

**Report on the Archaeology
of the Shiawassee National Wildlife Refuge:
The 2008 Field Season.**

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ABSTRACT

This report summarizes the results of a tenth season of archaeological investigations carried out in the Shiawassee National Wildlife Refuge (NWR), Saginaw County, Michigan. The field investigations, conducted under Federal Archaeological Permit No. 2002-MI/3-2 (Amendment 6, 10 March 2008), included both limited archaeological survey/salvage and test excavations. Nine volunteers and the project director contributed a combined total of 174 person days (approximately 1044 hours) of fieldwork.

Consistent with the goals of the survey/salvage portion of this project, a surface collection, totaling nine objects, was made from one of the eight sites that were monitored during the 2008 field season. These objects were collected to further document and salvage artifacts from archaeological sites that are being exposed through processes of erosion. No previously unrecorded sites were found.

Test excavations were conducted at site 20SA722. Goals of the test excavations included: 1) assess site stratigraphy and the nature of buried archaeological deposits; 2) obtain a representative sample of artifacts to assess site use through time and to relate site components to the broader local and regional culture history; 3) obtain material suitable for radiocarbon dating; and 4) obtain floral and faunal remains to assess site seasonality and subsistence practices. Thirty square meters were excavated at 20SA722 during the 2008 field season. These excavations yielded 36,953 catalogued objects. In addition, 21 samples, containing a total of 128.5 liters of sediment, were saved for flotation and 10 other soil samples were collected for possible future geological analysis.

Excavated material from site 20SA722 dates primarily to the Late Prehistoric period (ca. A.D.1400-1650). A portion of the excavated area was stratified with early Late Woodland material (ca. A.D. 500-1000) below the Late Prehistoric component. This project continues to demonstrate that significant archaeological resources are present within the boundaries of the Shiawassee NWR.

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INTRODUCTION

This report summarizes the results of a tenth season of archaeological investigations carried out in the Shiawassee National Wildlife Refuge (NWR), Saginaw County, Michigan. The field investigations, conducted under Amendment 6 of Federal Archaeological Permit No. 2002-MI/3-2, included both limited archaeological survey/salvage (surface survey and shovel-testing) and test excavations (Appendix A). Nine volunteers and the project director contributed a combined total of 174 person days (approximately 1044 hours) of fieldwork.

The goals of the survey/salvage portion of this project continued to be to document and collect artifacts from archaeological sites that are being exposed through processes of erosion and to investigate by shovel-testing, if, and to what extent, intact portions of the sites remain. Erosion, whether by natural or cultural means, exposes artifacts making them vulnerable to removal by persons untrained in archaeological recording techniques and unmindful of the irreparable damage that is caused by removing artifacts from their archaeological context. This project aims to limit such damage by recording the provenience of exposed artifacts and collecting them for future study. An assessment of the amount of erosion observed at each of the sites monitored in 2008 is presented in the Analysis and Evaluation section of this report. Erosion is described using terms such as minor/minimal, moderate and severe. Along this continuum, minor/minimal indicates that unvegetated riverbank was present, but no actual slumping of the riverbank was observed. Severe erosion indicates that portions of the riverbank, at least 30-50 cm thick, have slumped down to the waters edge. Erosion described as moderate would be somewhere between these two extremes.

Surface survey was limited to eight previously recorded sites. Surface collections, totaling nine objects, were made from one of the eight sites that were monitored during the 2008 field season. No previously unrecorded sites were found.

Test excavations were conducted at site 20SA722. These excavations were conducted primarily to: 1) assess site stratigraphy and the nature of buried archaeological deposits; 2) obtain a representative sample of artifacts to assess site use through time and to relate site components to the broader local and regional culture history; 3) obtain material suitable for radiocarbon dating; and 4) obtain floral and faunal remains to assess site seasonality and subsistence practices. Thirty square meters were excavated at 20SA722 during the 2008 field season. The 30 square meters are divided between two Excavation Blocks, Excavation Block E, 18 square meters, and Excavation Block F, 12 square meters (Appendix C). Excavation of Block E exposed several shallow hearth features (Features 12, 13, 16, and 17), and one small ash-filled pit (Feature 14). A single feature (Feature 15), probably a shallow trash pit, was exposed in Excavation Block F. The 2008 excavations at 20SA722 yielded 36,953 catalogued objects. In addition, 21 samples, containing a total of 128.5 liters of sediment, were saved for flotation. This material has not yet been analyzed or catalogued. An additional 10 soil samples were collected for possible future geological analysis.

Of the 38 archaeological sites/findspots monitored during the ten field seasons of this project (eight during the 2008 field season), 30 of them are being exposed by fluvial erosion. Because subsurface testing has been conducted on only six sites, and in most cases this testing has been only minimal, site areas for most cannot be reliably calculated. However, the 24 sites that are being exposed by fluvial erosion extend for over 7,200 meters along the Cass, Tittabawassee and Shiawassee rivers. It is not known how far inland from the rivers most of these sites extend. Shovel testing at 20SA722 has shown that site deposits extend at least 40-60 meters inland over a portion of the site. Shovel testing at 20SA1251 has revealed that, at least along one part of its length, this site extends over 100 meters inland.

Previously recorded sites/findspots that are not currently eroding in the river include 20SA1257 (Shiawassee #9), 20SA1276 (Shiaw. #13), and 20SA1277 (Shiaw. #14). Artifacts from these sites were originally found exposed in the “backdirt” of animal burrows and/or “tree throws”. Extensive shovel testing at 20SA1276 has identified apparent site boundaries indicating a site area of approximately 2.54 hectares. Shovel testing at 20SA1277 has shown that this site is quite large (Sommer 2002), but site boundaries have not yet been determined. Of the four sites identified in the farm units, one (20SA1304) is findspot of a single flake, one (20SA1305) is a scatter of late 19th / early 20th century debris that covers a fairly large area but is concentrated in a roughly 30X30 meter area, one (20SA1306) includes a 10X24 meter cluster of flakes and findspots of three flakes and an FCR scattered over a two hectare area, and one (20SA1307) includes a findspot of a retouched flake and two flakes in the midst of a roughly 30X30 meter area of late 19th / early 20th century debris.

Prehistoric artifacts recovered from the various sites on the refuge represent primarily Middle and early Late Woodland occupations (ca A.D. 1 - 1000). However, a few Late Archaic/Early Woodland period (ca. 3000-100 B.C.) artifacts and several later Late Woodland and Late Prehistoric (ca. A.D. 1000-European contact) items are also present in the recovered assemblages. Site 20SA722 is an exception in that most of the material appears to date to the Late Woodland to Late Prehistoric period. Historic period artifacts date primarily from the mid-19th century through the 20th century, though a few earlier historic items have also been recovered. A thin scatter of mid to late 20th century debris was present on all of the sites (as well as on non-site areas). This material was not considered archaeologically significant and in most instances was neither noted nor collected.

Combining the materials recovered from the surface of 20SA722 and from the test excavations at 20SA722, 36,962 objects were catalogued during the 2008 field season. All artifacts, field notes, and associated materials will be curated in the archaeological repository of the Historical Society of Saginaw County, Inc., per the 1983 Cooperative Agreement (14-16-0003-83-922) between the Historical Society and the United States Fish and Wildlife Service. An estimate of 8 ft³ of artifacts and less than one linear foot of notes and other documentation were produced during the 2008 field season.

Project History

The initiation of this project can be traced to concerns about the erosion of archaeological sites on Shiawassee NWR property voiced by local avocational archaeologist Robert R. Clunie. As early as 1995, Clunie noted the presence of prehistoric and historic archaeological materials eroding into the Tittabawassee River on refuge property. In 1999, in an effort to address this problem, we proposed to monitor archaeological sites in the refuge. Site monitoring was to include: "1) looking for evidence of illegal collecting/looting activities and reporting any such evidence to refuge managers; 2) recording provenience information for exposed archaeological remains; and 3) collecting exposed artifacts to prevent their removal by non-authorized individuals" (Sommer 1999). The proposed project was explicitly *not* intended to be a systematic survey designed to locate new archaeological sites. However, it was recognized that new sites would likely be discovered while trying to relocate previously recorded sites. Indeed, this turned out to be the case and 27 "new" archaeological sites were documented during the 1999 through 2002 field seasons (Sommer 2000, 2002 and 2003).

The 2000 field season was started with the same goals in mind. However, the project was expanded slightly to include shovel testing. Shovel testing is necessary to better assess the nature, state of preservation, and extent of the archaeological deposits. Due to constraints of time and personnel, shovel testing was limited to two sites, 20SA1251 and 20SA1254.

In 2001, the scope of the project was once again expanded, this time to include exploratory test excavations at 20SA1251 and 20SA1276. A limited amount of shovel testing was also conducted at these two sites, in part to help determine appropriate locations for the test excavations. Because of the

focus on test excavations and shovel testing, surface survey was not conducted as intensively as in the two previous field seasons of this project (Sommer 2000, 2001).

In 2002, priority was again given to conducting test excavations at 20SA1251. However, a limited amount of shovel testing was conducted at 20SA214 and 20SA1276, several previously recorded sites were monitored and surface collected, and the survey area was expanded to include portions of the bank of the Cass River and some farm units in sections 21 and 22 in Spaulding Twp. (Sommer 2003).

The 2003 field season included site monitoring and surface survey at several sites and excavations at sites 20SA1276 and 20SA1306. The limited test excavations at 20SA1306 indicated that this site is probably not eligible for inclusion on the National Register of Historic Places. Based on surface survey alone, it was argued that three other sites in the farm units, 20SA1304, 20SA1305 and 20SA1307, were likewise ineligible for the NRHP (Sommer 2004a).

The 2004 field season continued the practice of surface survey and monitoring of known sites on the refuge. Shovel testing was begun at site 20SA722 in order to begin investigating the late Prehistoric component at that site. Finally, additional shovel testing and test excavations were conducted at site 20SA1276 (Sommer 2005).

Priority was given during the 2005 and 2006 field seasons to shovel testing at sites 20SA722 and 20SA1276 and conducting test excavations at 20SA722. Surface survey/site monitoring continued, but to a lesser extent than in previous years (Sommer 2006, 2007).

The 2007 field season included survey/monitoring of 13 sites, with collections being made at five sites. A 50 X 50 cm column sample was taken from site 20SA1276. The column sample consisted of 10 flotation samples totaling 141.5 liters. The majority of the 2007 field season was spent excavating 27 square meters at site 20SA722 (Sommer 2008).

Acknowledgements

Several individuals directly or indirectly aided in carrying out this project. First, thanks are due to the managers and staff of the Shiawassee NWR, particularly Steve Kahl, and Edward DeVries. Their continuing concern for the archaeological resources of the refuge is appreciated. This project could not have been conducted without the dedication and hard work of numerous volunteers including, Kerry Bennett, Tim Bennett, Dave Hamilton, John Heintz, Ken Kosidlo, Mike Mauer, Deanne Perry, Jenn Sommer, and Melanie Wierda.

PROJECT SETTING

The Shiawassee NWR encompasses portions of James, Saginaw, Spaulding, Swan Creek and Bridgeport Townships, Saginaw County, Michigan. It contains over 9,500 acres of marshlands, grasslands, mixed hardwood forest, and croplands. Waterways running through the refuge include the Cass, Flint, Shiawassee, and Tittabawassee rivers, as well as the Birch Run, Bullhead, and Swan Creeks. Water levels on the refuge are intensively managed for wildlife habitat, especially for migrating waterfowl. This is accomplished using a combination of dikes, ponds, dams, and pumps. In addition, a part of the refuge is under cultivation by local farmers who leave standing a portion of their crops for use by wildlife.

The project area is located in part of a region informally known as the Shiawassee Flats. The Shiawassee Flats generally conforms to the area covered by the mid-Holocene Nipissing level of the Great Lakes. Because most of the area lies only a few meters above the present level of the Great Lakes, even minor lake level fluctuations in the past would have had important repercussions for local inhabitants.

Quaternary Geology

Like the rest of the Great Lakes region, the landforms in the project area are a result of geological processes associated with the Quaternary Period. Repeated glacial advances over the last 2.5 million years gouged out the less-resistant bedrock leaving behind the basins of the present Great Lakes. Wasting ice deposited assorted tills and lacustrine sediments were deposited in proglacial lakes. The processes of glacial advances and retreats, lake formation, and lake level fluctuations resulted in the landforms now present in the Saginaw basin. Several authors discuss these glacial and postglacial events (c.f. Butterfield 1986; Dorr and Eschman 1970:164-179; Eschman and Karrow 1985; Larsen 1985a, 1985b, 1987; Monaghan 1995; Monaghan and Lovis 2005; and Shott and Welch 1984:6-20). Dates are presented as radiocarbon years before present (B.P.).

During the latter stages of the Late Wisconsinan glaciation, the Saginaw lobe of the Laurentide ice sheet began to retreat forming a series of arcuate moraines that ring the Saginaw basin. The Port Huron moraine, on which the city of Saginaw is located, was formed when the ice front was temporarily stabilized ca. 13,000-12,800 B.P. The moraine at Bay City was formed slightly later. Meltwater from the retreating glacier collected in the Saginaw basin, giving rise to Lake Saginaw (Dorr and Eschman 1970).

At approximately 11,000 B.P., following a series of advances and retreats of the glacial margin, and the resulting lake level fluctuations, the Main Lake Algonquin stage was reached. The water level at this time is traditionally thought to have been approximately 184 meters above mean sea level (a.m.s.l.). More recent research suggests that it may have been significantly lower (Larsen 1987).

Continued northward retreat of glacial ice exposed a series of progressively lower, isostatically depressed outlets, thus allowing Lake Algonquin to begin draining. The lowest of these outlets was exposed around 10,300 B.P., initiating the Lake Stanley low phase of the Huron Basin sequence. Lake level at this time was more than 100 meters below the present level of 176.5 m. (Eschman and Karrow 1985:90; Monaghan 1995:2.4).

As the isostatically depressed outlets began to rebound, lake level began to rise, reaching its maximum level of 184 m around 4,500 B.P. (Larsen 1985b:68). This is known as the Nipissing I stage of Lake Huron. In the Saginaw Valley, the boundaries of Nipissing I were similar to those of the Main Algonquin stage (Butterfield 1986:106). Incision of the outlet at Port Huron led to a recession of the Nipissing I stage. At approximately 4,200 B.P., this recession was interrupted by a brief transgression referred to as Nipissing II. The Nipissing II level reached an elevation of approximately 181 m. Following the Nipissing II stage, the water level fell again to a level that has not yet been determined, but by around

3,200 B.P. the lake level rose to the Algoma stage of 179 m (Larsen 1985b, 1987:26). Recent work by Monaghan (1995) and Monaghan and Lovis (2005) in and around the Saginaw Valley has slightly altered the perceived timing of this sequence. They suggest that Nipissing I reached a maximum between 4,800-4,700 B.P., Algoma reached a short-lived maximum of 181 m just after 4,000 B.P., with a fall to modern levels by 3,400 B.P. Several minor climate-driven fluctuations of the lake level took place following the Algoma stage including a Post-Algoma low stage during which lake levels fell to as much as three meters below modern around 3,000 B.P; a Post-Algoma high period during which levels rose as much as three meters above modern levels around 1,800 B.P., a Pre-Modern low period beginning after 1,500 B.P. and finally, a Pre-Modern high period with levels once again reaching an altitude up to three meters above modern lasting from around 500-250 B.P.

The Quaternary Geology of the region is included on a map compiled by Farrand (1982). The major sediment/landform illustrated for the project area consists of Lacustrine Clay and Silt. This sediment is typically gray to dark reddish-brown. It generally underlies extensive, flat, low-lying areas, which were formerly inundated by glacial Great Lakes. This landform also includes small areas of lacustrine sand and clay-rich till (Farrand 1982).

Soils

The *Soil Survey of Saginaw County, Michigan* lists five soil types for the project area (Jaquinta 1994). These soil types include the following: Sloan-Ceresco complex, frequently flooded; Chesaning-Cohoctah complex, frequently flooded; Fluvaquents, frequently flooded; Zilwaukee-Mistequay complex, rarely flooded; and Zilwaukee-Mistequay complex, frequently flooded. These are all floodplain soils described as poorly or very poorly drained, nearly level areas on alluvial plains, with 0 to 2 percent slopes.

Paleoecology

The Saginaw Bay drainage basin is that area of Michigan that is drained by the Cass, Tittabawassee, Saginaw, Shiawassee, Flint, Bad, and Kawkawlin Rivers as well as many other smaller rivers and streams. The topography of the drainage basin is comprised of primarily lacustrine deposits exhibiting very little relief. This relatively flat topography is broken by a series of fossil beach ridges and end moraines. Due to the low relief and the often poorly drained lacustrine sediments, the valley contains many sizable wetland areas, including much of the project area.

Dice (1943) designated continuous regions of North America having similar climatic and ecological factors as biotic provinces. In Michigan, the Canadian province covers the Upper Peninsula and the northern Lower Peninsula, while the southern Lower Peninsula is covered by the Carolinian province. A transition zone that contains some elements of each of the larger communities separates these two provinces. Cleland (1966) refers to transition zones such as this as edge communities. He suggests that they contain a number of features that make them favorable habitats for humans and other animals. Egan (1990) points out that this transition zone contains small communities from each of the larger biotic provinces in a patchy configuration, resulting in a wide selection of plant and animal resources available to prehistoric people. However, she also points out that the dispersed nature of these resources may have caused logistic problems for prehistoric people attempting to utilize them.

The Saginaw Valley is located partly in the northern edge of the Carolinian biotic province and partly in the transition area between the Carolinian and Canadian provinces. Cleland (1966) gives a detailed description of both of these provinces. This location, along with the climate, geology, and physiography, combine to create a unique ecosystem in the Saginaw Bay drainage basin, which has been called the Saginaw District (Albert, Denton, and Barnes 1986:18). Because of its location in the transition area between two biotic provinces, the Saginaw Valley can support animals from both provinces and thus has a

wide variety of faunal species. Egan (1990) notes this diversity and points out that 77 percent of the northern coniferous forest mammal species, 87 percent of the southern deciduous forest mammal species, all of the inter-biome species, and 71 percent of the Great Plains grasslands species found in Michigan were historically found in the Saginaw Valley. Baker (1983) and Burt (1957) provide additional information on mammals present in Michigan. Bailey and Smith (1981) and Hubbs, Lagler, and Smith (2004) provide information about fish species native to Michigan. The abundance of faunal species available to prehistoric people in Michigan is attested to by the many faunal remains recovered in archaeological sites in Michigan. Cleland (1966) discusses archaeological evidence of the use of animals by prehistoric people in the Great Lakes region.

The vegetation sequence following deglaciation can be divided into four periods. The following description of this sequence was derived from maps of the vegetation history of the "Thumb area" of Michigan (Shott and Welsh 1984: figures 10-14). A spruce forest dominated the period lasting from 11,200 to 10,400 B.P. A pine-fir-spruce forest followed this and lasted until 8,000 B.P. From 8,000 B.P. until 4,000 B.P. an elm-maple-beech forest characterized the vegetation. A mixture of elm-maple-beech and oak-pine forests dominated much of the region until historic period land clearing activities. Prior to logging and agriculture, the clay soils of the Saginaw District supported beech and sugar maple forests, with wetter areas supporting hemlock, white pine, bur oak, swamp white oak, red ash and American elm (Albert, Denton, and Barnes 1986:18). Yarnell (1964) discusses the use of plants by the aboriginal inhabitants of the Great Lakes region.

Climate

The present climate of the Saginaw Valley is relatively mild and fairly uniform, and with a growing season of up to 153 days, it is comparable to southern portions of the state (Albert, Denton, and Barnes 1986:18). Iaquina (1994:2) summarizes climatic conditions for Saginaw for the period 1955-1980. The average daily winter temperature in Saginaw for this period was -4.5°C with an average daily minimum of -8.75°C . The average summer temperature in Saginaw was 20.9°C with an average daily high of 27.4°C . The climate in the Saginaw region is considered to have been sufficient for prehistoric agriculture (Yarnell 1964).

Culture History

Because of the large-scale interactions that obtained between human groups in the past, culture history must be viewed at a regional rather than local level. Several reviews of the regional cultural developmental sequence have been prepared (cf. Cleland 1992; Fitting 1975; Halsey 1999; Mason 1981). The cultural history presented below is discussed in terms of discrete chronological stages. In reality, the stages grade into one another and there are no distinct boundaries between them.

The initial human colonization of the Great Lakes region occurred during Paleoindian period (ca. 11,500 - 10,000 B.P.). These nomadic hunters and gatherers lived in small bands following herds of large game animals such as caribou and mastodon. In addition to hunting, Paleoindians probably utilized a variety of plant species. Paleoindian sites are recognized by the presence of diagnostic flake stone tools (especially fluted projectile points) and their manufacturing debris. Examples of Paleoindian sites in the Saginaw Valley region include the Gainey and Butler sites in Genesee County (Simons 1997; Simons et al 1984; Simons and Wright 1992) and the Barnes site in Midland County (Wright and Roosa 1966).

Coincident with the end of the Pleistocene Epoch and the beginning of the Holocene Epoch, the Archaic period inhabitants of the Great Lakes region began to exploit a wider variety of plant and animal resources. The Archaic period is divided into Early (ca. 10,000 - 8,000 B. P.), Middle (ca. 8,000 - 5,000 B. P.) and Late (ca. 5,000 - 3,000 B. P.) phases. In comparison to their Paleoindian predecessors, Archaic bands may have moved over somewhat restricted territories. However, they continued to be

highly mobile, periodically moving in order to exploit seasonally available resources. Towards the end of the Late Archaic period, people in the Great Lakes region began experimenting with horticultural practices as is shown by the presence of wild *Cucurbita* (squash) at around 3840 B.P. at the Marquette Viaduct site in Bay County, Michigan, and domestic *Cucurbita* by around 2820 B.P. at the Green Point site in Saginaw County, Michigan (Monaghan et al. 2006). Archaeological sites of this period are identified by a variety of diagnostic flaked stone artifacts including a variety of notched and stemmed projectile points. The Archaic period also saw the first use of copper and ground stone technologies. Early Archaic sites are not well known in the Saginaw Valley and none have been excavated and reported on. Middle Archaic sites are also little known from this region, with the Weber I site probably the best known excavated example in Saginaw County (Lovis 1989). Two other Saginaw County sites with excavated Middle Archaic Components include the Ebenhoh (Dobbs and Murray 1993) and Bear Creek sites (Branstner and Hambacher eds. 1994). Late Archaic sites are well known in the Saginaw Valley and include locations such as the Andrews site (Papworth 1967), Schmidt site (Fairchild 1977; Harrison 1966) and Feeheley site (Taggart n.d.).

The first use of fired-clay ceramics marks the beginning of the Woodland period in the Great Lakes region. Like the Archaic, the Woodland period is divided into Early (ca. 3,000 - 2100 B.P.), Middle (ca. 2,100 - 1,600 B.P.), and Late (ca. 1,600 - European contact) phases. The period from 600 B.P. until European contact is sometimes referred to as the Late Prehistoric Period. Throughout the Woodland period, mobility continued to decrease and cultigens such as squash, maize, and a variety of native seed plants became more important in the diet. By the latter part of the Late Woodland period permanent agricultural villages were established in many parts of the Great Lakes region. Woodland period archaeological sites are identified by the presence of diagnostic flaked and ground stone tools including a variety of notched, stemmed and triangular projectile points, fired-clay ceramics, and cultivated plant remains. The Schultz site, located immediately adjacent to the present project area, is the best example in the state of a stratified site spanning the entire Woodland period (Fitting 1972a).

The initial contact between Native Americans and Europeans marks the end of the Late Woodland period and the beginning of the Historic period. It is during the historic period that we can first speak of actual named Native American groups that lived in the Great Lakes region. Groups living in this region between the 17th and 19th centuries included, among others, the Ojibway, Sauk, Fox, Potawatami, Miami, and Ottawa (Cleland 1992; Tanner 1987). France claimed much of the Great Lakes region in the 17th century. As a result of the French and Indian War, in 1763 the area fell under British rule. The British period was relatively short-lived, and by the end of the 18th century control of the Great Lakes region was established by the United States. Early Historic period habitation sites are not well known in the Saginaw Valley. The Fletcher site in Bay County is an example of an 18th century Native American cemetery (Mainfort 1979). The Cater site in Midland County is a good example of both an early 19th century Native American occupation and a mid 19th century European Settler occupation (Beld 2002).

History of Archaeological Research

The Saginaw Valley has more documented archaeological sites than any other comparable region in Michigan. For over a century, the richness of the archaeological resources in this region has drawn considerable attention from avocational and professional archaeologists alike. During the late 19th century, William R. McCormick, a local pioneer settler, made and recorded the first known observations of archaeological remains found in the Saginaw Valley (McCormick 1883). Between 1891 and 1906 Eliza Golson collected hundreds of "indian relics" near her home in Saginaw County and meticulously described her finds in her diary (Klisch and Klisch 1980). A portion of her collection is still intact and is curated at the Historical Society of Saginaw County. Professional archaeology also got its start in the

late 19th century when Saginaw native Harlan I. Smith became the first professional archaeologist to conduct research in the region (cf. Smith 1894, 1901a, 1901b, 1901c). Although, Smith's earliest archaeological interests and studies focused on the Saginaw Valley, his attention soon turned to other regions.

Despite the significance of earlier archaeological contributions by McCormick and Smith, it is Fred Dustin who must be considered the founder of Saginaw Valley archaeology (Peebles 1978:86). In addition to his extensive and well-documented collection of artifacts from the region and his numerous publications, notes, and manuscripts, Dustin was an inspiration and a model for other avocational archaeologists and historians of his and later generations (cf. Fitting 1968). It is largely through his efforts and influence that much of the early history and archaeology of the Saginaw Valley has been preserved.

In addition to the long history of contributions by avocational archaeologists, professional archaeologists have shown considerable interest in the Saginaw Valley. Professional interest in the Saginaw Valley peaked during the late 1950s and 1960s. Several sites were excavated during this period including Andrews (Papworth 1967), Stroebel (Papworth 1967), Hodges (Binford 1963), Feeheley (Taggart n.d.), Green Point (Wright 1964), Schultz (Fitting 1972a; Ozker 1982), Schmidt (Fairchild 1977; Harrison 1966), Bussinger (Halsey 1976), Mahoney (Bigony 1970:167-192), Stadelmeyer (Bigony 1970:115-166) and several others. Field crews from the University of Michigan excavated all of these sites, usually with assistance from several local amateur archaeologists. Most archaeological fieldwork in the Saginaw Valley during the 1970s, '80s, and '90s was directed not so much by research interests, but primarily by cultural resource management concerns. Notable projects during these more recent decades include work at the Weber I and Weber II sites in Frankenmuth Township (Lovis 1989), the Bridgeport Township site (O'Shea and Shott 1990), site 20SA1034 (Dobbs et al. 1993), The Shiawassee River and Bear Creek sites (Branstner and Hambacher 1994) and the Casassa Site (Branstner and Hambacher 1995).

In addition to the projects listed above, six contract reports have been found that discuss archaeological surveys conducted within Shiawassee NWR boundaries. The first of these was an "Archaeological Survey of the Saginaw Reservoir Area" (Papworth 1959). The purpose of Papworth's survey "was to discover the presence of historic houses or other historic structures of significance, and to locate prehistoric aboriginal occupational sites, monuments, or pictographs of such nature that they would merit archaeological investigation and salvage by recording prior to the flooding of the land by reservoir waters." Papworth's project map depicts the location of 23 sites, seven of which are within the present boundaries of the Shiawassee NWR.

A second survey was designed to assess the impact of dike construction and other flood control measures proposed for the Shiawassee flats (Fitting 1977). Although, through a combination of field and library research, 89 archaeological sites were located, most of the survey areas were outside of the Shiawassee NWR boundaries. However, two sites within the refuge boundary, 20SA15 and 20SA361 were recorded. Site 20SA15 was surveyed during this and previous field seasons of the present project (Sommer 2000:10, 2001:10, 2004:12). Site 20SA361 was reported as a Late Woodland site located adjacent to the Cass River (Fitting 1977:37). This site was relocated during the 2002 field season and a Late Woodland temporal placement was confirmed.

A third project involving minimal field survey and library research was conducted within the Shiawassee NWR in 1978. This project was designed to "provide only a general impression of the refuge's cultural resources" (Whittier 1978). This project relocated 20SA361, and recorded several historical sites, including one located at 20SA722. However, no prehistoric materials were noted for this location. In 1980, a small-scale test investigation by the Saginaw Archaeological Commission, failed to locate any archaeological remains (Brunett 1980).

In 1993, Commonwealth Cultural Resources Group, Inc. (CCRG) contracted with the United States Fish and Wildlife Service to complete a “Baseline Artifact Inventory Survey of Museum Property and Indian Interests in National Wildlife Refuges Located in Michigan” (Robertson et al. 1993). This survey noted 14 archaeological sites within the Shiawassee NWR. The results of a second contract between CCRG and the U.S. Fish and Wildlife Service are presented in “Overview Study of Archaeological and Cultural Values on Shiawassee, Michigan Islands, and Wyandotte National Wildlife Refuges in Saginaw, Charlevoix, Alpena, and Wayne Counties, Michigan” (Robertson et al. 2000). This project was designed to identify and describe the known archaeological and cultural values of the three Wildlife Refuges listed in the title. Regarding the Shiawassee NWR, the study area included lands within the current refuge boundary, lands within the proposed expansion areas, and adjacent areas. In all, 244 archaeological sites are discussed for the Shiawassee NWR study area, most of which are not within the current boundaries of the refuge. Discrepancies between the data reported by CCRG and the data derived from previous field seasons of this project are discussed in Sommer (2001).

METHODS

Field Methods

The limited surface survey conducted during the 2008 field season consisted of walking along portions of the banks of the Shiawassee and Tittabawassee Rivers looking for exposed artifacts and noting the extent of erosion in site areas. Only at one site, 20SA722, were artifacts collected. Artifact locations were recorded using a GPS device. Site locations were plotted on 7.5' U.S.G.S. topographic maps using the DeLorme 3-D Topoquads computer program. Topographic maps used include the Alicia, Bridgeport, Saginaw, and Shields quadrangles.

Test excavations were conducted at 20SA722 using the site grid set up for shovel testing in 2004 (Sommer 2005). An autolevel and steel tape were used to lay out the excavation units. This provided for more accurate measurement in laying out the excavation units, but resulted in a slight incongruence between the excavation grid and the shovel test grid. The 30 square meters excavated at 20SA722 during the 2008 field season are divided between Excavation Blocks E and F (Appendix C). Individual (1X1 meter) excavation units are labeled according to the grid coordinates of their SW corner. Prior to laying out the actual excavation units, surface vegetation was removed as close as possible to the ground level.

Excavation of commenced by removing and screening the top 30 centimeters (plowzone) in each unit as a single level, with subsequent levels removed in five-centimeter increments. The depth of the plowzone varied across the units, but in all cases appeared to be greater than 30cm. Usually there was no clear distinction between the plowzone and subplow sediment, so it was not possible to remove the entire plowzone in one level and keep it totally separate from material below the plowzone. Depth measurements were taken as centimeters below datum (b.d.), which was arbitrarily chosen as the surface of one of the corners for each excavation unit. The surface datum location is noted on the square level sheet for each unit. Because the surface is relatively level at this location, the below datum measurements are essentially the same as below surface elevations across each unit. A single point was chosen from which to measure the depth of each unit to facilitate keeping the excavation floors level.

General excavation sediment was screened through ¼" mesh hardware cloth. To reduce damage to fragile artifacts, care was taken to remove them as soon as they were exposed rather than leaving them in the screen until all of the sediment was removed. Occasionally, rather than forcing all of the sediment through the screen, the small, resistant lumps were bagged up with the rest of the screen contents and were later water screened in the lab. The screen contents were bagged by provenience and assigned a Field Sample (FS) number. The FS numbers were assigned sequentially as samples were collected. They serve as a redundant record of provenience information to guard against accidental loss of this important information.

Excavation generally continued down until culturally "sterile" (absent, or very low artifact density) sediment was reached. In non-feature areas, this generally occurred around 70-85 cm below datum. The specific methods used in feature excavation varied depending on the size and nature of the feature. In general, features were divided into two or more sections with parallel or perpendicular profile lines labeled A-A', B-B' etc. The resulting sections were labeled Area 1, Area 2 etc. Plan views and profiles were drawn and photographed with a digital camera. Excavation within each feature Area proceeded by excavating with trowels, brushes and/or small plastic putty or paint knives. All feature fill was saved, the volume of fill was recorded in liters, and the material was bagged and assigned an FS number. The feature fill was thoroughly air-dried before being processed by flotation.

Excavation data, including information about soil characteristics, artifacts, excavation problems etc. for each excavation level were recorded on standardized Square Level sheets. Additional

information was recorded in the project director's field notes. Representative wall profiles and floor plans were drawn on graph paper and were recorded with digital photographs.

Lab Methods

After being collected all artifacts were taken to the archaeological laboratory at the Historical Society of Saginaw County, Inc. for processing. The first stage of artifact processing was to conduct a preliminary sort of the objects, separating them into material types. This sorting was done so that fragile objects such as bone and ceramics could be handled with extra care while cleaning. After sorting, the artifacts were carefully washed and fully air-dried prior to analysis. Artifacts from the 2008 field season of this project were catalogued under Accession F08-1. Each artifact was assigned a catalogue number according to the provenience and type of object. Several objects may be assigned the same catalogue number if they are same type of object and are from the same provenience. A Catalogue Record was filled out for each object recovered during this project. These records include the Catalogue #, Provenience, and Description of each artifact.

All of the objects recovered from the surface survey portion of the project have been catalogued. Except for the flotation samples, all of the material recovered from the test excavations has been sorted, washed and catalogued. Ceramic sherds and FCR were size sorted using an approximately ½" mesh screen. Ceramic sherds that pass through the screen are referred to as "sherdlets", and in the initial analysis only counts and weights are being recorded. Fire-cracked rocks were counted and weighed according to each of the two size categories and then, with the exception of FCR derived from feature contexts, discarded. Because of their non-cultural origin, snail shells from the excavations at 20SA722 were not catalogued, but they have been saved for possible future environmental studies. Some charcoal from feature contexts was likewise not catalogued. Although the cultural origins of the charcoal is not in doubt, it has not been catalogued because at least some is intended for radiocarbon analysis and will thus be destroyed.

Diagnostic artifacts, formal tools, and ceramic rimsherds have been labeled with their catalogue number. Non-diagnostic artifacts will be labeled as time permits. Catalogue numbers are written with permanent black or white ink on a layer of clear Acryloid B-72, and sealed with a layer of clear B-72. Artifacts are labeled prior to being photographed. Digital photographs have been taken of a representative sample of artifacts, including most of the diagnostic artifacts recovered during the 2008 field season. Any refitting of broken artifacts is accomplished using clear B-72 as an adhesive. Artifacts will be stored in the archaeological repository at the Historical Society of Saginaw County, Inc., in roughly one cubic foot, acid-free, boxes.

Initial processing has been completed for all of the flotation samples collected to date. Prior to processing, flotation samples were thoroughly dried to increase buoyancy of charred material. The soil was slowly dumped into a screen with window screen sized mesh immersed in a one hundred gallon tub. Water jets spraying up from the bottom of the tub into the screen provided gentle agitation, which was aided by hand mixing. Agitating the water in this way helped the sediment fall through the screen where the heavy fraction- ceramics, stone artifacts, bone etc., were collected. The light fraction- buoyant objects such as charcoal, seeds, etc., flowed out through a two-inch pipe located near the top of the screen and were collected in a very fine-mesh paint filter. The light and heavy fractions were labeled with their provenience information and dried. After drying, the light and heavy fractions from the 2008 flotation samples were size sorted by passing the material through nested geological sieves of 4mm and 2mm. This process yielded size categories of >4mm, 2<4mm, and <2mm. Weights for each size category were recorded in grams. Although some have been sorted, none of the flotation samples has yet been analyzed or catalogued.

Analysis and Evaluation

Eight previously recorded sites were surveyed/monitored during the 2008 field season. This section will present an analysis and evaluation of the materials obtained through the surface survey portion of this project. Analysis and evaluation of excavated materials from 20SA722 will be presented in a subsequent section.

20SA15

Site 20SA15 extends approximately 154 meters along the Tittabawassee River (Appendix B). A light scatter of FCR, flakes, Late Woodland pottery and Historic period material covers the site. A visit to the site in mid-April of 2008 revealed only minor erosion over most of the site area. High water and extensive vegetation on the bank resulted in poor surface visibility. No artifacts were observed during this initial visit. Several FCR were observed, but not collected, during a subsequent visit to the site in early June. Even in the absence of periodic high water (currently annual in spring), continued erosion of the fairly high, steep bank is expected. Diagnostic artifacts recovered in 1999, 2002 and 2004 indicate that Late Woodland and Historic period components are present (Sommer 2000:10, 2003:12, 2005:12). A 1955 aerial photograph of the site area shows that it was under active cultivation at that time.

20SA722 *Clunie Site*

This large site extends for approximately 960 meters along the bank of the Tittabawassee River (Appendix B). In 2000 a site datum was driven into the ground, which also serves as the beginning of Segments 1 East and 1 West. Wooden stakes were placed every hundred meters to the west, marking the beginning point of each segment (Sommer 2001:14). Because most, or all, of the stakes have been lost due to flooding and/or erosion, surface finds since 2002 have been plotted by GPS or have been given grid coordinates based on the Shovel Test grid set up in 2004 (Sommer 2005). The relatively high and steep riverbank was subject to moderate to severe erosion over much of the site area in 2005, 2006 and again in 2007. Only moderate erosion was observed during the 2008 field season.

Both surface survey and limited test excavations were conducted at 20SA722 in 2008. A total of 36,962 objects were catalogued from 20SA722 during the 2008 field season. These items are included in Accession F08-1 and were assigned Catalogue Numbers F08-1-1 through F08-1-1990. These items include nine objects derived from the surface, and 36,953 items derived from test excavations. Data from the test excavations will be discussed in a subsequent section of this report.

The surface collected material includes one grit-tempered rimsherd and eight grit-tempered body sherds. The rimsherd has a smoothed over exterior surface and is decorated with cord-wrapped stick impressions (Figure 1, #1989). Cord-wrapped stick impressions are spaced every 3-4 mm around the slightly rounded lip. An additional row of oblique cord-wrapped stick impressions is present on the exterior approximately 18-19 mm below the lip. The body sherds recovered from the surface in 2008 include six with cord-roughened exterior surfaces, one with a smoothed over exterior surface, and one with a destroyed surface (Figure 1, #1990). Two of the cord-roughened body sherds are conjoinable.

Based on the 2008 and previous season's fieldwork, this site represents a series of occupations that occurred during the Woodland, Late Prehistoric and Historic periods, with a possible earlier Late Archaic occupation. The ceramics recovered in 2008 all probably date to the Late Woodland through Late Prehistoric periods, supporting previous estimates based on surface survey and shovel testing, that the most intensive occupations occurred during these times.



Figure 1: 20SA722, ceramics from surface.

20SA1251 *Shiawassee #2*

This site consists of a scatter, dense in places, of FCR and other artifacts, which extends along the Shiawassee River for over a kilometer (Appendix B). It is bordered on either end by low marshes. Most of the riverbank along the site has become covered with vegetation over the last several years resulting in increased surface stability and minimal bank erosion. However, moderate to severe erosion was observed along some portions of the site (especially some of the higher density site areas) each year from 2004 through 2007. In 2008, only moderate erosion was observed, but again it was located primarily along the highest density portion of the site. During visits to the site in mid-April and late May, despite vegetation obscuring most of the ground surface, several flakes, FCR, and a single core were observed but not collected. The 1955 aerial photograph of this site indicates that it was cleared, and under cultivation at that time. According to the state site map, this site overlaps with the eastern portion of 20SA125. Papworth's (1959) project map shows almost a complete overlap between 20SA125 and 20SA1251. A new site number was assigned because of the lack of precise information on the location of 20SA125.

Thirty-one 50X50cm shovel test pits (STP 1-STP 31) were dug on this site during the 2000 and 2001 field seasons (Sommer 2001:17-20, 2002:13-14). In addition, 50 square meters were excavated at this site between 2001 and 2002 (Sommer 2002:25-27, 2003:23-28). Work in 2008 was confined to surface survey.

Based on material from previous field seasons, this site appears to contain Late Archaic/Early Woodland, Middle to early Late Woodland, Late Woodland and historic components. However, diagnostic artifacts indicate that the majority of the occupation debris found on the surface is probably derived from the Middle to early Late Woodland component. A Middle Woodland age AMS radiocarbon

date of 1960±40 BP (2 Sigma cal. BC 40 to AD 120) was obtained from a sample of charred organic residue scraped from the interior of a Green Point Incised, Cross Hatched vessel excavated from this site in 2002 (Sommer 2004). Shovel testing has revealed that large areas of relatively intact site deposits exist away from the eroding edge of the riverbank. Artifacts collected from this site indicate that a variety of prehistoric activities were conducted ranging from flaked stone tool and ceramic manufacturing and use, to woodworking, food storage and/or preparation, and probably hunting and fishing and on-site butchery. Finally, the presence of fairly large quantities of FCR indicates that fire was being used for heat, and/or food preparation.

20SA1273 Tittabawassee #1

This site is a findspot of two artifacts located on the bank of the Tittabawassee River (Appendix B). The 1955 aerial photograph of the site area shows a road adjacent to the river where the find was made. It does not indicate that the site area was cleared for farming. Heavy vegetation covered the riverbank and no artifacts were observed or collected from this site during two visits in 2008. Due in large part to the heavy vegetation, only minimal erosion of the riverbank was observed in the vicinity of the site. Artifacts reported previously include a grit-tempered ceramic body sherd with smooth exterior that was recovered in 2002 and the tip of a Bayport chert biface that was recovered in 2000 (Sommer 2001:25, 2003:18). The biface fragment exhibits a heavy patina and appears to be slightly water-rolled. This sherd may date to the Middle or Late Woodland periods. Interpretation of site function must await the recovery of additional artifacts through additional surface survey and subsurface testing.

20SA1274 Tittabawassee #2

This site consists of a loose cluster of pottery and a thin scatter of FCR and other artifacts extending approximately 150 meters along the Tittabawassee River (Appendix B). Heavy vegetation covered the riverbank and no artifacts were observed or collected from this site during two visits in 2008. Due in large part to the heavy vegetation, only minimal erosion of the riverbank was observed in the vicinity of the site. Based on artifacts recovered in 2002 and 2000, this site appears to represent one or more Late Woodland components. This assessment is based on the presence of multiple Late Woodland ceramic vessels and a triangular projectile point. The artifact assemblage suggests a variety of activities, including food processing or storage, flaked stone tool use and production, and using fire for heat and/or food preparation.

20SA1275 Tittabawassee #3

This site was originally recorded as a findspot of several small, grit-tempered pottery fragments located in a tree throw on the edge of an old road cut approximately 40 meters south of the Tittabawassee River (Sommer 2001:26, 2002:19-20). In 2006, three additional grit-tempered ceramic sherds were located on the riverbank approximately 70 meters east of the original findspot. Despite the distance between them, given the disturbed nature of the sediment around each of the findspots, it is thought best to lump them together under a single site designation (Appendix B). Future work may necessitate splitting the locations into two separate sites. The 1955 aerial photograph of the site area shows it to have been heavily wooded. The road cut is not clearly visible on the photograph, but the large trees growing in the area may have obscured it. Heavy vegetation covered the riverbank and no artifacts were observed or collected from this site during a single visit in 2008. Due in large part to the heavy vegetation, only minimal erosion of the riverbank was observed in the vicinity of the site.

Based on differences in their temper and paste, the three ceramic sherds recovered in 2006 probably represent at least two vessels, at least one of which is probably best described as Wayne ware. Wayne ware vessels are typically associated with the early Late Woodland period in the Saginaw Valley (Brashler 1981; Lovis 1990).

20SA1276 *Shiawassee* #13

This site is located approximately 250 meters north of the Shiawassee River (Appendix B). The site was originally located by observing artifacts in the backdirt piles from several animal burrows (Sommer 2001:26). These burrows are primarily located on and adjacent to an east/west trending linear ridge that crosscuts the site roughly around the 480-490 N line. The ridge itself is cut through by an old road that runs roughly north/south at approximately the 515-520 E line. Despite the fact that no “fresh” burrows were found during two visits to the site in 2008, a few flakes, FCR, and one destroyed grit-tempered ceramic sherd were observed on the surface in the vicinity of old burrows. None of these artifacts was collected.

One hundred and nineteen 50X50 cm shovel test pits (STPs) were dug on the site between 2001 and 2006 in order to ascertain the nature and extent of intact site deposits, and to identify an appropriate area for more extensive test excavations (Sommer 2002, 2003, 2005, 2007). Test excavations, totaling 65.25 square meters, were conducted in 2001, 2003 and again in 2004 (Sommer 2002, 2004a, 2005). The shovel test pits indicated that the main site area is flanked on the west by a low swale that appears to be an old channel or drain running north/south between the Shiawassee and Tittabawassee Rivers. We have been prevented from fully testing this assumption by high water levels, though decreasing artifact density near the edge of the swale supports the assumption. An eastern boundary was determined along the 520N line at approximately 580E, at 560N the eastern boundary is at 590E, and 600N the eastern boundary is at 620E. The eastern boundary varies from approximately 580E at 680N to 560E at 760N. Shovel testing has revealed that the northern boundary at the 540E line is approximately 830N. Along the 500E line, the southern boundary is at approximately 430N. Therefore, the site extends for approximately 400 meters in a north/south direction, and up to 130 meters in an east/west direction, covering a total of around 2.54 hectares.

Although no diagnostic artifacts were observed or collected during the 2008 field season, previous work indicates that this site dates between the Late Archaic and Late Woodland periods. The great majority of recovered artifacts indicate that the main period of occupation occurred during the Middle Woodland time period.

20SA1277 *Shiawassee* #14

This site is situated on a relatively high terrace (585’-590’ amsl) flanked by a marsh to the south, and a low swale to the east (Appendix B). The swale may be part of an old channel connecting the Shiawassee and Tittabawassee Rivers. The 1955 aerial photograph of the site area does not indicate any historic disturbance in the immediate site area. However, it appears that the low swale adjacent to the site was clear-cut. In 2001, eight 50X50cm shovel tests (STPs) were dug along a 90 meter long north/south transect, at 10-20 meter intervals, roughly paralleling the low swale to the east) (Sommer 2002:22). Prehistoric artifacts were recovered from every one of the STPs, so site boundaries have not been established. During two visits to the site in 2008, no artifacts were observed or collected.

Based on the material recovered in 2001 and 2007, this site is thought to date from the Middle through early Late Woodland periods. The faunal remains recovered from the site indicate that animals were butchered and/or cooked at the site. The ceramics also indicate activities related to cooking or

storage. The flakes and shatter indicate that flaked stone tools were made and probably used on the site. Furthermore, the presence of Upper Mercer chert, which naturally occurs in Ohio, indicates at least indirect ties to the south.

20SA722 Excavation Analysis and Evaluation

Excavation Characteristics

Thirty square meters were excavated at 20SA722 during the 2008 field season. The 30 square meters comprise two Excavation Blocks, Excavation Block E, 18 square meters, and Excavation Block F, 12 square meters (Appendix C). Individual (1X1 meter) excavation units are labeled according to the grid coordinates of their SW corner. Details of the field methods employed during the test excavation of this site are provided above in the *Methods* section of this report. An overall site description is also provided above, under 20SA722 in the *Survey Analysis and Evaluation* section.

Soil profiles for Excavation Blocks E and F are very similar to each other and to Excavation Block A/D reported previously (Sommer 2006, 2007, 2008). Excavation Block E is represented by the north wall profile of unit 569N 475E (Figure 2). A representative profile for Excavation Block F is shown by the north wall profile of unit 615N 439E (Figure 3).

Following is a generalized description of the soil profiles of Excavation Blocks E and F. The upper A-horizon includes an approximately 30-40 cm thick plowzone consisting of very dark grayish brown (10YR3/2) sandy silt. No significant change in color or texture is noted until approximately 45-50 cm when the soil becomes a very dark gray (10YR3/1) sandy silt. This darker zone, which is 15-20 cm thick, is probably a paleosol (buried A-horizon) that denotes a relatively stable former land surface during a period of reduced flooding. Between the plowzone and the paleosol, many units in Excavation Blocks E and F show a 5-10 cm thick zone of plowzone-colored sandy silt mottled with lighter (10YR4/2) and darker (10YR2/1) flecks. This is presumably a partially disturbed zone at the base of the plowzone. Plowscars were frequently visible in this zone. This is also the level in which (disturbed) shallow surface hearths such as Features 12 and 13 were first clearly encountered. At around 60-70 cm the soil is again a slightly lighter (10YR3/2 to 10YR2/2) sandy silt which continues down to a depth of approximately 90 cm. In many units, especially in Excavation Block E, the bottom 5-15 cm of this level was a darker (10YR2/1 to 10YR2/2) sandy silt. Below these relatively organic-rich zones is a massive deposit of medium/fine sand ranging in color from 10YR5/4 to 10YR4/2 and mottled with iron staining. The transition to this level is typically marked by numerous burrows and other forms of bioturbation. The north half of unit 569N 475E in Excavation Block E was excavated to a depth of 155 cm below the surface. The unit quickly filled with ground water up to the 147 cm level. Snail and bivalve shells were present throughout this zone and showed some tendency to occur in lenses of higher density. The north half of unit 615N 439E in Excavation Block F was dug down to approximately 190 cm below the surface and although the soil became very damp, the excavation did not fill with water as in Excavation Block E. The lower water table in this unit was likely a result of it being excavated later in the summer. The lower levels in Excavation Block F tended to be more heavily mottled with bioturbation than the corresponding depths in Excavation Block E. Between 140 and 150 cm, in Excavation Block F, there was a zone of mixed, or mottled, dark (10YR3/2 and 10YR2/1) sandy silt, lighter colored (10YR5/3) medium/fine sand, and grayish (10YR7/2 and 10YR6/2) sandy clay marl. Ten soil samples (SS 1-10 on Figure 2), taken from the north wall of unit 615N 439E in Excavation Block F, were saved for future geological analysis.

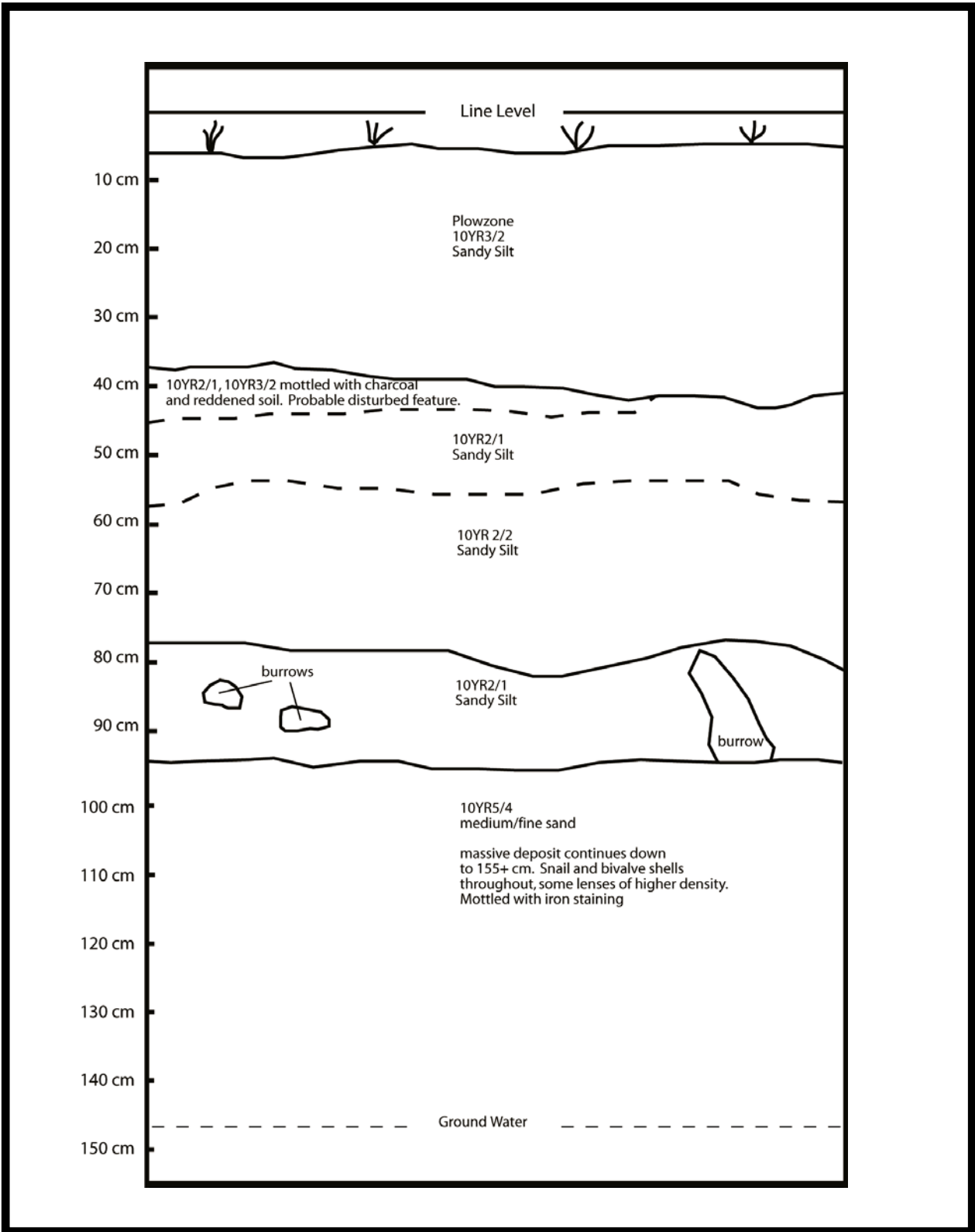


Figure 2: North Wall Profile, 569N 475E.

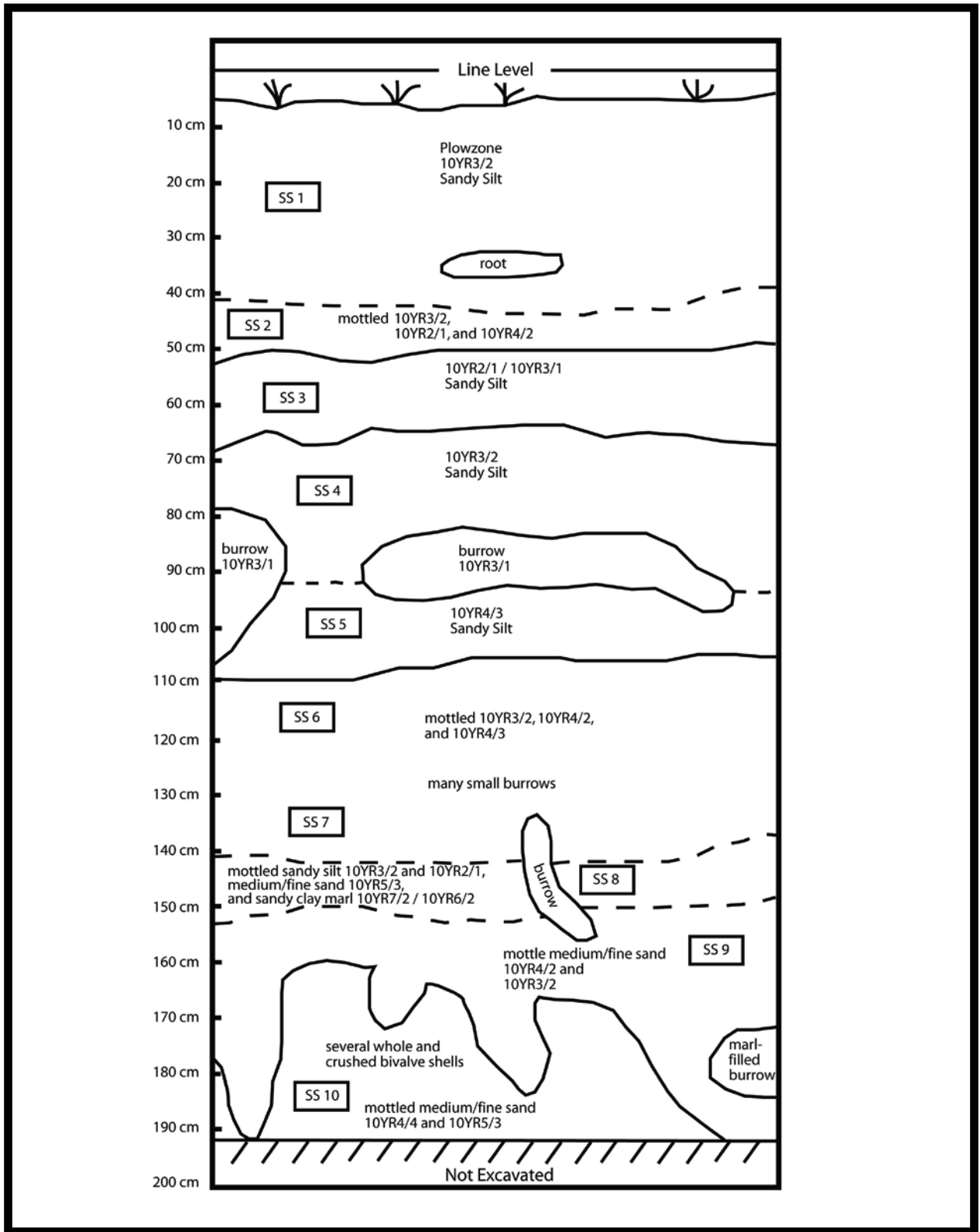


Figure 3: North Wall Profile, 615N 439E.

It was previously noted (Sommer 2007) that Excavation Blocks B and C showed two zones of relatively high artifact density separated by a 20 cm thick zone with a very low artifact density. The upper, more recent, high density zone occurred between 40 and 50 cm. The lower, earlier, high density zone was located between 70 and 80 cm below surface/datum. The 2008 material from Excavation Block F, the only Excavation Block for which distributional analysis has thus far been conducted, shows a bimodal distribution of ceramics with peaks at 35cm and 80cm and a low point at 55cm. The distribution of flakes shows a single peak at 35-40cm with a rapid drop off below 50cm.

Artifact Summary for Excavation Block E

A total of 36,962 objects were catalogued from 20SA722 during the 2008 field season. These items include nine objects derived from the surface (described above in *Analysis and Evaluation* section), and 36,953 items derived from Excavation Blocks E and F. The excavated items will be described in this section. The catalogued material from the excavation units represents only a portion of the cultural material actually present. In addition to the catalogued items, 21 samples, containing a total of 128.5 liters of sediment, were saved for flotation. Although this material has not yet been analyzed, it is clear that faunal and floral remains are abundant in many of these flotation samples. Other artifacts including lithics and ceramics are also present in the flotation samples.

Of the 36,953 catalogued objects recovered from the excavation units, 25,989 are derived from Excavation Block E and 10,964 are from Excavation Block F. The material from each Excavation Block will be considered separately.

The 25,989 catalogued items from Excavation Block E include 260 historic objects, 18,814 prehistoric objects, and 6,915 items of an undetermined origin. The latter group includes a possible hammerstone and another apparently unmodified stone, the relatively large size of which suggests human transport to the site. Other objects of undetermined origin include six bivalve fragments and 6,907 pieces of charred organics. Although most bivalves from the site are assumed to be related to prehistoric cultural activities, the provenience of the six included here indicates they are likely natural inclusions in the sediment. Most of the charcoal is wood charcoal. However, the charcoal assemblage also includes nine hickory nut shells (*Carya* sp.), 12 walnut shells (*Juglans* sp.), 10 acorn shells (*Quercus* sp.) seven unidentified nut shell fragments, one possible bean seed, four possible maize kernels, and 12 unidentified seeds. The bean, if identified correctly and if associated with the prehistoric component, would be one of very few identified from prehistoric sites in Michigan. Most of the charcoal is almost certainly a product of cultural activity, but some could represent natural forest fires.

Historic items from Excavation Block E include seven clay pigeon fragments; 15 brick fragments, including 14 yellow and one red brick; eight fragments of ceramic vessels; 50 coal/cinders/slag; three shards of flat glass (probably window glass); 53 glass vessel fragments; eight nail fragments, at least two of which are square nails; 98 scraps of iron; one fragment of barbed wire; one copper/brass percussion cap; four lead bullets; five .22 cal. shell casing; one 12 Gauge shot gun shell casing; one possible comb fragment made of plastic; one 1903 United States "Indian Head" penny; one probable tin token; one cow tooth and two fragments of saw-cut mammal bone, one of which is cut and polished. The ceramic vessel fragments include seven white paste earthenware fragments, two of which conjoin, and one unglazed sherd of red-paste earthenware. Most of the glass vessel fragments are from bottles, though one very thin, clear example may be from a light bulb. The glass assemblage includes 28 clear glass fragments, one amethyst-tinted, 18 brown, and six aqua glass fragments. Most of the historic items probably date to the mid-nineteenth through twentieth centuries.

Perhaps the most interesting Historic period item is a token made of a light-weight, white metal, probably tin (Figure 4). The obverse side of the token has a number 5 "shaded" with horizontal lines. A

circle of raised dots is present around the margin. The reverse side shows a similar circle of raised dots with the name FRED ROMEIKE in the center. The 8 June 1916 issue of the *Saginaw Daily News* contains an obituary for Frederick Ernest Romeike, a well-known Saginaw business man, born in Saginaw in 1869, who spent several years in the “liquor business”. The 9 October 1949 issue of the *Saginaw News* includes a picture from 1888 that shows the “Romeike grocery” that later became the “Romeike saloon”. At this point it still conjecture, but it appears likely that the token, the obituary, and the saloon are probably linked.



Figure 4: Block E, token.

The 18,815 prehistoric items from Excavation Block E include 2 grit-tempered clay pipe fragments; 4,470 ceramic sherds; 37 fragments of waste clay, or possibly daub; 9,199 unmodified vertebrate faunal remains, including fish, reptile, bird, and mammal remains; 1,852 unmodified bivalve mollusk remains; 18 modified bone/antler fragments; 39 bifacial tools (Table 1); 12 bipolar cores; 14 additional cores/core fragments; 3,020 lithic flakes and shatter; 19 retouched chert flakes; 90 utilized/edge-damaged chert flakes; two small hammerstones, weighing 163.4 grams and 204.0 grams respectively (Figure 5, #661), one netsinker; one fragment of ground banded slate that may be a gorget, or, possibly, a stone pipe fragment (Figure 6, #329); seven sandstone abraders (Figure 6, #7, 29); one copper bead (Figure 7, #1109) and one rolled copper scrap (Figure 7, #1040) that is probably a bead preform; two additional copper scraps; and 838 pieces of fire-cracked rock (FCR), only 28 pieces of which were from features and therefore were catalogued.

The netsinker is made of a flat, roughly oval, cobble of a limestone-like material. Modification of the original cobble is minimal. It consists of two shallow, flaked notches located opposite each other, one on each of the “long” edges of the cobble (Figure 5, #479).



Figure 5: Block E, net sinker and hammerstone.



Figure 6: Block E, ground slate, abraders, and cores.



Figure 7: Block E, rolled copper scrap and copper bead.

The ends of the copper bead are rough, indicating that it may be fragmentary. The surviving portion measures 12.7 mm long with a width ranging from 3.6 mm to 2.6 mm. The probable bead preform could have been used to produce a bead up to 25.5 mm long. Similar copper beads were recovered from the protohistoric Indian Hills Phase component of the Petersen site in northwestern Ohio (Abel 2002:49-52) and from the Late Prehistoric/protohistoric Dumaw Creek site in western Michigan (Quimby 1966:39-42).

The 39 bifacial flaked stone implements recovered from Excavation Block E include one bifacial core/preform made of bedded Bayport chert; three bifacial endscrapers made of bedded Bayport chert (Figure 8, #26, 681, 970) and a fragment of a fourth made of Bayport chert; 6 bifacial preforms or unfinished tools; one base fragment from a lanceolate shaped projectile point made of bedded Bayport chert (Figure 9, #1017); a triangular/lanceolate point made of bedded Bayport chert (Figure 10, #1091); three notched points; a triangular Levanna point made of Bayport chert (Figure 9, #387); 10 complete or fragmentary triangular (Madison-like) projectile points; a heavily resharpened triangular point that may be a drill made of either pebble or Bayport chert (Figure 9, #656); an additional “exhausted” Bayport chert biface that may have functioned as a drill (Figure 9, #1046); and 10 additional biface fragments including five made of Bayport chert, three made of either bedded Bayport or pebble chert, one Wyandotte chert example and one specimen that is either Wyandotte or Pipe Creek chert. The biface preforms include four Bayport chert examples (Figure 8, top row), one example made of either bedded Bayport or a pebble chert, and one example made of Upper Mercer chert (Figure 8, #802). The notched points include the base of a side-notched point made of Bayport chert (Figure 9, #151), a complete side-notched point made of Wyandotte chert (Figure 9, #86), and a corner-notched point made of Bayport chert (Figure 9, #723). The triangular (Madison-like) projectile points include seven Bayport chert

examples (Figure 10, #289, 864, 991, 1099) and three examples made of either bedded Bayport chert or pebble chert (Figure 10, #133, 817).

Table 1: 20SA722, biface metrics from excavation units.

Catalogue Number	Excavation Block	Type	Length (mm)	Width (mm)	Thickness (mm)
F08-1-337	E	Triangular preform	28.91	15.47	8.66
F08-1-670	E	Triangular preform	23.71	17.17	5.01
F08-1-692	E	Triangular/ovate preform	22.84	17.95	5.47
F08-1-802	E	Ovate preform	37.20	21.69	7.26
F08-1-990	E	Triangular preform	22.64	14.43	4.72
F08-1-133	E	Triangular, Madison	18.91	16.81	4.28
F08-1-289	E	Triangular, Madison	-----	14.46	4.45
F08-1-387	E	Triangular, Levanna	-----	20.37	5.68
F08-1-817	E	Triangular, Madison	21.69	11.14	4.02
F08-1-864	E	Triangular, Madison	20.87	13.14	4.09
F08-1-86	E	Side-notched	26.61	17.18	4.74
F08-1-723	E	Corner-notched	18.12	14.41	4.15
F08-1-1091	E	Lanceolate	44.47	15.81	6.10
F08-1-1099	E	Triangular, Madison	20.16	-----	4.05
F08-1-26	E	Bifacial scraper	38.03	20.92	6.88
F08-1-681	E	Bifacial scraper	24.77	24.88	7.04
F08-1-970	E	Bifacial scraper	30.36	26.44	9.07
F08-1-656	E	Triangular, Madison, drill?	-----	16.83	5.28
F08-1-1046	E	Exhausted biface, drill?	22.28	9.97	7.34
F08-1-1133	F	Triangular preform	19.88	17.22	4.71
F08-1-1472	F	Triangular preform	25.63	17.52	8.81
F08-1-1163, 1227	F	Triangular, Madison	33.40	19.87	5.44
F08-1-1233	F	Triangular, Madison	23.10	13.77	3.82
F08-1-1458	F	Triangular, Madison	-----	17.03	3.86
F08-1-1482	F	Triangular, Madison	18.71	15.69	4.45
F08-1-1226	F	Triangular, drill	-----	16.19	3.59
F08-1-1340	F	Notched/stemmed	-----	20.88	4.47
F08-1-1325	F	Bifacial scraper	29.86	18.34	7.11

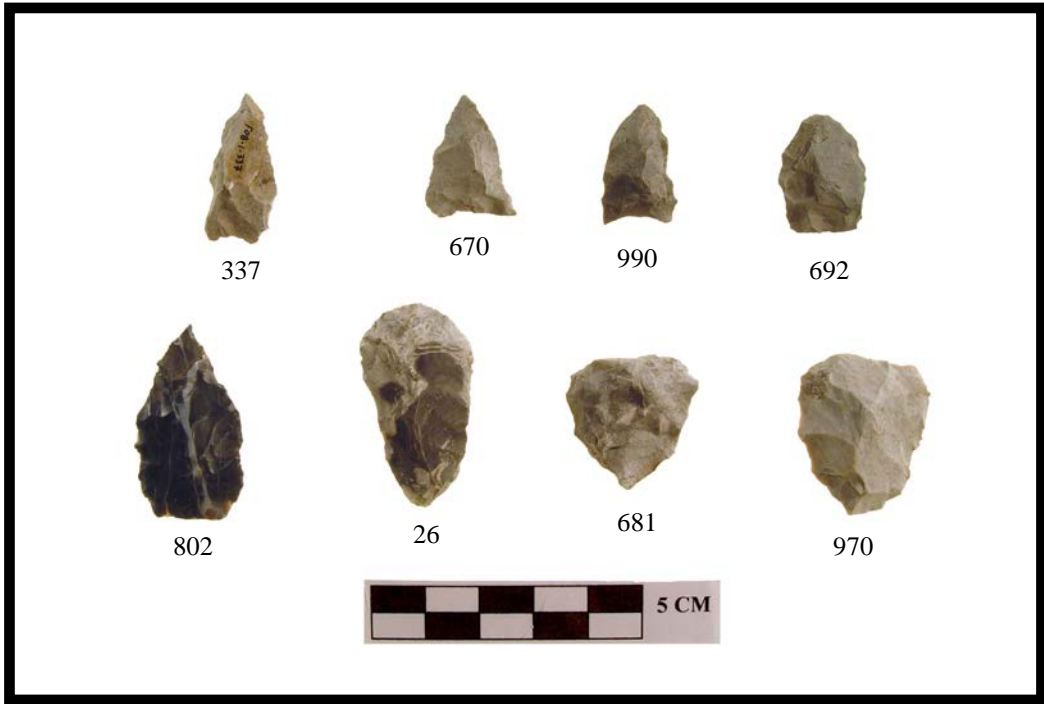


Figure 8: Block E, bifacial performs and scrapers.



Figure 9: Block E, bifaces.

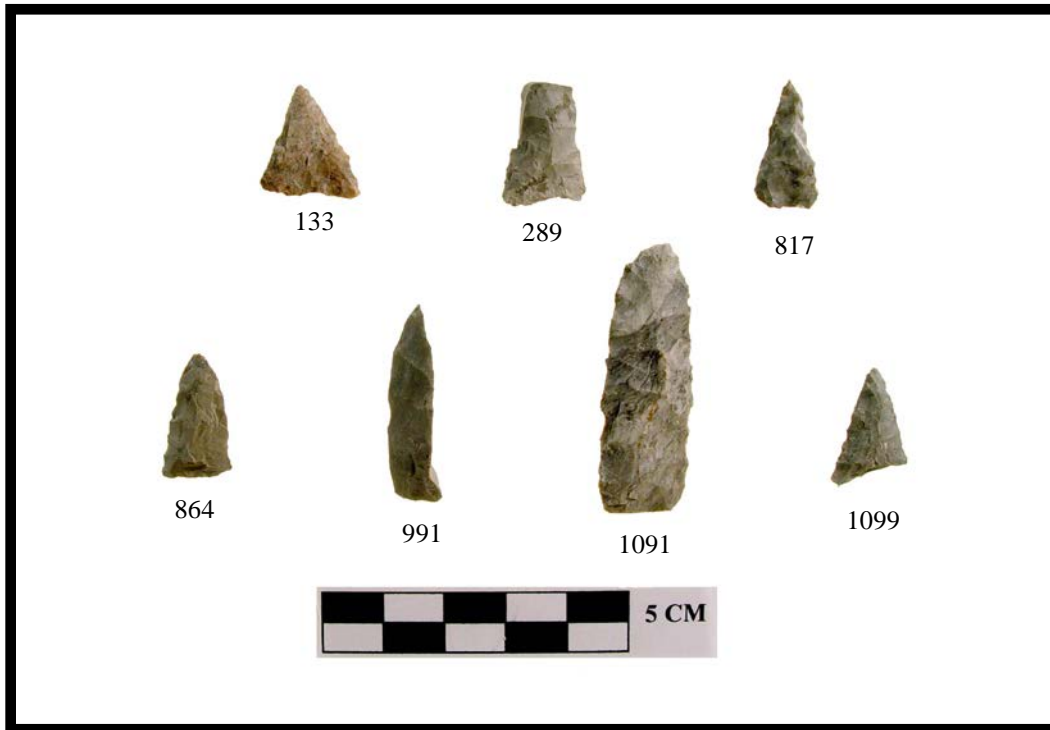


Figure 10: Block E, bifaces.

Other flaked stone tools, or probable tools, include 19 retouched flakes and 90 utilized/edge-damaged flakes. Nine of the retouched flakes exhibit at least some bifacial retouch (Figure 11, top row and bottom left), the rest show only unifacial retouch. One of the bifacially retouched flakes is a triangular projectile point made of Bayport chert (Figure 11, #390). Two other bifacially retouched Bayport chert flakes may also be projectile point fragments (Figure 11, #279, 338). The 19 retouched flakes include 15 specimens made of Bayport chert (Figure 11, #279, 338, 390, 152, 602, 701), one example of bedded Bayport chert (Figure 11, #280), two examples made from either bedded Bayport or a pebble chert, and one specimen made from an unidentified material that is probably Kettle Point chert (Figure 11, #97). The utilized/edge-damaged flakes include one quartzite example, 56 Bayport chert examples, seven additional specimens made of a bedded Bayport chert, one Wyandotte chert, and 25 specimens made of unidentified chert. The unidentified materials include one possible Kettle Point example, one possible Pipe Creek specimen and 23 examples that appear to be either Bayport, bedded Bayport, or a pebble chert.

Twelve bipolar cores were recovered from the 2008 Block E excavations at the Clunie site. The bipolar cores from Excavation Block E include eight Bayport chert examples (Figure 12, #27, 73, 87, 216, 493, 971, 1035), one bedded Bayport chert examples (Figure 12, #271), one example that is either bedded Bayport or a pebble chert (Figure 12, #824), one possible Pipe Creek chert specimen, and one Wyandotte chert example.

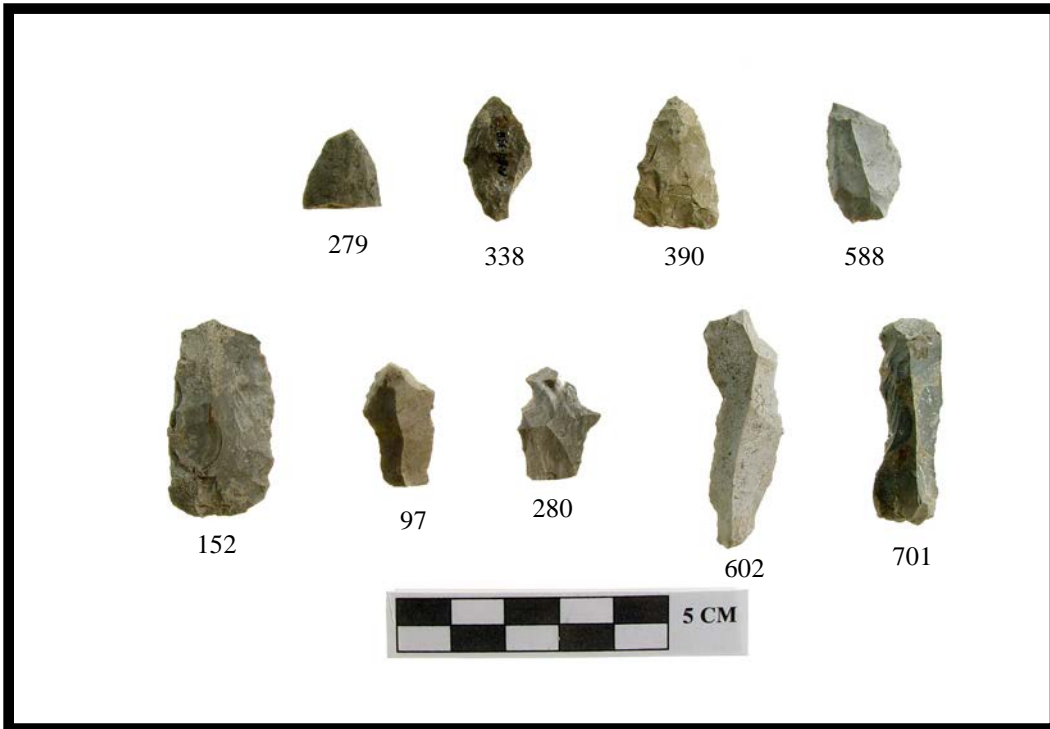


Figure 11: Block E, retouched flakes.

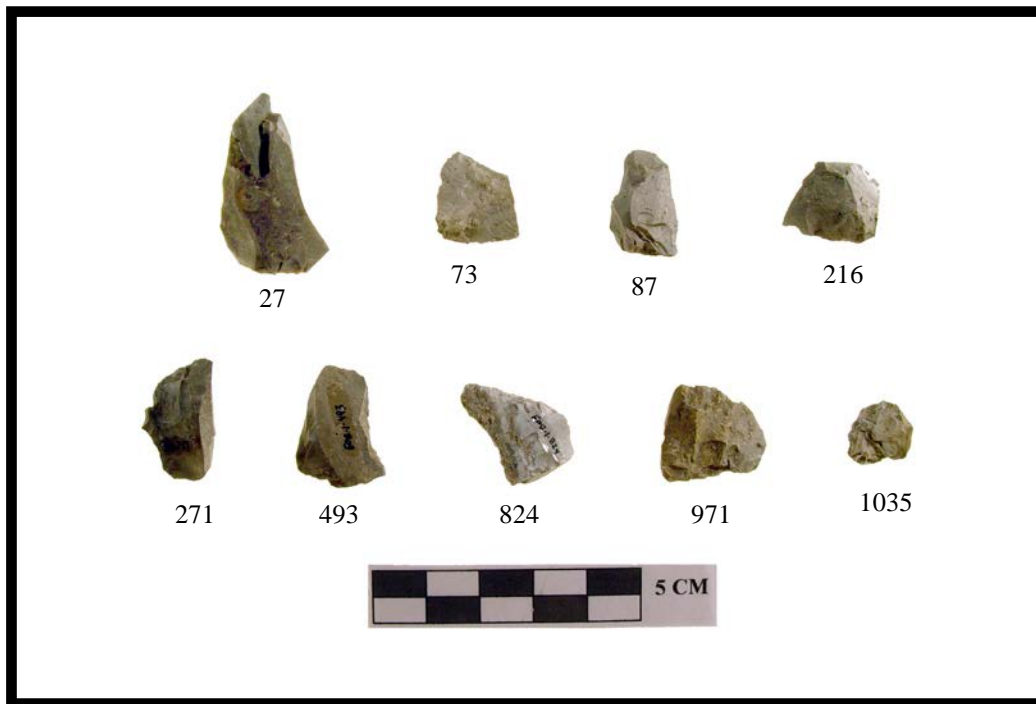


Figure 12: Block E, bipolar cores.

Fourteen additional cores or core fragments were also recovered from Excavation Block E. These cores include two Bayport chert examples, two bedded Bayport chert examples (Figure 6, #413, 615), eight examples that are either bedded Bayport or a pebble chert, one that is either Pipe Creek or Wyandotte chert, and one example that is either Greywacke or some similar coarser-grained material (Figure 6, #823).

The final flaked stone artifact category from Excavation Block E is waste material, including flakes and shatter. Raw material identification is made difficult for this assemblage by the great variability represented and the relatively small sizes of the individual pieces. The identifications listed below should be considered tentative at best. The vast majority of the 3,020 flakes and shatter recovered from Excavation Block E is locally available material including Bayport chert, bedded Bayport chert, pebble cherts, and material that is either bedded Bayport or a pebble chert. Only 209 specimens don't appear to fall into the above chert types. Several of these are likely also locally derived materials including nine flakes of unidentified chert, six quartzite flakes, 47 flakes of unidentified coarse grained rocks, and four quartz flakes. These materials could all have been found in local glacial till deposits. The only probably non-local materials represented in the flake assemblage include 75 Wyandotte chert flakes, 12 additional possible Wyandotte chert flakes, six Flint Ridge chalcedony flakes, one Upper Mercer chert flake, three possible Pipe Creek flakes, two possible Onondaga chert flakes and 44 possible Kettle Point chert flakes. The likely non-local component therefore comprises less than 7 % of the flake and shatter assemblage.

Of the 4,470 ceramic sherds, 22 are rimsherds and 4,448 are body/neck sherds. The body/neck sherds include 1,219 shell-tempered examples, 3,225 grit-tempered specimens and seven sherdlets with both grit and shell temper. Of the 1,219 shell-tempered body/neck sherds, 1,080 are either sherdlets or destroyed and were not further analyzed. The shell-tempered neck and body sherds complete enough to be analyzed include 92 with cord-roughened exterior surfaces, 23 with smoothed over cord-roughened exteriors, and 24 have exterior surfaces that are smooth or smoothed over to the point that the original surface treatment is obscured. The smooth or smoothed over shell-tempered sherds include one with a tool impression, one with a cord impression, and one with both cord and cord-wrapped stick impressions. Of the 3,225 grit-tempered sherds, 2,797 are either sherdlets or destroyed. Of the grit-tempered body/neck sherds with intact surfaces that are large enough to be analyzed, 191 exhibit cord-roughened surfaces, 152 have cord-roughened surfaces that were subsequently smoothed over, 81 have exterior surfaces that are smooth or smoothed over to the point that the original surface treatment is obscured, Two of the cord roughened sherds exhibit a cord-wrapped stick impressed decoration, two have cord impressed decorations, and one has a punctate decoration. Decorated sherds with smooth exterior surfaces include one tool impressed, one cord-impressed, two cord-wrapped stick impressed, and nine with finger trailed decoration.

The 22 rimsherds recovered from Excavation Block E represent a minimum of 18 vessels, including at least five shell-tempered vessels and 13 grit-tempered vessels. The seven sherdlets containing both shell and grit temper imply the existence of at least one additional vessel too fragmentary to be described further. At least two shell-tempered vessels are represented by three rimsherds which exhibit flattened, plain lips and smooth exteriors with a row of oblique tool impressions around the upper rim (Figures 13 and 14, #94, 14, 148). A third shell-tempered vessel has a flat, slightly thickened lip marked with tool impressions and a smooth exterior surface with slightly oblique tool impressions around the upper rim (Figures 13 and 14, #24). Two additional shell-tempered vessels are represented by rimsherds with destroyed exteriors. One vessel has a flattened lip with tool impressions, and the other's lip is marked with cord-wrapped stick impressions.

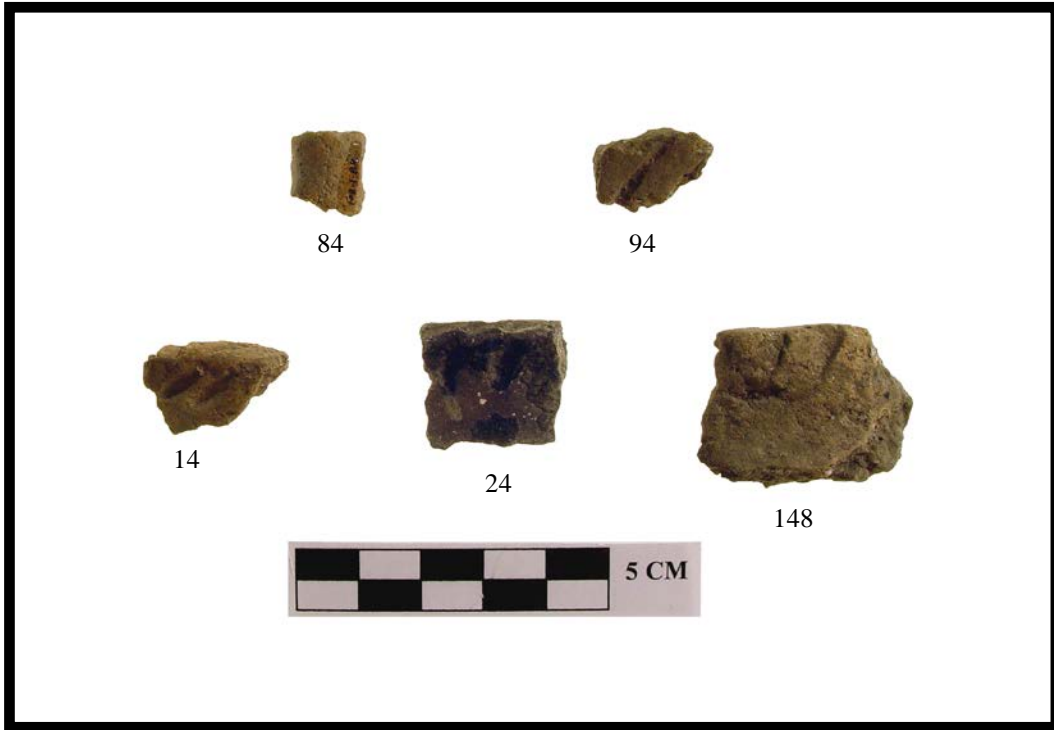


Figure 13: Block E, ceramic pipe and shell-tempered rimsherds.

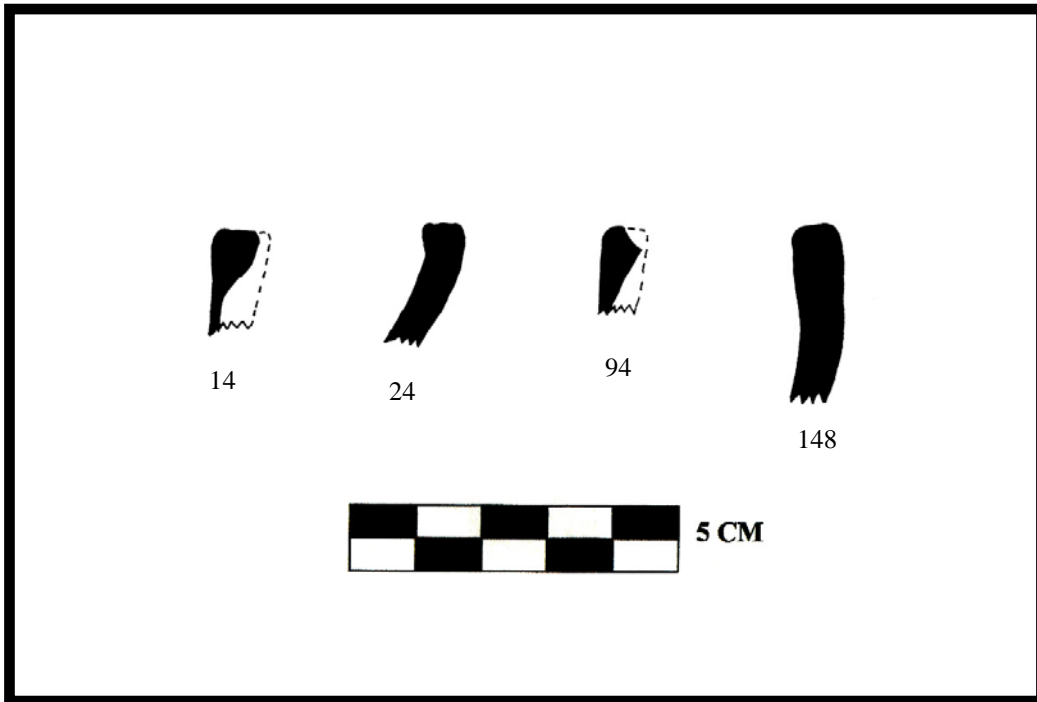


Figure 14: Block E, shell-tempered rimsherd profiles.

A grit-tempered vessel is represented by a sherd with a smooth exterior and a flat lip. Decoration consists of cord-wrapped stick impressions on the exterior rim/lip juncture and on top of the lip (Figures 15 and 16, #15). A second grit-tempered vessel also has a smooth exterior and a flattened lip. In this case, the top of the lip is marked by a smoothed-over cord impression that runs around the center of the lip. The exterior of the rim is marked with vertical cord-wrapped stick impressions (Figures 15 and 16, #1004). The eighth vessel, third grit-tempered vessel, from Excavation Block E has a thickened, almost collared, rim and a plain, flat lip. The smooth exterior of this vessel is marked by oblique impressions that appear to have been made with a thumbnail (Figures 15 and 16, #688, 689). A fourth grit-tempered vessel is unusual in having the exterior lip augmented with a clearly defined, 8.3 mm wide, appliqué strip marked with vertical tool impressions. An additional row of tool impressions is present on the exterior of the rim 7.4 mm below the bottom of the appliqué strip (Figures 15 and 16, #874). The fifth grit-tempered vessel is rather plain with a smoothed over cord-roughened exterior and a slightly thickened lip heavily (cord?) roughened on top (Figures 15 and 16, #1044). A sixth grit-tempered vessel is represented by a fragment of an applied collar that has exfoliated from the interior of the vessel. The plain lip appears thickened and beveled towards the exterior. The collar is 24.7 mm wide, has a smooth exterior, and is marked with oblique CWS impressions (Figures 17 and 18, #520). One grit-tempered vessel with a cord-roughened exterior has a folded-over rim and a plain, rounded lip. The upper rim and lip are marked by finger-pinching, which shows up particularly clearly on the smooth interior rim. The finger pinching has partially obliterated some of the exterior cord-roughening (Figures 17 and 18, #149). An eighth grit-tempered vessel is distinctly collared. The exterior of the collar and top of the lip are cord-roughened, but as in the previous vessel, finger-pinching around the top of the rim has smoothed out some of the cord-roughening. The vessel is smooth below the collar and appears to be marked by shallow vertical finger trails (Figures 17 and 18, #506). A ninth grit-tempered vessel has an undecorated cord-roughened exterior. The lip of this vessel is damaged, but appears to be marked by finger-pinching (Figures 17 and 18, #446). Two vessels are represented by sherdlet-sized rims. One is completely plain with a smooth interior and exterior and a flat lip. The other has a rounded lip with fine cord impressions on both the interior and exterior of the lip. Finally, two relatively thin, cord-roughened vessels are represented by rimsherds from the deeper levels of this Excavation Block. One, approximately 4.6 mm thick at 10 mm below the top of the lip, has a folded/pressed over lip marked with cord-wrapped stick impressions across the top of the lip (Figures 17 and 18, #116). At 3.2 mm thick at a point 10 mm below the lip, the other vessel is even thinner. The lip of this vessel is smoothed over, with no apparent decoration (Figures 17 and 18, #117).

Eighteen modified vertebrate faunal remains were recovered from Excavation Block E. They include one beaver incisor ground into a gouge-like form (Figure 19, #672); one ground, polished, and perforated bone or antler weaving needle/awl (Figure 19, #350); one cut and ground bone that may be a bead fragment (Figure 19, #468); one paddle-shaped cut and ground bone object (Figure 19, #760); one scored and snapped off bone fragment (Figure 19, #1082); one cut and ground medium mammal long bone shaft fragment (Figure 19, #209); two fragments of a bone or antler harpoon (Figure 20, #376); two conjoining fragments of an awl made from a white-tailed deer ulna (Figure 20, #237); and eight miscellaneous cut and/or ground bone fragments. At least one of the miscellaneous ground bone fragments is probably from a splinter awl, but it is a small fragment and is missing the tip. The deer ulna awl and the harpoon fragments were recovered at depths between 55 and 65 cm below the surface, indicating that they are probably associated with the earlier, Early Late Woodland occupation at the site. The rest of the modified bone fragments are likely associated with the Late Prehistoric component.

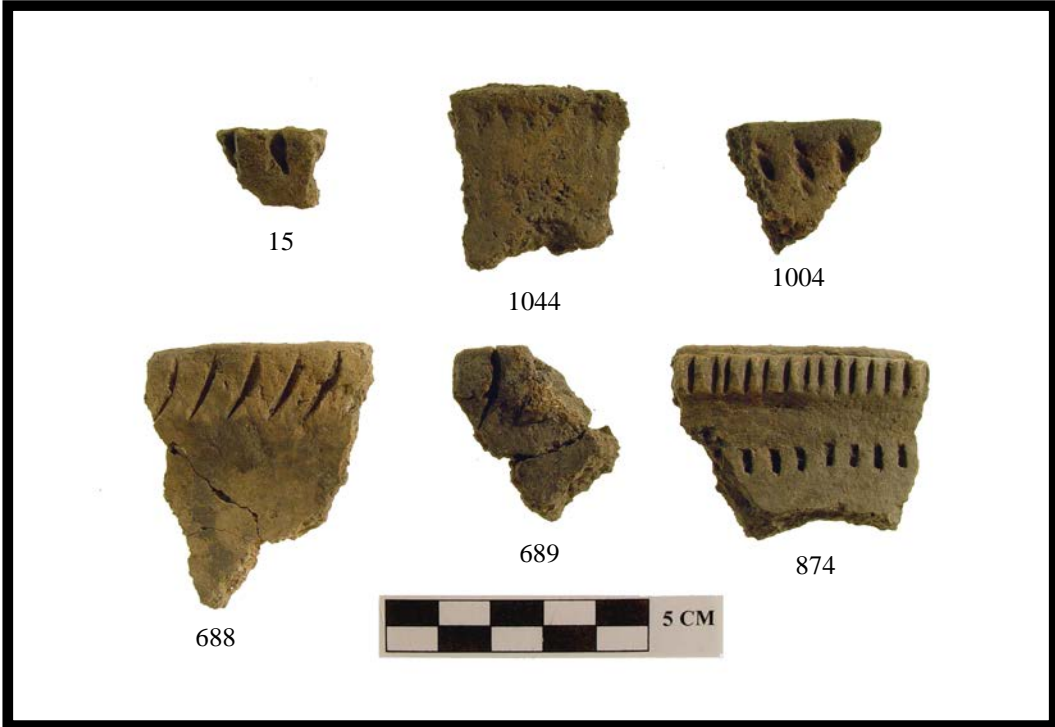


Figure 15: Block E, grit-tempered rimsherds.

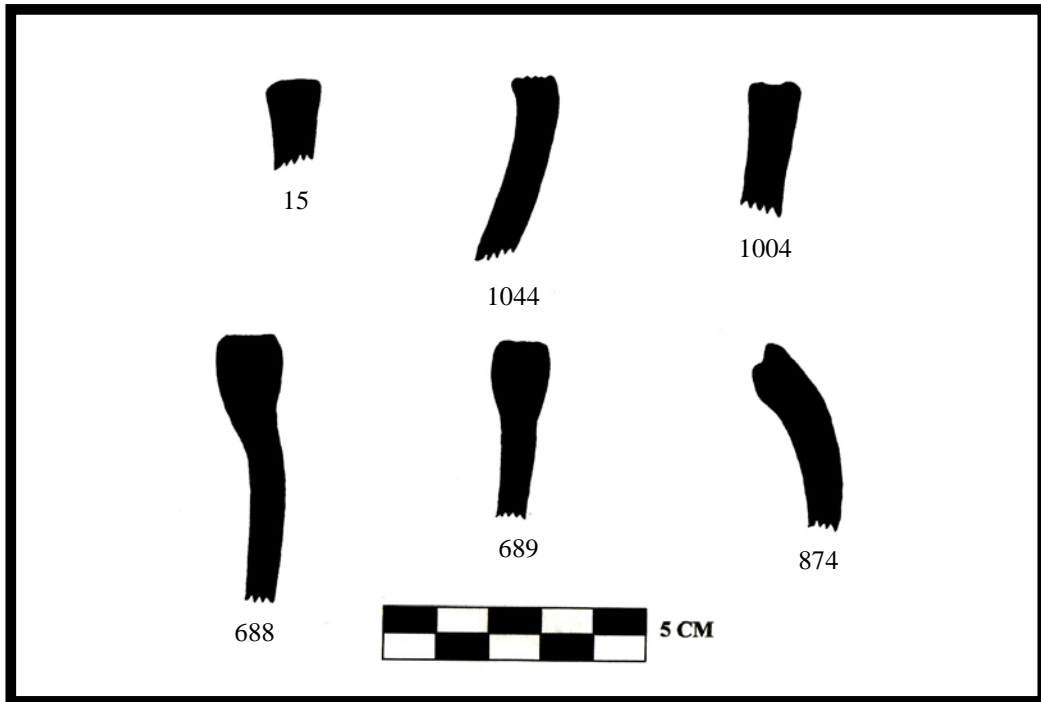


Figure 16: Block E, grit-tempered rimsherd profiles.

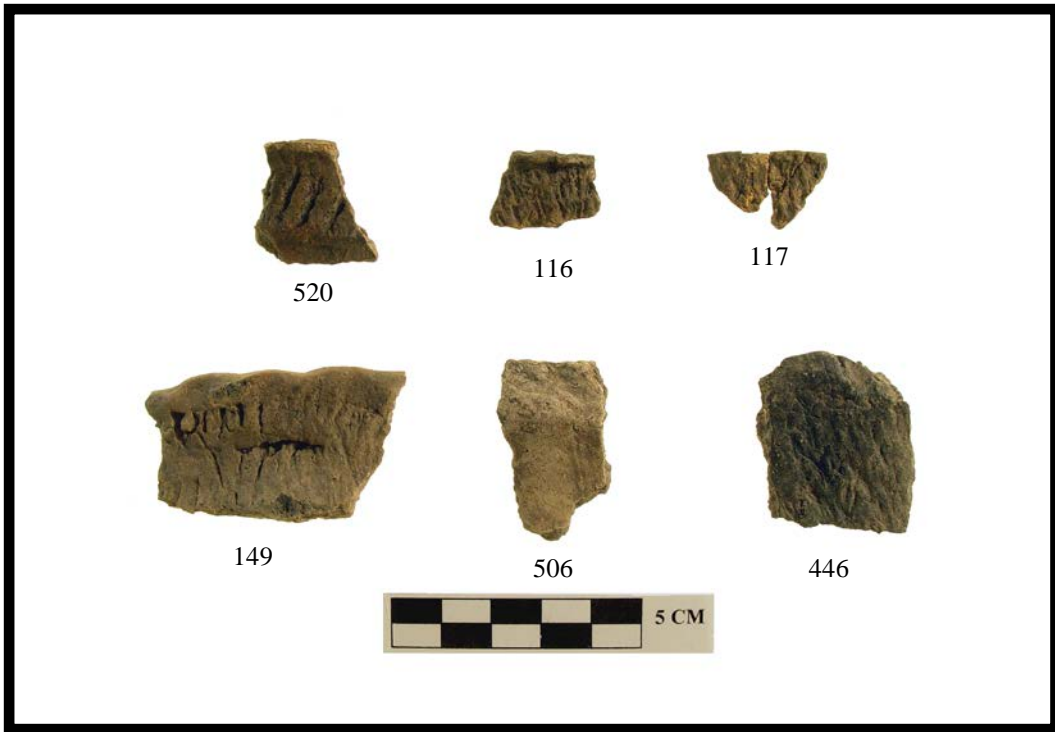


Figure 17: Block E, grit-tempered rimsherds.

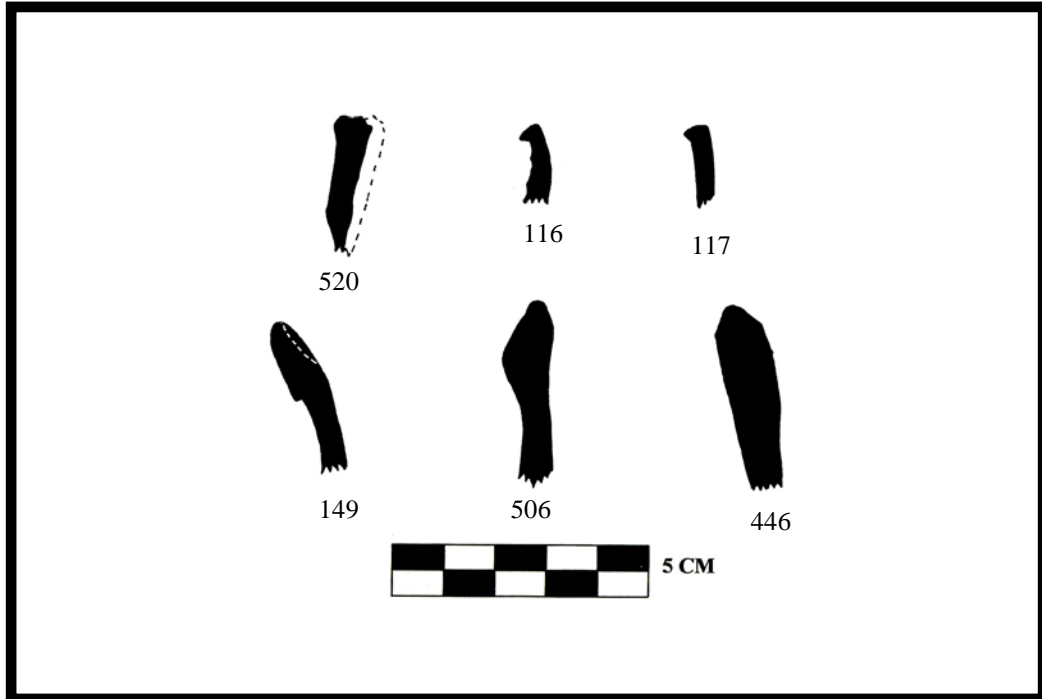


Figure 18: Block E, grit-tempered rimsherd profiles.



Figure 19: Block E, modified bone.



Figure 20: Block E, modified bone.

Unmodified faunal remains from Excavation Block E have not yet been fully analyzed. However, some preliminary identifications have been made. Vertebrate fauna tentatively identified include nine species of fish - lake sturgeon (*Acipenser fulvescens*), walleye (*Sander vitreus*), bowfin (*Amia calva*), catfish (Ictaluridae), gar (*Lepisosteus* sp.), freshwater drum (*Aplodinotus grunniens*), bass (*Micropterus* sp.), sucker (Catostomidae), and northern pike (*Esox lucius*); at least three reptiles – spiny softshell turtle (*Apalone spinifera*), unidentified turtle, and unidentified snake; at least one unidentified bird; 11 mammals – mole (Talpidae), mouse (*Peromyscus* sp.), vole (*Microtus* sp.), muskrat (*Ondatra zibethicus*), raccoon (*Procyon lotor*), beaver (*Castor canadensis*), river otter (*Lutra canadensis*), porcupine (*Erethizon dorsatum*), dog (*Canis lupus familiaris*), white-tailed deer (*Odocoileus virginianus*), and elk (*Cervus canadensis*). Up to five species of freshwater mussels have been tentatively identified, including threeridge (*Amblema plicata*), black sandshell (*Ligumia recta*) and/or spike (*Elliptio dilatata*), fatmucket (*Lampsilis siliquoidea*), and three-horned wartyback (*Obliquaria reflexa*). Of these, threeridge mussels are by far the most numerous and are the only species positively identified at this time.

Artifact Summary for Excavation Block F

The 10,964 catalogued items from Excavation Block F include 472 historic objects, 8,847 prehistoric objects, and 1,645 items of an undetermined origin. The latter group includes six possible sandstone abrader fragments that may be prehistoric, culturally produced items, or natural inclusions in the soil; 131 bivalve fragments; and 2,219 pieces of charcoal. Although most bivalves from the site are assumed to be related to prehistoric cultural activities, the provenience of the 131 included here indicates they are likely natural inclusions in the sediment. Most of the charcoal is wood charcoal. However, the charcoal assemblage also includes one walnut shell (*Juglans* sp.) and one unidentified nut shell fragment. Most of the charcoal is almost certainly a product of cultural activity, but some could represent natural forest fires.

Historic items from Excavation Block F include 167 clay pigeon fragments; nine fragments of ceramic vessels; one white porcelain button; four fragments of red brick; 84 coal/cinders/slag; 11 fragments of flat glass (probably window glass); 57 glass vessel fragments; 10 nail fragments, at least six of which are from square nails; one wood screw; 2 unidentified iron objects; 8 pieces of barbed wire; 4 additional wire pieces; 15 fence staples; 88 scraps of iron; two .22 cal. lead bullets; one .22 cal. shell casing; one 12 gauge shot gun shell casing impressed “PETERS LEAGUE” on the end; one small piece of mortar or concrete; two fragments of plaster with light blue paint on one surface; and four saw-cut bones. The ceramic vessel fragments include eight white paste earthenware fragments and one red paste earthenware fragment. This latter specimen is unglazed and may be from an earthenware tile, rather than a vessel. Of the white paste earthenware fragments, two are “flow blue” transfer printed, one has a light blue and orange annular decoration, and five are plain white/destroyed. Most, possibly all, of the glass vessel fragments are bottles. The assemblage includes nine clear glass fragments, 47 aqua fragments, and one dark green glass fragment. Most of the historic items probably date to the mid-nineteenth through twentieth centuries.

The 8,847 catalogued prehistoric items from Excavation Block F include 1,104 ceramic sherds; one fragment of waste clay, or possibly daub; 3,922 unmodified vertebrate faunal remains, including fish, reptile, bird and mammal remains; 2,607 unmodified bivalve mollusk remains; 7 modified bone/antler fragments; 16 bifacial tools (Table 1); six bipolar cores; four additional cores/core fragments; 1,134 lithic flakes and shatter; nine retouched chert flakes; 31 utilized/edge-damaged chert flakes; one sandstone abrader; one fire-cracked hammerstone fragment; one small fragment of an unidentified ground slate

object; two rolled sheet copper beads (Figure 21, #1933, 1330) and one rolled copper scrap/bead perform (Figure 21, #1871).

The ends of the shorter copper bead are rough, indicating that it may be fragmentary. The surviving portion measures 13.9 mm long with a width ranging from 5.4 mm to 5.8 mm. The longer bead is complete measuring 27.9 mm long and 4.2-5.1 mm in width. The probable bead preform could have been used to produce a bead up to 34.6 mm long. Similar copper beads were recovered from the protohistoric Indian Hills Phase component of the Petersen site in northwestern Ohio (Abel 2002:49-52) and from the Late Prehistoric/protohistoric Dumaw Creek site in western Michigan (Quimby 1966:39-42).



Figure 21: Block F, copper beads and modified bone.

The 16 bifacial flaked stone implements recovered from Excavation Block F include one bifacial endscraper with heavy usewear made of pebble chert (Figure 23, #1325); three triangular preforms made of Bayport chert (Figure 22, #1133, 1472); a base fragment from a notched projectile point made of either Pipe Creek or Kettle Point chert (Figure 22, #1200); One fragment of a notched or stemmed point made of Bayport chert (Figure 22, #1340); five triangular (Madison-like) projectile points; one triangular Bayport chert biface modified into a drill, but missing its tip (Figure 22, #1226); an additional drill-like tip made of Bayport chert (Figure 22, #1397); and three additional biface fragments including one made of bedded Bayport chert (Figure 22, #1227), one made of either bedded Bayport or pebble chert, and one made of Wyandotte chert. The triangular (Madison-like) projectile points include one bedded Bayport chert base fragment that refits with a tip fragment (Figure 22, #1163, 1227), a second base fragment of bedded Bayport chert (Figure 22, #1458), two Bayport chert examples (Figure 22, #1482), and one example that is either Bayport or a pebble chert (Figure 22, #1233).



Figure 22: Block F, bifaces.

Other flaked stone tools, or probable tools, include nine retouched flakes and 31 utilized/edge-damaged flakes. Two of the retouched flakes exhibit at least some bifacial retouch (Figure 23, #1473, 1628). Both are made of Bayport chert. One of the bifacially retouched flakes appears to be a fragmentary projectile point (Figure 23, #1473). The other seven retouched flakes show only unifacial retouch. They include five specimens made of Bayport chert (Figure 23, #1474, 1689), one made of bedded Bayport chert (Figure 23, #1398), and one made of either bedded Bayport or pebble chert (Figure 23, #1621). The utilized/edge-damaged flakes include 29 Bayport chert examples and two examples made of either bedded Bayport or a pebble chert.

The six bipolar cores recovered from Excavation Block F include 5 Bayport chert examples (Figure 24, top row and #1729) and one pebble chert example (Figure 24, #1743). The four additional cores include three Bayport chert examples (Figure 24, #1476) and one core fragment/shatter of either bedded Bayport or pebble chert (Figure 24, #1659).

The final flaked stone artifact category from Excavation Block F is waste material, including flakes and shatter. The vast majority of the 1,134 flakes and shatter recovered from Excavation Block F is locally available material including Bayport chert, bedded Bayport chert, pebble cherts, and material that is either bedded Bayport or a pebble chert. Only 19 specimens don't appear to fall into the above chert types. Several of these are likely also locally derived materials including two flakes of unidentified chert, five quartzite flakes, and three flakes of an unidentified coarse grained rock. These materials could all have been found in local glacial till deposits. The only probably non-local materials represented in the flake assemblage include three Wyandotte chert flakes, one additional possible Wyandotte chert flake, three flakes of Flint Ridge chalcedony, and two possible Pipe Creek chert flakes. The likely non-local component therefore comprises less than 1 % of the flake and shatter assemblage from Excavation Block F.

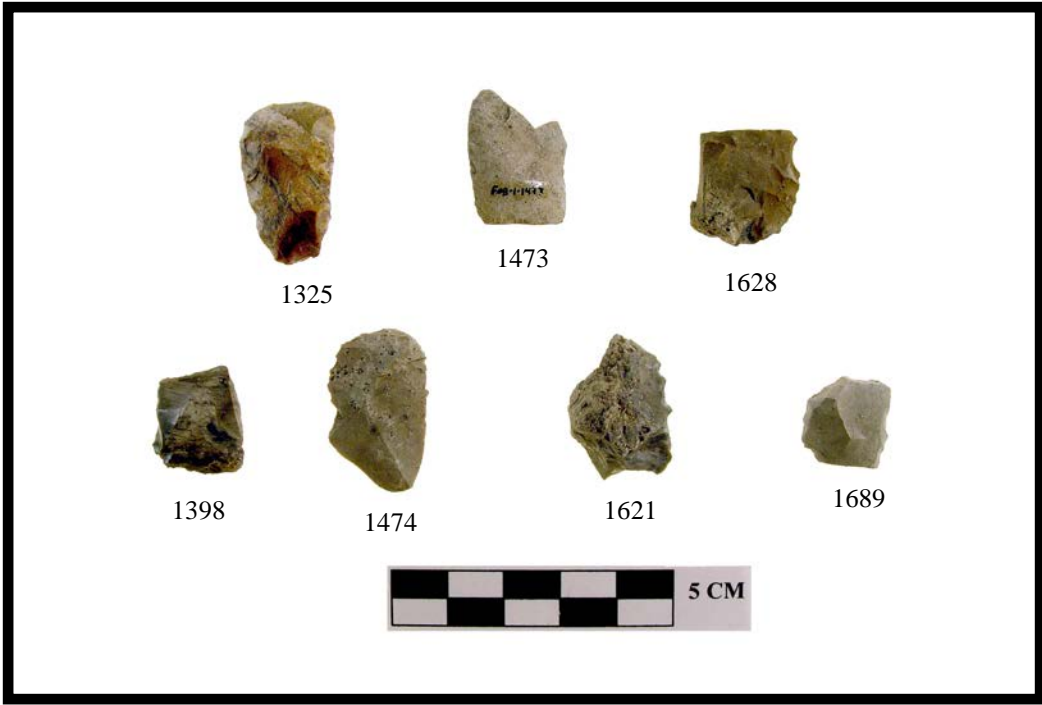


Figure 23: Block F, bifacial scraper and retouched flakes.

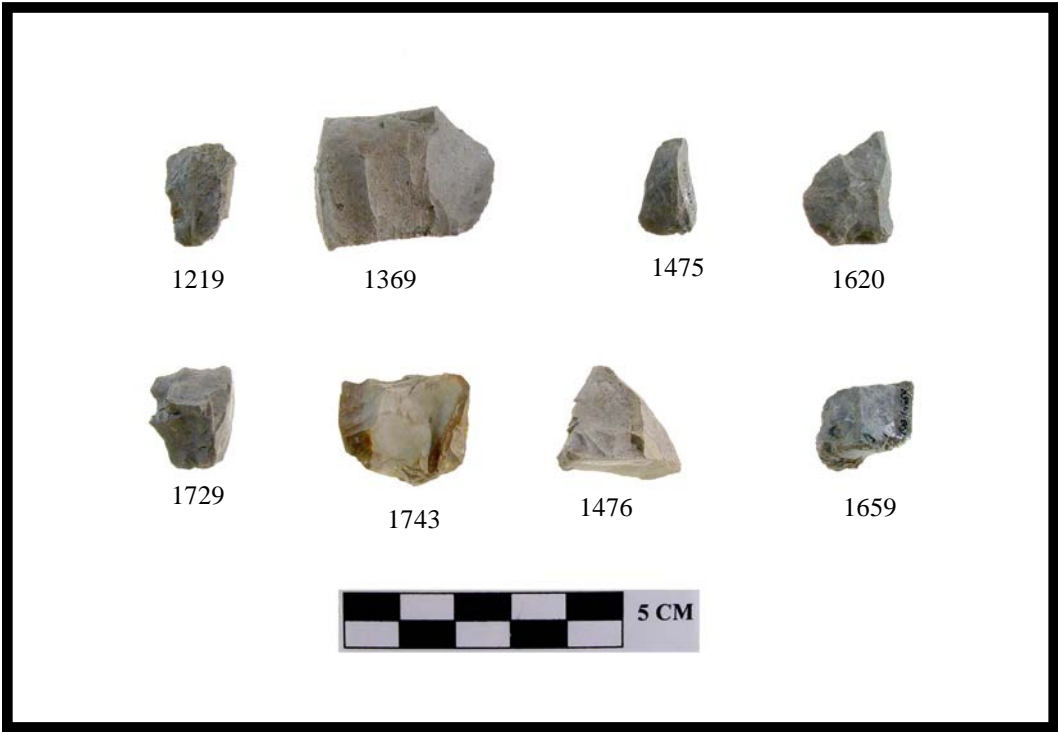


Figure 24: Block F, bipolar cores and cores.

Of the 1,104 ceramic sherds from Excavation Block F, eight are rimsherds and 1,096 are body/neck sherds. The body/neck sherds include 155 shell-tempered examples and 941 grit-tempered specimens. Of the 155 shell-tempered body/neck sherds, 152 are either sherdlets or destroyed and were not further analyzed. The three remaining shell-tempered sherds each have exterior surfaces that are smooth or smoothed over to the point that the original surface treatment is obscured. Of the 941 grit-tempered sherds, 832 are either sherdlets or destroyed. Of the grit-tempered sherds with intact surfaces that are large enough to be analyzed, 55 exhibit cord-roughened surfaces, 18 have cord-roughened surfaces that were subsequently smoothed over, and 36 have exterior surfaces that are smooth or smoothed over to the point that the original surface treatment is obscured. One of the cord roughened sherds also exhibits a cord-impressed decoration, as does one of the smooth sherds. Four of the sherds with smooth exterior surfaces exhibit finger trailed decorations.

The eight rimsherds recovered from Excavation Block F represent a minimum of six vessels, including one shell-tempered vessel and at least five grit-tempered vessels. The exterior of the shell-tempered rimsherd is destroyed. Still apparent though are small tool impressions or notches along the exterior lip of the vessel (Figures 25 and 26, #1491). One of the grit-tempered vessels is represented by a sherd with a smooth exterior and two shallow puntates/tool impressions located approximately 10.24mm below the top of the lip (Figures 25 and 26, #1552). The lip appears flat, or, possibly, slightly concave. The interior of this sherd is destroyed. A third vessel is represented by a grit-tempered rimsherd with a thickened or rolled over lip (Figures 25 and 26, #1758). The lip itself is smooth. There appears to be some texture or decoration immediately below the lip, but the sherd is broken at this point. The fourth, fifth, and sixth vessels each exhibit undecorated cord-roughened exteriors. Vessel 4 has a plain, flattened lip and a destroyed interior (Figure 25 and 26, #1306). Vessel 5 is a relatively thin vessel, measuring approximately 5.14 mm in thickness at a point 10 mm below the top of the lip. The cord-roughening on this vessel extends across the top of the lip (Figure 25 and 26, #1708). The sixth vessel is thicker than the fifth, measuring 8.31 mm in thickness at a point 10 mm below the top of the lip. This vessel, represented by three rimsherds, has a rounded, smooth lip (Figures 25 and 26, #1961, 1967).

Seven modified vertebrate faunal remains were recovered from Excavation Block F. They include one modified antler fragment and six medium or large mammal bone fragments. The modified antler is a burnt section near the end of a tine that has cut/chop marks and polish or usewear (Figure 21, #1172). Of the six modified medium or large mammal bone fragments, two conjoining fragments are from a beamer made from a white-tailed deer metatarsal (Figure 21, #1485, 1548). A third deer metatarsal fragment shows grinding/striations and is likely also from a beamer. One ground medium/large mammal long bone splinter is part of an awl (Figure 21, #1261). The remaining two modified bones are fragments of medium/large mammal long bone shafts with ground edges. One of these is also burnt.

Unmodified faunal remains from Excavation Block F have not yet been fully analyzed. However, some preliminary identifications have been made. Vertebrate fauna tentatively identified include eight species of fish - lake sturgeon (*Acipenser fulvescens*), walleye (*Sander vitreus*), bowfin (*Amia calva*), catfish (Ictaluridae), gar (*Lepisosteus* sp.), freshwater drum (*Aplodinotus grunniens*), sucker (Catostomidae), and northern pike (*Esox lucius*); two reptiles – spiny softshell turtle (*Apalone spinifera*), and an unidentified turtle; one bird; and seven mammals – mole (Talpidae), mouse (*Peromyscus* sp.), muskrat (*Ondatra zibethicus*), raccoon (*Procyon lotor*), beaver (*Castor canadensis*), white-tailed deer (*Odocoileus virginianus*), and elk (*Cervus canadensis*). Up to three species of freshwater mussels, including threeridge (*Amblema plicata*), black sandshell (*Ligumia recta*), and/or spike (*Elliptio dilatata*) have also been tentatively identified from Excavation Block F. Of these, threeridge mussels are the most numerous.

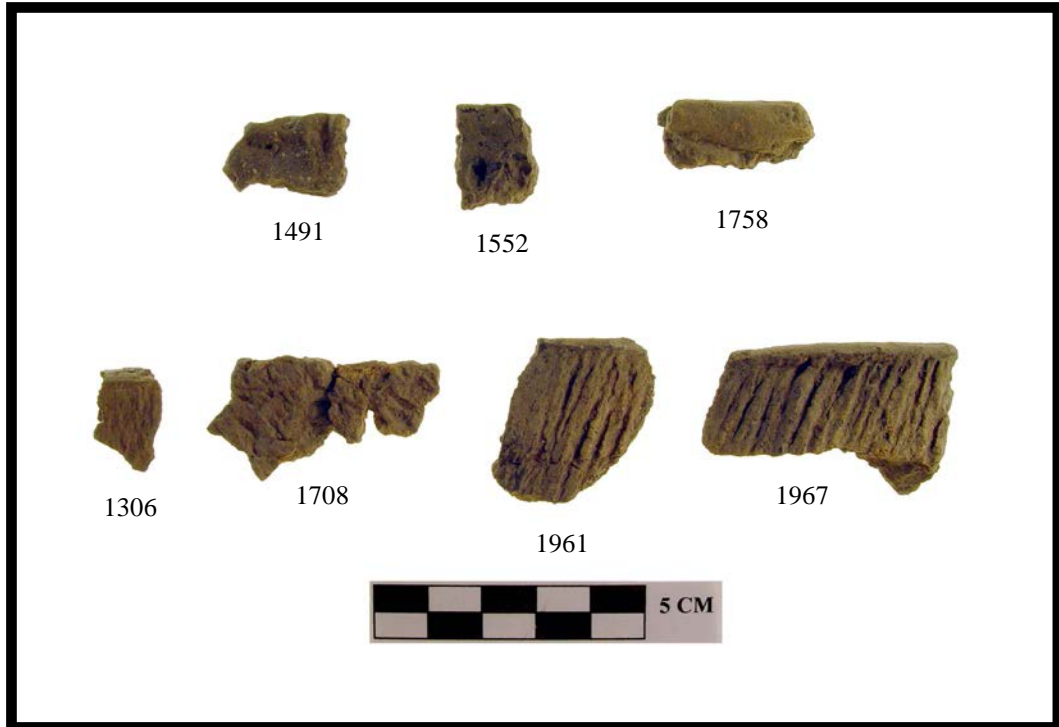


Figure 25: Block F, ceramic rimsherds.

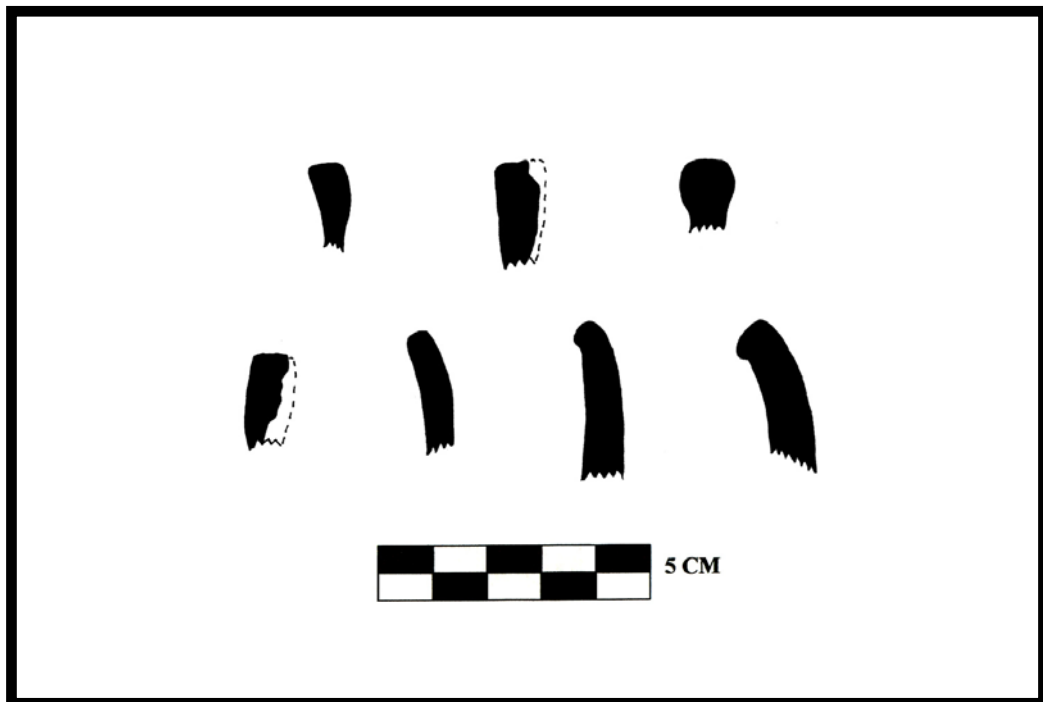


Figure 26: Block F, rimsherd profiles.

Feature Descriptions

Six features were recorded in the 30 square meters excavated at 20SA722 in 2008. Five were located in Excavation Block E and one in Excavation Block F. Four of the features in Block E (12, 13, 16, and 17) are thought to represent shallow surface hearths. Feature 14 is a small ash-filled pit. Features 12, 13, 16 and 17 were truncated to some unknown degree by the plowzone. Feature 14 did not appear to have been impacted by plowing. Feature 15 is the only feature recorded in Excavation Block F. This feature consisted of a small, shallow trash deposit that was truncated to some degree by plowing.

The feature volumes that are recorded below are all minimum values describing the amount of feature fill that was saved for flotation. All depths are recorded as centimeters (cm) below datum (b.d.), which was arbitrarily selected to be the surface of one of the corners of the excavation unit in which the feature is located. The flotation samples that were collected from these features have not yet been catalogued. Therefore, the lists of feature contents provided in the descriptions below should be considered preliminary assessments. The locations of the features within the Excavation Blocks are shown in Appendix C.

Feature # 12
Location Intact portions primarily in 569N 476E, extending into the unexcavated unit to the north. Plow disturbed portions extend across 568N 477E and 569N 475-477E. Disturbed portions also appear to extend into unexcavated units to the north, south, and east.
Plan intact portion is roughly circular/oval
Profile shallow, basin-shaped
Max. length 95 cm
Max. width 85+ cm
Depth defined 40 cm
Max. depth 50 cm
Volume 49 liters
Description Feature 12 appears to be a heavily plow-disturbed, shallow hearth (Figures 27 and 28). The feature matrix consisted of mottled ash, reddened soil and charcoal. Several ash lenses contained abundant charred acorn fragments. Chert flakes, ceramic sherds, and fish and mammal bones were present in the feature.

Feature # 13
Location 568-569N 471-473E
Plan almost entirely plow disturbed
Profile probably shallow, irregular basin-shaped
Max. length >200 cm
Max. width >100 cm
Depth defined 40 cm
Max. depth 45 cm
Volume 13 liters
Description Feature 13 was a shallow/surface hearth that was almost entirely disturbed by plowing (Figure 29). The size and distribution of feature material probably reflects this disturbance as the long axis of the scatter is oriented in the direction of the plowscars. Feature 13 did contain some dense concentrations of charcoal, ash, and reddened soil indicating it probably functioned as a hearth. Contents almost certainly associated with the hearth include mussel shells, chert flakes, fish and mammal bones, and a few grit-tempered and shell-tempered ceramic sherds.



Figure 27: Block E, Feature 12 plan view.



Figure 28: Block E, Feature 12 profile.



Figure 29: Block E, Feature 13 plan view.



Figure 30: Block E, Feature 14.

Feature # 14
Location 569N 469E, extending slightly into 569N 470E
Plan circular/oval
Profile bag-shaped
Max. length 25 cm
Max. width 20 cm
Depth defined 40 cm
Max. depth 55 cm
Volume 5 liters
Description Feature 14 was a small, bag-shaped pit packed full of ash (Figure 30). The ash appeared fairly homogenous though it did contain some charcoal, bone fragments, grit-tempered and shell-tempered ceramics and, at the very bottom, a complete, unburned valve from either a spike, or black sandshell mussel. The size, position, and unburned nature of the mussel shell in this feature suggests that it was intentionally placed there. The function of this ash pit is unknown. It is possible, perhaps likely, that the ash was being saved for some future use such as processing hides.

Feature # 15
Location 612N 438-439E
Plan irregular, plow-disturbed
Profile shallow, basin shape
Max. length 60 cm
Max. width 30 cm
Depth defined 35 cm
Max. depth 46 cm
Volume 15 liters
Description Feature 15 was a shallow, basin-shaped trash pit the upper portions of which were truncated by the plowzone (Figure 31). The bottom of the feature consisted of a 1-2 cm thick layer of bone, derived mostly from fish. Apart from the abundant bone and a few mussel shell fragments, there did not appear to be many artifacts in the feature.

Feature # 16
Location 568N 469E
Plan plow-disturbed but probably oval/circular
Profile shallow, basin shape
Max. length 55 cm
Max. width 50 cm
Depth defined 40 cm
Max. depth 48 cm
Volume 17.5 liters
Description Feature 16 was a shallow, basin-shaped hearth heavily plow-disturbed in its upper portions (Figure 32). The feature had no clear internal stratigraphy, but contained a mix of ash, charcoal, and reddened soil. Several FCR were clustered in the 40-45 cm level of this feature. Other artifacts were sparse, but did include at least one shell-tempered ceramic sherd.



Figure 31: Block F, Feature 15 profile.



Figure 32: Block E, Feature 16 profile.

Feature # 17
Location 568-569N 469E (568-569N 468E not excavated)
Plan circular/oval
Profile shallow, basin shape
Max. length 85 cm
Max. width 50+ cm
Depth defined 40 cm
Max. depth 52 cm
Volume 29 liters
Description Feature 17 was a shallow, basin-shaped hearth (Figure 33). The upper portions were disturbed by plowing, but probably not to a large degree. The bottom of the feature was lined throughout with a clear 2-3 cm thick layer of charcoal. The remainder of the feature matrix consisted of well-mixed ash and reddened soil. Artifacts were not numerous, but included several FCR, a few mussel shell fragments, a few bone fragments, and a bipolar core made of Bayport chert.



Figure 33: Block E, Feature 17.

Radiocarbon Dates

Although suitable material was collected, no radiocarbon dates have been obtained from our 2008 work at the Clunie site. Four dates were obtained on charcoal recovered during previous field seasons from Features 1, 3 and 9 (Sommer 2006, 2007). The results of those analyses are repeated here.

In 2005, two charcoal samples taken from Feature 1 were submitted to Beta Analytic, Inc., for radiocarbon analysis. One sample consisted of six grams of wood charcoal that were collected from a flotation sample taken from Feature 1, Area 4. Assuming our interpretation that Feature 1 consists of two overlapping pits, this sample dates the smaller, circular pit that makes up the southeast portion of Feature 1. The conventional radiocarbon age of this first sample is 340 +/- 50 BP (2 Sigma Calibrated AD 1440-1660). The second sample consisted of 8.8 grams of wood charcoal that was piece-plotted in Feature 1, Area 7. This sample dates the larger (northwestern portion) of the probable overlapping pits that make up Feature 1. The conventional radiocarbon age of this second sample is 490 +/- 50 BP (2 Sigma Calibrated AD 1400-1470).

In 2006, two additional charcoal samples were submitted to Beta Analytic, Inc., for radiocarbon analysis. One sample consisted of 11.5 grams of wood charcoal that were combined from flotation samples and excavated charcoal samples taken from Feature 3, Areas 1, 2, and 4. The conventional radiocarbon age of this first sample is 450 +/- 70 BP (2 Sigma Calibrated AD 1400-1530 AND AD 1550-1630). The second sample consisted of 20.0 grams of wood charcoal that was hand excavated from Feature 9, Area 1. The conventional radiocarbon age of this second sample is 270 +/- 60 BP (2 Sigma Calibrated AD 1470-1680 AND AD 1740-1810 AND 1930-1950). The multiple ranges in the calibrated dates reflect the fact that the conventional radiocarbon age crosses the calibrations curve in multiple places. In the sample from Feature 9, we can safely reject the two most recent calibrated age ranges on typological grounds of the artifacts contained in the feature.

DISCUSSION

Although modest, the continuing goals of the surface survey portion of this project, to document and collect artifacts from archaeological sites exposed on Shiawassee NWR property were met during the 2008 field season. In addition, the goals of the test excavations, to assess site stratigraphy and the nature of buried archaeological deposits; to obtain a representative sample of artifacts to assess site use through time and to relate site components to the broader local and regional culture history; to obtain material suitable for radiocarbon dating; and to obtain floral and faunal remains to assess site seasonality and subsistence practices were also met for site 20SA722. Ten seasons of fieldwork have clearly demonstrated that significant cultural resources are present within the boundaries of the Shiawassee NWR, including extensive buried archaeological deposits, which, at least in a portion of 20SA722, are stratified.

Although no evidence for it was recovered during the 2008 field season, the earliest period of occupation that we have good evidence for at the refuge is the Late Archaic or transitional Late Archaic/Early Woodland. In addition to the Meadowood related biface recovered from the surface of 20SA722 in 2006, greywacke flakes, found in 1999, provide possible, though certainly not conclusive, evidence for Transitional/Late Archaic occupations at 20SA722, 20SA1254, and 20SA1255. More suggestive is the cannel coal gorget and side-notched/expanding stemmed point with a ground base from 20SA1255, which was found during the 1999 field season (Sommer 2000:22-25). Other Late Archaic/Early Woodland material recovered during previous field seasons include a Meadowood point from 20SA214, Adena and Adena-like stemmed points, two broad-bladed stemmed points, and a Kramer-like point found at 20SA1251 during the 2000 and 2002 field seasons (Sommer 2001); and a possible Meadowood point and a corner-notched/side-notched point with a heavily ground base found at 20SA1251 during the 2001 field season. During the 2003 field season, an additional Meadowood point and a stemmed point increase the Late Archaic/Early woodland assemblage from 20SA214, while the two large stemmed knives and two "Ace of Spades/Ground base" points from the excavations add 20SA1276 to the list of sites with Late Archaic/Early Woodland occupations. An additional "Ace of Spades/Ground base" point was recovered from the surface of 20SA1276 in 2004 (Sommer 2005). Comparable Late Archaic/Early Woodland material is discussed by Beld (1991), Garland and Beld (1999), and Granger (1978). The paucity of Late Archaic age material from the refuge is certainly a result of the fact that most of the sites that have been found on the refuge would have been inundated by the Shiawassee embayment from sometime before the Nipissing maximum around 4,800 B.P. to after the Algoma maximum around 3,800 B.P. (Monaghan and Lovis 2005).

Middle and/or Late Woodland occupations are indicated at all of the sites for which diagnostic materials are available. Although initial assessments of the material from 20SA1251 and 20SA1276 stressed that Middle Woodland period artifacts were primarily from the latter half of the period, early Middle Woodland artifacts have also been recognized in the assemblages. The presence of late Middle Woodland, transitional Middle to early Late Woodland, and early Late Woodland artifacts, including Green Point, Ruben Linear, and Wayne Ware ceramics, cut and engraved turtle carapace bowls (cf. Halsey 1966), and Snyders-like, Jack's Reef, Raccoon Notched, and a variety of expanding stemmed points (cf. Fitting 1972b), at several sites suggests that the project area holds great potential for research into the poorly understood transitional period between the Middle and Late Woodland Periods (cf. Kingsley 1999:171-172).

As reported previously (Sommer 2004a:16, 32), the AMS radiocarbon date of 1960 \pm 40 BP (2 Sigma cal. BC 40 to AD 120) that was obtained from the sample of charred organic residue scraped from the interior of this Green Point Incised, Cross Hatched vessel excavated from 20SA1251 has implications for our understanding of the Middle Woodland ceramic chronology and for our understanding of cultural processes in the Saginaw Valley. This vessel type, and the ware group that includes it, were originally

defined at the nearby Schultz Site (Fischer 1972:161-165, 279-280) and are generally thought to date from the latter portion of the Middle Woodland period, from AD 300-500 (Kingsley 1999:151). The early Middle Woodland date from 20SA1251 indicates that the stylistic elements characterizing this type were introduced into the Saginaw Valley on a timeframe consistent with the spread of this style into other parts of Michigan (Sommer 2004b). This early Middle Woodland date also raises questions about local lake level fluctuations. Archaeologists have previously hypothesized that the early part of the Middle Woodland period was a time of relatively high lake levels, possibly as high as two or three meters above the modern mean (Fitting 1972a:257-258; Monaghan and Lovis 2005; Speth 1972:72-73). This high water stage has been cited as a possible explanation for the distribution of Middle Woodland sites in the Saginaw Valley (Lovis 1993:227; Lovis and Davis 1993:119). Given its low elevation, site 20SA1251 would have been inundated under such conditions. The dated ceramics from this site make it clear that although lake levels may have been high during a portion of the Tittabawassee Phase, conditions were dynamic and even low-lying areas were available for occupation during some parts of the early Middle Woodland. The AMS date of 1710 \pm 40 BP (2 Sigma cal. AD 230 to AD 410, intercept AD 330) on a nutshell from Feature 5 at 20SA1276 not only dates a period of the sites occupation, it also suggests that the associated Ruben Linear ceramics may date a couple centuries or more earlier than previously expected. Additional radiocarbon dates are sorely needed to help sort out the complex occupation sequence at both 20SA1251 and 20SA1276 and to continue to refine the ceramic sequence from the Saginaw Valley.

The Late Prehistoric/Upper Mississippian Period is another poorly understood portion of Saginaw Valley prehistory (Halsey 1999:263). Several sites located in the Shiawassee NWR have yielded artifacts that appear to date from this late period. A collared rimsherd with a dowel or finger impressed lip from 20SA15 is stylistically consistent with late Prehistoric ceramics (Sommer 2000:10). Excavations at 20SA1276 yielded a late-looking grit-tempered rimsherd with a possible strap handle attachment (Sommer 2004a). Triangular Madison points were recovered from the surface of 20SA214 in 2003 (Sommer 2004:13), 20SA1251 in 2000, 2001 and 2003 (Sommer 2001:18-19, 2002:15, 2004:15) from 20SA1254 in 2002 (Sommer 2003:17) and from 20SA1274 in 2000 (Sommer 2001:26). Madison points are associated with Late Woodland/Mississippian cultural phases across much of eastern North America (Justice 1987:224-226). Late Prehistoric items derived from test excavations conducted at 20SA1251 during the 2001 and 2002 field seasons include shell-tempered and limestone-tempered ceramics and triangular Madison Points (Sommer 2002).

Although Late Prehistoric items are present from several sites in the project area, they typically consist of only a few scattered artifacts in predominately earlier assemblages. The Clunie Site (20SA722) is an exception. At this site Late Prehistoric material is widespread and fairly abundant (see above). During previous field seasons, several Late Prehistoric artifacts were recovered from the surface of 20SA722, including shell-tempered potsherds with smooth and cord-roughened exteriors, a shell-tempered rimsherd with a strap handle, an additional strap handle from another shell-tempered vessel, grit-tempered rimsherds with finger-pinched lips, and triangular projectile points (Sommer 2000, 2001, 2004 and 2005). The shovel testing conducted at 20SA722 in 2004 and 2005 revealed that Late Prehistoric material is distributed, at a minimum, over an area nearly a hectare in extent (this assessment reflects the size of the area tested, not the boundaries of the Late Prehistoric component). Shovel testing also revealed the presences of several trash pit and possible hearth features. The features encountered in the STPs appeared to contain abundant bone, especially fish bone. The excavation of Feature 1 in 2005 and 2007 (Sommer 2006, 2008), Feature 9 in 2006 and 2007 (Sommer 2007, 2008), and Feature 11 in 2007 (Sommer 2008) confirmed this for at least three trash pit features. The occurrence of specialized trash disposal areas and the abundance of faunal remains present suggest fairly long-term occupation (perhaps several weeks or months?). However, compared with the amount of faunal remains recovered,

other material culture such as flakes, stone tools and ceramics is less abundant, arguing against long-term occupation. The hearth features excavated in 2006 and 2008, including Features 3, 6, 7, 12, 13, 16, and 17 contain less bone and other artifacts than the trash pits. The intensive burning of the hearths reduced most of the organics to ash and caused oxidation of the surrounding soil. Feature 10, excavated in 2007, appears to have been used both as a trash pit and a hearth. Though apparently not abundant, the presence of maize cobs and kernels was confirmed for Feature 11 in 2007. Additional maize kernels and a possible charred bean fragment were recovered in the vicinity of disturbed Feature 13 material in 2008. Whether or not the presence of these cultigens implies on site horticultural practices is debatable. A possible elk scapula hoe recovered in Feature 11 in 2007 may support such an inference (Sommer 2008). Further analysis of floral remains from the flotation samples will be required to assess the abundance of maize and other possible cultigens at this site. Radiocarbon dates from Features 1, 3 and 9 place the occupation(s) in the period of AD 1400-1680. At least two separate occupations are indicated, one in the AD 1400-1470 period and one in the period from 1470-1680. It is likely that the site actually represents a series of many relatively short-term occupations that span much of the 280 year period identified.

Because surface collections, and collections derived from limited shovel testing, cannot be assumed to provide representative samples of artifacts, it is therefore difficult to assign most sites to functional categories (i.e. base camps, resource extraction locales etc.) However, the wide range of artifact types and faunal remains recovered indicate that the prehistoric inhabitants of these sites participated in multiple activities. Artifacts such as flakes, bipolar cores, and cores, as well as anvils and hammerstones, all clearly indicate that flaked stone tool manufacturing, including early stages of nodule reduction, was an important activity at most of the sites describe above. The manufacture and use of groundstone tools/ornaments at several sites is indicated by the presence of finished and unfinished ground slate, shale, cannel coal, and schist objects and possibly by the presence of the sandstone abraders. Ceramics found at many of the sites suggest activities including ceramic vessel manufacture and food storage and/or preparation. Hunting is indicated by the presence of several of the notched/stemmed and triangular bifaces. FCR is ubiquitous at most of the sites, indicating that fire was being used for heating and/or food preparation. The density of occupation debris, the high degree of artifact fragmentation apparently caused by trampling, the abundant and varied stone tool manufacturing debris and the wide range of tool types recovered from the excavations at 20SA1251 and 20SA1276 all indicate that these sites probably served as base camps that were occupied by family groups, rather than resource extraction camps occupied by specialized task groups such as hunting parties.

Faunal remains, including a wide range of mammal, fish, bird, turtle, and clam/mussel species, were recovered or observed on the surface and in shovel tests at several of the sites. They are especially well preserved and well-represented at 20SA214, 20SA722, 20SA1254, 20SA1255, and 20SA1256. The faunal remains from these sites point to the importance of hunting, trapping, and fishing. Furthermore, based on site locations, fishing may be presumed to have been an important activity at most of the sites discussed here. The faunal remains also point to on-site butchering.

When they are fully analyzed, the relatively large faunal assemblages derived from the test excavations conducted at 20SA722 in 2005 and 2006, 20SA1251 in 2001 and 2002 and 20SA1276 in 2001, 2003 and 2004 (Sommer 2002; 2004a), are expected to provide a more complete picture of subsistence practices than has been available from surface and shovel test data. This is particularly true of the faunal remains recovered from the fine-screened and flotation samples taken from features at 20SA722, 20SA1251 and 20SA1276. Preliminary, non-quantitative assessment of a sample of the faunal remains recovered from 20SA1251 and 20SA1276 suggests that while large mammals such as White-tailed Deer probably accounted for the largest percentage of the meat portion of the diet, fish and small aquatic mammals such as muskrat and beaver were also extremely important. Initial assessment of faunal remains from 20SA722 indicates that fish may rival large mammals in importance.

Data from the test excavations at 20SA722, 20SA1251 and 20SA1276, particularly floral and faunal data, are also expected to allow an assessment of season of occupation. The presence of numerous charred hickory nuts and walnuts in several features at 20SA1276, strongly suggests a fall season of occupation. Charred nutshells were also observed in flotation samples and from general excavation contexts at 20SA1251. Large quantities of spring spawning fish such as suckers, walleye and sturgeon have been recognized in the samples from 20SA722, suggesting that this site was occupied during the spring. Turtle and mollusk shells also suggest warm season occupations. Other data, including the presence of shed deer antlers, beaver and other fur-bearing animals, and even charred maize cobs and kernels may suggest fall and winter occupations. However, assessment of these hypotheses awaits detailed analyses of the floral and faunal remains recovered from flotation samples.

Based on the limited shovel-testing conducted at 20SA214, 20SA722, 20SA1251, 20SA1254, 20SA1276, and 20SA1277 during the 2000-2002, 2004-2006 field seasons (Sommer 2001, 2002, 2003, 2005, 2006), the test excavations conducted at 20SA1276 during the 2001, 2003 and 2004 field seasons, at 20SA1251 during the 2001 and 2002 field seasons and at 20SA722 in 2005, 2006, and 2007, buried or otherwise relatively intact archaeological deposits are probably the rule rather than the exception in the refuge. It is quite possible that Late Archaic/Early Woodland deposits are stratified below Middle and Late Woodland deposits at some of the sites, but this has yet to be demonstrated and it does not appear to be the case for 20SA722, 20SA1251 or 20SA1276. The 2006 excavations at 20SA722 revealed clearly stratified late Prehistoric and Late Woodland components. The relative scarcity of Late Archaic/Early Woodland remains probably reflects the fact that much of the low-lying refuge may have been under water during large portions of these periods. Further, if they are indeed present, deposits of this age are likely deeply buried and less subject to exposure through erosion. Buried archaeological deposits, especially stratified deposits are extremely important because they are relatively undisturbed, often well-preserved, and in the case of stratified deposits, they allow detailed assessment of changing use of a particular landscape through time. Archaeologists have not had many opportunities to investigate buried or stratified deposits in the Saginaw Valley, thus adding to the potential significance of some of the archaeological sites recorded here.

Several of the artifacts recovered during the ten years of this project are indicative of interactions with cultural groups in surrounding regions. The presence of small amounts of Norwood chert suggests influence from cultural groups to the northwest. Interactions to the south and west are indicated by the presence of Illinois Havana/Hopewell-inspired Tittabawassee and Green Point Ware ceramics. The presence of Younge or Western Basin Tradition Macomb-like ceramics, of Pipe Creek chert, Upper Mercer Chert and Flint Ridge chalcedony from the Ohio region, Burlington chert from the Illinois/Missouri region, and Wyandotte chert from Indiana, points to southern, southeastern, and southwestern connections. Finally, interactions to the east are suggested by the presence of a small amount of Onondaga and Kettle Point chert from southern Ontario and New York. Sorting out the nature and frequency of the interactions with cultural groups in other regions remains an important area for future research.

In addition to prehistoric components, ten years of fieldwork on this project have also identified significant 19th and 20th century historical materials. Many of the 19th century artifacts are related to the late 19th century logging industry in the region. Logging artifacts, including a variety of rafting pins and chain dogs, are primarily associated with activities surrounding the rafting of logs to transport them down the rivers. Some of the late 19th and early 20th century artifacts along the riverbanks are likely associated with houseboats. Scatters of late 19th / early 20th century debris are also present at 20SA1305 and 20SA1307, two sites identified in 2002. Site 20SA722 also contains a sizeable early to mid-20th century assemblage associated with a row of “cottages” and house boats that extended along the bank of the Tittabawassee River (Sommer 2000, 2001). Several gunflints, as well as a possible “trade axe” recovered

in 1999, offer tantalizing evidence for 18th century or possibly earlier Historic period occupations in the project area.

Finally, illegal collecting of archaeological materials from sites within the Shiawassee NWR boundaries has been a problem in the past. Footprints observed on several sites in 1999, 2000 and 2004 suggested that it *may be* an ongoing problem. Very troubling was a report by one of the project volunteers that on 4 May 2006 two individuals were observed metal detecting and surface collecting on site 20SA722. The individuals left after being confronted and no evidence was ever found of their return, so it may have been an isolated incident. Although the extent is highly variable, fluvial processes are eroding most of the sites documented during this project. One of the effects of these processes is that occasionally archaeological materials are clearly visible on the river edges, making them susceptible to collection by persons untrained in the methods and importance of archaeological documentation. We are working to alleviate this problem through our outreach/education efforts, whereby community members are learning of the importance and cultural value of the archaeological record preserved within the wildlife refuge. It is believed that this community education, along with our continued field presence while monitoring these sites, serves as a deterrent.

SUMMARY AND RECOMMENDATIONS

This report summarizes the results of a tenth season of archaeological investigations carried out in the Shiawassee National Wildlife Refuge (NWR), Saginaw County, Michigan. The field investigations, conducted under Amendment 5 of Federal Archaeological Permit No. 2002-MI/3-2, included both limited archaeological survey/salvage (surface survey) and test excavations. Test excavations were conducted at site 20SA722.

Surface collections, totaling nine objects, were made from one of the eight sites that were monitored during the 2008 field season. No previously unrecorded sites were found.

Thirty square meters were excavated at 20SA722 during the 2008 field season. These excavations yielded prehistoric artifacts including ceramics, stone tools, fire-cracked rock, a large number and variety of plant and animal remains. Based radiocarbon dates and artifact styles, especially the triangular Madison-like points, the presence of shell-tempered ceramics and the decorative elements and motifs of the shell and grit-tempered ceramics, the primary period of prehistoric occupation appears to be the late Prehistoric period. The presence of shell-tempered ceramics suggests an Upper Mississippian affiliation. Late Woodland and Historic period objects were also recovered. In fact, in Excavation Blocks B, C, A/D, E, and F early Late Woodland artifacts have been found stratified below the Late Prehistoric material. In addition, 21 samples, containing a total of 128.5 liters of sediment, were saved for flotation.

Prehistoric artifacts recovered from the various sites on the refuge during 2008 and previous field seasons indicate that Middle and early Late Woodland occupations (ca A.D. 1 - 1000) predominate at most sites. However, Late Archaic/Early Woodland period (ca. 3000-100 B.C.) artifacts and several later Late Woodland and Late Prehistoric (ca. A.D. 1000-European contact) items are also present in the recovered assemblages. The Clunie site (20SA722) in particular has an extensive Late Prehistoric component. Historical artifacts date primarily from the mid-19th century through the 20th century. A few artifacts may date to the 17th or 18th century. A thin scatter of mid to late 20th century debris is present on all of the sites (as well as on non-site areas). This material is not considered archaeologically significant and in most instances was neither noted nor collected.

This project continues to demonstrate that significant archaeological resources are present within the boundaries of the Shiawassee NWR. It is clear that archaeological sites in the project area hold considerable research potential. This potential is heightened by the demonstrated presence of stratified archaeological deposits. Important research topics that could be addressed by sites in the project area include among others: 1) the nature of the Middle Woodland to Late Woodland transition period in the Saginaw Valley; 2) the nature of Late Prehistoric/Upper Mississippian adaptations in the Saginaw Valley; 3) the nature and frequency of interactions between cultural groups in the Saginaw Valley, and those in other regions; 4) human responses and adaptations to long and short term fluctuations in lake levels; 5) prehistoric subsistence practices and the role of horticulture/agriculture in resource-rich wetland environments; and 6) human-environmental interactions through time.

Recommendations

The recommendations made in previous reports for this project are still applicable (Sommer 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008). They are repeated below. Based on the results of the past ten seasons of fieldwork, the following recommendations are made.

- 1) Many of the sites that have been recorded on the refuge are documented primarily on the basis of artifacts exposed on the surface. Additional shovel testing should be employed to determine the spatial

extent of the sites that have been documented. This information is important both for cultural resource management and research purposes.

- 2) In addition to shovel testing to determine site boundaries, additional test excavations are needed to determine the extent of intact site sediments, to look for possible stratified deposits, and to determine whether cultural features are present and preserved. Test excavations will also provide more detailed information about the time periods represented and the nature of the activities conducted at the sites. Larger scale excavations will be needed at several of the sites to address a variety of questions including the potential research topics listed above.
- 3) Varying degrees of fluvial and other forms of erosion continue to impact most of the sites discussed in this report, exposing additional artifacts. For this reason, monitoring of these sites, including collecting and documenting exposed artifacts, should continue.
- 4) Continued survey involving walking exposed river banks and agricultural fields, and shovel testing in wooded areas is recommended in order to locate additional sites on the refuge. Because the processes that expose artifacts are variable even areas where archaeological sites have not been found should be periodically monitored.
- 5) This project has demonstrated that portions of the project area have a high density of archaeological sites. Several sites, including 20SA388, 20SA1252, and 20SA1270 appear to have been significantly impacted by past dike construction. For this reason, all proposed activities that will disturb the ground surface, including the construction of dikes, ditches, trails, roads, restrooms, other buildings, observation decks etc., should be preceded by an archaeological assessment of the area to be disturbed.
- 6) Illegal collecting of archaeological materials from sites within the Shiawassee NWR boundaries continues to be a problem. For this reason, continued efforts should be made to educate people about the irreparable damage that can result from removing artifacts from archaeological sites. A continued field presence, along with a sustained effort to monitor locations with known archaeological sites should reduce the potential of this problem.
- 7) Low-density prehistoric sites such as 20SA1304 and 20SA1306 probably represent single, short-term, task specific occupations. As such, they represent an important aspect of prehistoric cultural systems. Despite the fact that limited test excavations at 20SA1306 and surface survey at 20SA1304 indicated that these sites are probably not eligible for the National Register of Historic Places (because a lack of intact cultural features and the low probability of finding temporally diagnostic artifacts), these sites and others potentially located in the farm units on the refuge should continue to be monitored. Given the nature of these deposits, the only real chance of recovering diagnostic artifacts that would allow us place these sites in a specific cultural context is to search for materials exposed by plowing.

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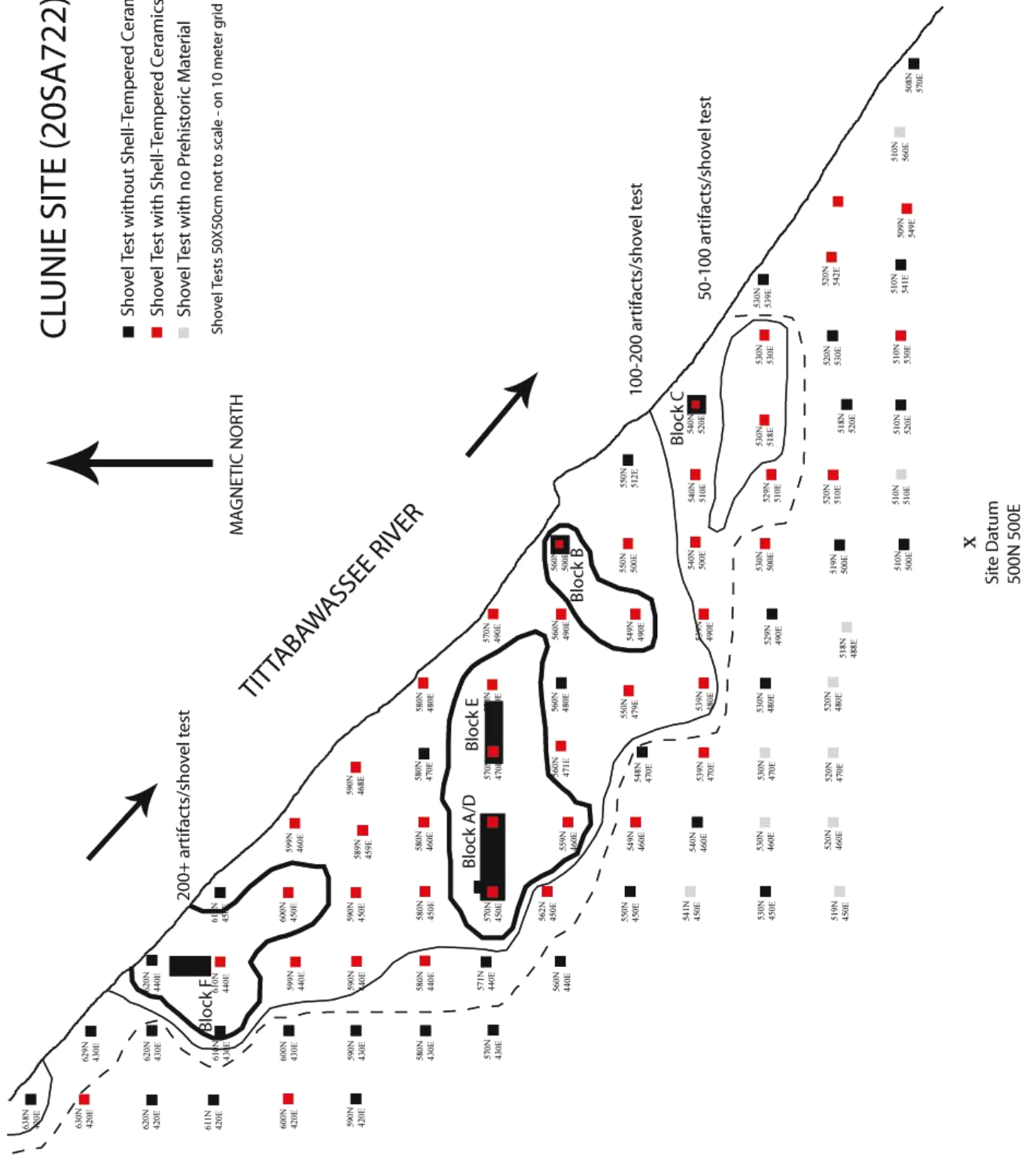
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APPENDIX C: Site Maps

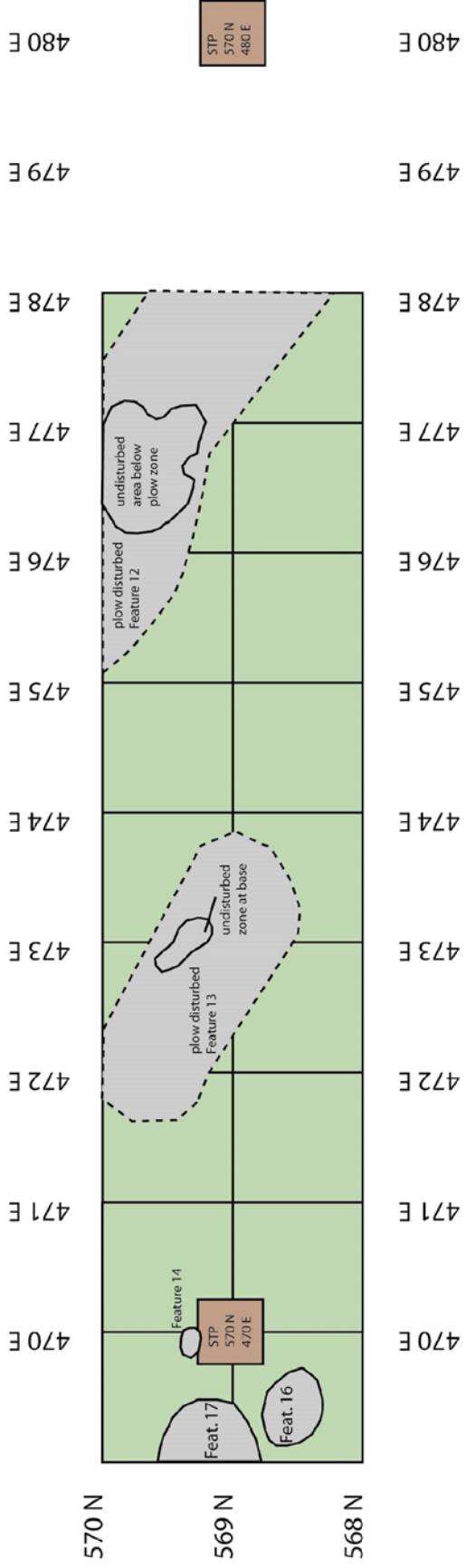
CLUNIE SITE (20SA722)

- Shovel Test without Shell-Tempered Ceramics
- Shovel Test with Shell-Tempered Ceramics
- Shovel Test with no Prehistoric Material

Shovel Tests 50X50cm not to scale - on 10 meter grid



X
Site Datum
500N 500E



CLUNIE SITE

20SA722

Excavation Block E



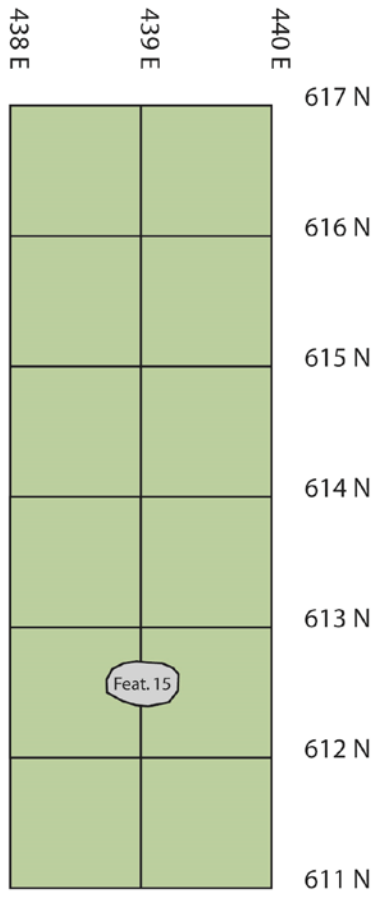
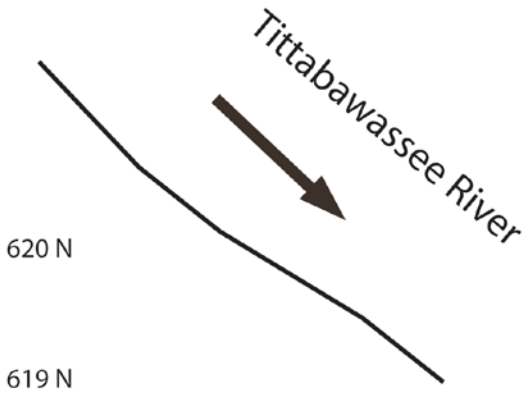
NORTH

CLUNIE SITE

20SA722

Excavation Block F

STP
620 N
440 E



STP
610 N
440 E



NORTH



Completed Units



Shovel Test Pit
(approx. location)