

**Report on the Archaeology
of the Shiawassee National Wildlife Refuge:
The 2002 Field Season.**

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ABSTRACT

This report summarizes the results of a fourth 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, included both limited archaeological survey/salvage and test excavations. Seventeen volunteers and the project director contributed a combined total of 151.5 person days 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 or farming practices, and to investigate by shovel-testing, if, and to what extent, intact portions of the sites remain. Surface collections, totaling 442 objects, were made from 19 sites that were monitored during the 2002 field season. Seven of these sites had not been previously recorded. Two sites, 20SA1276 (Shiawassee #13) and 20SA214 (Shiawassee #6), were subject to limited shovel testing. Nineteen shovel tests dug at 20SA1276 yielded 1,140 objects. A single shovel test excavated at 20SA214 yielded no cultural material.

Test excavations at 20SA1251 (Shiawassee #2) were conducted with several goals in mind including: 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. Twenty-six square meters plus an additional 50X50 cm column sample were excavated at 20SA1251 during the 2002 field season. These excavations yielded 71,792 objects. In addition to the catalogued specimens, 32 samples, containing a total of 354 liters of sediment, were saved for flotation. These flotation samples have not yet been processed.

Prehistoric artifacts represent primarily Middle and early Late Woodland occupations (ca. A.D. 0 - 1000). However, a few probably Late Archaic through Early Woodland period (ca. 1000-100 B.C.) artifacts are also present in the recovered assemblages. Historical artifacts date primarily from the mid-19th century through the 20th century. This project continues to demonstrate that significant archaeological resources are present within the boundaries of the Shiawassee NWR.

TABLE OF CONTENTS

Abstract, iii

List of Figures, vi

Introduction, 1

 Project History, 2

 Acknowledgements, 3

Project Setting, 4

 Quaternary Geology, 4

 Soils, 5

 Paleoecology, 5

 Climate, 6

 Culture History, 6

 History of Archaeological Research, 7

Methods, 9

 Field Methods, 9

 Lab Methods, 10

Analysis and Evaluation, 12

 20SA15, 12

 20SA214 Shiawassee #6, 12

 20SA361 Cass #4, 13

 20SA388 Shiawassee #11, 13

 20SA722, 14

 20SA1251 Shiawassee #2, 14

 20SA1252 Shiawassee #7, 16

 20SA1254 Shiawassee #3, 16

 20SA1273 Tittabawassee #1, 18

 20SA1274 Tittabawassee #2, 18

 20SA1276 Shiawassee #13, 19

 20SA1291 Shiawassee #18, 20

 20SA1299 Cass #1, 20

 20SA1300 Cass #2, 20

 20SA1301 Cass #3, 20

 20SA1302 Cass #5, 21

 20SA1303 Cass #6, 21

 20SA1304 Farm Unit #1, 21

 20SA1305 Farm Unit #2, 22

 20SA1306 Farm Unit #3, 22

 20SA1307 Farm Unit #4, 22

20SA1251 Excavation Analysis and Evaluation, 23

 Excavation Characteristics, 23

Artifact Summary, 23
Feature Description, 27

Discussion, 29

Summary and Recommendations, 32
Recommendations, 32

Bibliography, 34

Appendices

- Appendix A. Permits
- Appendix B. Site Location Maps
- Appendix C. Selected GPS coordinates
- Appendix D. Site maps
 - 20SA1251, Excavation Layout
 - 20SA1276, site map and shovel test locations

LIST OF FIGURES

- Figure 1: Bifaces from 20SA214.
Figure 2: Modified bone, bipolar core, and blade core from 20SA214.
Figure 3: Retouched flakes from 20SA214.
Figure 4: Celt/ax fragment and anvil/hammerstones from 20SA214.
Figure 5: Rimsherd from 20SA361.
Figure 6: Biface and retouched flake from 20SA388.
Figure 7: Flaked stone and ceramics from 20SA722.
Figure 8: Notched and Stemmed biface from surface of 20SA1251.
Figure 9: Bifaces from surface of 20SA1251.
Figure 10: Retouched flakes from surface of 20SA1251.
Figure 11: Notched stone (netsinker?) from surface of 20SA1251.
Figure 12: Abrader and celt/ax fragment from surface of 20SA1251.
Figure 13: Prehistoric and historic ceramics from surface of 20SA1251.
Figure 14: Notched and stemmed bifaces from excavation of 20SA1251.
Figure 15: Notched and stemmed bifaces from excavation of 20SA1251.
Figure 16: Triangular bifaces from excavation of 20SA1251.
Figure 17: Retouched flakes from excavation of 20SA1251.
Figure 18: Retouched flakes from excavation of 20SA1251.
Figure 19: Bipolar cores from excavation of 20SA1251.
Figure 20: Cores from excavation of 20SA1251.
Figure 21: Ceramic rimsherds from excavation of 20SA1251.
Figure 22: Ceramic rimsherds from excavation of 20SA1251.
Figure 23: Ceramic rimsherds from excavation of 20SA1251.
Figure 24: Ceramic rimsherds from excavation of 20SA1251.
Figure 25: Ceramic rimsherds from excavation of 20SA1251.
Figure 26: Ceramic rimsherds from excavation of 20SA1251.
Figure 27: Modified bone “beamer” from excavation of 20SA1251.
Figure 28: Modified bone artifacts from excavation of 20SA1251.
Figure 29: Ceramic sherd, retouched flake, and biface from 20SA1252.
Figure 30: Bifaces from 20SA1254.
Figure 31: Bifacial celt/ax preform from 20SA1254.
Figure 32: Retouched flakes from 20SA1254.
Figure 33: Cores from 20SA1254.
Figure 34: Modified bone and bipolar cores from 20SA1254.
Figure 35: Ceramic rimsherds from 20SA1254.
Figure 36: Decorated ceramics from 20SA1254.
Figure 37: Closeup of engraved gorget from 20SA1254.
Figure 38: Engraved gorget, possibly engraved stone, and gorget preform from 20SA1254.
Figure 39: Sandstone metate fragment from 20SA1254.
Figure 40: Hammerstones from 20SA1254.
Figure 41: Bipolar cores from 20SA1276.
Figure 42: Ceramic sherds from 20SA1276.
Figure 43: Ceramic sherd and core from 20SA1291.
Figure 44: Ceramic sherds and bipolar core from 20SA1301.
Figure 45: Ceramic sherds from 20SA1302.

Figure 46: Retouched flake, biface, and bipolar core from 20SA1303.

Figure 47: Slate pendant and ceramic rimsherds from 20SA1303.

Figure 48: Retouched flake from 20SA1307.

INTRODUCTION

This report summarizes the results of a fourth 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, included both limited archaeological survey/salvage and test excavations. Test excavations were conducted only at site 20SA1251. Seventeen volunteers and the project director contributed a combined total of 151.5 person days 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 or farming practices, 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. Surface collections, totaling 442 objects, were made from 19 of 21 sites that were monitored during the 2002 field season (Appendix B). Nine of the 21 sites had not been previously recorded. The survey area was expanded this year to include portions of the eroding edge of the Cass River and approximately 30 hectares of cultivated farmland located in sections 21 and 22 in Spaulding Twp.

Two sites, 20SA1276 (Shiawassee #13) and 20SA214 (Shiawassee #6), were subject to limited shovel testing. Nineteen shovel tests dug at 20SA1276 yielded 1,140 objects. A single shovel test excavated at 20SA214 yielded no cultural material.

Test excavations at 20SA1251 (Shiawassee #2) were conducted with several goals in mind including: 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. Twenty-six square meters plus a 50X50 cm column sample were excavated at 20SA1251 during the 2002 field season. These excavations yielded 71,792 objects. In addition to the catalogued specimens, 32 samples, containing a total of 354 liters of sediment, were saved for flotation. These flotation samples have not yet been processed.

Of the 38 archaeological sites/findspots monitored during the four field seasons of this project (21 during the 2002 field season), 30 of them are being exposed by fluvial erosion. Because subsurface testing has been conducted on only five sites (three during the 2002 field season), and this testing has been only minimal, site areas cannot be reliably calculated. However, the 24 sites that are being exposed by fluvial erosion extend for over 6,900 meters along the Cass, Tittabawassee and Shiawassee rivers. It is not known how far inland from the rivers most of these sites extend. Previously recorded sites/findspots that are not currently eroding in the river include Shiawassee #9 (20SA1257), Shiaw. #13 (20SA1276), Shiaw. # 14 (20SA1277), and Tittabawassee # 3 (20SA1275). Artifacts from these sites were originally found exposed in the “backdirt” of animal burrows and/or “tree throws”. Shovel-testing at 20SA1276 and 20SA1277 has shown that each of these sites are quite large (see Analysis and Evaluation section in this report for 20SA1276 and in Sommer (2002) for 20SA1277), but site boundaries have not yet been determined. Of the four new 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 10X20 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 a flake in the midst of a roughly 30X30 meter area.

Excavations at 20SA1251 yielded a high density of prehistoric artifacts including ceramics, stone tools, bone tools, fire-cracked rock, and a variety of plant and animal remains. Several cultural features were also identified in the excavation area. More may have been present, but, given the amount of bioturbation and other disturbances, additional cultural features, if present, could not be detected. The primary period of prehistoric occupation appears to be the late Middle Woodland. Small numbers of Late Woodland, Late Prehistoric, and possibly Early Historic age materials were also recovered. Nineteenth century debris is also common in the plowzone portion of the site.

Prehistoric artifacts recovered from the various sites on the refuge represent primarily Middle and early Late Woodland occupations (ca A.D. 0 - 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. Historical artifacts date primarily from the mid-19th century through the 20th century. 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 monitored sites, from shovel testing, and from the test excavations, 73,374 objects were catalogued during the 2002 field season. All artifacts, field notes, and associated materials will be curated in the repository of the Saginaw Archaeological Commission 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 17 ft³ of artifacts (not including the unprocessed flotation samples) and less than one linear foot of notes and other documentation were produced during the 2002 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 amateur archaeologist Robert R. Clunie. As early as 1995, Clunie noted the presence of prehistoric and historical 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 nine "new" archaeological sites (20SA1250 - 20SA1258) were documented during the 1999 field season (Sommer 2000), an additional nine "new" sites during the 2000 field season (Sommer 2001), and four "new" sites (20SA1289- 20SA1292) were located during the 2001 field season (Sommer 2002).

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.

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 Douglas Spencer and Edward DeVries. Their continuing concern for the archaeological resources of the refuge and their assistance in initiating this project are appreciated. This project could not have been conducted without the dedication and hard work of numerous volunteers including, Bob Clunie, Mike Neering, Don Simons, Tim and Kerry Bennett, John Heintz, Joe Brodzik, Jordan Nowaczyk, Melody Nowaczyk, Sev Fowles, Ralph Koziarski, Lora Linder, Gary Paquette, Sybil Paquette, Don Poppe, Mike Puffpaff, and Doug Reese. Don Simons deserves additional thanks for providing much of the field equipment used during the project. Bob Clunie kindly provided the use of his boat on several occasions, allowing easier access to some of the sites. Finally, I would like to thank the staff of the Historical Society of Saginaw County, Inc. for all of their help throughout the period fieldwork and report preparation.

PROJECT SETTING

The Shiawassee NWR is situated in parts of James, Saginaw, Spaulding, and Swan Creek Townships, Saginaw County, Michigan. It contains over 9,000 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. Currently, 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 Nippissing 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 proglacial lakes deposited lacustrine sediments. 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; 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 4200 B.P., this recession was interrupted by a brief transgression

referred to as Nipissing II. The Nipissing II level reached an elevation of approximately 181m. 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). Several minor fluctuations of the lake level took place following the Algoma stage until finally reaching the modern level of 176.5 m.

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 (Iaquinta 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 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 and Lagler (1974) 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 plant 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). Iaquinta (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.

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 may have began experimenting with horticultural practices. 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.

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.-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 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.

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 amateur and professional archaeologists alike. During the late 19th century, William R. McCormick, a local pioneer settler, made and recorded the first systematic 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). 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 amateur 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 amateur archaeologists, professional archaeologists have shown considerable interest in the Saginaw Valley. Professional interest in the Saginaw Valley peaked during the late 1950's and 1960's. Several sites were excavated during this period including Andrews (Papworth 1967), Stroebel (Papworth 1967), Hodges (Binford 1963), Feeheley (Taggart n.d.), Greenpoint (Wright 1964), Schultz (Fitting 1972; 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. Archaeological excavations continued in the Saginaw Valley during the 1970's, 80's, and 90's, but at a much smaller scale. Notable projects during these more recent decades include work at the Weber I and Weber II sites in Frankenmuth Township (Lovis 1989), and the Bridgeport Township site (O'Shea and Shott 1990).

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). 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 (see Analysis and Evaluation section).

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

Field methods for the surface survey and shovel-testing portion of this project were essentially the same as those developed during previous field seasons (see Sommer 2000:8, 2001:8). Sites were divided into 100 meter segments, which were subdivided into 10 meter sections. Artifacts from each 10 meter section were recorded and bagged together. A provenience recorded as "Segment 2 west, 30-40 west" indicates that an artifact was found between 30 and 40 meters west of the beginning of Segment 2 west. More precise proveniences were given for diagnostic artifacts, but all artifacts could at least be placed within a 10 meter section of a 100 meter segment. FCR was not collected, and counts were not made during the 2002 field season. Unless otherwise noted, west is synonymous with upstream and east is synonymous with downstream. When available, the datum established on sites in 1999 or 2000 was relocated and artifact proveniences were measured from that point. A site datum was not established for "new" sites recorded in 2001 and 2002. Rather, a GPS unit was used to obtain coordinates for individual artifacts (Appendix C). Site locations were plotted on 7.5' U.S.G.S. topographic maps. Topographic maps used include the Alicia, Bridgeport, Saginaw, and Shields quadrangles.

Shovel test pits (STPs) were excavated on two sites in 2002, 20SA214, and 20SA1276. STPs consist of 50 cm X 50 cm square holes dug in 10 cm levels. STPs were numbered sequentially at each site and were also labeled with their grid coordinates. Separate grid systems were set up for each of the sites. All sediment was screened through ¼ inch mesh hardware cloth. Depth was variable, but usually proceeded until a sterile level was reached. Most STPs were dug to a depth of 60-100 cm. It is impractical to dig such a small hole any deeper than 100 cm, so it could not be ascertained if site sediments extended below this depth. Information including level, depth, grain size and color of soil, and the presence of artifacts or other inclusions was recorded on standardized Shovel Test Forms. Artifacts from each 10 cm level were bagged separately.

One STP, labeled STP 1, was dug on 20SA214. This STP was located 10 meters magnetic north of stake marking the beginning of Segment 3 West. This location was chosen based on the high density of prehistoric artifacts (including flakes, FCR, and bone) visible on the adjacent eroded riverbank. Nineteen additional STPs were dug on 20SA1276. These STPs were numbered STP 11-29 and were labeled with their grid coordinates based on the site grid set up in 2001 (Sommer 2002:9). STP 1 was considered the site datum, and was arbitrarily labeled 500N 500E. The grid was set up using magnetic north, and the locations of the other STPs were labeled according to their distance (in meters) from, and direction in relation to, STP 1. For example, STP 10, which is located 10 meters north and 20 meters west of STP 1, is labeled with the grid coordinates 510N 480E.

Test excavations were conducted at 20SA1251 using the site grid set up during the 2001 field season (Sommer 2002). The grid was initially set up by arbitrarily selecting a site datum, which was given the coordinates 500N 500E. An east/west (magnetic) baseline was established using a surveyors transit set up over the site datum. Wooden stakes were driven into the ground along this baseline at 500N 520E, 500N 540E, and 500N 550E. Using triangulation off this baseline, the 2002 excavation units were established (Appendix D). Excavation units were labeled according to the grid coordinates of their SW corner. Prior to laying out the actual excavation units, surface vegetation was removed as close to the ground level as possible.

Excavation at 20SA1251 commenced by removing the plowzone in each unit as a single level, with subsequent levels removed in five-centimeter increments. Depth measurements were taken as centimeters below the surface. Because the transition between the plowzone and subplowzone was very

difficult to detect while excavating, the plowzone was considered to extend from 0-30 cm below the surface. The distribution of historic artifacts and very subtle changes in the soil color generally supported the division at 30 cm. However, plowscars could not be detected so the transition was somewhat arbitrarily defined. Excavation techniques were the same as those used during the 2001 field season; they are summarized below. General excavation sediment was screened through at least $\frac{1}{4}$ " mesh hardware cloth. It soon became apparent that by trying to force all of the dry, compacted sediment through even the $\frac{1}{4}$ " mesh screen, fragile artifacts were being damaged. To reduce such damage, the following procedure was used at 20SA1251: the soil was put into the screen and shaken as usual; the large lumps were carefully broken up by hand; additional light shaking removed the loose sediment, leaving the artifacts and small, hard lumps of soil. The screen contents were then dumped into a 10" diameter hand sifter with window screen-size mesh, which was immersed in five gallon bucket of water and gently agitated by shaking and stirring by hand. In this way the hard lumps of soil were broken down and washed out leaving only the artifacts and other larger debris. The material was then spread out on a towel to dry as the next level was excavated. This procedure saved time in the field by eliminating the process of "picking the screen" and greatly reduced damage to fragile artifacts. It also resulted in the recovery of many artifacts that would normally have fallen through the $\frac{1}{4}$ " mesh screen.

Several cultural Features were encountered at 20SA1251. Depending on their size and shape, they were generally divided into quarters or smaller segments. Plan views and profiles were drawn and photographed. Excavation within each quarter or smaller segment proceeded by excavating with trowels in five-centimeter levels until it was clear that no internal stratigraphy was present, at which time larger levels were sometimes removed. All feature fill was saved, the volume of fill was recorded in liters, and the material was bagged. The feature fill will be processed by flotation at a later date. Features excavated in 2002 were numbered Feature 1 through Feature 4. Using the label "Feature 1" was a mistake that could cause some confusion because this label was previously used for a possibly cultural feature excavated at 20SA1251 in 2001. Unfortunately, this mistake was not recognized until numerous samples, notes, drawings and photographs had already been taken/made with this label. Care will be taken to always include the date with any discussion of Feature 1.

A single 50X50 cm column sample, labeled Column Sample #1, was excavated from this site in 2002. The column sample was located in the NW $\frac{1}{4}$ of excavation unit 492N 555E (the remaining three quarters of this unit were not excavated). Excavation proceeded in five-centimeter levels, each measured with the aid of a line level from the surface of the SE corner of the column sample. The 0-5 cm level, which consisted primarily of the root mat, was screened through $\frac{1}{4}$ inch mesh hardware cloth. Sediment from the 5-60 cm levels was saved entirely for flotation. Each level included approximately 16-17 liters of sediment. The 60-70 cm level, which was below the artifact bearing occupation levels, was screened through $\frac{1}{4}$ in mesh hardware cloth to retrieve any artifacts that may have been brought down by animal burrows or tree roots.

Information about soil characteristics, artifacts, excavation problems etc. for each excavation level was recorded on standardized Square Level sheets. Representative wall profiles and floor plans were drawn on graph paper and were recorded with digital photographs and color and black and white prints. Color slides are not available because an error at the film processor resulted in the slide film being processed as prints.

Lab Methods

After being collected all artifacts were taken to the Saginaw Archaeological Commission 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 2002 field season of this project were catalogued under Accessions F02-1 through F02-19. 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 and shovel-testing portion of the project have been catalogued. Except for the fine-screened and flotation samples, all of the material recovered from the test excavations has been sorted, washed and catalogued. Due to the large quantity of very small material recovered from the fine-screened samples, they have not yet been sorted or catalogued. However, all of the material from the fine-screened samples was screened through $\frac{1}{4}$ " mesh screen and objects greater than $\frac{1}{4}$ " have been sorted, washed, and catalogued. Flotation samples have not been processed in any way. For the excavation material only, ceramic sherds and FCR were size sorted using an approximately $\frac{1}{2}$ " 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.

Biface analysis forms have been filled out for all potentially diagnostic bifaces recovered during this project. These forms record detailed measurements of each biface including length, width, thickness, stem length, stem width, stem thickness, base width, and blade length, as well as descriptions of several different attributes. Measurements in millimeters were taken with digital calipers. The biface analysis forms will be kept on file, along with the catalogue records, at the Saginaw Archaeological Commission of the Historical Society of Saginaw County, Inc.

Faunal remains were recovered from several of the sites in the project area. Although their surface context makes it difficult to rule out natural deaths, most of the faunal remains are assumed to be associated with the prehistoric components. This assumption is supported by the presence of culturally modified bones, including highly fragmented specimens, burned specimens, and specimens modified into bone tools. Furthermore, in all observed cases within the project area, *concentrations* of faunal remains were associated with prehistoric archaeological sites, and were never encountered in non-site areas. That this assumption is somewhat problematic is illustrated by the fact that occasionally obviously modern bones and carcasses were observed in the project area, both from site and non-site areas.

Diagnostic artifacts, formal tools, and ceramic rimsherds have been labeled with their catalogue number. 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 always labeled prior to being photographed. Digital photographs have been taken of a representative sample of artifacts, including all diagnostic artifacts recovered during the surface survey and shovel-testing portion of this project. Any refitting of broken artifacts will be accomplished using clear B-72 as an adhesive. Artifacts will be stored in the archaeological repository at the Saginaw Archaeological Commission of the Historical Society of Saginaw County, Inc., in roughly one cubic foot, white, acid-free, boxes.

Analysis and Evaluation

This section will present an analysis and evaluation of the materials obtained through the surface survey and shovel-testing portions of this project. Analysis and Evaluation of excavated materials from 20SA1251 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 covers the site. A smoothed over cord-roughened ceramic body sherd was the only artifact collected from this site in 2002. This artifact is included in Accession F02-5, and has been assigned catalogue number F02-5-1. Based on paste characteristics, this sherd probably dates to sometime in the Late Woodland period. Diagnostic artifacts recovered in 1999 indicate that Late Woodland and Historic period components are present (Sommer 2000:10). A 1955 aerial photograph of the site area shows that it was under active cultivation at that time. A datum has not yet been established for this site, but GPS coordinates were taken for the location of the potsherd (Appendix C).

20SA214 *Shiawassee #6*

Shiawassee #6 is a large site extending over 1,500 meters along the Shiawassee River (Appendix B). It is flanked on either end by low marshes. The main site area extends for approximately 900 meters in the central portion of the site. A low-density scatter of FCR and flakes characterizes the eastern and western ends of the site. The main site area consists of a very dense scatter of FCR, flakes, stone tools, faunal remains, and other artifacts. A scatter of primarily 20th century refuse covers much of the site. Aerial photographs indicate that the main site area was under active cultivation in 1955.

During the 2000 field season, a temporary site datum (a wooden stake) was driven into the ground near the eastern edge of the central portion of the site. The site datum also marks the beginning of Segment 1 West (and simultaneously 1 East). Wooden stakes were also placed every 100 meters to the west, marking the locations of the beginning of Segments 2 West through 9 West. Stakes were not placed to the east of the datum, nor were any artifacts collected from this portion of the site. A few of the wooden stakes could not be relocated during 2002 and they will need to be reestablished in the future.

One STP, labeled STP 1, was dug on 20SA214. This STP was located 10 meters magnetic north of stake marking the beginning of Segment 3 West. This location was chosen based on the high density of prehistoric artifacts (including flakes, FCR, and bone) visible on the adjacent eroded riverbank. STP 1 was dug down to 42 cm below surface. The sediment consisted of very dark grey silty clay containing no artifacts, pebbles or other inclusions. Excavation was stopped at 42 cm because the water table was encountered at that level. Given the density of artifacts visible at the eroded riverbank, it is somewhat puzzling that no artifacts were recovered in STP 1. It may be that artifact-bearing deposits are deeper than 42 cm. Much additional shovel testing will be necessary to substantiate whether, and to what extent undisturbed portions of this site remain.

Due to the large size of the site, poor surface visibility, and limited field time, a complete, systematic collection of this site was not conducted. However, artifacts were collected during several brief visits to monitor the site. A total of 34 prehistoric artifacts were collected from this site during the 2002 field season. These artifacts are catalogued under Accession F02-3, and include catalogue numbers F01-3-1 through F01-3-34.

Of the 34 artifacts that were collected from this site, 15 are bifacial implements, one of which is a bipolar core (Figure 2, B) made of Bayport chert. Five of the bifacial implements appear to be performs, though they may also have functioned as heavy-duty knives, cores, or in one case, a scraper.

Bifacial knives or projectile points include two corner-notched Snyders-like points made of Bayport chert (Figure 1, C, F), one corner-notched Jacks' Reef point made of Upper Mercer chert (Figure 1, B), a larger corner-notched Jacks' Reef-like point made of Bayport chert (Figure 1, E), one corner-notched/expanding stemmed point made of Bayport chert (Figure 1, A), an expanding-stemmed point made of Bayport chert (Figure 1, D), one fragment of a large triangular knife made of Bayport chert, and two tip fragments from large Bayport chert knives (Figure 1, G, H).

Other flaked stone artifacts recovered in 2002 include three flakes, seven retouched flakes, one utilized/edge-damaged Upper Mercer flake, and one core. The three flakes include one large bedded Bayport chert example and two blades or blade-like flakes made of Flint Ridge Chalcedony or possibly Burlington chert. Three of the retouched flakes are unifacial end or side scrapers. These include one Upper Mercer example, one Bayport chert example and one Flint Ridge Chalcedony example (Figure 3, A, B, C respectively). Two other scraper-like implements made of Bayport chert exhibit bifacial retouch along at least a portion of their edges (Figure 3, F, G). Two additional Bayport chert flakes with unifacial retouch may be cutting and/or scraping tools (Figure 3, D, E). The core is a conical (plano-convex) blade core made of an unidentified chert, possibly bedded Bayport (Figure 2, C).

Other prehistoric artifacts recovered from this site include four anvil/hammerstones (two pictured in Figure 4, B, C), one ground stone bit fragment from a celt or ax (Figure 4, A), one grit-tempered ceramic sherd with a smooth exterior, and the tip of a modified bone awl or mat needle (Figure 2, A).

Stylistically, the two corner-notched Snyders-like points and the corner-notched/expanding-stemmed biface are in the range of projectile points commonly found on Middle and Middle to early Late Woodland age sites (cf. Fitting 1972). The expanding-stemmed point is crude and very heavily reworked, but could easily fit within the same time period. The Jacks' Reef and Jacks' Reef-like points probably date to the latter portion of this sequence, within the early Late Woodland (Justice 1987:217-219). This is consistent with most of the materials recovered from this site during previous field seasons (Sommer 2000, 2001). Overall, based on materials recovered during the 2002 and previous field seasons, this site appears to be predominately Middle to early Late Woodland in age. A small amount of Late Archaic / Early Woodland, Late Woodland, and historic 19th and 20th century debris is also present.

20SA361 Cass #4

This previously recorded site was relocated for the first time during this project in 2002. The observed portion of this site exists as a thin scatter of flakes and FCR extending for approximately 30-40 meters along the eroding northeast bank of the Cass River (Appendix B). The state archaeological site files indicate that the major portion of this site is present in the now fallow agricultural field located adjacent to the riverbank. A single grit-tempered ceramic rimsherd was collected from this site in 2002 (Figure 5). This sherd exhibits a cord-roughened exterior and a smoothed over cord-roughened lip. A GPS reading was taken to obtain the coordinates of this sherd (Appendix C). Stylistically, this rimsherd appears to date to the Late Woodland period. A Late Woodland date is consistent with the age of the site recorded in the state site files.

20SA388 Shiawassee #11

As previously reported (Sommer 2001:13; Sommer 2002:12), a small dike covers the edge of the site, which extends for approximately 400 meters along the Shiawassee River (Appendix B). A small ditch, from which the sediment used to construct the dike was apparently derived, parallels the dike. Additional survey during 2001 revealed the presence of artifacts (flakes and FCR) eroding out of the north side (opposite the river) of this ditch along the central and eastern portions of the previously described site area. In addition, artifacts were observed eroding out of the east edge of the large ditch that runs north off the east end of the site, and out of the south side of the large ditch that runs west (not

parallel to the river) from the east end of the site (Appendix B). It therefore appears that, although diking activities have impacted the site, large areas of relatively undisturbed site deposits may remain. This needs to be determined with shovel testing and/or test excavations. The 1955 aerial photograph of the site area indicates that much, but not all, of the disturbance caused by the dike/ditch construction had already occurred. In addition, the photograph shows that the site area was under active cultivation at that time.

A thin scatter of FCR, flakes, other prehistoric artifacts, and assorted historic debris was observed covering the site. However, only two prehistoric objects were collected, both from the east side of the large north/south running ditch. These items were assigned catalogue numbers F02-4-1 and F02-4-2 in Accession F02-4. The artifacts include a corner-notched Bayport chert biface and a retouched flake also made of Bayport chert (Figure 6, A, B respectively). The biface is similar to Jacks' Reef points. Jacks' Reef Corner Notched points are a type associated with late Middle Woodland and early Late Woodland period across much of Northeast and Great Lakes region (Justice 1987:217-219).

20SA722

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). Due to the difficulty of relocating these wooden stakes, a GPS receiver was used to obtain coordinates for the artifacts recovered in 2002 (Appendix C).

Twenty-seven prehistoric artifacts were collected during the 2002 field season. These items are included in Accession F02-6 and were assigned Catalogue Numbers F02-6-1 through F02-6-6. The collected materials include one bipolar core of Bayport chert, one large retouched flake knife of a quartzite like material (Figure 7, A), and 25 grit-tempered ceramic sherds. The ceramics include one destroyed rimsherd with a cord-wrapped stick impressed lip, three destroyed "sherdlets", 12 sherds with striated interiors and exteriors – four of which also exhibited incised lines on the exterior (Figure 7, B-D), and one sherd with a geometric punctate design on the exterior (Figure 7, E). Sherds with horizontal interior striations, such as those recovered from this site, are typical of the transitional Middle Woodland/early Late Woodland Ruben Linear Cord Impressed type ceramics from the Schultz site in Saginaw County (Fisher 1972:176). Three sherds from the Casassa site in Saginaw County also exhibit interior striations (Holman 1995:8.16-8.18). The Casassa sherds have been related to Hacklander ware from western Michigan. Although Kingsley (1989) suggests that it is a Late Woodland type, Holman (1995:8.17) presents data suggesting a Middle Woodland beginning for Hacklander ware. The sherd with the punctate design is probably Late Woodland in age.

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 extensive low marshes. The 1955 aerial photograph of this site indicates that it was cleared, and under cultivation at that time. Twenty-three 50X50cm shovel test pits (STP 1-STP 23) were dug on this site during the 2000 field season (Sommer 2001:17-20) and eight additional STPs (STP 24-31) were dug during the 2001 field season (Sommer 2002:13-14). A major reason for digging the STPs during the 2001 field season was to locate a suitable area for test excavations. Twenty-four square meters were excavated at this site in 2001 (Sommer 2002:25-27) and an additional 26 m² were excavated in 2002. Material from the 2002 excavation units will be described in a subsequent section. This section will describe only the surface collected materials. All of the objects recovered from this site in 2002 were assigned to Accession number F02-1. Objects from the surface were given catalogue numbers F02-1-2186 through F02-1-2231.

Of the 46 objects collected from the surface of this site, 45 are prehistoric artifacts and 1 is an historic period object. No attempt was made to collect all artifacts that were exposed on the surface. Instead, only tools and potentially diagnostic artifacts were collected.

The only historic period artifact recovered from the surface of this site in 2002 is a fragment of a blue edge-ware plate made of white-paste earthenware (Figure 13, C). This plate style dates most commonly to the mid-19th century.

Prehistoric artifacts recovered from the surface of this site include one sandstone abrader (Figure 12, A), 26 bifacial implements, one ground stone celt/ax bit fragment (Figure 12, B), one notched stone (netsinker?) (Figure 11), 11 retouched flakes, one utilized/edge-damaged flake of Upper Mercer chert, and four grit-tempered ceramic sherds.

Several of the bifaces collected from the surface of this site are pictured in Figures 8-9. They include a variety of notched, stemmed, triangular, lanceolate and ovate forms, including finished and unfinished examples. Four corner-notched points were recovered from this site including a Jacks' Reef point made of Upper Mercer Chert (Figure 8, F) and three Snyders-like points made of Bayport chert (Figure 8, H-J). The Jacks' Reef point exhibits very light grinding or wear along its base and lower notches. Two corner-notched/expanding-stemmed points include a fragment from an Upper Mercer example and a Bayport chert example (Figure 8, A). Two expanding-stemmed points include Bayport chert and Upper Mercer chert examples (Figure 8, D and G respectively). The steeply beveled base of the Bayport chert example indicates secondary use as a scraper (Figure 8, D). Two Contracting-stemmed points were also recovered. The contracting-stemmed points include a heavily reworked Bayport chert example that is split lengthwise bipolarly (Figure 8, B) and an Adena-like point made of Kettle Point chert (Figure 8, E). The final stemmed point is a straight-stemmed example made of Bayport chert (Figure 8, C). Other finished bifaces include a lanceolate-shaped example made of Bayport chert (Figure 9, B), a large triangular biface made of Bayport chert (Figure 9, A), and a fragment of a large, probably ovate, knife made of an unidentified opaque whitish chert (Figure 9, D). The lanceolate biface exhibits moderate to heavy usewear or grinding around the tip and along the most convex edge. Other finished bifaces are represented by three tip fragments, two of Bayport chert and one of bedded Bayport, and three midsections, including two Bayport chert examples and one Upper Mercer example. Other bifacial implements recovered from the surface of 20SA1251 include five preforms and one core/scaper. Of the five preforms, two, including one made of an unidentified chert and one made of Bayport chert (Figure 9, E), may also have served as cores, and one Bayport chert example probably functioned as a large knife and also a core (Figure 9, C). The remaining two preforms do not appear to have functioned as knives or cores and both are made of Bayport chert.

Most of the bifaces probably date from the Middle to early Late Woodland period. However, the contracting stemmed Adena-like point is similar to several Early Woodland varieties (Justice 1987:189-198). The Jacks' Reef Corner Notched point is a type associated with late Middle Woodland and early Late Woodland period across much of Northeast and Great Lakes region (Justice 1987:217-219). Several corner-notched and expanding-stemmed bifaces were recovered from this site during the 2001 and previous field seasons, as were intermediate corner-notched/expanding-stemmed forms. As an assemblage, there seems to be a continuum between the notched and stemmed forms and it may be that the different configurations reflect use and resharpening rather than different types. Similar forms were common in the Middle to early Late Woodland levels at the nearby Schultz site (Fitting 1972:199-203).

Included in the flaked stone assemblage from this site are 11 retouched flakes, most which are pictured in Figure 10. Of the 11 retouched flakes recovered from the surface, nine are made on Bayport chert, one is a blade-like Upper Mercer chert flake with unifacial retouch (Figure 10, A), and one is a unifacially retouched scraper made from an unidentified chert, probably from a pebble source (Figure 10,

E). The Bayport chert examples are all unifacial or predominately unifacial cutting and/or scraping tools, three of which are made on decortication flakes (Figure 10, F, H, and I).

The small prehistoric ceramic assemblage from this site includes two grit-tempered rimsherds with smooth interiors and exteriors (Figure 13, A-B). The other two sherds from the surface include a body sherd with a smooth exterior and a body sherd with either an eroded or smooth exterior. Based on characteristics of their paste and surface treatments, all of these sherds are consistent with a Middle Woodland temporal placement.

Based on surface collected material from 2002 and previous field seasons, this site appears to contain Late Archaic/Early Woodland, Middle to early Late Woodland, Late Woodland and historic components. However, based on diagnostic artifacts, the majority of the occupation debris found on the surface is probably derived from the Middle to early Late Woodland component. 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.

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.

20SA1252 Shiawassee #7

This site extends approximately 200 meters along the Shiawassee River (Appendix B). It is flanked on both ends by low marshes. This site appears to have been heavily impacted by dike construction. The 1955 aerial photograph shows that the dike building activities occurred prior to that time. Five prehistoric artifacts were collected from this site during the 2002 field season. These items are included in Accession F02-7, and were assigned catalogue numbers F02-7-1 through F02-7-4. Artifacts recovered from this site include both flaked stone objects and ceramic sherds. Flaked stone objects include a unifacially retouched flake of Bayport chert and a bifacial knife/preform made of bedded Bayport chert (Figure 29, B-C respectively). The retouched flake (scraper) exhibits usewear/polish on its working edge. Ceramics include one sherd with a cord-roughened exterior (Figure 29, A) and two sherds with smoothed over cord-roughened exteriors.

20SA1254 Shiawassee #3

This site extends approximately 350 meters along the edge of a small Island in the Shiawassee River (Appendix B). Fire-cracked rock is ubiquitous, and several clusters probably represent eroded hearth features. The 1955 aerial photograph of the site area indicates that this landform is very dynamic and unstable. A large amount of erosion and deposition has occurred since 1955, and the main river channel has shifted from one side of the island to the other. In 2001, much of the site was covered with a deposit of silt and sand (Sommer 2002:17). Erosion and deposition are ongoing processes and much of the silt and sand that covered a portion of the site in 2001 was no longer present in 2002. Based on the 1955 photograph, it appears that several meters of the site have been lost to erosion since that time.

The 241 objects that were collected from this site during the 2002 field season are included in Accession F02-8 and have been assigned F02-8-1 through F02-8-55. These 241 objects include 235 prehistoric artifacts and six objects that may be prehistoric artifacts or natural inclusions on the site. These latter six objects include five bone fragments and one possibly incised/engraved stone (Figure 38, B). The possibly incised stone is a heavily eroded, very soft material with some obviously natural cracks

or lines running across one face. However, several of the incised (?) lines appear too straight for natural cracks and several cross each other at right angles that may indicate purposeful placement.

The 235 prehistoric artifacts include eight bifaces, two bipolar cores made of Bayport chert (Figure 34, B-C), four other cores also of Bayport chert (Figure 33), 24 flakes, eight utilized/edge-damaged flakes, seven retouched flakes (Figure 32), 175 ceramic sherds (Figures 35, 36) three gorget fragments (Figure 37, Figure 38, A, C), one sandstone metate fragment (Figure 39), two hammerstones (Figure 40), and one modified bone tool fragment (Figure 34, A). The modified bone is a flat, ground bone pointed tool, perhaps a bone point or a fragment of a weaving or mat needle.

Seven of the eight bifacial implements recovered from this site were manufactured from Bayport chert. One biface is a large flaked celt preform made of an unidentified coarse-grained rock (Figure 31). The Bayport chert bifaces included a side-notched point (Figure 30, A), two triangular Madison-like points (Figure 30, B-C), a tip fragment from a well-made knife (Figure 30, D), one trianguloid knife/preform (Figure 30, E), a second preform with a missing tip (Figure 30, F), and an edge fragment (Figure 30, G). The side-notched point is similar to early Late Woodland Raccoon Notched varieties, although the convex base is atypical (Justice 1987:219). This point appears rather heavily resharpened and may have started out as a corner-notched point. The triangular Madison like points are typical of Late Woodland arrow points across much of eastern North America (Justice 1987:224).

Eighteen of the flakes and all of the utilized/edge-damaged flakes are made of nodular Bayport chert. Other flakes include four Upper Mercer examples, one bedded Bayport chert flake, and one quartzite flake. All seven of the retouched flakes are also made of Bayport chert. The retouched flakes include four unifacial cutting and/or scraping tools, one probable scraper that is mostly unifacial but exhibits some bifacial retouch, one bifacially flaked cutting tool, and one large flake with a bifacially flaked drill tip on its distal end (Figure 32, F).

Of the 175 ceramic sherds, 10 are rimsherds and 165 are neck or body sherds. The rimsherds each represent a separate vessel and include both decorated and undecorated examples. Undecorated rimsherds include one with a smoothed over cord-roughened exterior (Figure 35, E) and two with cord-roughened exteriors (Figure 35, F, H). One of the rimsherds with a cord-roughened exterior exhibits a wiped or striated interior surface (Figure 35, F). A third rimsherd with a cord-roughened exterior has minimal decoration consisting of oblique cord-wrapped stick impressions around the top of the lip (Figure 35, G). Six of the rimsherds recovered from this site have more extensive decorations. One rimsherd has a tool-impressed lip with at least two rows of oblique cord-wrapped stick, or possibly tool impressions, around the rim (Figure 35, A). A second decorated rim exhibits tool impressions on a smooth exterior rim and cord-wrapped stick impressions around the top of the lip (Figure 35, B). A third decorated rimsherd exhibits tool impressions on a smoothed over cord-roughened exterior with additional tool impressions around the interior and exterior of the lip (Figure 35, C). A fourth rimsherd is decorated with incised lines and punctates on a smooth exterior (Figure 35, D). A fifth heavily decorated rimsherd exhibits at least eight horizontal rows of cord-wrapped stick or cord-wrapped cord impressions on the exterior of the rim and tool impressions around the top of the lip (Figure 36, D). Finally, one of the rimsherds exhibits a vertical rocker stamped decorations around the top of the exterior rim (Figure 36, E). This final example is typical of Middle Woodland Green Point ware ceramics (Fisher 1972). All of the other decorated and undecorated rimsherds are typical of several varieties of early Late and Late Woodland period ceramics.

Of the 165 neck and body sherds, 14 are decorated, 109 are undecorated, and 42 are destroyed. Decorated sherds include one example with an incised or rocker stamped decoration (Figure 36, A), one rocker stamped sherd (Figure 36, B), one sherd with a tool or cord-wrapped stick impressed decoration (Figure 36, C), five sherds with cord-wrapped stick decorations on a cord-roughened exterior (Figure 36, F), one sherd with a tool impressed decoration, and four cord impressed sherds. Undecorated sherds

include 94 with cord-roughened exteriors, 14 with smooth or smoothed over surfaces, and one sherd with a fabric impressed or possibly cord-roughened exterior. With the exception of the incised/rocker stamped and the rocker stamped sherds, which are probably Middle Woodland in age, most of the neck or body sherds probably date to the early Late to Late Woodland period.

Three groundstone gorget fragments, two of which refit, were recovered from this site in 2002. The two fragments that refit are part of a green slate gorget preform with a single hole partially drilled in one face (Figure 38, C). Subsequent to being partially smoothed, it appears that this gorget was notched by flaking two opposing edges at approximately the midpoint of the gorget. It is through these notches that the gorget broke. The third gorget fragment is made out of fairly soft reddish to yellowish material (Figures 37 and 38, A). A noteworthy feature of this specimen is that one face is incised with a geometric pattern of horizontal vertical and oblique lines, including areas of crosshatching (Figure 37). A portion of a biconically drilled hole is preserved in this fragment.

Based on artifacts recovered during this and previous field seasons, a wide variety of prehistoric activities can be inferred for this site. Activities included stone tool manufacturing and use, food storage and/or preparation, woodworking, hunting/trapping, butchery or other heavy-duty cutting, and use of fire for heating and food preparation. The majority of the prehistoric material recovered from this site appears to date to the early Late to Late Woodland period. However, a small amount of Middle Woodland age material is also present.

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. A site datum has not yet been placed on 20SA1273. The only artifact that was recovered in 2002 is a single grit-tempered ceramic body sherd with smooth exterior. This sherd is included in Accession F02-9 and was given the catalogue number F02-9-1. A GPS receiver was used to obtain coordinates for the location of this find (Appendix C). Previously, one other artifact, a tip fragment of a Bayport chert biface, was recovered from this site (Sommer 2001:25). This 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). Although a datum has not yet been placed on this site, three GPS readings were taken on artifact locations in 2000 (Sommer 2001) and an additional reading was taken on artifacts recovered in 2002 (Appendix C). Four prehistoric artifacts were recovered from this site in 2002. These items are included in Accession F02-10, and were assigned catalogue numbers F02-10-1 through F02-10-2.

Prehistoric artifacts collected from this site include three grit-tempered potsherds and one slightly water-rolled Bayport chert flake. The three ceramic body sherds include one with a cord-roughened exterior, one with a smoothed over cord-roughened exterior, and one destroyed example.

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.

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). Ten 50X50 cm shovel test pits (STPs) were dug on the site in 2001 in order to get an idea of the nature and extent of intact site deposits, and to identify an appropriate area for more extensive test excavations (Sommer 2002). Based on the presence of artifacts in the 2001 STPs, the known site area was described as being flanked on the west by what appears to be an old channel or drain running north/south between the Shiawassee and Tittabawassee Rivers, on the south by a linear, approximately one meter high, dike-like ridge, and on the east by an old road cut. Nineteen additional STPs were dug in 2002 to attempt to more accurately define site boundaries (Appendix D). The 2002 STPs indicate that although prehistoric cultural material does extend into the low lying old channel or drain, the density of material is very low and this feature probably does mark the western boundary of the site. The linear dike-like ridge does not mark the southern boundary of the site and in fact STP data indicate that the site extends at least 50 meters south of the ridge. The southern boundary of the site was not located. Likewise, the old road cut to the east does not mark a boundary of the site either. STPs indicate that site material is present at least 10 meters east of the road cut, but even this does not mark a site boundary. Finally, additional STPs were dug extending the STP transect to the north. Prehistoric cultural material was present in all of these STPs as well so a northern boundary was not determined either. Therefore, at the very least, the site extends 150 meters in a north/south direction, and 65 meters in an east/west direction. Because all STPs contained prehistoric materials, no site boundaries were established and the actual site area is almost certainly much larger. The 1955 aerial photograph of the site area indicates that the ridge borders the northern edge of an agricultural field. The road is clearly visible connecting the field to the south of the site with other fields located to the north, along the Tittabawassee River. The road cut clearly bisects the ridge, and thus postdates it. Artifacts were recovered from burrows directly on top of the western portion of the ridge, but no artifacts were observed in the numerous burrows on the ridge east of the road cut. The backdirt piles on the western portion of the ridge, from which prehistoric artifacts were recovered, are comprised of a dark sandy matrix very reminiscent of prehistoric midden deposits. In 2002 artifacts were retrieved from one of these backdirt piles by screening the sediment through ¼" mesh hardware cloth.

A total of 1188 objects were recovered from the backdirt of an animal burrow and the 19 STPs dug at the site in 2002. These include 1,153 prehistoric artifacts, 21 historic items, and 14 objects that may be historic, prehistoric, or natural occurrences. This last group includes two possible sandstone abraders, four shell fragments and eight pieces of charcoal. All of the items recovered from this site during the 2002 field season are included in Accession F02-2. These materials were assigned catalogue numbers F01-2-1 through F01-2-173.

Prehistoric artifacts recovered from this site include one bipolarly reduced biface made of Bayport chert (Figure 41, A), three bipolar cores (Figure 41, B-D), 245 flakes, one utilized/edge-damaged Bayport chert flake, 13 shatter, 108 bone fragments, 307 grit-tempered ceramic sherds, 12 fragments of waste clay/daub, and 463 FCR. Historic artifacts include 20 pieces of coal and cinders and one square nail.

The bipolar cores recovered from this site include two Bayport chert examples and one example made from either a pebble chert or bedded Bayport chert (Figure 41 A-D respectively). Of the 245 flakes recovered from this site, 237 are Bayport chert, two are quartzite flakes, two are Flint Ridge chalcedony, two are Wyandotte chert, one is Onondaga chert, and one is either bedded Bayport chert or Norwood chert. Of the 13 pieces of shatter recovered from this site, 11 are Bayport chert, one is a pebble chert and one is either pebble or bedded Bayport chert. All stages of lithic reduction appear to be represented by

the flake assemblage. A preliminary analysis of the faunal remains indicates that mammal, fish, and turtle are present in the assemblage.

The ceramic assemblage recovered from this site in 2002 includes two rimsherds, each from a different vessel. One rimsherd has a tool-impressed lip and some form of destroyed decoration on the exterior (Figure 42, A). The other rim is smooth on the exterior and interior (Figure 42, B). The remaining 305 sherds from this site include 32 decorated and undecorated body/neck sherds and 273 destroyed sherds. The destroyed sherds include sherds with eroded or damaged exterior surfaces and "sherdlets", or sherds small enough to pass through a $\frac{1}{2}$ inch mesh screen. Decorated body/neck sherds include three rocker stamped sherds, two incised sherds (Figure 42, C, E), one incised or rocker stamped example (Figure 42, D), and one possibly cord-impressed sherd. Undecorated sherds include 11 with cord-roughened exteriors, 11 with smooth exterior surfaces, one with a smoothed over cord-roughened exterior, and two with brushed exteriors (Figure 42, F).

The surface and STP data from this site, and the excavation data from 2001, clearly indicate a rather intensive occupation. Based on ceramic and projectile point styles, the most intensive period of occupation is thought to have primarily occurred during the latter portion of the Middle Woodland period.

20SA1291 Shiawassee #18

This site, which extends along the river for at least 50 meters, is located in on the southwest corner of Green Point Island, just downstream from the cut between the Tittabawassee and Shiawassee rivers that creates the island (Appendix B). This cut is man-made, and based on early plat maps for Saginaw County, the cut was made sometime between 1877 and 1896. Because this cut is all that separates 20SA1291 from 20SA1250 (see Sommer 2000, 2001), it is possible that they are portions of a single site. A GPS receiver was used to obtain coordinates for the east and west ends of the visible scatter of artifacts on this site (Appendix C). A thin scatter of flakes, FCR, and grit-tempered pottery were observed on the site, but the only artifacts that were collected in 2002 are a very thin grit-tempered ceramic sherd and a Bayport chert core (Figure 43, A and B respectively). These artifacts are included in Accession F02-11, and were assigned catalogue numbers F02-11-1 and F02-11-2. Based on the presence of the very thin, cord-roughened sherd, this site appears to have at least an early Late Woodland component.

20SA1299 Cass #1

This site consists of a light scatter of FCR and a grit-tempered ceramic sherd spread along 10-15 meters of the bank of the Cass River (Appendix B). A GPS receiver was used to obtain coordinates for the location of this artifact cluster (Appendix C). The potsherd is a body sherd with a cord-roughened exterior. This artifact is included in Accession F02-14, and was assigned catalogue number F02-14-1. Based on paste characteristics, the potsherd probably dates to the Late Woodland period.

20SA1300 Cass #2

This site consists of a light scatter of FCR and a grit-tempered ceramic sherds spread along 10-25 meters of the bank of the Cass River (Appendix B). A GPS receiver was used to obtain coordinates for the location of this artifact cluster (Appendix C). The only artifacts collected from this site in 2002 were three destroyed ceramic sherds. These artifacts are included in Accession F02-15, and were assigned catalogue number F02-15-1. Based on paste characteristics, these potsherds probably date to the Late Woodland period.

20SA1301 Cass #3

This site consists of a light scatter of FCR and other prehistoric artifacts spread along 10-20 meters of the bank of the Cass River (Appendix B). A GPS receiver was used to obtain coordinates for the location of this artifact cluster (Appendix C). Three artifacts were collected from this site including two grit-tempered ceramic sherds and a bipolar core made from quartzite (Figure 44, A-C). These artifacts are included in Accession F02-16, and were assigned catalogue numbers F02-16-1 and F02-16-2. The ceramics include one sherd with a cord-roughened exterior and one sherd with a smooth exterior. Based on paste characteristics, the ceramics probably date to the Late Woodland period.

20SA1302 Cass #5

This site consists of several dispersed clusters of artifacts, including ceramics, FCR, and flaked stone debitage, extending approximately 180 meters along the Cass River (Appendix B). Three GPS reading were taken on artifact clusters on this site (Appendix C). Ten artifacts, all grit-tempered ceramic sherds, were collected from this site in 2002. These artifacts are included in Accession F02-18, and were assigned catalogue number F02-18-1 through F02-18-5. This small ceramic assemblage includes three rimsherds and seven body/neck sherds. The rimsherds include one decorated with tool impressions on the exterior and lip, one undecorated, cord-roughened sherd similar to Wayne ware or "Saginaw Thin", and one sherd with two rows of punctates on a smooth exterior (Figure 45, A-C respectively). The body neck sherds include one with a cord impressed exterior (Figure 45, D), five sherds with cord-roughened exteriors and one destroyed sherd. The decorative techniques and paste attributes of these sherds are consistent with an early Late Woodland to Late Woodland time period.

20SA1303 Cass #6

This site consists of a thin scatter of artifacts spread along at least 490 meters of the Cass River (Appendix B). The northwestern (downstream) end of this site was not really established and it is likely that artifact scatter extends further in that direction. Several GPS readings were taken to establish coordinates where artifacts were recovered from this site (Appendix C). Forty-three prehistoric artifacts were recovered from this site. These artifacts are included in Accession F02-19, and were assigned catalogue numbers F02-19-1 through F02-19-18.

Flaked stone artifacts collected from this site include a unifacially retouched Onondaga chert flake (Figure 46, A), an ovoid biface made of Bayport chert (Figure 46, B), a quartzite bipolar core (Figure 46, C), and three Bayport chert flakes. Other artifacts include a ground slate pendant fragment (Figure 47, A) and 36 grit-tempered ceramic sherds. The pendant fragment is made of purple/red slate, has a biconically drilled hole near one end, and is broken through flaked notches located on opposite edges at the end opposite the hole.

The ceramics recovered from this site include two rimsherds and 34 body/neck sherds. The rimsherds include one example with an incised/crosshatched rim bordered below by two rows of small punctates (Figure 47, B) and one thin example with a very fine cord-roughened exterior and lip (Figure 47, C). Four decorated body/neck sherds were recovered including one rocker stamped and one incised example and two sherds with punctates or cord-wrapped stick impressions. Undecorated sherds include 16 cord-roughened examples, three smoothed over cord-roughened examples, three smooth specimens, and eight destroyed examples. The ceramic assemblage appears to include both Middle Woodland (crosshatched rim and rocker stamped body/neck sherd) and early Late or Late Woodland (undecorated, cord-roughened rim and body/neck sherds) vessels.

20SA1304 Farm Unit #1

This site consists of a findspot of a single utilized/edge-damaged Bayport chert flake. The flake was found on the surface of an agricultural field adjacent to the Birch Run Drain (Appendix B). Despite

good surface visibility and careful searching, no additional cultural materials were located in the vicinity of this flake. This artifact is included in Accession F02-13 and was assigned catalogue number F02-13-1.

20SA1305 Farm Unit #2

This site consists of a light scatter of late 19th / early 20th century historic debris observed on the surface of an agricultural field adjacent to the Birch Run Drain (Appendix B). The origin of this material is not clear. Neither the 1877, 1896, nor the 1916 Atlas of Saginaw County indicates a structure in this area. The debris may be from a slightly later house/structure, or it may a dump from a nearby residence. No artifacts were collected from this site.

20SA1306 Farm Unit #3

This site consists of four widely scattered loci of prehistoric debitage and FCR within an approximately 2.15 hectare survey area located in an agricultural field between the Cole ditch and the Birch Run Drain (Appendix B). A GPS receiver was used to obtain coordinates for the location of each locus (Appendix C). One locus (way point 1) consisted of approximately two dozen Bayport chert flakes scattered over a 10X20 meter area. A second locus (way point 2) consisted of a findspot of a single Bayport chert flake. The third locus (way point 3) consisted of a second findspot of a single Bayport chert flake. And finally, the fourth locus (way point 4) consisted of a findspot of one Bayport chert flake and one FCR. Despite careful searching around and between each findspot, no additional cultural materials were observed. No artifacts were collected from this site.

20SA1307 Farm Unit #4

This site consists of a retouched Bayport chert flake (Figure 48), an unmodified Bayport chert flake, and a scatter of late 19th or 20th century debris located in an agricultural field between the Cole ditch and the Birch Run Drain (Appendix B). A GPS receiver was used to obtain coordinates for the location of this artifact scatter (Appendix C). Only the retouched flake was collected. This artifact is included in Accession F02-12 and was assigned catalogue number F02-12-1. Although an unidentified local informant claimed there used to be a house at this location, no structures are noted on the 1877, 1896, or 1916 Atlases of Saginaw County.

20SA1251 Excavation Analysis and Evaluation

Excavation Characteristics

Twenty-six square meters plus an additional 50X50 cm column sample were excavated at 20SA1251 (Appendix D). Details of the field methods employed during the test excavation of this site are provided above in the *Methods* section of this report (see also Sommer 2002). An overall site description is also provided above, under *20SA1251 Shiawassee #2* in the *Analysis and Evaluation* section. Two excavation units (491N 540E, 492N 540E) were placed abutting the eastern edge of the 2001 excavation block (Appendix D). The remaining 24 units were located in a roughly L-shaped excavation block extending from 492-496N and 553-559E (Appendix D).

Test excavations in 2002 at this site revealed a soil profile comparable to that described for the 2001 excavations (Sommer 2002:25). The description is repeated below with some modifications. The 2002 excavations confirmed again that the site had been plowed and that portions of the sub plowzone were heavily disturbed by animal burrows and other forms of bioturbation. A typical soil profile from the excavated portion of this site consists of the following: an approximately 30 cm thick plowzone of very dark gray (10YR3/1 in the standard Munsell soil color chart) silty sand, followed by another 20-30 cm layer of very dark gray or very dark grayish brown (10YR3/1, 10YR3/2) medium sand. This second layer represents the upper level of the sub plowzone. The transition between the plowzone and the sub plowzone was very subtle, but could be recognized by the presence of small flecks of orange/rust colored inclusions in the sub plowzone. The third level consisted of a 10-30 cm thick, heavily mottled, usually burrow-disturbed zone of predominantly very dark gray medium sand. The transition between the third and fourth levels was highly variable and uneven. This highly uneven, variable, and disturbed transition made it very difficult to recognize cultural features. One definite cultural feature and three other probable or possible cultural features were identified. If others were present, they were so badly disturbed that they were not recognized. The fourth level generally consisted of an uneven layer, up to 25 cm thick, of light olive brown or brown (2.5Y 5/3, 10YR5/3) medium sand. Following the fourth level were several levels of probably water-laid, medium to coarse sands. These deposits ranged from light yellows and browns to grays. Layers of coarse sand usually contained numerous aquatic snail and bivalve shells. A deep test dug in 2001 revealed that starting at approximately 140 cm below the surface, a thin 2-4 cm layer of sandy clay is followed by an equally thin layer of fine-medium sand and a second layer of sandy clay. These clay layers contain fairly abundant quantities of vegetation, including wood fragments. Finally, at approximately 155 cm below the surface a layer of undetermined thickness of clay, coarse sand and gravel and aquatic snail and bivalve shells is present. The profile of these lower levels could not be confirmed in the portion of the site excavated in 2002 because the water table was hit at approximately 130 cm below surface. By far, most of the prehistoric artifacts were recovered from the two upper levels of the site.

Artifact Summary

The column sample and excavation units at this site yielded 71,792 catalogued objects. In addition to the catalogued specimens, 32 samples, containing a total of 354 liters of sediment, were saved for flotation. Because of the large number of artifacts recovered during the 2002 field season, a detailed description of all of the excavated material cannot be provided at this time. A summary, along with photographs of representative artifacts, is provided below.

Of the 71,792 objects recovered from the 2002 excavations at this site, 49,040 are prehistoric artifacts, 15,864 are historic period artifacts, and 6,888 are objects of undetermined origin. This last category consists of 4,046 bone specimens and 26 fish scales recovered from the plowzone; 1,164 shell fragments; 1632 charred plant remains including wood, walnut shells, seeds, roots/tubers; one unburned

nutshell and one unburned squash seed; one slate flake incised with two parallel lines; one possible polishing stone or hammerstone; five lime concretions/FCR; one probable crinoid fossil; and eight possible sandstone abraders. The bones from the plowzone are undoubtedly derived from both prehistoric and historic occupations, and some may represent animals that died or were washed up on the site. Bones from the plowzone include carp, bowfin, sturgeon, drum, other fish, beaver, porcupine, muskrat, dog, deer, possibly elk, other mammal, bird, turtle, snake, and possibly frog/toad. Some of the bones from the plowzone are calcined, suggesting a cultural origin. Bones from below the plowzone are assumed to represent prehistoric occupations. The shell fragments, charred plant remains, possible abraders and other stone objects are probably either natural inclusions on the site, or materials used by prehistoric occupants.

Objects associated with prehistoric occupation of the site include 55 bifaces (Figures 14-16), 12 cores (Figure 20), 25 bipolar cores (Figure 19), 18,951 flakes, 50 retouched flakes (Figures 17-18), 228 shatter, 106 utilized/edge-damaged flakes, 20 sandstone abraders, two celt/ax fragments, one possible celt/ax fragment that is fire-cracked, one ground slate chip, two hammerstones, 5,720 FCR (55,729.4g), eight cobbles from a rock cluster, 72 modified bones (Figures 27-28), 12,877 bone fragments, two fish scales, 105 waste clay/daub fragments, and 10,711 ceramic sherds (Figures 21-26).

Of the 55 bifacial implements recovered from the 2002 excavations at this site, 34 are Bayport chert, 14 are made from Upper Mercer chert, one is made from Flint Ridge chalcedony, one is bedded Bayport chert, and the remaining five are made of unidentified cherts. The bifaces include a variety of notched, stemmed, and triangular projectile points and knives, along with three drills/fragments, several preforms and preform fragments, and several miscellaneous biface fragments. Five corner-notched examples (Figure 14, D-E, G-I) are similar to late Middle to early Late Woodland Jacks' Reef Corner Notched points (Justice 1987:217-219). One expanding stemmed point (Figure 14, F) is probably a heavily resharpened Jacks' Reef Corner Notched point. One large corner-notched point is a heavily resharpened example of a Snyders-like variety (Justice 1987:201-204). Other corner-notched and expanding-stemmed forms (Figure 15, A-G) are similar to Schultz large and small expanding stemmed points from the Middle Woodland levels at the nearby Schultz site (Fitting 1972). One large triangular point or knife (Figure 16, A) is broadly similar to Middle Woodland age Copena points (Justice 1987:204-205). Smaller triangular points include one Late Woodland Madison-like point and one Late Woodland Levanna-like point (Figure 16, C and D respectively) (Justice 1987:224-228).

Bipolar cores include 25 examples, 15 of which are Bayport chert, with the remaining specimens including three Upper Mercer examples, three pebble chert examples, two Flint Ridge chalcedony examples and two examples made of unidentified cherts. Although classified as bipolar cores because of their technological attributes, some of these artifacts may have functioned as wedges or other tool types. Of the 12 other cores recovered from this site, nine are Bayport chert, one is Upper Mercer chert, one is pebble chert, and one is made of an unidentified chert. Most of the cores from this assemblage are informal flake cores, but one of the Bayport chert examples is a more formal blade core (Figure 20, C).

Of the 50 retouched flakes recovered during the 2002 excavations at this site, 28 are Bayport chert, nine are Upper Mercer chert, and 13 are unidentified. Retouched flakes are primarily unifacial, but bifacially flaked examples are also present. The retouched flake assemblage includes a variety of cutting and scraping tools, ranging from more formal endscrapers (Figure 17) to less formal unifacially and bifacially retouched flakes and blades (Figure 18).

A detailed analysis of the large bone assemblage has not been conducted. However, several generalizations can be made. Preservation appears variable, ranging from poor to good. Badly decomposed, unidentifiable bone was occasionally noted during excavation, but it was often intermixed with fairly well preserved specimens. Fish bone is probably underrepresented in the general excavation material because of the use of $\frac{1}{4}$ in mesh screens and in some cases because of poor preservation. Other than vertebrae and portions of some of the more robust bones such as dentaries, fish bone seemed scarce. More detailed, quantitative analyses will be necessary to support these generalizations. Preliminary identifications of some of the bone remains include bird, turtle, possible frog or toad, drum, catfish/bullhead, sturgeon, other fish, muskrat, beaver, raccoon, deer, probable elk, black bear, bobcat, fox, and other mammal. Several of the bone fragments are calcined.

In addition to the bone assemblage discussed above, 72 modified bone tools and bone tool fragments were recovered. Thirty-two of the modified bones are fragments of turtle carapace that have been cut, ground, and in some cases engraved (Figure 28, A). These modified turtle shell fragments probably represent bowls, although some could represent rattles or other objects. Also, it is likely that some of the apparently unmodified turtle shell fragments actually represent portions of these shell bowls.

One nearly complete bone tool is a beamer made from a white-tailed deer metatarsal (Figure 27, A). The proximal end of this metatarsal beamer was found in articulation with the naviculocuboid and cuneiform bones probably indicating either that this tool was made, used, discarded and buried quickly enough that the ligaments that hold these bones together did not have time to decompose, or that the proximal end of this tool was left in the hide or wrapped in something to prevent disarticulation. Other modified bone artifacts include point, awl, or needle fragments (Figure 28, B-D), a bipointed bone implement (Figure 28, E), a nearly complete beaver ulna awl (Figure 28, F), and an antler toggle head harpoon (Figure 28, G). Various other unidentifiable cut, ground, or polished bone tool fragments were also recovered.

Like the other artifact categories from this site, the ceramics have not yet been subject to a detailed quantitative analysis. What follows is a discussion of some of the general characteristics of the assemblage and a description of some of the rimsherds. Ceramics from this site are generally poorly preserved and fragmented into very small pieces. Of the 10,711 sherds recovered from the excavation units, 147 are rimsherds, several of which refit. A very conservative estimate of the minimum number of vessels represented by the rimsherds is 30 vessels. Smooth and smoothed over surface treatments seem to predominate in the assemblage, but cord-roughened exteriors are not infrequent. This appears to hold true both for the total sherd assemblage and for just the rimsherds. A small percentage of sherds have charred organic material adhering to their interior and/or exterior surfaces. Material scraped from one or more sherds of a partially reconstructable vessel (Figure 21, A) will be submitted for an AMS date when funds become available. A fairly high percentage of the sherds are decorated, especially those with smooth or smoothed over exteriors. Common decorative techniques exhibited by the rimsherds recovered from this site include rocker stamping (plain and dentate) (Figure 21, A; Figure 23, D; and Figure 24, A-E), dentate stamping (Figure 21, C; Figure 23, B, E; Figure 26, D), incising (Figure 21, A-C; Figure 22, B, D; Figure 23, E; Figure 24, C, E), punctates (Figure 21, A-C; Figure 22, B-D; Figure 23, B, E; Figure 24, B-D; Figure 25, C), cord and cord-wrapped stick impressions (Figure 22, C; Figure 23, A, C), and tool impressions (Figure 22, A, C; Figure 25, D). At least two sherds/vessels exhibit interior punctates / exterior nodes (Figure 23, D, F). Several sherds exhibit striated/brushed interiors (Figure 21, C; Figure 22, A, C; Figure 23, E). With one exception, all of the sherds from the 2002 excavation are grit-tempered. The exception is a limestone-tempered rimsherd with a smooth or smoothed over exterior (Figure 26, E). Limestone tempered vessels are very unusual in Michigan and are usually considered to be imported vessels. The example from this site is small vessel with a very short vertical rim that flares out at a roughly 90 degree angle at the shoulder probably creating a bowl-shaped vessel. This rim shape is more characteristic of Late Prehistoric/Mississippian vessels than of the Middle to early Late Woodland ceramics that comprise the rest of the assemblage. However, this preliminary assessment must be considered tentative.

Of the 15,864 historical items recovered from this site, 14,734 are fragments of coal and cinders. Ceramic objects comprise the next largest group of historic period materials. This group includes 103 fragments of white paste earthenware vessels, one fragment of a porcelain vessel, four yellow paste earthenware tile fragments, and 29 fragments of white clay pipes. In addition to plain white/destroyed fragments, the earthenware vessels include among others, blue, mulberry, black, brown, and red transfer printed vessels, fragments of blue edgeware vessels, and hand-painted blue and hand-painted polychrome vessels. Glass material includes one faceted blue bead, 24 bottle fragments, 86 other glass vessel fragments, and three flat glass fragments. Glass bottles and other vessels include clear, aqua, amethyst, brown/amber, dark green/black, and olive examples. Artifacts related to firearms and ammunition include two .22 cal. lead bullets, one honey-colored French gunflint, six lead shot/musket balls, one brass percussion cap, 27 brass or copper shell casings, and two fragments of clay pigeons. Historic period metal items include one iron horseshoe fragment, one iron coupling with a threaded interior, 142 square and wire nail fragments, one brass rivet, two iron rod fragments, one iron wire fragment, one lead scrap, and 601 iron scraps, many of which are probably badly corroded nail fragments. Other Historic period items collected during 2002 include one bone handle from a fork or knife, 27 red and yellow brick fragments, one unidentified bead-like object, one black plastic cap, one tube-shaped plastic object, one clear plastic ring, one plastic doll fragment, and 48 plastic scraps.

Four features or possible features were identified near the western end of the main excavation block in 2002 (Appendix D). Features excavated in 2002 were numbered Feature 1 through Feature 4. Using the label “Feature 1” was a mistake that could cause some confusion because this label was previously used for a possibly cultural feature excavated at 20SA1251 in 2001. Unfortunately, this mistake was not recognized until numerous samples, notes, drawings and photographs had already been taken/made with this label. Descriptions of the features are given below. In order to recover very small and fragile items, undisturbed feature fill was saved for flotation. This material has not yet been processed so it is impossible at this time to describe the feature contents.

Feature Descriptions

Feature #	1
Plan	irregular circular/oval
Profile	basin-shaped, rounded bottom
Max. length	105 cm
Max. width	90 cm
Depth defined	60 cm
Max. depth	90 cm, stain below this due to leaching and bioturbation
Description	This feature, located in excavation units 492-493N 553-554E, consisted of a large, relatively undisturbed, basin-shaped pit. One hundred and fourteen liters of feature sediment were saved for flotation. Although the flotation samples have not yet been processed and their contents are not known, several artifacts were observed while excavating this feature. These artifacts include grit-tempered pottery (including zoned rocker stamped and dentate rocker stamped sherds), bone fragments, charcoal, flakes and FCR. In addition, a cluster of large rocks, some of them fire-cracked, was present at the 60cm level of this feature. It is likely that a portion of this feature was present above the 60 cm floor, but could be distinguished from the dark sediment of the surrounding midden. This is suggested by the presence fairly dense concentrations/clusters of bone, flakes, and ceramics in the preceding excavation levels. The matrix surrounding the feature was very dark and heavily disturbed and in many cases the boundary between the feature and the surrounding disturbed zone was not clear.

Feature #	2
Plan	irregular oval
Profile	irregular basin-shaped
Max. length	80 cm (~50 cm in profile)
Max. width	55 cm (~42 cm in profile)
Depth defined	60 cm
Max. depth	80 cm
Description	Feature 2 was located in unit 493N 553E. It may have extended west into unit 493N 552E, but this unit was not excavated. Although this feature appeared quite large in plan view at the 60 cm floor, when profiled the darker, less disturbed, feature area was much smaller. The color and texture of the relatively undisturbed portions of the feature fill was very similar to that from Feature 1. However, no cultural material was observed while excavating Feature 2. Twenty-five liters of relatively undisturbed feature fill were saved for flotation. Two additional liters were screened through ¼ inch mesh, but no artifacts were recovered. Like Feature 1, the darker, relatively undisturbed sediment regarded as Feature 2 was surrounded by dark, but very heavily disturbed sediment. The dark nature of this surrounding sediment is thought to be a result of organic material leaching out of the Feature 2 deposit and of the extensive disturbance at the margins of the feature.

Feature #	3
Plan	irregular circular
Profile	irregular basin-shaped
Max. length	70+ cm
Max. width	70+ cm
Depth defined	60 cm
Max. depth	75 cm
Description	Feature 3 was located primarily in the northwest portion of unit 494N 553E. It may have extended slightly north into unit 495N 553E, but subsequent excavation of this unit did not reveal any significant portion of Feature 3. Feature 3 may also have extended west into 494N 552E and northwest into 495N 552E, but these units were not excavated. This feature was heavily disturbed by animal burrows and it is not clear if it represents a cultural feature or a collapsed burrow/den. Feature 3 contained several flakes, bone fragments and a small FCR cluster. The boundaries of the feature could not be clearly defined, but there was a slightly darker, slightly less disturbed, irregular basin-shaped deposit that may have been the remains of a cultural pit feature of some sort. This slightly darker, slightly less disturbed zone contained 60 liters of sediment. However, because of the still extensive disturbance, only 14 liters were saved for flotation.
Feature #	4
Plan	irregular oval
Profile	N/A
Max. length	70 cm
Max. width	30 cm
Depth defined	65 cm
Max. depth	75 cm
Description	Feature 4 consisted of an FCR cluster situated in dark, but heavily mottled/disturbed deposit with no clear boundaries. There was no concentration of artifacts, faunal material or charcoal in or around the FCR concentration. Because of the heavily disturbed nature of the dark surrounding soil, and the total lack of any pit or other structure to the feature, a volumetric assessment could not be made. However, a 10 liter sample of the darkest soil within and below the FCR concentration was saved for flotation. Despite a lack of charcoal, or burned soil, the FCR cluster indicates that this feature probably represents a disturbed hearth.

DISCUSSION

Although modest, the continuing goals of the surface survey and shovel-testing portion of this project, to document and collect artifacts from archaeological sites exposed on Shiawassee NWR property and to continue testing the subsurface extent and integrity these sites, were met and exceeded. 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 to varying degrees. Four seasons of fieldwork have clearly demonstrated that significant cultural resources are present within the boundaries of the Shiawassee NWR, including extensive buried archaeological deposits.

Middle and/or Late Woodland occupations are indicated at all of the sites for which diagnostic materials are available. 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, and Jack's Reef, Raccoon Notched, Snyders-like and a variety of expanding stemmed points, 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). The Late Prehistoric/Upper Mississippian Period is also an extremely poorly understood portion of Saginaw Valley prehistory (Halsey 1999:263). During previous field seasons, several Late Prehistoric artifacts were recovered from 20SA722, including shell-tempered potsherds with smooth and cord-roughened exteriors, grit-tempered rimsherds with finger-pinched lips, and triangular projectile points (Sommer 2001). Additional late Prehistoric artifacts, including shell and limestone tempered ceramics and triangular Madison Points, were recovered from the test excavation at 20SA1251 during the 2001 and 2002 field seasons (Sommer 2002). 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); 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.

It must be stressed that surface collections, and collections derived from limited shovel testing, cannot be assumed to provide representative samples of artifacts from the sites investigated. 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 described 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.

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, 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 20SA1251 in 2001 and 2002 and 20SA1276 in 2001 (Sommer 2002) 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 feature samples at 20SA1276 and probably also from the flotation samples that were taken, but not yet processed, from the features at 20SA1251. Preliminary, non-quantitative assessment of a sample of the faunal remains recovered from these test excavations 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.

Data from the test excavations at 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 from general excavation contexts at 20SA1251. Unfortunately, because the features from 20SA1251 have not yet been processed through flotation, it is not yet known what kinds or amount of floral and faunal material they contain. Spring spawning fish such as suckers or sturgeon have not been recognized in any quantity from either of the sites, suggesting perhaps that the sites were not occupied during the spring.

Based on the limited shovel-testing conducted at 20SA214, 20SA1251, 20SA1254, 20SA1276, and 20SA1277 during the 2000-2002 field seasons (Sommer 2001, 2002), and the test excavations conducted at 20SA1276 during the 2001 field season and at 20SA1251 during the 2001 and 2002 field seasons, 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 20SA1251 or 20SA1276. The relative scarcity of Late Archaic/Early Woodland remains probably reflects the fact that deposits of this age are 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 and materials recovered during 2002 and previous field seasons in the project area indicate interactions or influence originating from cultural groups in surrounding regions. The presence of Norwood chert suggests influence from cultural groups to the north. Interactions to the south and west are indicated by the presence of Illinois Hopewell-inspired 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, four years of fieldwork on this project have also identified

significant 19th and 20th century historical materials. Most of the 19th century artifacts appear to be related to the late 19th century logging industry in the region. Logging artifacts 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 certainly refuse 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” 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 earlier 18th century 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 and 2000 suggest that it may be an ongoing problem. Fluvial processes are eroding most of the sites documented during this project. One of the affects of these processes is that archaeological materials are clearly visible on the river edges, making them susceptible to persons untrained in the methods and importance of archaeological documentation. However, evidence of collectors was not observed in 2001 or 2002 and it may be that our presence while monitoring these sites has served as a deterrent.

SUMMARY AND RECOMMENDATIONS

This report summarizes the results of a fourth 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, included both limited archaeological survey/salvage and test excavations.

Surface collections, totaling 442 objects, were made from 19 of 21 sites that were monitored during the 2002 field season. Nine of the 21 sites had not been previously recorded. The survey area was expanded this year to include portions of the eroding edge of the Cass River and approximately 30 hectares of cultivated farmland located in sections 21 and 22 in Spaulding Twp. Two sites, 20SA1276 (Shiawassee #13) and 20SA214 (Shiawassee #6), were subject to limited shovel testing. Nineteen shovel tests dug at 20SA1276 yielded 1,140 objects. A single shovel test excavated at 20SA214 yielded no cultural material.

Exploratory test excavations were carried out at 20SA1251. Twenty-six square meters plus a 50X50 cm column sample were excavated at 20SA1251 during the 2002 field season. These excavations yielded 71,792 objects. In addition to the catalogued specimens, 32 samples, containing a total of 354 liters of sediment, were saved for flotation. These flotation samples have not yet been processed.

Artifacts recovered during the 2002 field season represent primarily Middle and Late Woodland occupations (ca. A.D. 0 - 1000). However, a few Late Archaic/Early Woodland period (ca. 1000-500 B.C.) artifacts and Late Prehistoric (post-ca. A.D. 1400) items are also present in the assemblages. Historical artifacts date primarily from the mid-19th century through the 20th century, but a few artifacts, including a French gunflint, may date to the 17th or 18th century.

This project continues to demonstrate that significant archaeological resources are present within the boundary of the Shiawassee NWR. It is clear that archaeological sites in the project area hold considerable research potential. 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). They are repeated below with some modifications. Based on the results of the past four seasons of fieldwork, the following recommendations are made.

- 1) Because most of the sites are still documented primarily on the basis of artifacts exposed on the surface, it has not been possible to determine site boundaries. Additional shovel testing should be employed to determine the spatial extent of the sites that have been documented. This information is important for cultural resource management 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 the potential research topics listed above.

- 3) Farming, along with 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) A systematic survey involving walking all exposed river banks and agricultural fields, and shovel testing in wooded areas is recommended in order to locate additional sites on the refuge.
- 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 dike construction. For this reason, **all** proposed activities that will disturb the ground surface, including the construction of dikes, ditches, trails, roads, bathrooms, 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 has been a problem in the past. Footprints observed on several sites along the Shiawassee River suggest that it may be an ongoing problem. For this reason, every effort should be made to educate people about the irreparable damage that can result from removing artifacts from archaeological sites. Furthermore, an increased effort to monitor locations with known archaeological sites should reduce the potential of this problem.

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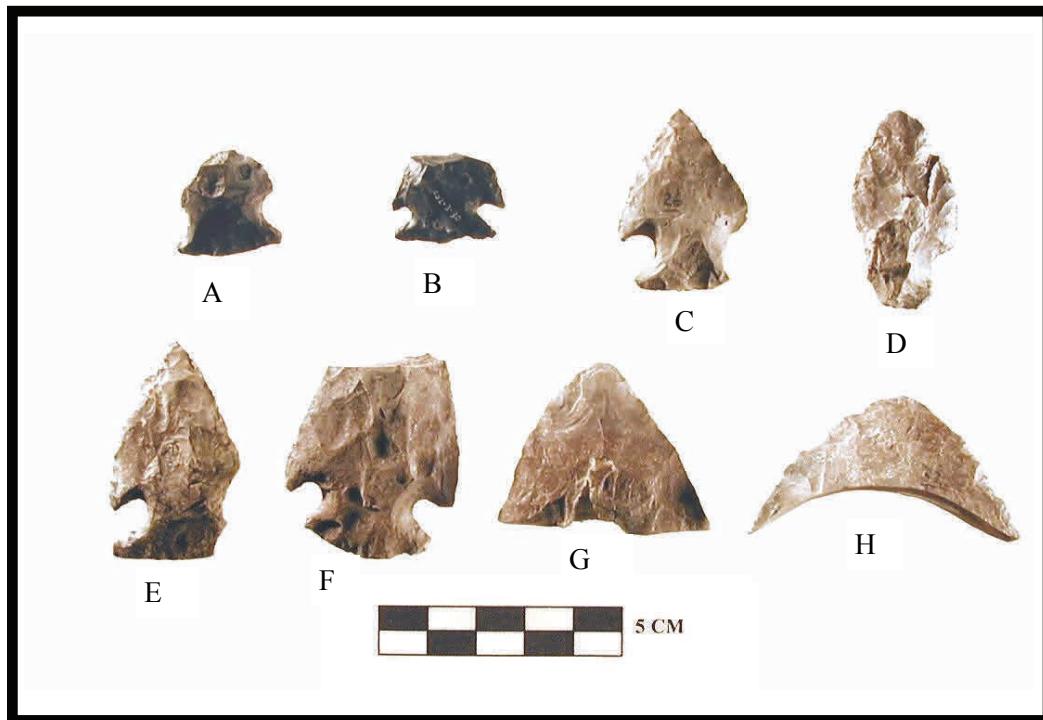


Figure 1: Bifaces from 20SA214.

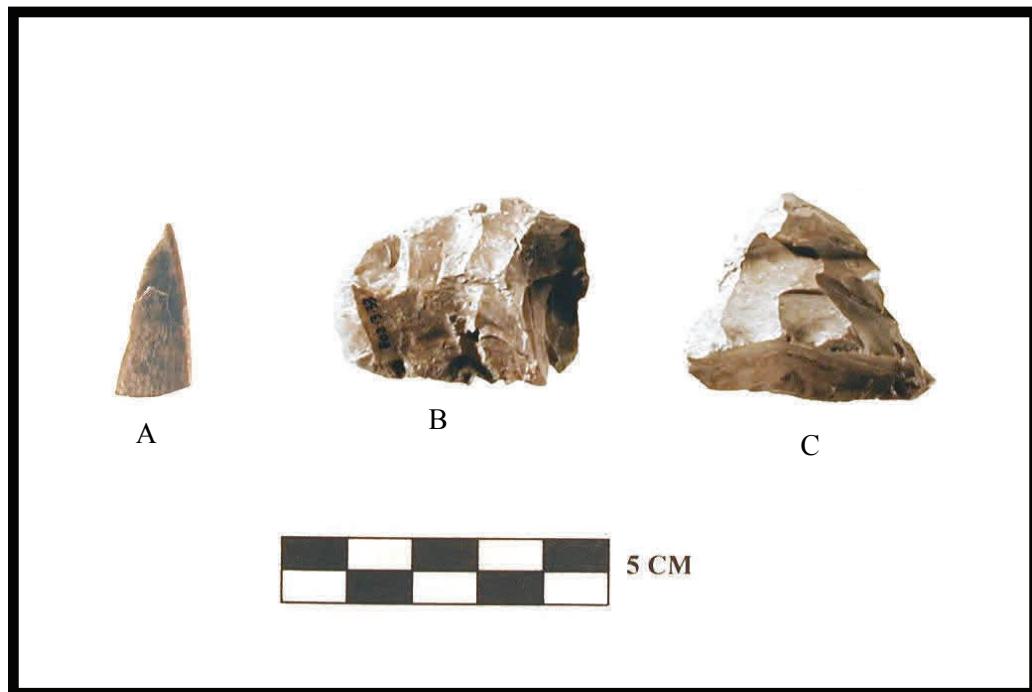


Figure 2: Modified bone, bipolar core, and blade core from 20SA214.

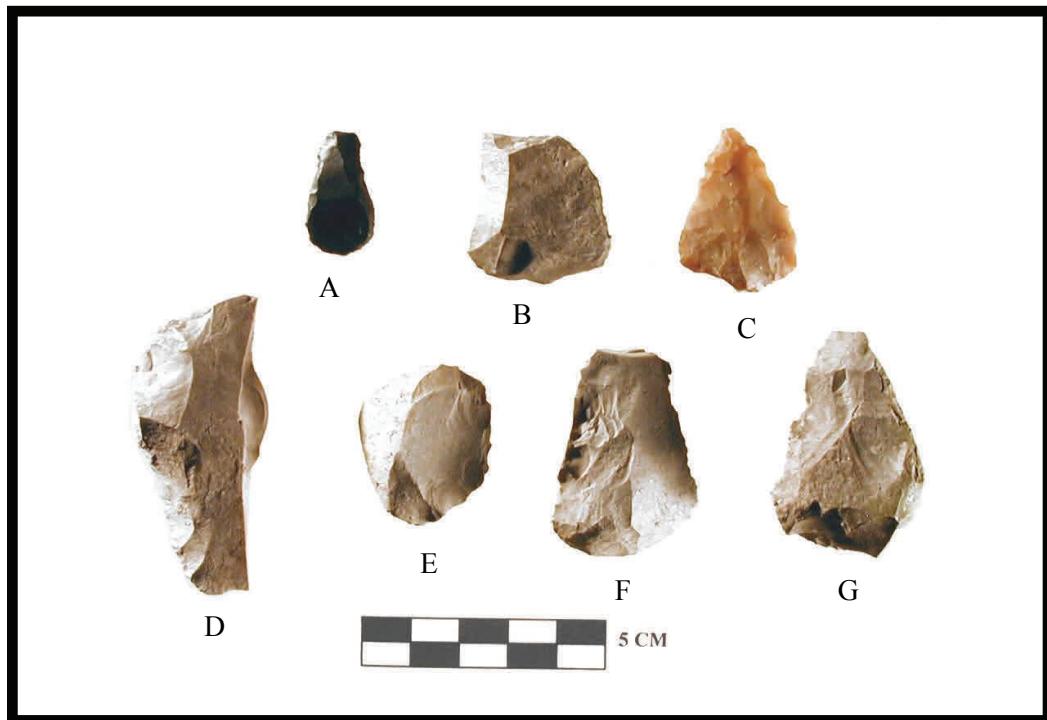


Figure 3: Retouched flakes from 20SA214.

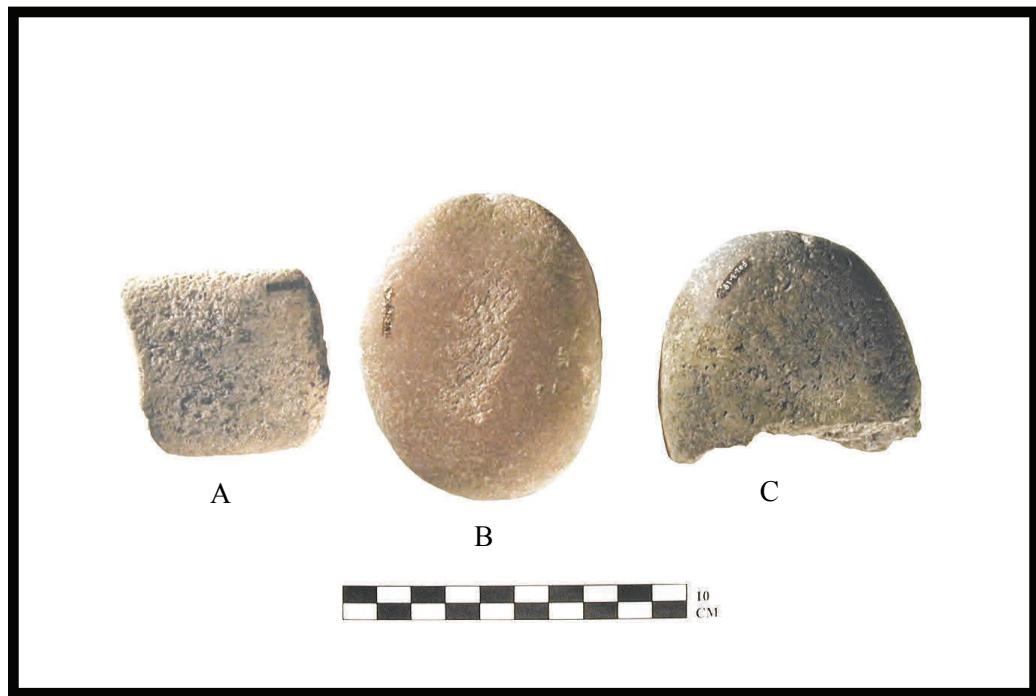


Figure 4: Celt/ax fragment and anvil/hammerstones from 20SA214.

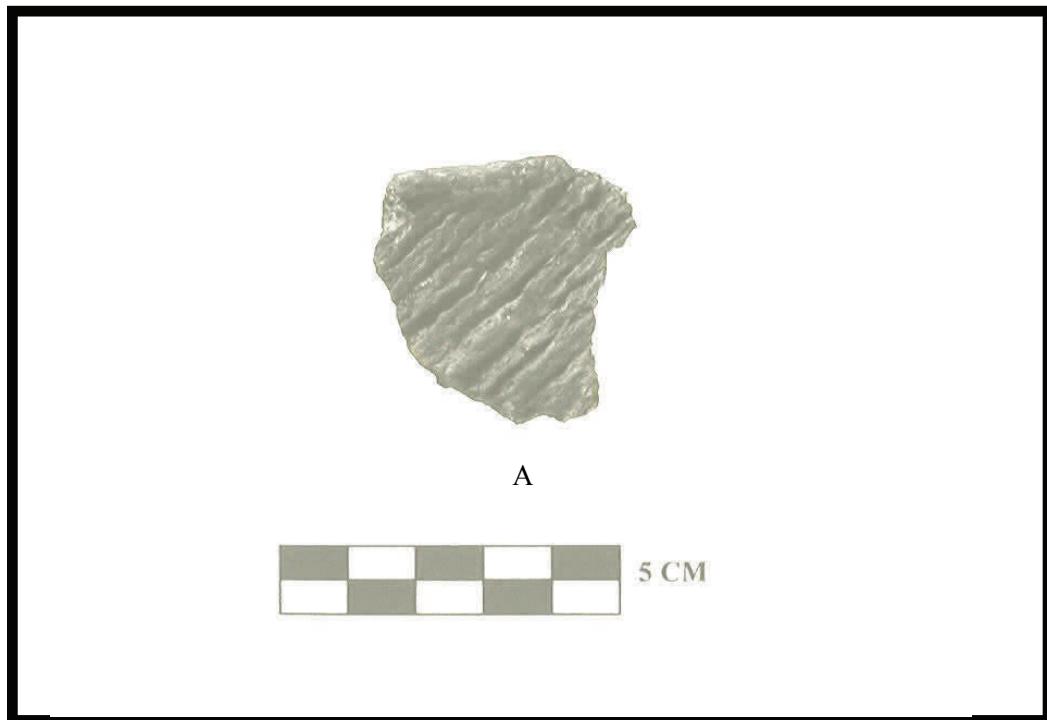


Figure 5: Rimsherd from 20SA361.

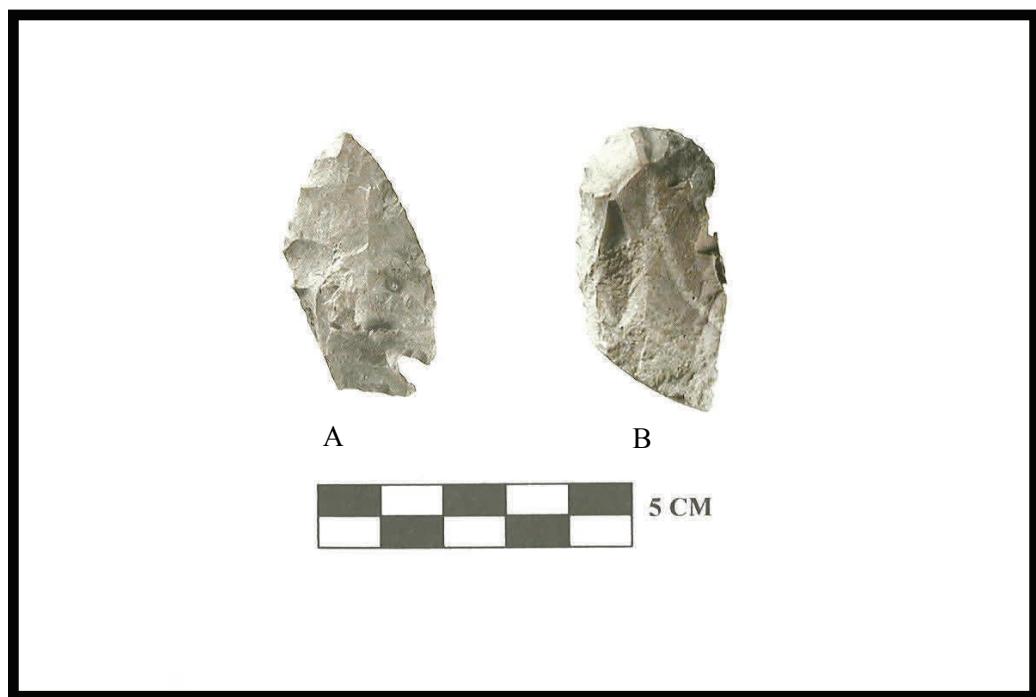


Figure 6: Biface and retouched flake from 20SA388.

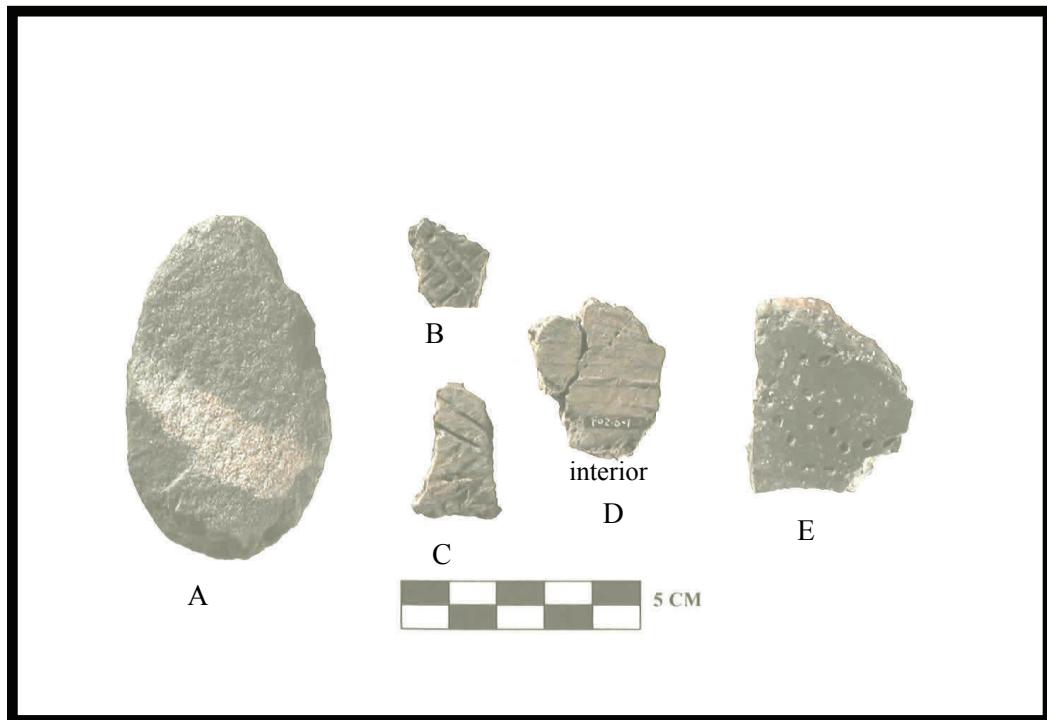


Figure 7: Flaked stone and ceramics from 20SA722.

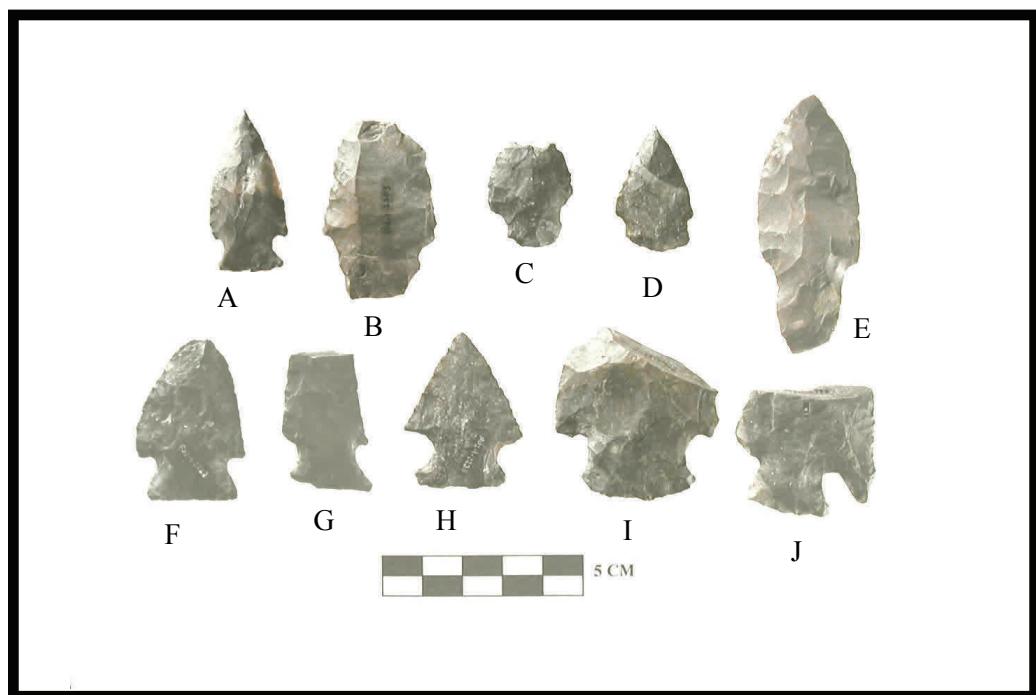


Figure 8: Notched and stemmed bifaces from surface of 20SA1251.

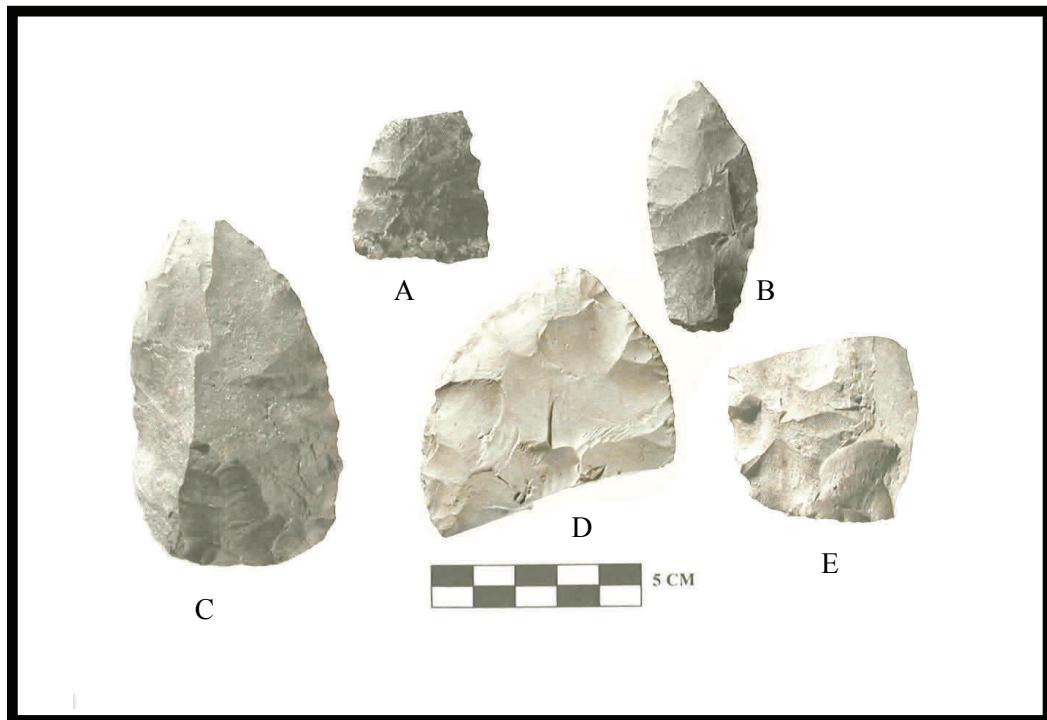


Figure 9: Bifaces from surface of 20SA1251.

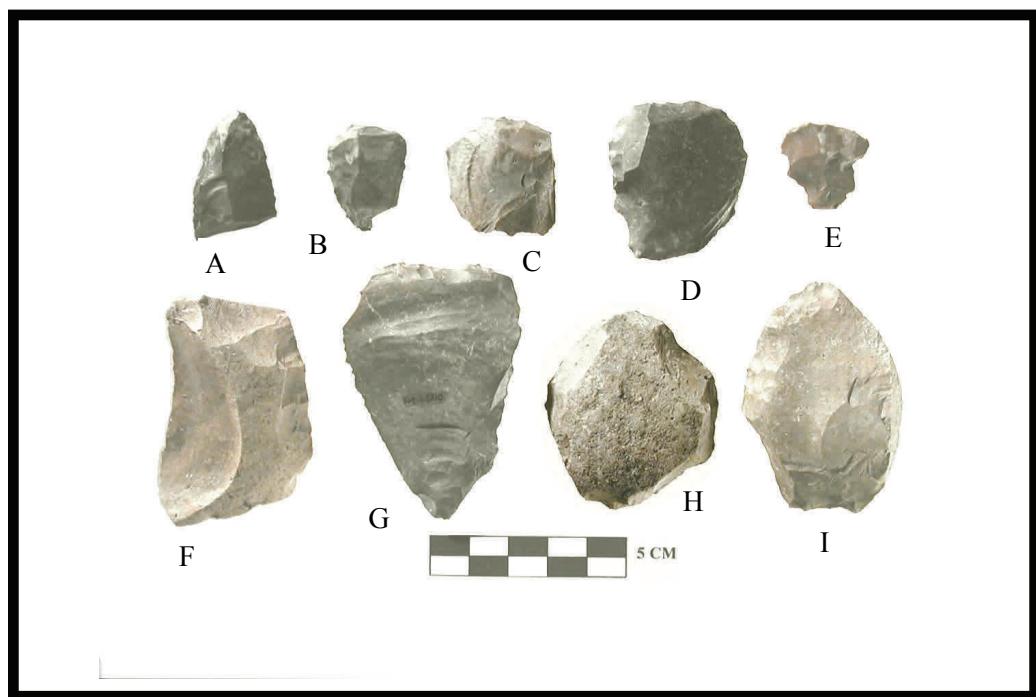


Figure 10: Retouched flakes from surface of 20SA1251.



Figure 11: Notched stone (netsinker?) from surface of 20SA1251.

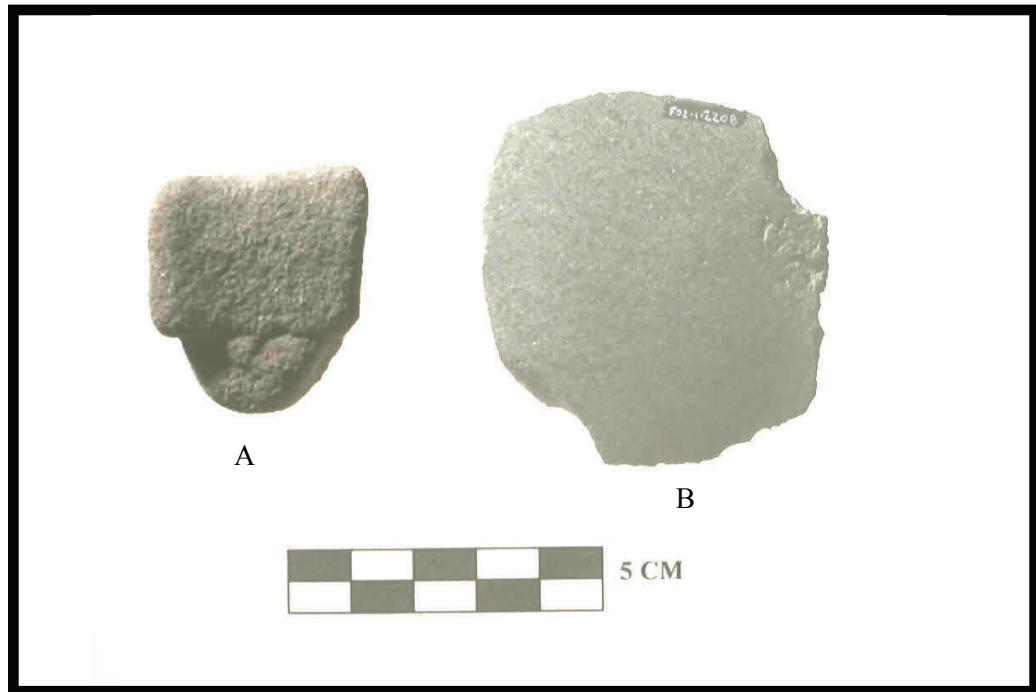


Figure 12: Abrader and celt/ax fragment from surface of 20SA1251.

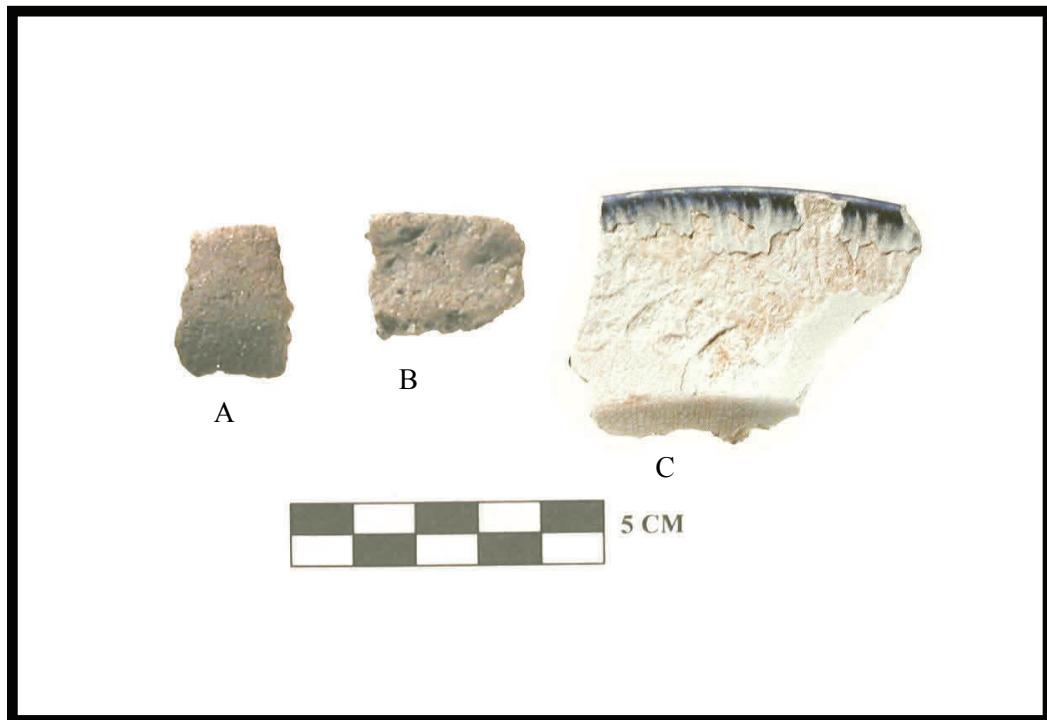


Figure 13: Prehistoric and historic ceramics from surface of 20SA1251.

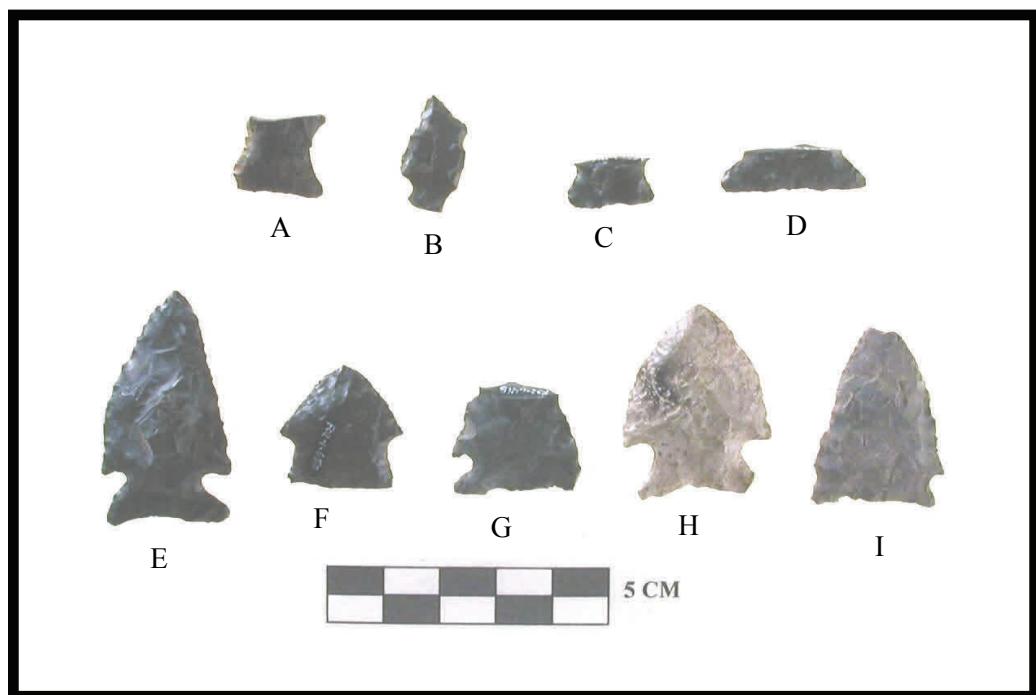


Figure 14: Notched and stemmed bifaces from excavation of 20SA1251.

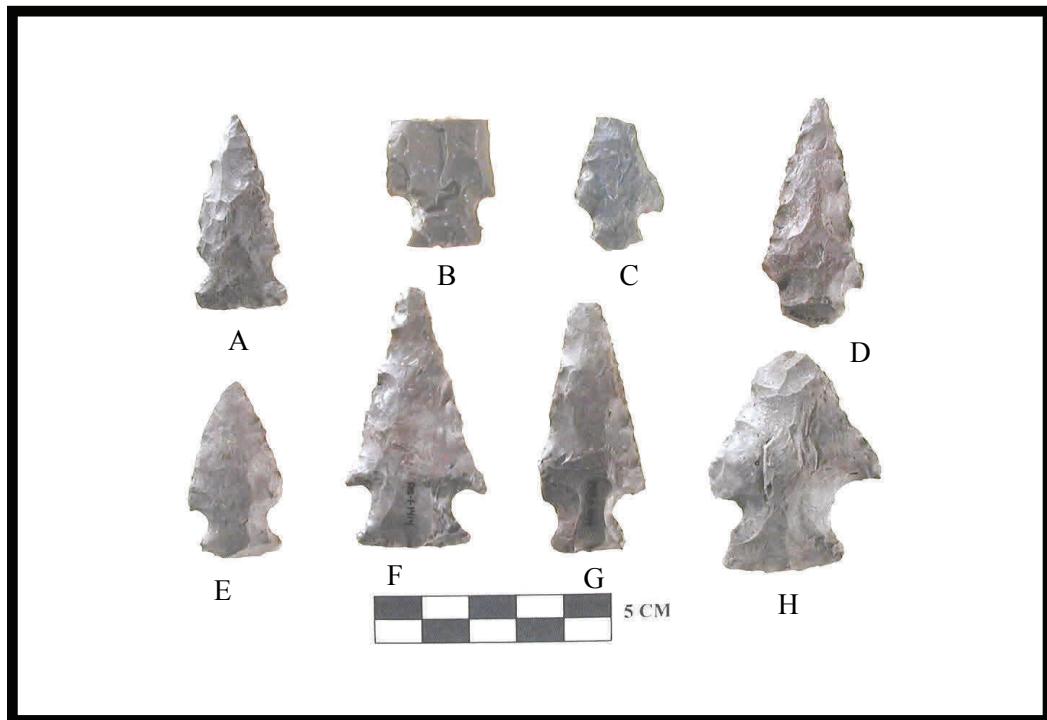


Figure 15: Notched and stemmed bifaces from excavation of 20SA1251.

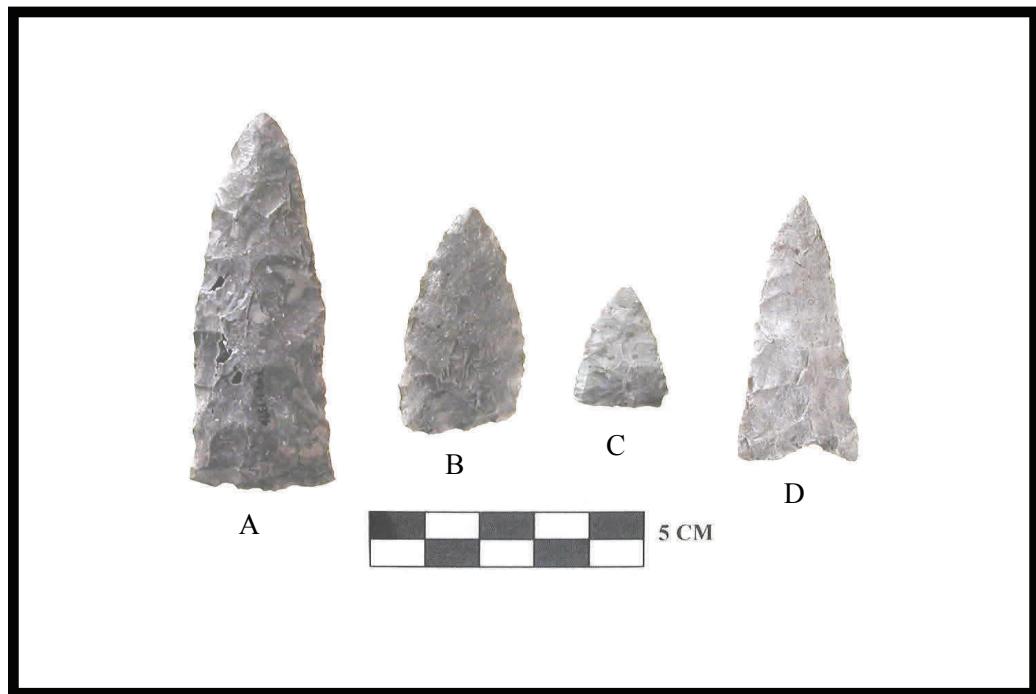


Figure 16: Triangular bifaces from excavation of 20SA1251.



Figure 17: Retouched flakes from excavation of 20SA1251.



Figure 18: Retouched flakes from excavation of 20SA1251.



Figure 19: Bipolar cores from excavation of 20SA1251.

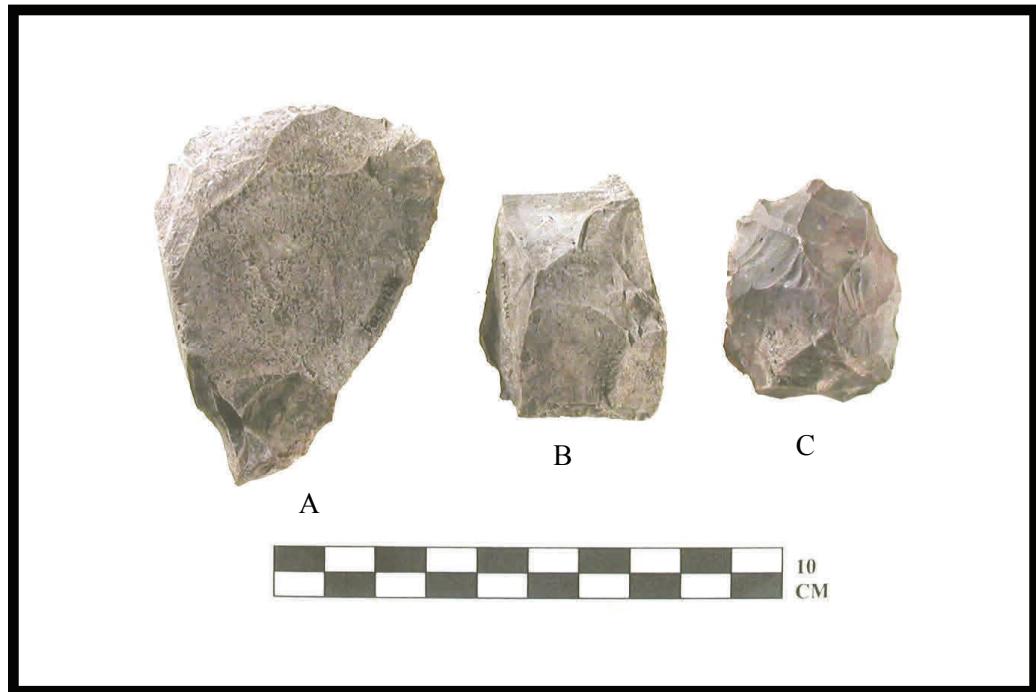


Figure 20: Cores from excavation of 20SA1251.

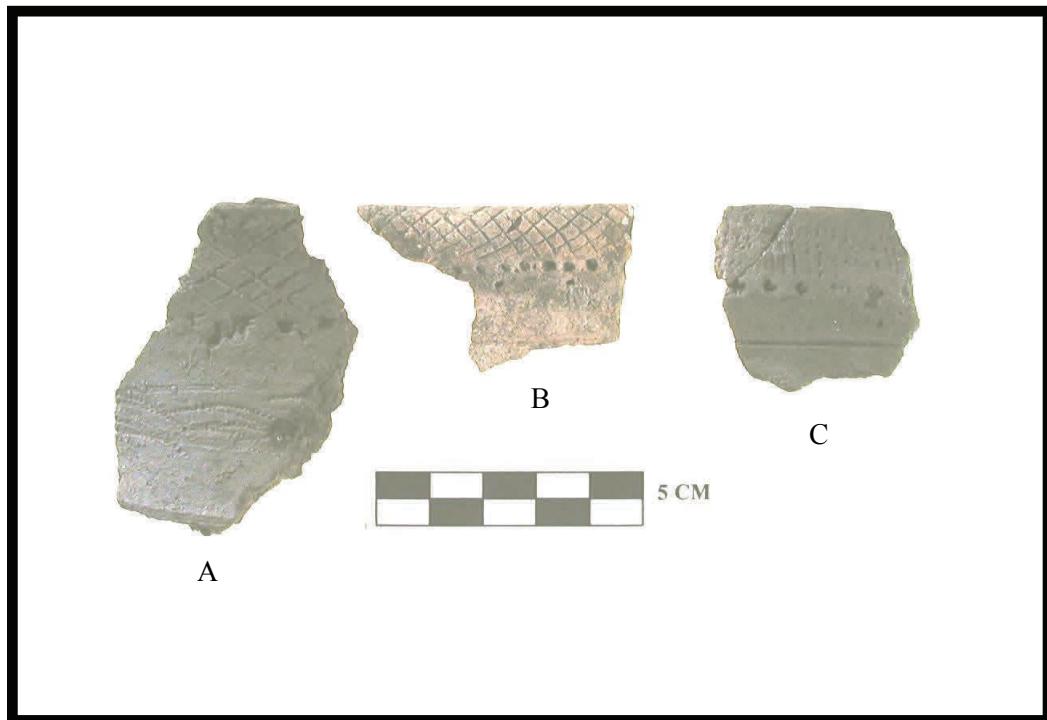


Figure 21: Ceramic rimsherds from excavation of 20SA1251.



Figure 22: Ceramic rimsherds from excavation of 20SA1251.

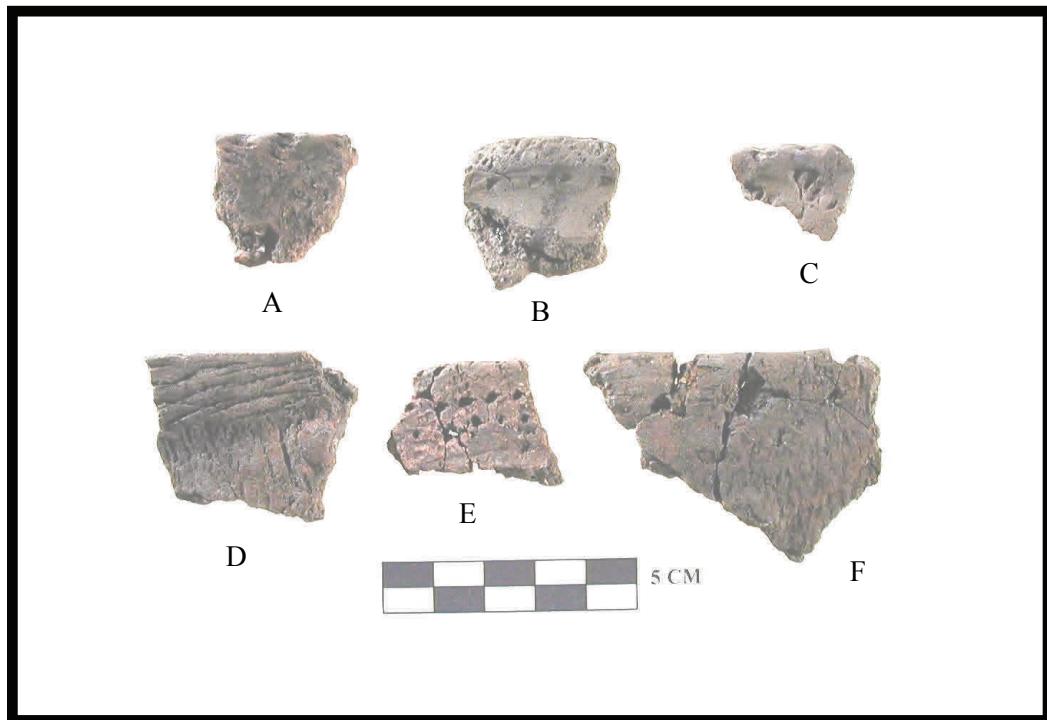


Figure 23: Ceramic rimsherds from excavation of 20SA1251.

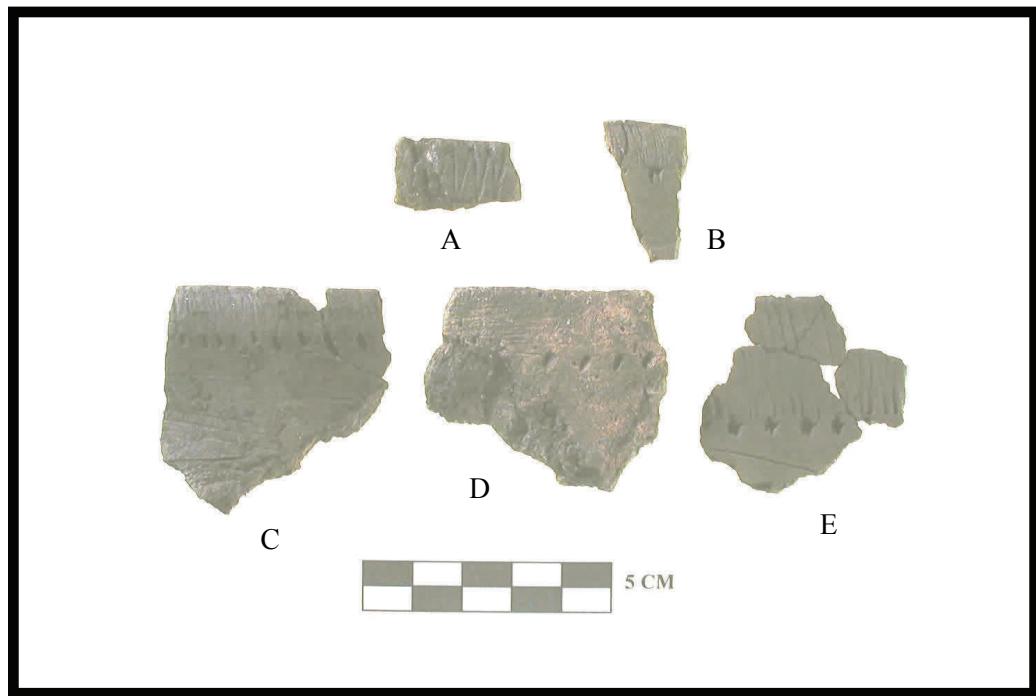


Figure 24: Ceramic rimsherds from excavation of 20SA1251.

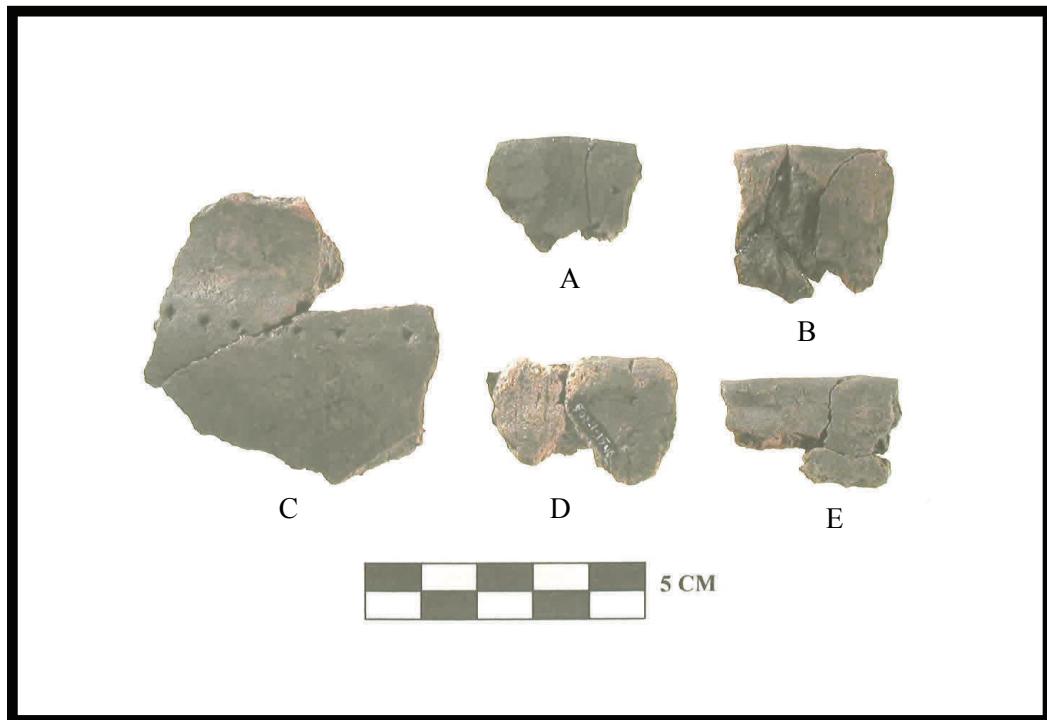


Figure 25: Ceramic rimsherds from excavation of 20SA1251.

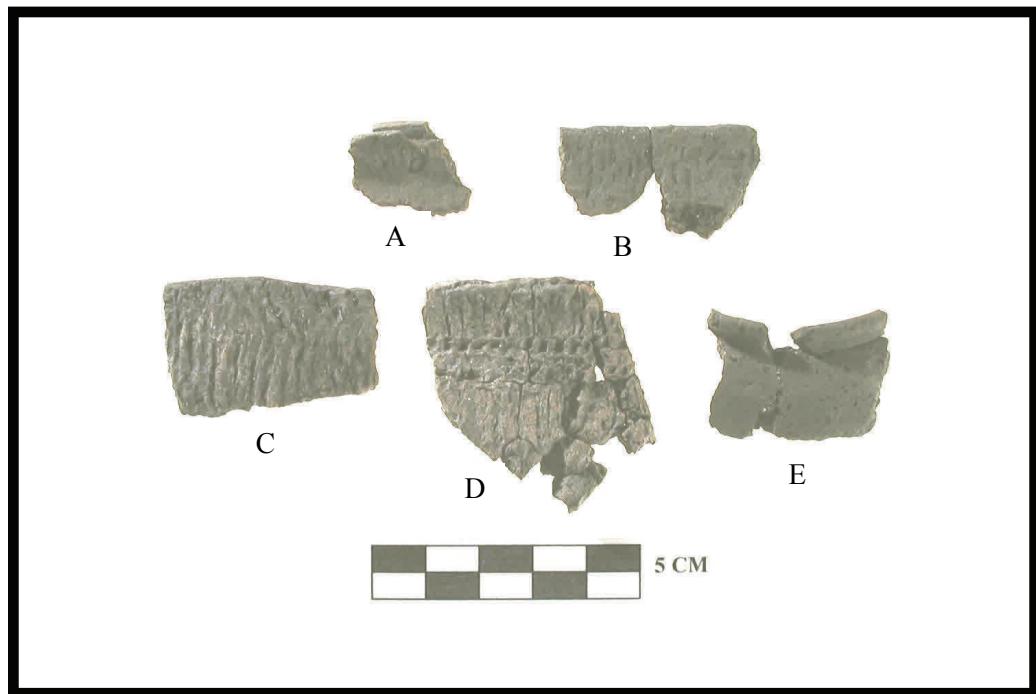


Figure 26: Ceramic rimsherds from excavation of 20SA1251.



Figure 27: Modified bone “beamer” from excavation of 20SA1251.



Figure 28: Modified bone artifacts from excavation of 20SA1251.



Figure 29: Ceramic sherd, retouched flake, and biface from 20SA1252.

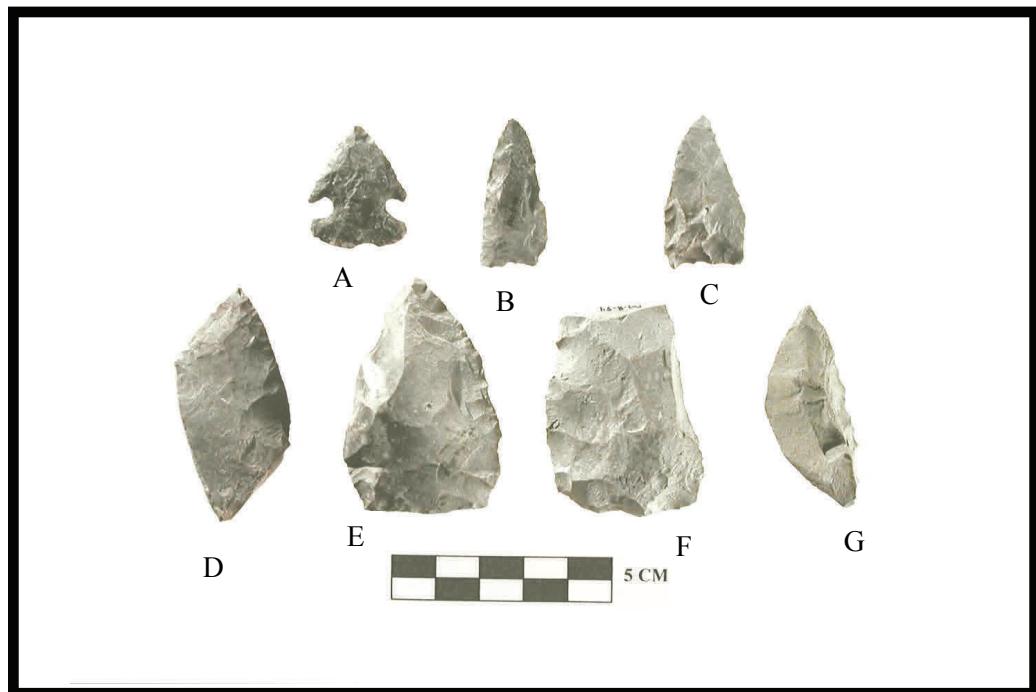


Figure 30: Bifaces from 20SA1254.



Figure 31: Bifacial celt/ax preform from 20SA1254.

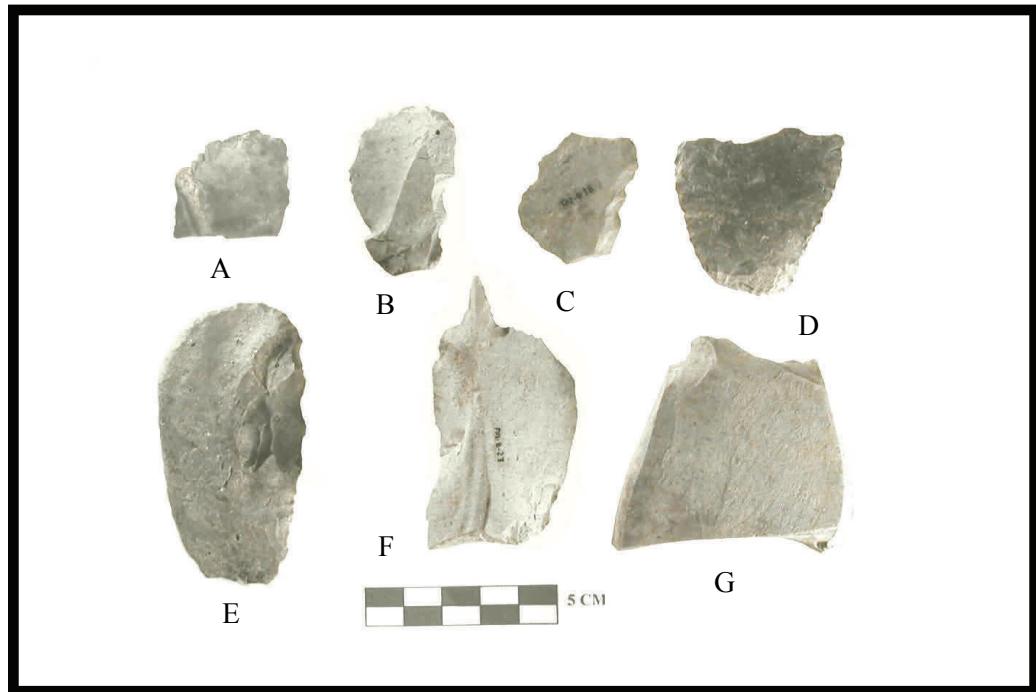


Figure 32: Retouched flakes from 20SA1254.

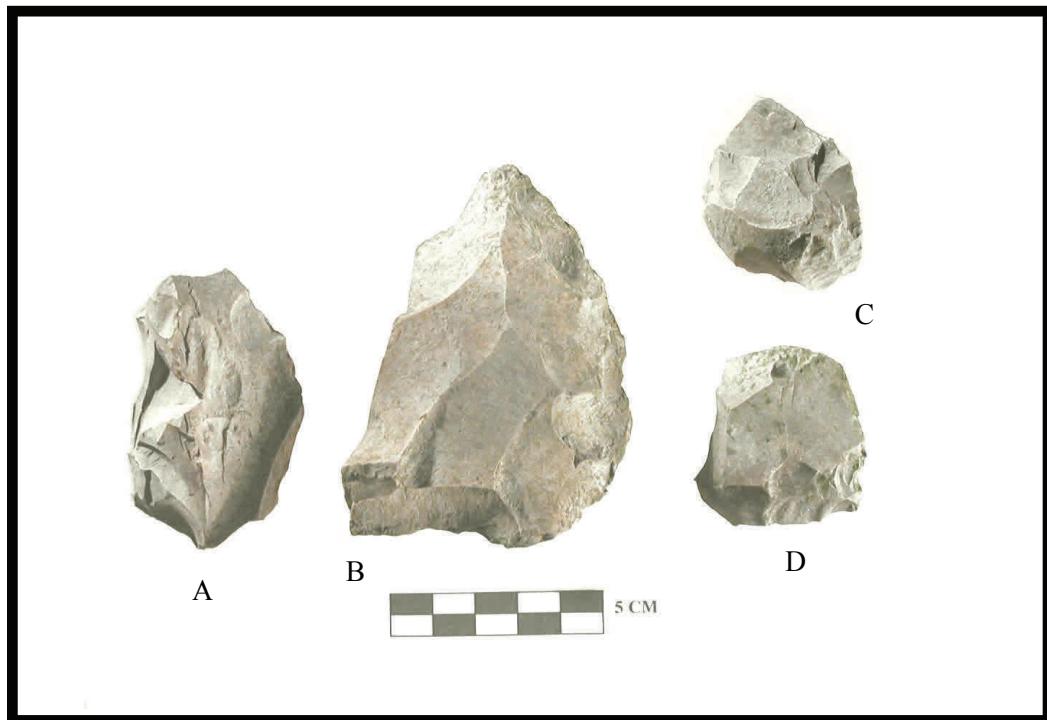


Figure 33: Cores from 20SA1254.



Figure 34: Modified bone and bipolar cores from 20SA1254.

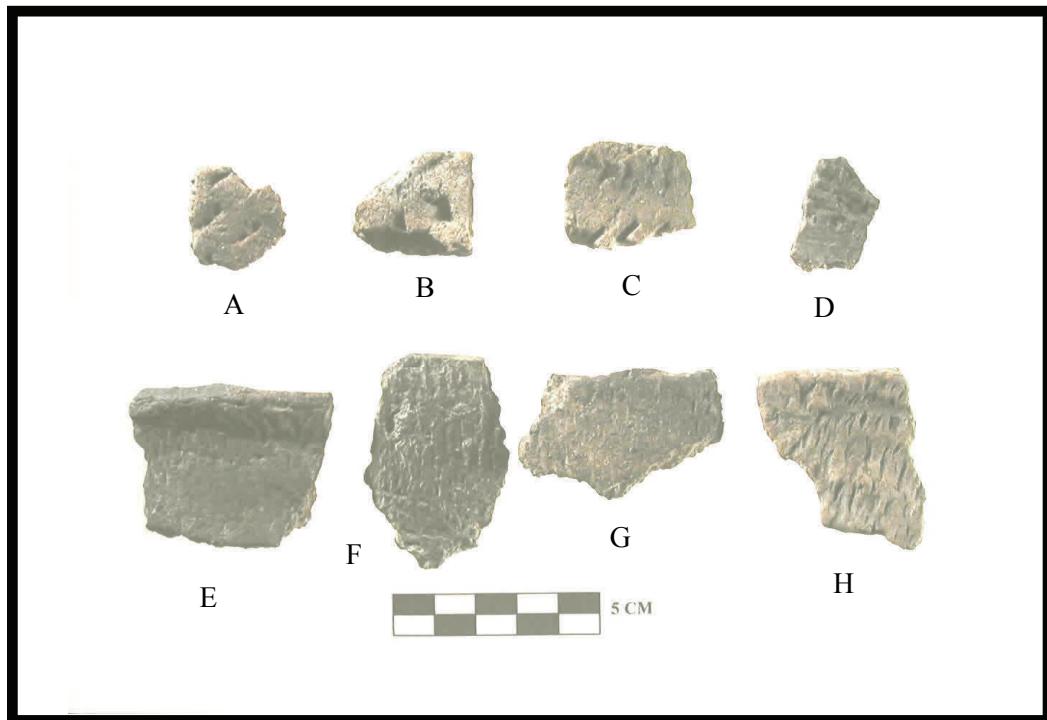


Figure 35: Ceramic rimsherds from 20SA1254.

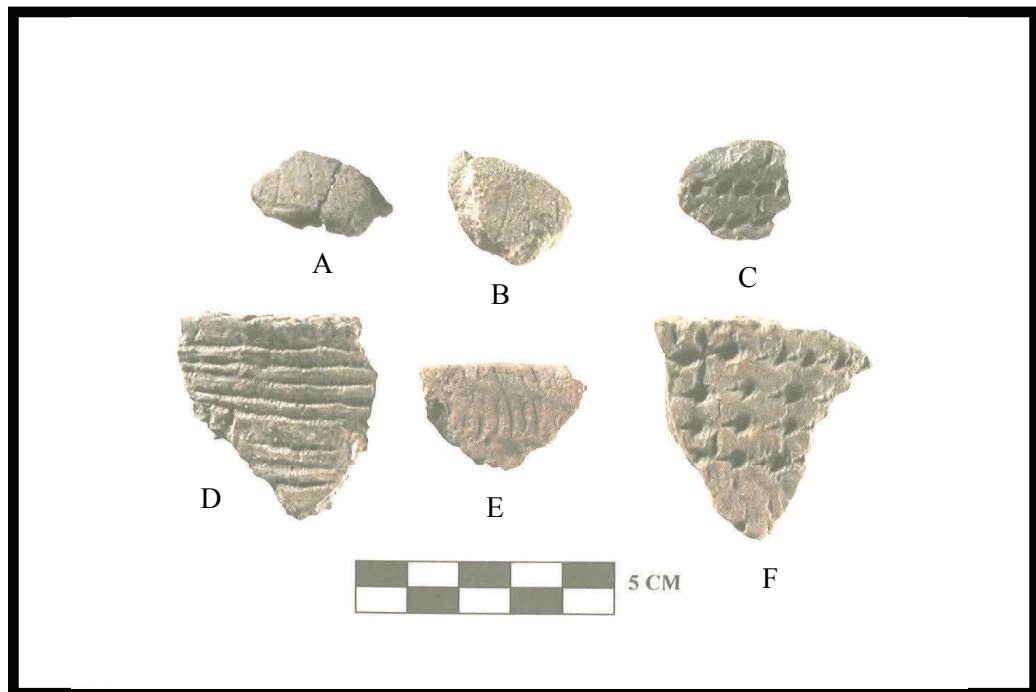


Figure 36: Decorated ceramics from 20SA1254.

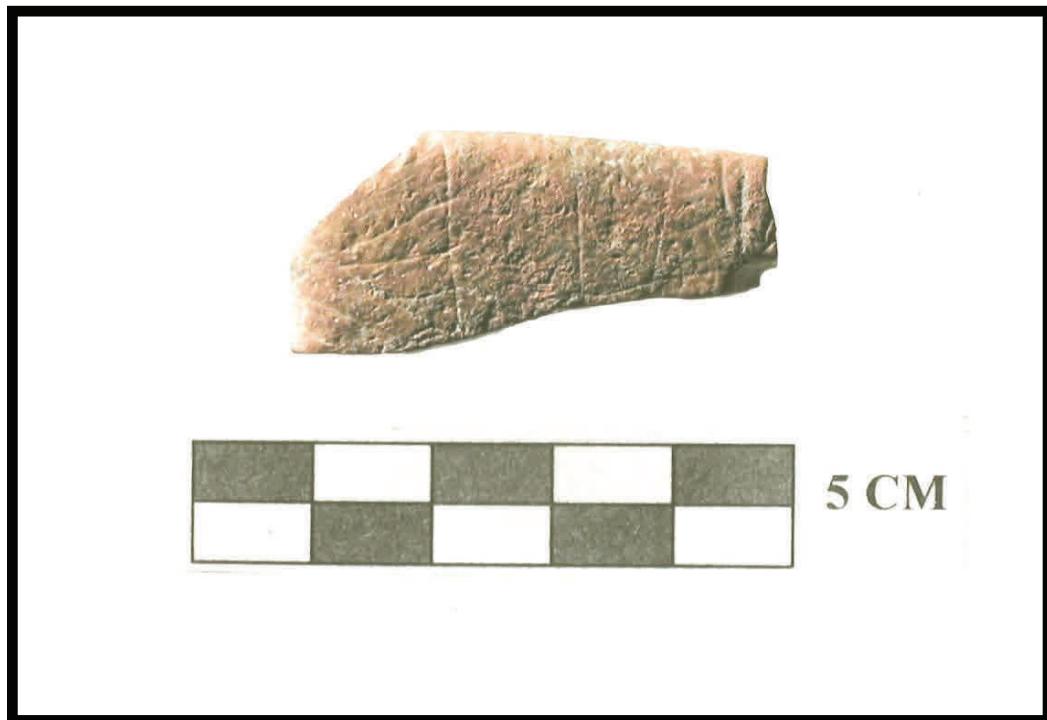


Figure 37: Closeup of engraved gorget from 20SA1254.

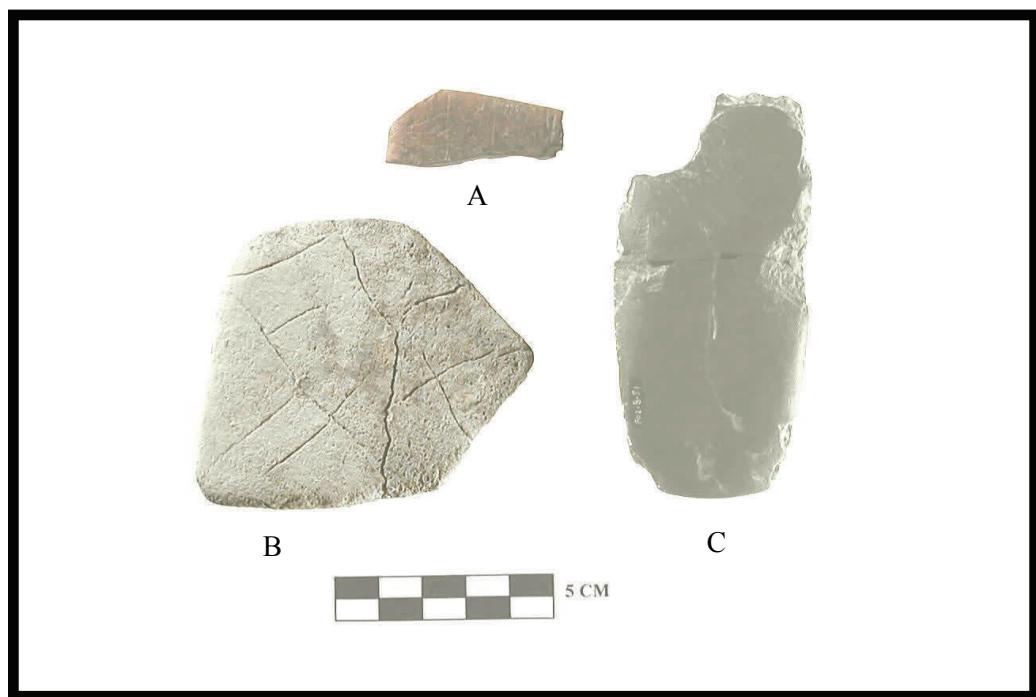


Figure 38: Engraved gorget, possibly engraved stone, and gorget preform from 20SA1254.



Figure 39: Sandstone metate fragment from 20SA1254.



Figure 40: Hammerstones from 20SA1254.

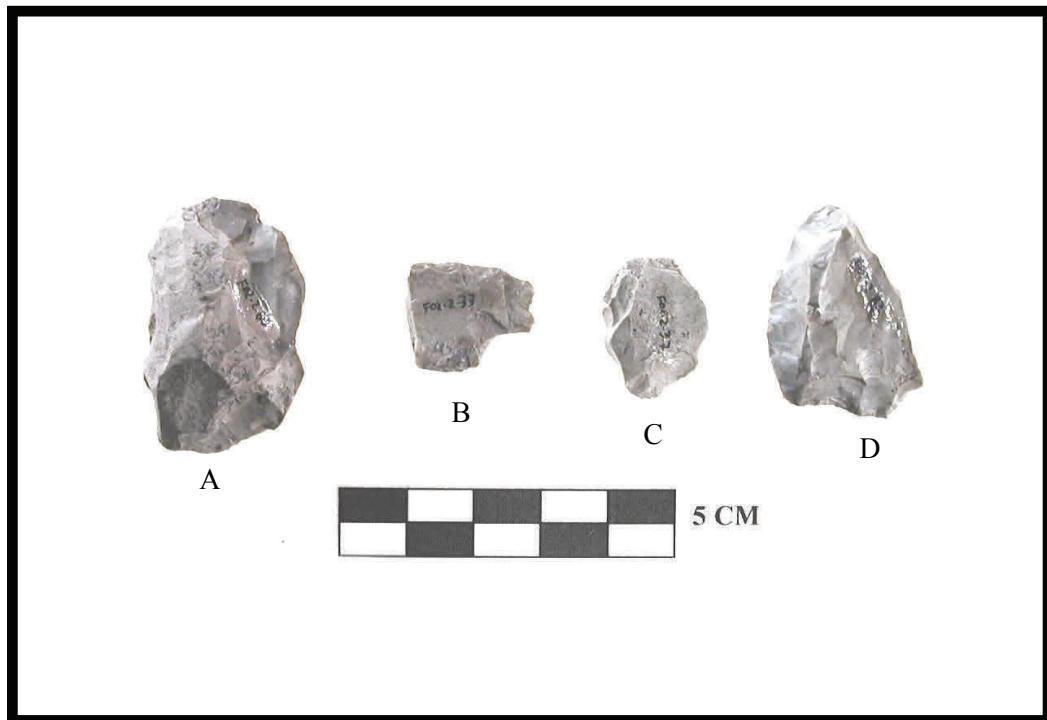


Figure 41: Bipolar cores from 20SA1276.

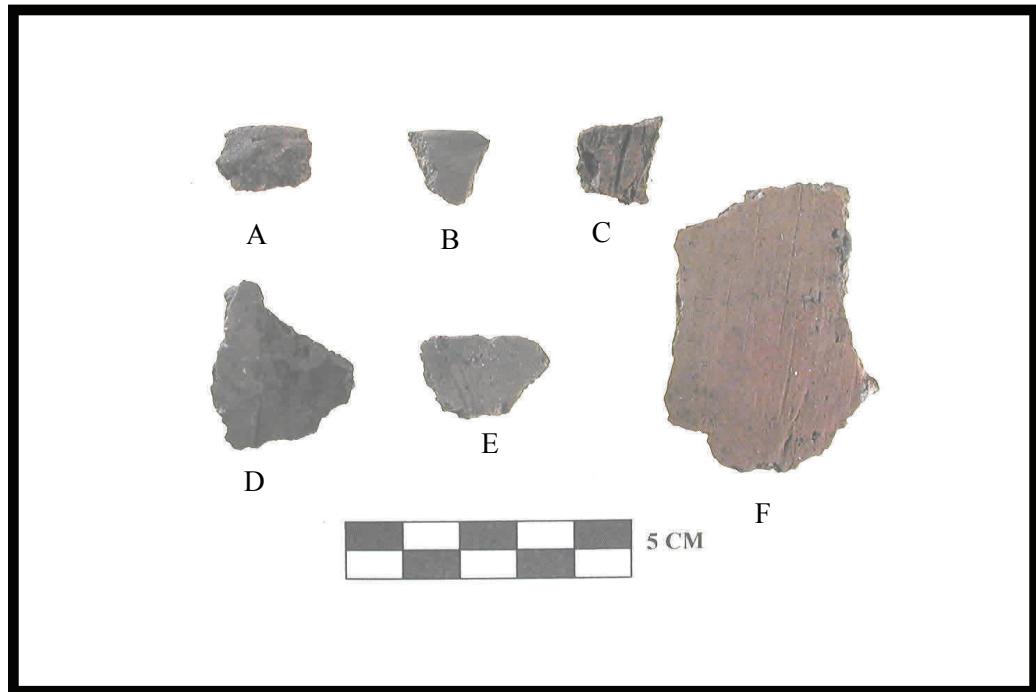


Figure 42: Ceramic sherds from 20SA1276.

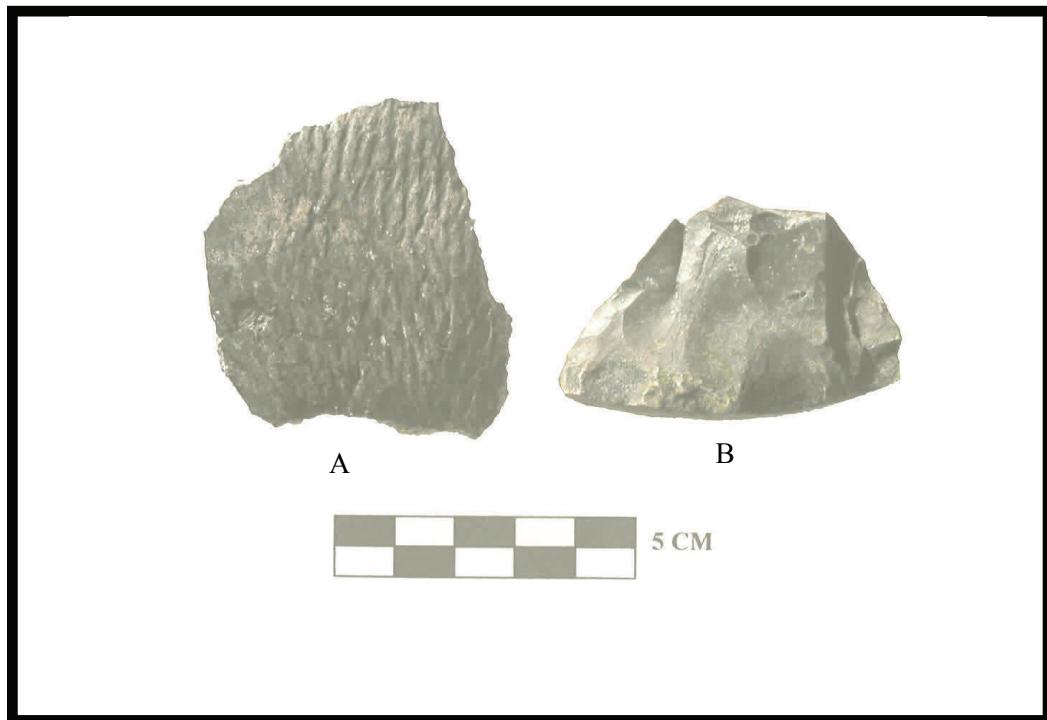


Figure 43: Ceramic sherd and core from 20SA1291.

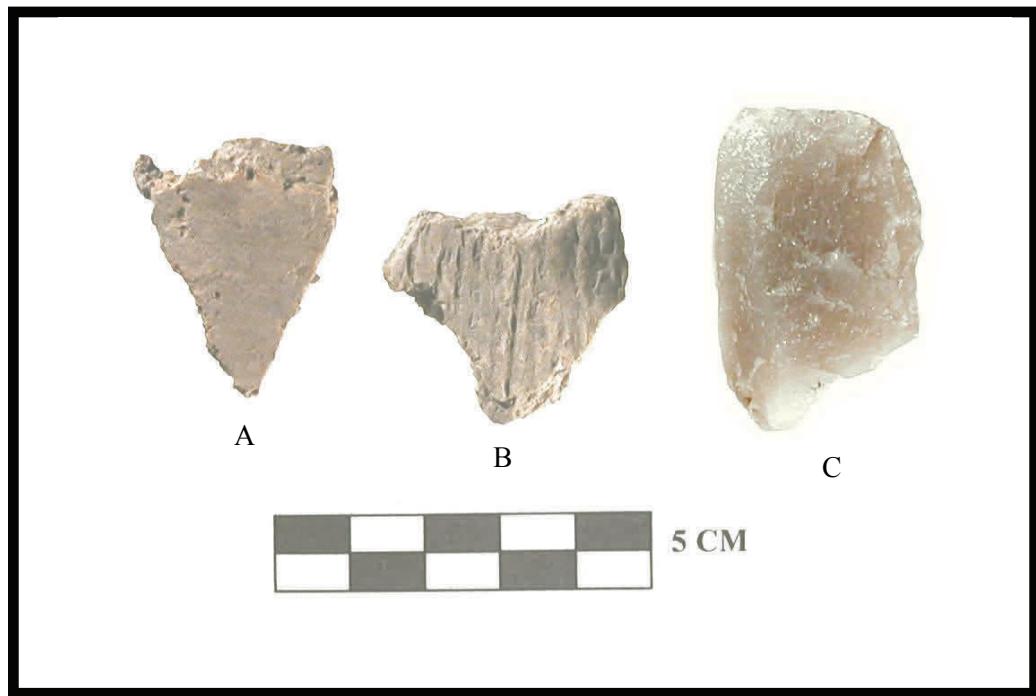


Figure 44: Ceramic sherds and bipolar core from 20SA1301.

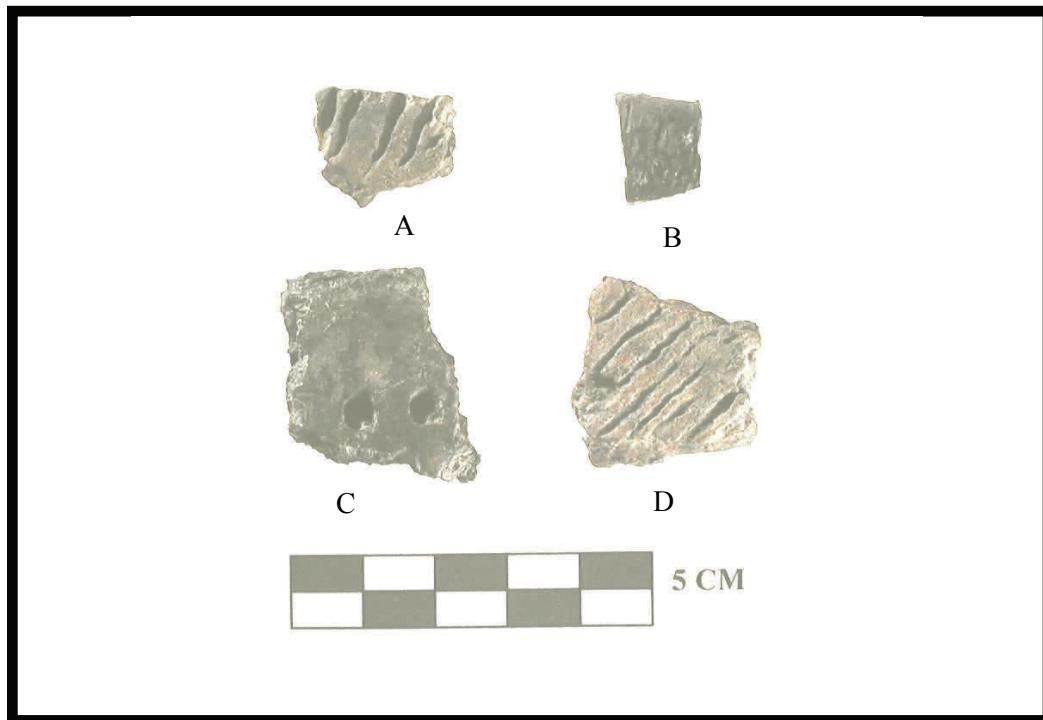


Figure 45: Ceramic sherds from 20SA1302.

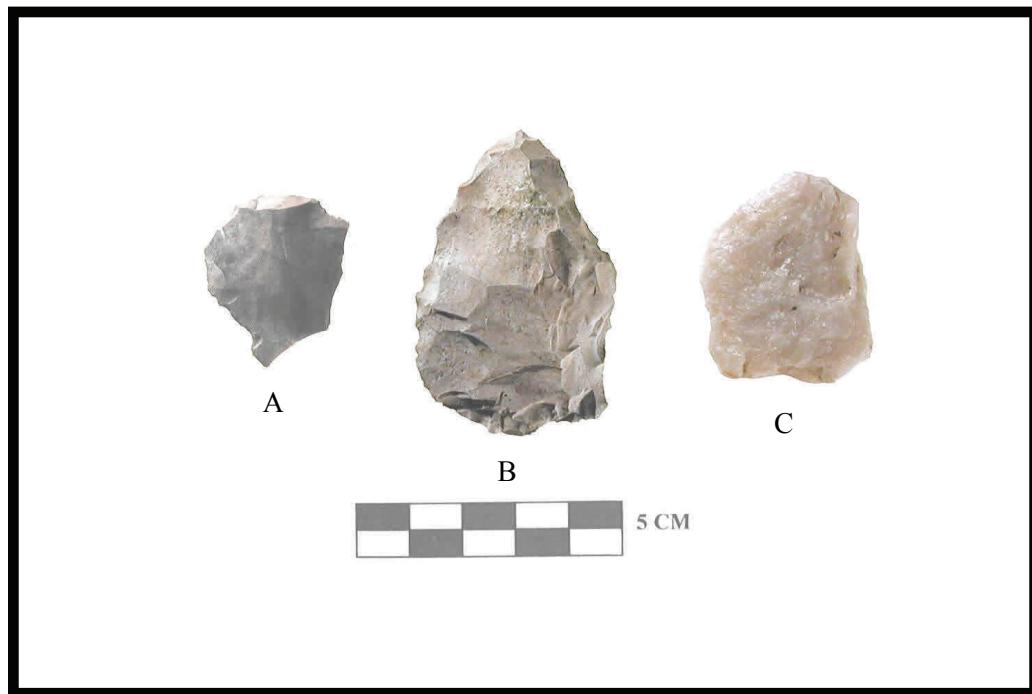


Figure 46: Retouched flake, biface, and bipolar core from 20SA1303.



Figure 47: Slate pendant and ceramic rimsherds from 20SA1303.

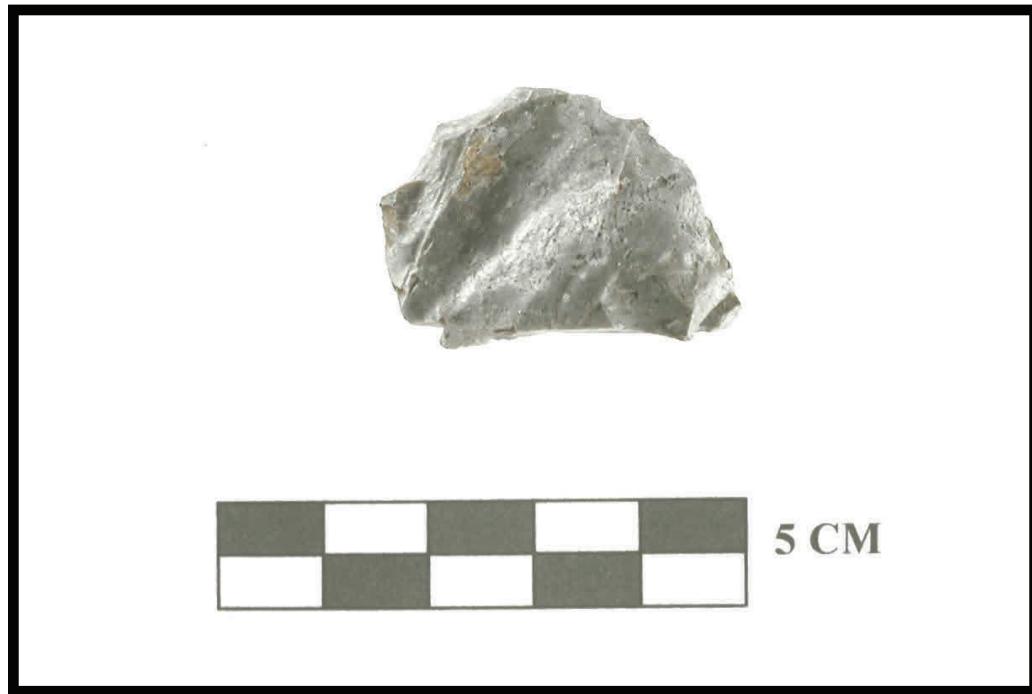


Figure 48: Retouched flake from 20SA1307.