ABSTRACT

Title of Thesis:	WESSELMAN FARM, AN ARCHAIC SITE ON THE LOWER GREAT MIAMI RIVER, HAMILTON COUNTY, OHIO
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Wesselman Farm is a previously unidentified precontact site in Hamilton County, Ohio. The site is an early Late Archaic period (4330 ± 30 to 4080 ± 30 BP [4959 - 4462 cal BP]) habitation site with dense midden development situated on a summit over the Great Miami River. This research was inspired by a small box of stone tools that a family had collected since the 1940s as they plowed the fields on their 15.38-hectare (38.00 acre) historic farmstead. The landowner's collection, archival research, geophysical survey, archaeological excavations, and radiocarbon dates each contributed valuable information in locating and interpreting this incredible archaeological site. The data also allows an understanding of the role this site had within the larger Archaic settlement system of extreme southwest Ohio and changes our understanding of Archaic settlement distribution theory.

WESSELMAN FARM, AN ARCHAIC SITE ON THE LOWER GREAT MIAMI RIVER, HAMILTON COUNTY, OHIO

by

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Dedication

The discovery of Wesselman Farm and following investigation for this thesis would not be possible without Uncle Bob, his fascination for history, advocation for preservation, and his invaluable support throughout this research project.

Acknowledgements

This thesis was inspired by the discoveries a family made on their historic farmstead in Hamilton County, Ohio. The archival research, survey, and excavations were carried out between 2020 and 2022 by the author of this thesis, Leeanne Mahoney, who has worked in the Cultural Resource Management industry for over 10 years. Dr. Jarrod Burks carried out the geophysical survey and offered invaluable insight in the selection of anomalies for planning the archaeological investigations. Tyler Swinney, Anthropology Collections Manager at The Cincinnati Museum Center (CMC) offered invaluable advice and assistance in the archaeological investigation. Bob Genheimer, George Rieveschl Curator of Archaeology at the CMC served on the thesis committee. Bob is owed a great depth of gratitude for all he has taught the author on the history of the Ohio Valley region and conducting archaeological investigations at precontact habitation sites, specifically those with pit features. Madawk Amyx Galloway, Bevin Kenney, Theodore S. Sunderhaus, and interested family members helped tremendously in the excavation efforts. Most important, the research for this thesis would not be possible without the landowner's permission, support, and genuine interest in history and preservation. Beta Analytic provided reliable and rapid radiocarbon results. In closing, a dedication of gratitude is well deserved to Kent D. Vickery, who served as a professor of anthropology at the University of Cincinnati for 34 years. Although the author never had the opportunity to work with him, his research of the precontact history of the Ohio Valley and specifically on Archaic period settlements was heavily used and deeply appreciated throughout the work of this thesis.

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Chapter 1 Introduction

1.1 Site Overview

The site identified during this research project was given the name "Wesselman Farm" by the author. The site was discovered on a historic 15.38 hectare (ha; 38.00 acre [ac]) unnamed private farmstead settled on the east side of the Great Miami River, just south of its junction with Taylor Creek in Hamilton County, Miami Township, Ohio. The Wesselman Farm archaeological site is on a summit 219.5 meters (m;720.0 feet [ft]) above mean sea level (amsl) overlooking the Great Miami River Valley. The site occupies an approximate 0.55 ha (1.35 ac) area centered on the summit. The topographical location of Wesselman Farm is depicted in Figure 1 below.

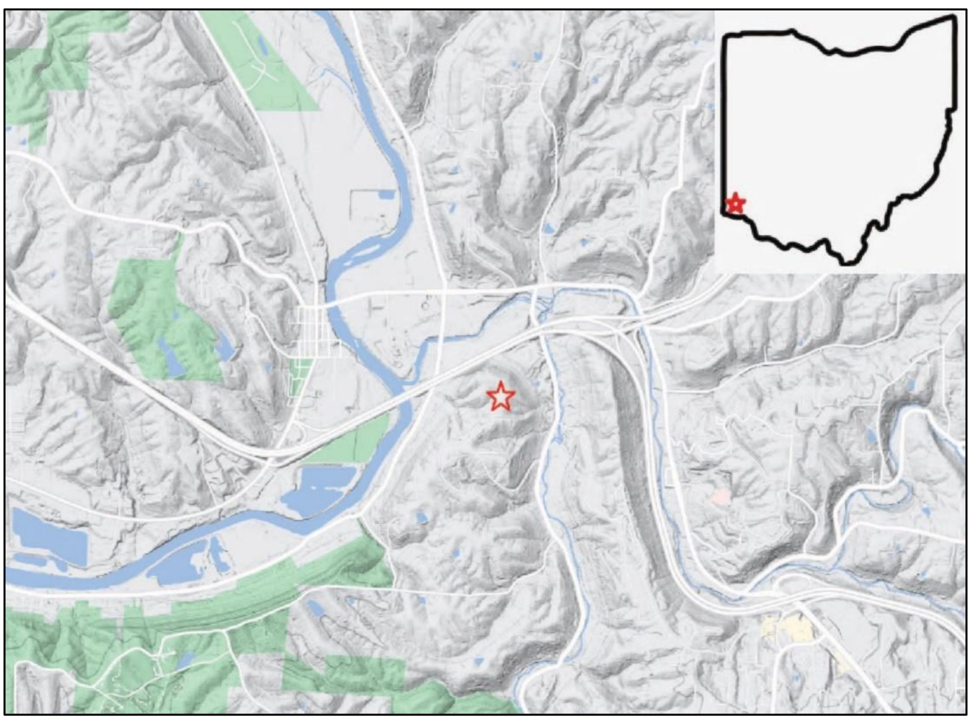

Figure 1. Topographic location of Wesselman Farm.

The entire investigation of the Wesselman Farm Site included a synthesis of available research of known sites within the region, a study of the landowner's artifact collection, and a geophysical survey of a portion of the summit, followed by test unit excavations. An investigation for additional undocumented resources in the area through communication with the local community and research at the CMC also contributed to the research. The methods of the archaeological investigation serve to answer the following research questions: What role did the Wesselman Farm Site have within the Archaic settlement system in southwest Ohio? How does this change how we currently model the Archaic settlement system within this region?

The archaeological investigation began with a geophysical survey using magnetic gradient instruments on the summit where the landowner had recovered most of the artifacts. The survey revealed a cluster of over 322 anomalies that were confirmed as pit features during the archaeological excavations. Pit features are created due to various activities including cooking and refuse disposal. The pit features sampled during the archaeological investigation were identified as refuse pits and dominated by burned limestone. They also contained a wide array of lithic and bone artifacts and food processing debris. Cultural material included polished bone objects, carapace bowls, chipped stone tools, ground stone tools, knapping pieces, and food remains. Radiocarbon dates obtained from wood charcoal and carbonized nut hull deposited in the pit features ranged 4330 ± 30 to 4080 ± 30 uncalibrated BP (4959 - 4462 calibrated [cal] BP and 3021 - 2492 cal BC).

The materials recovered from the Wesselman Farm Site are comparable to those found on other major archaeological Archaic sites in the area. Some of these major sites are nearby, and others are farther downstream toward the confluence of the Great Miami and the Ohio Rivers. The Wesselman Farm Site provenience and landowner information, including that of comparative collections discussed in this thesis are intentionally not mentioned in efforts to preserve privacy and security of the sites discussed

Wesselman Farm is one of a few upland early Late Archaic period settlements discovered in extreme southwest Ohio with extensive midden development and intact features. The radiocarbon dates indicate that the site was occupied during at least the early Late Archaic period. Knowledge of these types of sites is extremely limited in Ohio. The data collected from the Wesselman Farm Site serves future researchers in understanding early Late Archaic lifeways, and even changes what we currently theorize about the Archaic settlement system and site distribution.

1.2 Thesis Summary

Background research is presented in Chapters two and three to provide the foundation from which interpretations are made. Chapter four discusses how private collections may influence archaeological research and results.Chapters five and six present the data collected from the archaeological investigation and provide interpretations. The thesis concludes in Chapter 7 with a synthesis and discussion of the potential role the site had within the Archaic settlement system and future recommendations for the Wesselman Farm Site.

Chapter 2 Settlement Strategies and Site Distribution during the Archaic Period in Extreme Southwest Ohio

This chapter provides background and context for understanding how the Wesselman Farm Site fits within the Archaic settlement pattern in southwest Ohio. For this thesis, the Archaic period in Ohio spans 8000 - 500 BC (Ohio History Central n.d. [a]). Shifting cultural traditions, lifeways, and technological trends have led to the subdivision of the Archaic period timeline into three parts, Early (circa 8000 - 6000 BC), Middle (6000 -3000 BC), and Late (3000 - 500 BC) (Ohio History Central n.d. [b], n.d. [c]).

2.1 Archaic Site Development

A review of available data and literature of settlement patterns and site distribution theory gives some insight to the role that Wesselman Farm likely had within the larger Archaic settlement system of this region. Through the course of the Archaic period group mobility decreased, and by the end of the Archaic period sites were occupied more intensely and for longer periods (Baden 2021; Burdin 2021; Purtill 2009; Stafford 1994: 221). An assessment of literature about Archaic settlement patterns (Purtill 2009; Vickery 1980, 2008) and subsistence and settlement strategies (Binford 1980; Bader 2021) indicates that the Archaic people occupied different types of settlements and camps. These occupations would vary in range, occupancy numbers, and length of settlement. Each of these sites would play a contributing role to each other within the larger Archaic settlement system.

Generally, it is hypothesized that Archaic people were tethered to a region or broad location and were considered, in southwest Ohio, to be mobile. Archaic people lived in small groups, hunted, and foraged for subsistence. "…the Archaic period clearly was a culturally dynamic time of demographic fluctuation, intrastate population movement and growth, and shifts in settlement and subsistence strategies" (Purtill 2009: 593). As regional population grew within the Ohio Valley, a variety of settlements developed. People would cycle around different settlements throughout the year. This mobility was described by Binford (1980) as *residential* and *logistical*. Residential movements involve the entire local group moving from one camp to another. Logistical movements involve foraging by individuals or small task groups that would return to their residential camps.

During the Early Archaic in Ohio, people were considered *foragers* and did not store food, rather they adopted a foraging subsistence strategy that Binford (1980) describes as involving ranging away from their residential bases and gathering foods daily, then returning to their base camps. Base camps are the largest and most intensely utilized sites within the system and are defined as a site that was occupied for several months or seasons where a broad range of activities occurred. These sites could potentially have specialized activity areas, structures, and mortuary components (Binford 1980; Bader 2021: 64).

By the Late Archaic period population had increased, and people were increasingly less mobile and adopted a *collector* strategy. This strategy is characterized by Binford (1980: 10) as involving specialized task groups leaving a residential location temporarily in logistical food-procurement parties. Food is transported back to the residential location for storage for at least part of the year. These smaller groups would also converge at larger sites (base camps) to exchange goods and materials, share traditions, and likely to exchange mates (Purtill 2009; Vickery 1980, 2008). Collectors could also become groups that frequent certain resource-rich territories or locations in a habitually cyclical behavior. Binford (1982, 1983) calls this *territorial* or *long-term mobility*. A sense of ancestral connection would develop and what followed was likely a widespread view of group or familial ownership of these resource-rich but smaller home ranges (Burdin 2021: 102).

Site types can be conceptualized under the understanding of a group's mobility within their territory. In Matthew Purtill's (2009) comprehensive review of the Archaic period in Ohio, he described two primary Archaic site types identified along the Ohio River. The first is a semiannual or year-round occupation that would typically have midden development, burials, feature clusters, and house structures. The second are seasonal, late summer to early winter occupations from which bulk food processing took place. Vickery (1980) suggests these two main site types but refers to the more permanent sites as base camps and the smaller occupations as various seasonal sites. Base camps were intensively occupied multi-seasonally, or for much of the year, where a wide range of activities took place (Vickery 1980; Bader 2021: 64). These sites would have midden development and often include distinct specialized activity areas where bulk food processing took place. Vickery (1980) suggested two types of base camps, a "regional" and a "local" type. To date, these sites have only been documented along valley floors in southwest Ohio. Regional base camps were locations where many groups come together in semi-permanent camp sites, and local base camps were places that were occupied less and associated with a single band using the location regularly on a seasonal basis.

There are various sites that serve ancillary purposes to the larger base camps such as temporary camps or seasonal settlements used for lithic extraction, ephemeral hunting, collecting, and food processing (Purtill 2009). Temporary camp sites are sometimes referred to as “stations” (Vickery 2008; Binford 1980). Stations focused on a specific extractive activity to support larger base camps and were occupied for short durations. Seasonal settlements had longer periods of use and served the same purpose as stations but with a variety of extractive activities. Due to a longer occupation period, seasonal settlements exhibited midden development and mortuary practices, although evidence of the latter is extremely limited within the southwest Ohio archaeological record.

2.2 Increased Exploitation of Plant Resources

As mobility reduced during the Archaic period, the dietary focus began to shift away from the broad and wide-ranging diet of a highly mobile lifestyle. The Archaic diet was increasingly more concentrated on fewer resources (Stafford 1994: 222). Late Archaic people continued to enhance their exploitation of their local resources as hunter-gatherers with a deeper dependency of plant resources that was supplemented by hunting and fishing. This practice eventually became more focused or “anchored” in resource territories (Rossen and Turner 2021: 171). Groups of people would range within and cycle around these territories temporarily, seasonally, or annually.

Hardwood trees such as walnut, hickory, and oak became well established in southwest Ohio after the glaciers receded. The expansion of deciduous forest reached its northernmost limit around 2000 BC (Cleland 1966). Masts from these trees provided a good source of protein. Nuts and acorns were gathered, processed, and stored over long periods. The nuts were ready to gather in the fall and processed and stored through the winter. Nut oils were also highly desirable for nutritional and medicinal needs, and the nut hulls could be used as fuel in the fires.

Ground stone tools such as axes, pestles, and pitted stones became common during the Archaic and more common toward the later Archaic. The occurrence of these tools suggests an increased reliance on plant resources, especially nuts, and a less mobile lifestyle (Bader 2021: 60). Hardstone tools such as pestles and pitted hammerstones were highly effective in processing the masts. The increased quantities of nut hulls found in midden sites dating to the Late Archaic period and hardstone tools such as axes, suggest that Late Archaic people were deliberately clearing areas around these resources to maximize their nut production (Moore and Dekle 2010: 597). This practice is considered an early form of horticulture. The method was carried out by using tools, such as axes for clearing unwanted vegetation to allow for the better growth and development of the plant resources that were desired.

On Archaic sites in southwest Ohio, nut tree varieties such as walnut (*Juglans),* specifically black walnut (*Juglans nigra)* trees, and Hickory (*Carya)* were encouraged to flourish. Carbonized nut materials are common on numerous Archaic sites in the region. Patton and Curran (2016: 146) note that "the abundance of thick-shelled hickory and black walnut hulls suggests that these forest resources were an important component of the Archaic diet as has been evidenced at other temporally comparable sites throughout eastern North America" By the end of the Archaic period and into the Early Woodland period, walnut use declined as cultivation of indigenous seed crops intensified (Zeanah 2017: 14).

2.3 Understanding Topographical Distribution of Archaic Sites

Wesselman Farm is situated on a summit above the Great Miami River and its confluence with Taylor Creek. Archaeological survey biases in relation to the Archaic site inventory affects archaeologists' understanding of Archaic settlement patterns (Purtill 2018). Ultimately, lower elevation areas along streams and rivers and valleys are studied more by archaeologists than upland areas; this skews the archaeological data for Ohio.

Lower elevation areas have historically higher levels of cultivation, are more visible to collectors and archaeologists, and are more likely to be developed and require Cultural Resource Management (CRM) work. This creates difficulty in understanding the distribution and potential of sites in the uplands such as Wesselman Farm. Upland settings are not used as frequently for cultivation, are less accessible, and are less developed. More recently, within the last several decades, CRM work has impacted more upland settings. As data from these investigations is added to the archaeological inventory, the problems with archaeological bias may decrease.

Survey bias difficulty was acknowledged in a report on the Oberschlake site (33CT0648; Striker 2011: 276). Topographically, this site is like Wesselman Farm, but located further east in Clermont County, Ohio. The Oberschlake Site is an Archaic period camp used for processing nuts on an upland setting. The site was encountered during a CRM project in 2011 (Striker 2011: 276). In southwest Ohio, there are few recorded examples of upland sites that can be compared to Wesselman Farm.

Survey biases aside, Archaic sites are generally understood as more likely to occur close to major waterways (Purtill 2009). Specifically, Archaic sites are more likely to be situated at key vantage points on the landscape or at the juncture of two or more environmental zones to take advantage of critical resources (Bader 2021: 58). This is the case with Wesselman Farm. These positions allow access to a variety of resource procurement areas and transportation routes between settlements along the waterways.

2.4 Climate and Archaic Site Distribution

Climate also played a major role in how Archaic settlements were distributed in the region. Dramatic climatic change shifted the way of life for Archaic people. Global warming and moistening occurred between approximately 5000 and 2000 BC (Tankersley and Lyle 2019: 194. The greatest diversity of mammal species procurement occurred during this period and Archaic populations procured a greater number of aquatic vertebrates such as amphibians and reptiles, than any other cultural periods (Tankersley and Lyle 2019: 201). With increased food supply in the later part of the Archaic period, groups began to increase in size, settle more, build sturdier homes, mobility decreased, and technology and subsistence bases expanded to exploit this widening array of resources (Purtill 2009: 565).

Archaic occupations increased in Ohio between 3000 and 1000 BC. This period saw the end of the post glacial changes and the establishment of modern land and sea levels (Geistweit 1970: 45). The rivers and streams assumed their present base levels as well as their associated land and geological features. Near the end of the Late Archaic period, circa 3000 to 500 BC., the warming and moistening climatic period gradually shifted to a dry and cooler climate (Tankersley and Lyle 2019: 194). Settlements were becoming gradually less mobile and more sedentary and had an increased reliance on plant-based resources. This behavior is represented within many known sites in the southwest Ohio region including the Wesselman Farm Site and those in the surrounding area. There are many other similarities between the Wesselman Farm Site and other Archaic sites in the region which are discussed in the next chapter.

Chapter 3 Background

A review of relevant literature, collections, and records at the CMC in conjunction with an assessment of archaeological sites recorded in the Ohio Archaeological Inventory (OAI) maintained by the Ohio State Historic Preservation Office (SHPO), identified numerous Archaic sites within the region that share artifact assemblages like Wesselman Farm's assemblage.

3.1 Previously Recorded Archaic Sites and CRM Surveys Within One Mile of Wesselman Farm

A search of records maintained by the Ohio SHPO and the CMC identified that six archaeological sites and two prior cultural resource surveys within 1.61 kilometers (km, 1.00 mile [mi]) radius of Wesselman Farm. Four of these archaeological sites were discovered during a survey conducted in 1990 by the University of Cincinnati for a proposed wastewater treatment plant and do not date to the Archaic period

Adjacent to the wastewater treatment plant, to the east, is Site 33HA0174 that was recorded by Frederick Starr in 1958. Starr conducted one of the first professional archaeological surveys in southwest Ohio and published his research in *The Archaeology of Hamilton County Ohio* in 1960. Starr surface collected from a plowed field on the (then) farmstead where 33HA0174 was found. He talked with the local landowner who had collected artifacts from the area. Starr recovered limestone-tempered ceramic sherds, two stemmed points, a side-notched point, a Woodland leaf blade, a three-quarter grooved axe, and several pieces of lithic stone material. He also found a large quantity of bone and shell on the surface. He identified the site as having both Archaic and

Woodland period occupations. The information regarding Starr's survey was reviewed at the CMC, where the recovered materials were also re-examined by the author. The site was never investigated further, however the material assemblage reported by the landowner would suggest the site was a seasonal settlement.

The previously mentioned sites are located on lower terraces above Taylor Creek. The sixth site (33HA0367) was recorded by the Miami Purchase Association at 213.36 m (700 ft) of elevation on a high ridge top overlooking Taylor Creek, the second ridge back from the Great Miami River (Scheurer 1975). This is a similar elevation and topographic position as Wesselman Farm. At the time of this site's documentation, the landowner presented a large collection of precontact artifacts. Temporally associated with the Archaic period, the artifacts included projectile points, stone adzes, axes, slate gorgets and other miscellaneous materials. The site was recorded as a seasonal Archaic camp (i.e., seasonal settlement), but no additional archaeological work has occurred at the site

Starr reported numerous sites in the area during his reconnaissance surveys and through communication with local landowners. The cultural resources surveys that occurred within one mile of Wesselman farm either encountered archaeological sites or recommended avoidance of known sites. There have been no further archaeological surveys within the vicinity of the Wesselman Farm Site. The presence of these sites and lack of extensive previous surveys suggests that there may be the potential for more unrecorded archaeological resources in the area. These resources could be on the lower terraces along the waterways but also on the higher elevations. Site 33HA0367 represents the only site identified in the vicinity of Wesselman Farm that also occupies a ridge top.

As discussed previously concerning archaeological bias, there are more sites currently recorded in the lower areas than in the uplands.

3.2 Regional Archaeological Sites Potentially Associated to the Wesselman Farm Site

There are other sites within this region of extreme southwest Ohio that share many similarities to the Wesselman Farm Site and have the potential to be associated as part of the same pattern of seasonal migration. As established, Archaic settlements are not isolated occupations, they are a part of a network sites that served various roles within the larger Archaic settlement system. The location of the Wesselman Farm Site along a major waterway leads to a logical comparison of the site to others along the Great Miami River and the Ohio River. Nearby Late Archaic sites include Dravo Gravel, Mount Nebo, and DuPont. Figure 2 illustrates this area of extreme southwest Ohio and the placement of the Wesselman Farm Site in relation to these known archaeological sites and surrounding waterways.

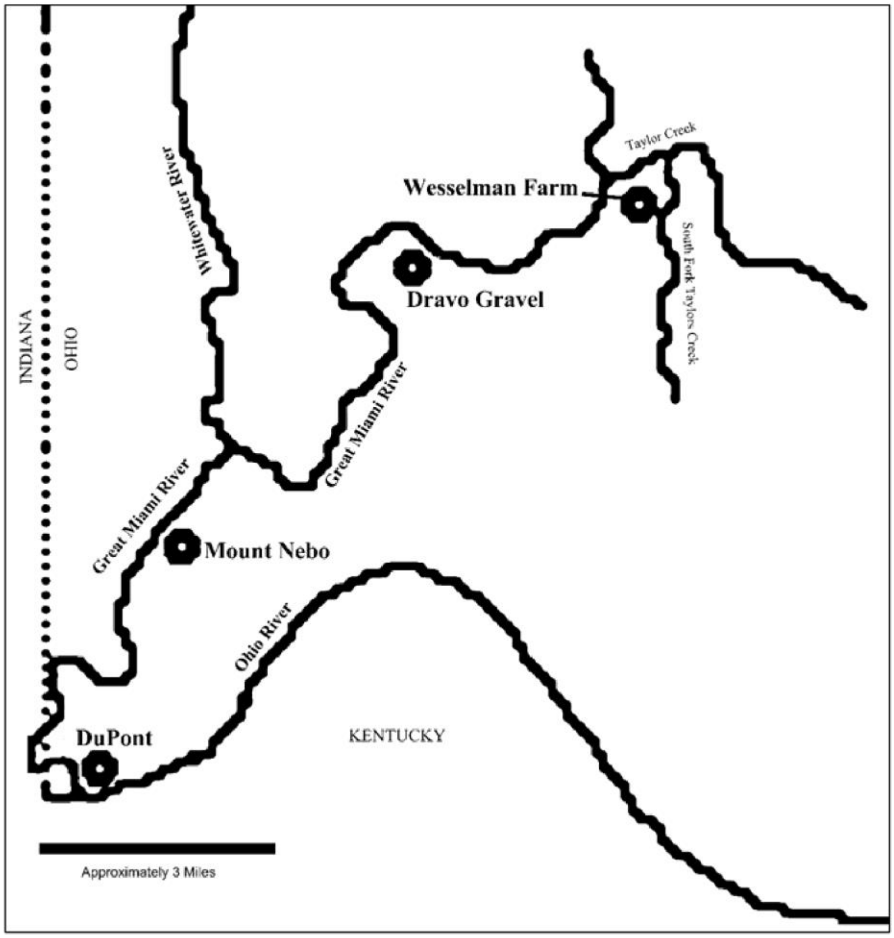

Figure 2. Wesselman Farm location in association with waterways and nearby major sites.

Dravo Gravel (33HA377) is an archaeological site located less than 4.0 km (2.5 mi) downriver on the Great Miami from the Wesselman Farm Site. In 1978, Dravo Gravel was added to the NRHP. Much of this site has been destroyed by massive gravel procurement operations designed to remove a deposit of highly desirable size gravel estimated at 30 m (100 ft) thick (Vickery 1977: 3). The NRHP nomination form (United States Department of the Interior 1978) filed with the SHPO describes the site as significant for yielding valuable information concerning the lifeways, and settlement patterns of the middle Late Archaic group in southwest Ohio. The materials recovered from Dravo Gravel are like those found at Wesselman Farm, particularly the McWhinney Heavy Stemmed, the most common point type found on Wesselman Farm. The site covers an area of 2.29 ha (5.70 ac) and was dated to 2340 ± 55 BP (Vickery 2009: 9-10). Only one radiocarbon date was collected from this site, so the occupation range may vary widely from this single date.

At the time Dravo Gravel was investigated by the University of Cincinnati, archaeologists studied the private collections amassed by a couple of local collectors (Vickery 1997). The private collections played a major role in understanding the site. The site was actively compromised by the gravel operations, and these collections provided insight on the site that would otherwise be lost. For example, the University's survey recovered 17 McWhinney points, private collections contained 137 McWhinney points. There were other Late Archaic point types, such as Big Sandy, Lamoka, and Brewerton that were only recovered by private collectors. This diversity within the Archaic point types would not be known without cooperation with the private collectors. Additionally, point types from the Early Archaic, Middle and Late Woodland, and Mississippian periods are only represented in the private collections.

There was a wide range of tools recovered and documented at Dravo Gravel, suggesting a wide range of activities. The site is characterized as a local base camp where smaller groups aggregated seasonally (Vickery 1977: 127). Vickery (1977) further described the role that Dravo Gravel had in the Archaic settlement system by connecting the site to others that had available literature at the time such as Twin Mounds Village, 33HA0043 (located adjacent to the north boundary of DuPont), DuPont (33HA0045) farther downriver at the junction of the Great Miami River and the Ohio River, and Bullskin Creek (33CT0029) farther east along the Ohio River in Clermont County. Mount Nebo (33HA0152) is between Dravo Gravel and Twin Mounds Village along the

Great Miami River and was officially surveyed 10 years after the Dravo Gravel excavations. Like Dravo Gravel, Mount Nebo had a strong Late Archaic context and reportedly dense, and possibly wider artifact distribution than Dravo Gravel. Unfortunately, the site never had the opportunity to be subsurface tested before its destruction.

In 1975, Mount Nebo was listed on the NRHP, and likely represents a local or regional base camp. This site is situated approximately 15.1 km (9.4 mi) south of Wesselman Farm, along the Great Miami River. At the time when it was recognized for National Register listing, it was described as one of the richest sites in the Lower Great Miami River Valley (United States Department of the Interior 1975). Voluminous amounts of cultural material were exposed on the ground surface every year after plowing (Pape and Cowan 1987). At Mount Nebo, the Archaic component of the site was concentrated on highest elevation area of the site, the western end overlooking the Great Miami River, along the rim of the Elizabethtown terrace (Pape and Cowan 1987). This terrace was at an elevation of 161.5 m (530 ft) above mean sea level.

The most comprehensive survey conducted at the site was carried out by the Cincinnati Museum of Natural History (now CMC) in 1987 (Pape and Cowan 1987). This survey involved a systematic surface collection, interviews with local collectors, and assessments of private collections. The Late Archaic materials from Mount Nebo are very similar to those discovered at Wesselman Farm. The site was interpreted as predominately Late Archaic but spans from the Paleoindian period to the Woodland period. The McWhinney point type was reported to be the most discovered tool. Ground stone tools such as mauls, grooved axes, and bell-shaped pestles were also discovered at the site. Frederick Starr (1960) reported that "…the many flint scrapers and points are identical to those found from the DuPont Site". Like Wesselman Farm, this material was discovered on the surface after plowing. A mound was reported at Mount Nebo and interviews conducted in 1987, at the time of the Museum's survey, revealed that although human bones were never identified within the Mount Nebo site boundary, they were frequently found north of the site boundary.

Unfortunately, the extent of the surface and subsurface deposits and features will never be known at Mount Nebo. The only formal investigations of the site consisted of surface collection. The site likely extended farther as suggested by the accounts of the collectors interviewed during the 1987 CMC survey, however, major gravel pit excavations and later use as fly ash landfill areas by the Cincinnati Gas and Electric Company have destroyed the areas bordering the site to the north, south, and east. In the late 1990s, the mineral rights for the land were sold to a gravel company and the entire area was unfortunately excavated over 15.2 m (50 ft) deep for gravel. The gravel company supposedly pushed all the topsoil containing the site context to the eastern extent of the property before mining the gravel (Personal communication with landowner 2021). The landowner reported that as this pile erodes, artifacts continue to be found and the family does have a collection of this material. The significance of this site can be best interpreted from its associated materials and records curated at the CMC.

Twin Mounds Village (33HA0043) is within the National Register District, Shawnee Lookout Archaeological District. In 1974, this approximately 809.37 ha (2,000.00 ac) district was added to the NRHP, and includes a summit enclosure, approximately 15 mounds, and multiple habitation areas from small seasonal settlements to multi-component villages (United States Department of the Interior 1974 [a]). Precontact occupation of this area spans over 10,000 years. The sites in this area were documented earlier by Holmes Ellis in 1942 and Stephen Frederick (Fred) Starr in 1958. In 1968, Fred Fischer of the University of Cincinnati led excavations throughout the area to record sites for the Hamilton County Park District. Fischer also corroborated sites that local collectors had reported finding precontact materials (Fischer 1968). Materials and information gathered during the survey and information from private collections were used to interpret the sites. Private collections from the entire area exhibited a wide range of artifacts including those attributed to the Archaic period. Twin Mounds Village is an upland site less than 1.61 km (1.00 mi) from DuPont and the relationship between the two sites is considered important to the Late Archaic settlement pattern (Dalbey 1977: 87). DuPont is also included in the Shawnee Lookout Archaeological District (United States Department of the Interior 1974 [a]).

DuPont is recognized as one of the largest Late Archaic sites in Ohio (4.61 ha [11.00 ac]). The site is approximately 23.03 km (14.32 mi) downriver from the Wesselman Farm Site. Like Dravo Gravel and Mount Nebo, the true extent of the site was never determined. The first archaeological investigation of DuPont was in 1955 as a salvage effort in response to construction activity by the DuPont Chemical Company (Dalbey 1977). Currently the land containing DuPont is owned by Duke Energy for their coal-fire electricity generating station. This station was in full operation by 1926 (Dalbey 1977) and it is unknown how much, if any of this site is intact.

Radiocarbon dates obtained from carbon samples at DuPont range 4485 ± 75 to 4100 ± 65 BP (Vickery 2009: 9-10). The site can be characterized as a large regional base camp. DuPont was likely a permanent settlement for precontact groups, although the entire population that occupied the site likely did not stay there year-round during the Archaic period (Vickery 2009). The site is very similar to Dravo Gravel and Mount Nebo, however much larger. DuPont continued to be occupied into the Woodland period (Struever and Vickery 1973: 1199).

Major sites such as DuPont, Mount Nebo, and Dravo Gravel were a unique network of seasonal and permanently occupied sites by hunter-gatherer (collector) groups some 4500-5000 years ago (Vickery 1977: 127). The use and distribution of these sites was dependent on a multitude of factors including available food and materials resources, transportation, climate, population, and topography. Settlement use of these sites may coincide with numerous smaller ancillary sites within the region.

There are several additional Archaic sites of various types that are recorded officially and unofficially along the Great Miami River within the 23.04 km (14.32 mi) between Wesselman Farm and DuPont. Starr (1960) mentions a few of these sites. Although Star's book was published over 80 years ago, upon review, it suggests that this area of southwest Ohio was intensively used during the precontact period and specifically during the Archaic period and through the Woodland period. Evidence of this Archaic occupation was mostly destroyed by the development and industrialization in the area, however private collections have some insight to offer. Private artifact collections have contributed significantly to many of the previously discussed sites and may also introduce new sites.

Chapter 4 Local Private Collections

Private collections in southwest Ohio contributed to the interpretation of nearly all sites mentioned in this paper. These collections may each hold their own bias; however, they can add to the archaeological interpretation. Collections can even inspire archaeological research (such as the Wesselman Farm private collection) and be recorded on the state's inventory. This chapter discusses some of the collections that contribute directly to this research. The most important is the private collection of Wesselman Farm.

4.1 The Importance of Working with Private Collectors

Private artifact collections have a lot to offer to our understanding and interpretation of the archaeological record. That is not to imply that artifact collection by private landowners should be encouraged, but simply that these existing collections could offer valuable information to archaeologists and researchers that would otherwise never be known within the scientific community. It is important to assess each opportunity to study these collections within each unique circumstance with an open mind.

Bonnie Pitblado (2014) discusses the importance of a collaborative approach between professional archaeologists and private landowners. Pitblado further discusses that the ethics associated with artifact collecting are as complex and nuanced as the people doing the collecting. She emphasized that collections offer valuable information to researchers and used an example of Clovis points by comparing what archaeologists' understanding of Clovis sites would be with and without collaboration with collectors. The result of this study illustrates that without the help from private collectors, archaeologists' understanding of Clovis-era people within the study area would be sparse and much less understood.

Private collections, from sites that were severely compromised or destroyed by development or industrial activity, before protective legislation was enacted or outside of the jurisdiction of the protective legislation have contributed significantly to the understanding of numerous precontact sites in extreme southwest Ohio. Archaeological excavations and interpretation of major nearby sites such as Dravo Gravel, Mount Nebo, Shawnee Lookout Archaeological District, and DuPont, that are discussed in Chapter 3, were heavily influenced by information shared by private landowners and collectors in their prospective areas. Private collections can provide a greater diversity of artifact classes and a greater range within types compared to a single recovery episode carried out by a formal archaeological investigation (Pitblado 2014). This is due to several reasons including collecting in various conditions and often following different plowing episodes throughout the seasons. It is more likely to produce a greater variety of artifacts within an assemblage as a collector than can be done on a day of a professional archaeological survey or entire Phase I investigation (Pitblado 2014).

The private collection of Wesselman Farm was accumulated by the family over the past nearly 80 years while farming and managing the land. Prior to this present research, there was no known digging with intent to search for artifacts on this property. Professional archaeologists have been unaware of this site and because the property is private, did not have the opportunity to investigate the area. The use of this property by precontact peoples may have never been realized and this research opportunity would not be possible had it not been for the landowner's fascination for history and preservation.

4.2 Private Artifact Collection from Wesselman Farmstead

Since the 1940s, a family has collected projectile points and ground stone tools while working the land at their farmstead. The artifacts were recovered by the landowner from various areas on the 15.38 ha (38.00 ac) farmstead. These locations include the summit overlooking the Great Miami River and two areas on the terrace above Taylor Creek and South Fork Taylor's Creek used for gardening adjacent to a bank barn and farmhouse. Most of the artifacts were discovered on the summit. while tilling for use as a cornfield, from the 1950s through the 1980s. The landowner's collection totals 32 artifacts. No records were kept of where on the farmstead or when each artifact was recovered; however, the landowner claimed that the majority of the chipped stone tools and all the ground stone tools were recovered from the summit. The landowner's artifacts were loaned to the researcher for the duration of the archaeological research. The collection was thoroughly cleaned, examined, and identified using relevant literature.

Most of these artifacts are diagnostic of the Archaic period and more specifically, the Late Archaic (8000 - 500 BC). A review of all the diagnostic projectile points collected by the landowner from the farm using Justice (1987) suggests that the date range for these points could span the entire Archaic period and into the proceeding Woodland period. The latter is represented by an Adena Stemmed point and a Lowe Flared Base point. Table 1 lists the artifacts within this private collection, and it is followed by Figures 3 and 4, with a selection of illustrated ground and knapped stone artifacts from the collection.

Table 1. Artifact assemblage of the private collection of Wesselman Farm.

Artifact	Quantity	Raw Material	Temporal Period
McWhinney Heavy Stemmed	6	Boyle (2), Breathitt (2), Laurel (3)	Late Archaic
Matanzas Side Notched	2	Brassfield	Late Archaic
MacCorkle Stemmed	1	Laurel	Early Archaic
Adena Stemmed	1	Laurel	Early Woodland
Lowe Flared Base	1	Boyle	Woodland
Lamoka	1	Laurel	Late Archaic
Untyped PPK	3	Upper Mercer Nellie Variety (1), Laurel (1), Unknown (1)	Probable Archaic
Biface	3	Breathitt (1), Laurel (1), Unknown chert (1)	Unknown
Flake	2	Laurel	Unknown
Modified Flake	1	Laurel	Unknown
Bell Pestle	3	Granite	Probable Archaic
Conical Pestle	1	Granite	Probable Archaic
Unknown Pestle/ Fragment	1	Granite	Probable Archaic
Pitted Hammerstone	1	Unknown hardstone	Probable Archaic
Full Grooved Axe	1	Tillite	Probable Archaic
Three Quarters Grooved Axe	2	granite	Archaic-Woodland
Full Grooved Maul	1	Unknown hardstone	Archaic -Woodland
Unknown Polished Round Stone	1	Unknown hardstone	Unknown
Total: 32			

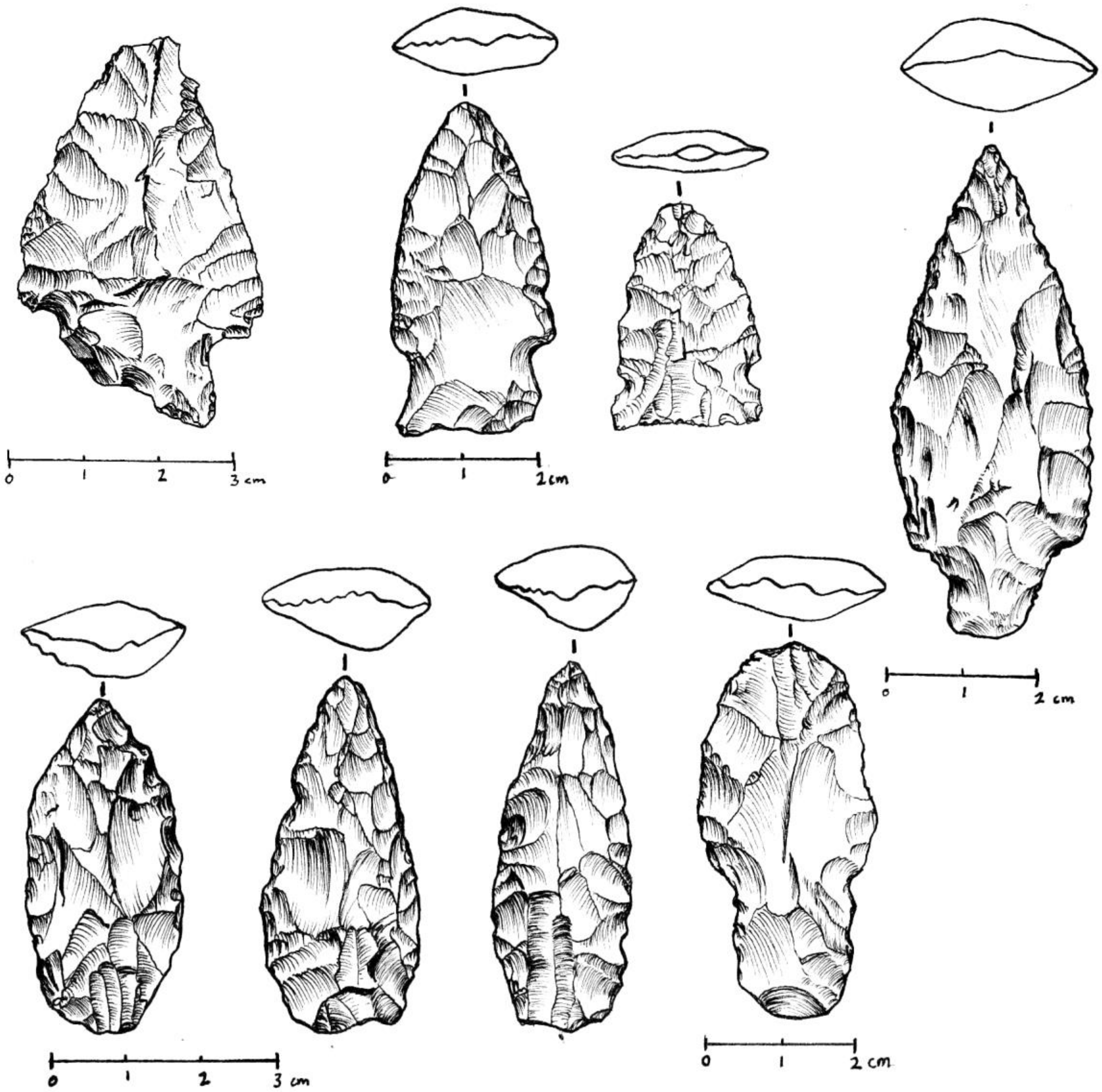

Figure 3. Selection of points from the private collection of Wesselman Farm.

Illustrated by the author; Top (left-right): MacCorkle Stemmed (earliest point, representing the Early Archaic period), Lowe Flared Base (Middle Woodland period), Matanzas Side Notched (Late Archaic period), McWhinney heavy Stemmed (Late Archaic period) Bottom (left-right): three unidentified points from the Late Archaic period (two are potential McWhinney points with broken bases) and an Adena Stemmed (Late Woodland period)

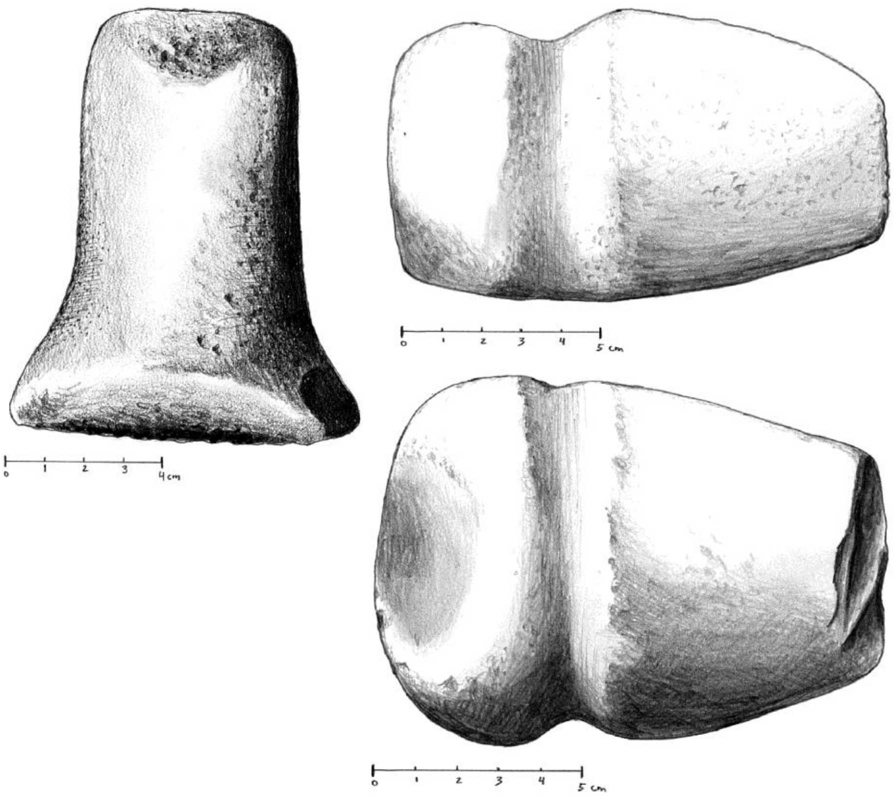

Figure 4. Ground stone pestle and axes from the private collection of Wesselman Farm.

Illustrated by the author; bell pestle exhibiting heavy use/grinding wear (left), full grooved axe, bit end broken (top right) and three-quarter grooved axe (bottom).

4.3 The Minges-Hammer Collection

In 2020, the CMC received a donated collection from the Minges family whom lived near Wesselman Farm and had discovered artifacts after tilling their agricultural fields. The collection consists of 79 chipped stone artifacts. on June 5, 2021, Marie Minges was interviewed to understand were and how the collection was amassed.

The artifacts were surface collected from the family farmstead on Forfeit Run Road, under a mile northeast of Wesselman Farm. The materials were collected, as they were exposed from plowing the field, adjacent to the farmhouse. This field is on a terrace on the south side of Forfeit Run. Forfeit Run follows a course for approximately 644.0 m

(0.4 miles) that was altered slightly by modern development and joins Taylor Creek just northwest of Wesselman Farm. The family continued collecting artifacts on the next generation farmstead on Blue Rock Road. This location is on a terrace on the south and west side of Blue Rock Creek north of Wesselman Farm. Blue Rock Creek menders 2.1 km (1.3 mi) northwest and flows into the Great Miami River.

The artifacts were collected from these two locations and their provenience was not recorded, so it is impossible to separate the two collection areas. Neither of these locations were recorded with the OAI. The collection represents the type of materials that landowners may find along tributaries of the Great Miami River near Wesselman Farm. This data suggests the presence of precontact peoples during the temporal periods represented by these point types. The collection was analyzed and sorted by temporal period using Justice (1987). Of the 79 chipped stone artifacts, many are complete or partial spearpoints (Table 2). The Paleoindian points consisted of two Clovis points. A selection of these points is illustrated in Figure 5 and represent the temporal span of the collection.

Table 2. Artifact assemblage of the Minges-Hammer collection.

Artifact	Quantity	Temporal Period
PPK	2	Paleoindian
PPK	48	Archaic
PPK	6	Woodland
PPK	3	Mississippian
PPK/Biface/Fragments	20	Unknown

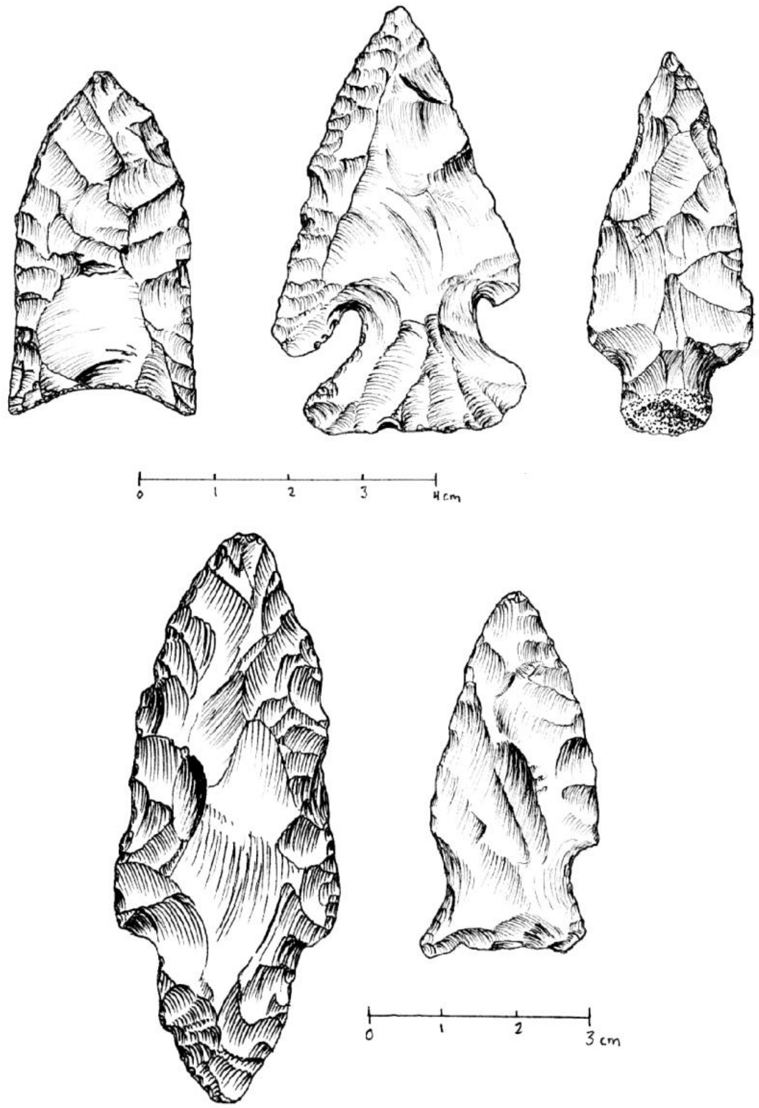

Figure 5. Selection of projectile points from the Minges-Hammer collection.

Illustrated by the author; Top (left-right): Clovis Cluster (Paleoindian period), Thebes Cluster (Early Archaic period), McWhinney Heavy Stemmed of the Late Archaic Stemmed Cluster (Late Archaic period), Bottom (left-right): Adena Stemmed of the Dickson Cluster (Early Woodland period), Lowe Cluster (Middle to Late Woodland)

The discovery of these artifacts suggests a continuous occupation of the terraces above tributaries of the Great Miami River from potentially the Paleo-Indian period to the Late Woodland period. Like the Wesselman Farm collection, the Archaic period, and specifically the Late Archaic period is represented in this collection. Additionally, the McWhinney stemmed point, of the Late Archaic period is the most found tool. Many of these chipped stone tools were crafted from locally available cherts and some retain pebble cortex indicating that the raw material was likely collected along the gravel beds of the local waterways.

In summary, a review of this collection suggests that there are many sites in this area that have the potential to contribute to our understanding of settlement patterns and distributions throughout the precontact period and especially the Archaic period. Like other sites within this area near Wesselman Farm, The Late Archaic period is strongly represented in the artifact collections. The greater representation of Archaic points could suggest a more intense occupation of the landscape during this time. Collections such as these as well as gathering information from local landowners can potentially contribute a significant amount of information to archaeologists' understanding of settlement patterns and site distribution in the southwest Ohio region.

Chapter 5 Archaeological Investigation of the Wesselman Farm Site

The archaeological investigation was led by the author. Geophysical survey, light detection and ranging (LIDAR) imagery, and test unit excavations were all important components in understanding of the Wesselman Farm Site. The geophysical survey was essential in identifying the potential boundary of the site and feature locations, and planning excavations. The survey methodology was designed to minimally impact the site. Certain areas of interest, revealed in the geophysical survey, were avoided, and include potential house structures that represent circular void patterns within the anomalies. These potential house structures will remain intact for preservation and future interpretation. Artifacts recovered from the survey were analyzed and interpreted by the author.

The methodology of the archeological excavation is presented in Appendix A. The artifacts recovered from the field and/or borrowed from the landowner were cleaned, sorted, and cataloged. Following the initial processing procedures, cultural material was separated into material type and functional groups. The analysis methodologies are presented in Appendix B. The site coordinates, magnetic gradient data, maps, and site plans are excluded from this document in effort to maintain site security, however they will be curated permanently at the CMC with the complete excavation records and artifacts.

5.1 LIDAR Imagery Review

It can be difficult to identify earthen features on the ground from a ground-level vantage point. The summit, where Wesselman Farm is situated, is the highest point near the junction of the Great Miami River and Taylor Creek. Earthworks and earthwork enclosures are recorded at topographical positions and locations such as this in southwest Ohio. LIDAR imagery was referenced to determine if the Wesselman Farm area had retained any evidence of such a feature.

Earthwork sites such as Fortified Hill (33BU0031) and Miami Fort (33HA0004), in southwest Ohio are listed on the NRHP (Squier and Davis 1848; United States Department of the Interior 1974 [a], [b]). Fortified Hill is an earthwork enclosure with mounds located approximately 17.7 km (11.0 mi) to the northeast on the west side of the Great Miami River. Miami Fort is a summit enclosure of stone and earthen embankments within the Shawnee Lookout Archaeological District located approximately 14.5 km (9.0 mi) to the southwest.

LIDAR data provided online by the Ohio Geographically Referenced Information Program was processed using quantum geographic information system software (QGIS) in efforts to better interpret the topography of Wesselman Farm and determine if there are any such artificial landforms, earthworks, or mounds visible on LIDAR imagery. There were no such earthen features identified from this data (see Figure 6).

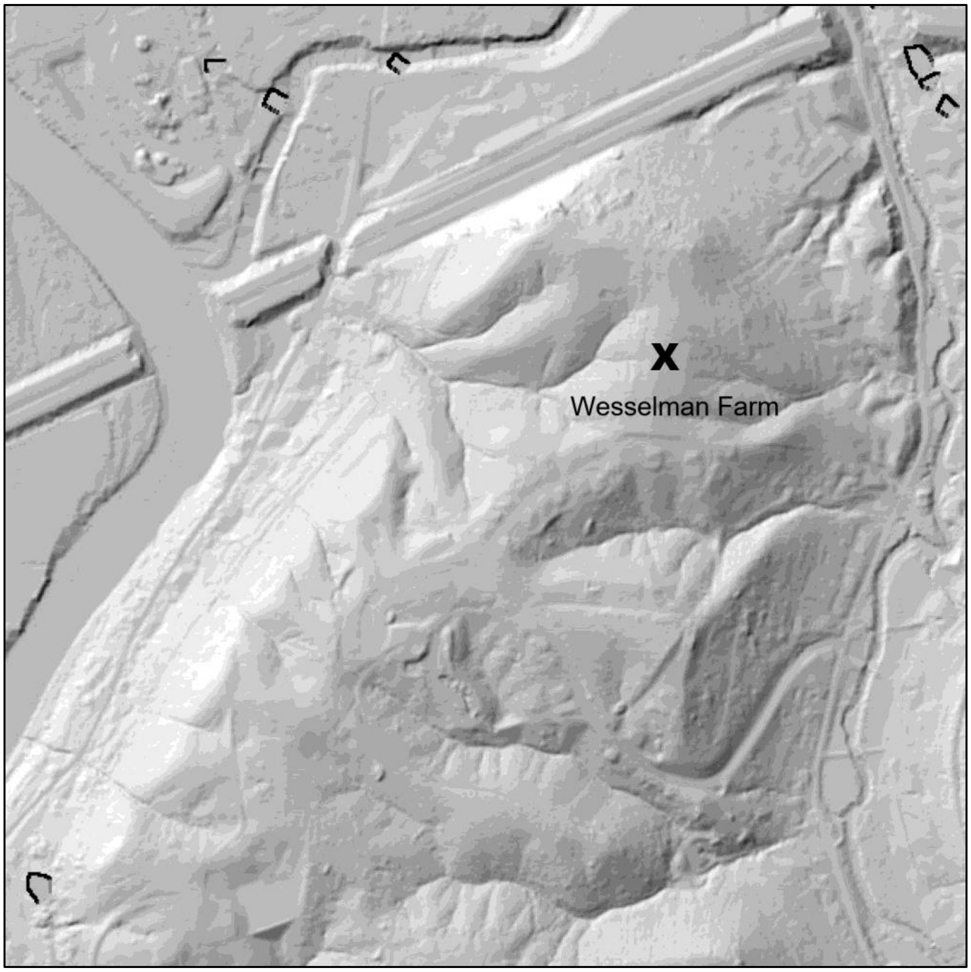

Figure 6. LIDAR imagery of the Wesselman Farm Site and surrounding area.
Produced by the author.

Although the results can be disappointing, it is relevant within the framework of researching the Wesselman Farm Site to determine if earthen features could exist on this landform. This summit has had a long history of plowing that may have destroyed any surface-visible features. This disturbance is seen on the imagery as a flattened area bordered by push dirt from the plow creating linear outer edges of the agricultural field. Geophysical survey methods using magnetic gradient instruments can detect subsurface features even after regular plowing. The geophysical survey did not identify any evidence of earthen mounds, man-made landforms, or earthworks. The survey did identify subsurface features that are discussed in the next section.

5.2 Geophysical Survey Results

On August 1, 2021, the geophysical survey was conducted at the Wesselman Farm Site. The purpose of the survey was to determine the potential for archaeological features or deposits in an area of the farmstead where the landowner had found the most surface finds. The geophysical survey methods and subsequent planning for the archaeological investigation are described in Appendix A, Methods. The magnetic gradient instruments used for the geophysical survey involved several spatially separated sensors fixed to a cart that was systematically pushed across the field following a grid system until the desired amount of ground was surveyed. The device sent data to a fixed base station and used a Real Time Kinematics (RTK) Global Positioning System (GPS). The sensors on the cart measured the gradient of the magnetic field or the difference between the paired sensors. Materials and subgrade disturbances can cause a disruption in the Earth's magnetic field that the sensors detect. Some materials react very strongly to the sensors such as metal, brick, burned soil, and burned igneous and metamorphic rock (especially from ovens and hearths). The instrument also detects subtle anomalies such as soil disturbances or concentrations of decayed organic materials

Approximately 1.5 ha (3.7 ac) were surveyed on the summit, or hilltop portion of the farmstead. Review of the data collected resulted in the identification of approximately 322 anomalies clustering in an area encompassing approximately 0.55 ha (1.35 ac). The anomalies could include precontact deposits and features, historic deposits, or be spurious anomalies. Anomalies need to be investigated further before considered as an archaeological feature. Figure 7 shows the results of the magnetic gradiometry survey.

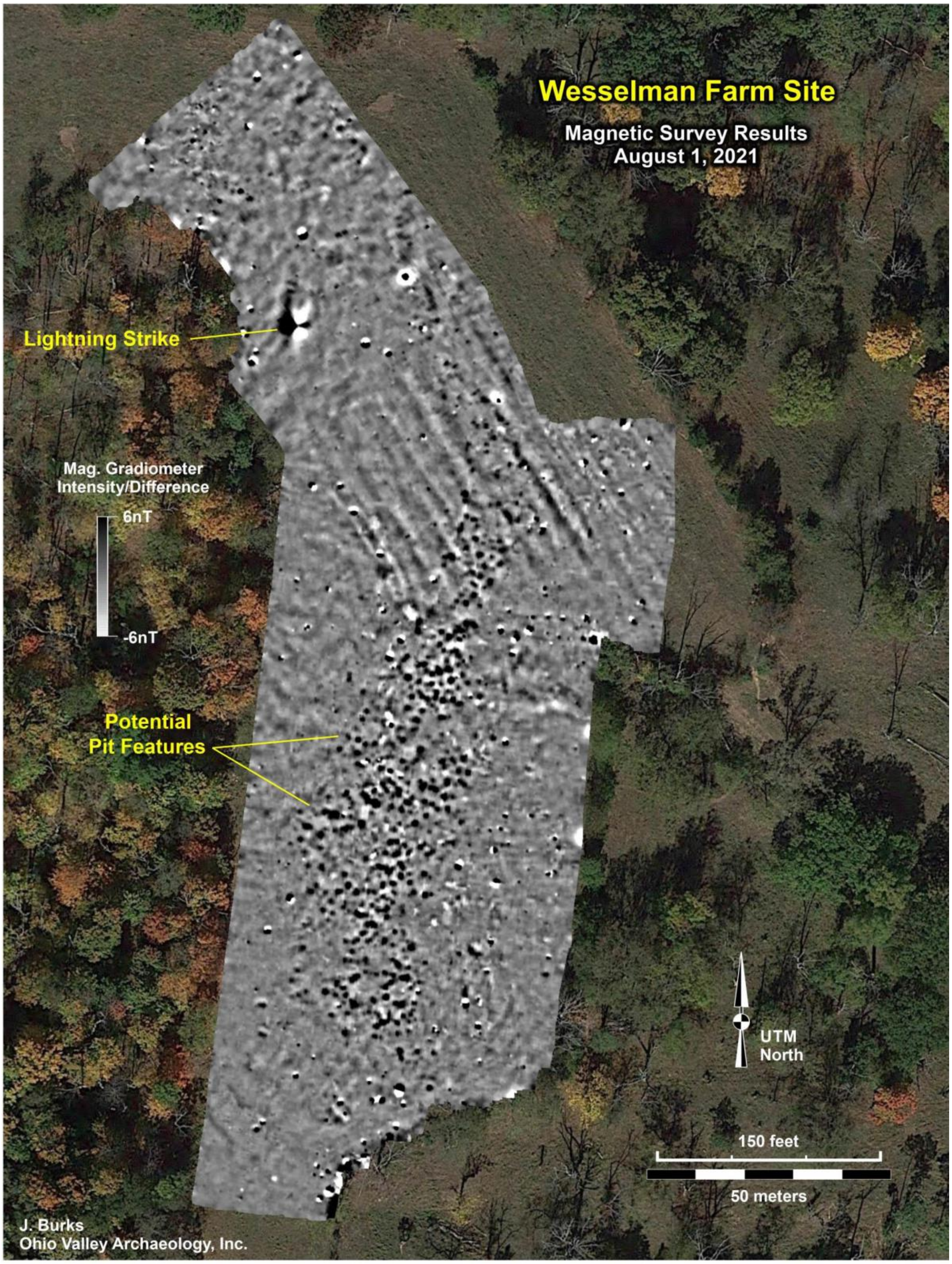

Figure 7. Geophysical survey map showing magnetic gradiometry results.
Dr. Jarrod Burks of Ohio Valley Archaeology Inc. (used with permission)

The anomalies represent a wide range of magnetic strength. Precontact features likely include earth ovens, roasting pits, storage pits, middens, burials, and several other types of pit features that were also used as refuse pits or were filled back in by natural processes. Superimposition of some of the anomalies or potential pit features suggest that the site was possibly occupied repeatedly over an unknown span of time. On November 15, 2021, a selection of the anomalies was located and flagged for potential excavation. The archaeological investigation, discussed in the next section, validated some of the anomalies as precontact features and supplied data to interpret the purpose, chronology, and degree of occupation on this landform.

5.3 Archaeological Excavation of the Wesselman Farm Site

To gain an understanding of what the anomalies were in the magnetic gradiometry data, a 20 x 20 m (65.6 x 65.6 ft) area was selected within a portion of the site near the center of the anomaly cluster. Within this block, 20 anomalies were selected for additional investigation and sampled using a soil sample probe measuring 3.81 centimeters (cm) (1.50 inches [in]) in diameter. The soil probe was taken to a depth of non-cultural stratigraphy or to the estimated base of the anomaly. For probing, a central sample was taken from the anomaly and in each cardinal direction. The samples were evaluated to determine which anomalies to excavate. Soil probes were examined for considerations of depth of feature matrix and presence of burned material that could provide radiocarbon dates.

The features with the greatest depth of cultural deposits and the likelihood to contain high amounts of cultural material and carbon were selected. Following this sampling procedure, three anomalies were ultimately selected for an archaeological excavation. Two excavation units were placed to capture a portion of three anomalies. The field methods are described in more detail in Appendix A, Methods. Figure 8 shows the block, grid pattern, unit placement, and features selected for probing and excavation.

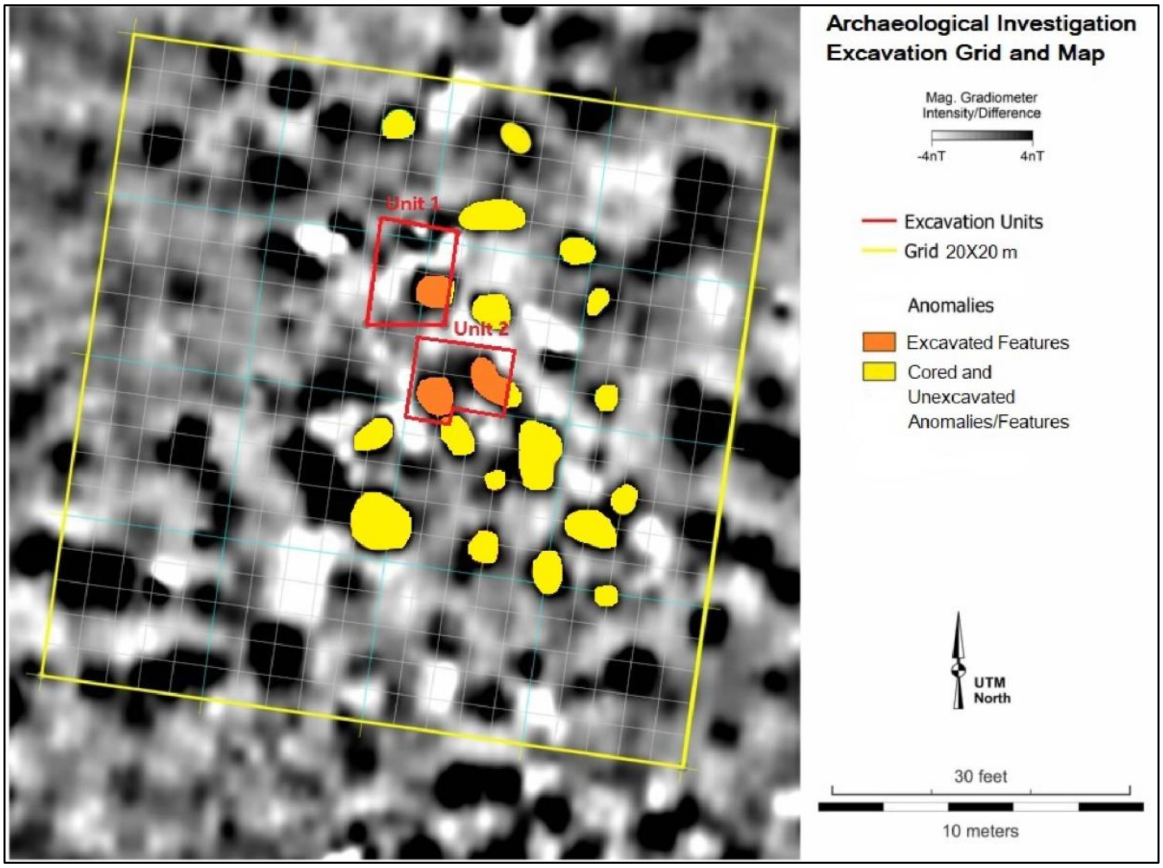

Figure 8. Archaeological investigation grid and map.
Dr. Jarrod Burks (used with permission) and edited by the Author

Unit 1 was a 3.0 m x 2.5 m (9.8 x 8.2 ft) block that contained one anomaly. The anomaly was identified as a single pit feature and designated Feature 1. Unit 2. began as a 2.0 m x 3.0 m (6.6 x 9.8 ft) block and was extended by 0.5 m (1.6 ft) to the south. Unit 2 contained two anomalies and excavation revealed that one of the anomalies included three distinct pit features and the other represented two pit features. The features were designated 2A, 2B, 2C, and 3A, 3B (non-pit feature). and 3C. The northwestern portion of the unit remained unexcavated below the plow zone due to time constraints. The plow zone within both units was approximately 32.0 cm (12.6 in) deep and is described following the discussions of the features. Each feature and associated contents are described in the following subsections. Illustrations of Unit 1 and Unit 2 are presented in Figure 9 and Figure 10.

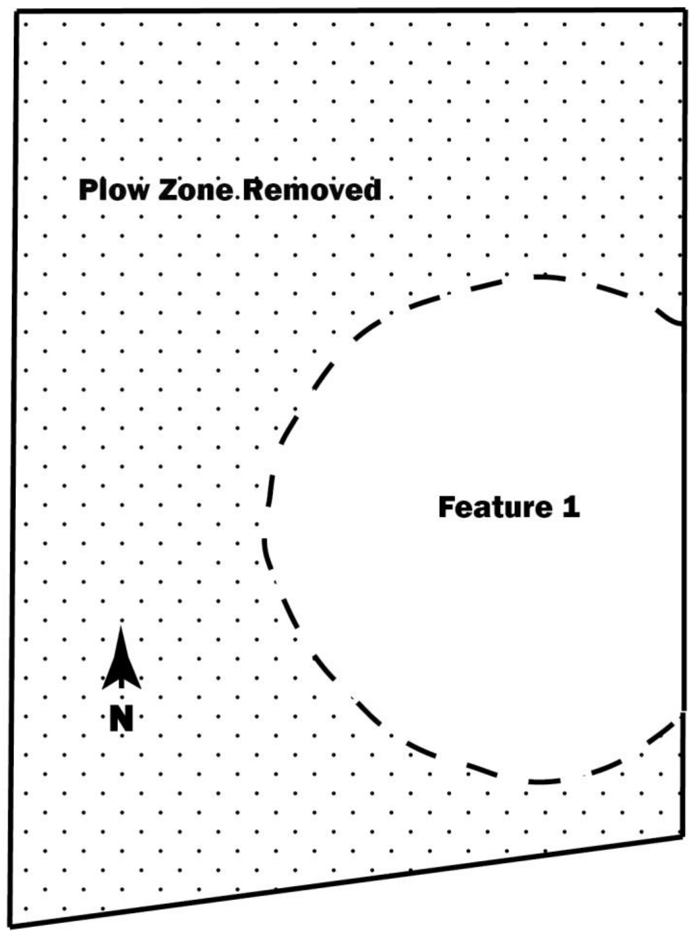

Figure 9. Unit 1 plan view.
Produced by the author.

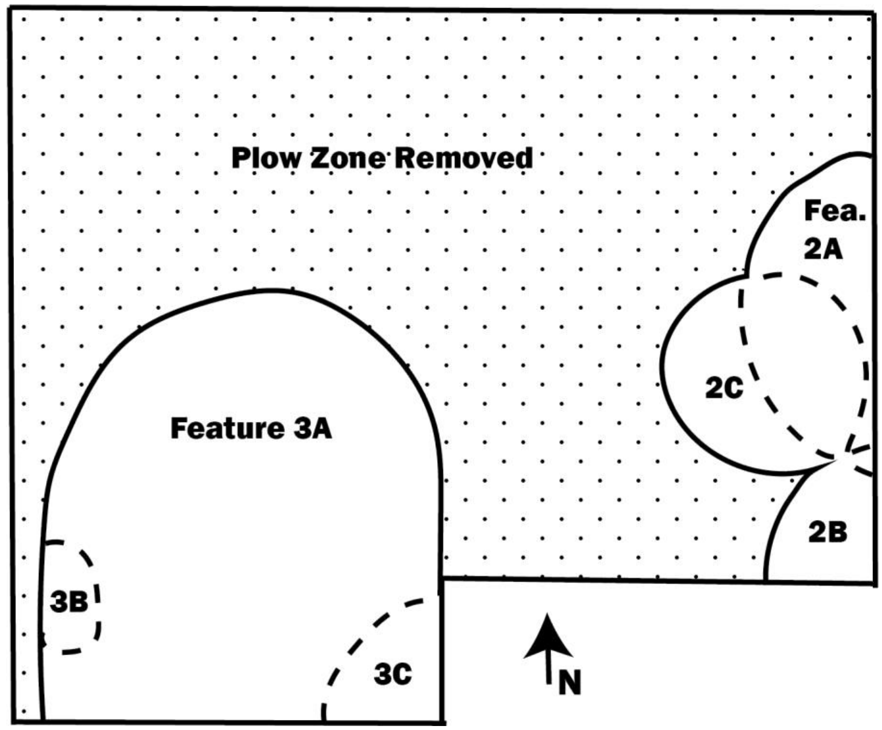

Figure 10. Unit 2 plan view.
Produced by the author.

1.5.3 Feature 1

Feature 1 is located within Unit 1 and a portion of the feature extends east outside of the unit. The feature represents a low-density refuse pit containing debris from fire or cooking features, knapping waste, and food waste. Feature 1 may have been initially used as a storage pit. The feature is nearly circular at the opening and just under 2.0 m (6.6 ft) in diameter. The exterior walls of the pit taper inward gradually from the top until 50.0 cm (19.7 in) below the surface and drop steeply and narrow to a flat base at 74.0 cm (29.1 in) deep with a basal dimeter of approximately 60.0 cm (23.6 in). The feature presented at the top as a cluster of burned limestone. Upon excavation, the burned limestone was random and dispersed throughout the fill but heavier at the top. A total of 10.4 kilograms (kg; 23.0 pounds[lbs.]) of burned limestone and 0.45 kg (1.00 lbs.) of fire cracked rock (FCR) was dispersed within the feature.

Stratigraphically, the pit consisted of two horizons that follow a basin-shaped profile. Horizon A is an organically stained brown (10YR 4/2) silty clay loam that reaches a maximum depth of 62.0 cm (24.4 in) the center of the pit. This horizon containes the most artifacts and burned limestone. Horizon B is a yellowish brown (10YR 5/4) silty clay, slightly mottled with brown (10YR 4/2) silty clay. The soil includs heavy amounts of charcoal flecking, with fewer artifacts and burned limestone. Figure 11 depicts Feature 1 with the southern bisect removed, exposing the shape of the pit and the feature's stratigraphy.

Figure 11. Feature 1, southern bisect removed.
Photograph by the author.

Recovered cultural material, from the feature fill, include debitage, flake tools, and botanical and faunal remains. These materials were more concentrated in the upper portions of the pit but were generally mixed into the entire fill. A fragment of carbonized nut hull was collected from the base level of the feature, 62.0 – 74.0 cm deep (24.4 – 29.1 in). This sample dates to 4080 ± 30 BP (Beta - 618775; Carbonized nut hull; δ13C = −25.4‰) 2857 - 2492 cal BC (p = 0.95 Calibrated at 2σ with the program INTCAL20 [Ramsey 2009; Reimer, et al., 2020]). In comparison to the other features discussed below, Feature 1 contains the least number of artifacts in relation to fill volume. The artifacts recovered from Feature 1 are listed in Table 3.

Table 3. Artifact assemblage for Feature 1.

Artifact	Quantity
Stone Tools	**Count**
Modified Flake Tool	2
Unmodified Granite Cobble	1
Ground Stone Tool Fragment	1
Debitage	**Count**
Abraded	14
Complex	62
Cortical	63
Dihedral-faceted	19
Flake Fragment	167
Flat	51
Multifaceted	30
Shatter	31
Indeterminate	7
Faunal	**Count**
Polished (possible awl)	2
Fish Scale	1
Turtle (unburned)	5
With Cut Marks (burned)	1
Various Unburned (mostly Deer)	95
Various Burned (mostly Deer)	37
Burned and Heat Fractured Rock	**Weight (kg)**
Burned Limestone	10.4
FCR	0.09
Other	**Weight (g)**
Fired Clay/Burned Soil Fragments	18
Carbonized Wood and Nut	28.1

2.5.3 Feature 2A

Feature 2A is within Unit 2 and extends beyond the unit's eastern wall. Approximately half of the feature was excavated. The feature is estimated to be a circular pit that measures 1.0 m (3.3 ft) in diameter at the top. The feature represents a refuse pit to dispose of waste produced by creation, use, and maintenance of cooking features and possibly nearby earth ovens. The walls of the pit taper inward gradually from the top until 50.0 cm (19.7 in) below ground surface then drop steeply and narrow to a flat base at 88.0 cm (34.6 in) deep. The basal dimeter is approximately 55.0 cm (21.7 in). The feature was identified just under the plow zone as a dense and centrally located cluster of heavily burned limestone. A section of Feature 2B intruded into the southern portion of Feature 2A but was not distinguished as a separate feature until 58.0 cm (22.8 in) below ground surface. Since such a small portion of Feature 2B was excavated and most fill materials were focused near the central cluster of burned rock in Feature 2A, the materials excavated to 58.0 cm (22.8 in) below surface are considered as part of Feature 2A. Feature 2A is pictured below in the eastern wall of Unit 2 (Figure 12) and labeled "A".

Figure 12. Unit 2 facing east wall, Features 2 A, B, and C.
Photograph by the author.

The deposition of materials, within Feature 2A, is concentrated in the center of the pit 38.0 – 58.0 cm (14.9 - 22.8 in) below ground surface. Two horizons are present within the feature. Horizon A is an organically stained dark grayish brown silty clay to a depth of 68.0 cm (26.8 in) below the surface. Horizon B is a brown (10YR 4/2) silty clay mottled with yellowish brown (10YR 5/4) clay and included heavy amounts of charcoal flecking, but with fewer artifacts and burned limestone than Horizon A. The artifacts recovered from Feature 2A are listed in Table 4.

Table 4. Artifact assemblage for Feature 2A.

Artifact	Quantity
Stone Tools	**Count**
Drill	1
Modified Flake Tool	2
Graver	1
Bladelet	1
Unmodified Flake Tool	1
Debitage	**Count**
Abraded	3
Complex	32
Cortical	9
Dihedral-faceted	7
Flake Fragment	48
Flat	17
Multifaceted	6
Shatter	17
Indeterminate	6
Faunal	**Count**
Polished Bone Fragments	2
Polished Bone Needle or Hair Pin	1
Fish vertebra (burned)	1
Turtle (unburned)	5
Turtle (burned)	4
With Teeth Marks (burned)	1
Various Unburned (mostly Deer)	58
Various Burned (mostly Deer)	93
Burned and Heat Fractured Rock	**Weight (kg)**
Burned Limestone	35.38
FCR	1.36
Other	**Weight (g)**
Fired Clay/Burned Soil Fragments	4.4
Carbonized Wood and Nut	16.2

3.5.3 Feature 2B

Only a small portion of Feature 2B was excavated. The feature is in the southeastern corner of Unit 2 and intruded into the outer perimeter of Feature 2A. Feature 2B is likely shallower than feature 2A and reached a depth of 68.0 cm (26.8 in) below ground surface within the unit. Feature 2B was not recognized as separate from Feature 2A until a depth of 58.0 cm (22.8 in) below ground surface when it was identified as a cluster of burned limestone. As a result, only the materials excavated 58 - 68 cm (22.8 –

26.8 in) below ground surface are considered exclusively from Feature 2B. Recovered materials include two broken flakes, six bone fragments (one unburned and five burned), 1.13 kg (2.50 lbs.) of burned limestone, and 0.2 g (< 0.1 oz) of carbonized nut hulls. The shape and diameter of Feature 2B is indeterminate due to the limited excavation. The feature is labeled as “B” in Figure 12.

The soil colors and are consistent with the B Horizon of Feature 2A. Feature 2B was also likely a refuse pit for waste materials produced from cooking and processing activities. No temporal diagnostic materials were present within the feature fill.

4.5.3 Feature 2C

Feature 2C was deposited before Feature 2A and Feature 2B. Feature 2A intrudes nearly the entirety of Feature 2C, of which only 14.0 cm (5.5 in) remained undisturbed beneath Feature 2A. Feature 2C is possibly the base of an oven considering its depth and that it contained evidence of *in situ* burning. The base of the feature was identified 92.0 cm (36.2 in) below ground surface and was flat and circular with a diameter of 65.0 cm (25.6 in). The soil is a dark gray (10YR 4/1) silty clay mottled with a brown (10YR 4/3) silty clay. This feature contained heavy amounts of wood charcoal flecks and larger fragments (7.2 g [0.3 oz] collected), a few slabs of very badly burned limestone (approximately 680 g [24 oz[), one biface fragment, very sparse amounts of debitage (*n* = 6) and burned faunal bone and turtle carapace fragments (*n* = 7). A sample of wood carbon was collected from the floor of this feature dates to 4330 ± 30 BP (Beta - 618776; Wood carbon; δ13C = n/a) 3021 - 2891 cal BC (p = 0.95 Calibrated at 2σ with the program INTCAL20 [Ramsey 2009; Reimer, et al., 2020]). The base of the feature and its relationship to Features 2A and 2B are depicted in Figure 12 and labeled as “C”.

5.5.3 Feature 3A

Feature 3A is the largest feature encountered and was not completely excavated. The southern portion of Unit 2 was extended 0.5 m (1.6 ft) to capture more of the feature, as well as Feature 3B (discussed in the next section). However, the feature continues outside of the extension into the south wall and likely connects to another anomaly present in the magnetic gradient data (see Figure 8). Feature 3A is estimated to be an oval or kidney bean shaped pit feature used as a refuse pit for waste created from maintenance and use of cooking features and earth ovens. The profile of Feature 3A is basin-like with steep sides that slop to a wide and flat bottom. The excavated portion extends 1.5 m (4.9 ft) from the southern wall and is 1.35 m (4.4 ft) wide. The floor of the feature begins to taper up toward the south wall, so it is estimated that approximately three fourths of the feature was encountered within Unit 2 and excavated.

The top of the feature was identified below the plow zone as a centrally located large and dense cluster of burned limestone. Upon excavation, the cluster of burned limestone in the center of the pit was densely packed with little fill between the stones. In addition, much of the limestone was so badly burned that it crumbled under the trowel. The density of limestone was relatively consistent up to a depth of 63 cm (24.8 in) below the surface where it decreased significantly toward the base of the feature at 78 cm (30.7 in) below surface. Over 123 kg (273 lbs.) of burned limestone was contained within the feature, although a significant amount crumbled upon excavation and could not be weighed.

Clear horizons were not identified within the feature. The fill is generally a brown (10YR 4/3) silty clay, however there were some subtle changes with slight yellowish clay mottling along the edges of the pit. The center of the pit is more organically stained and darker grayish brown. The bottom 15.0 cm (5.9 in) of the pit is slightly mottled with a yellowish brown (10YR 5/4) clay. The feature is depicted in Figure 13 as “A” before the south wall was extended. The cluster of burned limestone can be seen in the south wall as well as the general shape of the feature. The “B” marks Feature 3B that is discussed in the next section.

,

Figure 13. South wall of Unit 2 before extension, Feature 3A and Feature 3B.
Photograph by the author.

Most of the artifacts were in the central portion of the feature, with the dense rock cluster. Artifacts were noted in lesser quantities outside of this central portion. Feature 3A contained the greatest variety of artifacts recovered during the entire excavation effort at the Wesselman Farm Site. These artifacts include a nearly complete carapace bowl, a perforated shuttle or hair pin with a broken tip, a McWhinney point and partial points, a portion of a polished bone bead, and several polished bone and awl or perforator fragments. Burned and unburned faunal and turtle bone fragments, debitage, flake tools, and botanical remains including carbonized nut hull were also recovered. A fragment of carbonized hickory nut hull found in the center of the rock cluster with the turtle carapace bowl was selected for radiocarbon dating. The hull dates to 4120 ± 30 BP (Beta - 617416; Carbonized nut hull; $\delta 13C = -24.1‰$) 2868 - 2577 cal BC ($p = 0.95$ Calibrated at 2σ with the program INTCAL20 [Ramsey 2009; Reimer, et al., 2020]). A breakdown of the artifacts recovered from Feature 3A is presented in Table 5.

Table 5. Artifact assemblage for Feature 3A.

Artifact	Quantity
Stone Tools	**Count**
McWhinney Heavy Stemmed	2
Unknown PPK Fragment	1
Biface	4
Modified Flake Tool	14
Hammerstone	1
Ground Stone Tool Fragment	1
Cores	**Count**
Core Fragment	4
Debitage	**Count**
Abraded	7
Complex	129
Cortical	70
Dihedral-faceted	16
Flake Fragment	212
Flat	79
Multifaceted	94
Retouch	1
Shatter	48
Indeterminate	51
Faunal	**Count**
Carapace bowl (partially mended)	1
Perforated Shuttle	1
Polished Bone Fragments	5
Polished Bone Bead	1

Artifact	Quantity
Fish (Burned and unburned)	1 (vertebra), 1 (fish scale)
Turtle (unburned)	55
Turtle (burned)	21
With Teeth Marks (burned)	1
With Cut Marks	5
Mussel Shell	2
Various Unburned (mostly Deer)	297
Various Burned (mostly Deer)	203
Burned and Heat Fractured Rock	**Weight (kg)**
Burned Limestone	123.8
FCR	0.68
Other	**Weight (g)**
Fired Clay/Burned Soil Fragments	16.9
Carbonized Wood and Nut	10

6.5.3 Feature 3B

Feature 3B is a dog burial present within the pit refuse designated as Feature 3A. The burial appeared to be deposited on the outer edge of the base of Feature 3A and is considered a separate feature because the burial may be a separate event from the deposition of the feature fill. The dog was placed in a curled position, with its back to the fill 65.0 – 78.0 cm (25.6 – 30.7 in) below ground surface. The base of the burial shared the same floor as the main feature. The cranium was initially discovered in the south wall of Unit 2 (as indicated "B" in Figure 13) and this portion of the south wall in Unit 2 was extended by 0.5 m (1.6 ft) to capture the rest of the burial.

A piece of burned limestone was beneath the dog, wood charcoal was among the remains, and burned limestone was atop of the dog with feature fill material. The remains were mostly *in situ* and articulated except the pelvis, which was shifted out of place. An explanation for this movement could not be discerned. The dog was surrounded by feature fill material. One of the dog's humeri bones was submitted for radiocarbon testing. The result was a date of 4100 ± 30 BP (Beta - 617417; Bone; δ13C = − 20.6‰)

2864 - 2500 cal BC (p = 0.954 Calibrated at 2σ with the program INTCAL20 [Ramsey 2009; Reimer, et al., 2020]). The burial is represented in Figure 14 and Figure 15. The cranium was removed from the wall of the unit before the expansion and thus not articulated with the remains at the time the photos were taken.

Figure 14. Feature 3B dog burial within Feature 3A.
Photograph by the author.

Figure 15. Feature 3B dog burial detail view.
Photograph by the author.

7.5.3 Feature 3C

Feature 3C is a feature that was partially excavated with Feature 3A. The sequence of deposition of this feature and Feature 3A could not be determined. This feature contained homogenous material like that recovered from 3A and was not from Feature 3A until cleaning the east wall of the extension in Unit 2 for photographs. The feature was identified as a small cluster of limestone on the outer rim of Feature 3A in the east wall of the Unit 2 extension (see Figure 13, labeled “C”). This feature was represented as an anomaly in the magnetic gradient data just southeast of Feature 3A. Only the outer edge of this feature was estimated to have been excavated with Feature 3A and thus the complete size, shape, as well as the feature type is not determined. A whole

Archaic point, that shares characteristics from Early Archaic Kirk Corner Notched and Mid-Late Archaic Brewerton Corner Notched types was recovered from the east wall of the extension within the small rock cluster approximately 45.0 cm (17.7 in) below ground surface. The point was manufactured from Cedarville-Guelph chert. A sample of carbonized walnut hull was also collected in association. The nut hull radiocarbon dates to 4110 ± 30 BP (Beta - 618774; Carbonized nut hull; $\delta 13C = -25.1‰$) 2867 - 2573 cal BC ($p = 0.95$ Calibrated at 2σ with the program INTCAL20 [Ramsey 2009; Reimer, et al., 2020]). Based on the radiocarbon date, the point is more likely to be a Brewerton Corner Notched type from the Late Archaic period. The single point and the carbon sample were the only materials collected that were identified as originating from Feature 3C. The point is illustrated in Figure 16.

Figure 16. Brewerton side notched point.
Illustrated by the author.

8.5.3 Plow Zone

The plow zone for the Units 1 and 2 extends to a depth of approximately 30.0 – 35.0 cm (11.8 -13.7 in) below ground surface. The plow zone material from Unit 1 was 90 % screened and the plow zone material from Unit 2 was 50 % screened. The two units are discussed together since they are positioned within 0.5 m (1.6 ft) from each other, and the materials recovered from both were very similar. The plow zone contained nearly all the diagnostic point types recovered from the excavations at Wesselman Farm. These points potentially spanned the entire Archaic period. A portion of a possible St. Albans point dates approximately to 8900 - 8500 BC (Justice 1987:90), within the Early Archaic period. The point is burned and possibly of Brassfield chert. The McWhinney Heavy stemmed points (4000 - 1000 BC) (Justice 1987: 138) and the Matanzas Side Notched point (3700 - 2000 BC) (Justice 1987: 119) are considered to date to the Late Archaic period and appear to be mostly of Laurel chert.

A sparse amount of pottery was collected from the plow zone, but not found within the context of any undisturbed feature fill. The fragments were poorly preserved, as expected due to the proximity to the surface and history of plowing. FCR rarely occurred within the feature fill but was more commonly found in the plow zone than burned limestone. For this project, FCR is defined as hardstone such as ingenious rock that was often heated for cooking or boiling (and suffered subsequent heat fracture) and burned limestone is defined separately since it was not typically used for boiling but was commonly used as a heat source for cooking pits. It is important to note that the landowner reported he collected and disposed of the larger stones as the plow struck them. The occurrence of FCR and burned limestone at or near the ground surface may have been originally much higher. The plow zone also contained the majority of the debitage. These materials were likely displaced from the features by agricultural activity or deposited separately from the features. The artifacts recovered from the plow zone in both units are detailed in Table 6.

Table 6. Artifact assemblage for plow zone materials.

Artifact	Count
McWhinney Heavy Stemmed	8
Matanzas Side Notched	1
St. Albans	1
Karnak Unstemmed	1
Unknown PPK Fragment	5
Biface	47
Drill	4
Core	13
Modified Flake Tools	65
Unmodified Utilized Flake Tools	20
Debitage	6,029
Pottery	13
Various Burned and Unburned Bone (mostly Deer)	106
Carbonized Botanical	---

Chapter 6 Analysis and Interpretation

A discussion of the data collected during the archaeological investigation follows. The magnetic gradient data, archaeological features, and artifacts recovered from the site all contribute to the interpretation of Wesselman Farm. The data collected during the archaeological investigation provides the necessary information to interpret and begin to understand the activities that occurred at this site and place it within the Archaic settlement system.

6.1 Feature Distribution and Interpretation

The archaeological investigation revealed that many of the anomalies identified following the geophysical survey could be clusters of features. Of the 20 anomalies within the 20.0 m x 20.0 m (65.6 ft x 65.6 ft) block, only one was suspected to be non-cultural following the soil sample survey. Three of the anomalies were selected for partial or full excavation and they were discovered to be six different pit features. Some of these features intruded on each other indicating repeated use of this landform for an unknown span of time. It is possible that in addition to the 322 anomalies initially identified following the geophysical survey, there could be more cultural features occupying this 0.55 ha (1.35 ac) area. This site boundary is calculated by the span of space occupied by the cluster of anomalies on the landform. Void patterns can also be seen in the magnetic gradiometry data that may indicate the locations of house structures. The site activity could potentially expand beyond the cluster of anomalies. Artifacts were observed on exposed ground sloping down from the landform surrounding the site.

Radiocarbon dates were acquired for four of the six pit features encountered during the archaeological investigation. The radiocarbon dates range 4330 ± 30 to 4080 ±

30 uncalibrated BP (4959 - 4462 cal BP and 3021 - 2492 cal BC). This effectively assesses the features excavated at Wesselman Farm to be within the early Late Archaic period. The radiocarbon dates between the pit features are tightly clustered and overlap. The intense midden development, superimposition of features, and relatively contemporaneous carbon dates suggest that the Wesselman Farm Site was inhabited at least seasonally (a few months at a time) during the Late Archaic period. This may be the result of small groups of people repeatedly occupying the site for as much as half a millennium.

The primary material found in each of the features was burned limestone. This limestone likely resulted from cooking activities and the maintenance and construction of earth ovens and fire features. The limestone was likely sourced adjacent to the site. Less than 50 m (164 ft) to the west, downslope and in a wooded area, is a seasonal spring, the bed of which is limestone. Limestone slabs are also eroding from the bank. See the photograph (Figure 17) which was captured in late November of 2021 following a rainy week.

Figure 17. Seasonal spring, west of site (central), facing southwest.

The water in the spring flows during wet periods. At the Wesselman Farm Site, following precipitation, the water soaks into the ground and encounters the clay that is a confining layer at approximately 80.0 cm (31.5 in) below ground surface. Then water travels across the confining layer of clay beneath the silty top stratum and downslope into the ravine. This process collects water in the ravine and exposes the limestone that provided the source for the materials used for the cooking activities. During hot and dry seasonal conditions, such as those observed at the site in the mid-summer of 2021, this creek is not flowing so it may not be expected to provide a year-round source for water.

The Archaic period falls within the Holocene Climatic Optimum, in which conditions were warmer and wetter than today (Tankersley and Lyle 2019: 194). Towards the end of the Holocene Climatic Optimum, a cooling and drying trend occurred. Research on aeolian deposits in the Ohio Valley have provided some indication of how this cooling trend effected the southwest region of Ohio. Between 4,500 and 4,200 years ago, severe landform degradation and initiation of aeolian processes including sand dune reactivation in the Ohio Valley indicate severe drought conditions (Purtill et al. 2019:12). The radiocarbon dates at the Wesselman Farm Site indicate that it was most likely used immediately before this climatic cooling trend. The site may have been abandoned by Late Archaic groups during the following period of drought, as suggested by the absence of radiocarbon dates from later periods.

Hardstone igneous material used for FCR was found in far less quantity within the pit features than burned limestone, however it was found in larger quantities in the plow zone. The hardstone material was not witnessed within this ravine; however, it was observed within the gravel beds of Taylor Creek (approximately 450 m [1,476 ft] north), South Fork Taylor's Creek (approximately 355 m [1,165 ft] east), and the Great Miami River (approximately 650 m [2,133 ft] west). These locations were likely to be the primary raw material sources for many of the lithics recovered across the site which will be discussed in Section 6.4.

Earth ovens began to appear in the Eastern Woodlands region of North America during the Archaic period (Seeman and Dancey 2000; Horn 2018: 1). Hot rock cooking is a technology that most hunter-gatherer societies used at some point (Horn 2018: 1). Hot rock technology allowed for a wide variety in cooking methods that included open air griddles, baking, steaming, boiling, and even sweat baths (Thoms, 2009: 577; Horn 2018). Different types of rocks were used for different methods. For instance, limestone would be heated in a fire and placed in a pit with food and covered to cook a meal effectively in a fuel-efficient way. Alternatively, rocks could be heated in the base of the pit *in situ* and the food could be added when the flames die down. Igneous rock was used in the same way but more suited for boiling and steaming methods than limestone because igneous rock fractures rather than crumbles. The stone could be placed into a pit with water or a ceramic vessel to heat or boil contents.

Broken pottery is often recovered from (the later) Ohio Hopewell earth ovens during excavation and indicates boiling water or cooking food in pots (Horn 2018: 30). Although no ceramics were found within the pit features at the Wesselman Farm Site, fragments were found in the plow zone. The absence of pottery fragments in the pits could be attributed to different depositional events, although sample size bias cannot be ruled out. The pottery on the surface and/or within the plow zone may be the result of activities occurring at different times than the excavated pits that date to the Archaic period. The temper and thickness of the sherds is generally more characteristic of the Early Woodland period in southwest Ohio (Purtill 2009: 578).

Horn (2018) describes the experimental process of making and using earth ovens that may give some insight into how and why these features were used at the Wesselman Farm Site. Limestone becomes brittle after it is burned so it cannot be repeatedly used, hence it is discarded into used cooking pits at the site. Igneous rock, however, has much more durability and reuse. The hardstone igneous rock (FCR) does eventually fracture under high heat, if the temperature fluctuates rapidly, and when water is added to the pit of hot rocks for boiling or steaming. Small pieces of FCR were found in the pits may have been considered no longer useful. Larger pieces were likely stored, stacked, or scattered on the surface for the intent to reuse. The larger pieces were potentially picked up and discarded historically while tilling the field for crops.

Six pit features were excavated during the archaeological investigation within three of the anomalies identified from the geophysical survey. There are potentially three types of pit features encountered between the six pit features at the Wesselman Farm Site. Feature 1 appears to have only been used as a refuse pit or used as a storage pit and later as a refuse pit. This feature had the lowest ratio of burned rock and no evidence of *in situ* burning. Features 2A, 2B, and 3A potentially were used as ovens and then thoroughly cleaned out and ended their life cycle as refuse pits. The pits were not lined with burned soil, suggesting that the temperature of the pits was not high enough or the cleaning of the pit cleared away the burned soil. Burned soil fragments were seen within the fill and collected when possible; however, much of the burned soils encountered were too friable to survive the screening process. Each pit feature contained secondary deposits dominated by burned rock and the fill was mostly flecked by carbon. Feature 2C contained evidence of *in situ* burning. The base of this feature contained large slabs of burned limestone and heavy amounts of wood charcoal that appeared undisturbed. The pit features, except Feature 2C, contained carbonized nut hull. Nut hull was likely deposited as refuse or used as a fuel source with wood.

6.2 Evidence of Sustained Habitation

The excavations at the Wesselman Farm Site uncovered numerous artifacts that are generally associated with sites with sustained habitation (i.e., seasonal settlements or basecamps). The magnetic gradient imagery shows circular voids within the cluster of anomalies likely indicating house structures. These voids were not excavated due to time constraints to focus on assessing a greater number of anomalies. However, the archaeological excavations uncovered some evidence of activities suggesting a prolonged and repeated occupation of the site.

Artifacts associated with various habitation activities were uncovered in both Unit 1 and Unit 2. Fragments of polished bone, potentially from an awl, were within Feature 1 in Unit 1. In Unit 2, the levels containing the upper portion of Features 2A, B, and C, contained portions of a polished bone pin. Feature 3A contained most of the sustained habitation-related artifacts. These materials included a broken carapace bowl, a polished bone pin, a polished and snapped lateral half of a bone bead, a proximal end of a perforated and polished bone shuttle, and various polished bone shaft and tip fragments likely from awls, shuttles, or perforators. Many carapace fragments within the general faunal assemblage are possibly bowl fragments since some appear to be moderately polished or scraped on the interior surfaces.

Chipped stone artifacts such as drills and gravers were recovered from the site. These specialized tools were used for tasks such as reaming holes through leather, bone, and wood. Drills and drill fragments within the plow zone of Unit 1 included one complete specimen with a flat base, one complete specimen with a flared base, one complete double-ended specimen (with some polish or use wear), and one tip fragment. Within the levels containing portions of Features 2A, 2B, and 2C were two single-spurred gravers made from a flake and one whole flared base drill. Gravers were used for cutting, engraving, or perforating various types of organic material like bone, shell, and wood.

Fired-clay pottery is generally associated with a more sedentary lifestyle. Pottery has been found in assemblages across Ohio in dated deposits as early as 4500 BP (Purtill 2009: 576-578). Early assemblages are small in number and often composed of highly eroded sherds with various types of course temper. Pottery technology did not become widely adopted until sometime after 2650 BP during the Woodland period (Stothers and Abel 1993; Purtill 2009: 576). At that time, people were much more sedentary. The pottery sherds recovered from the Wesselman Farm Site were found in the plow zone context. None of the pottery was associated with the radiocarbon-dated context of the pit features, therefore, the pottery cannot be considered contemporaneous with the Archaic artifacts. The lack of Woodland period artifacts within the assemblage or within the pit features suggests an ephemeral use of the site during that time. The Wesselman Farm Site may be characterized as a temporary camp, or a "station" during the Woodland period as described by Vickery (1980) and Binford (1980).

Most of the pottery sherds collected at the Wesselman Farm Site were identified as thick eroded body sherds with rock and grit or quartz and chert temper. No decoration could be discerned on any of the pottery faces. These pottery types are considered probable Early Woodland in southwest Ohio and share some characteristics with the described types of Adena Plain, Dominion Thick, Leimbach Thick, and Fayette Thick ceramic wares (Purtill 2008; Haag 1940; Cramer 1989; Griffin 1943; Shane 1967). Only a few fragments retained both interior and exterior surfaces and could be measured for thickness. Three sherds with coarse sand, grit, and crushed igneous rock averaged 8.1 mm (0.3 in) in thickness. There were three sherds that contained some sort of coarse temper that had since leached out, possibly limestone or sandstone. These sherds averaged 5.6 mm (0.2 in) in thickness.

Types of artifacts associated with sustained occupations such as polished bone shuttles, pins, and awls, carapace bowls, specialized chipped stone tools, and pottery recovered from the Wesselman Farm Site were also reported as associated with pit features at other major nearby seasonal and year-round base camps such as Dravo Gravel and DuPont (Vickery 1977; Dalbey 1977). A diverse artifact assemblage suggests an occurrence of a wide range of tasks. This behavior suggests that the settlement of the Wesselman Farm Site was denser and more prolonged than what would be expected for a temporary campsite. The activities that occurred at the site were not focused on a single extraction activity such as nut processing like at the Oberschlake site, a temporary camp or station, situated on a similar landform farther east in a neighboring County. The artifact assemblage of the Wesselman Farm Site suggests that the site was occupied for several months at a time or at least seasonally. The site could be characterized as a base camp.

6.3 Conflict Within the Local Archaic Settlement System

There was possibly conflict between Archaic groups within the region, possibly over resources or over socio-economic disputes. As the exploitation of resources such as nuts, knapping material, and hunting grounds intensified, groups within this region of southwestern Ohio likely began to recognize and maintain territorial boundaries. These locations would be distinguished as a territory worth defending or restricting access to its resources. Sustained use of a locality such as this could also hold special significance for ancestral veneration and social memory (Pollack et al. 2021: 226). The Wesselman Farm Site was likely culturally important, possibly in a disputed area, and contained valuable resources. There is evidence of potential conflict at other known sites within the region.

In 1975, field excavations at DuPont uncovered two Late Archaic burials that suggested conflict or potential warfare at the site. One individual was a male with four

McWhinney points found among the skeletal remains. Two of these points severed parts of the vertebrae (Dalbey 2007: 59; Dalbey 1977). McWhinney points are unique to this portion of the Ohio Valley and up the Great Miami River and recovered from the Wesselman Farm Site. The other burial excavated at the site identified an individual with two spearpoints lodged into their backside. These points were not identified by type but were described by Dalbey (1977: 138) as an ovate-base spear point intruding into the left scapula and a tip of a spearpoint lodged into the left rear rib cage. Prior to that discovery, warfare had not been identified in the archaeological record within the Late Archaic period. These burials may indicate friction among groups within the region including the area surrounding the Wesselman Farm Site. There is no indication of violence at the Wesselman Farm site, however a spherical full grooved maul or mallet is included in the private collection (Figure 18). McWhinney points are also among the private collection and found during the archaeological excavation. Numerous mauls were also discovered by private collectors at Mount Nebo and were documented and photographed during the time the survey of the site in 1987.

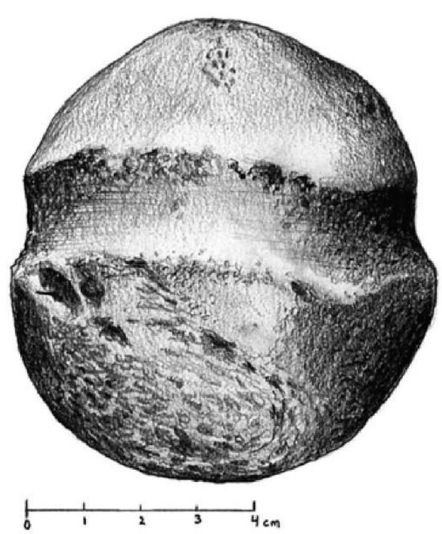

Figure 18. Full grooved stone maul.

Mauls were used for many purposes including quarrying flint (Converse 1966: 132), as a war club, bola stone, or for cracking open nuts and mollusks (DeRegnaucourt 2004). These ground stone tools could be used to process bones for marrow, dried meat, or plant resources (Fedyniak and Giering 2016). As a hammerstone, this maul could have served several purposes including a hafted hammer tool and a potential weapon. The maul recovered from the Wesselman Farm Site was not tested for residue, and it does not have enough use wear or damage to discern a distal or proximal end. Slight battering damage is visible on both ends. Heavier impact or grinding damage would be expected if the maul was used heavily for food processing or used for quarrying flint.

The strategic location of the Wesselman Farm Site may have served, in tandem with subsistence strategies, as a lookout for approaching groups and a safe location away from the bustle of river activity. Due to the degree of slope surrounding the summit, the site is accessed more easily from Taylor Creek or South Fork Taylor Creek, both navigable waterways. The Great Miami River was heavily trafficked, and the Wesselman Farm Site provided a location along navigable waterways that was off the main traffic course. The elevated position, higher than any other known sites in that vicinity, offered a suitable lookout. The site could also be well sustained by water from the spring and surrounding food resources such as masts and animals such as deer and turtle. Remains of masts, deer, and turtle were common among the botanical and faunal remains recovered from the pit features. Lithic raw material resources were also available in gravel bars along Taylor Creek and along extensive gravel bars at the junction of Taylor Creek and the Great Miami River.

6.4 Lithic Interpretation

Analysis of the lithic materials recovered from the Wesselman Farm Site provides information such as behavioral patterns and preferences, site habitation activities and purpose, knapping techniques, and tool manufacturing types. Interpretations derived from the chipped stone tools and ground hardstone tools allow for a much more complex understanding of the Wesselman Farm Site. A complete lithic analysis methodology designed by the author for this thesis can be found in Appendix B, Methods. The methods were created from knapping experimentation of river cobbles collected within the vicinity of the Wesselman Farm Site.

Many of the raw materials used for hardstone and chipped stone tools at the Wesselman Farm Site were observed in the nearby Taylor Creek and South Fork Taylor's Creek but were most abundant along gravel bars in the Great Miami River. The river has extensive gravel bar deposits at its junction with Taylor Creek and especially further south at the mouth of the Whitewater River. Both areas were inspected by the author and determined to have possibly provided most of the raw material sources of chert and hardstone materials that were used for knapped and ground tools at the Wesselman Farm Site. A lesser amount of raw material is represented by exotic sources that were likely brought into the area or traded.

Regionally available raw material is common among the lithic assemblage of the Wesselman Farm Site and the previously discussed sites such as Dravo Gravel, Mount Nebo, and DuPont. Hardstone material for ground stone tools, such as granite, was likely sourced as cobbles along the waterways including the Great Miami River. The Ordovician strata within the southwest Ohio region does not contain chert, rather chert was brought to the area by glacial activity from farther north (Pape and Cowan 1987; Dalbey 2007: 29). The latest glaciation event to impact the Wesselman Farm area occurred in the Pleistocene Epoch which lasted until about 11,700 years ago (Ohio History Central n.d. [d]). During this time, the river valleys, including the Great Miami River Valley were formed as the ice melted and huge volumes of water were discharged (Ohio History Central n.d. [d]). This created the extensive glacial river terraces and outwash deposits that filled ancient valleys with sediment (sand, silt, gravel, cobbles, and boulders). The outwash material found in gravel bars provided an important source to the native people for raw materials used for stone tools, particularly in this area of southwest Ohio (Dalbey 2007).

Most of the diagnostic tools recovered during the archaeological excavation were manufactured of regionally available chert types, Laurel chert is the most common. The diagnostic point types recovered mostly represent the Late Archaic period. One point could be Early Archaic. The temporal period of the points collected by the landowner are not considered since they were collected around the entire farmstead and not exclusively from the summit. The earliest point recovered from the archaeological excavation of the Wesselman Farm Site is a St. Albans associated with the Early Archaic period (Justice 1987: 90). The point was found in the plow zone of Unit 1. The other diagnostic points are identified as Late Archaic and were found in the plow zones of Unit 1 and 2, and within Feature 3A. The diagnostic points and raw material are tabulated in Table 7.

Table 7. Diagnostic points collected during the archaeological investigation and raw material.

Point Type	Count	Raw Material
McWhinney Heavy Stemmed	5	Laurel
McWhinney Heavy Stemmed	1	Flint Ridge Chalcedony
McWhinney Heavy Stemmed	1	Cedarville-Guelph
McWhinney Heavy Stemmed	1	St Louis Green
McWhinney Heavy Stemmed	1	Brassfield
McWhinney Heavy Stemmed	1	Unidentified
Karnak Unstemmed	1	Laurel
Matanzas Side Notched	1	Laurel
St. Albans	1	Unidentified
Kirk Corner Notched	1	Cedarville-Guelph
Unknown PPK Fragments	5	Laurel
Unknown PPK Fragments	1	Unknown

The McWhinney Heavy Stemmed was the most identified point during the archaeological excavation. These points date to the Late Archaic period, 4000 - 1000 BC (Justice 1987). Dravo Gravel, Mount Nebo and DuPont also contained a high ratio of McWhinney Heavy Stemmed points. A review of published literature regarding Archaic sites in this region of the Miami and Ohio River Valleys confirmed that the McWhinney Heavy Stemmed point is unique to the area. The development of this projectile point may have occurred some 4,500 to 5,000 years ago (Vickery 1977: 85). These points are often found in greater numbers than any other diagnostic points on Late Archaic sites within the southwest Ohio, southeast Indiana, and northern Kentucky regions.

The McWhinney Heavy Stemmed projectile point was first defined by J.M. Heilman in 1970 based on his findings at the McWhinney Village site (Geistweit 1970: 149; Vickery 1972). The McWhinney Village site is farther north of the Wesselman Farm site in Preble County Ohio. The McWhinney Heavy Stemmed point is characterized by its thick-stemmed form, with a short stem in relation to its overall length (Justice 1987: 138). Vickery (1972) summarized the point's description from Geistweit (1970) as being of medium size with a characteristically thick cross section and frequent retention of the cortex of the chert flake or nodule from which they were manufactured at the base of the stem. However, the haft element can vary widely among the type. The retention of cortex on the base that is often pebble-like or water-worn (Geistweit 1970: 149; Justice 1987: 138). The water worn cortex suggests the raw material was procured from gravel bars along the Great Miami River and other major rivers and streams.

The points were possibly used as multi-purpose tools for a variety of activities such as prying, cutting, and hunting (Lawson 2018). They were also reworked into other hafted tools such as scrapers, knives, and spokeshaves. The assemblage of McWhinney Heavy Stemmed points, including the landowner's and those recovered during the archaeological investigation, display a wide range of damage, blade modifications, and use wear. A selection of these points are featured in Figure 19, each illustration representing a different modification variation or use of McWhinney points.

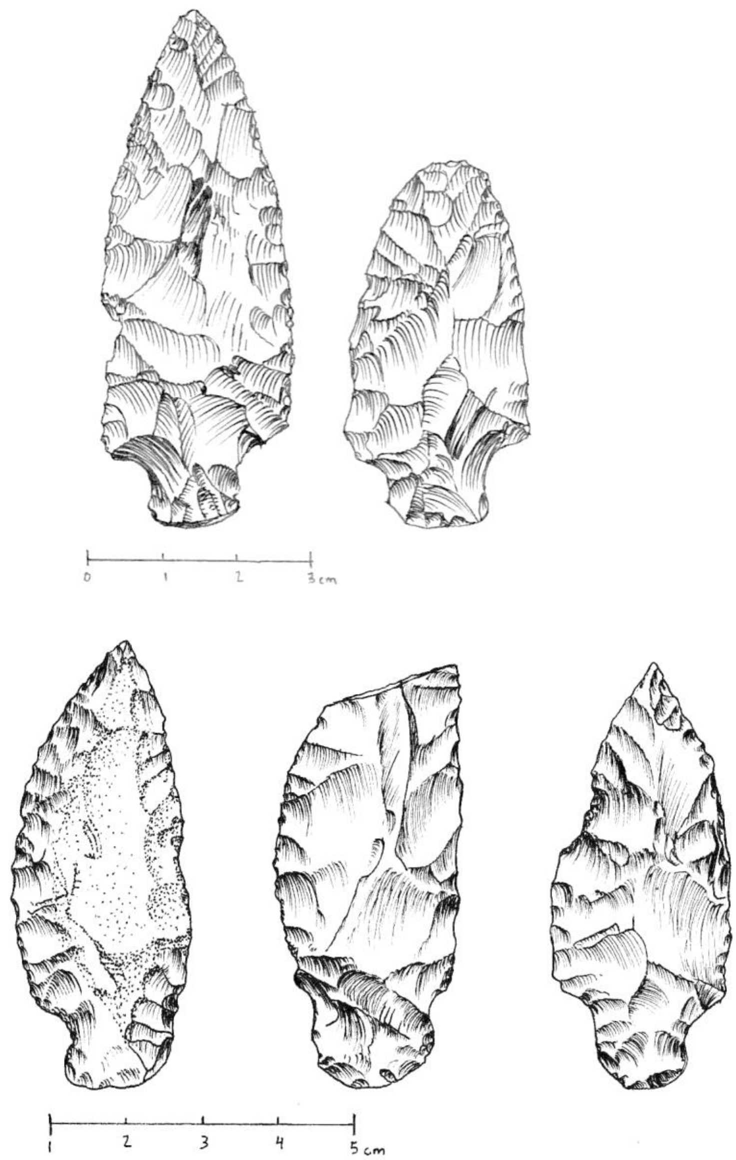

Figure 19. McWhinney Heavy Stemmed points used as multi-purpose tools.

Illustrated by the author; top: recovered from excavation; spearpoint (left), scraper edge (right), bottom: landowner collection; knife (left), knife/prying tool exhibiting a broken tip possibly from prying activity (middle), scraping/haft straitening spokeshave exhibiting a notched wear/use on lateral edge (right)

The knapping debris, or debitage, created in the process of making these tools may also offer a lot of information about the activities that occurred at the Wesselman Farm Site. The most common material identified within the debitage assemblage was Laurel chert. Brassfield, Breathitt, and Harrison County were also noted in significant numbers within the assemblage. The ratio of raw material sources present was very similar among features, with Laurel chert the most prevalent. Table 8 tabulates the percentage of raw material and source recorded for the feature contexts.

Table 8. Debitage raw material deposited within all features.

Raw Material Type	Raw Material Source	Percentage Within Features
Chert	Laurel	32.9
Chert	Unidentified	26.2
Chert	Breathitt	8.5
Chert	Harrison County	7.5
Hardstone	Greenstone	7.5
Chert	Brassfield	6.8
Chert	Cedarville-Guelph	4.3
Chert	St. Louis Green	2.4
Chert	Sonora	0.9
Chert	Zaleski	0.9
Chert	Liston Creek	0.6
Chert	Burlington	0.4
Chert	Harrodsburg	0.4
Chert	Flint Ridge	0.2
Quartzite	Quartzite	0.2
Chert	Elco	0.1
Chert	Upper Mercer	0.1
Hardstone	Rhyolite	0.1

Laurel chert was the most common raw material chert type used to manufacture stone tools at Wesselman Farm was Laurel chert. Laurel chert was also heavily used for stone tools within the Whitewater River Drainage system of southeastern Indiana and extreme southwest Ohio (DeRegnaucourt and Georgiady 1998: 127). This material was also frequent among the lithic assemblages of other Archaic sites such as Dravo Gravel, Mount Nebo, and DuPont. Laurel chert was observed and collected in the summer of 2021 as cobbles and pebbles during a reconnaissance survey carried out by the author in areas west and north of the Wesselman Farm Site along the Great Miami near the Taylor Creek junction, and within Taylor Creek. Some of this material was also knapped into rough bifacial forms by the author. The debitage from these experiments were studied to develop the lithic analysis methodology. The material either eroded from outcrops in bedrock farther north or was carried by glacial activity. The Great Miami River was the main outlet channel in southwestern Ohio for the glacial meltwaters that eroded Silurian Laurel and Brassfield limestones and Illinoian till containing Laurel cherts (Dalby 2007: 29).

Other cherts were available regionally and common within the southwest Ohio, southeast Indiana, and northern Kentucky regions. Chert was possibly sourced from outcrop locations, traded, or possibly made available in rivers and streams such as the Ohio River due to past glacial activity and water flow. Brassfield chert outcrops are found along the Ohio River (DeRegnaucourt and Georgiady 1998: 34; Dalbey 20017), east of the Wesselman Farm Site. Cedarville-Guelph was commonly used in western Ohio and is found in the Great Miami River (DeRegnaucourt and Georgiady 1998: 44; Dalbey 2007: 31). Kentucky cherts such as St. Louis Green can be found along the Ohio River (DeRegnaucourt and Georgiady 1998: 158-159) where it was deposited by the north-flowing Liking River (Dalbey 2007: 7). Harrison County is found as nodules along the Ohio River in southern Indiana and northern Kentucky and was heavily used and widely traded within and outside of the region (DeRegnaucourt and Georgiady 1998: 109). Burlington chert outcrops on both sides of the Mississippi River farther west and was also widely traded (DeRegnaucourt and Georgiady 1998: 172). Cherts such as Flint Ridge, Zaleski, and Upper Mercer are typically found farther northeast in Ohio and were possibly traded (DeRegnaucourt and Georgiady 1998), but can be found in the Ohio River, some in reduced numbers (Dalbey 2007: 31).

Raw material of the lithic assemblage gives some insight into the mobility of the people that inhabited the Wesselman Farm Site. The common source areas identified within the lithic assemblage of the Wesselman Farm site indicate that people using the area relied heavily upon the Ohio and Great Miami Rivers and their tributaries and likely stayed within the Tri-state region, and likely also encountered groups from farther west and east along the Ohio River, or from further south in Kentucky. They relied on locally available resources but possibly were mobile (to an extent) within the extreme southwest Ohio region. The most frequently visited area was likely the Ohio River, since a variety of these material types were found there, or they regularly encountered people from the Ohio River.

Debitage was sorted by the combinations of characteristics exhibited on the proximal end into categories. Certain techniques, behaviors, tool types, and knapping sequence can be theorized based on the proximal end. Within Features 1 and 2A, flake fragments and flake (complex, cortical, and flat) were the most common. This can be the expected for an assemblage created from knapping river cobbles. The cobbles require a significant amount of platform preparation to provide a platform from which a strike would carry the momentum to shear off a bulk of material from a rounded cobble (Binford and Quimby 1963:279; personal experimentation). An appropriate strike would be made on a flat platform and not the water-worn cobble cortex. The expected result is a high ratio of cortical and flat platform types, the latter would also have a high ratio of scaring from preparation and be considered complex platform types.

Within feature 3A, flake fragments and flakes (complex, multifaceted) were the most common. The assemblage represents what would be expected from activities that involved later stage reduction. A lower ratio of cortical flakes compared to Features 1 and 2A were recovered. Multifaceted platforms retain multiple facets from the removal of numerous previous flakes, and thus occur more frequently in later stages of tool edge formation and maintenance. However, early reduction occurred within the assemblage of Feature 3A, that also had a biface preform that was "stacked" and discarded because the knapper had failed to thin the piece. Cortical platforms were identified in comparable numbers to flat platforms, just slightly less frequently in Feature 3A. As discussed previously, flat platforms were made for proper platform preparation, especially when knapping a river cobble.

Common throughout the entire assemblage was the retention of water-worn cortex and locally available raw material sources. This represents the use of local gravel bars for much of the lithic production. Platform preparation and early-stage biface manufacture platform types were also frequent; however, the intention of the finished piece should be considered when discerning biface stages. At the Wesselman Farm Site, McWhinney Heavy Stemmed point is the most common finished tool type recovered. These points lack an extensive finer edge finishing process that would be represented by a frequent occurrence of multifaceted and complex platform types. Multifaceted and complex platform types are more prevalent in Feature 3A but not Feature 1 and 2A. Feature 3A contained two McWhinney Heavy Stemmed points. However, the general collection of debitage from the Feature 3A indicates that refined tools were being manufactured and core preparation took place. Debitage from early-stage biface production and crude tool manufacturing was more common in Features 1 and 2A.

Modified and unmodified utilized flakes are more common than finished tools which is indicative of a mobile lifestyle. It is more expedient economical to use flakes for a task at hand rather than having a formal specialized tool. Manufacturing formalized tools is time-consuming, and these tools were often transported from place to place and re-used for the manufacture effort to be worthwhile. Tools dull and break from use and need constant maintenance and resharpening. Retouched flakes are nearly absent from the assemblage, indicating that formal tool maintenance was not occurring as frequently as simple biface production, core preparation and the use of flake tools.

6.5 Faunal and Botanical Remains

No formal analysis of the faunal remains was preformed for the Wesselman Farm Site, however, if a diagnostic faunal element was recognized it was documented. The faunal remains recovered from the plow zones of Units 1 and 2, and all the features were dominated by deer. Turtle was also common and present in nearly all the pit features. Sparse fish remains were identified in the upper portion of Feature 1, and the combined Features of 2A, 2B, and 2C, and 3A. Additionally, highly degraded mussel shell fragments were observed. About half of the bone was burned. Cutmarks were identified on faunal (likely deer) remains from Feature 1 and Feature 2A. A bone fragment in feature 3A and a fragment in the combined upper portion of Feature 2A, Feature B, and Feature C, has carnivore teeth marks on one end, possibly from a dog.

The evidence shows a dependency on large game, namely deer, as a food source. Turtles were the second most found animal remains. Marine remains such as fish and mussel are scarce. These findings would suggest a late summer through early fall habitation. The site is along the river; however, fish remains were scarce, which may suggest that the site was not occupied during the spring and early summer. Fish remains may be recovered from the soil samples collected at the site when they are processed. Animal protein likely was consumed on site. The meat was possibly processed for transport or long-term storage. Feature 1 was possibly a storage pit that could have stored food through the winter.

Nut hull, mainly black walnut, appears in all the pit features except the earth oven, (Feature 2C). As discussed previously, nuts were processed on site, as evidenced by the pestles (landowner collection) and nutting stones (landowner collection and excavated assemblage). The hulls were possibly used for fueling fires, as well as wood and perhaps deposited in the pits as refuse. Masts were consumed and stored on site or carried away for winter stores to support other sites such as Dravo Gravel and DuPont.

The general process of processing nuts is described by Jessica Diemer-Eaton (2014) in her article, “Food Nuts of the Eastern Woodlands Native Peoples”:

> “They put handfuls of nuts in a mortar … with a heavy pestle, cracked the nuts open, all while adding water. When a sufficient amount of water was added to the cracked nuts, it was stirred so the nut meats separated from the shells, at which point, the meats and shells being different materials in the water, one floated to the top while the other sank to the bottom (this method focuses on making a hickory nut milk while separating). Another method calls for the cracked, un-separated nuts to be thrown into boiling water, during which the heavy nut meats were suspended in the liquid as the light shells were carried to the top with the current of the boiling water. If the nuts were left longer with no rapid boil, the waterlogged shells fragments sank to the bottom. Using these methods, the Native Peoples were able to process larger amounts of nuts with less energy and time devoted to it.”

The water that was used to process nuts was likely used as a soup or broth. Nut oil was highly desired and could be extracted by boiling the water and scooping off the oils that collected on the water surface (Diemer-Eaton 2014). Oils could be stored in containers such as ceramic pots for a period.

The flotation samples collected during the archaeological investigation from each pit feature could contain a variety of botanical remains including nut hull. These samples will be processed at the CMC at a later date. The soils may contain a variety of botanical remains, the occurrence of which may suggest what season the site was occupied. The data may suggest certain lifestyles or mobility such as plants known for horticulture or wild plants often exploited seasonally.

6.6 Evidence of Dogs at the Wesselman Farm Site

A dog burial (Feature 3B) was recovered from pit Feature 3A during the archaeological excavations. The skeletal remains of the dog are in excellent condition and were cleaned by the author. The author analyzed the remains with the assistance of the CMC archaeology collection staff. The dog was identified as a mature male upon inspection of the wear of its teeth and pelvis. The skeletal remains presented bent and warped spinal processes on several vertebra. This deformity was prevalent in the upper lumbar with processes shifted left. Two of the lower thoracic were fused, within the T8 and T11 range. These deformations to the spine possibly occurred due to the age of the animal or as a result of the dog being used for pulling or carrying loads.

A study done by Diane Warren (2004) of archaeological dogs from Illinois and the Southeastern United States, suggests that certain spinal deformities are the result of the dog being used as a transport or working dog to carry a pack or materials. A later study by Katherine J. Latham (2016) declared that the difference in prevalence of deformities of the spinal processes in transport dogs compared to unworking or wild wolves was inconclusive in the comprehensive analysis of dog and wolf skeletal remains. In fact, the 2016 study resulted in a higher frequency of this deformity in wild wolves. However, the deformity is likely to occur in both dogs and wolves as they age and specifically on the mid-thoracic lumbar. Dogs are more likely to live longer if humans are caring for them, thus increasing the likelihood of the deformity. Spinous process deformations could be the consequence of a working dog carrying a pack or pulling loads.

No evidence of trauma could be identified on the dog remains and no objects were recognized as associated with the burial. Burned limestone and wood charcoal was deposited under and atop the dog. The burial was surrounded by refuse material that was homogenous with Feature 3A. The dog was seemingly placed along the edge of the feature base. The dog was buried in a flexed position on its right side with the head to the north and facing west.

Further evidence of pre-contact dogs at the Wesselman Farm Site can be found in the site’s artifact assemblage. An example is within the fill of Feature 2A, where a portion of burned long bone (possibly deer) was chewed on the end by a carnivorous animal, possibly a dog. Dog burials are reported in other Archaic period sites in Ohio such as neighboring Dravo Gravel, located a few km south, where the burials of two dogs and ten humans were encountered (Vickery 2008: 13). Archaic dog burials are known to be associated with human burials. In the case of Feature 3B, there were no human remains found in association with the dog burial, although such mortuary features could exist at the site.

Chapter 7 Conclusion

The following site interpretations are made following the analysis of all the data collected from the Wesselman Farm Site. This data was derived from background research, landowner collections and new archaeological survey and excavation fieldwork. The chapter concludes with a discussion of threats to archaeological sites in southwest Ohio and future recommendations for the Wesselman Farm Site.

7.1 Synthesis and Discussion of the Potential Role of the Wesselman Farm Site within the Archaic Settlement System

The Wesselman Farm Site is an upland early Late Archaic habitation with ephemeral Early Archaic and Early Woodland components. There are few examples of similar upland sites recorded in southwest Ohio for comparison. None of the comparable sites contain the intense midden development encountered on the Wesselman Farm Site. The site occupies an approximate 0.55 ha (1.35 ac) area on a summit that has remained largely undisturbed within an historic farmstead. The discovery of this site changes how archaeologists currently model the Archaic settlement system.

Archaic people had mobile lifestyles but became increasingly less mobile by the Late Archaic period. They migrated between various sites and settlement areas to exploit seasonally available resources. The current Late Archaic settlement theory for southwest Ohio speculates that settlement strategy consisted of two types of base camps (regional and local) and various smaller sites such as temporary camps (stations) and seasonal settlements. Base camps are thought to occur along the waterways and lowland areas while the smaller ancillary sites that support the base camps are predicted for upland locations (Vickery 2008: 22 - 23). Temporary camps and seasonal settlements would not have intense midden development, if any. The Wesselman Farm Site exhibits extensive midden development, large numbers of pit features, and superimposition of features, all on an elevated upland ridge, and does not fit well into the current Late Archaic settlement theory.

The Wesselman Farm Site assemblage and feature types do not show evidence of bulk processing or procurement of any specific resource. This behavior fits the model as a seasonal site inhabited to extract a resource to support base camps below such as Dravo Gravel and DuPont. A wide range of habitation activities occurred at the Wesselman Farm Site and the site has intense midden development. The superimposition of features and tight cluster and overlap of radiocarbon dates suggests that the site was revisited and inhabited 4330 ± 30 to 4080 ± 30 uncalibrated BP (4959 - 4462 cal BP and 3021-2492 cal BC) by small groups of people. The data collected during the archaeological investigation of the Wesselman Farm Site suggests that upland sites possibly served as base camps. However, the Wesselman Farm Site is not large and was not inhabited by larger groups of people like nearby local and regional base camps such as Dravo Gravel and DuPont. The Wesselman Farm Site is characterized by a third category of base camps, a *residential base camp*.

A residential base camp is defined herein as a site that was used by smaller groups or even family units repeatedly for a span of time (at least seasonally), contains midden development, and evidence of a wide range of activities. As more residential type base camps are identified, there may be more evidence to support that some of these sites were occupied on a year-round basis. Sites that fit the construct of residential base camps may be identified on a variety of topographical locations. Inhabitants of residential base camps may have communed at larger sites such as local or regional base camps to exchange goods and ideas but preferred to live independently away from the larger groups. Upland locations like the Wesselman Farm Site provide safe overlook placement, out of view from the activity below. The area would also provide access to resource zones were not available within the vicinity of the sites below.

There is little evidence from the Wesselman Farm Site to suggest that the Late Archaic people who once occupied the site travelled from great distances. Most of the raw materials encountered at the site and other nearby major sites can be sourced locally. Additionally, if magnetic gradient imagery technology was more widely used on Late Archaic sites or on private properties like the Wesselman Farm Site, more sites with midden development may be identified. Late Archaic sites are possibly more sedentary than realized or at least Late Archaic people possibly travelled less often and stayed within the region. Rather than the sites supporting other sites construct, the various types of sites described be Vickery (2008) may be more independent. The larger base camps along the Great Miami and Ohio Rivers may represent cultural centers where people came together seasonally to exploit certain resources or exchange ideas, but some people likely lived there for longer periods. Sites farther away from the main waterways or in the uplands may be territorial areas were smaller family groups lived for extended periods or seasonally.

The Archaic people that inhabited the Wesselman Farm Site may have supported, shared a relationship, or gathered with inhabitants of Dravo Gravel. Similarities in features and artifacts assemblages between the two sites may suggest that their occupation periods are coeval. An earlier component likely existed at Dravo Gravel but was not identified at the time of the salvage operations. Many of the same materials were also surface collected from Mount Nebo, however this site was destroyed before any further investigation occurred. The inhabitants of the Wesselman Farm Site, Dravo Gravel, and Mount Nebo possibly traveled to or shared a relationship with even larger settlements such as DuPont. Radiocarbon dates at DuPont indicate that the Wesselman Farm Site and DuPont were occupied during the same relative time.

Investigations of these sites took place before geophysical survey technology was commonly available. The density of pit features was possibly not entirely realized for sites such as Dravo Gravel and DuPont or recognized at all for Mount Nebo at the time of their salvage operations or investigations. These investigations occurred in 1977,1955, and 1987, respectively. The Wesselman Farm Site offers an incredibly unique dataset. The site occupies a small area in comparison to other major sites; however, it is possibly the densest known concentration of early Late Archaic archaeological features in southwest Ohio. DuPont was recognized for its intense Archaic component however much of the site was destroyed. Ultimately, there are currently no known sites in the region comparable to the Wesselman Farm Site. There may be comparable sites on similar landforms on private property that have yet to be identified by an archaeologist.

The Wesselman Farm Site, Dravo Gravel, Mount Nebo, and DuPont serve as an example of a network of sites within the area that attest to a larger Archaic settlement system. This system involved regional base camps such as DuPont, local base camps such as Dravo Gravel and possibly Mount Nebo, residential base camps like the Wesselman Farm Site, and temporary camps or stations such as the Oberschlake site to exploit their prospective regions as part of the Archaic People's subsistence strategies.

Discovering new sites on upland landforms such as the Wesselman Farm Site, will continue to build upon our understanding of Archaic settlement patterns and site distribution theory.

7.2 Threats to Archaeological Resources in the Lower Great Miami River Valley

In the Great Miami Valley and Ohio Valley region there are likely more sites that have not been identified or recorded. The private collection donated to the CMC by the Minges family, the Wesselman Farm Site private collection, and records of other sites within the region housed at the SHPO and the CMC suggest this is a possibility. Much of the surrounding area around the Wesselman Farm Site remains private residential property. The once rural agricultural area on the west side of Cincinnati, Ohio is slowly giving way to modern housing development. The disappearance of farmsteads leads to the loss of archeological sites, as historic farmsteads are replaced by residential complexes, modern development, and industrial facilities. These projects are often not required under any state or federal authority to be evaluated for historic resources. Such projects include the housing development that abuts the Wesselman Farm Site to the south, extending from the same summit landform.

Gravel mining is another major threat to archeological sites in southwest Ohio. In the Great Miami River Valley there are deep and rich glacial outwash deposits of gravel that have been exploited since the early twentieth century. Gravel quarrying is exempted from Section 106 review. Therefore, there is no oversight legislation to protect these sites on private property. This has led to the destruction of many recorded sites, some even with National Register status including Dravo Gravel and Mount Nebo.

7.3 Recommendations for Preservation and Future Research at the Wesselman Farm Site

Excavating an archaeological site destroys the context of that resource. However, to understand and interpret an archaeological site, it must be physically deconstructed in some way (Knudson 1999: 374). At the Wesselman Farm Site, less than 0.01% of the anomalies identified on the geophysical survey were excavated. That very small percentage produced approximately 8,592 artifacts, numerous botanical samples, and hundreds of kilograms of burned limestone and FCR. Following this investigation, it is the intent of the property owner and family to preserve the site and maintain the area for its present use as a cattle pasture. This thesis provides the family with interpretable information that gives a history of their farmstead that they can connect to and appreciate.

A lot of thought was given by the author on how best to interpret the site and disturb it as little as possible while honoring the family's intentions. The geophysical survey provided an invaluable tool in understanding the footprint and potential extent of subsurface features without disturbing the site. The survey also served to identify precise locations of the potential features to excavate. The alternative approach would be a close-interval Phase I systematic shovel testing survey followed by scraping back large areas of topsoil to identify features. This approach was considered far too destructive for the research goals of this thesis and vested interest of the researcher and the property owner to preserve the site. There is an ethical balance between scientific investigation and site preservation. Ultimately, some portion of the site, particularly at least one of the anomalies present on the magnetic gradient data had to be excavated for interpretation.

If circumstances arise that would require the site to be excavated again, such as a salvage operation due to imminent endangerment, this should be accomplished by selecting more of the anomalies identified in the geophysical survey for excavation. Any additional materials recovered from the site should be curated at CMC with the rest of the collection. Communication with additional landowners in the surrounding area and even local historical societies may also add to the context of the site and understanding of settlement patterns and land use history of this area in the lower Great Miami River Valley region in southwest Ohio.

The methods of research and interpretations at the Wesselman Farm Site were based on the knowledge and experiences of the writer but were also influenced by fellow colleagues and archaeological professionals. None of these individuals are of indigenous descent. If future research were to occur at the Wesselman Farm Site, the involvement of indigenous perspective in the development of research goals and methods would offer a considerably greater depth of value to the interpretation. It is important to understand that the goals here were to answer the research questions of the writer, whose goals may differ entirely than those from indigenous communities. As archaeologists, we should consider why we are asking questions, who are we answering the questions for, and for what purpose.

In the immediate future, the site is intended to be preserved as it has been on this historic 15.38 ha (38 ac) farm in southwest Ohio for almost 80 years. On this quiet summit, nearly surrounded by trees over the Great Miami River and Taylor Creek, the pasture is to be maintained as a grassy area. The family on this farmstead has learned a great deal about Native American history on their farm through the course of this research and takes great pride in preserving this small but extraordinary unique piece. The unassuming ground on the top of a summit holds a time capsule of information that has only just begun to reveal its contents. For now, the curious herd of cattle have lost their entertainment in watching the author carry out the archaeological excavations, but they have gained back this small portion of their favorite grazing ground.

Appendix A: Methods

Archaeological Investigation Methods

The goal of the archaeological methodology is to identify the site and collect the appropriate information that can be easily interpreted and answer the research questions. The intention of the excavations is to be as least destructive as possible and to record information in a manner that can be easily understood and built upon for potential future research.

The landowner identified an area on the farmstead where many of the artifacts collected were initially found. A survey grid was established in that area using a RTK GPS and the magnetic gradient data that was tethered on that grid. The geophysical survey covered approximately 0.55 ha (1.35 ac) and identified a cluster of approximately 322 anomalies centered on the highest portion of the landform. The anomalies were suspected to represent potential pit features but would require ground truthing before assuming they are cultural features.

A 20.0 x 20.0 m (65.6 ft x 65.6 ft) block was placed roughly in the center of the site within a high concentration area and a universal transverse mercator (UTM) coordinate grid system was then laid over the magnetic gradient map. A fence using metal garden stakes and metal fencing was temporarily constructed to enclose the entire block in efforts to keep livestock and otherwise unwanted activity out. Within the block, over 40 potential anomalies were identified in the magnetic gradient data. Nineteen of those anomalies were selected for ground truthing by soil sample survey (one feature had begun excavation before the survey). The soil sample survey consisted of a 3.8 cm (1.5

in) diameter soil sampling probe taken at the approximate center of the feature and a sample in each cardinal direction within the feature. The soil samples were inspected on-site for the presence of artifacts, charcoal or burned soil, and characteristics within the core such as stratigraphy. The results were recorded, and the samples were discarded in the field. Following the soil sampling survey, the anomalies assessed as most likely cultural and contain materials that could answer the research questions (i.e., evidence of burning and higher concentrations of artifacts and carbon) were selected for excavation.

Test units were opened over the anomalies chosen for excavation and expanded to encompass the entire anomaly. The units were planned out using the grid system designed within the 20.0 x 20.0 m (65.6 x 65.6 ft) block. The soil horizon identified as the plow zone was removed to expose the anomaly within each unit. A plan view was photograph was taken, and a drawing was drafted for each unit following the removal of the plow zone. The methods of excavation varied between the features encountered on the Wesselman Farm Site depending on the feature's exposure within the unit and stratigraphy. The feature excavation methods are described below.

- **Feature 1 (Unit 1):** The feature was bisected on the north to south or east to west axis. The first bisected half was excavated at 10 cm (3.9 in) intervals ending at the base of the feature. The exposed axis wall was photographed and drawn. Soil horizons were identified along the bisected wall and the remaining half of the feature was excavated by horizon, taking an approximately 10.00 L (2.64 gal) soil sample for each horizon.

- **Features 2A, 2B, 2C (Unit 2):** These features expanded into the east wall of Unit 2 and were excavated in 10 cm (3.9 in) levels for each feature until the base of the feature was reached. For each level, a 10.00 L (2.64 gal) soil sample was collected. Levels one through three contained materials from all three features since the separation between them was not initially identified until the base of level 3. Approximately half of Feature 2A was captured within the unit, a quarter or less of Feature 3B, and the base level of Feature 3C. Photographs were taken throughout the process and a profile was drawn to illustrate the profile of the features in the east wall of Unit 2.

- **Features 3A, 3B, 3C:** These features were captured within the boundary of Feature 3A. Feature 3A was initially bisected into an east and west half. The west half was excavated in three levels due to time constraints since the feature fill was relatively homogenous and no clear stratigraphy was recognized. The eastern portion was excavated as a whole part. The feature extended into the southern wall of Unit 2 and a dog cranium with apparent articulation was also recognized in the wall. A portion of the southern wall of Unit 2 was expanded southward by 0.5 m (1.6 ft) to capture more of the feature and the dog burial (Feature 3B). The southern portion was designated the south half and excavated in whole. During this process, the dog burial was kept separated and excavated in whole. During wall cleaning of the feature, it was recognized that a small portion of an additional feature (Feature 3C) was intruding or was intruded on by Feature 3A. A whole point and mast carbon was scraped from the wall and represents the only artifacts designated as collected exclusively from Feature 3C. A 10.00 L (2.64 gal) soil sample was collected at each level. There is a possibility that more material from Feature 3C was excavated with the southern extent of Feature 3A. Photographs were taken throughout this process and drawings were drafted for the profile of the southern wall and the extension.

After the features were excavated, field paperwork was updated with all relevant data. Soil feature fill was screened through 0.64 cm (0.25 in) mesh. The plow zone was partially screened (Unit 1: 90% Unit 2: 50%). Materials that did not pass through the mesh were collected and bagged by provenience. Artifacts identified in the field as FCR and burned limestone were weighed on site and recorded by provenience. This material was placed in their prospective feature locations before backfilling the units. Remaining materials were removed from the site by the author for cataloging, cleaning, and analysis. The author organized the entire collection for donation to the CMC by the landowner. Following the completion of the thesis, the author transported the collection to the CMC Geier Collections and research Center and prepared the collection for permanent curation along with all mapping and excavation records. The soil samples were also taken to CMC and will be processed for flotation by the author following the completion of the thesis.

Laboratory and Curatorial Methods

After the cultural materials were collected and recovered from the field, the author cleaned, sorted, and cataloged them. Following the initial processing procedures, artifacts were separated into material type (e.g., flint and hardstone) and functional type (e.g., debitage, modified debitage, projectile points, tools, etc.). Debitage was then further classified by the morphological attributes retained on their platforms (e.g., flat or faceted), and treatments (e.g., heat treatment). Artifacts were counted and weighed. If the artifacts retained any diagnostic characteristics, identification specifying cultural/ chronological types (if known) were documented. Length, width, and thickness of diagnostic projectile points were recorded as necessary. All diagnostic artifacts and samples of undiagnostic artifacts were photographed.

Lithic Analysis Methods

Manufacture and maintenance of chipped stone tools produces voluminous amounts of debris, and lithic materials are often the most common artifacts identified on precontact sites in North America. The term "lithic materials" and further use of the word "lithic" before identifiers such as "artifact(s)" and "debitage", refer to stone tools and chipped stone debris (also referred to as "flakes") of any anthropogenic (human-created) stone object. Identification of raw material types and source was made by visual, normal eyesight inspection for lithic materials and low magnification was used as necessary. Hardstone tools such as axes, pestles, and celts were often made from hardstones such as granite, basalt, rhyolite, and sandstone that was recorded if identified. For chipped stone tools such as spearpoints and bifaces, and debris, raw material type such as chert (or flint), that is a fine-grained cryptocrystalline siliceous rock, is typically most common in southwest Ohio. However, other types such as quartz, quartzite, and jasper were also identified.

Debitage Characteristics

The terminology of lithic tools and debitage characteristics described in this section was strongly adopted from available literature provided by authors such as Whittaker (1994) and Andrefsky (2001). The proximal end of debitage pieces, or flakes, retain a *platform*, the surface or point of applied force at which the blow was struck. Flakes struck with a hard stone hammer or a softer hammer of antler, bone, or wood, often have bulbs of percussion and platforms. The *bulb of percussion* is a "swelling" that occurs below the platform on the *ventral* or interior surface. Ripples emanating from the center of the bulb along the ventral surface may also be present. Tiny cracks, or *radial fissures* may also be on the ventral surface pointing back to the bulb of percussion. Small tear-shaped or leaf-shaped "pops" off the ventral surface on the bulb called *parasitic flake scars* or *eraillures* may be present. The bulb of percussion is relatively flatter when soft hammer or pressure flaking techniques are used. The exterior or *dorsal* surface of a flake could have numerous flake scars or *facets* from previous flakes stuck through the reduction stages. The cortex of the raw material may be present on the dorsal surface. A high percentage of cortex could indicate an early reduction stage or core preparation and the higher the number of flake scars on the dorsal surface could indicate a later stage of reduction, however, this is not always the case.

The flake terminates at the distal end, the edges of the flake fanning out from the point of the blow. The proximal and distal ends of the flake must be present to make the determination of a complete flake. From the force of the knapper's blow, the flake could terminate with a *feather* edge, *hinge*, *step fracture*, or *overshoot*. Feather terminations are the most common and the typical goal of the knapper. They are created when the force of the blow travels smoothly through the raw material and exits creating a thin, sharp, "feathered" edge. In a hinge termination, the blow was struck, and the fracture surface turned sharply upwards where it exited forming a rounded "hinge" at the end of the flake. A step fracture terminates the flake at a right-angled break. This usually happens when a flake broke from a piece before the force completed its exit from the raw material. In the case of an overshoot, the force from the blow bends to follow the edge of the core or knapped piece and the rate of concavity increases on the ventral surface toward the termination of the flake.

Raw material Background Information

The raw material source was recorded for immediate interpretation of this report and potential future interpretations. This "…allows the archaeologist to reconstruct settlement patterns, trade and exchange systems and to make inferences about social structure of precontact peoples through space and time" (DeRegnaucourt and Georgiady 1998: 11). The raw material was likely obtained directly from its geologic outcrop or eroded areas or from a deposit which occurred naturally such as an ancient alluvial plain, glacial moraine, gravel bar, or otherwise relocated by a number of natural circumstances including water, gravity or ice. Materials were possibly obtained locally and followed by a locally based tool production at a nearby site. Alternatively, the raw material could be quarried at a distance with cores being reduced to a transportable size and distributed around the region for further reduction into tools. Primary production could also take place at the location of the raw material source and finished tools could be transported throughout the region. Any combination of these strategies for collecting raw material for tool production and tool distribution could take place. Raw material sourced from a distance could imply long-distance travelling, and their social, political, and economical interaction with outside groups. The raw material cortex, if retained on the lithic material, was identified. The cortex was further divided into the sub-categories; nodular, tabular, subcortex, or absent with a water-worn surface. These characteristics can help to further indicate the raw material type source location.

At the Wesselman Farm Site, water worn cortex was common. Water-worn or *pebble* surface exhibits a thin, worn, and often brown, rusty brown, or grayish rind that was smoothed by tumbling in waterways. Water-worn surface is indicative of extraction of chert raw material from secondary deposits such as gravel bars or ravines.

The most desired raw material for knapping is composed mostly of silica, with a preference of the material being as homogenous as possible. The more homogeneous the material is, the less flaws and irregularities are present, allowing the force of the knapper's blow to travel smoothly and predictably through the material. Types of materials used include chert (or flint), basalt, rhyolite, other cryptocrystalline silicates, obsidian, or quartzite. Heat treatments were used to improve workability of the raw material. Heat treatment can change the color and texture of the material, making it less grainy and smoother. This is especially the case for many of the cryptocrystalline silicates such as chert and flint. The book, "Prehistoric Chert Types of the Midwest" by Tony DeRegnaucourt and Jeff Georgiady, published in 1998, was referenced heavily to determine raw material source. The raw material source is provided as best estimate by using macro identification and is not without fault. New outcroppings, material, and information continues to be discovered.

Debitage Classification and Definitions

The act of knapping a tool produces copious amounts of stone debris, called debitage. Debitage represents the discarded and unused pieces of lithic material produced from the reduction of an objective piece (Andrefsky 2006: 82). Each piece of debitage was counted, weighed, and raw material type and source was recorded if identified. The presence of cortex was also recorded. Heat treatment was recorded, if discernable. The pieces were examined individually for traits as described previously such as striking platform, bulb of percussion, flake terminus, and use and wear evidence to classify the debitage into defined categories and separate out tools.

Debitage was sorted into categories determined by their platform morphology. Numerous characteristics were examined on a flake to determine the morphology of its platform or identify the absence of a platform. Many of the following classifications of flakes have been adopted from Andrefsky (1998 and 2005). The table below describes the categories that the debitage was sorted into for this research project.

Table 9. Debitage categories.

Platform Type	Platform description	Platform Interpretation
Cortical	Striking platform retains cortex.	This is often a product of the initial stage of the reduction sequence and core preparation.
Flat	A single faceted platform that is caused by a single previous flake removal.	This is more common in early stages of the reduction sequence, detached from non-bifacial tools such as unidirectional cores, a flake blank, or from blade manufacture when combined with notably abraded edges.
Abraded	Platform contains evidence of abrading or grinding on the platform surface that may diminish or eliminate facet ridges, that requires low magnification to identify.	Abrading strengthens the platform edge allowing for the application of greater force (striking) loads and increasing successful flake removal by decreasing platform failure by crushing or collapse. This technique is used throughout the knapping process but utilized frequently in later stages of tool production when more care is being taken by the knapper as the objective piece is in its final stages of production.
Dihedral-faceted	A surface having or formed by two intersecting faces.	Assemblages dominated by flakes with double faceted platforms are generally produced when isolating a platform throughout the knapping process and more commonly in early-stage blank production through late-stage biface production.
Multifaceted	Multiple facets are observed on the platform but only along one face of the object. Light abrasion may or not be present.	Assemblages dominated by flakes with multifaceted platforms are generally associated with later stages of biface reduction but can also be present in early-stage biface reduction.
Complex	The platform exhibits an angular surface scar created by the removal of several	These scars are typically the result of precision platform preparation with a soft hammer or antler billet using a

	striking platform preparation flakes and trimming the edge of the piece.	combination of compression and hammer motion. This can occur throughout the process but more commonly in blank preparation and late-stage biface production when the intent is to thicken the edge in preparation to thin the knapped piece.
Crushed	The platform, or point of applied force, appears crushed or sheared and no bulbs of force are present. Compression forces should be present and if the flake is whole, compression rings originating from either end should meet near the center of the flake.	Created by opposing striking and compression forces on either end of the raw material. The force was commonly by hard hammer and the technique could be used throughout the reduction process but was a more common practice in gravel-based tool industries.
Retouch	The striking platforms of these flakes are usually faceted, and ridges between flake scars appear for they include a small part of one side of the biface tool (Frison 1968, 149).	Created by the retouch, re-sharpening, or reshaping on a stone tool. The dorsal side of the flake may also exhibit varying degrees worn edges, polish, or gloss from the tool's repetitive use.
Indeterminate	Striking platform is present, but no decision could be made on a category.	This could be the case for many reasons including post-depositional weathering or breakage.
Flake Fragment	A striking platform is missing. The flake represents the distal end only, or otherwise broken, but does retain characteristics of a flake such as radial fissures on the ventral surface or flake scarring on the dorsal surface.	Broken flakes that have lost their platform end can occur during the knapping episode or after deposition.
Shatter	Angular fragments of workable material that are lacking any flake characteristics or a flake lacking a platform and otherwise missing attributes that would constitute a flake.	Angular fragments can be produced throughout the knapping process but are more common when hard hammer force applied during core preparation or from bipolar flaking techniques.

Chipped Stone Tool Categories

Artifacts categorized as chipped stone tools Include curated and expedient tools. Any diagnostic attributes were documented if retained on the artifact and specific cultural/chronological types were recorded if known. Curated tools such as a projectile point or knife (PPK), often bifaces, and sometimes scrapers and unifaces, and others are tools that were maintained for a period and re-used. Maintenance of these tools possibly involve sharpening and reshaping the tool, thus creating the retouch flakes described previously. Modification of PPKs could in effect change their characteristics to a degree that it is no longer recognizable or even misinterpreted as a different type (Flenniken and Raymond 1986; Andrefsky 2005). Informal flake tools were analyzed separately from the debitage and are typically created for temporary use for activities such as on-site butchery or common domestic-related activities where a formal tool is too unnecessarily complicated for immediate use. Often, they are flakes of varying sizes and shapes depending on the activity for their use with either no retouch or minimal shaping and retouch to aid in the specific task to be performed. The categories below represent a general tool collection of formal and informal tools that are commonly found within an assemblage, but they are not mutually exclusive. Other types of tools may be identified and described further within the documentation of this investigation.

PPK – Projectile Point/Knife (PPK) is a bifacially worked stone tool that was used as a spear point, arrowhead, knife, saw, for prying, and/or numerous other activities and often hafted. It is commonly referred to as a projectile point and technically also a stage 4 biface (*finished point*) and is diagnostic in the sense that its form and flaking characteristics, attributes, and overall shape and form can associate it with a specific period and/or culture. "Specific types were constantly reproduced during a time period because of cultural standards of what constituted a structurally and stylistically appropriate tool" (Justice 1987: 6). The book, "Stone Age Spear and Arrow Points" written by Noel D. Justice was referenced strongly for point types and descriptions.

Biface –A chipped stone artifact that is bifacially worked and possibly used as a tool or discarded during the working process for several reasons. Bifaces are described in terms of stages of manufacture. Biface stage was determined, as adopted from Andrefsky (2001: 41-9), Andrefsky (2005: 32) and Whittaker (1994: 199-206). At Stage 1 (*edged blank*), edges of the flake blank are prepared by pressure flaking and crushing, Stage 2 (*thinned biface*), thinning and shaping to regularize the piece, Stage 3 (*preform*) the form is thinned to the point that the emphasis shifts to shaping while continuing to thin as necessary, Stage 4 (*finished point*) the final piece, that would typically be considered as a PPK with no discernable characteristics to identify it to a specific temporal or cultural period. Artifacts such as a Hoes, retouched flakes, and PPK's are or can be technically bifacial. Chipped stone artifacts that are bifacial but not diagnostic or a PPK, and a specific use cannot be determined, were termed a biface.

Modified Flake Tool – A flake detached form a core that was used expediently (such as a blade) and retouched to assist in its intended purpose and used as a tool. A modified flake tool would likely serve as an everyday cutting and scraping tool for a variety of domestic tasks for which formalized tools were unnecessarily complicated (Friberg 2020: 167). This intentional modification could involve the alteration of the edge opposite the utilized edge or the utilized edge. Modification can include retouch, grinding, snapping, or burination, any of which would dull the edge and make the hand-held tool easier to use or make the working side more useful to the task at hand.

Unmodified Flake Tool – A piece of debitage that is not modified by retouching or shaping after being stuck and detached from the core and is utilized as-is. The flake has evidence of being used such as damage and microwear on at least one edge.

Core – Nodule of raw material with at least three flake scars. These include cores from which primary flakes were detached to serve as blanks and blanks for "core tools", (Wright 1992: 78). A core itself could be used as a tool or flakes struck from the core were subsequently modified into tools. An exhausted core is small in size, shows no evidence of numerous flake removals, and no additional flakes can be removed because all of the platforms are either too small or not usable for proper flake removal.

Ground Stone Tool Categories

Ground Stone tools are tools made by any combination of repeated flaking, pecking, grinding, pounding, drilling, and incising. Ground stone tool manufacturing is a very labor-intensive process often followed by polishing with sand and using water as a lubricant. A diverse range of raw materials were selected for ground stone use and there may be relationships between stone and tool types (Wright 1992: 54). Physical properties of the material could be preferred for hardness, density, roughness, and fragility. Raw material types could include flint, basalt, granite, rhyolite, sandstone, limestone, and quartzite. Cobbles found along streams and in areas were glacial till and outwash was exposed were common sources of raw material for hardstone tools.

Hammerstone – Stone objects that show evidence of battering, crushing, and grinding that may be evident in a central location or around the perimeter of the object. "Stream rounded pebbles and cobbles of less brittle stone make the best flecking hammers" (Whittaker 1994: 87). The term *Pecking Stone* (Cobble or Pebble) may also be used for a smaller cobble with irregular traces of pecking used for less forceful activities such as percussion knapping.

Axe – Tool with a cutting edge, typically manufactured partly via abrasion, pecking, grinding, and polishing. Axes can be tapered to either end, straight sided or irregular. They can be grooved (full grooved, or 3/4 grooved). The full grooved axe is considered the first of the grooved stone axe styles (approximately 3000 - 1000 BC) but the two types probably overlapped at various times and locations with some cultures during the Late Archaic and probably into the Early Woodland time frame (Harris 2016: 113).

Pestle – Upper, mobile stone in a pair of pounding and "vertical rotary grinding" stone tools. A core or unmodified cobble that is often pecked to an even elongated shape, the use surface is confined to one or both ends of an elongated blank (Wright 1992: 69). Pestles are often described as bell-shaped, irregular, conical, cylindrical (bipolar or unipolar), figural, or miscellaneous.

Ground Stone (Cobble or Pebble) – A cobble or pebble with diffuse, irregular ground surface(s) which are often linear and smooth or even polished.

Applying the Analysis Data and Conclusion

The entire assemblage of debitage collected during this investigation was analyzed individually for its physical characteristics and assigned categories based on a characteristic or combination of characteristics. The method of analysis used, attribute analysis, sorts the debitage by platform type. Using this type of debitage analysis seeks to record the attributes of the debitage while assigning categories that allow for behavioral interpretations. Debitage analysis should be well defined, replicable, be universally understood. The data should be interpretable in the context of future research. The process and organization of sorting debitage by platform morphology was largely adopted from that of Andrefsky (1998, 2005) and is intended to be used in conjunction with other inferences such as raw material type, and technological and/or characteristically defined patterns within the lithic assemblage.

The striking platform is the point of the flake (proximal end) and the point of applied force where the blow was struck to detach the flake. The platform can offer invaluable insight about how the blow was struck and the intent of the result that can indicate the stages of manufacture and technological strategies (Andrefsky 1998, 2005). Characteristics existing on the platform, or lack of, are used to separate the debitage into the following categories: cortical, flat, abraded, dihedral-faceted, multifaceted, complex, crushed, retouch, indeterminate, flake fragment, or shatter. The platform type in combination with other characteristics or patterns recognized within the assemblage can offer insight about technological strategies, behavioral patterns, social and economic structure, and site use.

A high or low ratio of a particular category can indicate a higher relevance of a certain knapping stage. For example, an assemblage dominating in complex platforms with a very low or no relevance of cortical platforms can indicate late-stage reduction episodes occurring at a distance from where the raw material was collected. A high occurrence of cortical and flat platforms within the debitage with little to no presence of later stage reduction evidence, as seen on abraded platforms, could indicate a quarry site. Additionally, other recognized traits among the debitage debris could be compared with the data such as the percentage of dorsal cortex, raw material type and source, or heat treatment to obtain a more complex understanding of the site and activities or answer various research questions. Retouch flakes can also show a specific use of the site. “Stone tools become dull rather quickly…Tools such as side scrapers, end scarpers, knives, and drills were continually modified throughout their lifetime of functional utility…" (Frison 1968, 149). Debitage presenting a highly polished dorsal side could indicate the presence of woodworking or agriculture in the area and a dulled blade edge on a retouch flake could indicate repetitive cutting and hunting activities.

Exotic raw materials within an assemblage could indicate contact with outside groups and the platforms present on such material could indicate the state the material was delivered in (i.e., delivered in nodules or knapped to a degree for portability). Mobility also has an impact on raw material procurement (Binford 1980). Local exploitation of good quality raw material could be opportunistic or even exploited economically while the use of local poor-quality material could be a result of energetic efficiency (Jeske 1992). Lithic technology can reflect social and economic adaptations to the environment. The use of locally sourced cobbles and the bipolar knapping technique can be a response to energy being divided between and increasing amount of social and political responsibilities and environmental stressors in later precontact periods (Jeske 1992).

The objective of the lithic analysis is to record data in a manner that allows the future researcher to use any part or combination of the recorded attributes for their intended research and interpretation while making insightful interpretations from the data for this immediate investigation. It is generally understood that lithic reduction often begins with the formation of the initial tool and continues through the life of the tool until it is discarded. This is a reductive process, and various characteristics of debitage occur within this progression. These traits, the types of tools discovered at a site, raw materials, and other documented information can serve to deepen our understanding of behavioral patterns, and technological practice which allows for a comprehensive interpretation of activities within a site and site function.

Ceramic Analysis Methods

After ceramic material was recovered from the field it was cleaned with water and a soft bristle toothbrush or dry brushed, sorted by temper, and cataloged by the author. Following these initial processing procedures, the ceramic sherds were inspected macroscopically to determine temper type, portion, decoration, and vessel type if discernable. These characteristics were recorded if identified. The sherds were also inspected for distinguishing marks or designs.

Early pottery in Ohio is recognized as thick-walled types with combinations of course tempers such as rock, grit, debitage, and sand (Keener and Nye 2007; Purtill 2008). Late Archaic cultures are the first documented peoples to produce pottery in Ohio. Ceramic vessels were used to store water and oil made from nuts and seeds. The use of pottery could indicate that terminal Late Archaic and Early Woodland groups began to settle permanently, as a nomadic group would not likely want to transport large ceramic containers as they traveled (Ohio History Central n.d. [c]).

Bone Analysis Methods

After bone material was recovered from the field it was cleaned, sorted, and cataloged by the author. Following the initial processing procedures, the bone was inspected macroscopically and organized into burned and unburned categories. The bone was then sorted by species if such information could be recognized. The material was also inspected for characteristics such as cut marks, carving, polishing, canine or other types of teeth marks, and any other postmortem characteristics resulting from animal or human manipulation. Any such characteristics were recorded if identified. If pieces were noticed to mend together, they were glued using an acid-free clear adhesive.

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