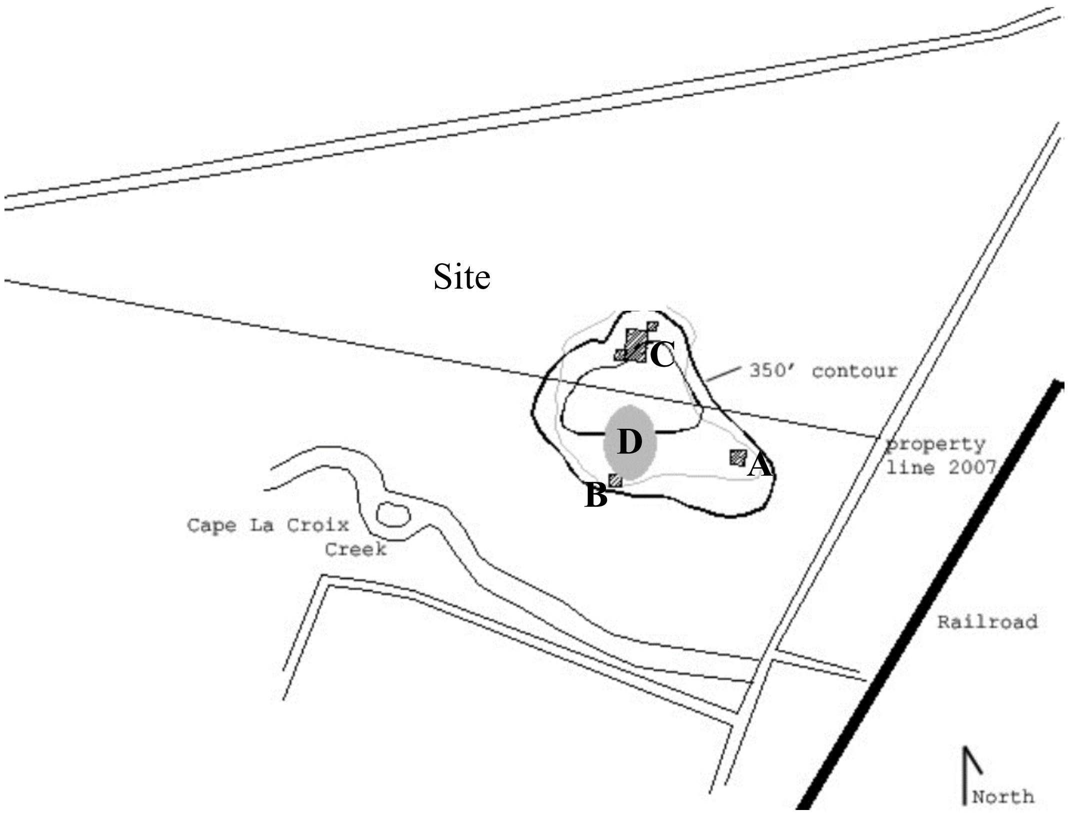

Figure 4: Excavated areas: A, "cemetery"; B, midden; C, house basins 1 and 2; D, house basin 3. (Map based on Brennan 2007 and Wilke 1983).

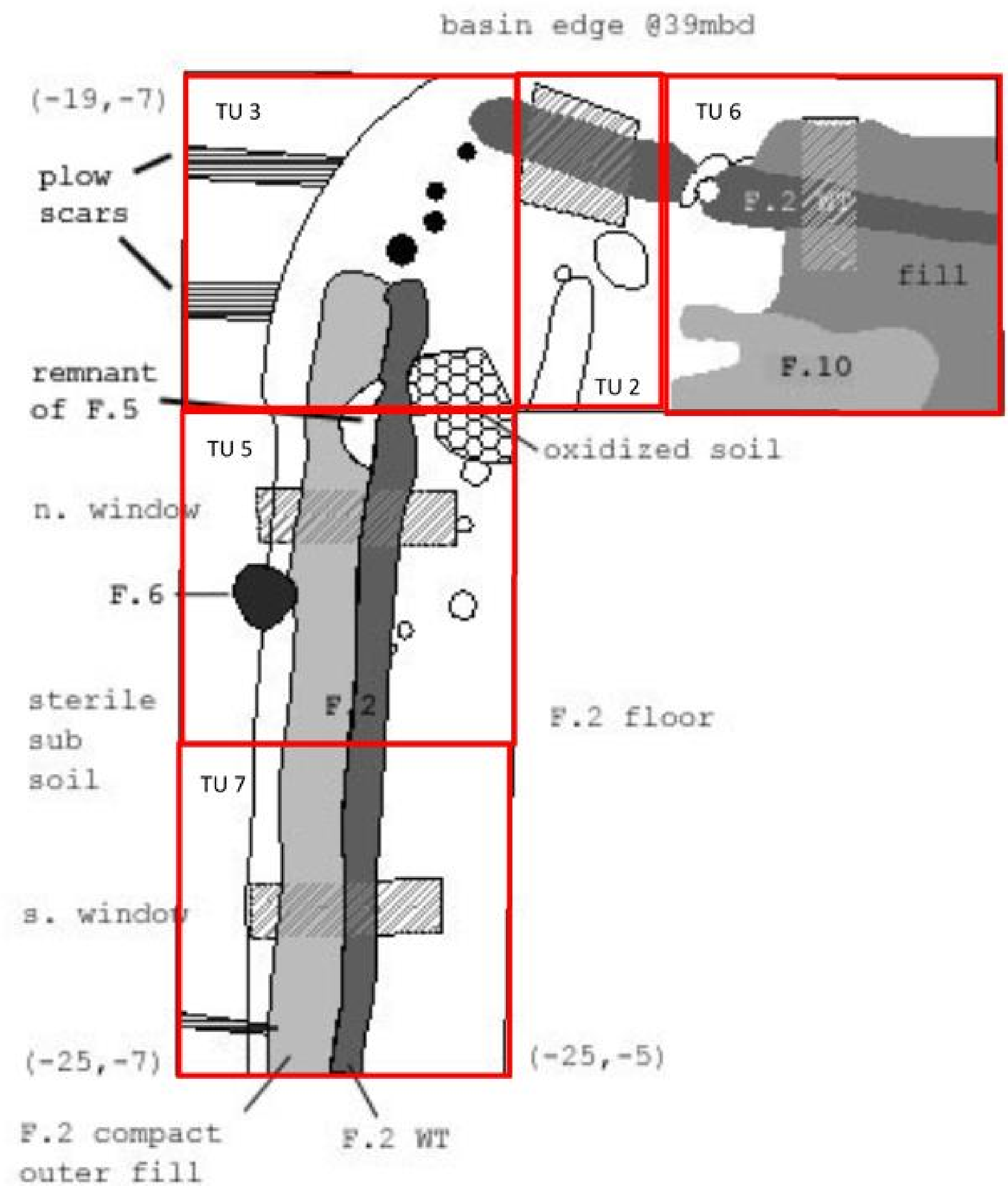

Figure 5: Layout of artifacts and features in House Feature 3 (From Brennan 2007). Also outlined are the five test units dealing with House Feature 3. The units I have chosen for my project are TU 5 and TU 7.

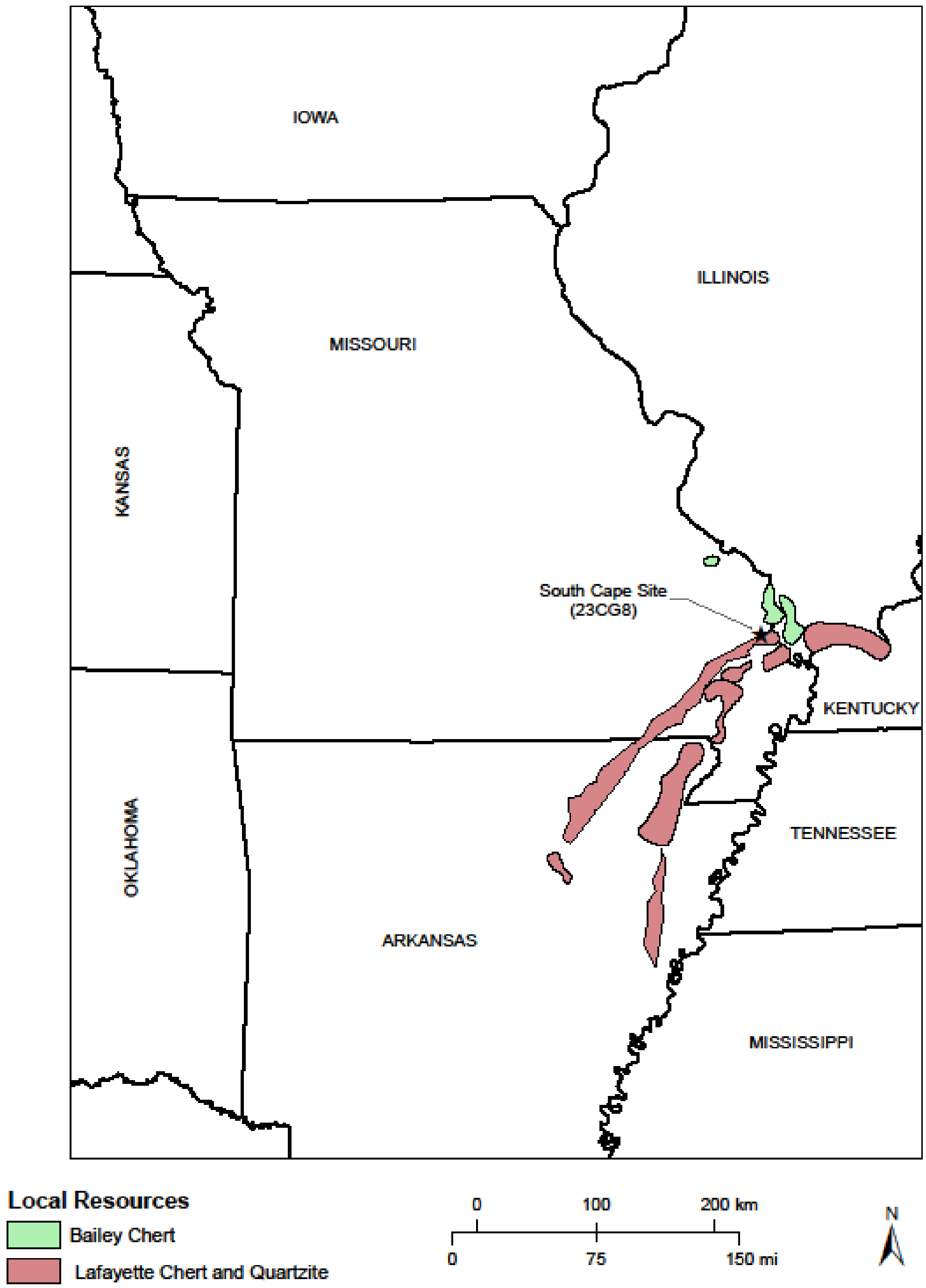

Figure 6: Local Lithic Raw Material Resource Areas

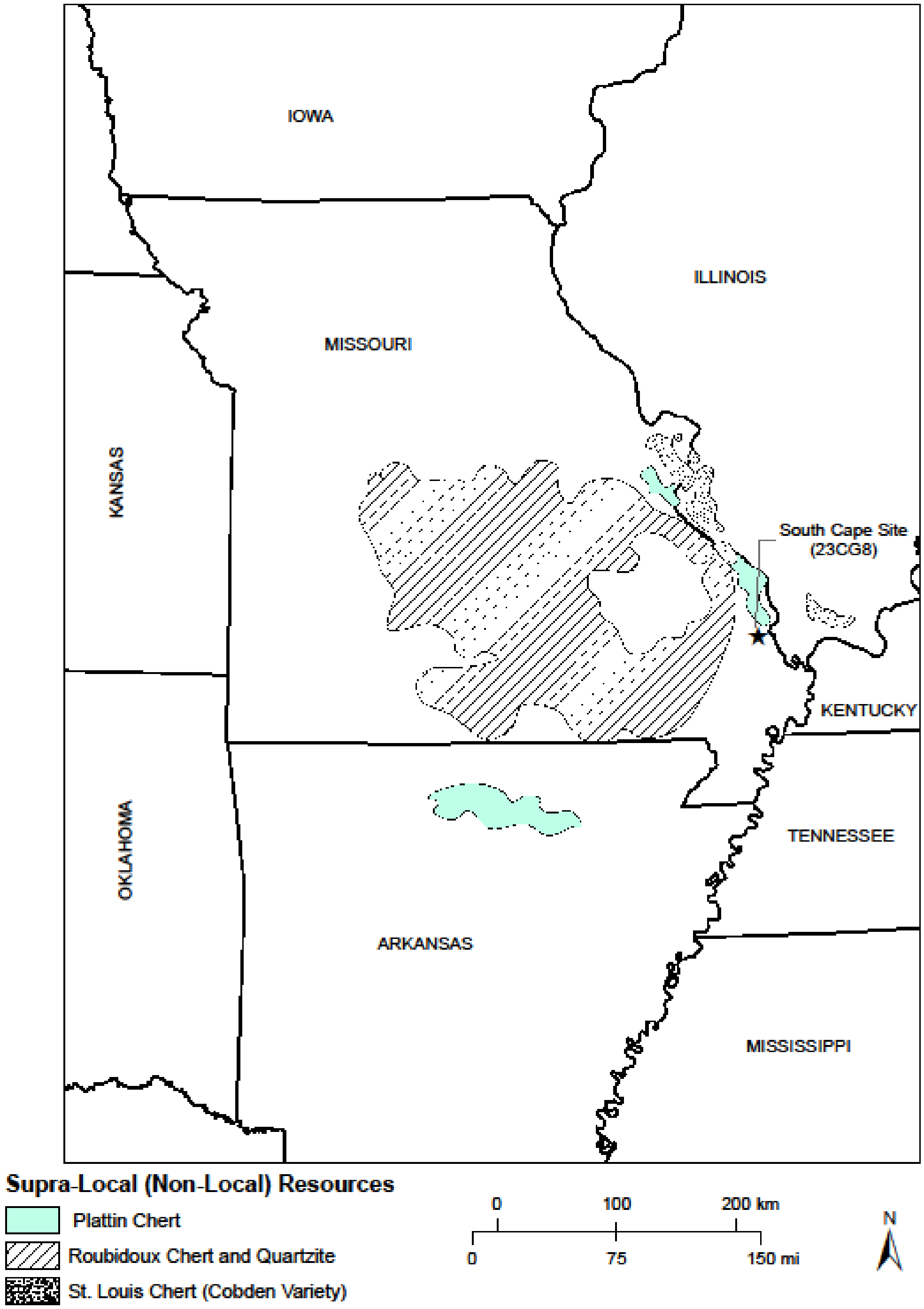

Figure 7: Supra-Local (Non-Local) Lithic Raw Material Source Areas Part 1

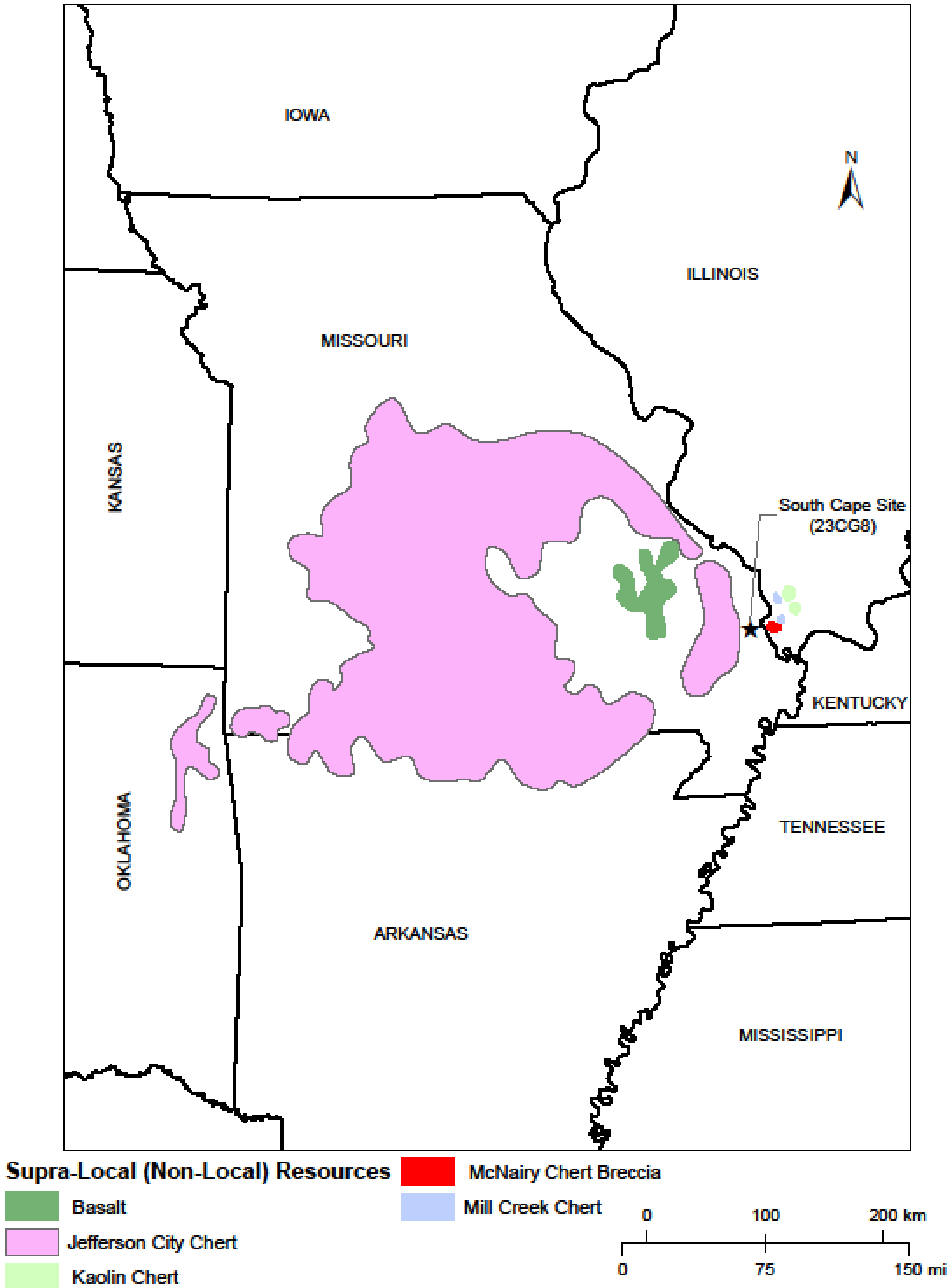

Figure 8: Supra-Local (Non-Local) Lithic Raw Material Source Areas Part 2

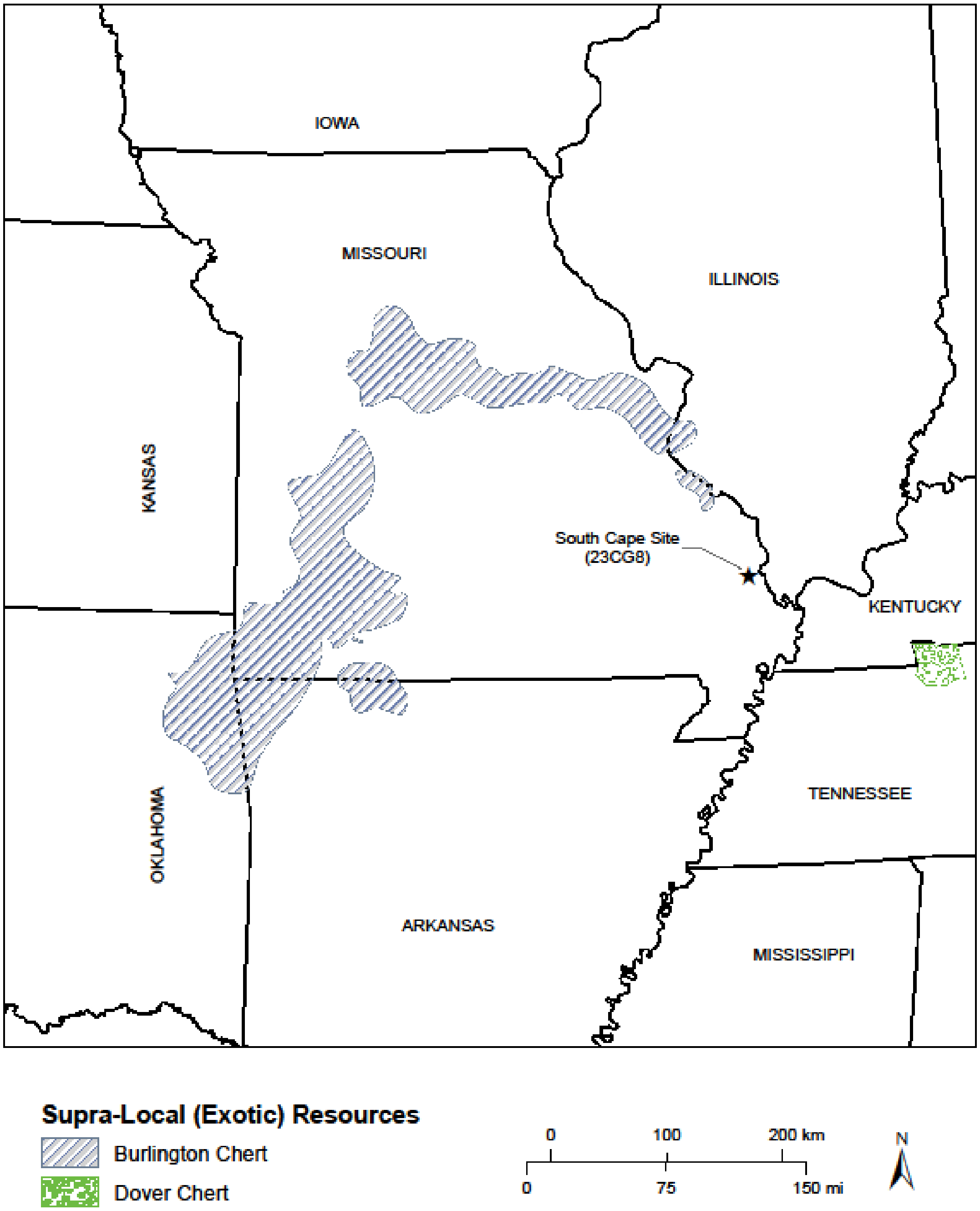

Figure 9: Supra-Local (Exotic) Lithic Raw Material Source Areas

CHAPTER 3: METHODS

This study of household flaked stone technology at South Cape was accomplished through a series of six steps: (1) gathering relevant existing information regarding the site; (2) consultation; (3) developing hypotheses and archaeological test expectations concerning flaked stone technology at the site; (4) selecting the lithic artifact sample; (5) analyzing the lithic artifact sample; and (6) using the results to test the hypotheses.

Gather Existing Information about the South Cape Site

I have gathered and synthesized four types of existing information about the site including field and lab records, publications, technical reports and presentations. All four types of existing information are discussed below.

Site records are curated at Southeast Missouri State University in Cape Girardeau, Missouri. These records were used to understand site structure and select samples from specific excavation units for analysis. These site records include those produced by Dr. Duncan Wilkie, Dr. Tamira Brennan Christensen, and Dr. Jennifer Bengtson. By examining these records, I was able to develop a more complete understanding of what fellow researchers discovered and their interpretations of the data in order formulate my research. Furthermore, I was able to look at extant site records with a fresh perspective and was able to use their interpretations and analysis to focus my research on the most relevant aspects of the South Cape site.

Extant literature on the South Cape site consists of four presentations (Helton 2014,2016; Wilkie 1982, 1983), one unpublished manuscript (Helton 2015), one peer-

reviewed publication (Bengtson 2017), two non-peer reviewed publications (Christensen 2010; Koldehoff and Brennan 2010), two technical reports (Christensen 2007; Kohn 2010), and one masters' thesis (Stephens 2010). The site is also briefly mentioned in one book (Chapman 1980).

Consultation

Consultation was a vital part of this project. To study the South Cape site, I obtained verbal and written permission from Dr. Jennifer Bengtson at Southeast Missouri State University, where the collections were stored, to look at the collections and select specimens for analysis.

Second, I consulted with the Osage Nation throughout the entire process. The South Cape site is located along the Mississippi River, which is extremely important to the Osage Nation. Also, federal authorities have recognized that the Osage peoples are related to the prehistoric Mississippians. By consulting with the Osage Nation throughout the entire process, I have provided them with information about a site that is not well known but could be a useful source of information for them in the future. I received both verbal (via a consultation meeting with the Osage Tribal Historic Preservation Officer, Dr. Andrea Hunter, and the Council of Tribal Elders) and written support from the Osage Nation (via a mailed letter). In their response, the Osage THPO and the Council of Tribal Elders asked me to exclude from my sample artifacts from units containing or adjacent to, burials or associated funerary objects.

During the consultation process, I also reached out to other Tribes listed on the U.S. Department of Housing and Urban Development along with those that showed up

through searching the National Online Native American Graves and Repatriation Consultation Database, has having interest in the area surrounding Cape Girardeau and the South Cape Site. I contacted these Tribes via email and written letters of intent, including a copy of my thesis research proposal, and did not receive any other contact or concerns from their Tribal Historic Preservation Officer or related Tribal official.

Select Flaked Stone Artifact Sample

My research goals concern houses and households, and therefore I sought to analyze archaeological remains from house features at the South Cape site. As outlined in Chapter 2, previous excavations at the site involved the recovery of remains from several house features.

For my house feature sample, I decided to study a sample of remains from House Features 1 and 3 for a number of reasons. First, as stated above, House Feature 1 is the only house feature at the South Cape site that had been previously studied in any detail. This previous work provided a useful foundation of knowledge that could facilitate my research. Second, House Feature 1 is in the northern portion of the site whereas House Feature 3 is located in the south, and a comparison had the potential to shed light on Wilke's proposed functional division of the site into a northern ritual precinct and a southern domestic area. Third, previous analyses of the site indicate that the archaeological deposits within House Features 1 and 3 consist mainly of primary and/or secondary refuse, rather than post-abandonment refuse (Koldehoff and Brennan 2010; Schiffer 1987). Therefore, we can be fairly confident that these deposits result mainly from the behaviors of house residents rather than behaviors of other individuals.

I took several factors into account in selecting samples of artifacts from House Features 1 and 3. First, as explained above, through consultation with the Osage Nation, it was determined that I would not sample units that had contained burials, or were adjacent to burials. Second, only units containing flaked stone artifacts were included in the sample (all units from both house features contained flaked stone artifacts). Third, I sampled units from comparable architectural zones (house edge units versus house interior units) in the two house features, as a means of controlling for archaeological site formation processes.

After these criteria were applied, the resulting House Feature 1 sample consisted of three units: 9L, 10L, and 11L. The resulting House Feature 3 sample consisted of two units: TU5 and TU7 (Figure 5). These units were selected because most of the interior units in House 3 contained burials. Once those units, and adjacent units, were excluded from consideration, the only remaining House Feature 1 units available for sampling were those on the edges of the house feature. In the case of House Feature 3, only edge units were available for sampling, because edge units only were excavated. Therefore, only edge units from House Features 1 and 3 are included in the sample. With that being said, all flaked stone artifacts recovered from each sample unit were analyzed.

It is important to note that the archaeological sample is potentially biased in at least two ways. First, while Brennan screened deposits with ¼ inch mesh screens, it is not known whether Wilke screened deposits, nor the mesh sizes of any screens he used. This possible difference in screen usage and mesh size may have generated size biases that skew the analysis of comparisons of house features 1 and 3. Second, by excluding units from the centers of the house features, any behaviors characteristic of central areas within

the represented houses are not presented here. These possible biases cannot be detected or corrected for in the present study, but I can nonetheless keep those potential biases in mind as I analyze- and interpret the artifact data.

Flaked Stone Technological Theory: Expedience and Curation

In recent archeological efforts to learn about past flaked stone technologies, the concepts of lithic curation and expedience have proven especially useful. In this context, the terms *curation* and *expedience* refer to the degree to which a group's lithic technology is oriented towards maximizing tool use life. A curated technology results from high energy investment in maximizing tool use-life, whereas a more expedient technology reflects low energy investment in maximizing tool use-life. Thus, curation and expedience refer to a continuum; one end represents a highly curated technology while the other end represents a highly expedient technology.

In the case of a relatively curated technology, community members use tools and tool stone fairly conservatively because they need to make flaked stone tools last. This may indicate limited access to raw material for producing new tools. To enable this long use-life, people tend to invest energy in repairing and repurposing broken tools, resharpening dull tools, and stockpiling lithic raw material. In contrast, in the case of a more expedient technology, people generally use tools and tool stone less conservatively, as they are less concerned with making flaked stone tools last, or with maintaining access to lithic raw material for the production of new tools. Thus, in the context of an expedient technology, people do not invest heavily in repairing and repurposing broken tools, resharpening dull tools, or stockpiling lithic raw material (Andrefsky 2001, 2005;

Bamforth 1986; Bradbury and Carr 1995; Carr 1994; Daniel 2001; Parry and Kelly 1-987; Shott and Ballenger 2007).

In order to characterize the degree of curation or expedience reflected in a flaked stone assemblage, archaeologists frequently use the concept of lithic reduction stage (e.g. Bradbury and Carr 1999; Parry and Kelly 1987; Shott and Ballenger 2007). The sequence of events involved in the production and consumption of a flaked stone tool compose a reduction trajectory. Basic steps in a typical reduction trajectory include raw material acquisition, core reduction, modification of a flake or core into a tool, use of that tool, and subsequent cycles of tool rejuvenation and re-use (Andrefsky 1998, 2001, 2005; Bradbury and Carr 1999). The trajectory ends when reductive events cease due to tool discard, loss, or abandonment. Reduction at early points in a potential trajectory can be called *early stage reduction* (e.g. detaching a flake from a core, shaping a flake into a tool) while reduction at later points can be called *late stage reduction* (e.g. rejuvenating a tool by re-touching a broken edge, recycling the tool for an alternative purpose when the object becomes damaged or too small to serve its original function). The proportion of early stage reduction out of total reduction is high in a relatively expedient flaked stone technology, because individuals typically discard a given flaked stone tool before reducing it through later use-life stages; the user replaces the discarded tool with a new tool (such as a new flaked stone tool, a metal tool, or glass tool), rather than continuing to use and reduce the flaked stone tool. Conversely, the proportion of early stage reduction is low while the proportion of late stage reduction is high in a more curated technology because individuals typically reduce flaked tools though later use-life stages.

Furthermore, archaeologists frequently use the concept of "formality". Tool formality has also been used as an indicator of the degree of curation vs. expedience. A flaked stone reduction strategy can be described as relatively expedient if it involves little energy investment, and relatively formal if it involves high energy investment. By extension, the products and byproducts of a given strategy can be described as relatively expedient or formal (Andrefsky, 2005: pp. 226-227; Sobel, 2012: p. 7). Moreover, lithic raw material availability affects expedience. When tool stone is abundant, reduction is relatively expedient. In contrast, a scarcity of stone encourages formality, because the need to conserve encourages the manufacture of tools that are multifunctional, readily rejuvenated, and long-lived. The regular production of tools with these qualities requires high energy investment and thus generates relatively formal tools (Andrefsky, 2005: Sobel 2012).

Develop Archaeological Expectations for Testing Hypotheses

As explained in Chapter 2, the hypotheses below derive from previous research at South Cape. When applied to these hypotheses, the lithic technological theory reviewed above generates a series of archaeologically-testable expectations.

The first hypothesis is based on Brennan and Koldehoff's (2010) conclusion that South Cape residents acquired and consumed both local and non-local lithic raw material and is as follows:

My first hypothesis states that: South Cape residents regularly acquired and consumed both local and supra-local lithic raw material at the site. However, they

regularly acquired and consumed higher quantities of local lithic raw material, relative to quantities of supra-local lithic raw material, at the site.

Archaeological Test Expectations and Measures. If Hypothesis 1 is correct, then the majority of flaked stone artifacts from the South Cape site should be made of local lithic raw material, and a minority should be made of supra-local lithic raw material. Thus, cores, tools, and debitage should each display significantly higher proportions of local than of supra-local lithic specimens.

In terms of archaeological measures, both tools and debitage should display significantly higher proportions of local lithic raw material than supra-local lithic raw material. I will identify lithic raw material types via visual attributes observable through a 10x lens. I will also use Jack Ray's 2007 guide to chipped-stone resources as a reference for proper identification.

The second hypothesis follows suit, from a second conclusion from Brennan and Koldehoff (2010), in which they state that South Cape residents obtained non-local cherts mainly through exchange (Figures 7 and 8). These non-local cherts were obtained not simply to meet utilitarian needs, but also because they were symbolically associated with prestigious and powerful mound centers and elites. They also noted a distinction between Mill Creek chert and other non-local cherts.

My second hypothesis states that: South Cape residents used local raw material relatively expediently. In contrast, they used supra-local lithic raw material less expediently (i.e., in a more curated manner). Among supra-local lithic raw materials, Mill Creek chert had a unique reduction trajectory, related to its importance in Mississippian hoe technology.

Archaeological Test Expectations and Measures. If Hypothesis 2 is correct, then on average, artifacts made of local lithic raw material should be in earlier stages of reduction, reflecting a more expedient strategy, compared to artifacts made of supra-local lithic raw material. Among supra-local lithic artifacts, Mill Creek chert specimens should reflect a unique reduction trajectory.

For Hypothesis 2 there are several variables for both tools and debitage to take into account, all of which are detailed below.

- <u>Flaked Stone Tool Reduction Stage Variables</u>. Tool assemblages resulting from relatively expedient reduction generally display: high proportions of tools with marginal versus invasive flaking; high proportions of tools with unifacial versus bifacial flaking; high proportions of tools with cortical versus non-cortical surfaces; and high mean size values within tool morphological or functional type classes. Therefore, the local tool sample from the house features, individually and combined, should display significantly high values of these variables, compared to the supra-local (non-local and exotic) tool sample. Contingency table analyses will be used to identify significant differences in proportions, and t-tests will be used to identify significant differences in mean sizes.

- <u>Flaked Stone Tool Functional Type</u>. Each flaked stone tool was classified according to functional type, using Andrefsky's general typology. Interestingly, there were only two functional tool types found in my study sample (Biface and Projectile Point), of which more indepth definitions follow. This classification has two purposes. First, it is part of the process through which flaked stone artifacts will be classified as tools versus debitage, a step necessary for the analysis of flaked stone tool reduction stage indicators explained elsewhere in this section. Second, the tool functional typology will match that used by previous researchers, for purposes of comparison. Previous work on the study sites indicates the samples will likely include mainly the following flaked stone tool functional types:

- <u>Biface</u>. A tool that has two surfaces (faces) that meet to form a single edge that circumscribes the tool. Both faces usually contain flake scars that travel at least half-way across the face. Bifaces are objective pieces, defined by Andresky 2005, as a rock or artifact that is modified by the removal of detached pieces; they have been extensively modified by flake removal across the facial surfaces. The term "biface" refers to the shape of the artifact and does not necessarily imply the function (Andrefsky 2005: 179). Bifacial cores have been used as chopping or cutting tools. Others have been

modified for hafting or attachment to a handle or shaft. They are one of the most common types of objective pieces found at archaeological sites. They come in many sizes and shapes and have hundreds of specialized names for these shapes (Andrefsky 2005:22).

- Projectile Point. A biface or uniface that has two converging lateral edges, and contains evidence of haft modification. These are often identified as arrow points, dart points, and spear points. However, use-wear analyses indicate these artifacts were also used for slicing, cutting, sawing, whittling, scraping, splitting, and piercing (Andrefsky 2005:204).

- Flaked Stone Debitage Reduction Stage And Expedience Variables. As explained above, relatively expedient reduction involves high proportions of early stage reduction activity. Within a reduction trajectory, debitage assemblages generated during early stage reduction are often distinct from debitage assemblages generated during late stage reduction. In general, a high proportion of early stage reduction yields debitage displaying: (1) high frequencies of cortical (or low frequencies of non-cortical) debitage; (2) high frequencies of flakes baring single-faceted and cortical (or low frequencies of flakes baring multi-faceted) platforms; (3) high mean size (length, weight, and thickness) values, with weight treated as the more accurate size indicator; (4) a high mean ratio of flake platform thickness to flake weight; (5) a low mean ratio of dorsal scar count to dorsal surface area; and (6) in some cases, high frequencies of bipolar (or low frequencies of non-bipolar) debitage (Andrefsky 1998:110-118, 119-120).

Therefore, the local lithic debitage samples from the house features, individually and combined, should contain relatively high proportions of early stage reduction byproducts, and therefore should yield significantly higher values of these variables. In contrast, the Mill Creek chert debitage samples from the house features, individually and combined, should contain relatively low proportions and yield significantly low values. Contingency table analyses will be used to identify significant differences in proportions, and t-tests will be used to identify significant differences in mean sizes.

My third hypothesis follows Brennan and Koldehoff's (2010) conclusion that tool manufacturing occurred at the household level. Although we generally assume that this was the case in Mississippian communities, it is possible that some households did not

regularly make most of the tools that they used, but obtained them from other tool producers in the community. Therefore, rather than make the assumption that all households were equally involved in flaked stone tool production, we need to demonstrate it. My third hypothesis states that: Flaked stone tool production regularly occurred at the household level. In other words, flaked stone tool production was a common component of household production at the site.

Archaeological Test Expectations and Measures. If Hypothesis 3 is correct, then both South Cape house feature samples should contain deposits indicating that the occupants engaged in relatively early through late stages of reduction. Indicators of early stage reduction include the presence of early stage debitage, and the presence of non-exhausted cores, here defined as 3 cm or larger in maximum length, would constitute additional evidence of early stage reduction. Both samples should also reflect late stage reduction activity, indicated by the presence of relatively exhausted cores (equal to or less than 30 mm) and/or late stage debitage.

To test hypothesis 3, I use two attributes as indicators of core reduction stage – core length and core weight. I define early stage cores as those that are “large,” with lengths at least as great as the upper quartile of lengths for the entire core sample. A second measure is the same, but for core weight. I use one attribute to measure flake reduction stage – flake platform type. I define flakes with simple platforms as early stage, and those with complex platforms as late stage.

A fourth and final hypothesis, based on both Wilkie’s initial work in 1983 and subsequent work by Brennan and Koldehoff (2010) and Bengtson (2017), concerns the proposed functional division of the South Cape site as well as inter-house variation.

These researchers have suggested that the North half of the site had a particular ritual importance while the South part did not. If this is the case, then we could speculate that Household 1 and Household 3 had different economic roles in the community and beyond. My forth hypothesis states that: House 1 and House 3 had different positions within the local and supra-local socioeconomic systems. These differences yielded different tool stone acquisition, reduction, and consumption patterns.

Archaeological Test Expectations and Measures. If Hypothesis 4 is correct, then comparisons of the H1 the H3 samples should reveal some significant differences. Inter-household variation in tool stone acquisition strategies should be indicated by significant differences between house feature samples in raw material type proportions. Inter-household variation in production practices should be indicated by significant differences in debitage heat alteration, reduction technique, and reduction stage indicators. Inter-household variation in flaked stone tool consumption patterns should be indicated by significant differences in flaked stone tool morphofunctional type frequencies, tool formality, and tool exhaustion.

To test Hypothesis 4 in terms of variation in raw material usage, I compared the proportion of chert by type and source area in the samples from House Feature 1 and House Feature 3. To test Hypothesis 4 in terms of variation in production practices, I compared mean core size (length, weight); debitage heat alteration (chi square, altered versus non altered); debitage reduction technique type (Bipolar versus non-bipolar); and debitage reduction stage (debitage platform type, debitage cortex presence/absence, debitage mean size, debitage dorsal scar count/surface area, debitage platform thickness/flakeweight) between House Feature 1 and House Feature 3. Finally, in terms

of inter-household variation in flaked stone consumption patterns between House Feature 1 and 3, I looked at differences in flaked stone tool morphofunctional types, tool formality, and tool exhaustion.

CHAPTER 4: RESULTS

This chapter presents the results of analyses designed to test the four hypotheses described above concerning household level flaked stone tool production and consumption at the South Cape site. The results are based on my analysis of 1,867 flaked stone artifacts from the site. This sample includes 53 cores, 1,792 pieces of debitage, and 22 tools recovered from the two sampled house features. Photographic examples of a sample of the cores, debitage, and tools can be seen in Appendices A-C. The artifacts include specimens from both local and supra-local geological sources, relative to the site location.

Test of Hypothesis 1

Hypothesis 1 states that South Cape residents regularly acquired and consumed both local and supra-local lithic raw material at the site. However, they regularly acquired and consumed higher quantities of local lithic raw material, relative to quantities of supra-local lithic raw material, at the site.

As stated in Chapter 3, If Hypothesis 1 is correct, then the majority of flaked stone artifacts from the South Cape site should be made of local lithic raw material, and a minority should be made of supra-local lithic raw material. Thus, cores, tools, and debitage should each display significantly higher proportions of local than of supra-local lithic raw material.

The results of Hypothesis 1 are detailed in the proceeding paragraph. The classification of artifacts into specific lithic raw material types was carried out based on

the work of Ray (2007). In addition, I conferred with Ray to check my classifications. Thus, I am relatively confident in the lithic raw material type and source area assignments. As shown in Tables 4-5 and Figures 6-9 these distinctions are based on distances between the South Cape site and lithic source locations. Local sources are located < 10km from South Cape. Supra-local sources are located 10-100km from South Cape, whereas exotic sources are located more than 100km from South Cape.

Out of the total sample of 1,867 artifacts from the South Cape site, I was able to classify 1,466 as made of either local or supra-local lithic raw material. The remainder could not be classified, mainly because they were quite small, precluding confident typing. I recognize that this inability to classify smaller specimens introduces size biases into the artifact sample. This in turn may have led to biases in identified lithic raw material type frequencies, given the well-known relationship between flake stone artifact size and raw material source proximity (Eerkens et al. 2007). These possible biases will be considered when interpreting results.

Of the 1466 artifacts that could be classified into lithic types, a total of 1,399 (95.4%) were identified as local types and 67 (4.6%) as supra-local types. Of artifacts classified as local lithic raw material, most are made of Bailey chert (97.81%), while a few are made of Lafayette chert (2.12%), and Lafayette quartzite (0.07%). Among artifacts made of supra-local lithic materials, Mill Creek chert (31.51%), Kaolin chert (21.92%), and Burlington chert (15.07%), are most common. Dover chert (6.85%), Roubidoux quartzite (5.48%), Basalt (5.48%), Jefferson City chert (4.11%), and St. Louis-Cobden Variety chert (4.11%) are less frequent. The other sources (Jefferson City-quartzite, Mill Creek/Kaolin chert, McNairy Chert breccia, and Plattin chert) are each

less common with only one specimen of each lithic type present in the supra-local artifact sample. Among the identified supra-local sources, Dover and Burlington chert are exotic while the remainders are non-local.

The analysis of these lithic raw material source area data support Hypothesis 1. The dominance of local lithic raw material is clearly evident within the artifact sample as whole; as noted above, 95% of typed specimens are made of local lithic raw material. Local lithic raw material also dominates within each morphofunctional class, as shown by an analysis of the relationship between artifact morphofunctional type and lithic raw material type, where lithic raw material is divided into two types - local and supra-local. The core, debitage, and tool samples are each comprised mainly of local lithic specimens; 96% of cores are made of local lithic raw material, 96% of debitage is made of local lithic raw material, and 86% of tools are made of local lithic raw material, whereas only 4% of cores and debitage, and 14% of tools, are made of supra-local lithic raw material. Although the percentage of local lithic raw material is noticeably lower among tools than among the other morphofunctional types, a contingency table analysis indicates that there are no meaningful differences among cores, debitage, and tools in regard to the percentage of local versus supra-local lithic raw material.

Local lithic raw material also dominates within each morphofunctional class when lithic raw material is divided into three source types – local, non-local, and exotic (Tables 14-16). The study sample contains 16 specimens made of exotic chert; one Burlington chert core, 14 pieces of exotic chert debitage (nine of Burlington chert and five of Dover chert), and one Burlington chert tool. The analysis does not show any significant differences among morphofunctional types in the proportions of artifacts from local, non-

local, and exotic sources. Within each morphofunctional type, specimens of local lithic raw material compose the great majority. Among debitage and tools, non-local specimens are less common, and exotic specimens least common. Among cores, non-local and exotic lithic raw material specimens are equally common, with just one core from each of these supra-local source areas.

Test of Hypothesis 2

Hypothesis 2 states that South Cape residents used local raw material relatively expediently. In contrast, they used supra-local lithic raw material less expediently (i.e., in a more curated manner). Among supra-local lithic raw materials, Mill Creek chert had a unique reduction trajectory, related to its importance in Mississippian hoe technology.

As stated in Chapter 3, If Hypothesis 2 is correct, then on average, artifacts made of local lithic raw material should be in earlier stages of reduction, reflecting a more expedient strategy, compared to artifacts made of supra-local lithic raw material. Among supra-local lithic artifacts, Mill Creek chert specimens should reflect a unique reduction trajectory.

Tools. If Hypothesis 2 is accurate, then compared to tools made of supra-local lithic raw material, those made of local lithic raw material should display a more expedient technology (vs. a more curated, formal technology). Therefore, tools made of local lithic raw material should display significantly higher percentages of specimens with marginal (vs. invasive) flaking, unifacial (vs. bifacial) flaking, and cortical (vs. non-cortical) surfaces. Also, tools made of local lithic raw material should display significantly higher mean size values. As seen in Table 17, some of the analyses show the expected trends. Compared to the supra-local tool sample, the local tool sample shows a

higher percentage of tools with marginal (vs. invasive) flaking and a higher percentage of tools with cortical (vs. non-cortical) surfaces. However, none of this variation is statistically significant.

The lack of statistical significance might be explained by one of at least three factors. First, perhaps there is no meaningful difference between local and supra-local lithic tools with respect to reduction expedience. Alternatively, this outcome may instead represent sampling biases; the lithic tool sample, especially the supra-local lithic tool sample, is quite small and may not adequately represent supra-local flaked stone tools at the site as a whole. Finally, the lack of a significant difference might result from differences in local vs. supra-local raw material size and form. Specifically, as explained in Chapter 2, Mill Creek chert is from a supra-local source and naturally occurs in large tabular pieces, whereas the local cherts naturally occur in smaller, non-tabular, more rounded forms. Therefore, all other things being equal, supra-local Mill Creek chert may have been more likely than local chert to yield cortical debitage. Thus, the Mill Creek chert debitage may be masking or minimizing the variation between local and supra-local debitage with respect to reduction expedience indicators.

The flaked stone tool size comparisons do not clarify the nature of differences between local and supra-local lithic reduction expedience at the South Cape site. Among complete specimens, local lithic projectile points have a higher mean weight. However, contrary to what is expected, supra-local points have a significantly higher mean length than local points, using nonparametric statistics. However, since the difference in mean length is minimal (1.3 mm) and the supra-local point sample is small ($n = 3$), a definitive

conclusion about size differences between local and supra-local projectile points at the South Cape site cannot be made.

Debitage. If Hypothesis 2 is accurate, then compared to debitage made of supra-local lithic raw material, debitage made of local lithic raw material should reflect greater expedience. Thus, local lithic debitage should display significantly higher percentages of cortical (vs. non-cortical) surfaces, higher percentages of simple (vs. complex) platforms, higher mean size values (length, weight), a higher mean ratio of flake platform thickness to weight, and a lower mean ratio of dorsal scar count to dorsal surface area. As shown in tables 17 and 20, none of the analyses of these variables yield significant differences between local and supra-local lithic debitage. Moreover, the results do not uniformly show the trends we would expect if Hypothesis 2 is correct. For example, the debitage made of supra-local lithic raw material is on average larger than that made of local lithic raw material. Also, cortex is more common on debitage made of supra-local lithic raw material than on debitage made of local lithic raw material. Since the lithic debitage sample is relatively large, the lack of significant differences between local and supra-local lithic artifacts in terms of technological and mean size values may indicate that there are no meaningful differences between local and supra-local lithic debitage with respect to reduction expedience. Once again, an alternative possibility is that the large tabular form in which some of the nonlocal material occurs (see Chapter 2) accounts for this difference, so that even late stage reduction on these specimens could result in large pieces.

Mill Creek Chert Tools and Debitage. The test of hypothesis 2 includes a comparative analysis of artifacts made of Mill Creek chert relative to other lithic artifacts

from the South Cape site (Tables 18-20 and 21-22). The study sample contains one tool (a projectile point) and twenty twopieces of debitage made of Mill Creek chert. Hypothesis 2 generates the expectation that Mill Creek chert will reflect a reduction strategy that differs from other supra-local chert as well as from local chert specimens. This expectation is met; the Mill Creek artifact sample suggests a less expedient (more curated) reduction trajectory. The Mill Creek chert projectile point has relatively late stage reduction attributes, including invasive flaking, bifacial flaking, and no cortex. This projectile point is smaller than the average projectile point made of local chert. The Mill Creek chert debitage also points to less expedient reduction. Compared with other supra-local debitage, the Mill Creek debitage sample has a significantly lower mean length and mean weight. Also, compared to other supra-local debitage and local debitage, the Mill Creek debitage sample has a significantly lower mean ratio of platform thickness to flake weight. In sum, the analysis suggests that on the whole Mill Creek chert was used in a more curated fashion, than local chert specimens.

Test of Hypothesis 3

Hypothesis 3 states that Flaked stone tool production regularly occurred at the household level. In other words, flaked stone tool production was a common component of household production at the site.

Archaeological Test Expectations. If Hypothesis 3 is correct, then both South Cape house feature samples should contain deposits indicating that the occupants engaged in relatively early through late stages of reduction. Both house feature samples should reflect early stage reduction activity, as indicated by the presence of early stage

debitage. The presence of non-exhausted cores, here defined as 3 centimeters or larger in maximum length, would constitute additional evidence of early stage reduction. Both samples should also reflect late stage reduction activity, indicated by the presence of relatively exhausted cores (equal to or less than 30 mm) and/or late stage debitage.

Results. To determine whether the study samples meet expectations, I considered core size data (Table 23) and flake platform data (Table 24) for each house feature, as explained in Methods. The H1 sample contains seven cores. Of these, six (86%) are "large" based on length, having a length equal to or greater than the 41.3 mm, which is the upper quartile of core lengths for the entire sample. All seven H1 cores are "large" based on weight, as all seven weight more than 11 g, the upper quartile. Thus, most of the H1 cores are "large," and can be viewed as evidence of early stage reduction activity. The house 1 sample also contains 146 complete flakes, and 91 (62%) of these have simple platforms. These data indicate that the H1 sample contains early and late stage cores, and early and late stage flakes, and early stage specimens are more common among both cores and flakes.

The H3 sample contains 40 cores. Of these, eight (20%) are "large" based on length, and 17 (43%) are "large" based on weight. The H3 sample contains 380 complete flakes. Of these, 312 (82%) have simple platforms. These results indicate that the H3 sample contains early and late stage cores, and early and late stage flakes. Among cores, early stage specimens are more common, while among flakes, late stage specimens are more common.

In sum, each house feature yielded remains of early and late stage reduction. This lends some supports the hypothesis that flaked stone tool production was a regular part of

the economy of both households. The variation among house features in the prevalence of remains of early versus late stage reduction is considered in more detail below.

Test of Hypothesis 4

Hypothesis 4 states that House 1 and House 3 had different positions within the local and supra-local socioeconomic systems. These differences affected different tool stone acquisition, reduction, and consumption patterns.

Archaeological Test Expectations. If Hypothesis 4 is correct, then comparisons of the H1 the H3 samples should reveal some significant differences. Inter-household variation in tool stone acquisition strategies should be indicated by significant differences between house feature samples in raw material type proportions. Inter-household variation in production practices should be indicated by significant differences in debitage heat alteration, reduction technique, and reduction stage indicators. Inter-household variation in flaked stone tool consumption patterns should be indicated by significant differences in flaked stone tool morphofunctional type frequencies, tool formality, and tool exhaustion. In order to get results for Hypothesis 4, I carried out multiple statistical comparisons of the H1 and H3 artifact samples to determine whether these samples meet test expectations.

<u>Variation in Raw Material Type Proportions.</u> To explore interhousehold differences in raw material acquisition patterns, the H1 and H3 samples were compared with respect to lithic raw material source area, and also specific lithic raw material type. When the H1 and H3 cores samples are compared, there are no significant inter-house differences in the percentages of cores made of local lithic raw material versus those

made of supra-local lithic raw material. However, it is noteworthy that only two of the 47 cores in the total core sample are made of supralocal stone, and both of those supra-local specimens are from House 3. In contrast, none of the cores in the House 1 sample are made of supralocal stone. We do see significant differences when comparing house feature samples with respect to specific lithic types (Table 28). Compared to the H1 core sample, the H3 core sample contains a significantly lower percentage of Lafayette (local) chert specimens. In fact, nearly all local lithic cores from H3 are made of Bailey chert, whereas the local lithic cores from H1 are distributed almost evenly between the two represented local sources – Bailey and Lafayette.

Compared to the H1 debitage sample, the H3 debitage sample contains a lower percentage of specimens made of supralocal lithic raw material, and higher percentage of specimens made of local lithic raw material; this variation is not significant. However, when the two house features are compared with respect to specific lithic types, the whole table is statistically significant. In both samples, the vast majority of the debitage is made of Bailey, a local chert. Also, the House 3 sample contains higher percentages of Basalt, Dover chert, Kaolin chert, Lafayette Quartzite, Mill Creek chert, and Roubidoux Quartzite, and lower percentages of Burlington chert, Jefferson City Quartzite, Lafayette chert, McNairy Breccia, and St. Louis-Cobden Variety chert specimens (Table 29).

The H1 and H3 tool samples were also compared in terms of lithic raw material type, and the analysis reveals no significant differences. All tools in the H1 sample are made of local lithic raw material, 80% of tools in the H3 sample are made of local lithic raw material, while the others are made of non-local and exotic lithics (Table 30).

The test of hypothesis 4 includes a comparative analysis of artifacts made of Mill Creek chert to other lithic artifacts from the South Cape site for H1 and H3 (Tables 25-27). The study sample contains only 23 specimens made of Mill Creek chert. When Mill Creek is classified as a supra-local source, the results are not statistically significant, however, both H1 and H3 show high percentages of local lithic raw material (93.83 and 95.77%). When Mill Creek is distinguished from other supra-local specimens and then removed from other supra-local lithic raw material the results are significant meaning that the Mill Creek chert specimens have a statistically significant influence on the supra-local lithic raw material sample.

Inter-Household Variation In Production Practices. Inter-household variation in production practices should be indicated by significant differences in the following variables: core mean size (length, weight) (Table 23); debitage heat alteration (chi square, altered versus non altered) (Table 31); debitage reduction technique type (Bipolar versus non-bipolar) (Tables 32-34); and debitage reduction stage (debitage platform type, deb cortex presence/absence, debitage mean size, debitage dorsal scar count/surface area, debitage platform thickness/flakeweight) (Tables 23-24).

There is a significant difference between H1 and H3 in core mean size and flake mean size. On average, cores and complete flakes from H3 are shorter and weigh less than those from H1. In terms of debitage heat alteration, the percentage of heat altered debitage in the H3 (76.52%) sample is slightly lower than the H1 sample (83.15%) (Table 35). Furthermore, according to chi-square analysis; the proportion of debitage that shows evidence of heat alteration is greater for H3 than H1, ($p=0.0301$). In terms of debitage reduction technique type, both samples for H1 and H3 have higher percentages of non-

bipolar flakes than bipolar flakes with 97.69% and 98.18% respectively (Table 36). Debitage in H3 has a significantly higher mean ratio of debitage platform thickness/flake weight and a significantly higher mean number of dorsal scars to dorsal surface area (Table 23). Moreover, of all the technological variables analyzed, platform type was the only one with statistically significant results (Table 24); House 3 showcases a higher percentage of simple platforms than House 1, which is an indicator of more early stage reduction. Even though the majority of the statistical analyses were not statistically significant, future analysis with a larger artifact sample could possible show that all stages of reduction occurred in both houses.

Inter-Household Variation In Flaked Stone Tool Consumption Patterns. Inter-household variation in flaked stone tool consumption patterns should be indicated by significant differences between H1 and H3 in in flaked stone tool morphofunctional types, tool formality, and tool exhaustion. In terms of tool morphofunctional types, both H1 and H3 yielded only projectile points. This suggests that projectile points were the most common formal chipped stone tool type typically used at the household level at this site. In terms of tool formality, all of the tools from both H1 and H3 are bifacially flaked. Both H1 and H3 showcase 60% invasively flaked tools vs. 40 % marginally flaked tools (Table 24).

In terms of differences in tool exhaustion, the H3 sample has a higher percentage of complete tools than H1 sample. Among complete tools those from H3 have a greater average length and weight than complete tools in H1, although the differences are small. These data do not provide clear evidence of any differences in tool exhaustion. H3 used less exhaustively and H1 used theirs exhaustively.

Table 4: Counts of Artifact Morphofunctional Types within Local and Supralocal Raw Material Types[a]

Raw Material Type	Core	Debitage	Tool	Total
Local	45	1336	18	1399
Supra-local	2	62	3	67

- Warning: 20% of cells have expected count less than 5, ChiSquare suspect.

[a]Not Significant

Table 5: Percentages of Artifact Morphofunctional Types within Local and Supralocal Raw Material Types

Raw Material Type	Core	Debitage	Tool	Total
Local	3.22	95.50	1.29	100.01
Supra-local	2.99	92.54	4.48	100.01

Table 6: Counts of Artifact Morphofunctional Type within Specific Local and Supralocal Raw Material Types (Statistical Analysis: $x^2 = 87.2$, $p < .0001$)

Raw Material Specific	Source Location	Core	Debitage	Tool	Total
Bailey Chert	Local	40	1375	14	1429
Basalt	Supra-Local (Non-Local)	0	4	0	4
Burlington Chert	Supra-Local (Exotic)	1	9	1	11
Dover Chert	Supra-Local (Exotic)	0	5	0	5
Jefferson City Chert	Supra-Local (Non-Local)	1	2	0	3
Jefferson City Quartzite	Supra-Local (Non-Local)	0	1	0	1
Kaolin Chert	Supra-Local (Non-Local)	0	16	0	16
Lafayette Chert	Local	5	22	4	31
Lafayette Quartzite	Local	0	1	0	1
McNairy Chert Breccia	Supra-Local (Non-Local)	0	1	0	1
Mill Creek Chert	Supra-Local (Non-Local)	0	22	1	23
Mill Creek/Kaolin Chert	Supra-Local (Non-Local)	0	1	0	1
Plattin Chert	Supra-Local (Non-Local	0	1	0	1
Rubidoux Quartzite	Supra-Local (Non-Local)	0	3	1	4
St. Louis Chert (Cobden-Variety)	Supra-Local (Non-Local)	0	3	0	3
Total	N/A	47	1466	21	1534

Table 7: Percentages of Artifact Morphofunctional Type within Specific Local and Supralocal Raw Material Types

Raw Material Specific	Source Location	Core	Debitage	Tool
Bailey Chert	Local	2.80	96.22	0.98
Basalt	Supra-Local (Non-Local)	0.00	100.00	0.00
Burlington Chert	Supra-Local (Exotic)	9.09	81.82	9.09
Dover Chert	Supra-Local (Exotic)	0.00	100.00	0.00
Jefferson City Chert	Supra-Local (Non-Local)	33.33	66.67	0.00
Jefferson City Quartzite	Supra-Local (Non-Local)	0.00	100.00	0.00
Kaolin Chert	Supra-Local (Non-Local)	0.00	100.00	0.00
Lafayette Chert	Local	16.13	70.97	12.90
Lafayette Quartzite	Local	0.00	100.00	0.00
McNairy Chert Breccia	Supra-Local (Non-Local)	0.00	100.00	0.00
Mill Creek Chert	Supra-Local (Non-Local)	0.00	95.65	4.35
Mill Creek/Kaolin Chert	Supra-Local (Non-Local)	0.00	100.00	0.00
Plattin Chert	Supra-Local (Non-Local	0.00	100.00	0.00
Rubidoux Quartzite	Supra-Local (Non-Local)	0.00	75.00	25.00
St. Louis Chert (Cobden-Variety)	Supra-Local (Non-Local)	0.00	100.00	0.00

Table 8: Counts of Artifact Morphofunctional Type within Specific Local Raw Material Types (Statistical Analysis: $x^2 = 54.6$, $p < .0001$)

Raw Material Type	Core	Debitage	Tool	Total
Bailey Chert	40	1375	14	1429
Lafayette Chert	5	22	4	31
Lafayette Quartzite	0	1	0	1
Total	45	1398	18	1461

- Warning: 20% of cells have expected count less than 5, ChiSquare suspect.

Table 9: Percentages of Artifact Morphofunctional Types within Specific Local Raw Material Types

Raw Material Specific	Core	Debitage	Tool	Total
Bailey Chert	2.80	96.22	0.98	100.00
Lafayette Chert	16.13	70.97	12.90	100.00
Lafayette Quartzite	0.00	100.00	0.00	100.00
Total	3.08	95.69	1.23	100.00

Table 10: Counts of Artifact Morphofunctional Types within Specific Supralocal Raw Material Types (Statistical Analysis: NS[a,b])

Raw Material Specific	Core	Debitage	Tool	Total
Basalt	0	4	0	4
Burlington Chert	1	9	1	11
Dover Chert	0	5	0	5
Jefferson City Chert	1[+] (p=0.07)	2	0	3
Jefferson City Quartzite	0	1	0	1
Kaolin Chert	0	16	0	16
McNairy Chert Breccia	0	1	0	1
Mill Creek Chert	0	22	1	23
Mill Creek/Kaolin Chert	0	1	0	1
Plattin Chert	0	1	0	1
Roubidoux Quartzite	0	3	1	4
St. Louis Chert (Cobden Variety)	0	3	0	3
Total	2	68	3	73

[a] NS: Not significant
[b]ACTUS, an alternative contingency table analysis, was carried out due to low cell counts, which make a conventional chi-squared analysis inapplicable.
[+] Significantly High Value

Table 11: Percentages of Artifact Morphofunctional Types within Specific Supralocal Raw Material Types

Raw Material Specific	Core	Debitage	Tool	Total
Basalt	0.00	100.00	0.00	100.00
Burlington Chert	9.09	81.82	9.09	100.00
Dover Chert	0.00	100.00	0.00	100.00
Jefferson City Chert	33.33	66.67	0.00	100.00
Jefferson City Quartzite	0.00	100.00	0.00	100.00
Kaolin Chert	0.00	100.00	0.00	100.00
McNairy Chert Breccia	0.00	100.00	0.00	100.00
Mill Creek Chert	0.00	95.65	4.35	100.00
Mill Creek/Kaolin Chert	0.00	100.00	0.00	100.00
Plattin Chert	0.00	100.00	0.00	100.00
Roubidoux Quartzite	0.00	75.00	25.00	100.00
St. Louis Chert (Cobden Variety)	0.00	100.00	0.00	100.00
Total	2.74	93.15	4.11	100.00

Table 12: Counts of Artifact Morphofunctional Types within Local and Supralocal Raw Material Types (Statistical Analysis[a] : NS[a])

Raw Material Type	Cores	Debitage	Tools	Total
Local	45	1398	18	1461
Supralocal	2	68	3	73

[a] Not Significant
*Warning: 20% of cells have expected counts less than 5, ChiSquare suspect. Therefore this statistic is unreliable.

Table 13: Percentages of Artifact Morpohofunctional Types with Local and Supralocal Raw Material Types

Raw Material Type	Cores	Debitage	Tools	Total
Local	3.08	95.69	1.23	100.00
Supralocal	2.74	93.15	4.11	100.00

Table 14: Counts of Artifact Morphofunctional Types within Local, Nonlocal, and Exotic Raw Material Types (Statistical Analysis[a]: NS[a])

Raw Material Type	Cores	Debitage	Tools	Total
Local	45	1398	18	1461
Supralocal: Nonlocal	1	54	2	58
Supralocal: Exotic	1	14	1	16
Total	47	1466	21	1535

[a] Not Signficant
*Warning: 20% of cells have expected counts less than 5, ChiSquare suspect. Therefore this statistic is unreliable.

Table 15: Percentages of Artifact Morphofunctional Types within Local, Nonlocal, and Exotic Raw Material Types

Raw Material Type	Cores	Debitage	Tools	Total
Local	3.08	95.69	1.23	100.00
Supralocal: Nonlocal	1.75	94.74	3.51	100.00
Supralocal: Exotic	6.25	87.50	6.25	100.00

Table 16: Percentages of within Local, Nonlocal, and Exotic Raw Material Types within Morphofunctional Types

Raw Material Type	Cores	Debitage	Tools
Local	95.74	95.36	85.71
Supralocal: Nonlocal	2.13	3.68	9.52
Supralocal: Exotic	2.13	0.96	4.76
Total	100	100	100

Table 17: Relationship between Artifact Technological Variables and Raw Material Source Area, Where Mill Creek Chert is Classified as a Supra-Local Lithic Raw Material.

General Artifact Class	Technological Variable 1	Technological Variable 2	Local N *(%)*	Supra-local[c] N *(%)*	Statistical Analysis[a]
Tool	Flaking	Invasive	10 *(58.82)*	2 *(66.67)*	NS[b]
		Marginal	7 *(41.18)*	1 *(33.33)*	
		TOTAL	17 (100)	3 (100)	
		Bifacial	17 (100)	3 *(100)*	NS[b]
		Unifacial	0 *(0)*	0 *(0)*	
		TOTAL	17 *(100)*	3 *(100)*	
Tool	Cortex (Presence or Absence)	Present	1 *(5.88)*	0 *(0)*	NS[b]
		Not Present	16 *(94.12)*	3 *(100)*	
		TOTAL	17 *(100)*	3 *(100)*	
Debitage	Cortex (Presence or Absence)	Present	219 *(22.26)*	18 *(32.73)*	NS[a]
		Not Present	765 *(77.74)*	37 *(67.27)*	
		TOTAL	984 *(100)*	55 *(100)*	
Debitage	Platform Type	Multi-faceted	111 *(22.20)*	11 *(36.67)*	NS[a]
		Single-faceted & Cortical	389 *(77.80)*	19 *(63.33)*	
		TOTAL	500 *(100)*	30 *(100)*	

[a] NS: Not significant
[b]ACTUS, an alternative contingency table analysis, was carried out due to low cell counts, which make a conventional chi-squared analysis inapplicable.
[c] Supra-local chert artifact sample includes artifacts made of Mill Creek chert

Table 18: Relationship between Artifact Technological Variables and Raw Material Source Area, Where Mill Creek Chert is Distinguished from Other Supra-Local Lithic Raw Material.

General Artifact Class	Technological Variable 1	Technological Variable 2	Local N *(%)*	Supra-local N *(%)*	Mill Creek N *(%)*	Statistical Analysis [a]
Tool	Flaking	Invasive	10 *(58.82)*	1 *(50.00)*	1 *(100)*	NS[b]
		Marginal	7 *(41.18)*	1 *(50.00)*	0 *(0)*	
		TOTAL	17 *(100)*	2 *(100)*	1 *(100)*	
		Bifacial	17 *(100)*	2 *(100)*	1 *(100)*	NS[b]
		Unifacial	0 *(0)*	0 *(0)*	0 *(0)*	
		TOTAL	17 *(100)*	2 *(100)*	1 *(100)*	
Tool	Cortex (Presence or Absence)	Present	1 *(5.88)*	0 *(0)*	0 *(0)*	NS[b]
		Not Present	16 *(94.12)*	2 *(100)*	1 *(100)*	
		TOTAL	17 *(100)*	2 *(100)*	1 *(100)*	
Debitage	Cortex (Presence or Absence)	Present	219 *(22.26)*	11 *(30.56)*	7 *(38.89)*	NS[a]
		Not Present	765 *(77.74)*	25 *(69.44)*	11 *(61.11)*	
		TOTAL	984 *(100)*	36 *(100)*	18 *(100)*	
Debitage	Platform Type	Multi-faceted	112 *(22.40)*	7 *(29.17)*	3 *(60.00)*	NS[a]
		Single-faceted & Cortical	388 *(77.60)*	17 *(70.83)*	2 *(40.00)*	
		TOTAL	500 *(100)*	24 *(100)*	5 *(100)*	

[a]NS: Not significant
[b]ACTUS, an alternative contingency table analysis, was carried out due to low cell counts, which make a conventional chi-squared analysis inapplicable.

Table 19: Relationship between Artifact Technological Variables and Raw Material Source Area, Where Mill Creek Chert is excluded from the Analysis.

General Artifact Class	Technological Variable		Local N *(%)*	Supra-local N *(%)*	Statistical Analysis [a]
Tool	Flaking	Invasive	10 *(58.82)*	1 *(50.00)*	NS[b]
		Marginal	7 *(41.18)*	1 *(50.00)*	
		TOTAL	17 *(100)*	2 *(100)*	
		Bifacial	17 *(100)*	2 *(100)*	NS[b]
		Unifacial	0 *(0)*	0 *(0)*	
		TOTAL	17 *(100)*	2 *(100)*	
Tool	Cortex (Presence or Absence)	Present	1 *(5.88)*	0 *(0)*	NS[b]
		Not Present	16 *(94.12)*	2 *(100)*	
		TOTAL	17 *(100)*	2 *(100)*	
Debitage	Cortex (Presence or Absence)	Present	219 *(22.26)*	10 *(28.57)*	NS[a]
		Not Present	765 *(77.74)*	25 (*71.43)*	
		TOTAL	984 *(100)*	35 *(100)*	
Debitage	Platform Type	Multi-faceted	111 *(22.20)*	7 *(29.17)*	NS[a]
		Single-faceted & Cortical	389 *(77.80)*	17 *(70.83)*	
		TOTAL	500 *(100)*	24 *(100)*	

[a] NS: Not significant

[b]ACTUS, an alternative contingency table analysis, was carried out due to low cell counts, which make a conventional chi-squared analysis inapplicable.

Table 20: Relationship between Artifact Mean Size Variables and Raw Material Source Area, Where Mill Creek Chert is Classified as a Supra-Local Lithic Raw Material.

General Artifact Class	Technological Variable	Local N *(Mean)*	Supra-local N *(Mean)*	Statistical Analysis[a]
PPK	Mean Length (mm)	16 (25.37*)*	3 *(26.63)*	$Z=1.96$ $p< 0.05$[b]
	Mean Weight (g)	18 (*1.64)*	3 *(1.50)*	NS[abc]
Core	Mean Length (mm)	45 *(37.51)*	2 *(41.80)*	NS[abc]
	Mean Weight (g)	45 *(27.64)*	2 *(20.80)*	NS[abc]
Debitage (Complete Flakes)	Mean Length (mm)	595 *(19.01)*	34 *(20.24)*	NS[abc]
	Mean Weight (g)	595 *(1.35)*	34 *(2.16)*	NS[abc]
Debitage (Complete Flakes)	Platform Thickness/Weight	519 *(18.12)*	29 *(23.77)*	NS[abc]
Debitage (Complete Flakes)	Number of Dorsal Scars to Dorsal Surface Ratio (mm^2)	583 *(0.01)*	33 *(0.01)*	NS[abc]

[a] NS: Not Significant
[b] Wilcoxon Rank Sum Test
[c] T-Test

Table 21: Relationship between Artifact Mean Size Variables and Raw Material Source Area, Where Mill Creek Chert is distinguished from Other Non-Local Raw Material (there were no Mill-Creek Cores).

General Artifact Class	Technological Variable	Local N *(Mean)*	Supra-local N *(Mean)*	Mill Creek N *(Mean)*	Statistical Analysis[a]
PPK	Length (mm)	16 *(25.37)*	2 *(27.15)*	1 *(25.60)*	NS[ab]
	Weight (g)	18 (*1.64)*	2 (1.80*)*	1 *(0.80)*	NS[ab]
Debitage (Complete Flakes)	Length (mm)	595 *(19.00)*	26 *(22.10)*[d]	7 *(13.31)*[d]	F= 3.6 $p < .03$[b]
	Weight (g)	595 *(1.35)*[f]	26 *(2.61)*[ef]	7 *(0.51)*[e]	F= 4.3 $p < .02$[b]
Debitage (Complete Flakes)	Platform Thickness/Weight	519[c] *(18.12)*	24[c] *(15.08)*	5[c] *(65.50)*[e]	F= 21.1 $p<.001$[b]
Debitage (Complete Flakes)	Number of Dorsal Scars to Dorsal Surface Ratio (mm^2)	583[c] *(0.01)*[h]	26 *(0.01)*[g]	7 *(0.01)*[gh]	NS[ab]

[a] NS: Not Significant

[b] Wilcoxon Rank Sum Test (or Kruskall Wallace test)

[c] These debitage values differ from the total number of debitage complete flakes due to null values listed for the technological variable for each chert type

[d] Ordered Differences Report shows that the difference is significant between supra-local and Mill Creek with a p=0.0304

[e] Ordered Differences Report shows that the difference is significant between supra-local and Mill creek with p=0.0315

[f] Ordered Differences Report shows that the difference is significant between supra-local and local with p=0.0061

[g] Ordered Differences Report shows that the difference is significant between supra-local and Mill Creek with p<0.001

[h] Ordered Differences Report shows that the difference is significant between Mill Creek and local with p<0.001

Table 22: Relationship between Artifact Mean Size Variables and Raw Material Source Area, Where Mill Creek Chert is Excluded from the Analysis (were no Mill Creek Cores).

General Artifact Class	Technological Variable	Local N *(Mean)*	Supra-local N *(Mean)*	Statistical Analysis [a]
PPK	Length (mm)	16 *(25.37)*	2 *(27.15)*	NS[abc]
	Weight (g)	18 *(1.64)*	2 *(1.80)*	NS[abc]
Debitage (Complete Flakes)	Length (mm)	595 *(19.00)*	26 *(22.10)*	T= 1.9 $p < 0.03$[c]
	Weight (g)	595 *(1.35)*	26 *(2.61)*	T= 2.7 $p<0.01$[c]
Debitage (Complete Flakes)	Platform Thickness/Weight	519[d] *(18.12)*	24[d] *(15.08)*	NS[abc]
Debitage (Complete Flakes)	Number of Dorsal Scars to Dorsal Surface Ratio (mm^2)	583[d] *(0.01)*	26 *(0.01)*	NS[abc]

[a] NS: Not Significant
[b] Wilcoxon Rank Sum
[c] T-Test
[d] These debitage values differ from the total number of debitage complete flakes due to null values listed for each technological variable for each chert type

Table 23: Inter-House Variation in Artifact Mean Size Values

General Artifact Class	Technological Variable	House 1 N *(Mean)*	House 3 N *(Mean)*	Statistical Analysis[a]
PPK	Length (mm)	2 *(23.00)*	15 *(24.35)*	NS[a]
	Weight (g)	4 *(1.47)*	15 *(1.26)*	NS[a]
Core	Length (mm)	7 *(60.41)*	40 *(33.72)*	Z= 3.0 $p < 0.0027$[b]
	Weight (g)	7 *(98.02)*	40 *(14.98)*	Z= 3.7 $p < .0002$[b]
Debitage (Complete Flakes)	Length (mm)	179 *(22.56)*	451 *(17.67)*	T= 7.1 $p < 0.0001$[c]
	Weight (g)	179 *(2.07)*	451 *(1.12)*	T= 4.8 $p < 0.0001$[c]
Debitage (Complete Flakes)	Platform Thickness/Weight	158[d] *(12.58)*	392[d] *(20.77)*	T= 5.2 $p < 0.0001$[c]
Debitage (Complete Flakes)	Number of Dorsal Scars to Dorsal Surface Ratio (mm^2)	172[d] *(0.008)*	446[d] *(0.013)*	T= 5.4 $p < 0.0001$[c]

[a] NS: Not Significant
[b] Wilcoxon Sum Test
[c] T-Test
[d] These debitage values differ from the total number of debitage complete flakes due to null values listed for the technological variable

Table 24: Inter-House Variation in Artifact Technological Variables

General Artifact Class	Technological Variable 1	Technological Variable 2	House 1 N *(%)*	House 3 N *(%)*	Statistical Comparison[a]
Tool	Flaking	Invasive	3 *(60.0)*	9 *(60.0)*	NS[b]
		Marginal	2 *(40.0)*	6 *(40.0)*	
		TOTAL	5 *(100)*	15 *(100)*	
		Bifacial	6 *(100)*	15 *(100)*	NS[b]
		Unifacial	0 *(0)*	0 *(0)*	
		TOTAL	6 *(100)*	15 *(100)*	
Tool	Cortex (Presence or Absence)	Present	0 *(0.0)*	1 *(6.67)*	NS[b]
		Not Present	6 *(100.0)*	14 *(93.3)*	
		TOTAL	6 *(100.0)*	15 *(100.0)*	
Debitage	Cortex (Presence or Absence)	Present	33 *(18.44)*	111 *(24.61)*	NS[a]
		Not Present	146 *(81.56)*	340 *(75.39)*	
		TOTAL	179 *(100.0)*	451*(100.0)*	
Debitage	Platform Type	Multi-faceted	55 *(37.67)*	68 *(17.89)*	$x^2 = 23.03$ $p<0.001$
		Single Faceted &Cortical	91 *(62.33)*	312 *(82.11)*	
		TOTAL	146 *(100.0)*	380 *(100.0)*	

[a] NS: Not Significant
[b]ACTUS, an alternative contingency table analysis, was carried out due to low cell counts, which make a conventional chi-squared analysis inapplicable.

Table 25: Inter-House Variation, is Classified as a Supra-Local Lithic Raw Material (Statistical Analysis: NS[a])

Source Location	House Feature 1	House Feature 3
	N *(%)*	N *(%)*
Local	289 *(93.83)*	1109 *(95.77)*
Supra-Local	19 *(6.17)*	49 *(4.23)*
Total	308 *(100)*	1158 *(100)*

[a] NS: Not Significant
[b] Wilcoxon Sum Test

Table 26: Inter-House Variation, Where Mill Creek Chert is distinguished from Other Supra-Local Lithics.(Statistical Analysis: x^2= 11.3, p<. 004)

Source Location	House Feature 1	House Feature 3
	N *(%)*	N *(%)*
Local	289 *(94.14)*	1109 *(95.77)*
Supra-Local	17 *(5.54)*	28 *(2.42)*
Mill Creek	1 *(0.33)*	21 *(1.81)*
Total	307 *(100.01)*	1158 *(100)*

Table 27: Inter-House Variation, Where Mill Creek Chert is excluded from the Analysis (Statistical Analsysis: $x^2= 7.6$, p<. 006)

Source Location	House Feature 1 N *(%)*	House Feature 3 N (%)
Local	289 *(94.44)*	1109 *(97.54)*
Supra-Local	17 *(5.56)*	28 *(2.46)*
Total	306 *(100)*	1137 *(100)*

Table 28: Inter-House Variation in Cores by Selected Raw Material Type (Statistical Analysis[a]: $x^2= 18.8$, p<001[b])

Raw Material Type	House Feature 1 N *(%)*	House Feature 3 N (%)
Bailey Chert (Local)	3 *(42.86)*	37 *(92.50)*
Burlington Chert (Exotic)	0 *(0)*	1 *(02.50)*
Jefferson City Chert (Nonlocal)	0 *(0)*	1 *(02.50)*
Lafayette Chert (Local)	4 *(57.14)*+	1 *(02.50)*-
Total	7 *(100.00)*	40 *(100)*

- Warning: 20% of cells have expected count less than 5, ChiSquare suspect.

[a]ACTUS, an alternative contingency table analysis, was carried out due to low cell counts, which make a conventional chi-squared analysis inapplicable.
[b]Whole table significance, based on ACTUS
+ Significantly high value
- Significantly low value

Table 29: Inter-House Variation in Debitage by Specific Raw Material Type (Statistical Analysis: x2=49.56, p<0.001)

Raw Material Type	House Feature 1 N *(%)*	House Feature 3 N (%)
Bailey Chert	191 *(88.84)*	780 *(94.66)*
Basalt	0 *(0)*	2 *(0.24)*
Burlington Chert (exotic)	4 *(1.86)*	2 *(0.24)*
Dover Chert (exotic)	0 *(0)*	5 *(0.61)*
Jefferson City Chert	1 *(0.47)*	1 *(0.12)*
Jefferson City Quartzite	1 *(0.47)*	0 *(0)*
Kaolin Chert	5 *(2.34)*	11 *(1.33)*
Lafayette Chert	8 *(3.72)*	4 *(0.49)*
Lafayette Quartzite	0 *(0)*	1 *(0.12)*
McNairy Chert Breccia	1 *(0.47)*	0 *(0)*
Mill Creek Chert	1 *(0.47)*	17 *(2.06)*
Mill Creek/Kaolin Chert	1 *(0.47)*	0 *(0)*
Rubidoux Quartzite	0 *(0)*	1 *(0.12)*
St. Louis Chert (Cobden Variety)	2 *(0.93)*	0 *(0)*
Total	215 *(100.04)*	824 *(100.04)*

- Warning: 20% of cells have expected count less than 5, ChiSquare suspect

Table 30: Inter-House Variation in Tools by Specific Raw Material Type (Statistical Analysis[a]: NS[ab])

Raw Material Type	House Feature 1 N *(%)*	House Feature 3 N (%)
Bailey Chert	5 *(83.33)*	9 *(60.00)*
Burlington Chert	0 *(0)*	1 *(6.67)*
Lafayette Chert	1 *(16.67)*	3 *(20.00)*
Mill Creek Chert	0 *(0)*	1 *(6.67)*
Roubidoux Quartzite	0 *(0)*	1 *(6.67)*
Total	6 *(100)*	15 *(100.01)*

[a] Not Significant
[b] ACTUS, an alternative contingency table analysis, was carried out due to low cell counts, which make a conventional chi-squared analysis inapplicable.

Table 31:Inter-House Variation in Artifacts with/without evidence of Heat Alteration (Statistical Analysis: x^2=6.08, p = 0.0137)

House Feature Association	No N *(%)*	Yes N *(%)*
1	166 *(18.82)*	33 *(12.31)*
3	716 *(81.18)*	235 *(87.69)*
Total	882 *(100)*	268*(100)*

Warning: 20% of cells have expected count less than 5, ChiSquare suspect

Table 32: Inter-House Variation in Artifact Completeness 1(Statistical Analysis: x^2= 96.87, p<0.001)

House Feature	Angular Shatter Debitage N *(%)*	Broken Tools and Debitage N *(%)*	Bipolar Flake Complete Debitage N *(%)*	Complete Debitage and Tools N *(%)*	Flake Fragment Debitage N *(%)*	Hoe Flake Complete Debitage N *(%)*
1	86 *(19.68)*	38 *(7.60)*	5 *(18.52)*	200 *(27.82)*	5 *(100)*	0 *(0)*
3	351 *(80.32)*	462 *(92.40)*	22 *(81.48)*	519 *(72.18)*	0 *(0)*	2 *(100)*
Total	437 *(100)*	500 *(100)*	27 *(100)*	719 *(100)*	5 *(100)*	2 *(100)*

- Warning: 20% of cells have expected count less than 5, ChiSquare suspect

Table 33: Inter-House Variation in Artifact Completeness 2 (Statistical Analysis: x^2= 94.76, p<0.001)

House Feature Association	Angular Shatter (Debitage) N *(%)*	Broken (Tools and Debitage) N *(%)*	Complete (Debitage and Tools) N *(%)*	Complete Flakes (Bipolar and Hoe) N *(%)*
1	86 *(19.68)*	38 *(7.58)*	205 *(27.41)*	5 *(100)*
3	351 *(80.32)*	463 *(92.42)*	543 *(72.59)*	0 *(0)*
Total	437 *(100)*	501 *(100)*	748 *(100)*	5 *(100)*

- Warning: 20% of cells have expected count less than 5, ChiSquare suspect

Table 34: Inter-House Variation in Artifact Completeness 3 (Statistical Analysis: x^2= 56.70, p<0.001)

House Feature Association	Complete (Tools and Debitage) N *(%)*	Not Complete (Tools and Debitage) N *(%)*
1	210 *(27.89)*	124 *(13.22)*
3	543 *(72.11)*	814 *(86.78)*
Total	753 *(100)*	938 *(100)*

Table 35: Inter-House Variation in Heat Alteration of Debitage (Statistical Analysis: x^2= 3.98, p<0.0301[a])

House Feature Association	Not Heat Altered N *(%)*	Heat Altered *N (%)*	Total N *(%)*
1	153 *(83.15)*	31 *(16.85)*	184 *(100)*
3	593 *(76.52)*	182 *(23.48)*	775 *(100)*

[a] Fisher's Exact Test

Table 36: Inter- House Variation in Bipolar vs. Non-bipolar Debitage (Statistical Analysis : NS[a])

House Feature Association	Bipolar N *(%)*	Non-bipolar N *(%)*	Total N *(%)*
1	7 *(2.31)*	296 *(97.69)*	303 *(100)*
3	20 *(1.82)*	1077 *(98.18)*	1097 *(100)*

[a] Not Significant

Table 37: Inter-House Variation in Broken Vs. Complete Tools (Statistical Analysis: NS[a])

House Feature Association	Broken N *(%)*	Complete *N (%)*	Total N *(%)*
1	3 *(75.00)*	1 *(25.00)*	4*(100)*
3	7 *(50.00)*	7 *(50.00)*	14 *(100)*

[a] Not Significant

CHAPTER 5. CONCLUSIONS

Summary of Results

In this study, I set out to address three issues in Mississippian archaeology. The first issue of concern is the continued bias towards large, mound bearing sites, which leads to a lack of attention to rural hinterland sites. A second issue is the lack of rigorous, household-level lithic analysis, especially at non-mound hinterland sites. A final issue is the need for additional research on the South Cape site, a non-mound hinterland site in southeast Missouri. I addressed these issues by developing four hypotheses concerning flaked stone tool production and consumption at South Cape. These hypotheses are derived from general assumptions in Mississippian archaeology and lithic technological theory, and specific inferences generated in previous studies of the South Cape site. I tested these hypotheses through an archaeological analysis of flaked stone artifacts from two house features at the site. In total, I analyzed 1,867 artifacts, most of which are made of chert.

Hypothesis 1 asserts that South Cape residents regularly acquired and consumed both local and supra-local lithic raw material at the site. However, they habitually acquired and consumed higher quantities of local lithic raw material, relative to quantities of supra-local lithic raw material, at the site. My analysis of artifact source location data supports this hypothesis, indicating South Cape residents regularly acquired and consumed both local and supra-local lithic raw material. However, residents regularly acquired and consumed higher quantities of local lithic raw material than of supra-local

lithic raw material. This trend is apparent among artifacts in all morphofunctional classes (tools, cores, and debitage), indicating that all phases in the flaked stone reduction involved the reduction of primarily local (versus supra-local) lithic raw material.

Hypothesis 2 asserts that South Cape residents used local raw material relatively expediently. In contrast, they used supra-local lithic raw material less expediently (i.e., in a more curated manner). Among supra-local lithic raw materials, Mill Creek chert had a unique reduction trajectory, related to its importance in Mississippian hoe technology. The tool analysis carried out to test Hypothesis 2 yielded inconclusive results, neither supporting nor disproving the hypothesis. For tools, none of the observed variation between specimens of local stone and those of supra-local stone was statistically significant. This outcome could indicate that there is no meaningful difference between these groups of tools with respect to reduction expedience. Alternatively, this outcome may represent sampling biases; the tool sample, especially the supra-local tool sample, is quite small and may not adequately represent supra-local flaked stone tools at the site as a whole.

Likewise, the debitage analysis carried out to test Hypothesis 2 did not reveal significant differences between local and supra-local specimens with respect to reduction expedience. Moreover, the results do not uniformly show the trends we would expect if local lithic raw material was used expediently, while supra-local lithic raw material was used in a more curated fashion. For example, the debitage made of supra-local lithic raw material is on average larger than that made of local lithic raw material. In the study sample, compared to debitage of local lithic raw material, debitage made of supra-local lithic raw material has a higher percentage of specimens with multifaceted platforms, as

expected, but also higher mean size values and a higher percentage of cortical specimens. How do we explain these seemingly contradictory trends? One consideration, given the lack of statistical significance, is that there may not have been meaningful differences between local and supra-local lithic raw material reduction expedience. Another possibility is that debitage at the site does fit expectations, but my debitage sample is too small to show the differences between local and supra-local debitage. A third possibility is that my sample of debitage does accurately reflect trends at the site, and that these trends relate to differences between local and supra-local raw material size and form. For example, Mill Creek chert is a supra-local chert that naturally occurs in large, thin, tabular slabs; these are essentially natural preforms that need only decortification for reduction into hoes. Such differences would explain the larger mean size and higher percentage of cortical specimens, yet lower percentage of specimens with simple platforms and other indicators of expedience, among debitage made of supra-local (vs. local) stone. An even larger debitage sample, and a finer grained recover technique (using 1/8 inch screens), could indicate which, if any, of these explanations is accurate.

Hypothesis 3 asserts flaked stone tool production regularly occurred at the household level. In other words, flaked stone tool production was a common component of household production at the site, generating the expectation that both the House 1 and House 3 samples will contain remains of early through late stage reduction. The results meet this expectation; both house feature samples contain remains of early through late stage reduction activity, suggesting that in both House 1 and House 3, household members regularly made flaked stone tools. While this outcome does not offer conclusive evidence of wider patterns at the site, it leaves open the possibility that all South Cape

households included members that habitually not only used flaked stone tools, but also made and maintained those tools.

Hypothesis 4 asserts that the households associated with House 1 and House 3 held different positions within the local and supra-local socioeconomic systems, resulting in different flaked stone raw material acquisition, reduction, and consumption patterns. The comparison of the House 1 and House 3 samples yields some support for this proposition. The samples contain approximately equal percentages of artifacts made of local versus supra-local lithic raw material. However, when we consider only cores, only debitage, or only tools, we find that H3 has higher proportions of supra-local specimens and lower proportions of local specimens, compared to the H1 sample. When we examine only Mill Creek chert, we find that the H3 sample has a significantly higher proportion of Mill Creek chert artifacts, compared to the H1 sample. When we entirely remove Mill Creek artifacts from the analysis, then the H1 sample shows a significantly high proportion of supra-local (versus local) artifacts, compared to H1. These results point to inter-household differences in lithic raw material acquisition and reduction strategies, but not necessarily tool consumption patterns. The results suggest that Household 3 acquired and reduced higher proportions of supra-local lithic raw material, primarily Mill Creek chert, compared to Household 1. However, the tool raw material type analysis indicates that either both households ultimately had similar proportions of local versus supra-local tools, or the tool sample is biased with respect to raw material type proportions.

The inter-house comparison also suggests that on average, compared to House feature 1, House feature 3 contains smaller cores, smaller flakes, a higher percentage of heat altered (versus non-altered) debitage, and a higher percentage of flakes with simple

(versus complex) platforms. Moreover, in both house feature samples, the only identified formal tools are projectile points and these appear to have been used fairly exhaustively. These observations may indicate that compared to Household 1, Household 3 tended to engage in relatively late-stage reduction activity. The findings might also indicate that PPKs were the most common formal tool type used at the household level at South Cape.

In sum, residents at South Cape regularly acquired and consumed higher quantities of local lithic raw material than of supra-local lithic raw material. However, it is not clear that there were differences between local and supra-local stone with respect to reduction expedience. It appears that in both households, flaked stone reduction was a habitual component of the economy, but evidence of differing tool stone acquisition strategies suggests variation between the households in their roles in local and supra-local socioeconomic systems. Finally, the results may indicate that projectile points were the most common type of formal tool used at the household level.

Discussion

This thesis addresses many of the same issues discussed in other Mississippian studies. Unlike most other studies, this one looks at these issues from the perspective of a hinterland site, without focusing on the links between that site and one or more large mound centers. A discussion of the results shows how this hinterland-centered approach can produce meaningful contributions to Mississippian archaeology.

Numerous Mississippian studies explore flaked stone technology with an emphasis on exchange of lithics between sites. In particular, these studies are concerned with the distribution of tool stone from large mound centers, like Cahokia, to smaller

settlements. In contrast, by detailing the South Cape flaked stone technological system, my analysis directs attention to hinterland communities not simply as passive consumers of imported tool stone, nor as suppliers of stone to more central sites, but rather as active producers and active consumers of their own flaked stone tools. The Hypothesis 1 and 2 test results show that even though South Cape residents obtained some supra-local lithic raw material, they used mainly local stone for tool production activities within the settlement. Furthermore, the residents of South Cape made most of their flaked stone tools, from the earliest through the latest stages of the reduction trajectory.

South Cape is located in close proximity to rich chipped-stone raw material resources, and my analysis shows that these nearby deposits were the main source of lithic raw material used by South Cape residents. On the whole, then, South Cape residents did not have an urgent technological need to import supra-local lithic raw material. Therefore, the importation of supra-local stone almost certainly occurred in the context of broader sociopolitical relationships. This inference is supported by the fact that most of the supra-local lithic raw material in my sample is from non-local (versus exotic) sources; this observation suggests South Cape inhabitants generally obtained these resources from kin and other close allies. It also suggests that South Cape residents sometimes acquired non-local lithics by traveling directly to the sources, rather than just getting these supra-local lithics through down-the-line exchange.

Mississippian flaked stone studies centered on residential sites generally focus on inter-community variation, and inter-household variation within large mound centers such as Cahokia. My research contributes to the smaller body of work examining households and inter-household dynamics within hinterland sites. The Hypothesis 3 and 4

test results support the inference that most, if not all, South Cape households regularly produced and consumed flaked stone tools. The results do not support arguments for part time or full time household specialization in flaked stone tool manufacture, but they do suggest that Household 3 and Household 1 differed in the proportions of specific lithic types used to make flaked stone tools. This variation might result from inter-household differences in supra-local socio-economic activity, or in the resident's tool stone type preferences.

The results of my study are also relevant to method and theory in Mississippian lithic analysis. This study shows some of the advantages of an attribute analysis method and a lithic technological organization theoretical framework. This approach – particularly the attribute analysis of debitage - directs our attention not only to issues of lithic raw material acquisition and tool function, but also to lithic reduction and use-life stages. This perspective encourages a more systemic view of the flaked stone technology at the local and supra-local scales.

The outcomes of this study also have implications for interpretations of the social and ritual organization of the South Cape community, and the spatial structure of the settlement. Starting with Duncan Wilkie's 1970s and 1980s work at South Cape, researchers have considered the possibility of a functional division between a more domestic south and more ritual or ceremonial north side of the site. This hypothesis is supported by evidence that House 1, located on the north side of the site, was ritually distinctive. As discussed by Wilkie (1983) and Bengtson (2017), compared to houses on the south side of the site, House 1 had unique architecture, large size, multiple infant burials, and ceramics symbolizing the female body, motherhood and infancy. I purposely

selected house features from both the north and south to explore this hypothesized functional division. The Hypothesis 3 and 4 test results suggest that there are in fact meaningful differences between the House 1 (north side) and House 3 (south side) in raw material acquisition patterns, offering some support for the spatial division scenario. The greater relative abundance of local (vs. supra-local) stone in the House 1 sample (vs. House 3 sample) may relate to the apparent significance of House 1 as a women's special use structure. This difference may indicate that in this case, contrary to traditional archaeological models, a ceremonially important structure is associated with a prevalence of local rather than exotic resources. This in turn raises questions about gender bias in archaeological assumptions concerning space and status in past societies; we generally assume that socially and ritually important structures were strongly associated with exotic resources, but perhaps that assumption is not valid for some structures that are important in relation to women's roles.

Contributions

This thesis contributes to Mississippian Archaeology in several respects. As discussed above, this study helps correct the bias towards large mound-bearing sites, by contributing to the growing body of work on houses and households at hinterland sites. Also, this study contributes to Mississippian flaked stone research through a rigorous household-level attribute scale lithic analyses informed by a lithic technological organization framework.

This project also contributes to the archaeology of the South Cape site. Other work on South Cape has looked at the flaked stone assemblage in the context of a broader

inter-site analysis of Mississippian flaked stone assemblages. However, my study centers entirely on South Cape lithics, with a focus on inter-household flaked stone variation. Moreover, the present study adds much needed depth to the small list of extant literature on the South Cape site.

Moreover, this study provides the Osage Nation with new information, which the Nation may find useful, about the South Cape. The current thesis work is also one of few recent studies carried out in consultation with the Osage Nation Traditional Cultural Advisors and the Osage Nation Tribal Historic Preservation Office, directed by Dr. Andrea Hunter. This consultation has helped open a line of communication between Southeast Missouri State University and the Osage Nation, which may prove productive in future archaeological endeavors of mutual interest.

Recommendations for Future Work

I recommend continued analyses of hinterland sites, with a focus on house features, to further explore household production and consumption in these rural communities. Continued work in this area, with an intentional focus on the dynamics within hinterland households and communities, should generate enough case studies for us to more effectively understand the diversity of Mississippian communities across time and space. Also, continued work in this area should focus on detailed attribute level analyses of specific artifacts or resources, to rigorously household production and consumption.

Continued analysis of the information-rich South Cape site is needed. While there has been one previous thesis and several publications concerning both the ceramic and

lithic assemblages from the site, many basic analyses have not yet been conducted and reported. First and foremost, an overall inventory of the South Cape assemblage at Southeast Missouri State University needs to be completed, so that interested parties can see what there is to study, and thereby develop suitable sampling strategies for specific research projects. I was lucky enough to learn about the South Cape assemblage while earning my undergraduate degrees at Southeast Missouri State University, but wider dissemination of information about the assemblage could generate additional research on the collection. Of course, this kind of process requires additional funding, and therefore probably will not be possible until funding for that purpose is provided to the Southeast Missouri State University Anthropology program.

We need not only inventory, but also additional analyses of existing collections from the South Cape site. This necessarily entails struggling with problems resulting from differences between field directors in archaeological recovery and documentation methods, but my study shows that these problems can be overcome, to some extent. In particular, I strongly recommend additional analysis of flaked stone artifacts, since there is already a strong base of information about the lithics (e.g., the present study and Koldehoff and Brennan 2010).

My project is based on a small sample of the flaked stone artifacts recovered during Wilkie's 1970s - 1980s excavations and Brennan's 2007 excavations at the site. Future work should include samples of flaked stone from house features besides H1 and H3, and from midden deposits at the site. By examining archaeological variation among a larger sample of house features, we can more productively explore social, political, economic, and ritual variation among households, and between the North and South

sections of the South Cape site. Moreover, by comparing lithics from house features and middens, one can better understand the entire reduction trajectory and technological system, and archaeological site formation processes at South Cape. It would also be beneficial for future researchers if excavated sediments were screened with 1/8th inch mesh or smaller to recover micro-debitage. The current sample does not include much debitage generates during very late stage reduction, and the use of smaller screens would provide that sample, and thereby enable a more conclusive understanding of variation in the inhabitants' use of local, non-local, and exotic stone.

Future work at the South Cape site should also take advantage of the rich artifact assemblages from the multiple house features at the site, as well as non-house remains, to learn more about household and community life in the Mississippian hinterlands. This should involve analyses of diverse classes of remains including not only lithics but also ceramics, faunal remains, botanical remains, and soil samples. The study of these remains, and how they vary within and among features at the site, could tell us a lot more about not only production and consumption, but also other spheres of life such as ritual, gender, social hierarchy, exchange, and human interaction with the natural environment at South Cape, and by extension, the Mississippian hinterland generally.

Another productive avenue of research would be to use field records to understand variation in house architecture at the site. For example, House Features 1 and 3 display differences in size, construction, ritual, and relationship to gender dynamics. An analysis looking at more house features would contribute to a growing body of research on Mississippian houses and how they relate to environmental, social, political, economic, and ritual dimensions of the Mississippian world.

Also, future researchers must continue to communicate with the Osage Nation and other tribes linked with the site's Mississippian inhabitants. This should be done not only to consult about human remains and associated funerary goods to comply with the Native American Graves Protection and Repatriation Act, but also to collaborate in mutually beneficial ways on research, interpretation, and preservation projects concerning the South Cape site. Tribal consultation is a valuable opportunity to improve the quality, accuracy, and relevance of outcomes.

Future work should include more public education and outreach. I will present the results of this study in a variety of settings, including lectures at Southeast Missouri State University and the Osage Nation, and an article for the quarterly newsletter of the Missouri Archaeological Society, which includes avocational as well as professional archaeologists. Other means of engaging the public could include public site visits or a demonstration of archaeological field methods in a "mock" site on the Southeast Missouri State campus, when more field work is completed at the South Cape site.

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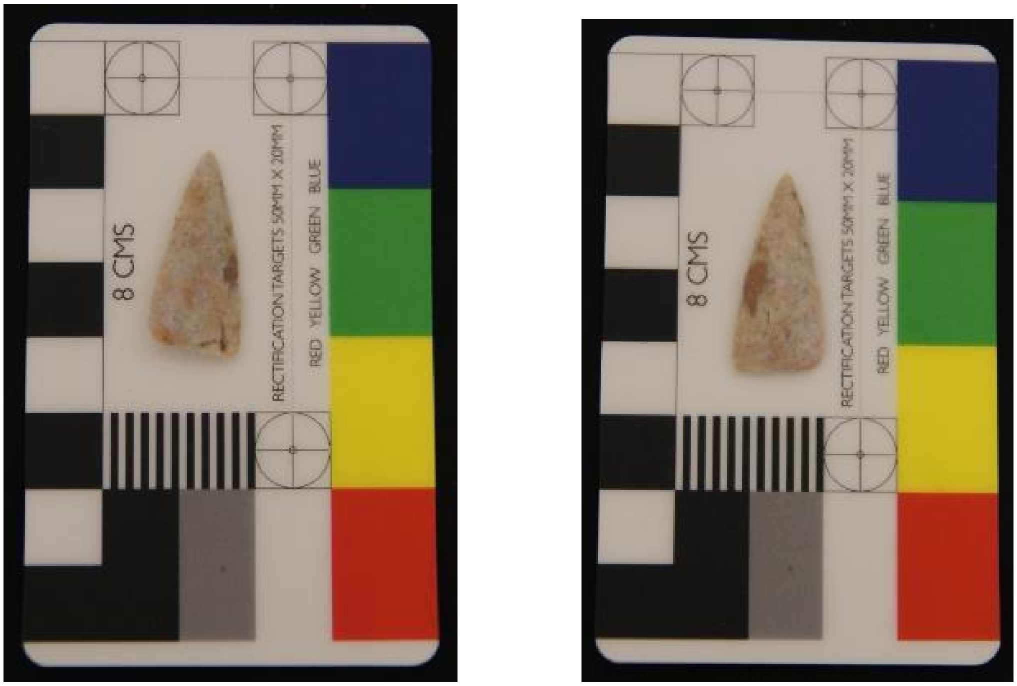
APPENDICES

Appendix A. Tool Photographs

Appendix A-1: Unidentified PPK, Rubidoux Quartzite

Appendix A-2: Unidentified PPK, Mill Creek chert (Heat Treated)



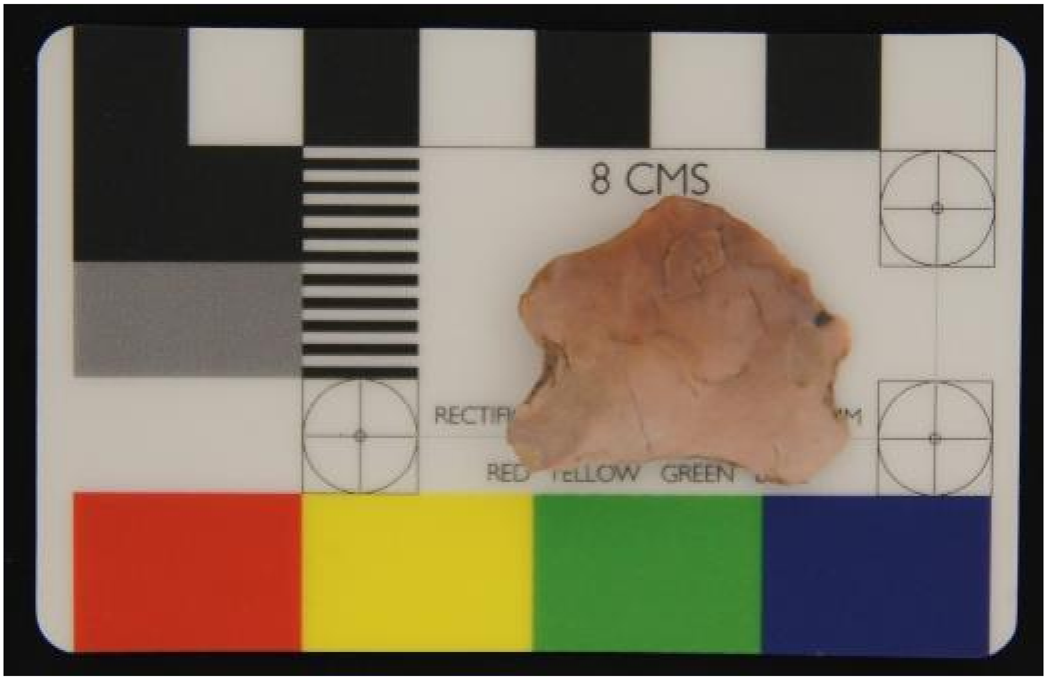
Appendix A-3: Unidentified PPK Burlingtion chert

Appendix A-4: Unidentified PPK, Bailey chert

Appendix A-5: Unidentified PPK Bailey chert
(with tip missing/possible heat damage)

Appendix A-6: Unidentified PPK Bailey chert (Unnotched)

Appendix A-7: Madison PPK Bailey chert (proximal end)



Appendix A-8: Side-Notched PPK Fragment, Rubidoux Chert

Appendix A-9: Madison PPK, Bailey chert

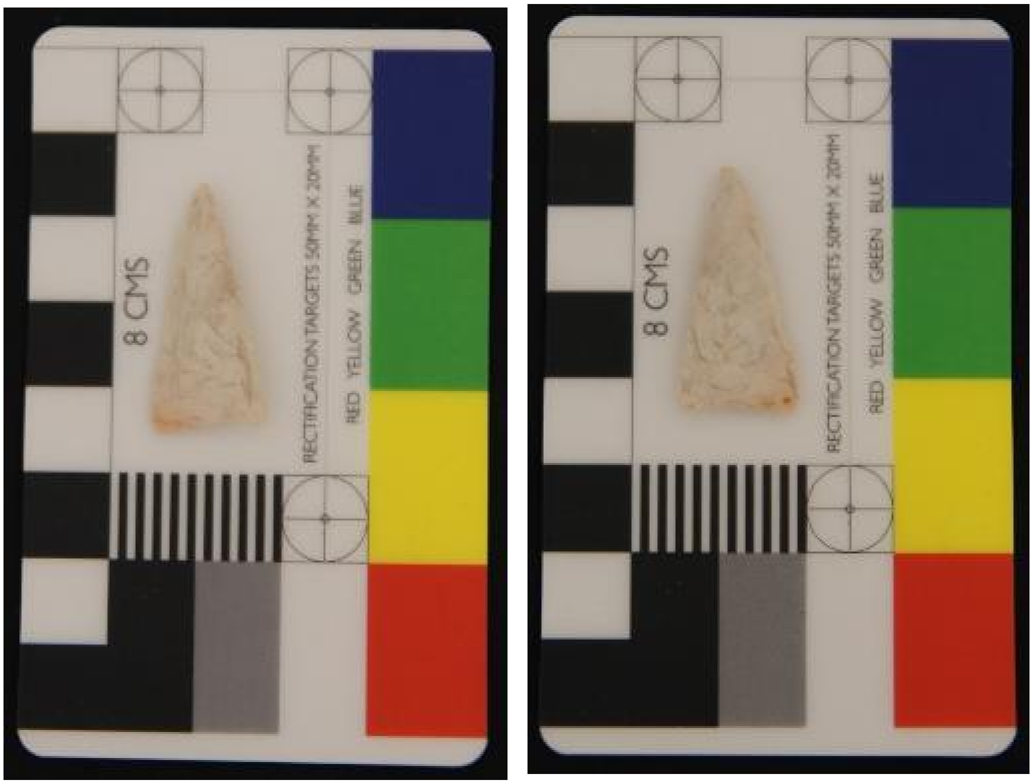
Appendix A-10: Madison PPK, Burlington chert

Appendix A-11: Madison PPK, Bailey chert (with cortex)

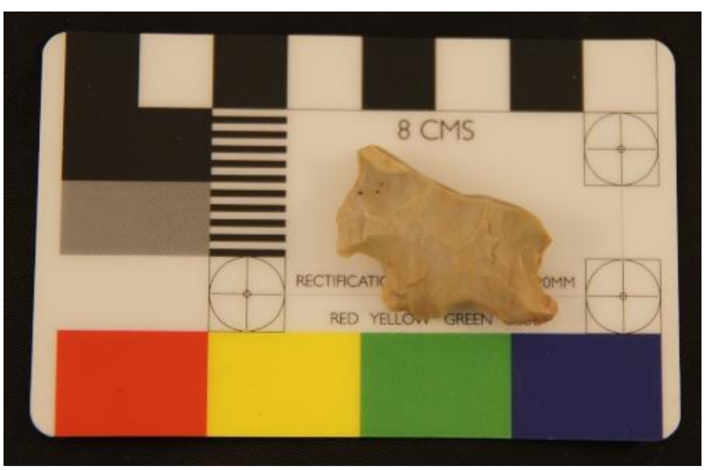
Appendix A-12: Madison PPK, Bailey chert

Appendix A-13: Madison PPK, Lafayette chert

Appendix A-14: Corner-Notched/Side-Notched PPK, Lafayette chert



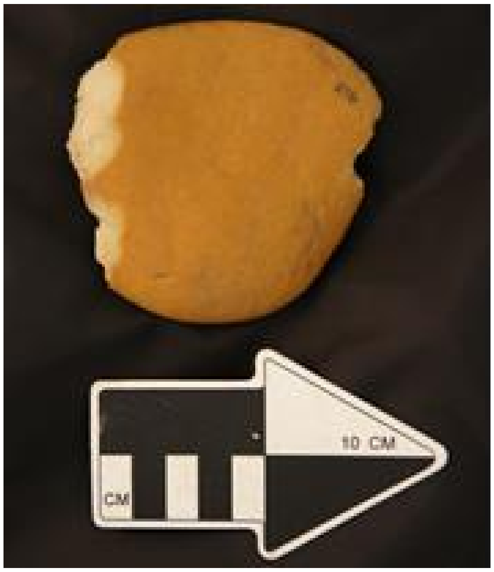
Appendix A-15: Madison PPK, Bailey chert

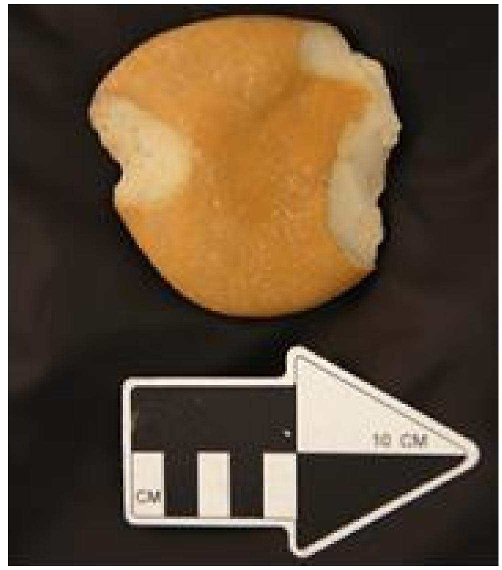


Appendix A-16: Base of Unidentified PPK, Bailey chert

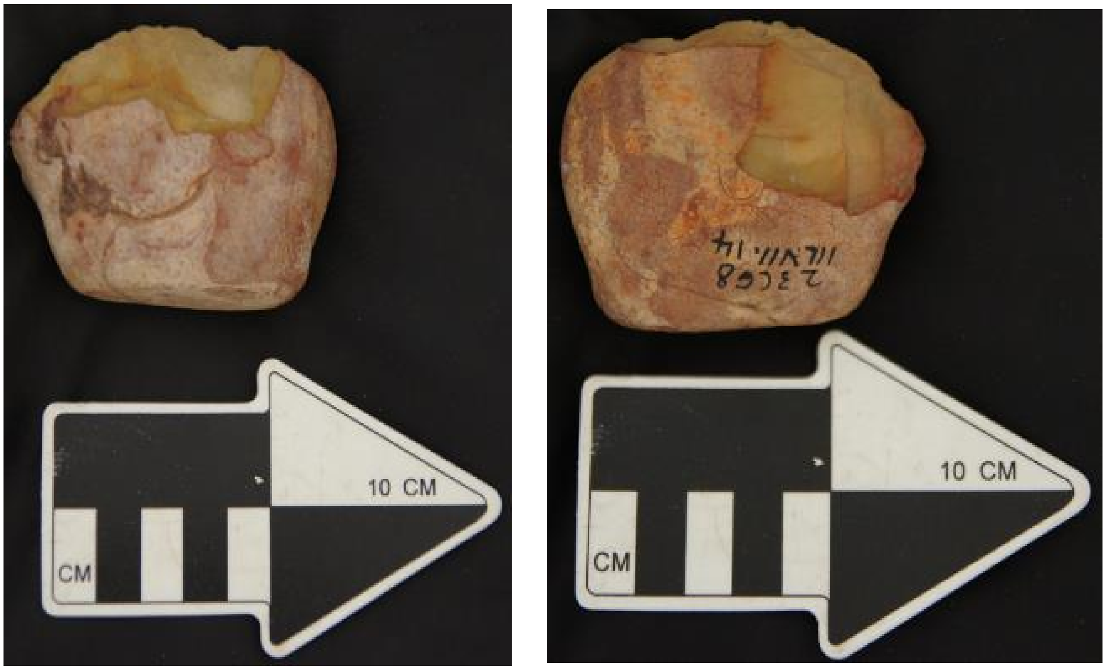
Appendix A-17: Scallorn PPK, Bailey chert

Appendix B. Core Photographs.

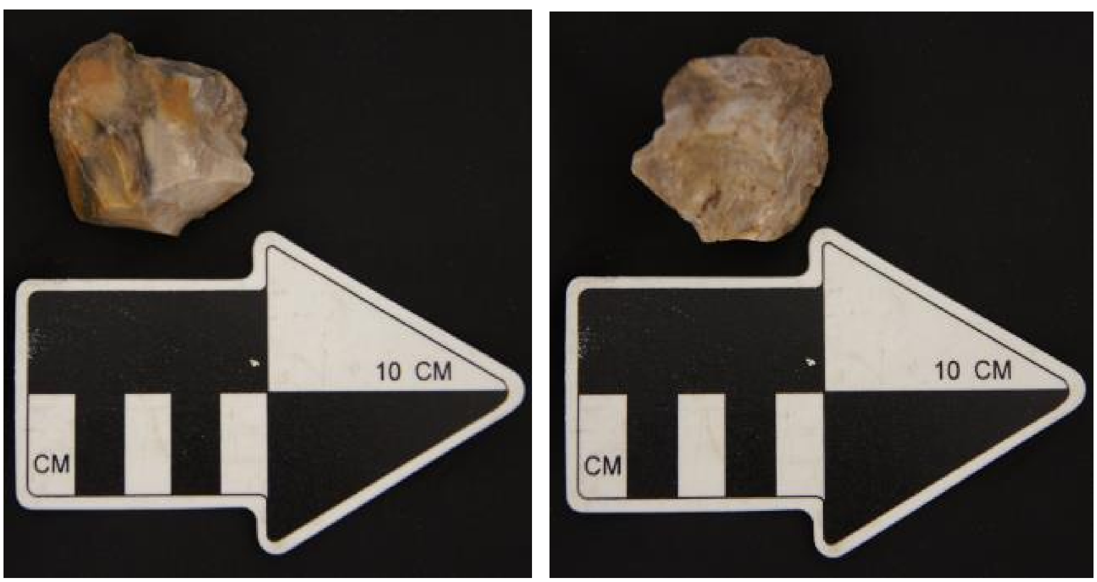




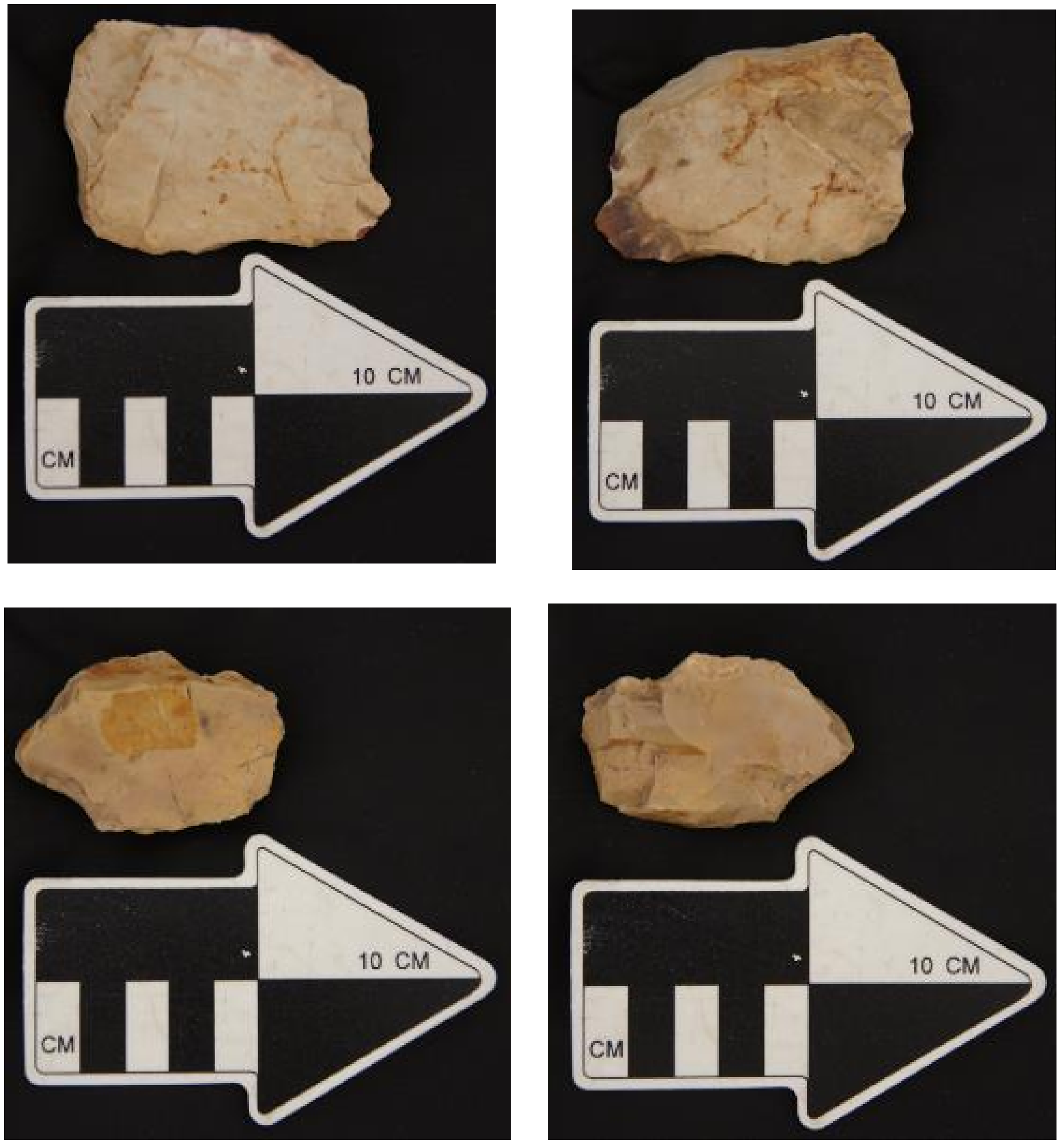
Appendix B-1: Core, Lafayette Chert



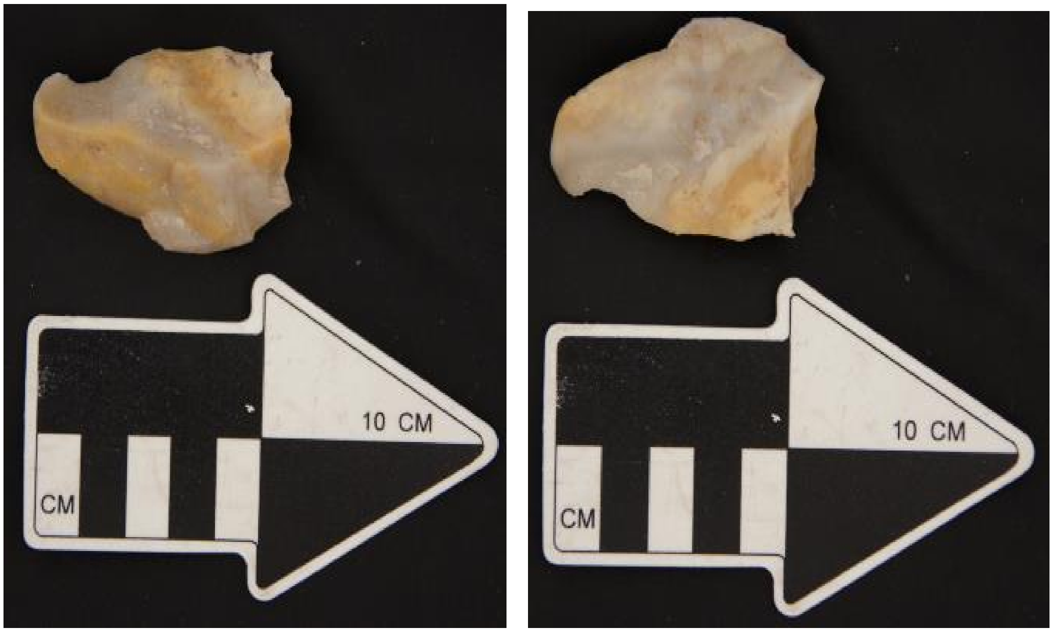
Appendix B-2: Core , Lafayette chert



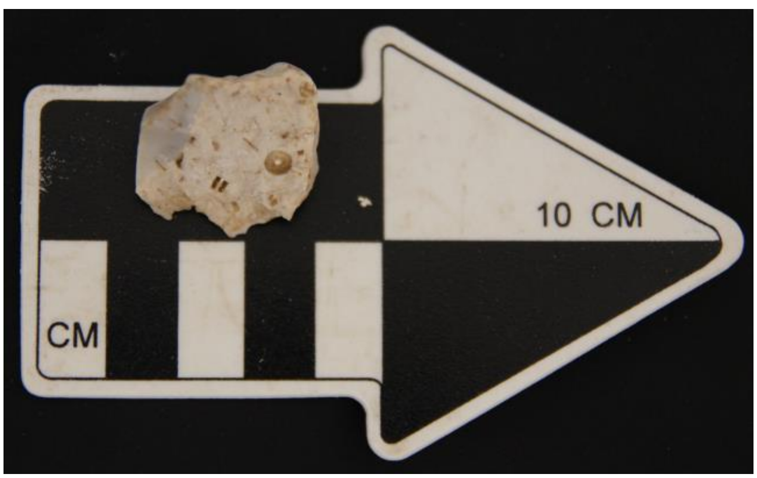
Appendix B-3: Bifacial Core, Lafayette chert



Appendix B-4: Two Cores, Bailey Chert

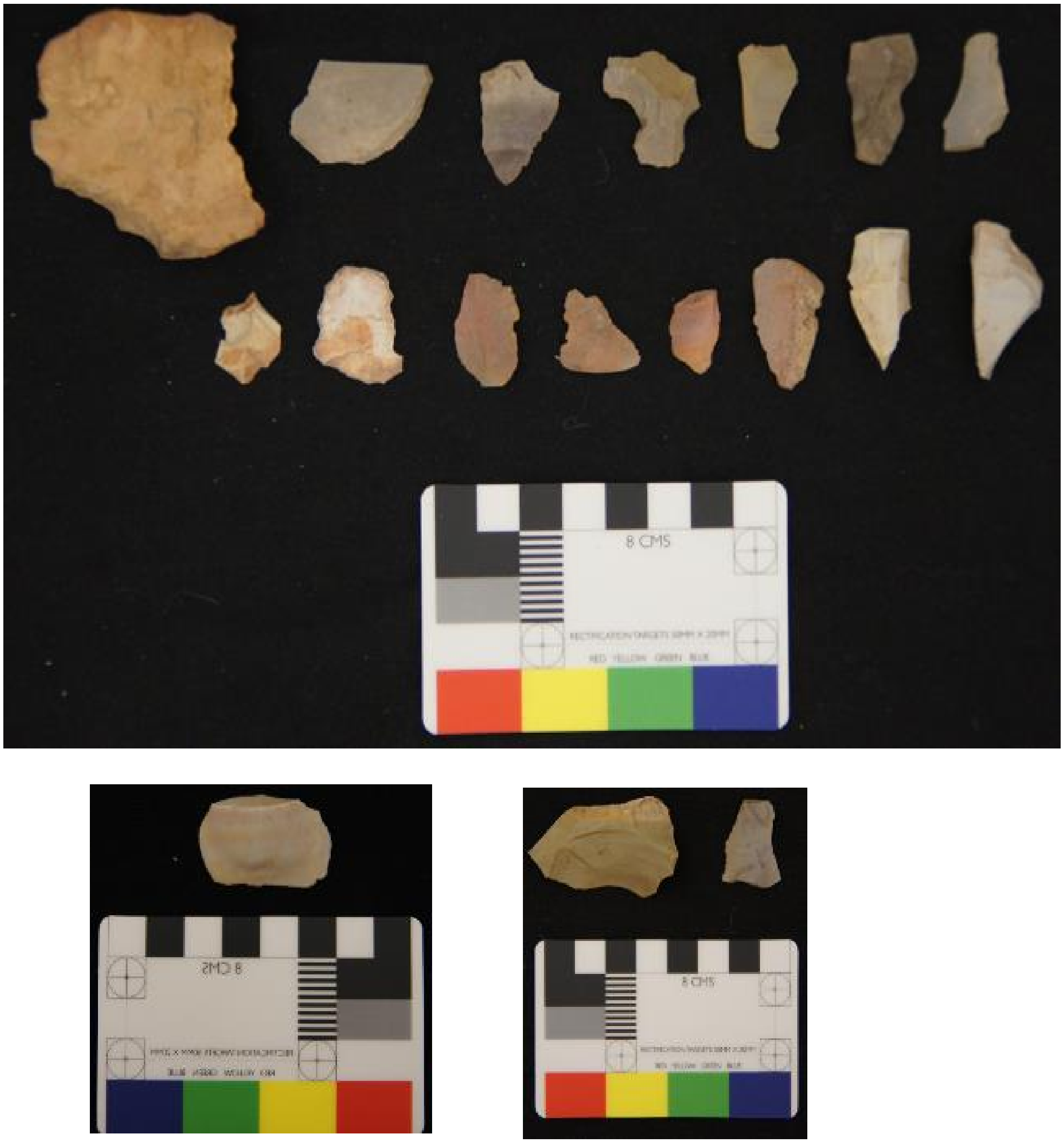


Appendix B-5: Core, Jefferson City chert

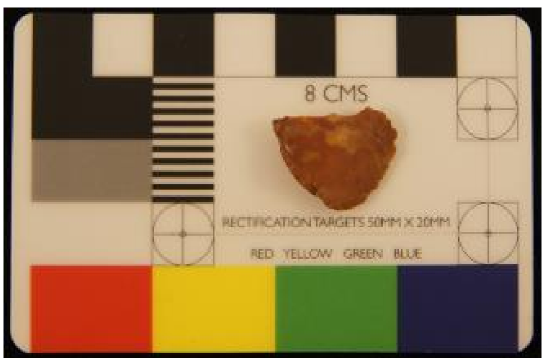


Appendix B-6: Core, Burlington chert

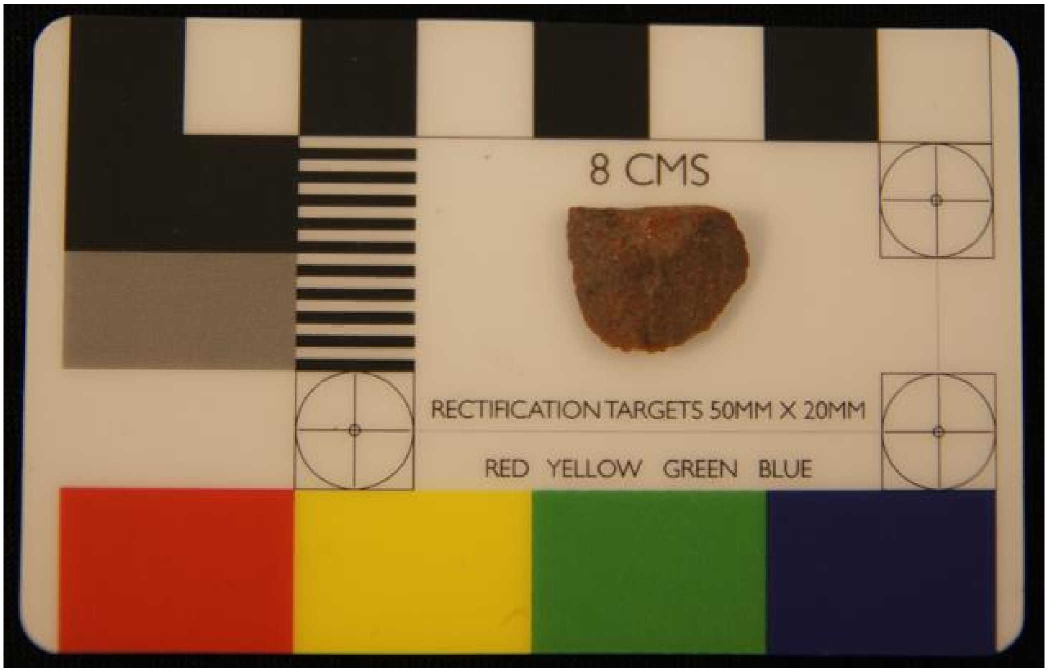
Appendix C. Debitage Photographs.



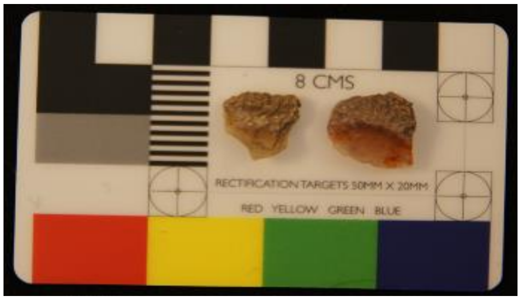
Appendix C-1: Bailey Chert (Local)

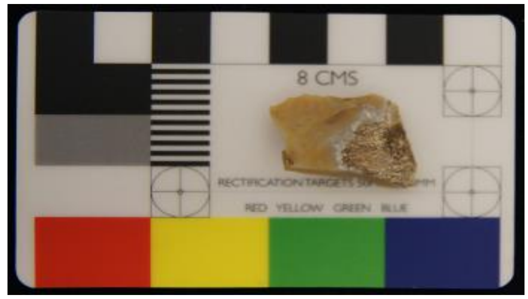


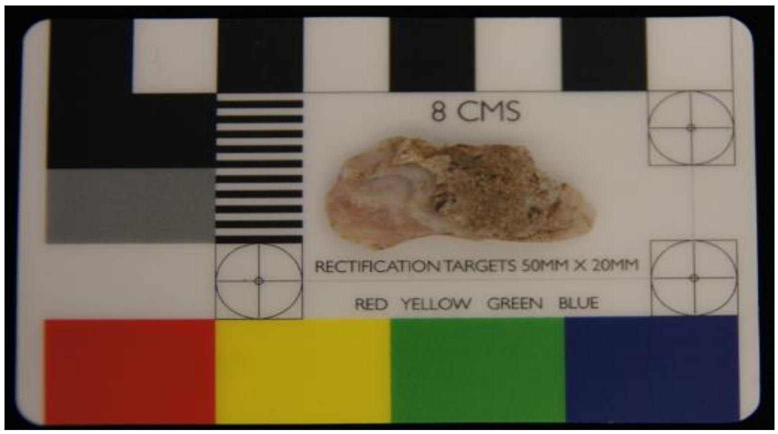
Appendix C-2: Lafayette Chert (Local)



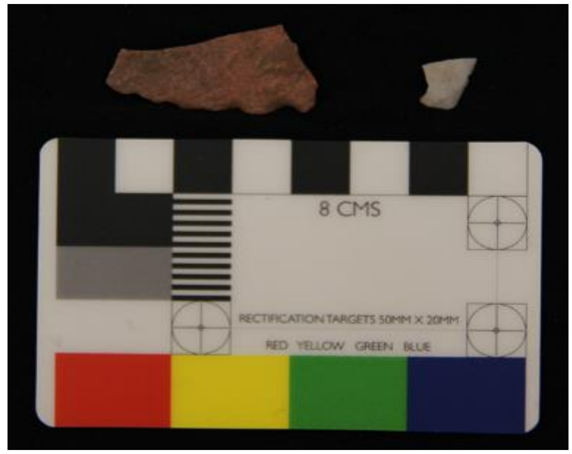
Appendix C-3: Lafayette Quartzite (Local)



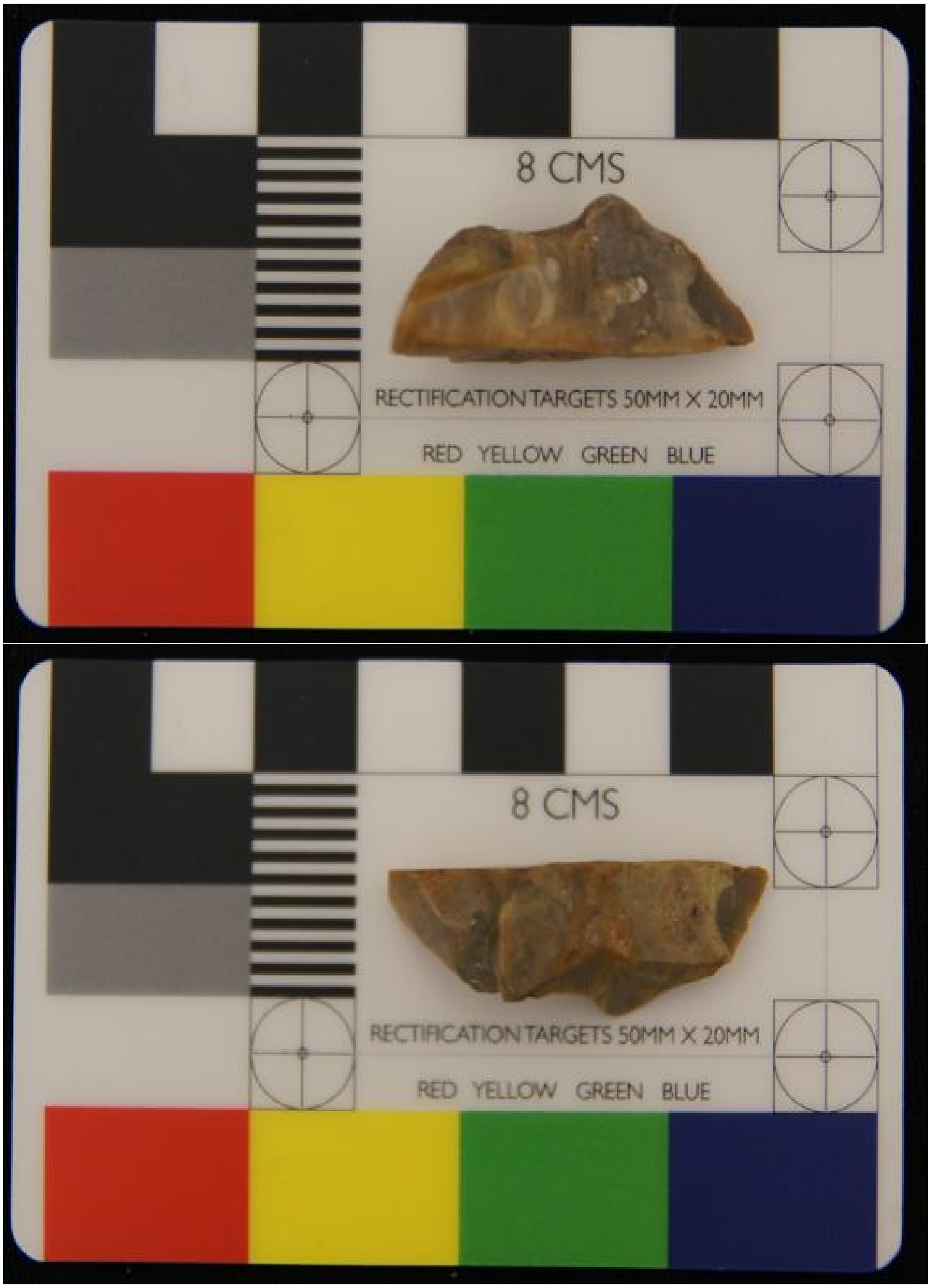




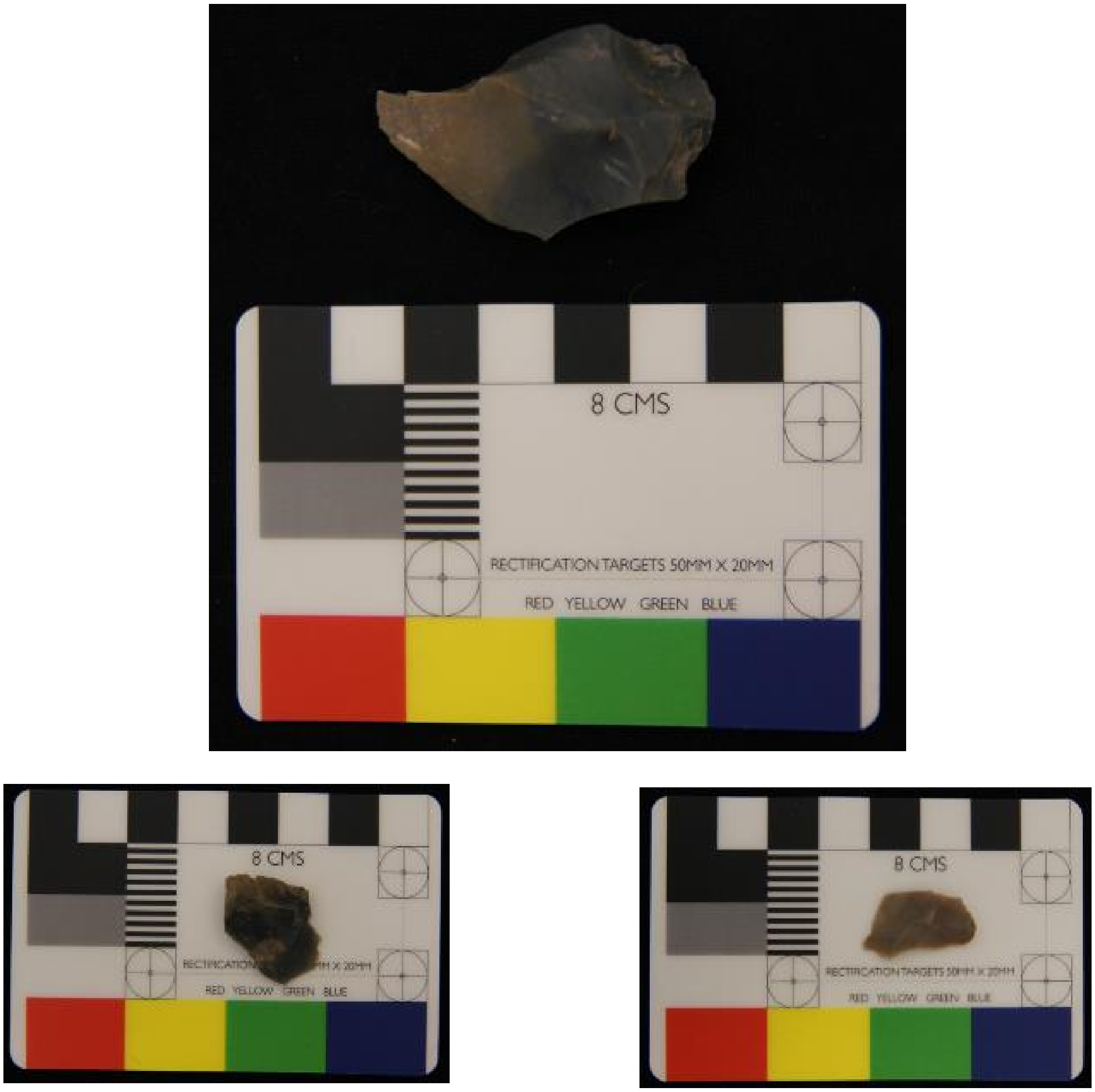
Appendix C-4: Kaolin Chert (Nonlocal)



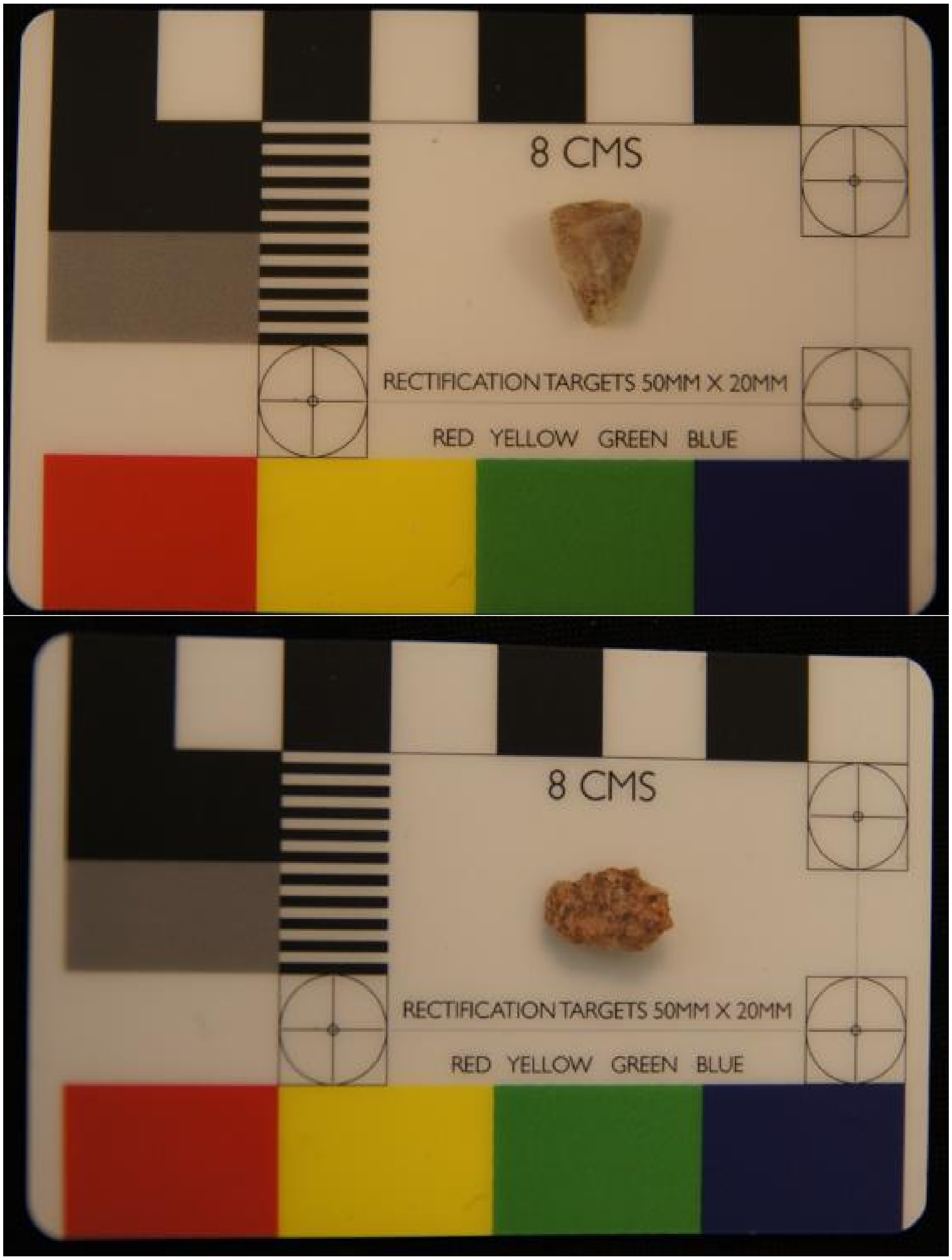
Appendix C-5: Mill Creek Chert (NonLocal)



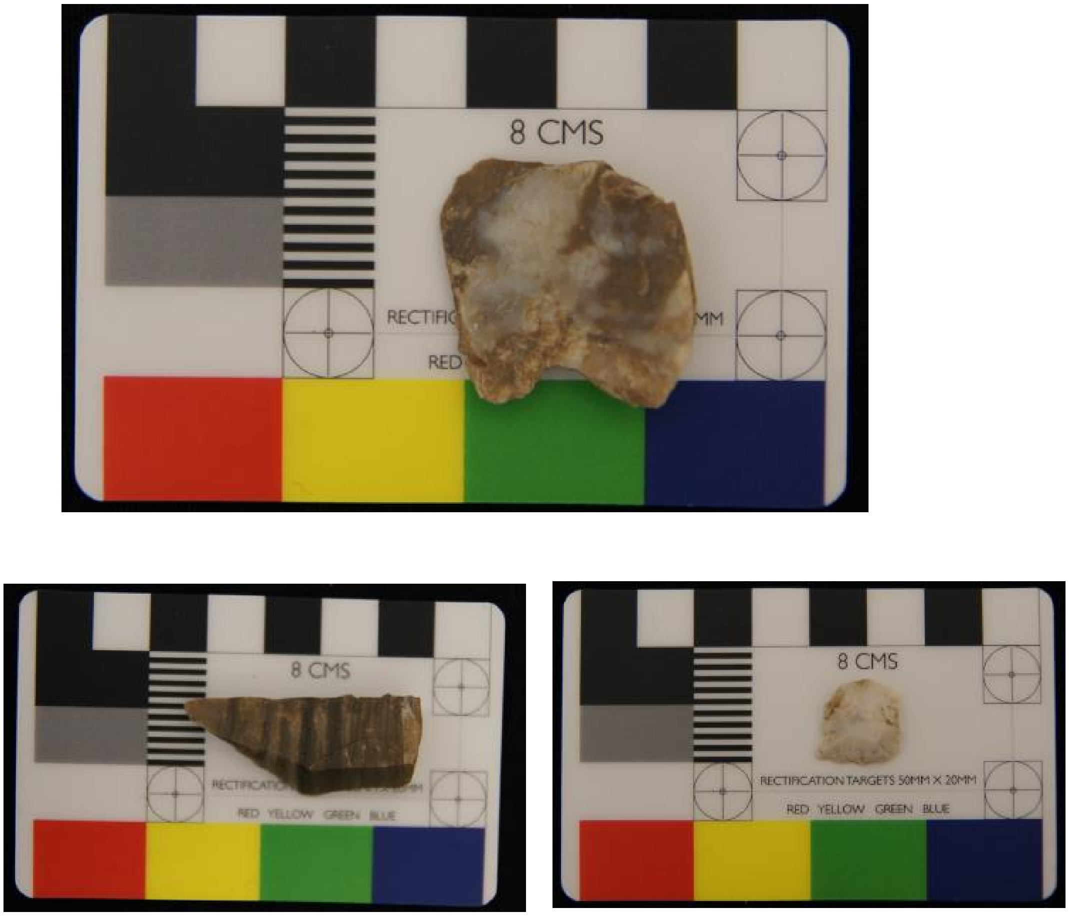
Appendix C-6: Plattin Chert (NonLocal)



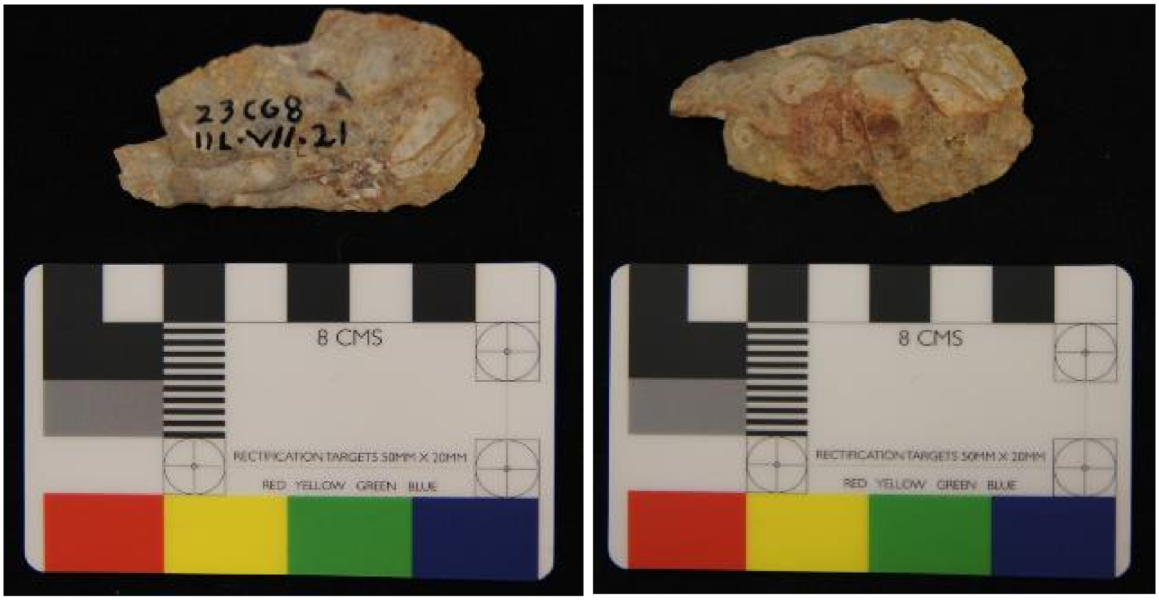
Appendix C-7: St.Louis Coden Variety Chert (Nonlocal)



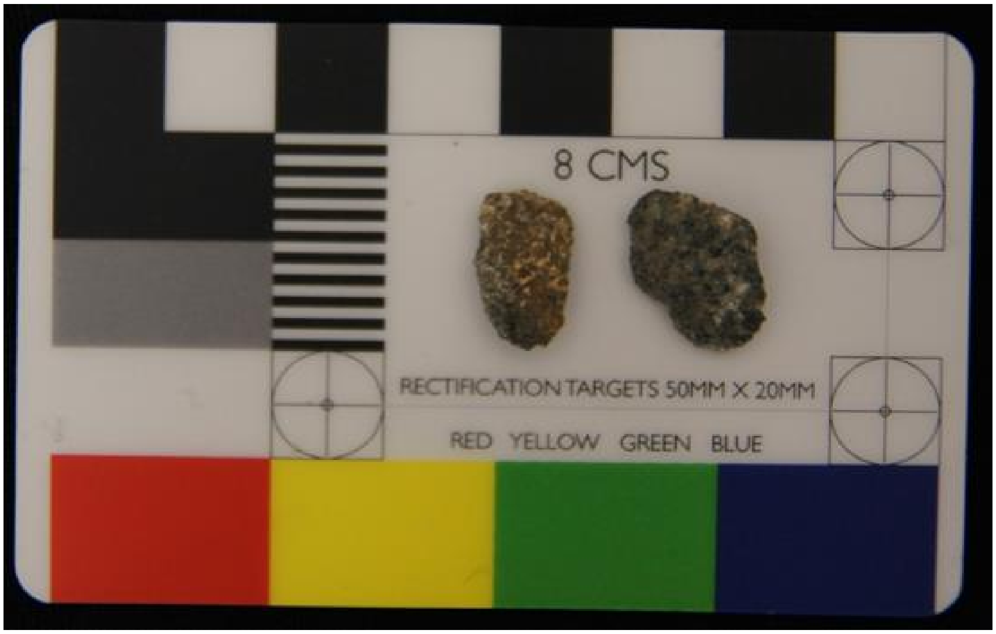
Appendix C-9: Rubidoux Quartzite (2 pcs) (Nonlocal)

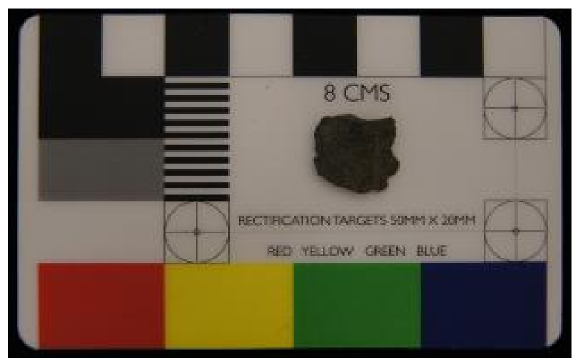


Appendix C-10: (Center and Bottom Left) Jefferson City Chert (Bottom Right) Jefferson City Quartzite (Nonlocal)

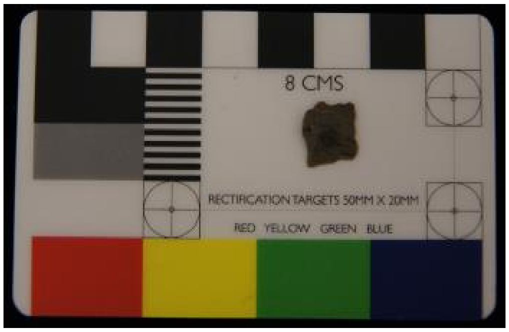


Appendix C-11: McNairy Chert Breccia (Nonlocal)

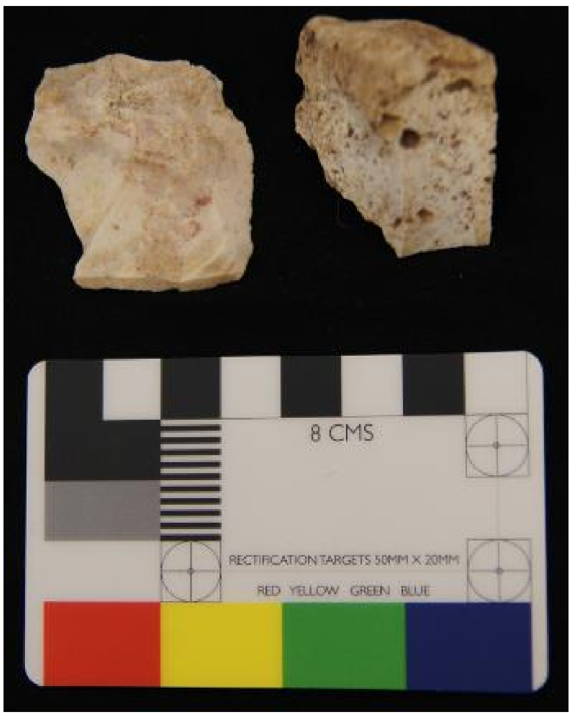


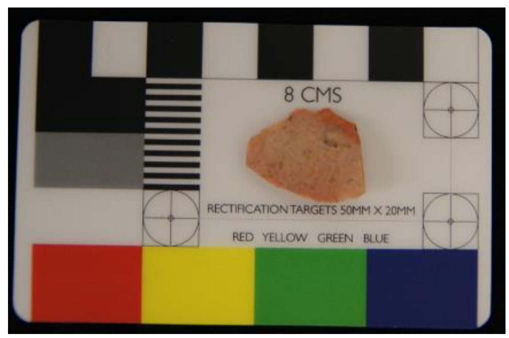


Appendix C-12: (Center) Flaked Basalt (Bottom) Basalt (Nonlocal)



Appendix C-13: Dover Chert (Exotic)





Appendix C-14: Burlington Chert (Exotic)