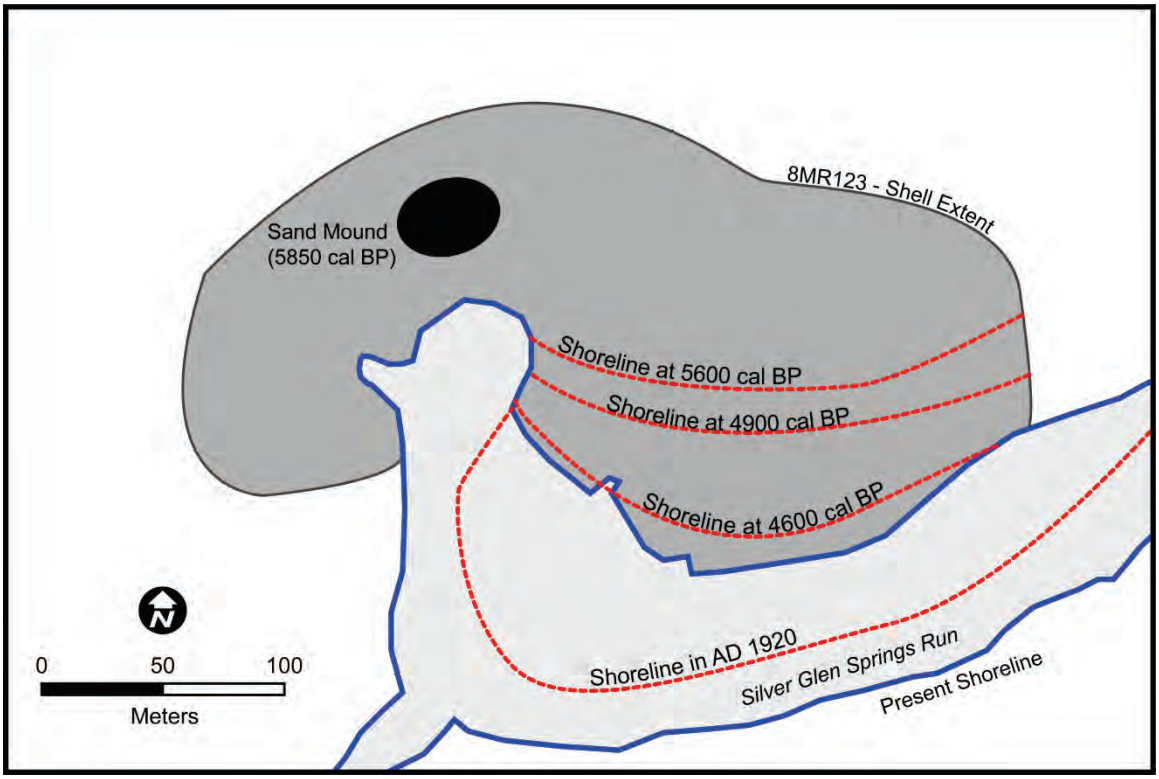
CULTURAL RESOURCE ASSESSMENT SURVEY OF SILVER GLEN SPRINGS RECREATIONAL AREA IN THE OCALA NATIONAL FOREST, FLORIDA



Asa R. Randall, Meggan E. Blessing, and Jon C. Endonino

Technical Report 13
Laboratory of Southeastern Archaeology
Department of Anthropology
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USFS Acc# LKGF00434

September 2011

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Cover illustration showing the projected extent and chronology of shell deposition within 8MR123, the Silver Glen Springs site.

MANAGEMENT SUMMARY

The University of Florida (UF) Laboratory of Southeastern Archaeology (LSA) conducted a cultural resource assessment of the Silver Glen Springs (SGS) Recreational Area in the Ocala National Forest under a Participating Agreement with the United States Forest Service (UFSF), Accession No. LKGF00434. This work was conducted in advance of planned improvements to the recreational area associated with the SGS Watershed Restoration Project. The USFS identified several areas of potential effect (APEs) that spanned the SGS pool margin and run, in addition to the upland terrace. These APEs intersect the known boundaries of 8MR123, the Silver Glen Springs site, which was one of several large shell mounds within the watershed that were severely impacted by shell mining in the early 20th century.

The LSA used a multifaceted strategy to document the extent, character, and disposition of cultural resources within the APEs. Methods included close-interval shovel testing (n = 232), bucket augering adjacent to the spring pool (n = 55), stratigraphic testing (n = 6 test units), and pedestrian survey. Bulk samples for zooarchaeological analysis were retrieved from a stratigraphic column, select bucket augers, and feature fill. Eight carbon samples were submitted for AMS age determination.

Despite extensive mining, portions of the "amphitheater" of shell observed by Jeffries Wyman in 1872 surrounding the spring pool remain intact today. These deposits are varied, but include portions of a Thornhill Lake phase mortuary mound, dense terrestrial shell-bearing lenses, and organic-rich subaqueous shell midden in excess of 2-m thick. REDACTED Based on radiocarbon assays, shell deposition may have occurred as early as 6800 cal BP, but began in earnest ca. 5600 years ago at the onset of the Thornhill Lake phase. Continued terrestrial and spring-side shell deposition during the Orange period (through at least 4000 cal BP) resulted in the progradation of the shell mound 60 m into the spring run. The zooarchaeological assemblage is dominated by aquatic vertebrate and invertebrates, and is comparable to Archaic collection strategies documented elsewhere along the St. Johns. The evidence for post-Archaic shell deposition was limited to isolated deposits on the western edge of spring pool.

Testing along the upland terrace identified intact, well-stratified, and mostly shell-free components dating to the Paleoindian/Early Archaic, Mount Taylor, Orange, and St. Johns periods. The evidence for Paleoindian/Early Archaic habitation was limited to unifaces and heavily patinated waste flakes. The Mount Taylor period is well-represented by a diverse lithic assemblage composed of stemmed hafted bifaces, modified flakes, microliths, and waste flakes. Spatial analysis indicates that several activity areas may be present. The Orange period occupation is evidenced by fiber-tempered Orange Plain and Incised sherds. Spatial analysis suggests that the Orange habitation area was arranged in an arc or semi-circle around a ca. 70-m wide plaza.

Subsurface architecture is also likely present, based on the distribution of small shell pits. In addition, at least one large Orange period shell-filled pit was documented. Such pits have been found in great numbers south of the spring. St. Johns I and II components were concentrated northwest of the spring pool. The LSA also documented a mined shell ridge (8LA4242), likely dating to the Archaic, situated east of 8MR123. The site contains an intact tram road constructed during the mining process, likely in the early 1920s.

This investigation demonstrates the research potential of sites that have been severely impacted by shell-mining. In spite of ground disturbing activities, significant cultural resources remain within the SGS recreational area today. The LSA identified zones of disturbance based on the integrity of cultural deposits within the survey area. These zones form the basis for our recommendations for future construction activities within the project area.

ACKNOWLEDGMENTS

This project was a true collaboration that was enabled by the hard work and support of many individuals and institutions. Our many thanks go to USFS Heritage Program Manager Rhonda Kimbrough, without whose invitation and constant guidance this project would never had been possible. On the University of Florida end, Ken Sassaman formulated the research design and thereafter facilitated the project with technical advice, editing and critique of rough drafts, and administrative support. Throughout the fieldwork and report preparation process, USFS archaeologist Ray Willis freely imparted his knowledge of Ocala National Forest cultural resources and was always ready to lend a helping hand. We also thank District Ranger Mike Herrin for his continued support throughout the project.

The fieldwork was accomplished only through the help of dedicated professionals and undergraduates. Jason O'Donoughue was a true partner throughout the initial phase of the survey. Later fieldwork went smoothly with the expert help of Micah Mones, Mark Donop, Clete Rooney, and Jon Endonino. The summer of 2010 will be remembered as one of the hottest in Florida, and I cannot thank enough the University of Florida St. Johns Archaeological Field School students who mastered shovel testing amidst the heat, including Andrea Bartnick, Jessica Bartnick, Katie Cook, Cody Davis, Kevin Gaduski, Erin Harris-Parks, Summer Jupin, Clayon Melhado, John Moran, Matthew Newton, Allison Nick, Lori O'Neal, Lisa Wright, and Edward Zegarra. Steve Cromer and Jerry Boyer of the USFS provided engineering assistance throughout the project. Jerry Boyer also graciously provided us with Henderson family photographs of the main spring and recreational area from the 1920s through 1950s. Pat Tooley helped us immeasurably as a liaison between the USFS and the park concessionaire. Back in the laboratory, Meggan Blessing analyzed and organized the bulk samples, and Jon Endonino categorized seemingly innumerable flakes. Andrea and Jessica Bartnick quietly and efficiently performed the initial sample processing, and were helped by Anna Binder, Katie Cook, and Summer Jupin.

Administrative support was provided by the Department of Anthropology, University of Florida. In particular, we are thankful for the efforts of Office Manager Karen Jones and extend thanks to Chair Allan Burns. Financial assistance for this project was provided by the Hyatt and Cici Brown Endowment for Florida Archaeology. Our many thanks also go to the Juniper Club, who have graciously opened up their treasured lodge to us over many field seasons.

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CHAPTER 1
INTRODUCTION

Asa R. Randall

In the summer of 2010, the Laboratory of Southeastern Archaeology (LSA), Department of Anthropology, University of Florida entered into a Participating Agreement with the United States Forest Service (UFSF) to provide a cultural resource assessment in conjunction with the Silver Glen Springs Watershed Restoration Project. This project was executed as USFS Accession No. LKGF00434. The Silver Glen Springs (SGS) watershed, managed as part of the Ocala National Forest, attracted human settlement over a period spanning at least 10,000 years. Unfortunately, the spring and its surrounding environs have been severely altered by 20th-century land-use practices. Mining and dredgework removed large portions of a massive shell mound complex observed in the 19th century, designated site 8MR123. Land clearing and road construction in the upland portion of the tract has potentially exposed or reworked cultural deposits as well. Contemporary use of the run and upland for recreation continue to negatively affect remaining cultural and natural resources. Despite these impacts, significant cultural resources are known or suspected across much of the watershed (Figure 1-1). The present study was conducted in anticipation of improvements to existing facilities within the SGS recreational area by the USFS. Since 2007, the LSA and affiliated University of Florida St. Johns Archaeological Field School have performed extensive reconnaissance and stratigraphic testing on the south side of the watershed. The LSA's research experience and the management goals of the USFS provided a unique opportunity for mutually beneficial collaboration. In particular, this partnership was dedicated to identifying and protecting cultural resources, restoring the watershed, improving aquatic habitat, and enhancing public education at Silver Glen Springs.

This report presents the methods and results of fieldwork and laboratory research conducted between July, 2010 and June, 2011. In brief, the LSA employed a multi-faceted testing strategy that involved close-interval shovel testing, bucket augering, stratigraphic testing, and pedestrian survey. This research documented well preserved, and stratified deposits across the project area. In anticipation of discussing these results at length, a brief summary is in order. At low elevations, near the spring, shell-bearing deposits dating to the Mount Taylor and Orange period remain intact despite extensive shell mining. These include terrestrial and well preserved subaqueous components, much like those documented at Salt Springs (O'Donoughue et al. 2011). REDACTED

Mostly shell-free Archaic components were identified north of the spring, while Archaic and later Woodland occupation was documented to the northwest. Limited, but persistent, evidence for Paleoindian or Early Archaic occupation was also found. During the course of excavations we also secured eight radiocarbon assays (Appendix C) and zooarchaeological analysis from a variety of shell and shell-free deposits. The following sections of this chapter provide an overview of the present investigations of the SGS watershed, including the priorities of the USFS regarding watershed restoration and cultural resources and the research orientation of the LSA's work.

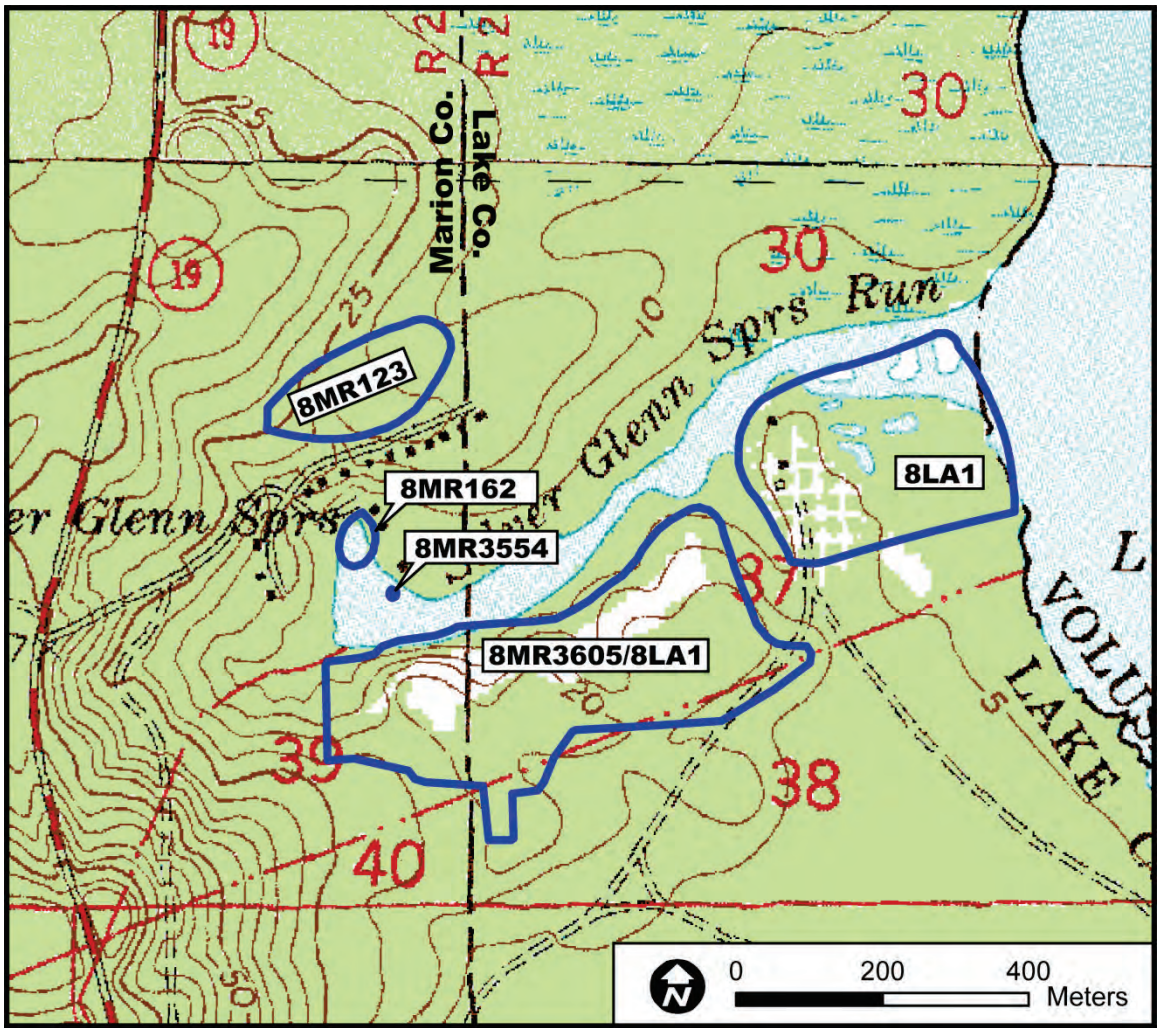

Figure 1-1. Subsection of the Juniper Springs (1994) USGS Quad showing the known location of archaeological resources within the Silver Glen Springs Watershed prior to the current assessment (boundaries for 8MR123 derived from Florida Master Site File data).

BACKGROUND OF INVESTIGATIONS

The SGS recreational area encompasses the northern half of the SGS watershed, a unique landscape characterized by stunning natural beauty, critical habitats, significant cultural resources, and intensive use by eager visitors (Figure 1-1). The anchor point, and great attractor, of this landscape is the first magnitude Silver Glen Springs. The bulk of the surface water is derived from two deep vents at the western aspect of the watershed (Figure 1-2). Water also emerges from several seep springs along the run, including the "sand boils" made famous in *The Yearling* by Marjorie Kinnan Rawlins (1938). The water courses one kilometer through a channel of variable width before it debouches into Lake George, Florida's second largest body of water and an expanded segment of the St. Johns river. The run and spring pool are host to densely packed and diverse aquatic-

Figure 1-2. Main pool at Silver Glen Springs, facing west. Photograph taken in January, 2011.

and terrestrial species (Pandion Systems 2003). The run is bordered by dense, established wetlands composed of cypress and hardwood species. The upland portion of the SGS transitions from mesic to xeric forests as one travels away from the run.

Prior to this survey, cultural resources had been documented across much of the SGS (Figure 1-1). During the 19th century, the spring was surrounded by a large shell mound, and was referred to as an "amphitheater" by Jeffries Wyman (1875: 39). The remnants of this mound and shell-free upland components are designated site 8MR123, the Silver Glen Springs site, in the Florida Master Site File (FMSF). Although severely reduced by mining operations, excavations by Florida State University (FSU) in 1990 determined that intact shell-bearing deposits dating to the Mount Taylor period are present near the spring pool (Marrinan et al. 1990). Artifacts diagnostic of cultural periods spanning the Paleoindian through St. Johns periods have also been recovered from this portion of the SGS. Two site numbers have also been given to cultural resources within the spring and run. Site 8MR162, D. B.'s Cave, encompasses the main vent, where worked animal bone and chipped stone were noted in a sediment-free lateral cavern. Farther down the run is 8MR3554. This site number was given to a possible dugout canoe preserved in the channel bed. As recently summarized by the LSA, the south side of the run is characterized by an almost unbroken distribution of cultural resources (Sassaman et al. 2011a). These are subsumed in the FMSF as sites 8LA1 and

8MR3602. Both shell bearing and shell-free components are present along this portion of the run and are associated with Early Archaic through St. Johns II occupation. This landform contained at least two large shell mounds, a sand burial mound, and one or more well preserved habitation loci. In sum, the SGS contains evidence for occupation spanning at least 10,000 years and representing most of the known cultural periods in northeast Florida. Moreover, the watershed contains remnants of some of the largest and most intensively occupied shell mounds along the St. Johns.

The complexity of pre-Columbian habitation of the SGS is mirrored in contemporary land-use practices and ownership. The SGS falls under the jurisdiction or management of numerous entities. The northern half of the run, including the spring and upland tract of the recreational area, is managed by the USFS. The recreational area provides a terrestrial access point for day-use visitors interested in picnics, swimming in the spring, and hiking along developed trails. It is partially developed, with parking areas, a concession, portable toilets, and picnic tables and grills. The current configuration of the recreational area is in part a product of private ownership of the area prior to 1990. In addition to development as a camp ground, including the construction of cabins and other facilities, previous owners were responsible for removing shell and dredging portions of the spring run. The SGS also straddles two Florida counties (Marion and Lake), and borders Volusia county to the east. The surface water component is under the jurisdiction of the Florida Department of Environmental Protection and the St. Johns River Water Management District. The watershed is a popular destination for boaters. Although boats cannot enter the spring pool, they have mostly unfettered access to the run (Figure 1-3). Impact from boating is varied, but includes scarred or denuded channel beds, displaced sediment from anchoring, decreased water quality, and an increase of visitors to the recreational area (Pandion Systems 2003). Finally, the south side of the run and associated islands within the channels are owned by the non-profit Juniper Club of Louisville, Kentucky. Today the Juniper Club is oriented towards

Figure 1-3. Boats anchored along the shoreline of the Silver Glen Springs south of the buoy line and spring pool, facing southwest. Photograph taken from the recreational area in April, 2011.

conservation of their resources. In the early 20th century, however, they were responsible for mining and dredgework within the confines of their property and along the run.

As can be expected in such a complicated arrangement, there are a number of competing interests regarding the management and use of the SGS watershed. Foremost among these concerns is finding an ideal balance between public access and conservation of key natural and cultural resources. In order to mitigate the long-term effects of these land-use practices, and prevent future degradation from overuse, the USFS has initiated planning for restoration of the watershed. In particular, they have identified impacts to extant resources ranging from poorly designed facilities to the management of public access. The restoration project could potentially involve the demolishment of extant facilities, installation of new buildings and infrastructure, road repaving or decommissioning, and trail cutting and refurbishment. Each of these activities could impact significant cultural resources.

In order to facilitate the planning process, and limit the effect on cultural resources, the USFS entered into the cooperative agreement with the LSA to provide a cultural resource assessment of areas of potential effect. The initial boundaries of the restoration project were defined as a tract surrounding the spring pool and parking lot, and corridors encompassing the entrance road and utilities lines (Figure 1-4). During the course of executing the cooperative agreement, however, the project area was expanded to include areas to the east, fronting the spring pool and run (Figure 1-4). The USFS identified five priorities for cultural resource assessment based on the goals of the restoration project:

(1) Gridded archaeological testing in an area about 100 x 195 m, bounded on the south and east by the asphalt road where parking, a concession stand, and bathrooms/septic may be placed to manage public access and use to reduce impacts to cultural and natural resources within the watershed.

(2) Archaeological testing at regular intervals along a 300-m long linear route looping east from the existing parking lot through the hickory hammock, south to the floodplain, then back east to the swim area of the spring. The data acquired will be used to reduce impacts to exposed and subsurface cultural resources associated with rerouting foot traffic to and from the swim area.

(3) Gridded archaeological testing in a 75 x 75-m tract around the entrance/fee station on the entrance road to identify an area that will avoid impacts to sensitive resources and facilitate public access management.

(4) Identify and record cultural resources damaged by erosion along the shoreline and mining escarpment of site 8MR123. Data generated will provide the foundation for recommendations regarding shoreline stabilization to protect cultural resources.

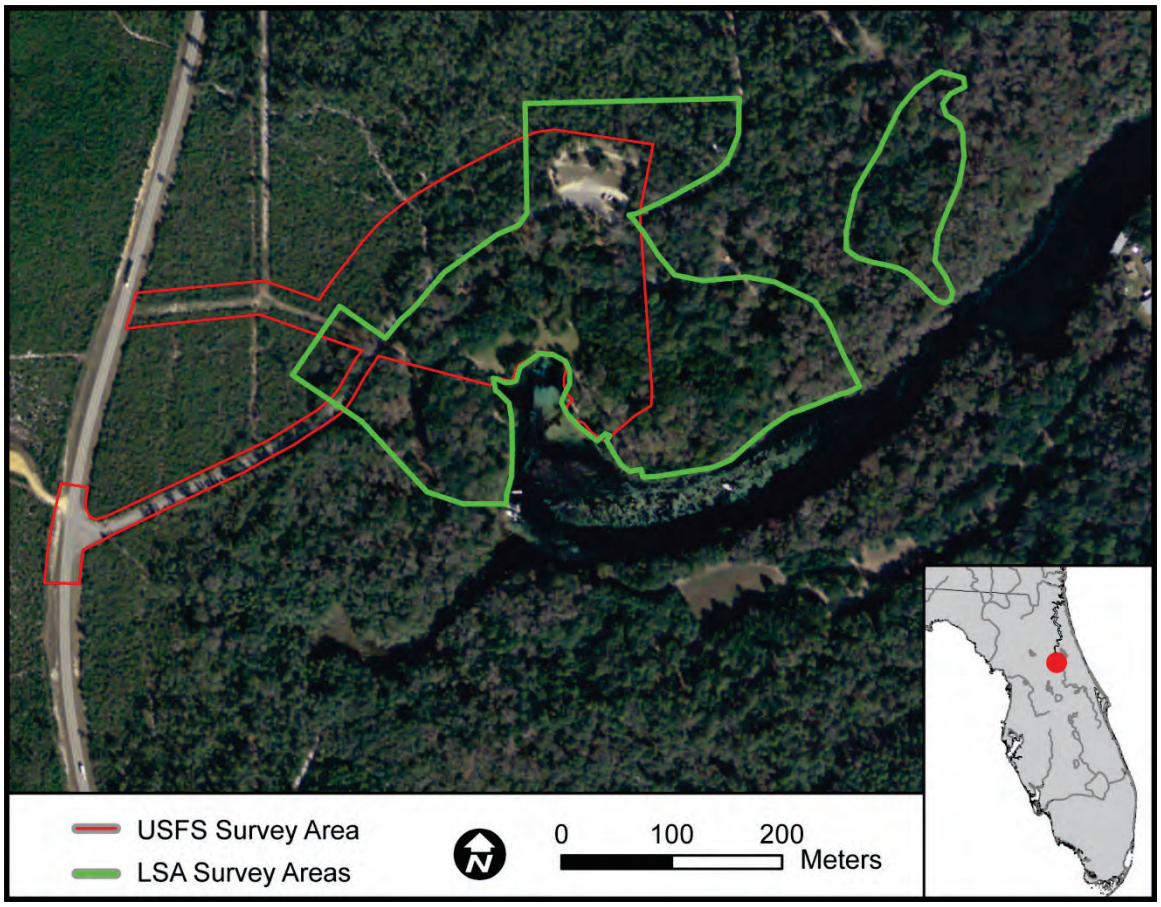

Figure 1-4. Location of USFS (2010) and LSA (2010–2011) survey areas at the Silver Glen Springs Recreational Area.

(5) Testing of additional areas such as along the entrance road, utility corridors or other easements, and fronting the spring run that may be necessary for providing infrastructure designed in a manner to reduce impacts to the watershed. This could support road decommissioning or trail refurbishment and construction.

Ultimately, the primary concern for archaeological testing was the acquisition of data regarding the character, extent, and integrity of cultural resources within areas of potential effect. These data can be used to address a variety of issues relevant to the watershed restoration process. Of immediate concern is the establishment of cultural resource management recommendations (Chapter 7), which will help guide planning and execution of restoration efforts within the watershed. A related concern, however, was that the resultant data will be used to educate visitors about dynamic cultural use of natural resources within the watershed through time. These data and their anthropological significance provide a context for interpreting contemporary land use. The messages of long-term occupation of the area can encourage responsible behavior to sustain watershed values for future generations.

RESEARCH ORIENTATION

The cultural resource assessment needs of the USFS articulate directly with the objectives of the University of Florida's LSA. The mission of the LSA is to provide research and educational opportunities that generate significant knowledge about the past in an ethical and professionally responsible manner. The bottom line is that all archaeological research conducted by the LSA is problem-oriented and guided by principles of stewardship so as to limit impact to cultural resources. By following these tenets, it is the goal of LSA investigations to acquire data in the field and laboratory that can inform resource protection, provide contexts for interpreting past social processes, and promote awareness of and appreciation for the diverse human experiences materialized in the archaeological record.

Since 2000, the LSA has conducted research into the histories of shell mound dwelling communities of the middle St. Johns river valley. On the basis of these projects, regional research, and the known characteristics of cultural resources within the project area, we have identified several research problems that relate to the scope and character of the SGS watershed restoration project:

(1) Determine the onset of shellfish collection and deposition, and its relationship to emergent aquatic resources of the SGS watershed. The exploitation of shellfish is a visible change in the practices of ancient communities within the region. Shellfish collection began in some, but importantly not all, portions of the St. Johns basin some 7300 years ago. The recent investigations at Salt Springs (8MR2322) (O'Donoughue et al. 2011), for example, identified shell-free deposition as late as 6400 years ago. Throughout the basin, age determinations point to a variegated history of exploitation practices that may be tied in part to the development of hydrologic regimes suitable for human habitation or resource exploitation. Situated on a first magnitude spring and adjacent to massive lake, the SGS watershed is an ideal locale to examine the dynamics of fluctuating water levels, development and transformation of aquatic regimes, and concomitant social processes. Indeed, a corollary concern is determining when habitation of the watershed began, regardless of the deposition of shellfish. Determining the extent to which 8MR123 was a suitable or preferred location for shellfishing can be addressed through radiocarbon determinations, consideration of the interface between terrestrial and shoreline deposition, and characterization of deposit composition.

(2) Characterize changes in the composition and condition of food remains and related technologies. A central concern of contemporary research into lifeways along the St. Johns is understanding the interplay between social and subsistence intensification. Beginning some 6000 years ago, inhabitants of the St. Johns routinely engaged in exchange relationships with communities farther afield, and likely staged large-scale gatherings involving the deposition of large quantities of shellfish and at times the interment of the dead. The question remains, how did past communities exploit and mobilize resources to meet the needs of daily living and large-scale gatherings? This issue can be addressed through a careful consideration of subsistence remains, the

provenance and technological characteristics of artifact assemblages, and depositional contexts.

(3) Locate and characterize non-subsistence deposition in relict shell deposits. One long held assumption of past archaeological research in the St. Johns is that shell mounds are simply garbage heaps. Analyses of the depositional histories of shell-bearing sites throughout the region, however, indicate that shellfish remains and earth were routinely used to terraform natural landscapes and modify extant surface deposits (Endonino 2010; Randall 2010). These practices range from mundane (community architecture) to ritual (mortuary mounds and ceremonial platforms), and their identification can lead to important insights into the structure and cosmology of ancient communities.

(4) Determine if upland portions of the landscape were used for habitation purposes. Since the 19th century, shell mounds have been the primary object of regional research, due in no small part to their visibility and potential for organic preservation. This focus has been at the expense of documenting non-shell bearing components associated with mounds. The recent recognition that some shell mounds were not places of everyday living has brought this lacuna into sharp relief. The few large-scale projects that have examined such components, particularly at the Lake Monroe Outlet Midden (8VO53), have documented diverse assemblages indicative of intensive habitation that are not necessarily replicated in shell deposits (Archaeological Consultants and Janus Research 2001). Reconnaissance of the upland portion will help fill in this extensive gap in our knowledge of past practices.

(5) Characterize the location, depth, and composition of intact archaeological deposits across portions of site 8MR123 that were mined for shell and/or subject to ongoing erosion. The destructive actions of shell miners in the 19th and 20th centuries seriously compromised the vast majority of known shell mounds along the St. Johns. Although some mounds were likely eradicated, intact remnants are routinely encountered at sites throughout the region. The assumption that vestigial traces of mounds retain little scientific value, and by extension lack significance, is a serious threat to their long-term preservation. That is, the best way to protect these resources is through documentation. Investigations throughout the shell-bearing portions of site 8MR123 can provide a baseline for managing these resources as well as provide a basis for extrapolating their original configuration.

(6) Educate student field and laboratory assistants in archaeological best practices. A portion of this research was conducted with the help of undergraduate students attending the University of Florida St. Johns Archaeological Field School at the Juniper Club. The SGS watershed restoration project provides a unique opportunity to expose students to the methods, ethics, and concerns inherent in a cultural resource assessment.

These research goals provided a framework for the testing and sampling strategies employed throughout this project.

REPORT OUTLINE

The remainder of this report is divided into six chapters. Chapter 2 places the SGS within the context of environmental and social changes from the Late Pleistocene and throughout the Holocene. Also provided here is a brief history of research into the archaeology of the SGS watershed, highlighting pre- and peri-mining observations made during the late 19th and early 20th centuries. Chapter 3 presents the methods and results of reconnaissance survey conducted across the landform, while the details of stratigraphic testing are provided in Chapter 4. Particular attention is paid to delineating and characterizing intact and significant cultural resources across the landform. Successive chapters detail the artifact (5) and zooarchaeological (6) assemblages recovered during our investigations. The report concludes with a summary of the results and management recommendations.

CHAPTER 2
THE SILVER GLEN SPRINGS WATERSHED IN CONTEXT

Asa R. Randall

This chapter situates the Silver Glen Springs (SGS) watershed in its environmental and culture historical contexts. The environment is considered first, focusing in particular on physiography and hydrology. The archaeological contexts are then reviewed. In both cases a regional overview is provided, followed by locality-specific discussions.

ENVIRONMENTAL CONTEXT

The SGS watershed is situated at the intersection of Marion, Lake, and Volusia counties, approximately 15 km north of Astor, Florida. The watershed is defined by the first magnitude Silver Glen Springs that issues forth along a 1 km long run into Lake George (Figure 2-1). This lake is the second largest body of water in Florida. In addition to SGS it directly receives water input from the St. Johns river, Juniper Springs and Sweetwater Springs to the south, and Salt Springs to the north. The current configuration of these hydrological features and the greater St. Johns basin resulted from of a long history of fluctuating sea level and attendant progradations and regressions of surface waters, localized faulting and solution of carbonate sediments, as well as more recent factors such as channel dredging for navigation. A number of syntheses and cogent discussions of the geology and geomorphology of Florida have been published (Randazzo and Jones 1997; White 1970). Those aspects relevant to the SGS watershed are discussed here.

Regional physiography

Like all of Peninsular Florida, the regional physiography of the St. Johns River Valley ultimately owes its current configuration to marine processes (Schmidt 1997). Currently, the dry land of Peninsular Florida occupies approximately one-half of the Florida Platform. Extending out into the Gulf of Mexico and Atlantic, the Platform is characterized by low relief, and is composed of Cenozoic carbonate sedimentary lithologies that lie unconformably upon a Paleozoic and metamorphic basement.

The Florida Platform has been alternatively inundated by shallow seas and exposed as dry land during much of the Cenozoic epoch. The low elevation of the Platform (a maximum of 104 meters in the Panhandle) has made it particularly susceptible to relatively small changes in sea level. Sea level fluctuation has resulted in frequent progression and regression of marine, estuarine, and near shore environments. This process has left the Florida coastal zone dominated by positive features including elevated relict upland ridges, barrier beaches, and sand dunes, and negative features representative of shallow seafloors (Schmidt 1997). Terraces that reflect long-term sea level stands have been identified. In the study area these include the Silver Bluff and Palmlico Terraces (0-8 m amsl) and Penholoway and Talbot Terraces (8-21 m amsl).

Figure 2-1. Location of springs contributing to Lake George (USGS Daytona Beach 100k quadrangle)

Additionally, the carbonate composition of many of Florida's sedimentary deposits has been equally influential. Carbonate lithologies are particularly susceptible to dissolution, which results in karst topography and hydrogeology. Typical features of karst topography are sinkholes, sinking rivers, disappearing lakes, and springs.

Geomorphologists recognize a number of physiographic regions defined by topography, surficial geology, and hydrology (Cooke 1939; Schmidt 1997; White 1970). The St. Johns River is located in the Atlantic Coastal Lowlands, a zone typified by coast-parallel features. Most positive features in this region are relict beaches and marine terraces formed during the Late Pleistocene and Holocene, and are composed of siliclastic marine sediments. The headwaters and mouth of the river are situated within the Eastern Valley, while the middle St. Johns occupies a position west of the Crescent City-Deland Ridge. The Crescent City-Deland Ridge is the only karst-dominated topography in the region, and is a major source of groundwater via the Floridan Aquifer.

Groundwater and channeled water hydrology of the St. Johns is linked to precipitation and geology. Ultimately, all of Florida's freshwater is derived from precipitation (Miller 1997). Although much precipitation is lost due to evapotranspiration and runoff, a significant portion is returned for the recharge of aquifers. Water levels for most of Florida's streams and lakes are directly related to the aquifer levels. Florida has five principle aquifers, only two of which have output in the middle St. Johns. In general, the study area is typified by an undifferentiated surficial aquifer. Water is typically unconfined in Pleistocene and Holocene sediments averaging 50 feet in thickness, and is present at or just below the ground surface. The Floridan Aquifer is the most extensive and productive of all of Florida's aquifers. It extends throughout the state, in addition to Georgia, Alabama, and South Carolina. Generally, the Floridan Aquifer is restricted to carbonate rocks of Tertiary Age, and remains confined well below the ground surface. The aquifer is unconfined or outcrops in regions where these carbonate rocks are thin or have been penetrated by sinkholes. In the study region, the Floridan Aquifer discharges via several first-order magnitude (greater than 100 cubic feet per second or more) springs, including Silver Spring, Silver Glen Springs, and Blue Spring.

As Miller (1998:28) notes, the dominant factor in the study region's landscape is water, which is concentrated along the St. Johns River drainage. The St. Johns river, which has its headwaters in southern Brevard County and discharges into the Atlantic at Jacksonville, is the largest river in Florida, measuring 500 km. It is also unique as it is one of few rivers in the northern hemisphere to flow from south to north. Although it is extensive and broad, the St. Johns discharges on average only 8,300 cubic feet per second. The discharge is related primarily to volume and less to velocity. This is due to a wide floodplain and a low gradient (0.02 m per kilometer) (Miller 1998:28). For most of its length, the St. Johns is within 2 m of mean sea level. The low gradient makes the river responsive to small changes in sea level, and even today the river is tidally influenced as far south as the Wekiva River.

The St. Johns River is composed of three distinct segments whose different characteristics relate to a complex geomorphic history (Adamus et al. 1997; Schmidt 1997; White 1970). Like many of the large river systems in Florida, the St. Johns River is situated in a swale between elevated, upland ridges. Although this configuration was once thought to have formed during late Pleistocene times as a drowned lagoon, it is now believed to have been formed in part within a beach-ridge plain (White 1970) during the early Pleistocene. With the exception of the lower St. Johns, the river is characterized by lakes arrayed in a linear fashion, oriented with the flow of the river. White (1970) suggests that these lakes are sinkholes which have been differentially filled with sediment and linked by channeled surface water.

The upper segment flows between southern Brevard County to Sanford, Florida. This segment is the headwaters, and is characterized by poorly integrated braided streams and extensive wetlands. The middle St. Johns, between Sanford and Lake George, is often referred to as the St. Johns Offset. In a headward-consequent course, the river would be expected to flow from the headwaters to Jacksonville in a relatively straight line following the late Pleistocene beach ridges of the Eastern Valley. However, at Sanford the St. Johns jogs to the west, flowing west of the Crescent City-Deland Ridge. North of Lake George, the river jogs back to the east. It is believed that this portion of the river formed during the early Pleistocene during a period of low sea level, when the offset portion of the river captured the headwaters south of Sanford. The river was eventually integrated when the basin was first inundated, creating an estuary. The drainage pattern of the middle St. Johns is dominated by an anastomosing pattern, characterized by numerous parallel channel segments. The floodplain is composed of freshwater marshes and swamps. The lower St. Johns is situated between the eastward jog north of Lake George to the mouth at Jacksonville. This course is parallel with Crescent Lake, a relict channel of the St. Johns abandoned when the middle St. Johns switched to its current location. This section of the river is essentially a drowned estuary, and is characterized by a broad channel, averaging over 1 km in width, and inshore marine habitats.

Late Pleistocene and Holocene Environmental Trends

The same processes that have affected the physiography and hydrology of Florida, namely fluctuating sea level and attendant shifts in climate and environmental regimes, have structured human settlement and their archaeological recognition in the study region. At the end of the Pleistocene sea levels were significantly lower than today (upwards of 40 m), resulting in the extension of inhabitable land over 200 km into the Gulf of Mexico and to a lesser extent the Atlantic (Faught 2004). Between roughly 12,000 and 10,000 years ago sea levels initially rose quickly, inundating large expanses of the Florida Platform and interior drainages. Although near-modern levels were gradually achieved by 6000 years ago (Faught 2004), sea level fluctuated throughout the middle and late Holocene. The increase in sea level and surface water resulted in the inundation of many early sites. Although inundated sites are routinely discovered in low-energy environments such as the Gulf of Mexico and interior sinks and drainages, many sites along the Atlantic Coast were likely destroyed or deeply buried by transgressing shorelines (Ste. Claire 1990).

The reduction of river gradients in response to sea level change resulted in the initial alluviation and subsequent surface stabilization of interior and coastal fluvial regimes, which in turn affected the flow and biotic characteristics of river channels and floodplains (Schulderein 1996). Peninsular Florida's arid late Pleistocene conditions, characterized by low surface water levels, gradually gave way to a wetter, modern regime ca. 7000 years ago (Watts et al. 1996). At 11,000 years ago oak scrub and prairies characterized peninsular Florida. Around 9500 years ago pine and swamp vegetation expanded from South Carolina throughout much of the Coastal Plain, becoming fully established by 5500 years ago in southern Florida (Watts et al. 1996: 37).

Although the broad characteristics of the middle St. Johns were in place well before humans entered the region, the late Pleistocene and Holocene history of the valley has important consequences for settlement and archaeological recognition. Today, the floodplain is dominated by multiple channels, oxbow cutoffs, lakes, and lagoons. These suggest a complicated history of channel switching, avulsion, and infilling. In part, this variation is related to the shallow gradient of the river and sea level. Based on the distribution of archaeological sites, this hydrologic regime dates to at least 7000 years ago when the elevation of the river rose to within a meter of present-day levels. However, there were likely significant shifts in the course of the river that would have had effects on the distribution of swamps and wetlands. The presence of archaeological sites hundreds of meters from the main channel, or outside of the range of productive shellfish beds, indicates changes have occurred (Wheeler et al. 2000). The picture is further complicated in shallow bodies of water, such as Lake George. Presumably, much of the lake bed was once exposed as land. Where the pre-inundation channel of the St. Johns was situated with respect to the SGS watershed is unknown. More data are necessary to understand the complexity of channel changes through time. Finally, while it is has long been assumed that springs along the St. Johns did not have established flow until well into the Holocene (Miller 1998), this hypothesis has yet to be tested across a wide range of locations. Indeed, recent investigations of Salt Springs indicate that water was flowing there as early as 9000 years ago (O'Donoughue et al. 2011). More recent changes in the flow characteristics of the river have been wrought during the last 200 years. In addition to the urbanization of the headwaters, the majority of the main channel of the St. Johns has been dredged. Historic documents indicate that the river was first dredged in portions as early as the 1880s, including Volusia Bar at the south end of Lake George (207th House of Representatives, Document no. 1111). During the last century, the river has been fully channelized.

Silver Glen Springs Watershed

The SGS watershed is hydrologically defined by the first magnitude (greater than 100 ft^3/sec discharge) Silver Glen Springs. Water issues out from a main vent in the center of the spring pool, as well as a secondary vent to the west (Figure 2-2). From here it travels ca. 1 km along a channel of variable width, where it debouches into Lake George. Today the spring pool is surrounded by low-lying topography associated with the recreational area. This surface configuration is no doubt a product of ancient shell

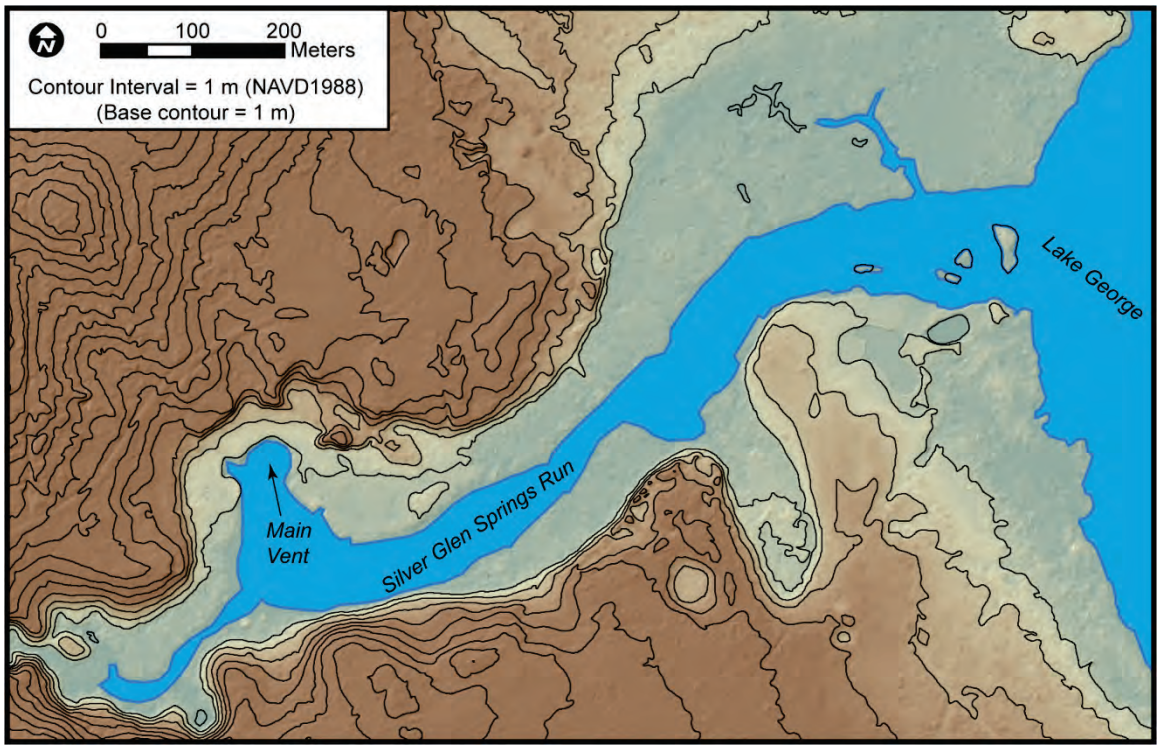

Figure 2-2. Topography of the Silver Glen Springs watershed (elevations derived from the Volusia County Department of Public Works LiDAR dataset)

deposition and recent shell removal (below). The spring run flows between elevated landforms on either side, with wetlands of varying width separating the channel from the shoreline. The upland slope is generally quite steep, and rises rapidly in absolute elevation from 1.0 to 4.0 m. Although this slope no doubt reflects the natural geomorphology of the basin, particularly to the west, it should be kept in mind that anthropogenic deposits are present on both the north and south of the run. Like the spring pool, much of the topography here is a consequence of ancient deposition.

A variety of soils are present within the SGS watershed (Figure 2-3). The following descriptions are derived from USDA-NRCS (2011) definitions and soil surveys of Lake (United States Department of Agriculture 1975) and Marion (United States Department of Agriculture 1979) counties. *Paola fine sand* (0 to 8 percent slopes and 8 to 17 percent slopes) is present in the western aspect of the recreational area. Subtypes of this soil vary by slope, and range from level sand hills to strongly sloping surfaces associated with sinks, ridges, and stream banks. This soil is excessively drained, and is associated with pine-scrub oak forest. The project area also contains *Pomello sand*, which is moderately well to somewhat poorly drained soil. Unmanaged vegetation is typified by scrub oak, dwarf live oak, sawpalmetto, and various pines. Outside of the project area to the northeast is poorly drained *Immokalee sand*, which is host to longleaf and slash pines and undergrowth of sawpalmetto, gallberry, waxmyrtle, and pineland threeawn. Much of the spring run is bordered by soils of the *Sellers* and *Pamlico* series.

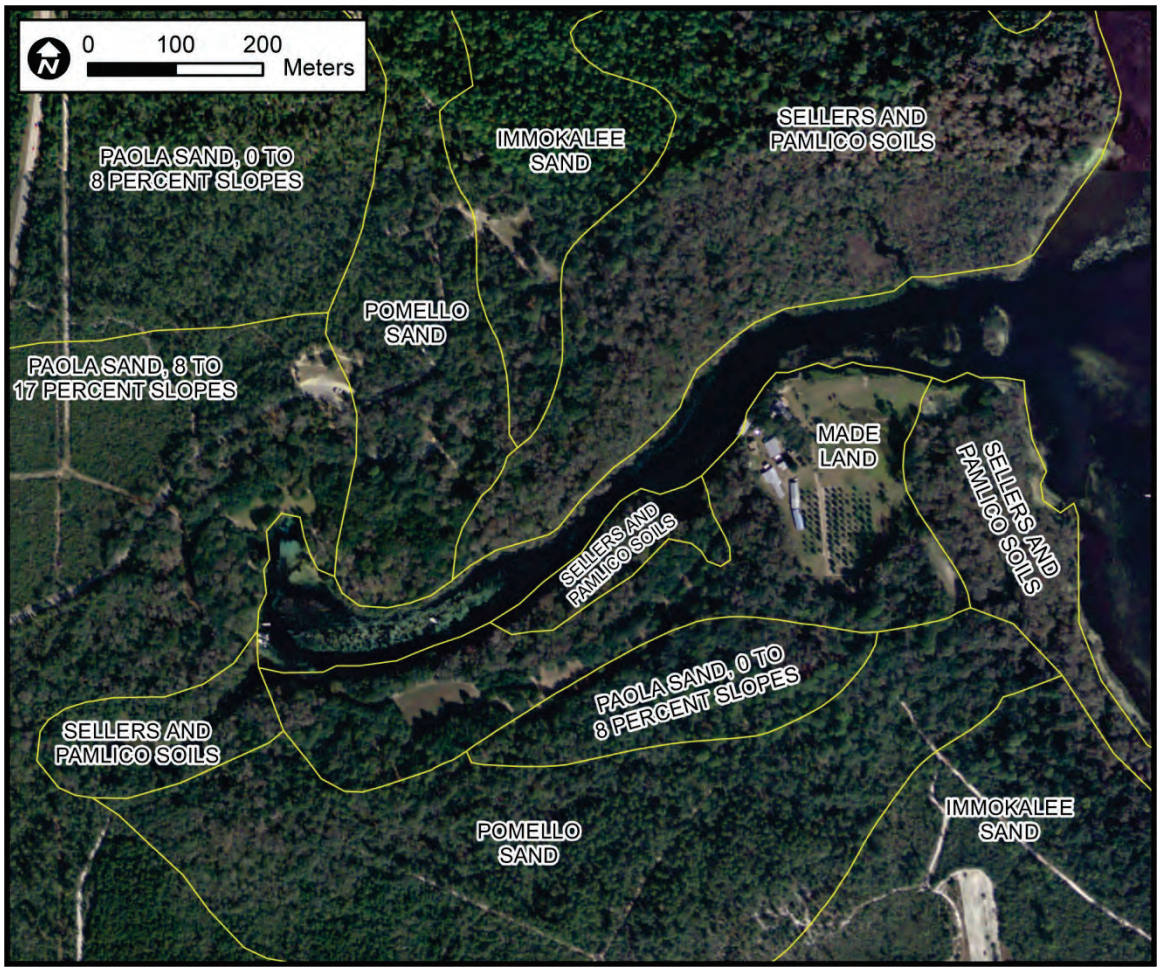

Figure 2-3. Soils present within the Silver Glen Springs watershed.

These poorly drained soils are typical of depressional areas, poorly defined drainage ways, and level floodplains. Native vegetation consists of pond pine, tupelo gum, sweetbay, bald cypress, gumtrees, cypress, greenbrier, wax myrtle bushes, with undergrowth of gallberry or pickerelweed and perennial grasses. The one exception on the southern half of the run is *Made Land*, a description that the USDA employs for locations which have been heavily impacted by cutting or filling. Indeed, much of this area was mined for shell in 1923, which no doubt resulted in the reworking of deposits across much of the terrace edge.

The forests comprising the margins and uplands of the SGS are host to a wide array of fauna. Those of economic importance to humans include white-tailed deer, black bear, raccoon, opossum, gopher tortoise, and turkey. Numerous species of birds, mammals, reptiles, amphibians, and gastropods also inhabit these zones. The wetlands associated with the SGS run and Lake George basin provide habitat for a diverse array of aquatic fauna. Vertebrates such as alligator, turtle, otter, and upwards of 40 species of fish are present. In addition, the wetlands away from the main pool and within Lake

George are potential habitat for numerous mollusks. Species of importance to the inhabitants of the SGS include the gastropods *Viviparus georgianus* (banded mystery snail) and *Pomacea paludosa* (Florida apple snail), as well as the freshwater bivalve (Unionidae). Smaller gastropods such as *Elimia sp.* (rasp Elimia), and the rams horn and mesa-rams horn (*Planorbella sp.*) can be found with these other species. Unfortunately, little detailed information on the habitat preferences, habit, and seasonal life histories of these species is currently available. It is unknown in what frequencies these invertebrate species normally co-occur. Moreover, few data exist on whether there is predictable variation in their seasonal or spatial availability. In general, all species prefer shallow near-shore environments, such as grassy marshes and shallow lagoons (Quitmyer 2001). *Viviparus* prefer soft, muddy substrates with slack water, such as lagoons, creek edges, lakes, and springs (Clench and Turner 1956). *Pomacea* is known to prefer marshes with emergent vegetation, typically with at least 50 cm of water (Darby et al. 2002).

Recent Landscape/Land Use Change (1923–Present)

Like much of the St. Johns basin, the SGS was radically transformed by mining and dredging operations. Much of what we know about the pre-modification arrangement of the SGS is derived from early explorers and archaeologists whose observations will be related in subsequent sections. Now is a good time, however, to outline changes that have occurred in the last century. Lake County probate documents record agreements regarding the sale of shell and permission to mine and dredge on both sides of the run. C. W. Perkins, later the Lake George Shell Corporation, was granted the right to mine shell on the south side of the run, including the mouth and portions to the southwest of there. He was also granted permission to mine shell on the north side, approximately half-way down the run. Furthermore, he was permitted to dredge the channel in order to facilitate loading shell onto barges. In 1932, the agreement for the south side of the run was amended. Perkins apparently had excavated shell bearing deposits well below the water level in numerous places along the run, in violation of the agreement. Similarly, the Juniper Club was faulted for removing shell for their own roads, and allowing Marion County workers to do the same. The Lake George Shell Corporation was given the right to mine remaining shell above the water level up to 500 feet from the spring run. We also know that beginning sometime in the early 1930s, Henry Henderson (then owner) began removing shell from around the spring, although it is unknown whether it was carted away or dredged (see below). He even constructed a house that overlooked the spring pool. Over the years, the northern side of the run has passed through several owners, who further developed the property. Many of these structures were recorded on the Juniper Springs USGS topographic quadrangle (Figure 1-1). When the recreational area was acquired by the USFS in 1990 the majority of this infrastructure was removed.

There are no known photographs of SGS prior to or during shell mining. However, aerial (Figure 2-4) and terrestrial (Figure 2-5, 2-6) photographs record the effects of mining shell and developing the land for recreational use. Aerial photographs captured by the USDA are available from 1941, 1958, and 1974, as is a recent image

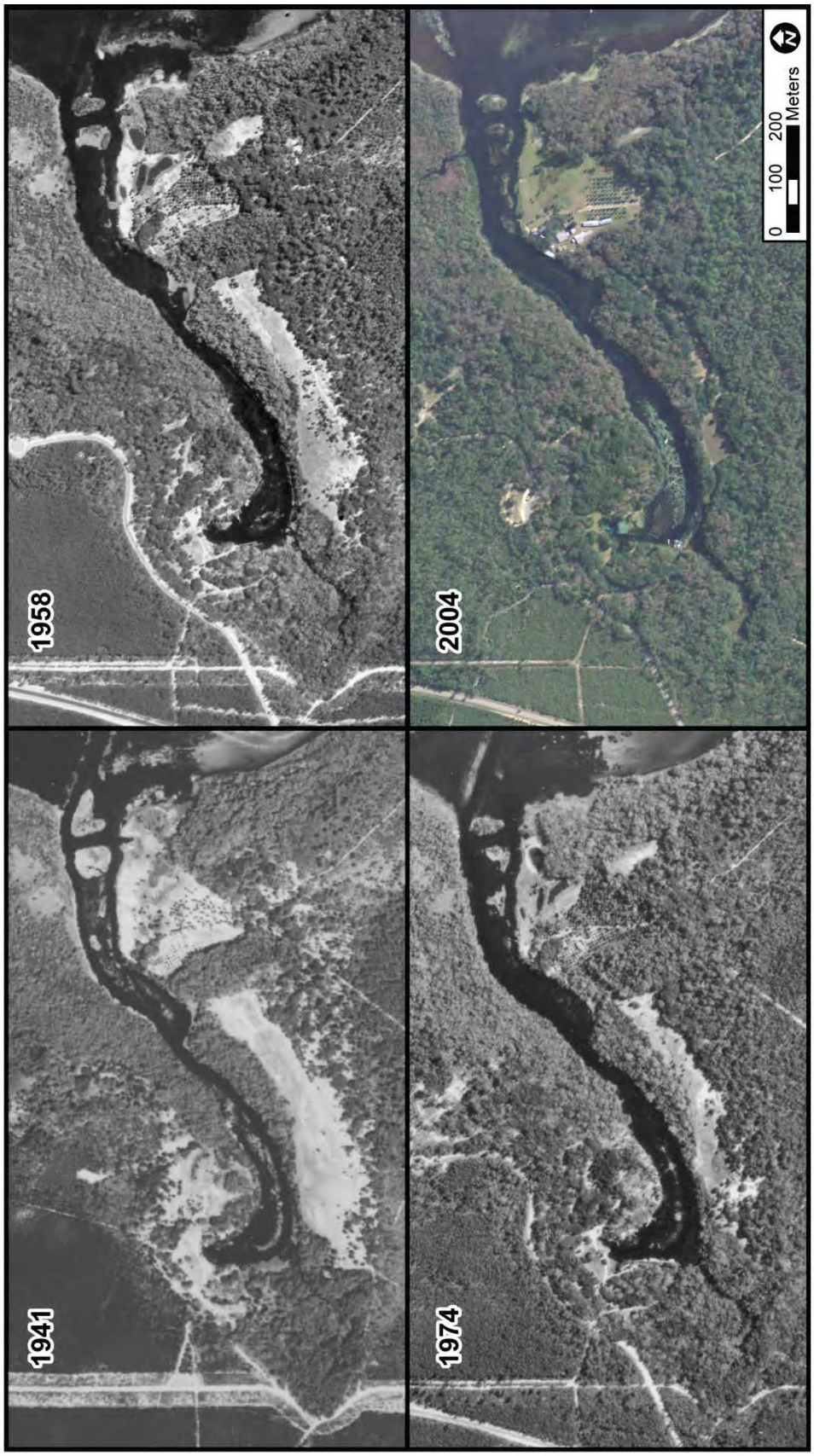

Figure 2-4. A comparison of aerial photographs of the Silver Glen Springs watershed, taken between 1941 and 2004.

from 2004. There are several patterns of note. In 1941, there are a number of areas that were cleared of vegetation, as evidenced by light colored patches. Importantly, this includes the tract around the spring pool and extending into the uplands, as well as the majority of southern border of the spring run. The southwest portion of the run is cleared back approximately 400 feet, consistent with the probate court documents. At the mouth of the run is the other southerly clearing. This is associated with the Juniper Club's lodge and other infrastructure. Across the SGS in successive years, vegetation filled in these cleared areas, leaving a patchy network of open spaces and immature forests. The other notable change is the location of trails and roadways in the vicinity of the recreational area. In 1941 there are several small trails and pathways from the entrance road down to the spring pool. By 1958, a wide entrance road, still in used today, with an apparent turn around loop to the west was installed, leaving small trails abandoned. No clear changes are evident in the 1974 aerial. Sometime between 1974 and 1990, when the park was still in private hands, the main parking lot for the recreational facility was constructed.

Two photographs are available from the time between 1934 and sometime around 1941. One of the earliest known photographs of the spring was taken by Herman Gunter in 1934 (Figure 2-5), apparently well after mining had reduced the 8MR123 mound. In the foreground light-colored sand and shell within a trail and sloping down towards the run are evident. In the background is the southern side of the run, which at this point in time remained vegetated. Another undated photograph (Figure 2-6) shows a very similar view. In this case, however, the southern margin of the run is cleared. Based on the probate court documents and aerial imagery, it seems likely that this photograph post-dates 1934. By this time, vegetation was growing above the spring, although the margin of the pool remained clear of vegetation.

ARCHAEOLOGICAL CONTEXTS

A number of syntheses of Florida prehistoric archaeological contexts have been issued for the St. Johns Basin (Goggin 1952; Miller 1998; Russo 1990a) and for the state of Florida (Borremans 1990; Milanich 1994; Milanich and Fairbanks 1980; Russo 1990b). These and other locality-specific studies are drawn upon to review the culture history of the middle St. Johns River.

Paleoindian (ca. 13,000–11,000 cal BP[1]) and Early Archaic (ca. 11,000–7500 cal BP)

The late Pleistocene Paleoindian traditions include Clovis, Suwannee-Simpson, and Dalton, which are identified on the basis of diagnostic hafted bifaces. In addition to lanceolate hafted bifaces, the toolkits are characterized by a suite of formal unifaces (Daniel et al. 1986), bola stones (Neill 1964), the "Aucilla adze," and a variety of bone

[1] Calibrated years before present.

Figure 2-5. Early photograph of the Silver Glen Spring pool, facing south. Captured by Herman Gunter on June 12, 1934. Courtesy of the State Archives of Florida.

Figure 2-6. Photograph of Silver Glen spring pool, facing south. The date is unknown, but presumed to post-date 1934 based on the south side clearing. Courtesy of Jerry Boyer, USFS.

and ivory tools (Dunbar and Webb 1996). Early Holocene traditions dating between ca. 12,000 and 10,000 years ago are identified by Side-Notched and Corner-Notched Bolen points (Bullen 1975). Aside from changes in hafted biface morphology and the addition of new tools, the toolkits of these horizons are consistent with Paleoindian forebears, particularly Dalton.

Today these sites are typically restricted to inundated contexts such as drowned river segments (Dunbar et al. 1988; Faught 2004), sinkholes (Clausen et al. 1979), or perched basins and depressions (Daniel and Wisenbaker 1987; Neill 1964; Sassaman 2003a). A trend towards increased surface water ca. 11,000 years ago and subsequent settlement expansion is attested by Early Archaic diagnostics at Late Paleoindian sites, as well as small numbers of Early Archaic diagnostics in previously uninhabited localities. In general, they are redundant and may represent frequent residential mobility (Milanich 1994). Noting the co-occurrence of Paleoindian artifacts and karst topography in northwest Florida, Dunbar and Waller (1983) posited the "Oasis" hypothesis, that in effect Paleoindian populations were tethered to karst regions, abundant in toolstone and reliable surface water. Although this model matches the general distribution of early components, Paleoindian and Early Archaic diagnostics have been recovered from the St. Johns Basin (see below).

Between 10,000 and 7300 cal BP Florida's Archaic traditions remain poorly defined (Austin 2004a; Milanich 1994). Stemmed points, consistent with the Kirk Stemmed type and locally referred to as Kirk, Wacissa, Hamilton, and Arredondo (Bullen 1975) are distributed throughout the North, Central, and Gulf Central portions of the state, often in similar localities as early forms (Milanich 1994). Stratigraphic excavations at Harney Flats (Daniel and Wisenbaker 1987), West Williams (Austin 2004a), and Trilisa Pond (Neill 1964) indicate an increase in the diversity of unifacial technology.

This period also witnesses the establishment of a long-standing mortuary tradition involving the interment of individuals in shallow bodies of water such as ponds or sinkhole margins. Windover Pond (ca. 9500–7500 cal BP) in Brevard County represents the earliest and is the most thoroughly investigated pond mortuary in the region (Doran 2002b). These sites are typified by large numbers of individuals, and appear to have been repeatedly used over extended periods. For example, at least 168 individuals were interred at Windover Pond over the course 1300 years. Outside of the middle St. Johns pond burials continue into the Middle Archaic (Beriault et al. 1981; Doran 2002a).

In general, Paleoindian and Early Archaic sites are underrepresented within the study area (Sassaman et al. 2000). Several factors may account for this, including a lack of adequate toolstone as well as fewer surveys of submerged contexts. In the St. Johns Basin, early sites are expected to occur adjacent to first or second-magnitude springs fed by the Floridan Aquifer, including Silver Glen Springs, Salt Springs, Juniper Springs, Fern Hammock Springs, Green Cove Springs, Beecher Springs and Blue Spring (Miller 1998:84). The few known sites and isolated finds that have been documented seem to fit this overall pattern (Sassaman et al. 2000). A survey of Crescent Lake demonstrated that there is great potential for recovering early assemblages in the region (Sassaman 2003a).

Crescent Lake is a perched water source that was well-watered throughout the late Pleistocene and early Holocene. Collector surveys and near-shore survey of submerged contexts revealed the presence of numerous early diagnostics. Paleoindian and Early Archaic diagnostics have been recovered from the SGS (see below), and have also been reported from the bottom of Lake George (Thulman 2009).

Middle and Late Archaic (ca. 7500–2800 cal BP) Archaic

Several environmental and social trends define the Middle and Late Archaic. In broad terms the Middle and Late Archaic periods are coeval with increasingly wetter conditions of the middle Holocene, with essentially modern conditions occurring by the end of the Late Archaic. Sites of this period are found throughout much of Florida, and for the first time are located in the interior forests, along the St. Johns River and the Atlantic Coastal Lagoon (Milanich 1994:77). Lifeways predicated on intensive shellfishing are present in the St. Johns by 7300 cal BP and no later than 6000 cal BP on the northeast coast of Florida (Russo 1996). The distribution of sites reflects an overall increase in available surface waters and the exploitation of new habitats, as well as a probable increase in population. By 5500 years ago regionalization is evident across Florida. These new traditions, focused particularly on wetlands, presumably resulted in increasingly larger populations and more permanent settlements (Milanich 1994:87).

Throughout Florida, changes in material culture, including projectile point styles and the appearance of pottery, are used to delineate subperiods and local traditions. In the middle St. Johns several subperiods have been defined, including the Newnan Horizon, the Mount Taylor culture, and the Orange period. Additionally, the "preceramic Archaic" is a generic term denoting Middle to Late Archaic traditions dated between 7000 and 4600 cal BP which were without pottery technology. Archaeologists typically assign sites to the preceramic Archaic when Archaic-age assemblages lacking diagnostic artifacts are recovered.

Newnan Horizon (7500–4600 cal BP): Across much of Peninsular Florida researchers have recognized the Newnan Horizon, characterized by short, narrow stemmed, broad bladed chipped stone hafted bifaces (Milanich 1994:76). A number of types have been defined, including Newnan, Marion, and Putnam (Bullen 1975). There is significant variation in the form of stemmed hafted bifaces from this period, leading to a less formal designation of the "Florida Archaic Stemmed" type, which includes any broad-bladed stemmed hafted biface. Lithic artifacts during this period were typically manufactured from thermally altered chert or silicified coral (Ste. Claire 1987). Dates place Newnan sites between 7500 and 4600 years ago (Milanich 1994:77), although similar forms were likely produced into the Late Archaic.

Settlement in interior Florida, which contains much of the available chert and silicified coral for the production of stone tools, is characterized by a dichotomy between large, diverse assemblages and small lithic scatters. The large sites have been interpreted by Milanich (1994:79) as indicative of reduced seasonal mobility. Austin (2001) suggests, however, that the larger sites likely represent more intensive short-term

reduction episodes near raw material outcrops. Several quarries have been identified, including the Senator Edwards site in central Florida (Purdy 1975). Newnan horizon hafted bifaces are routinely recovered in shell midden contexts along the middle St. Johns. The lack of toolstone in the middle St. Johns precludes their local production. Lithic provenance studies indicate that chipped stone tools were being imported into the region from West and Central Florida (Endonino 2007).

Mount Taylor (ca. 7300–4600 cal BP): The Mount Taylor culture (ca. 7300–4600 cal BP) has been defined to describe the intensive late Middle Archaic and early Late Archaic occupation centered on the extensive wetlands of the middle St. Johns River, the adjacent Ocklawaha and Wekiva rivers, and associated Atlantic Coastal Lagoon (Goggin 1952; Wheeler et al. 2000). This is an archaeological construct, and it refers to a suite of site types and diagnostic artifacts. Recently, the period has been split into an early Mount Taylor phase (ca. 7300–5600 cal BP) and a late Thornhill Lake phase (5600–4600 cal BP), on the basis of changes in the frequency and style of exotic objects and mortuary traditions (Beasley 2008; Endonino 2010). Although the broad details of lifeways are known for this period, the Mount Taylor culture still remains poorly understood for several reasons. Mount Taylor period components are typically buried deeply under later components or submerged under alluvium or peat deposits. Moreover, many sites of this period have been destroyed or impacted by modern land-use practices. The majority of shell mounds were mined in part or whole for road fill during the middle of the 20th century (Milanich 1994).

Settlement patterns during this period are not well known (Wheeler et al. 2000). Seasonality studies of late Middle Archaic sites in the coastal Timucuan Preserve (Russo et al. 1993) suggest that these communities likely had well-established patterns of movement within each region. Although this does not preclude movement either within the middle St. Johns, or to the Atlantic coast or interior, it does suggest that populations were relatively circumscribed. Based on botanical remains and hydrology, Grove's Orange Midden has been interpreted as a multiseasonal occupation (Russo et al. 1992). Based largely on the assumption that shell mounds are villages, it is typically presumed that the large shell deposits throughout the middle St. Johns represent multiseasonal to permanent year-round base camps that articulate with smaller task and season-specific localities (Wheeler et al. 2000). This remains to be tested.

Sites with Mount Taylor components are present throughout the middle St. Johns basin (Sassaman et al. 2000). Although many sites are located adjacent to the main channel of the St. Johns, many others are situated within low-lying swamps or marshes. Wheeler et al. (2000) suggest that there are several general configurations, including ovoid midden-mounds, ridges of shell, complexes of shell fields, ridges, and mounds in addition to small, diffuse middens. The configuration of Mount Taylor occupations is made less clear in multicomponent sites, where Mount Taylor assemblages are partially or completely obscured by later deposits, but are generally characterized by linear footprints (Randall 2010).

It is unclear how these sites are internally organized, and whether there are specific areas for habitation, refuse disposal, or other tasks. Based primarily on stratigraphic inference and non-mounded shell bearing sites, some Mount Taylor occupations appear to be composed of households arranged in a linear fashion (Randall 2010). Few features are known from this time period. Aside from the occasional post-mold, features that have been recorded at large sites such as the Lake Monroe Outlet Midden (8VO53) (Archaeological Consultants and Janus Research 2001) and Fort Florida (8VO48) (Johnson 2005) tend to be large shell-filled basins. Further evidence comes from the Lake Monroe Outlet midden, where lithic reduction tasks were apparently segregated from domestic refuse or processing tasks (Scudder 2001). Similarly, at the Hontoon Island North site (8VO202) primary and secondary midden were separated in space suggesting the presence of discrete habitation and refuse areas (Sassaman et al. 2005). Stratigraphically, Mount Taylor shell mounds are characterized by shell lenses, typically composed of whole and crushed *Viviparus*, *Pomacea*, and bivalve. Strata can be composed of a mixture of the these taxa, or as concentrations of a single taxa. The addition of sand within shell deposits may be a later practice (Sassaman et al. 2011a). In many cases individual strata are composed of a single taxa, which may be burned, whole, or crushed. Another feature of Mount Taylor sites is the presence of concreted shell, which can occur either as thick, extensive lenses or as localized conglomerates (Wheeler et al. 2000:145). It has been suggested that concreted shell deposits form by the interaction of ash, shell, and percolating water.

In addition to basal deposits of concreted shell, Mount Taylor sites typically contain saturated or submerged components that appear to have been inundated during or soon after deposition. Due to the cost and time involved in dewatering and excavating saturated deposits, these have only rarely been investigated, but include Salt Springs (O'Donoughue et al. 2011) and Groves' Orange Midden (8VO2601), a Mount Taylor and Orange period site on the eastern shore of Lake Monroe (McGee and Wheeler 1994). Groves' Orange midden, for example, is a segment of the much larger multicomponent Old Enterprise mound and shell field complex (8VO55). Stratigraphic excavations yielded five discrete strata. The earliest primary deposition (Stratum IV) dates roughly between 7000 and 6000 cal BP and is characterized by dense *Viviparus* shell deposits. These early dates are supported by a dates clustering around 7300 cal BP from the base of Live Oak Mound and Hontoon Dead Creek Mound (Sassaman 2003c, 2005), indicating that the establishment of wetland habitat and its exploitation by residents of the middle St. Johns occurred by at least 7300 years ago, if not before. At Grove's Orange Midden, this basal stratum underlies a thick peat deposit (Stratum III) which dates 6000 and 4400 cal BP (McGee and Wheeler 1994). This peat is thought to represent a seasonal marsh, which suggests a high water stand or an increase in the hydroperiod (Randall 2010). Rare artifacts within this stratum attest to shifts in refuse disposal that likely relate to micro-environmental changes. Above this peat deposit is another dense *Viviparus* deposit dating to the end of the preceramic Archaic. These data not only demonstrate the variability in surface waters through time, but also demonstrate that much of the early record of the Preceramic Archaic lifeways is likely submerged and covered along Florida's lakes and rivers.

Ceremonialism was a widespread and prominent component of Mount Taylor culture lifeways, as evidenced by the construction of monumental shell mounds and mortuary-related sand mounds. Although traditionally viewed as relatively late-period constructions or the result of mundane activities, some Mount Taylor mounds were deliberately constructed as ritual and/or mortuary mounds as demonstrated by early observations by Jeffries Wyman (1875) and C.B. Moore (1999), and more recent excavations at Bluffton Burial Mound (8VO23) (Sears 1960), Mount Taylor (8VO19) mound (Wheeler et al. 2000), the Harris Creek site (8VO24) on Tick Island (Aten 1999), Live Oak Mound (8VO41) (Sassaman 2003c), Hontoon Dead Creek Mound (8VO214) (Sassaman 2005), and the Tomoka Mound complex (8VO81) (Piatek 1994) on the Tomoka River. Although Mount Taylor burials have only been recorded in a few cases, similarities in the form and internal structure of these mounds indicates that many if not all were mortuaries at one point in time (Endonino 2003).

Although only a handful of mounds have been archaeological tested in modern times (Bluffton, Mount Taylor, Harris Creek, Live Oak, Tomoka, Hontoon Island North and Hontoon Dead Creek Mound, Thornhill Lake, Silver Glen Run Locus A), many more no doubt existed prior to their destruction during the 20th century. That many of the mounds contained preceramic deposits was well documented by Jeffries Wyman (1875). Wyman, then curator of Harvard's Peabody Museum, made extensive collections and observations of shell-bearing sites throughout the middle St. Johns River between 1860 and 1873. Through pedestrian surveys and collections, observations of cut-banks, and small excavations, Wyman recorded over 40 ridges, ridge complexes, and conical mounds throughout the basin. Later in the 19th century, C.B. Moore (1999) revisited many of these sites. His more intensive excavations provide both a confirmation of the preceramic origins of many mounds, as well as documented the stratigraphic sequences and mortuary nature of these sites.

Most ceremonial mounds share design elements and internal sequences (Endonino 2003; Randall and Sassaman 2005; Wheeler et al. 2000). Many mounds are crescent-shaped ridges, with steeply sloping sides and asymmetrical summit mounts 5 to 11 m tall. Excavations at Hontoon Dead Creek Mound and Live Oak Mound determined that at least these two were erected rapidly, on the order of several hundred years at most, and composed primarily of shellfish remains (Randall 2010). The extent to which these mounds encase earlier mortuaries is unknown. Moreover, it is unlikely that all mounds were constructed this rapidly, or for the same ceremonial purposes.

The construction of mortuary mounds may be a practice as old as the Mount Taylor period. Early (Mount Taylor phase) mortuary mounds are best known from the Harris Creek site (8VO24). At Harris Creek mortuary deposits have been dated anywhere between 7000 and 5900 cal BP. As related by Aten (1999), the Harris Creek mortuary was constructed by emplaced shell and white sand upon a preexisting shell deposit in small scale mortuary events. At least 140 individuals were interred in this mound. Later Thornhill Lake phase mortuaries such as Bluffton and the Thornhill Lake mounds (8VO58) are round, truncated cones. Like the earlier mortuaries, these mounds tend to be erected on top of existing shell deposits. At Bluffton this layer was

intentionally burned (Sears 1960). Earthen mounds of sand (typically brown in color) or muck were then constructed on this shell foundation. Although grave goods are rare in early contexts (Aten 1999), Thornhill Lake phase burials (such as at Thornhill Lake) were interred with exotic artifacts. Subsequent to interment, these earthen mounds were frequently capped with shell, which in some cases was clearly excavated from preexisting midden deposits (Aten 1999; Piatek 1994).

The importance of wetlands is evident not only in the placement of sites, but in the subsistence remains. Mount Taylor lifeways were characterized by fishing-hunting-subsistence economy. Faunal analysis at Grove's Orange Midden (Russo et al. 1992; Wheeler and McGee 1994), Lake Monroe Outlet Midden (Quitmyer 2001), and Blue Spring Midden B (8VO43) (Sassaman 2003c), and Salt Springs (Blessing 2011) demonstrate the dominance of aquatic species, which could have been acquired from marshes, slackwater lagoons, and sloughs. Although it was once thought that shellfish contributed a small percentage of the diet, recent studies indicate that between 33 and 98 percent of the dietary meat weight was derived from freshwater shellfish. Studies have shown that shellfish diversity varies with site contexts, and may reflect local ecological variations (Quitmyer 2001). A diverse array of fish were collected, including catfishes, sunfish (*Lepomis sp.*), gar (*Lepisosteous sp.*), largemouth bass (*Micropterus salmoides*), and eel. Turtle was also collected, including such species as the soft shelled turtle (*Apalone ferox*), sliders, and mud/musk turtles.

Where waterlogged conditions have enabled the preservation of plant matter, such as at Groves Orange Midden (Newsom 1994; Russo et al. 1992), Salt Springs (Talcott 2011), and Windover Pond (Newsom 2002) a stable pattern characterized by high diversity is established by no later than 9500 years ago. Pulpy fruits such as black gum, prickly pear, saw palmetto, maypop, wild plum, blackberry, persimmon, red mulberry, elderberry and grape appear to have been the most important (Newsom 2002). These fruits were supplemented with starchy seeds such as amaranth, pigweed, and knotweed, as well as the greens from these and other species. Numerous tubers were potentially eaten. Cabbage palm hearts and shelf fungi have also been identified (Newsom 2002).

Mount Taylor period assemblages are typified by mundane and decorative material culture manufactured from locally available bone, fired clay, and wood, in addition to exotic materials (Wheeler et al. 2000). Bones from deer and other terrestrial animals were used to make a variety of tools including gouges, awls, needles, fids, projectile points, and decorative pins. Wooden tools have been recovered from saturated deposits such as Groves' Orange Midden (Wheeler and McGee 1994) and include tool handles and net floats. Fired clay objects of various shapes and sizes have also been recovered from numerous contexts.

Nonlocal materials used to manufacture tools and items of adornment speak to the extensive trade networks which Mount Taylor culture groups were engaged in. Marine shell appears early in the Mount Taylor phase, and demonstrates contact or movement to coastal regions. By the Thornhill Lake phase, marine shell was abundant, and in the case *Strombus gigas*, was apparently imported from southern Florida. Shell tool assemblages

are dominated by woodworking tools, including *Busycon sp.* axes and adzes, as well as celts made from *Strombus gigas* shell. Marine shell was also used to make containers, which are often recovered with residue adhering to the interior surfaces. These are preferentially made from left-opening whelks, and may have been used for medicinal or ritual beverages (Sassaman et al. 2011b). Decorative shell artifacts are also typical, and include marine shell beads and plummets made from large whelk columella, as well as decorative shells such as *Oliva sp.* Shark teeth are often recovered. Many have been drilled to facilitate hafting for use as a tool or as personal adornment. Contact with the interior and west coast is demonstrated by the presence of lithics materials of nonlocal origin (Endonino 2007). There is no source for raw material for chipped stone tools in the St. Johns basin, and many artifacts appear to have been traded into the region as performs and finished forms. Hafted bifaces are consistent with those of the Newnan horizon. Aside from hafted bifaces, some Mount Taylor lithic assemblages contain microlithic tools that appear to have been used for the production of objects, potentially marine shell beads (Randall 2010). These appear to date to the Thornhill Lake phase based on excavations at Lake Monroe Outlet Midden (ACI and Janus Research 2001).

The presence of ground stone beads and bannerstones provides evidence for contacts more far afield during the Thornhill Lake phase. Groundstone beads have been recovered from several mortuary and cache contexts, (Thornhill Lake mounds 1 and 2 and Coontie Island respectively) (Clausen 1964; Moore 1999). Although their origins are unknown, they are quite similar to tubular beads produced in Mississippi and the Mid-south during the Middle Archaic. Bannerstones have been recovered from several mound contexts, including Thornhill Lake, Tomoka Stone, and Coontie Island. The forms are consistent in form and raw material with those manufactured in the middle Savannah River in Georgia and South Carolina (Sassaman 2004).

Orange (4600–3600 cal BP) and Early St. Johns (3600–2800 cal BP): The appearance of pottery in shell middens of the St. Johns River and Atlantic Coastal Lagoon signals the end of the preceramic traditions and the beginning of the pottery producing traditions. Orange tradition fiber-tempered pottery has been dated as early as 4800 years ago in the lower St. Johns, although pottery does not appear in the middle St. Johns until 200 years later (Sassaman 2003b). By 3600 years ago fiber-tempered pottery ceases to be manufactured, signaling the end of the Orange period, and is wholly replaced by spiculate-pasted wares. Once thought to be diagnostic of the St. Johns period, radiocarbon dates (Sassaman 2003b) and paste characterization studies (Cordell 2004) demonstrate that spiculate pottery was produced during the Orange period and continued through the end of the Late Archaic and into the St. Johns Period.

Orange period lifeways have been portrayed as continuing the basic trends set in motion during the preceding Mount Taylor period (Milanich 1994:86). Excluding the production of pottery, and new hafted biface types such as the Culbreath, Lafayette, Clay and Levy varieties, continuity is suggested by the continued use of marine shell and stone tools, although marine shell does appear in reduced frequency at some sites. As evidenced by subsistence data from Blue Spring Midden B (Sassaman 2003c) and

Grove's Orange Midden (Russo et al. 1992), communities continued to exploit aquatic habitats, routinely collecting from local shellfish beds and capturing fish and turtles.

The economic importance of wetlands is demonstrated by the continued focus of settlement adjacent to the river. Orange sites are most likely to be found along productive wetlands and marshes, often in the same locales as earlier preceramic components, while there is a decrease in sites in the interior forests of northern Florida. The more numerous and larger Orange components may very well reflect an overall increase in population. This observation, however, must be tempered by the fact that preceramic components may not be adequately recorded due to inundation, stratigraphic ambiguity, or a lack of diagnostic artifacts.

Although there certainly is significant continuity, divergence in traditions within the St. Johns is evident during Orange times (Sassaman 2004). The upper St. Johns is characterized by smaller sites that may, when taken as a whole system, constitute year-long settlement (Sigler-Eisenberg et al. 1985). In the lower St. Johns, large and presumably multi-seasonal settlements are surrounded by smaller probable fish-processing stations (Russo et al. 1993). In addition to these habitation areas, large shell rings have been identified both at the mouth of the St. Johns and along the coast (Russo and Heide 2001). These sites were likely accretionally but intentionally constructed, and were the loci of communal feasting and ritual activities (Russo 2004; Saunders 2004).

Settlement in the middle St. Johns has been less well documented, but it appears to replicate Mount Taylor site types, characterized by a dichotomy between extensive middens, mound complexes with abundant pottery, and small task sites. Because these sites have not been routinely investigated, data on their internal organization and function are scarce. Sassaman (2003c) has identified a possible Orange period semi-circular compound at Blue Spring Midden B. The compound was situated above a Mount Taylor midden and adjacent to a Mount Taylor mound. At least three households and their associated refuse piles were inferred. Although seasonality data has not been forthcoming, the site was repeatedly occupied.

Emerging data, primarily from the SGS, indicates that Orange communities in the middle St. Johns actively mounded shell as their coastal neighbors did. In general, Orange pottery at mound sites is rare. At Bluffton the pottery was deposited adjacent to and not on top of the mound (Wheeler et al 2000). In excavations at Live Oak Mound, Sassaman (2003c) recovered only a small number of sherds, all from near the surface. However, large quantities of decorated Orange pottery is present at several mounds, including the Mouth of Silver Glen Springs Run (8LA1), Harris Creek, Enterprise, and Orange Mound. In most cases it is unclear if the mounds were in the shape of a linear ridge or a U. Based on the observations of Wyman, however, the mound at the mouth of the SGS run was U-shaped, although it remains to be determined when it attained that configuration.

Orange fiber-tempered pottery has been treated primarily as a chronological marker. Bullen (1972) constructed five subperiods, based on changes in vessel

construction and surface decoration. The unilineal sequence consisted of a transition from Orange Plain to Incised (Orange Incised and Tick Island) wares, which were eventually replaced by spiculate-tempered St. Johns Incised vessels. However, radiocarbon dates have shown that variation in tempering agents, vessel form, and surface treatment likely reflect spatial variation in the production and use of pottery (Cordell 2004; Sassaman 2004), and not necessarily temporal trends as once thought. Sassaman (2004) suggests that village sites such as Blue Spring Midden B are dominated by plain pottery that was rarely used over fires, while large and complex sites such as Harris Creek and Silver Glen Run are dominated by incised vessels that were routinely used over fire. He suggests, as Saunders (2004) does for the coastal Orange shell rings, that the different distribution likely represents different social contexts, where plain pottery was used in mundane contexts, and incised pottery was used primarily during ceremony and communal feasts. Recent dates from 8LA1 on Tick Island Incised components indicate this variant post-dates classic Orange Incised vessels, and may be associated with domestic and ritual contexts (Gilmore 2011).

The recent upheaval in the chronology and typology of fiber- and spiculate-tempered wares has left an approximately 1000 year gap between the Orange and St. Johns I periods. A "Transitional" period was defined by Bullen as a bridge between primarily fiber-tempered assemblages and incised spiculate-tempered wares (Milanich 1994:88). Isolating sites of this period has remained problematic (Miller 1998:76), likely because many of the wares thought to occur after the Orange period are actually coeval. Although the term "Transitional" should be discarded, there is a need to document sites of this period. An early date on a spiculate-tempered assemblage at the Joseph Reed Shell Ring (8MT13) in southern Florida indicates that this interval will likely be populated with components as more dates are acquired (Russo and Heide 2002).

St. Johns (ca. 2800–500 cal BP)

Although St. Johns pottery dates as early as 4400 cal BP, fully developed St. Johns lifeways begin around 2800 cal BP, and continues into European contact. The archaeological culture was defined by Goggin (1952), who used changes in pottery styles to identify subperiods. The St. Johns I (ca. 2800–1300 cal BP), is typified by plain "chalky" spiculate-tempered wares, and the St. Johns II (ca. 1300–500 cal BP), typified by plain and check-stamped varieties. These ceramic types are formally referred to as St. Johns Plain and St. Johns Check Stamped, respectively. Additional subperiods have been identified by the presence of foreign wares or local copies of them, as well as changes in mortuary ritual (Milanich 1994:247). As Miller (1998:79) notes, however, these divisions are not easily traced because the diagnostic artifacts or sites are rare.

Although there are numerous changes in social organization, material culture, and ceremonialism, that were incorporated from external contacts, the St. Johns period may be marked by conservatism (Miller 1998:78). In general it is assumed that along the St. Johns river, St. Johns I and to a certain extent St. Johns II lifeways continued seemingly unchanged "from that of their late Archaic, Orange-period predecessors" (Milanich 1994:254). This assumption is based primarily on the fact that St. Johns I components

are likely to be found on sites with Orange components, and this trend continues with a similar frequency of reoccupation for St. Johns II components (Miller 1998; Sassaman et al. 2000). However, there have been very few archaeological investigations of these post-Archaic components. The continuity made apparent by the reuse of locations may be superficial at best. In general, however, villages, short-term task sites, and large ceremonial mounds are likely present throughout St. Johns river and its tributaries, and along the coastal lagoons from Jacksonville into Brevard County. Although equally distributed on the coast and along the St. Johns, St. Johns period sites are also located in interriverine localities. Increases in population from Orange to St. Johns II times are suggested by increases in sites per century. Unfortunately, village contexts have rarely been excavated, so it is unknown how large the residential populations of each these places may have been, or how they may have been structured.

Continuity with Orange period subsistence practices is a likely possibility. Coastal assemblages are dominated by oyster and coquina, in addition to estuarine fishes (Milanich 1994: 257). Subsistence data from the St. Johns period wet site deposits at 8VO202 on Hontoon Island indicate that populations continued to focus on the collection of aquatic resources, such as gar, catfish, largemouth bass, alligator, and turtle, in addition to *Viviparus* and bivalve (Wing and McKean 1987). A wide array of plants were also exploited, including many that were collected during the preceding Archaic (Newsom 1987). Cultigens that supported large populations and complex forms of social organization elsewhere in the Southeast occur in relatively limited frequencies. Bottle gourd (*Langeria siceria*) seeds and rind fragments and *Cucurbita pepo* gourd fragments were recovered in St. Johns II contexts, although these were likely used for containers or net floats. Maize, a staple throughout much of the Southeast by St. Johns IIb times, was present only in historic contexts. Although cultivation or encouraged gardening may have been practiced, it does not appear to have been widespread or intensive in the middle St. Johns.

Changes in material culture throughout St. Johns I and II times were primarily restricted to pottery decoration and hafted biface types (Milanich 1994:247, 263). Hafted bifaces were typically small, and include the Jackson, Florida Copena, Bradford, Columbia, Broward, Taylor, Westo, Florida Adena, Gadsen, Sarasota, and Ocala types (Bullen 1975). Plain St. Johns wares dominate St. Johns I components. Locally produced Dunns Creek Red vessels were produced during Ia and Ib times, while during Ia copies of Deptford and Swift Creek and during Ib Weeden Island vessels were produced. These often were deposited in mortuary contexts. At A.D. 750, potters began to apply check-stamped designs with wooden paddles. During IIa times, late Weeden Island pottery and copies were made, while elements of the Southeastern Ceremonial Complex are evident in IIb assemblages. During St. Johns IIa or IIb times, there is a shift to the use of small hafted bifaces such as Pinellas, Ichetucknee, and Tampa Points. Other tools found throughout St. Johns period assemblages were shell adzes, celts, picks and hammers. Bone tools include a variety of awls, pins, pendants, and beads.

Ceremonial and political life appears to have been transformed in relation to external contacts (Goggin 1952, Milanich 1994:260-262). Mounds of the St. Johns I

period were low, truncated cones constructed of sand. Bundle burials, extended interments, and cremations were placed into the mound. Many mounds were reused for multiple interments, which may indicate that interred individuals were members of the same lineage, as in Weeden Island mounds. During the St. Johns Ia period, larger mounds were constructed, and exotic items such as galena and copper were interred, along with locally made St. Johns Plain and Dunns Creek Red pottery. Towards the end of Ia, Hopewell influences are evident in the construction of log tombs. Mounds of Ib age show evidence for Weeden Island influences. St. Johns IIa mortuary practices appear similar to earlier practices in that they continue to be used for multiple, likely kin-based burials (Milanich 1994:268).

Beginning with the St. Johns IIb subperiod, the construction of mounds takes on a different character, and is clearly influenced by Mississippian cultures to the north and west. Although it is unknown precisely what level of social organization was present at this time period, the symbolism and quantity of material culture is similar to chiefly societies elsewhere in the Southeast at this time. At least three large pyramidal mounds were present in the middle St. Johns basin, including Shields, Mt Royal, and the Thursby Mound located across the St. Johns channel from Hontoon Island. These sites were large earthen works, likely constructed in stages. C.B. Moore (1999) excavated all of these sites, and recovered caches of copper, galena, silver and gold from Spanish shipwrecks, *Busycon* shells, greenstone celts, and clay vessels and effigies in addition to scattered or poorly preserved human remains.

PREVIOUS RESEARCH IN THE SILVER GLEN SPRING WATERSHED

Observations of the SGS watershed extend back to the late 18th century. The following is a review of the key details revealed in prior research.

Early Observations (1774–1956)

William Bartram visited Silver Glen Springs (which he called Johnsons Springs) during his second trip to the St. Johns in the late summer of 1774. Although he does not mention the presence of shellfish remains or artifacts on the surface, he does describe how he encountered interesting topography in the vicinity of the spring pool. In a report to his benefactor, Dr. Fothergill, Bartram (1775) describes how he had:

> come to the mouth of Johnsons Springs; padled near a mile up & come to a vast Fountain, almost in every respect like the other great Spring that I visited before [likely Salt Springs]. I went a shore, mounted very high, hills very steep next the Creek, but fell away more gradually back, & enterd a beautifull grove of Palm Trees.. mounted a very high ridge, from whence had an almost endless view of a vast bared desart, although together impenetrable so thickly over grown with short schrubby Oaoks, Bays, Yapon, Prinos & short laurel bushes...

So described (with original spelling), Bartram apparently traversed across a mounded deposit at the spring, and continued up slope until he encountered the xeric scrub-oak that dominates the top of the terrace. That Bartram failed to mention of the presence of shell is not problematic. In many of his encounters with shell deposits elsewhere he did not make a connection between shell mounds and Native Americans.

Jeffries Wyman, first curator of Harvard University's Peabody Museum of Ethnology and Archaeology, provided the earliest description of archaeological deposits within the Silver Glen Spring watershed, which he referred to as "Silver Spring Creek" (Wyman 1875). Within the watershed he encountered one of the largest and most elaborate shell complexes anywhere along the St. Johns. Wyman (1875:38–39) relates how the spring run:

> has upon its banks the most gigantic deposits of shells met with on the waters of the St. John's. There are two distinct portions; one forming an amphitheatre which surrounds the source or "boil," and which is the Williams Spring of John Bartram, and the other occupying the right bank of the creek at its mouth, as well as the shore of the lake. The two together are said to cover an area of twenty acres. The one just mentioned is much the larger and consists of three portions forming as many sides of a hollow square. The first extending along the shore of the creek, near the mouth of which it has a height of from twenty to twenty-five feet by measurement; the second is on the shore of the lake, and measures from a hundred and fifty to two hundred feet in width, and the third extends inland at nearly right angles to this. Between these ridges is a deep valley, in which the shells are entirely wanting or are only sparingly found.

In describing this area, Wyman identified two shell mounds within the watershed. The largest is situated at the mouth of the run. This site, entered into the FMSF as site 8LA1, has been the subject of recent investigations by Sassaman and colleagues (2011a). Wyman described a second deposit, now referred to as site 8MR123, as an "amphitheater" of shell surrounding the spring pool. Unfortunately, he does not provide further details such as the length, width, height or thickness of the mound, nor does he indicate how it was arranged, aside from being an amphitheater. In his unpublished field notes, housed at Harvard University's Countway Library of Medicine, he indicated that the mound was approximately 3 to 4 m high (Wyman 1872). A test of his elevation and plan measurements with modern survey data indicates that his field measurements were quite accurate (Randall 2010).

Given the size and complexity of the mounds along Silver Glen Springs, it is surprising that Clarence B. (C. B.) Moore only made brief mention of the locality. Moore (1894) noted two sand mounds in the vicinity of the run. Although he did not discuss the shell deposits there, they were noted on a large scale site map (Figure 2-7). Moore (1894:176) described a sand and shell mound, now referenced as site 8LA3 "Mound A near Silver Glen Spring," situated approximately one mile north of the spring run on the shore of Lake George. He indicated that it measured roughly 0.6 m (2 ft) high, and 10.6 m (35 ft) in diameter. During excavation the site was "totally demolished." Although no human remains were uncovered, he did report a few sherds of unknown type, in addition to the presence of charcoal and *Viviparus* shells. Moore also mentioned a second sand mound, now referenced as site 8LA4, or "Mound B near Silver Glen Spring." Moore locates the mound "on the property of Mr. Greenleaf, at Silver Spring." He describes this mound as slightly larger than 8LA3. In his excavations he identified three human crania and some long bones, but did not find any artifacts (1894:176-177). Recent survey of the southern side of the run suggests that 8LA4 may be situated 400 m from the main pool, on the Juniper Club's property (see below). In addition to Wyman and Moore, passing mention was made by the surveyor Le Baron (1884:774). He provides somewhat

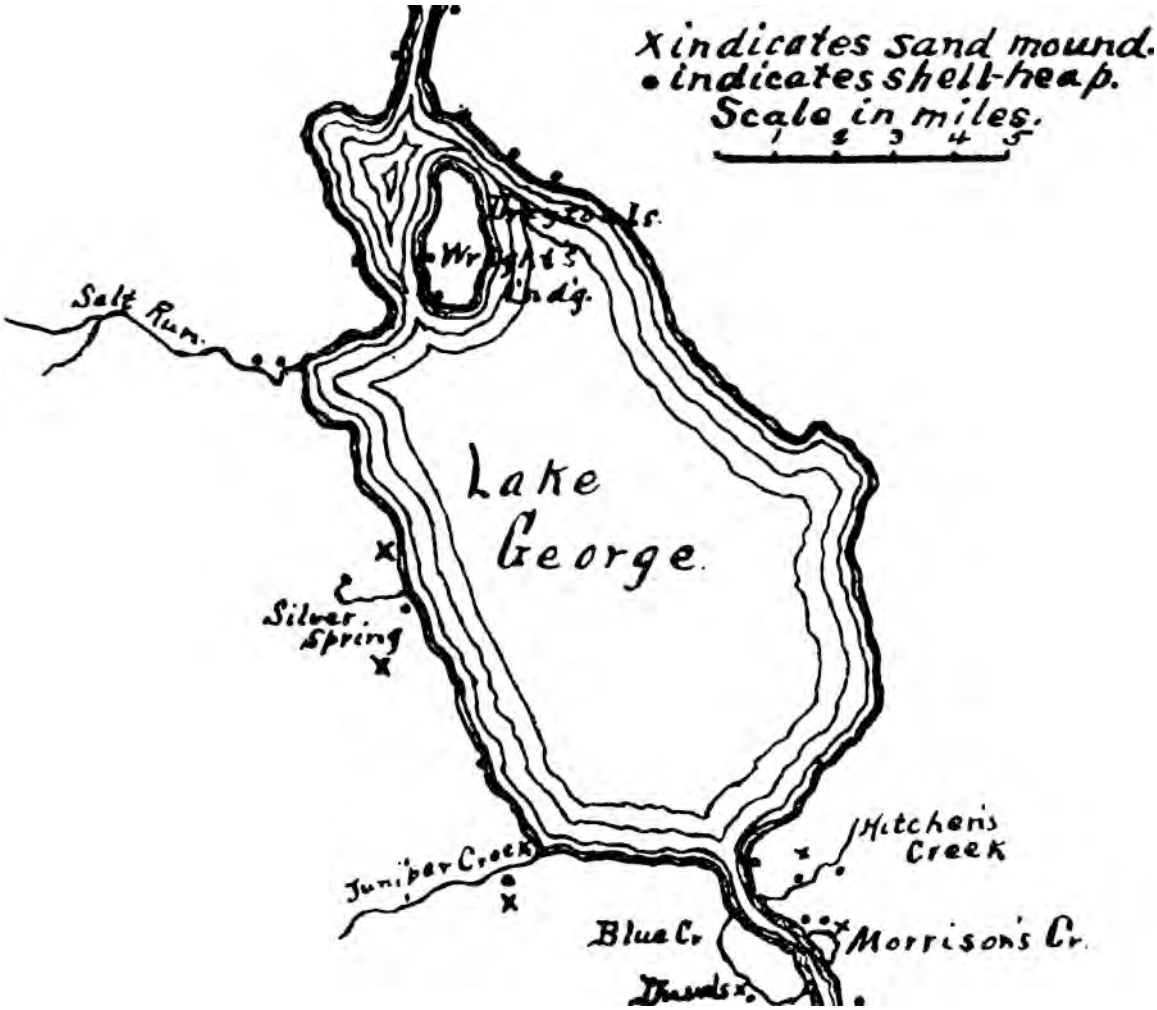

Figure 2-7. Archaeological sites in the vicinity of Lake George visited by C. B. Moore (modified from Moore [1999]).

contradictory summaries for shell works in the area, referring to a shell mound "at the mouth of Silver Run," and "a very large shell-bluff on land of Damon Greenleaf, at the mouth of Silver Spring."

Silver Glen Springs was all but forgotten for a generation. As previously described, shell mining commenced in 1923, and continued until the 1940s at least. Remarkably, observations were made of 8MR123 as it was being despoiled. In an aptly named report, *The Remains at Silver Glen Spring,* Potter (1935) related his impressions of the site made during a CCC Camp overnight visit (June 7–8) in 1935.

> The original remains are estimated to have covered in the vicinity of fifteen (15) acres, being mainly composed of the usual snail shell. It is estimated that in the past fifteen (15) years, close to five (5) acres have been removed for various purposes, mostly road construction. While the area involved is more or less irregular. the length of' the remains

> has been paced at close to four hundred thirty (430) yards, with the width varying considerably.
>
> As stated, these remains are not in a virgin. untouched condition and could not at the time be very conveniently investigated in detail. However, there is a suggestion there may have been a burial mound here at an early time, which later was utilized by a migrating people for a kitchen midden site. Skeletal remains have been found at this site by various Enrollees in the progress of the Project work, and the writer, himself, has secured several interesting bones thereof.

Potter's description provides few details. It is clear that shell was in the process of being removed from a mound measuring 400 m long or more, and that the mining had begun in the early 1920s. Moreover, he suggests that burials were found at the site, and in particular, below shell deposits. Allen Taylor (1935) provided a brief description of artifact finds from near the spring and along the Juniper Club shoreline. He noted that he found 28 unbroken "points" of flint and other materials. Illustrations of some indicate they are Florida Archaic Stemmed varieties. Also found were polished bone implements, shell adzes, and possibly one bone projectile point.

Of greater interest is a sketch map of the location, showing the area of shell removal and the contemporary spring pool and run morphology (Potter 1935) (Figure 2-8). Unfortunately, there is no scale to this map, and it cannot be georeferenced accurately. However, there are several features worth of mention. First, at this time shell was being removed from north of the spring run. A dashed line entitled "Outside Contour" would seem to indicate shell had been removed from south of the secondary spring towards north of the main boil. Arrows associated with the area of shell removal suggest that shell was still topographically elevated, trending from west to east. That is, there was still a shell mound remaining to the east of the spring pool. Notably, shell deposits upwards of 3 m thick are still preserved in this location. On the south side of the run there are notes for a "Shell Heap" and an easterly "Old Pit." The shell heap is no doubt Locus C of site 8MR3602/8LA1, preliminarily identified as dating to the St. Johns period by the LSA . The old pit is also likely the remnants of Locus A, a Mount Taylor shell ridge. A final insight regards the eastern shoreline. In Potter's diagram, the channel is constrained just south of the main spring pool. From there, the channel is relatively the same width. Today, however, the channel expands just south of the main pool. Currently this area is shallow, and the deepest part of the channel is located on the southern edge of the run. The implication is that an unknown quantity of shell was removed from the southeast side of the spring pool margin, effectively doubling the width of the run at this point.

The Silver Glen Spring site was also mentioned in passing by Neill et al. (1956) in their discussion of zooarchaeological assemblages from preceramic Archaic shell sites along the St. Johns River. Site 8MR123 was one of the locations from which they acquired samples. In their description (1956:384), they provide important details on the depth and culture-historical association of remnant deposits:

> The Silver Glen Springs site, or that part of it under consideration here, is a very large shell midden, located about 9 miles northwest of Astor, Lake County, Florida. The midden borders a

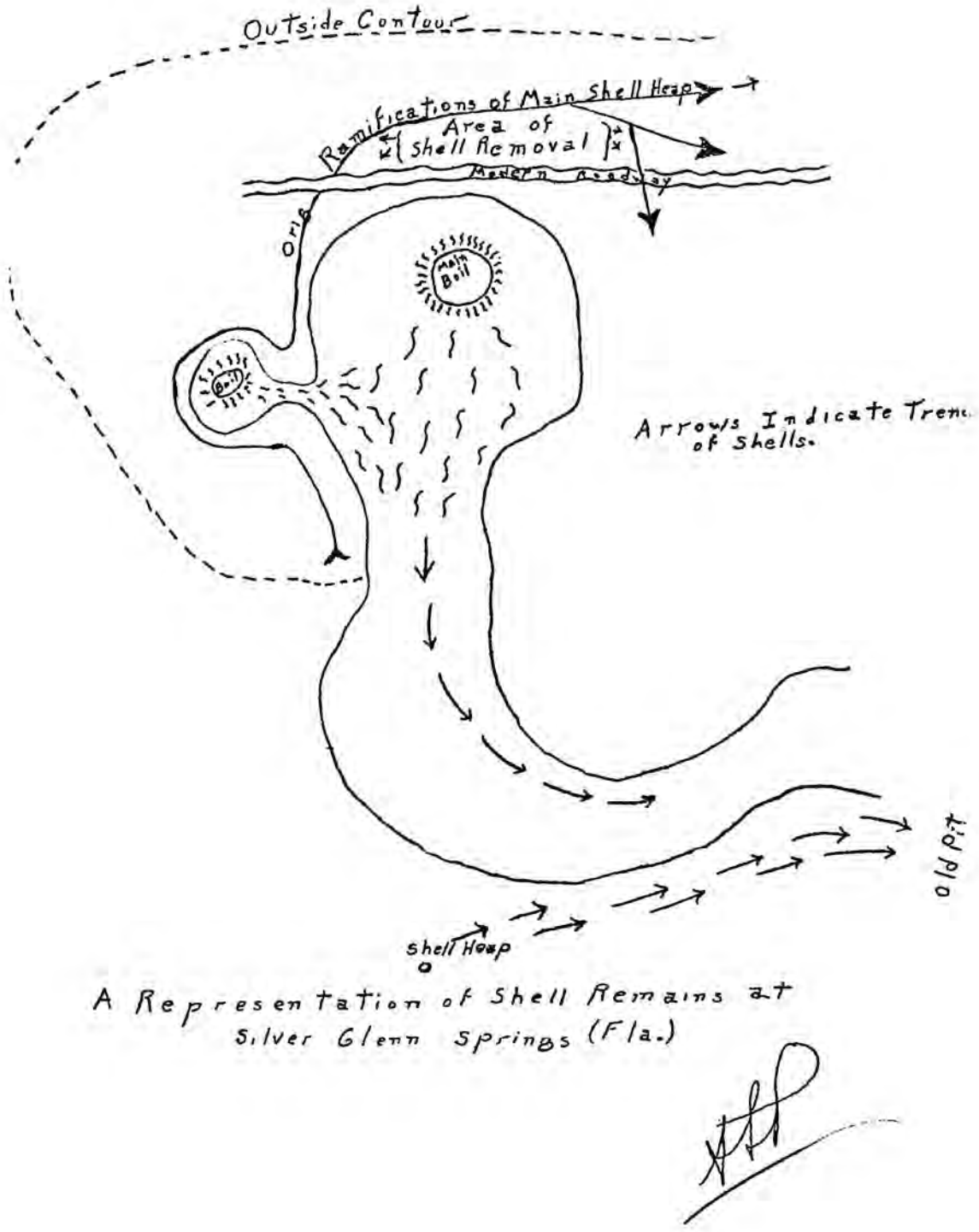

Figure 2-8. Plan sketch map of Silver Glen Springs and Run showing the arrangement of shell deposits and location of mining operations observed in June, 1935 (from Potter [1935], reproduced from photocopy).

> group of large springs, the combined flow of which forms a sizeable river. The spring run is about 0.6 miles long, and empties into Lake George, a portion of the St. Johns River system. According to local residents, at one time the shell was piled in places to a depth of 20 feet or more. However, vast quantities of it were removed to pave roads in the Ocala National Forest, and a dozen or more houses are now scattered over the remainder of the midden. Excavations were made in a part of the site from which about 10 feet of overlying shell had already been removed. A test cut was carried down another 4 feet, in undisturbed shell. As might be expected, no sherds were encountered at this depth. At Silver Glen Springs, the lowest levels of the shell are at least a foot or two below the present water table, and in places are compacted into a very hard breccia. Much of the midden is preceramic; fiber-tempered and later horizons are also present.

Clearly, by the time 8MR123 was observed it had been significantly reduced and houses had been constructed on top of it. Still, at least a meter of intact deposits were encountered, and they appeared to date to the Mount Taylor period. Moreover, Neill and colleagues suggest that saturated components are present as well.

The descriptions provided above are the only published accounts of archaeological deposits in the SGS in the years prior to the recreational area's acquisition by the USFS. However, photographs and informant testimony indicates that park visitors routinely encountered artifacts and human burials within the confines of 8MR123. In general, the finds are consistent with Paleoindian through St. Johns II traditions. For example, one photograph curated by the State Archives of Florida shows a number of artifacts laid out on a towel, purportedly recovered at 8MR123 (Figure 2-9). The assemblage includes at least one Newnan hafted biface, some modified bone or antler tools, and pottery (likely St. Johns). Similarly, Norman (2010) published several black and white plates curated in the Henderson Library that show artifacts purportedly from Silver Glen Springs. Hafted bifaces consistent with the Florida Archaic Stemmed variety are most prevalent, but examples of Early Archaic Bolen side-notched and St. Johns era Hernando hafted bifaces are also present. Also depicted are a wide variety of marine shell tools, including adzes, axes, and a likely vessel. Another plate shows a variety of decorated fiber-tempered sherds and St. Johns Check Stamped examples. Finally, I would note that during the present field work, a park visitor had in his possession what may be the base of a fluted Paleoindian hafted biface which he claimed was recovered from the recreational area in the 1970s.

Figure 2-9. Artifacts presumably from site 8MR123. Entitled "Pottery, bones, and arrowheads: Silver Glen Springs, Florida," photographed in 1955. Courtesy of the State Archives of Florida.

REDACTED

Systematic Excavations (1990–Present)

Systematic investigations of the SGS watershed commenced in 1990 with excavations at 8MR123 by Marrinan and colleagues (1990; Stanton 1995) of Florida State University (FSU) (Figure 2-10). This project targeted remnants of the shell ridge

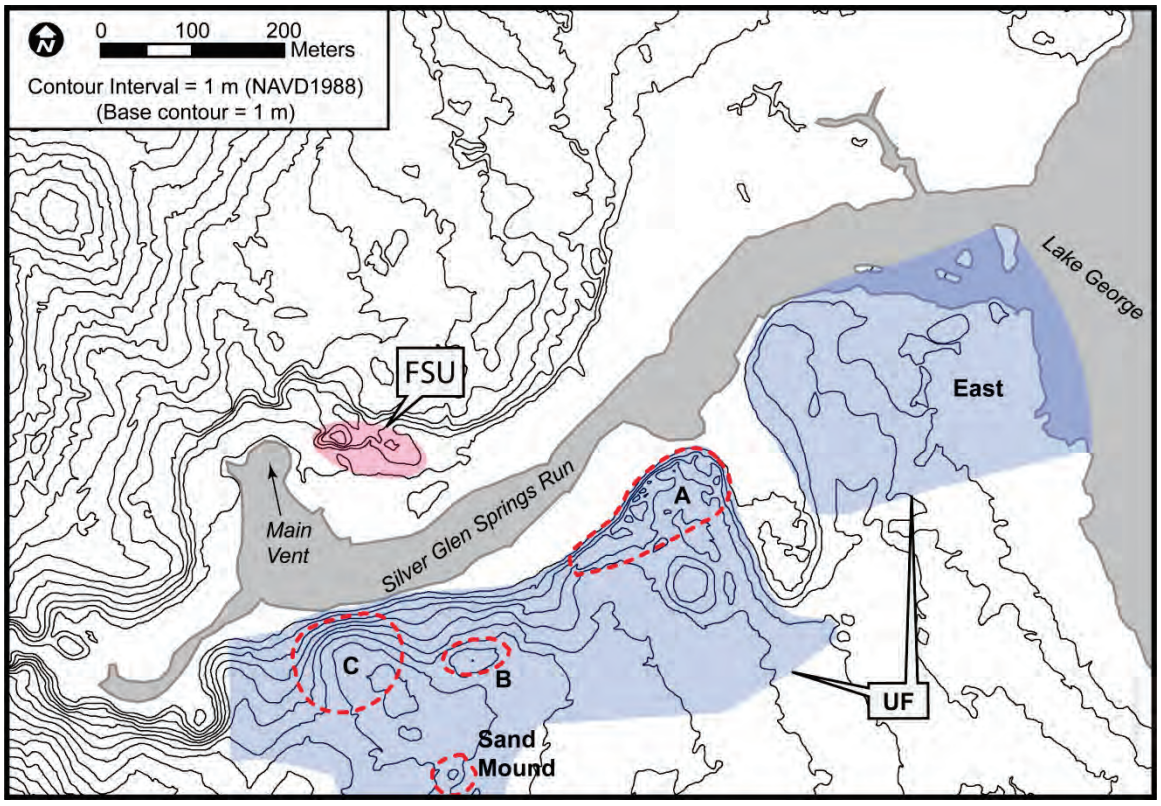

Figure 2-10. Location of cultural deposits investigated by Florida State University's 1990 excavations (red) at 8MR123, and the University of Florida's 2007–2010 excavations at 8LA1/8MR3602 (red dashes highlight loci discussed in the text).

near the spring pool with two 1 x 1-m column samples. No basemap was published, and Bill Stanton and the LSA field crew could not specifically relocate the test units in 2011 based on original field notes. However, based on Stanton's recollection and extant topography, these units were likely situated in the elongated ridge to the east of the spring pool. Today this ridge rises approximately 3 meters above the surrounding terrain at its highest point. This elevation is higher than it would have been in 1990, as the USFS capped the ridge with clean fill after excavation. In 1990, however, this ridge had been the foundation for the land manager's (Morgan) house. The Morgan House Unit (MHC), as it was called, was excavated after the profile had been cut back and squared. Excavation exposed a 3-m deep stacked sequence of shell-bearing and sandy strata lying on basal sand. Because of the small window provided by the test unit size, little can be said about the structure or orientation of the strata. The base of the unit was characterized by a very dark sandy stratum (likely a buried A horizon) above dark gray sand. Above this unit were numerous shell-bearing strata with specific shellfish taxa varying in abundance and fragmentation. They also intercepted several possible living surfaces, inferred here by the co-occurrence of crushed shell in tan sand. A second unit (FSU-TU2) was excavated along the low-lying extension of the ridge, approximately 40 m southeast of the MHC unit. This unit exposed a 1.8-m deep profile, characterized by relatively flat-lying, mostly shell-bearing, strata situated above a basal gray sand.

Interestingly, a ca. 10-cm thick stratum was described as tan sand. No human remains were encountered during FSU's investigations.

The deposits exposed by FSU were all preceramic Archaic, no pottery was recovered. Marrinan et al. reported four age determinations from radiometric assays from four discrete strata. This total includes samples from near the top and bottom of each test unit. Marrinan et al. noted that the intercepts for the assays are in reverse order (i.e. the oldest date is at the top of the sequence, the youngest is at the bottom). A second issue is that the assays have large errors. For three of these assays, the reversal of the intercept is not necessarily a problem. When calibrated, assays from the top and bottom of the MHC unit and the bottom of FSU-TU2 are statistically coeval, and give a total range for the deposits here between 5650–4620 cal BP. This places the bulk of deposition with the Thornhill Lake phase. The fourth assay (5620 ± 260), from the top of FSU-TU2 remains an issue. In addition to being out of sequence, the calibrated range (7160–5890 cal BP) falls outside the range of the other three assays. It is quite possible that this estimate is simply an error produced during the analysis. Alternatively, the submitted sample included charcoal from old and young strata (hence the large sigma). A third possibility is that the charcoal from the sample (and by extension the matrix from which it was derived) truly is older, and was transported there either during mining activities or by Mount Taylor inhabitants. The material culture assemblage fits comfortably within the Thornhill Lake phase. Modified marine shell was recovered, including a left-opening (*Busycon contrarium*) vessel from FSU-TU2 and a small drilled bead. Also recovered was a Hillsborough hafted biface, part of the Florida Archaic Stemmed cluster. One possible microlith was also noted. Finally, analysis of the zooarchaeological assemblage by Stanton (1995) identified predominantly aquatic vertebrate and invertebrate species.

Since 2007, the University of Florida's St. Johns Archaeological Field School (UF) has conducted extensive investigations of the southern-side of the SGS run, on property owned by the Juniper Club (Sassaman et al. 2011a). Field work has targeted the remnants of the U-shaped shell mound at the mouth of the run (referred to as 8LA1-East) as well as the tract extending westward along the run (Figure 2-11). The field research program has been multi-faceted, and consisted of augering, shovel testing, stratigraphic excavations, pedestrian survey, remote sensing (GPR) and topographic mapping. The results of this work recently reported by Sassaman and colleagues (2011a) are numerous and varied. In lieu of recapitulating these results at length, a few summary points are in order.

Investigations of 8LA1-East have met with mixed results. On the basis of aerial photography and topographic mapping, it is evident that much of the mound complex was mined away, including much of the ridge along the run and Lake George, where Wyman reported deposits upwards of 25 feet high. Thick shell deposits, likely Mount Taylor in age, front the run near the Juniper Club lodge. Excavations within the channel islands, and at the northeast corner of the Juniper Club's property revealed that the deposits here were likely relocated during the mining process. Pedestrian survey of the northeast point and fronting Lake George recovered a large quantity of fiber-tempered pottery. The assemblage is dominated by technologically distinct Orange Incised pottery that is

consistent with the Florida Museum of Natural History's collection from the mouth of the run. AMS assays on soot from vessels in this location indicate that pottery deposition (and shell deposition by extension), occurred sometime between 4800–3800 cal BP. Stratigraphic investigations in the likely vicinity of the south ridge identified an array of buried sand and shell deposits, including several large shell-filled pits. An AMS assay from one pit that contained plain fiber-tempered sherds places the inception of shell deposition here as early as 4080–3730 cal BP. A GPR survey presented tantalizing evidence for a circular arrangement of subsurface features (likely different densities of shellfish), approximately 80 m in diameter. Scattered lithics in shell-free deposits, including microliths, attest to Mount Taylor and possibly earlier occupation at the base of the mound complex as well.

Investigations to the west involved reconnaissance survey and stratigraphic excavations. As a reminder, this area was cleared of vegetation and mined for shell in the 1920s and 1930s. The effects of this destruction are evident today in mining escarpments, borrow pits, and open fields. Shovel testing revealed that shell is largely concentrated along the shoreline, and becomes diffuse or absent within 100 m of the SGS run. This portion of the run is characterized by a relatively unbroken distribution of cultural deposits dating from at least the Mount Taylor period onward, and likely even earlier based on surface finds. Deposits of Mount Taylor age are concentrated in the eastern portion of this tract. In contrast, pottery of the St. Johns I and II periods is concentrated at the far western aspect of this landform. Orange pottery was found to be concentrated mid-way down the run, and in association with a slightly mounded area. Finally, the reconnaissance survey also documented a ca. 2-m high sand mound 200 m south of the run. The mound was not tested, and so its age is unknown. However, it is presumed to date to the St. Johns period based on its size and shape, a low truncated cone approximately 20–30 m in diameter. This mound may be C.B. Moore's "Mound B near Silver Glen Spring...on the property of Mr. Greenleaf."

Surface topography and artifact assemblages were used to define several "Loci" across the tract (Figure 2-11). These locus definitions are used to discriminate sub-sections of the site for discussion purposes, even though cultural deposits are widespread across the landform. Locus A represents the remains of a mined shell ridge. Topographically, the locus is characterized by a ca. 180-m long, 60-m wide ridge escarpment and pit left over from mining operations here. Profile-cuts into preserved remnants revealed upwards of 3-m of intact deposits. On the basis of 7 radiocarbon assays, this shell ridge emerged rapidly at the end of the Mount Taylor phase, between 6300 and 5740 cal BP. After a period of use that involved the frequent deposition and crushing of shellfish, inhabitants emplaced sand across a wide stretch of the ridge. In many places this sand shows evidence for burning. Thereafter, inhabitants began depositing large quantities of shellfish and sand. The structure of these later deposits may represent sequential household floors and associated middens. Locus B is an area of elevated shell that today overlooks a large clearing. This place has been intensively tested as part of Zack Gilmore's dissertation research. Gilmore (2011) documented a Thornhill Lake phase shell deposit on the east side of Locus B, and well-stratified deposits spanning the Thornhill Lake phase and Orange periods to the west. The Orange

component is remarkable in that it is characterized primarily by large and deep pits, presumably used for processing shellfish and other foodstuffs. At some point during the Orange period, this landform and the associated pits were capped off with a thick lens of shell by communities who also produced Tick Island Incised pottery. Gilmore argues that the intensive pit digging is likely related to ritual gatherings at 8LA1-East. Finally, limited stratigraphic excavations have been conducted within Locus C, a ridge nose that overlooks the spring pool. Excavation in down slope units intercepted thick, organically enriched midden deposits with predominantly St. Johns plain pottery. This deposit dates to roughly 3000 years ago. Stratigraphic excavations in the center of Locus C identified small shell filled pits amidst largely shell-free matrices. The pottery assemblage included St. Johns Check Stamped varieties, and was dated to roughly 700 years ago. Together, investigations suggest that Locus C may represent a St. Johns I/II village, but further testing will be necessary to confirm or invalidate this inference.

CONCLUSION

The configuration of the SGS watershed today reflects a complex and interwoven history of natural and cultural processes reaching back nearly 12,000 years. The most visible components of this landscape are the four known shell and sand mounds that were constructed along the spring and run. Yet the preponderance of data indicate that most portions of the watershed were incorporated into the daily and ritual lives of its inhabitants. Although fragmented by recent land use practices, there can be no doubt that significant cultural resources remain to be documented across this landscape. It is to the investigation of these resources that we now turn to in Chapter 3.

CHAPTER 3
RECONNAISSANCE SURVEY

Asa R. Randall

This chapter summarizes the results of reconnaissance survey within the Silver Glen Springs Recreational Area (SGSRA), conducted in advance of facilities improvement. The areas of potential effect (APEs) fall within, or are adjacent to, the known boundaries of the Silver Glen Springs site, listed in the Florida Master Site File (FMSF) as site 8MR123. Planned activities that could involve ground disturbance include parking lot maintenance and expansion, installation of a bathhouse and related drain field and subsurface sewage lines, construction of a fee station and through-way expansion, and trail and grounds refurbishment. The goal of the reconnaissance survey was to document the extent and character of intact and disturbed cultural deposits within the APEs (Figure 3-1).

As detailed in Chapter 2, there are significant archaeological resources within the boundaries of the SGSRA. Due to a variety of factors, however, very little is known of the distribution, composition, and culture-historical associations of these deposits. Of particular note are the shell deposits that surround the spring pool. While horizontally extensive today, the current disposition of cultural resources reflects only a small portion of a much greater terraformed landscape. As noted by Jeffries Wyman over a century ago, the spring boil was surrounded by an "amphitheater" of shell, at least 3 to 4 m high. Much of this shell mound was removed in the 1930s, and was subsequently altered while the property was operated as a campground until 1989. Excluding the testing by Marrinan (1990), all archaeological knowledge has been limited to impressionistic discussions and surface finds near the spring. Moreover, there has been no systematic testing of areas away from the spring pool. Importantly, investigations elsewhere along the St. Johns, including the south side of the SGS run, have demonstrated that landforms away from shell mounds, particularly flat upland terraces, may be where a number of activities that did not involve the deposition of shellfish took place in antiquity.

A variety of methods were used to identify cultural resources in the APEs, including excavation of shovel test pits, bucket augering, and pedestrian survey. The survey resulted in the excavation of 232 shovel test pits and 55 bucket augers across the SGSRA. Dense and largely intact shell-free cultural deposits were documented away from the spring pool and run. Intact remnants of the mined shell-bearing portion of site 8MR123 were routinely encountered at lower elevations in proximity to the spring pool (including shell and organic shell-free deposits). Diagnostic artifacts and radiocarbon determinations indicate intensive habitation occurred throughout the survey area from at least the preceramic Archaic through the St. Johns II periods (ca. 7000 to 500 years ago), and likely earlier. Finally, during pedestrian survey we identified a previously unrecorded shell deposit (site 8LA4242 [NF Site #11-12, Ocala], the Silver Glen Springs Run North Mound). This site is unique in that it contains both the remnants of a mined shell mound, in addition to a tram road constructed out of shell. Collectively the results

Figure 3-1. Areas tested during the shovel test reconnaissance survey.

indicate that the SGSRA was a complex cultural landscape with deep history. Although shell mining and other land modification have altered portions of the landform, the reconnaissance survey results have delineated significant cultural resources throughout the SGSRA. In the following sections we provide descriptions of the survey methods employed for each reconnaissance area, including testing strategies, recording procedures, and mapping protocols. We then provide detailed discussions of the reconnaissance results focusing on the integrity, culture-historical association, and distribution of cultural resources.

SHOVEL TEST RECONNAISSANCE

Methods

The USFS defined three areas where ground disturbing activities could occur (Figure 3-1): Area A includes the primary parking lot to the north of the spring pool, Area B encompasses the entrance road and fee station, and Area C is situated along a service road and foot trail. The reconnaissance survey was designed to provide cultural resource managers and project planners with detailed knowledge of the distribution and depth of intact archaeological deposits. Equally important was the goal to generate data relevant to research concerning ancient culture-historical associations and land use patterns.

Because archaeological deposits are known or are suspected throughout the SGSRA, the objective of archaeological assessment was not Phase I reconnaissance, but rather determination of the depth, horizontal extent, character, and integrity of cultural deposits. The usual 30-m interval of shovel test pits (STPs) for Phase I reconnaissance would be insufficient to provide an accurate account of subsurface remains because disturbances potentially varied across the site. Instead, we excavated STPs at 10-m intervals to achieve the level of resolution necessary to provide an accurate map of subsurface deposits. In Areas A and B, where the project area was a polygon, STPs were excavated in transects oriented to the long axis of the project area. In Area C the transect followed a corridor along a proposed access trail. A standard system of STP nomenclature was established at the beginning of the project. Each transect was given an alphabetic designation, while individual STPs were given a numeric designation. STP numbering was restarted with each transect, giving each STP a unique designation. For example, STP 12 excavated in Transect A has the designation of STP A-12. Specific details on each area's reconnaissance layout and nomenclature will be discussed below.

Shovel test pit excavation procedures followed standard protocols. STPs measuring 50-by-50 cm in plan provided sufficient exposure to detect facies between intact and disturbed deposits. Each STP was excavated to a depth of 1 m below surface when possible. In some cases, STPs could not be excavated to this depth due to the presence of concreted shell midden, or alternatively, due to saturated deposits. When cultural materials were recovered at a depth of 100 cm below surface a 3-inch bucket auger was used to continue testing. After excavation, detailed notes were recorded on the depth, color, and composition of soil profiles and strata encountered within each STP. Particular attention was paid to delineating the contact between intact and disturbed

contexts. Evidence for recent disturbance included banded or mottled stratigraphy, or the inclusion of modern artifacts or fill.

The geographic position of each STP was acquired with a Magellan MobileMapper CX GPS. This handheld unit has an estimated horizontal accuracy of ± 1 m. The spatial data was post-processed by merging excavation results into a geospatial database. Spatial and subsurface data on individual STPs are provided in Appendix A. Excluding near-surface road gravel deposits, excavated sediment was passed through 1/4-inch hardware cloth. All prehistoric and pre-1950 cultural materials retained in the screen were bagged for analysis, while a representative sample of modern materials was also kept for comparative purposes. Artifacts were washed, cataloged, and subjected to secondary analysis in the laboratory (see Chapter 5). The artifact catalog is provided in Appendix B.

Area A - Parking Lot

Overview: Area A was tested in anticipation of resurfacing and potential expansion of the primary parking lot. A second concern was identifying a suitable location into which a bath house, septic tank, and sewage drain field could be installed with minimal impact to cultural resources. The boundaries of Area A were defined by the USFS to provide coverage that included a ca. 30 m buffer around the existing parking lot, in addition to coverage in the vicinity of a large depression to the northeast of the lot. As a result, Area A is an irregularly shaped tract that measures a maximum of 195 m along an east–west axis, 100 m along a north–south axis, and covers 1.7 ha (Figure 3-1, Figure 3-2). The tract is situated on an upland terrace, some 130 meters north of the spring pool. This portion of the SGSRA is relatively flat, lying at elevations between 6.0 and 8.0 m NAVD1988[2]. The area is approximately centered on the main parking lot of the SGSRA, and is bounded to the south by the main asphalt entranceway, and to the east by an aggregate-covered trail. Ground cover in the cleared lot consists of a mixture of grass, limestone aggregate, and asphalt (Figure 3-3C). The western and northern boundaries are situated within undeveloped xeric scrub-oak forest (Figure 3-3A).

Transects were oriented from east to west (Figure 3-2). Testing began near the northwest corner of the tract, which we located with the GPS. We began testing by establishing Transect A as a baseline. We laid out STP locations at 10-m intervals along the transect using a sighting compass to maintain orientation and a cloth tape to ensure accurate between-STP distances. This same procedure was continued throughout subsequent testing of this tract, and we used Transect A as a reference. On occasion, STPs were offset a meter or more due to dense roots or ground coverage. Transects A through J were arranged serially from north to south. Transect K was placed at the northeast corner of the tract to fill in a gap created by the difference between the transect azimuth and the project boundary's northern border. Portions of Transects H and I intercepted the asphalt roadway. A gas-powered saw was used to cut ca. 75 x 75-cm

[2] As measured from the Volusia County LiDAR dataset, relative to the North American Vertical Datum of 1988.

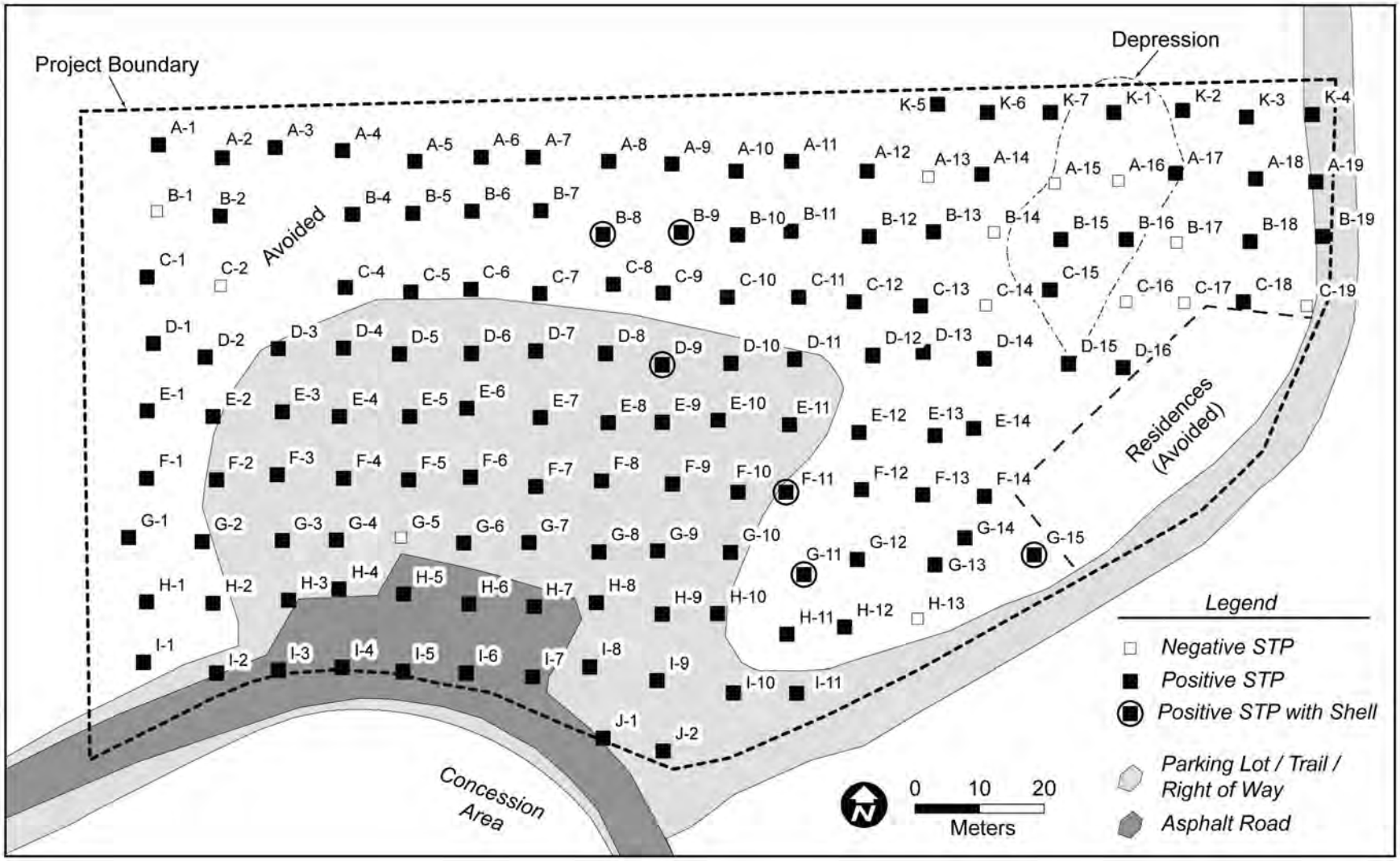

Figure 3-2. Map of shovel test pits excavated in Area A.

Figure 3-3. Photographs of shovel test pit excavation in Area A. A) forested area north of the parking lot. B) cutting through asphalt in the southern portion of the parking lot. C) grass and aggregate-covered parking lot, facing southwest.

wide holes through the asphalt (Figure 3-3B). Once the asphalt was peeled back, STP excavation proceeded as normal. After backfilling, the asphalt was replaced in its original location. Finally, two STP locations were avoided during testing, as indicated in Figure 3-2. During initial excavation of STP B-3, an underground hornet nest was disturbed, and two crew members were stung. We abandoned excavation of that STP.

Subsequent survey of the area revealed that the hornet's nest extended to the vicinity of STP C-3. Given the potential for further injury, we did not excavate there. We also avoided testing near the cleared lot on the eastern margin of the project area. This lot contains recreational vehicles, a storage shed, numerous power cables on the surface, and the high probability of buried utilities.

Results Summary: The LSA excavated 147 STPs within the boundaries of Area A (Figure 3-2). Of these, 134 encountered ancient and historic cultural deposits (based on the recovery of artifacts), while only 13 yielded no cultural materials at all. The negative shovel tests were distributed discontinuously across the tract, although some do cluster around the surface depression. A total of 1333 artifacts were recovered (Table 3-1). The artifact assemblage is dominated by lithic tools and debitage, including bifaces, hafted bifaces, microliths and unifaces, and informal modified flakes. In fact, given the distance of the SGS to the closest lithic raw material source (ca. 50 km) there is a considerable amount of lithic tools present. Pottery was also recovered, including Orange fiber-tempered wares and St. Johns plain sherds. Historic and recent artifacts—mostly glass, small brick fragments, and the occasional aluminum can pull-tab—were scattered throughout disturbed profiles. There is no evidence for sustained historic occupation at this location. Based on recovered diagnostics the intact pre-Columbian deposits date from as late as the St. Johns I period back to the Mount Taylor period, and possibly earlier. The vast majority of diagnostic artifacts are attributable to the Mount Taylor and Orange periods. A small amount of vertebrate fauna was also recovered. The low frequency is likely due to the limited presence of shell, which was encountered in only six shovel tests. Finally, evidence for disturbed deposits was encountered in a total of 59 STPs (Figure 3-4). Excluding a handful of STPs, evidence for disturbance was spatially concentrated in the grass- and asphalt-covered parking lot.

Cultural Deposit Character and Integrity: To better understand the distribution and integrity of archaeological deposits, it is instructive to consider the relationship between stratigraphic profiles, ground cover, and artifact depths. For the purposes of this discussion, STPs can be separated into areas that were *forested* (n = 89), *cleared* with grass or aggregate (n = 50), or *asphalt* covered (n = 8). Table 3-2 presents a summary of the maximum depths of disturbed deposits observed during testing, in addition to the depths of pottery, lithic artifacts, and shell.

The primary assumption behind the classification of STPs by ground cover is that that currently forested areas are less likely to have been disturbed. As noted in Chapter 2, the SGSRA has undergone significant land alteration throughout the past century. Although precise documentation for much of this land modification is lacking, historic aerial photographs do provide a sense of the changing configuration of infrastructure and ground disturbing activities. The earliest aerial photograph on record for this area is from 1941. As shown in Figure 3-5, Area A was predominantly forested, with limited evidence for ground clearance. The two exceptions to this are a roadway or trail that courses north-northeast through the tract, and a large, light-colored linear feature (indicating the land here was cleared) in the eastern aspect of the tract. The trail is

Table 3-1. Artifacts Recovered from Shovel Test Pits, site 8MR123.

Object Class	Area A		Area B		Area C		**Total**	
	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt
Biface	13	59.9	4	39.3			17	99.2
Hafted Biface	9	53.5	8	34.2	2	18.6	19	106.3
Microlith	8	2.0	7	3.3	1	1.3	16	6.6
Uniface	5	9.8	4	4.6	1	53.6	10	68.0
Modified Flake	10	32.2	3	11.8	5	27.0	18	71.0
Debitage	947	425.6	281	124.5	83	194.3	1311	744.4
Core	3	11.7			1	28.2	4	39.9
Misc. Rock	15	180.0	4	59.5	5	79.0	24	318.5
Orange Incised	9	41.4	2	7.7			11	49.1
Orange Plain	56	232.5	13	23.6			69	256.1
St. Johns Plain	3	18.6	38	104.2	2	11.6	43	134.4
Saint Johns Check Stamped					10	213.3	10	213.3
Sand Tempered Plain			3	8.1	2	4.0	5	12.1
Unidentified Pottery			18	50.3			18	50.3
Crumb Sherds[†]	186	88.5	29	13.8	10	8.6	225	110.9
Marine Shell					9	82.4	9	82.4
Paleofeces					4	10.5	4	10.5
Vertebrate Fauna	15	14.2	26	18.5	1466	923.2	1507	955.9
Modified Vertebrate Fauna					2	6.2	3	13.4
Historic	54	138.8	2	27.0	15	163.5	71	329.3
Total	1333	1308.7	442	530.4	1619	1832.5	3394	3671.6
Survey Area (ha)	1.67		0.57		0.22[‡]		2.46	
Density (artifacts/ha)	798		775		7359		1379	
Density of non-organic artifacts (artifacts/ha)	789		729		622		760	

[†]Sherds less than ½" in maximum size.
[‡] Corridor with 4-m wide buffer.

overgrown today, but is still evident on the surface as a 10- to 20-cm deep depression. The eastern anomaly corresponds to the large depression evident on contour maps. Aerial photographs of subsequent years (see Chapter 2) illustrate that the entrance roadway, and likely the asphalt covered portion of the parking lot, was constructed sometime before 1958. The rest of the parking lot appears to have been cleared sometime after 1974.

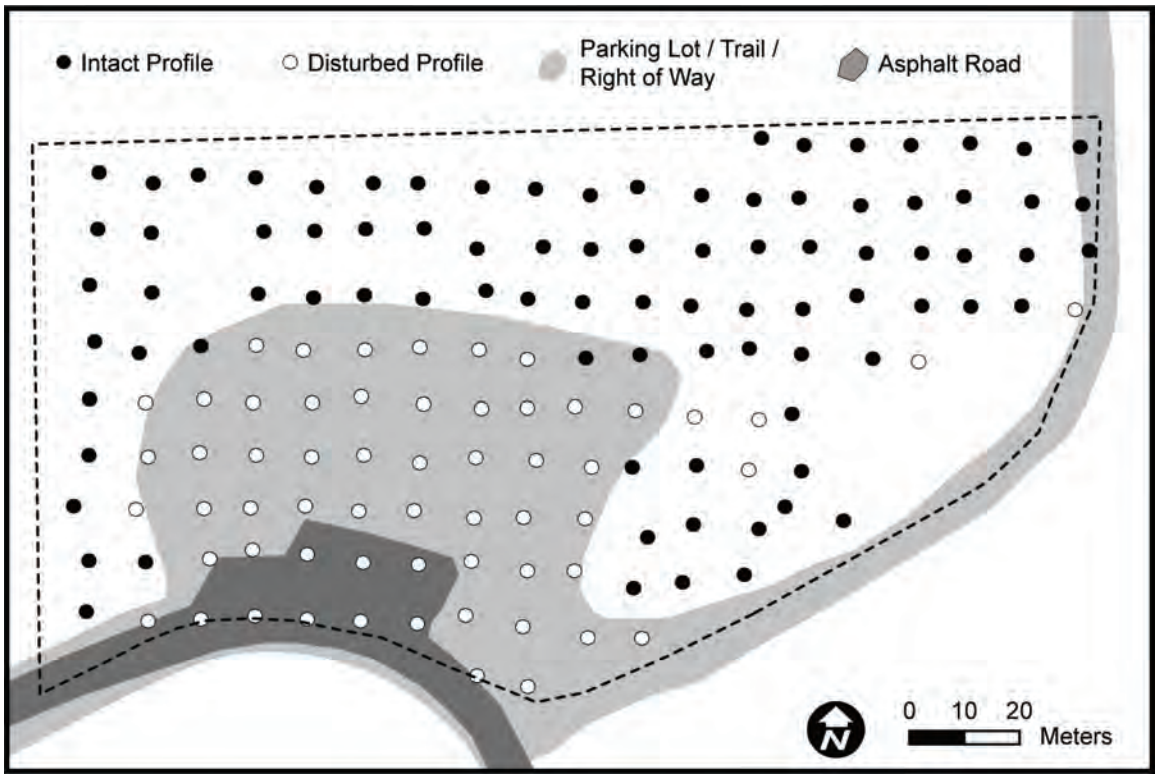

Figure 3-4. Distribution of shovel test pits with evidence for disturbances in Area A.

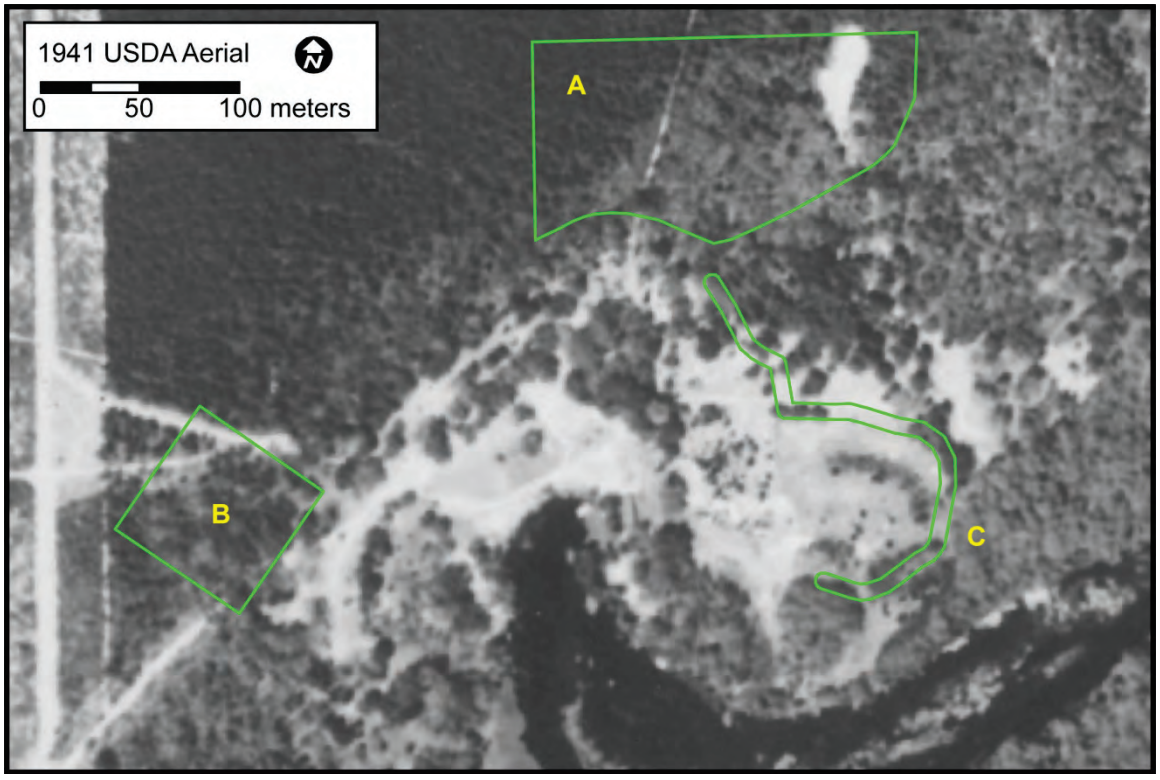

Figure 3-5. USDA 1941 aerial photograph showing the location of shovel tested areas.

Table 3-2. Summary of Subsurface Depths for Disturbed and Artifact-bearing Deposits Within Area A.

Disturbed Depth (cm)	Count	Mean	Median	Std. Dev.	Min.	Max.
Asphalt (n = 8)	8	61.8	59	21.4	43	110
Cleared (n = 50)	44	24.8	23	10.1	8	50
Forested (n = 89)	7	31.4	20	31.6	16	103
Total† (n = 147)	59					
Top of Pottery (cm)	**Count**	**Mean**	**Median**	**Std. Dev.**	**Min.**	**Max.**
Asphalt	3	89.3	90	9.0	80	98
Cleared	17	49.8	50	20.1	0	90
Forested	23	57.2	50	13.0	40	90
Total†	43					
Top of Lithics (cm)	**Count**	**Mean**	**Median**	**Std. Dev.**	**Min.**	**Max.**
Asphalt	7	45.7	45	13.7	30	65
Cleared	49	44.3	50	22.6	0	85
Forested	69	57.0	60	22.3	0	100
Total†	125					
Top of Shell (cm)	**Count**	**Mean**	**Median**	**Std. Dev.**	**Min.**	**Max.**
Asphalt	0	-	-	-	-	-
Cleared	1	-	30	-	30	30
Forested	5	57.0	50	22.2	30	80
Total†	6					

†Total includes only STPs for which explicit subsurface data were available.

Today, forested areas are present on the north, east, and west borders of the survey tract. Shovel tests in the forested/northern project area have the following generalized profile: 0–15 cm below surface (cmbs) light brownish gray (10YR6/2) sand, 15–25 cmbs light gray (10YR7/1) sand, 25–100 cmbs strong brown (7.5YR5/6) sand (Figure 3-6A). Although there is some variability in the depths of these horizons, the profile is generally consistent with the USDA-NRCS definition of Paola fine sand. A typical soil profile of Paola fine sand yields the following horizons: 0–15 cm light gray sand with organic matter; 15–70 cm light gray fine sand; 70–166 cm yellow fine sand.

Clearly disturbed profiles were encountered in only 7 STPs (Table 3-2), with depths ranging between 16 and 103 cm below surface (cmbs). Three of these (E-2, G-2, and C-19) were situated on the forest border. STP E-2 and G-2 were deeply disturbed (between 90 and 103 cmbs) based on mottling, or in the case of G-2, historic artifacts. There is nothing on the surface to indicate why these two areas were impacted so deeply. STP E-2 may have been a filled in animal burrow, as only one half of the unit was disturbed, and no historic artifacts were recovered below 20 cmbs. On the other side of

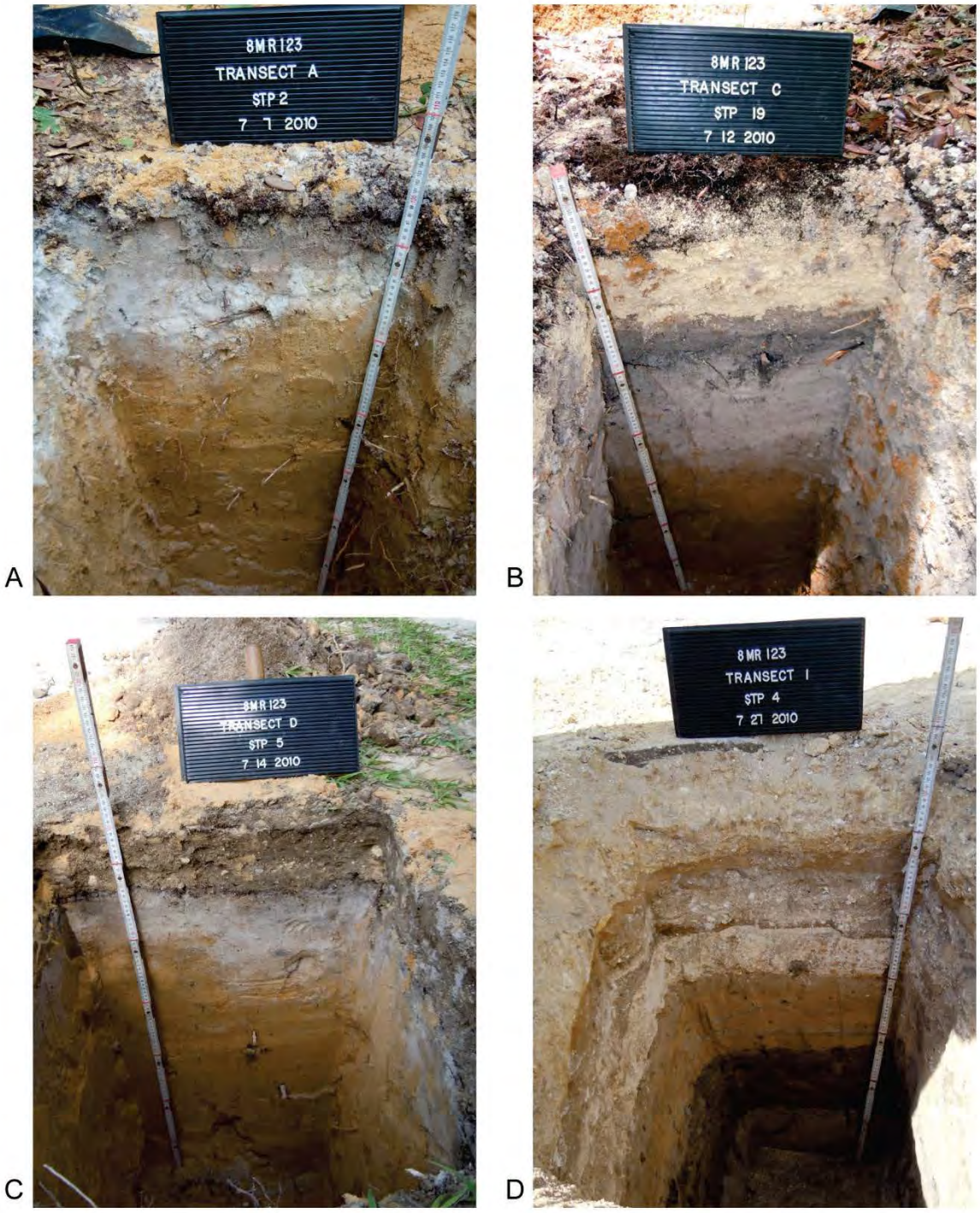

Figure 3-6. Photographs of selected Shovel Test Pit profiles within Area A. A) STP A-2, B) STP C-19, C) STP D-5, D) STP I-4.

Area A is STP C-19. Unlike the prior examples in which the original soil was disturbed, in C-19 a 16-cm thick layer of limestone aggregate road fill was emplaced upon the original ground surface (Figure 3-6B). That is, the original soil profile remained intact. The ground surface and was simply capped during road construction. This kind of disturbance is prevalent in the parking lot as well (see below). The rest of the disturbed STPs are situated to the west of the avoided residential area (E-12, E-13, F-13, and D-16). Here, the disturbance (made evident by banded or mottled stratigraphy) was limited to the top 15 to 20 cm. These may be associated with the depression.

The above described disturbances involved the reworking or deposition of soil and other fill. There was another kind of disturbance encountered in the forested zone that was limited to the 2-m deep depression in the northeast corner of Area A. As previously described, one goal of the Area A testing strategy was to determine whether this depression was a natural feature such as a sinkhole, or a product of recent land alteration. Inspection of historic aerial photography suggests that this area was cleared of vegetation in 1941. The morphology of the depression further supports the notion that this area represents a borrow pit. First, the depression is linear (and not circular as would be expected of a sink). Secondly, the margins of the depression are irregular and jagged, with several sides having the appearance of heavy machinery cuts. Finally, all the boundaries are relatively steep except for the south end which has a gentler slope. This area may have been an access point for equipment.

Further support for the depression as borrow pit comes from the shovel test results. In general, STPs within the depression were negative or recovered limited artifacts. STP C-15, for instance, yielded only a .22 cal rimfire casing near the surface. Otherwise, only 9 lithic flakes in total were recovered from 5 STPs in or bordering on the pit. The soil profiles do not show any evidence typical of land modification such as mottling or banding. However, a comparison of soil profiles in the vicinity of the depression suggest that the upper meter or more of the original ground surface was stripped away. Depicted in Figure 3-7 is a west to east cross section diagram of the depression, highlighting the relationship between observed soil horizons and elevation. Intact soil horizons at high elevations include an organic A horizon, a light gray to white B horizon, and a yellow or strong brown Bt horizon. Within the depression the A horizon was either very shallow (only a few centimeters thick) or not present at all. Moreover, the B horizon was all but missing. In consideration of all the available data, it is our conclusion that the depression is not natural, but is the result of excavation sometime prior to 1941.

Based on our observations, the STP profiles within the forested area represent developed soil horizons, there are no cultural strata that can be visually observed. That is, all organic matter typical of a living surface has been stripped by pedogenic processes. However, a consideration of the depths at which pottery, lithic artifacts, and shell were recovered indicates that this portion of the site is largely intact (Table 3-2). This situation can be visualized in a diagram comparing the absolute surface elevation, depth of testing, and thickness of cultural deposits. As shown in Figure 3-8A, the top of cultural deposits

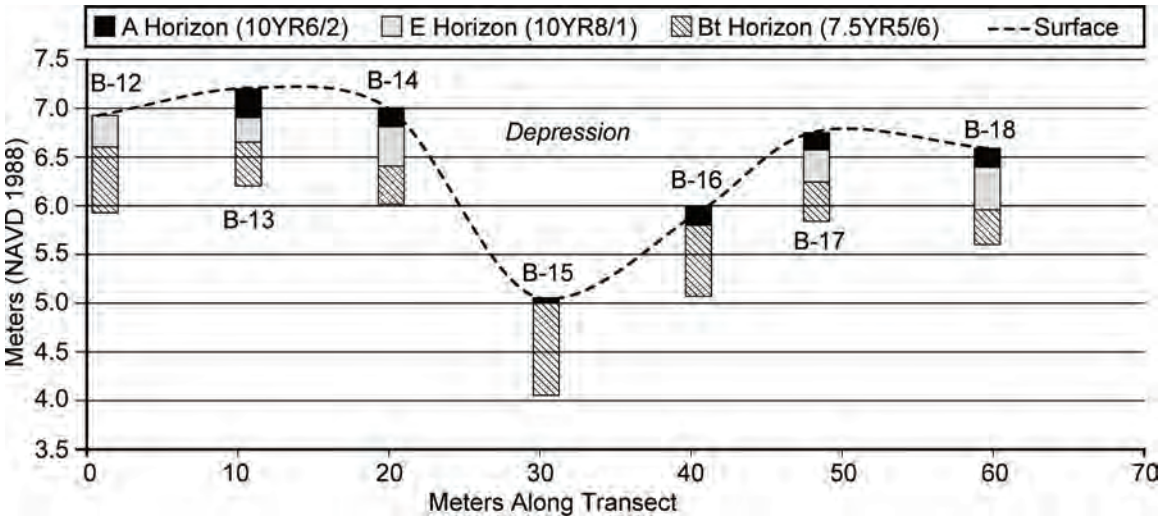

Figure 3-7. Comparison of shovel test pit soil horizons and absolute elevation in the vicinity of the surface depression in Area A (vertically exaggerated).

is principally confined to elevations starting between 40 cmbs and 50 cmbs. Artifact-bearing sands ranged in thickness between 50 to 100 cm. The notable exception to this west to east trend is in the vicinity of the surface depression, lending further support to its identification as a recent borrow pit from which soil was removed.

The depths of recovered artifacts indicate that the site is not only intact, but is well-stratified. That is, cultural materials were recovered in their expected chronological sequence. Pottery (mostly Orange Plain and Incised wares) was recovered between 40 and 90 cmbs, with a central tendency between 50 to 57 cmbs. In contrast, lithics (including debitage and stone tools) were first encountered anywhere from the surface all the way to a depth of 100 cmbs. Although widely distributed in elevation, the central tendency of the top of lithic assemblages was around 60 cmbs. This lower elevation is consistent with the well-documented pattern of higher frequencies of chipped stone tools in preceramic components.

While useful to consider broad trends, summary statistics actually mask some clearer patterning which is revealed in individual STPs. Due to the manner in which shovel tests are excavated, it was not always the case that precise depth of diagnostic lithic tools could be recorded. However, consider the following examples where explicit depths for artifact assemblages could be recovered. In B-9, pottery was found between 45 and 75 cmbs, while lithic debitage occurred between 75 and 85 cmbs. Similarly, in B-10 pottery was found at 50 cmbs, whereas lithic debitage was recovered between 70 and 90 cmbs. Similar separation of artifact assemblages by depth were noted in C-5, C-8, C-9, D-1. Hafted bifaces typically associated with the preceramic Mount Taylor period tended to occur at lower elevations. For example, a diagnostic Newnan hafted biface was recovered in STP D-13 at a depth of 80 cmbs (FS 65.1). Another hafted biface,

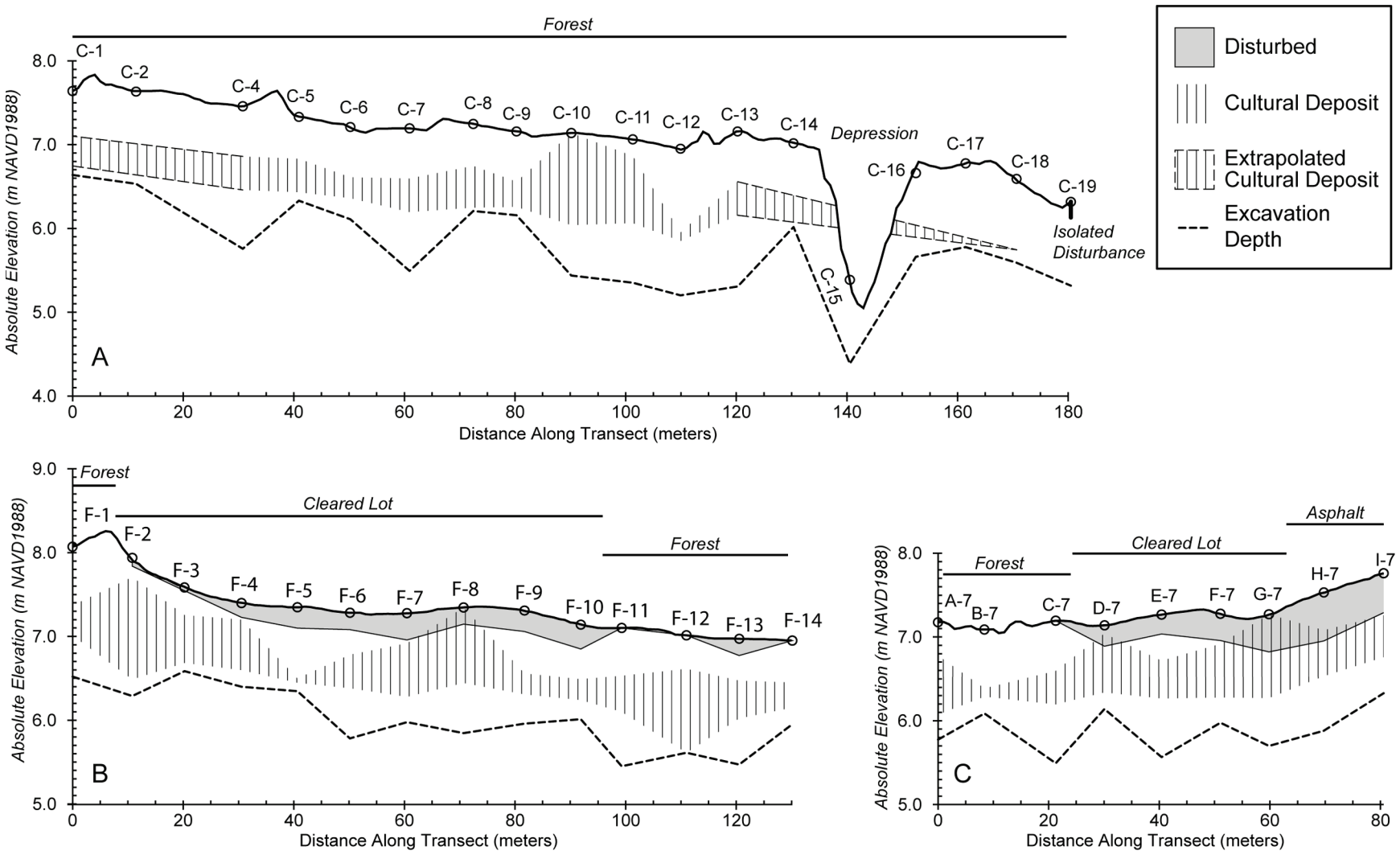

Figure 3-8. Comparison of Area A shovel test pit absolute elevation, ground cover, and depth of disturbed deposits (vertically exaggerated). A) west to east. B) west to east. C) north to south.

approximating a Florida Archaic Stemmed variety, was found in STP C-13 (FS 39.1) at a depth of 95 to 100 cmbs. The chronological position of this form is less well understood, although it likely dates prior to the Orange period.

The one possible exception to the lack of visible cultural deposits are lenses of freshwater shellfish in 5 STPs within the forested area (including B-8, B-9, F-11, G-11, and G-15). The presence of shellfish this far away from the water is extremely interesting, and cannot be simply reduced to incidental shellfish disposal. That is, short of an animal preferentially burying shellfish, they had to be emplaced there by humans away from the primary locus of shellfish deposition. Shell was encountered at depths between 30 and 80 cmbs with a central tendency between 50 and 57 cmbs. The lenses tend to be thin (between 5 and 10 cm thick), and composed primarily of *Viviparus* shell. Based purely on depth, these would appear to be associated with the Orange occupation, although only B-9 (and D-9 in the cleared lot) yielded Orange pottery. The results of Test Unit 6 (Chapter 4) suggest that the shell clusters are in fact associated with the Orange component. Finally, it is important to note that the distribution of shellfish tends to be clustered into two or more groups, to the north and east of the parking lot. Their discontinuous distribution provide hints of discrete activity areas.

The patterns outlined above provide a sense of the integrity and character of undisturbed cultural resources. We can now turn to those portions of Area A that show evidence for recent land alterations. Unlike the forested zone, near-surface disturbance was evident across the parking lot (Figure 3-4). In fact, all but three STPs (D-3, D-10, and D-11) showed evidence for alteration, and these were located on the margins of the parking lot. Today, the parking lot is covered with bare ground, limestone aggregate, and grass with oak trees interspersed (Figure 3-3C). To recap, as early as 1941 this area was still forested with only a dirt trail coursing through it (Figure 3-5). By 1958, the road which presently forms the southern and eastern border of Area A had been constructed. The asphalt and grass parking lot was cleared and constructed sometime between 1974 and 1990, when the SGSRA was transferred to the USFS.

Within the asphalt-free zone, STPs were typically disturbed to a depth of 23 cmbs, although there was a range between 8 and 50 cmbs (Table 3-2). STPs had two kinds of disturbed profiles. Some STPs suggest that once the area was cleared, material was deposited upon an intact surface. STP D-5, for example, has 14 cm of road aggregate superimposed upon a buried A horizon (Figure 3-6C). Below this buried A, the soil profiles were consistent with those identified in the forested zone. Thus, in these cases, there was limited subsurface disturbance (likely limited to the removal of trees and roots). In others, however, there was evidence for more intensive disturbances in the form of banded or marled sands and aggregate, typically between 15 and 30 cm below the lot surface.

Although disturbed to varying depths by cutting and filling, it is likely that much of the cultural resources within the asphalt-free area were left intact. This disposition is illustrated in a west to east interpolated subsurface profile generated from the STP results (Figure 3-8B). In general, cultural resources are found below the zone of disturbance.

Although both pottery and lithics were found near the surface, they tended to be found at least 50 cm below the current lot surface. Furthermore, this portion of the site also appears to be well stratified. Just like the forest, pottery was recovered above lithic-only assemblages in a number of STPs (including D-5, E-7, E-9, G-11, H-8, I-9, and J-2).

In contrast to the previously described zones, the asphalt-covered lot has undergone significant alteration. Of the 8 STPs excavated through the asphalt, all were disturbed between a depth of 43 and 110 cmbs, with a tendency towards 60 cmbs (Table 3-2). Profiles of STPs in this zone were variable, but tended to show evidence of both cutting and filling. The most extreme case is exemplified by STP I-4 (Figure 3-6D) which was impacted to a depth of 110 cmbs. Several strata are evident. Towards the base there is a banded sand, which is covered by a gray sand layer that was filled with charcoal, presumably from trees or vegetation that was burned during the clearing process. This layer is covered by alternating lenses of yellow sand and charcoal enriched sand. The upper layers of the STP are composed of limestone aggregate, apparently deposited during the process of road construction (and possible refurbishment). Although not all STPs were this extensively altered, historic and recent objects were recovered deep within STPs. For example, a rusted spark plug was found in H-6 between 70 and 100 cmbs. Given the limited number of STPs that penetrated the asphalt, it is difficult to say precisely what ancient cultural deposits remain. Lithics, for example, were found in 7 STPs, but were typically at a higher elevation than elsewhere in Area A. Pottery, to the contrary, was found only between 80 and 98 cmbs, much lower than in either the lot or forest. Indeed, consideration of a north to south STP-derived profile (Figure 3-8C) suggests that the construction of the asphalt portion of Area A either cut or mixed the upper layers of cultural deposits.

Collectively, the STP results within Area A demonstrate that there is a regular pattern to disturbances across Area A. Figure 3-9 presents below surface disturbed deposit contours. The forest showed very little evidence for sub-surface reworking of deposits. The one exception to this is the depression and associated clearing to the north and east of the project area. Within the parking lot, the depth of disturbance increases from only 10 cm or so in the north down to 90 or more cm to the south (see also Figure 3-8C).

Spatial Patterning: The close-interval grid and large horizontal extent of Area A is conducive for examining spatial patterning in the distribution of artifact assemblages. The caveat that these trends likely reflect hundreds — if not thousands — of years of activity must be remembered. Moreover, because our testing strategy did not include delimiting site boundaries it is unknown how much further cultural resources extend outside the project tract. Although repeated occupations can lead to overlapping and fuzzy boundaries, a recent study of Archaic use of space suggests that it was highly structured and partitioned over longer stretches of time (Randall 2010). Indeed, there are several intriguing spatial patterns apparent in the STP finds (Figure 3-10).

As the by-product of tool production lithic debitage provides one possible baseline for the structure of past activities. Depicted in Figure 3-10 is an interpolated

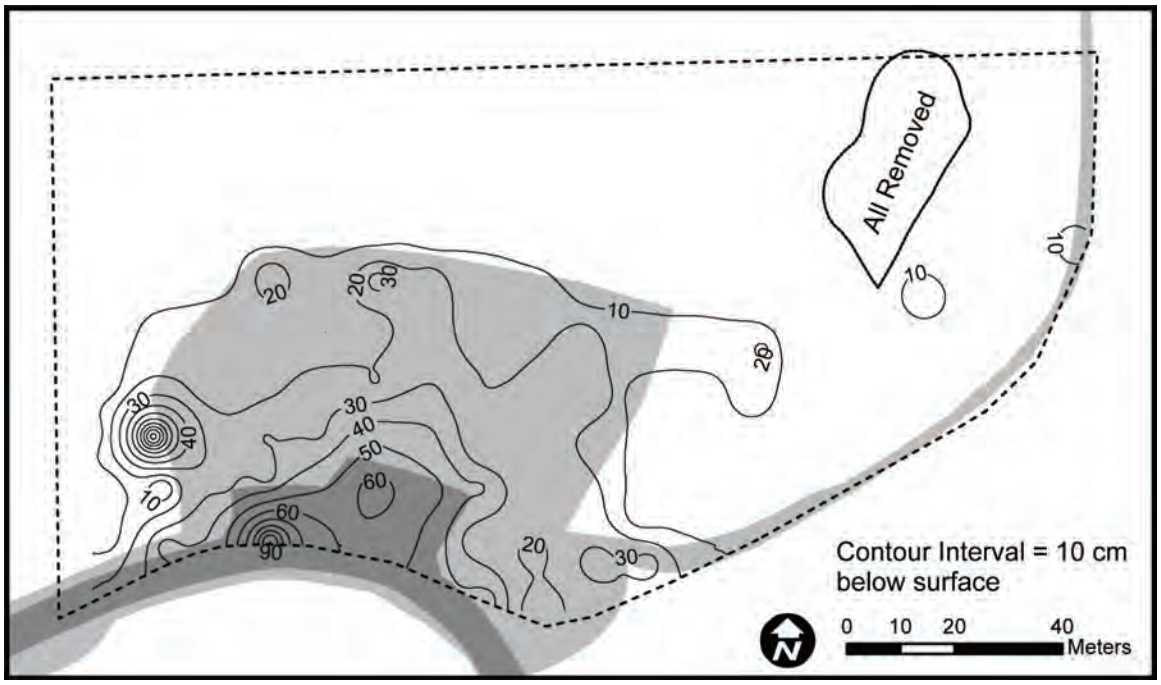

Figure 3-9. Interpolated depth of disturbance within Area A.

density map of debitage (calculated by flake count per STP in ESRI ArcGIS). A total of 947 flakes were recovered from Area A. At the largest scale, debitage was widely distributed throughout the survey area, with only 21 STPs not yielding lithic flakes. The negative STPs were principally clustered around the borrow pit. At a smaller scale, two large clusters of dense debitage are present. The largest concentration is situated along the western border of the parking lot, and measures roughly 70 m north-south and 40 m east-west. Debitage counts here average around 17 flakes per STP, and range between a low of 6 (STP I-2) to a high of 80 (STP D-3). The other cluster is located in the east-northeast corner of the parking lot leading up to the borrow pit. This area measures roughly 50-m long and 30-m wide. Debitage counts average 11 per STP, with a range between 5 (D-9, D-12, D-13) and 33 (D-10). There are other clusters with average counts above 10. One is located to the north of the parking lot (A-8, A-9), while two others (A-14, K-6) are situated on opposite sides of the borrow pit (A-19, B-18). In the latter two cases, it is likely that there was one primary cluster that was bifurcated when the borrow pit was excavated.

By itself, the distribution of debitage tells us little of the possible range of practices occurring onsite. Chapter 5 details the technological characteristics of the lithic assemblage, which are consistent with both tool maintenance and late-stage bifacial production. However, consideration of lithic tool classes (bifaces and other chipped stone tools) lends credence to the notion that there are discrete activity zones (Figure 3-10). Consider, for example, the location of bifaces (n = 13) and whole and fragmentary hafted bifaces (n = 9). Excluding three examples (H-8, H-9, H-10), bifaces tend to be

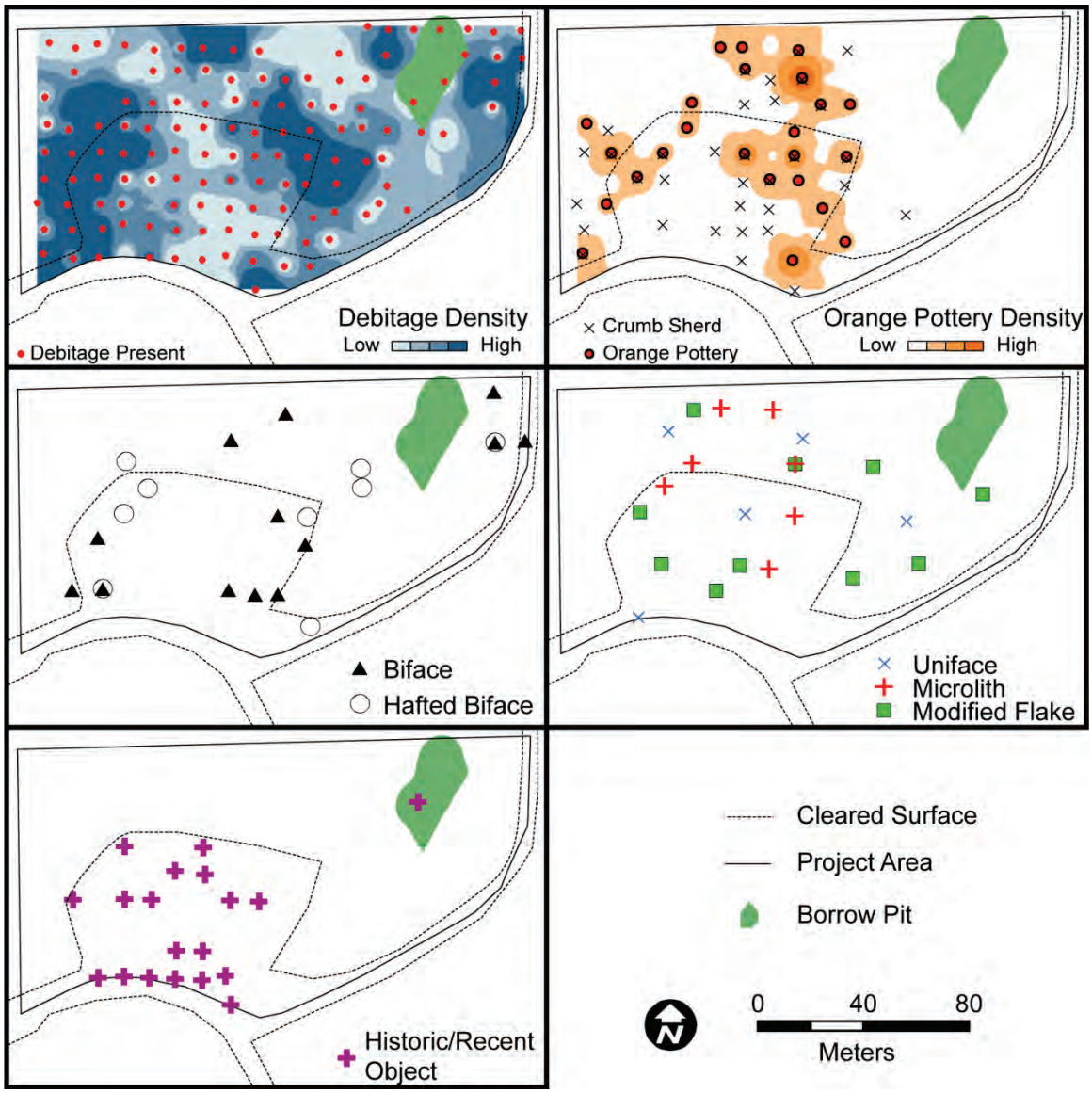

Figure 3-10. Distribution of artifact assemblages within Area A.

situated amidst lithic debitage clusters. Even these outliers are immediately adjacent to flake clusters, and thus their association cannot be ruled out based on STP results alone. In contrast, unifaces, microliths, and modified flakes tend to cluster away from or on the margins of biface and debitage clusters. This is most evidenced on the western half of the tract, where microliths and modified flakes are spread across the parking lot. Modified flakes were also present along the southeast border of the tract. Again, the chronological relationship of many of these tools is largely speculative. We know, for example, that the hafted bifaces are Mount Taylor or Orange period in origin, while many of the bifaces are likely Archaic as well. There is good reason to suspect the microliths date towards the fifth millennium (based on their presence in large quantities at Lake Monroe Outlet Midden and Thornhill Lake), although they have been found in post-

Archaic components elsewhere in the state. The unifaces likely to date from the Early to Middle Holocene, while modified flakes could date to any time period. Regardless, the presence of formal tools (bifaces and unifaces) coupled with expedient tool forms is indicative of a wide range of on-site activities. The function of the microlithic assemblage is unclear (see Chapter 5), but presumably they had a narrow purpose based on their morphology and formality. Taken together, the spatial and technological characteristics of the chipped stone tool assemblage are indicative of an array of practices that may have been segregated between production and use zones.

In contrast to the lithic assemblages, the pottery recovered from Area A provides an opportunity to examine chronologically restricted spatial patterning. Sherds of the St. Johns period were identified in three widely-spaced STPs (A-11, H-8, G-13). In each case the sherds were a plain variety. The lack of check stamped wares would suggest a pre-AD 750 date of occupation, but the sample size is far too small to state this with confidence. Post-Archaic occupation of this portion of the upland would appear to have been infrequent, or not involving the deposition of pottery. In contrast, 24 STPs yielded fiber-tempered pottery (not including crumb sherds). This assemblage includes 9 (41.4 g) Orange incised examples and 56 (232.5 g) Plain varieties, with sherd counts ranging between 1 to 17 per STP. On the basis of technology and style, these sherds are consistent with the later Orange occupation documented on the south side of the run (Gilmore 2011). Orange series sherds were recovered across much, but importantly not all, of Area A. At the coarsest scale (Figure 3-10) fiber-tempered sherds were found exclusively in the western 2/3 of the survey area. Although this may be a product of the borrow pit and the avoided residential zone, the persistence of sherds to the west suggests that the Orange occupation was spatially discrete, and centered around the parking lot.

The distribution of fiber-tempered sherds warrants closer inspection (Figure 3-11). While tenuous, the STP results hint at activity areas (possibly household clusters) arranged in an arc or circle. In general, fiber-tempered pottery is restricted to an arcuate swath through the middle of the survey tract. The interior diameter of the swath is roughly 70 m, while the exterior diameter is close to 150 m. At smaller scales, this swath is broken up by voids characterized by either a lack of pottery, or only small fiber-tempered crumb sherds (crumb sherds are any sherd less than 0.5” in maximum dimension). Presumably, crumb sherds have experienced higher incidence of breakage than non-crumb sherds. Two possible explanations include (a) taphonomic factors such as trampling, or (b) size-grading during cleaning and sweeping of living areas. Looking at Area A, the largest void is roughly 70 m in diameter (labeled as a “hypothesized plaza/clearing” in Figure 3-11). This void also corresponds with the parking lot, and one reason for the lack of sherds could be recent land alteration. However, as shown in the prior discussion on the integrity of deposits, artifact bearing strata within the lot largely remain intact (save for the area beneath the asphalt). The center of the “plaza” contains only crumb sherds, while it is bordered by STPs bearing plain and incised sherds, with discrete shell deposits present further to the east. Fiber-tempered sherds are found around this central void (to the north, west, and east). This arcuate distribution is anywhere between 10 and 50-m wide. Within this ring of fiber-tempered sherd-bearing STPs are

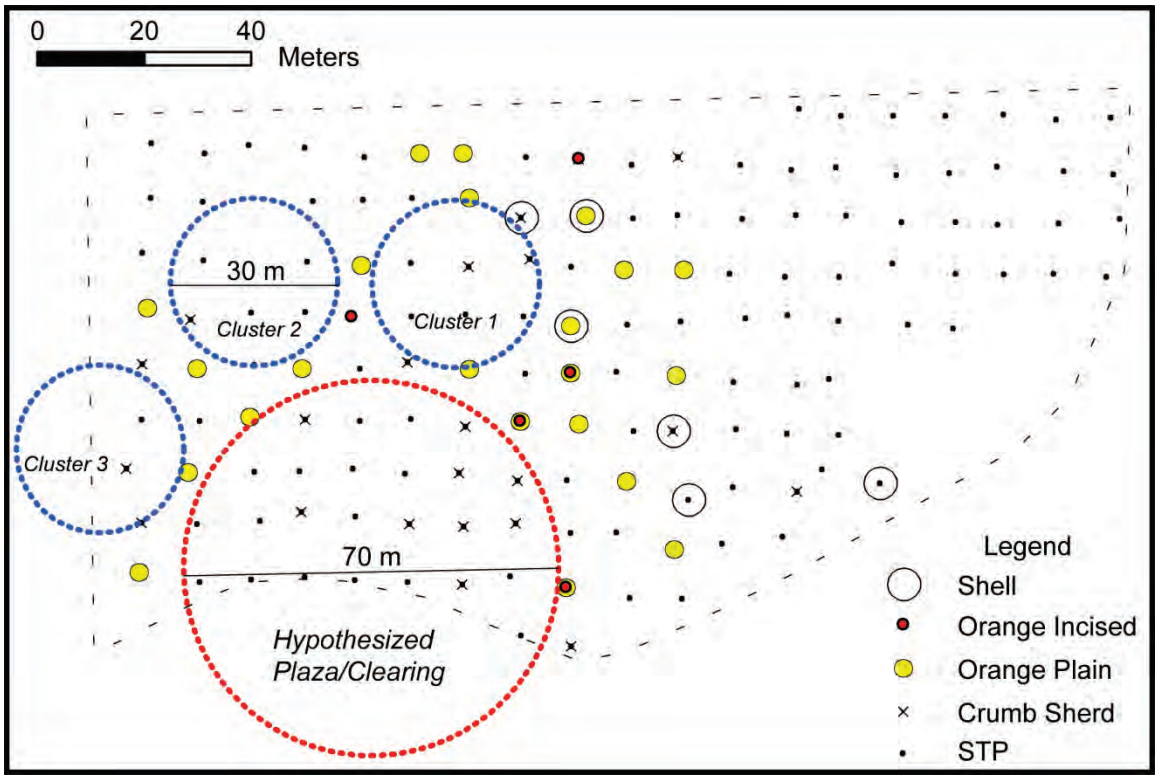

Figure 3-11. Possible Orange period household clusters based on the distribution of shell and pottery, Area A.

smaller (30-m wide) voids (labeled as "cluster" in Figure 3-11). The best example, Cluster 1, is situated just to the north of the main void. It contains only one crumb sherd in the interior, and is bordered by STPs bearing sherds and shell on almost all sides. More tenuous examples are situated to the west, southwest of Cluster 1. Cluster 2, for example, may be the product of avoiding STPs B-3 and C-3. Cluster 3, on the other hand, may just be an artifact of being situated on the survey border.

The incidence of pottery fragmentation appears to be non-random, and presumably reflects areas which have undergone differential cleaning and/or trampling. One possible interpretation of the discrete and structured distribution of fiber-tempered sherds is that they collectively represent a circular or curvilinear village. If curvilinear, the central plaza would measure approximately 70 m in diameter, while the exterior of the living area (as defined by the presence of pottery) is roughly 150 m in diameter. Household clusters around the village edge would be approximately 20 m wide. If an open arc, it would face the spring pool.

To be sure, making inferences based on shovel test data carries many pitfalls. Even 10-m interval gridded testing is a coarse resolution for illuminating the organization of past activity areas. However, we know that Late Archaic Orange and affiliated communities routinely arranged themselves in curvilinear settlements. Indeed, arcuate or circular architecture built from shell is a hallmark of Orange and Stallings period

communities on the coast of Florida and Georgia. The defining architectural element is a central plaza, which can range between 25 to 200 m in diameter (Russo 2004). These plazas are frequently devoid of shell, although pits can be found in them. The plaza is surrounded on at least three sides by shell, mounded to varying heights. Although there are many isolated examples (which tend to be on the smaller side of the spectrum), others can be nested. For example, Rollins shell ring is composed of a central U-shaped plaza (ca. 150 m in diameter) which is surrounded by smaller shell rings arranged around 20 to 30-m diameter plazas. Moreover, not all circular villages are composed of mounded shell. Working in the middle Savannah River region, Sassaman et al. (2006) were able to infer circular villages based on the distribution of relatively clean interior plazas which were ringed with occupation debris. Arranged between the plaza and exterior midden were pit clusters that likely corresponded with household architecture.

Delineating Orange settlements within the St. Johns basin is an ongoing process. To date, all possible Orange village examples have been identified in dense shell deposits. Sassaman (2003c) tentatively identified an arcuate Orange compound at Blue Spring on the basis of primary and secondary midden deposits and pit features. Closer to 8MR123, research by the LSA on the south side of the Silver Glen Spring Run (Site 8LA1) has delimited two Orange period components. Locus B is a small shell bearing site at the same elevation as Area A. The deposits are characterized by deep steaming pits and mounded shell (Gilmore 2011). Aside from pits, however, the arrangement of activities onsite remain poorly understood. The other component is 8LA1-East, which Wyman described as a U-shaped shell mound. Although much of the site has been destroyed, LSA's continued research there suggests that at the largest scale Orange communities were responsible for the U-shape configuration of the mound. Evidence for discrete habitation areas has been less forthcoming, although a GPR and close-interval coring survey delimited a possible circular arrangement of shell in varying densities. More research will be necessary at all these locations to further define the spatiality of Orange habitation space. Wyman also described an amphitheater of shell around the main pool at 8MR123, much of which may date to the Orange period (see bucket auger results below). Circularity in villages and monuments has precedent along the St. Johns, as well as with culturally-affiliated groups across the lower Southeastern United States. Whether or not Area A contains a shell-free circular village will take further testing. Chapter 4 reports the results of stratigraphic testing on the edge of Cluster 1.

In final consideration of the spatial distribution of finds within Area A, just as interesting as what we did find are those cultural categories that are absent or found in small amounts. Historic objects (mostly non-diagnostic glass, metal fragments, and the rare ceramic) are clearly concentrated in the parking lot area and borrow pit (Figure 3-10). Further back in time, there is limited evidence here for post-Archaic occupations. At the early end of the chronological spectrum, there were tool fragments with morphologies consistent with the late Pleistocene or Early Holocene cultures. Also found in limited quantities frequencies were organic objects, such as vertebrate fauna. Marine shell was absent. The low incidence of organic objects is not a surprise given the lack of extensive shellfish deposits. Those fragments that were found, however, underscore that a variety of activities did occur in this place.

Area B – Fee Station

Overview: Area B was tested in advance of the proposed installation of a fee station kiosk and reconfiguration of the entrance road (Figure 3-1). Currently there is an unused wooden kiosk (8 x 6 ft) on the south side of the entrance road built on top of a concrete footer (14 x 7 ft). Preliminary plans call for the demolishment of the extant kiosk, and construction of a larger fee station in the middle of the road. The entrance roadway would also have to be expanded to allow vehicles to turn around. Area B was defined by USFS as a ca. 75-m long segment of the road, with a 45 m (150 ft) buffer to the north and a ca. 30-m buffer (100 ft) to the south. As a result of these requirements, Area B is a square tract measuring 75 m on a side, and covers 0.57 ha. The tract straddles, and is oriented parallel with, the entrance roadway (Figure 3-1, Figure 3-12). The roadway is asphalt-covered, and is bordered by a ca. 4-m wide right-of-way (ROW) on either side. The eastern border of Area B intersects with a cleared power line corridor. Like Area A, the project area is situated on an upland terrace some 120 m from the spring pool. This portion of the SGSRA slopes down towards the spring, dropping in absolute elevation from a high of 10.0 m in the west to 5.0 m in the east. Ground cover north of the road is an undeveloped xeric scrub-oak forest, while south of the road is a mixture of recent juniper and mowed lawn (associated with the land manager's cabin). Historic aerials indicate that the current road was established between 1941 and 1958 (Figure 3-5). This road replaced a trail that coursed along the southern border of the project area. At least two cleared corridors were present in the northeast corner of the tract in 1941. These have been replaced by the current utilities corridor.

Transects were oriented parallel to the road, and were excavated from southwest to northeast (Figure 3-12). Testing began with STP M-1, which was situated adjacent to a posted entrance sign established by the USFS as the western boundary of the project tract. We laid out STP locations at 10-m intervals along the transect using a sighting compass to maintain orientation and a cloth tape to ensure accurate between-STP distances. Occasionally STPs were offset a meter or more due to dense roots or ground coverage. Transects N and O were laid out to the south of Transect M, while Transects P–S were located on the north side of the road. Unlike Area A we did not test underneath the asphalt roadway. The dense distribution of trees in Area B necessitated the exclusive use of the bucket auger in 6 STPs (O-5, P-2, P-7, P-8, Q-5, and R-7). Cultural materials were recovered in only STP P-8, no doubt due to the smaller sampling size of the auger. One STP location was avoided (O-8) due to the presence of marked utilities.

Results Summary: The LSA excavated 55 STPs within the boundaries of Area B (Figure 3-12). Of these, 49 encountered cultural deposits while 6 yielded no cultural materials at all. Excluding STP S-3, all negative results were in locations where only the bucket auger was used. A total of 442 artifacts were recovered (Table 3-1). This density is comparable to Area A. Also similar was the artifact assemblage composition, which is dominated by lithic tools and waste flakes, including bifaces, hafted bifaces, microliths, unifaces, and modified flakes. Unlike Area A, the majority of pottery was post-Archaic in age. St. Johns Plain was the most abundant, with minor amounts of non-spiculate pasted-wares. Orange Plain and Orange Incised were also recovered, but in smaller

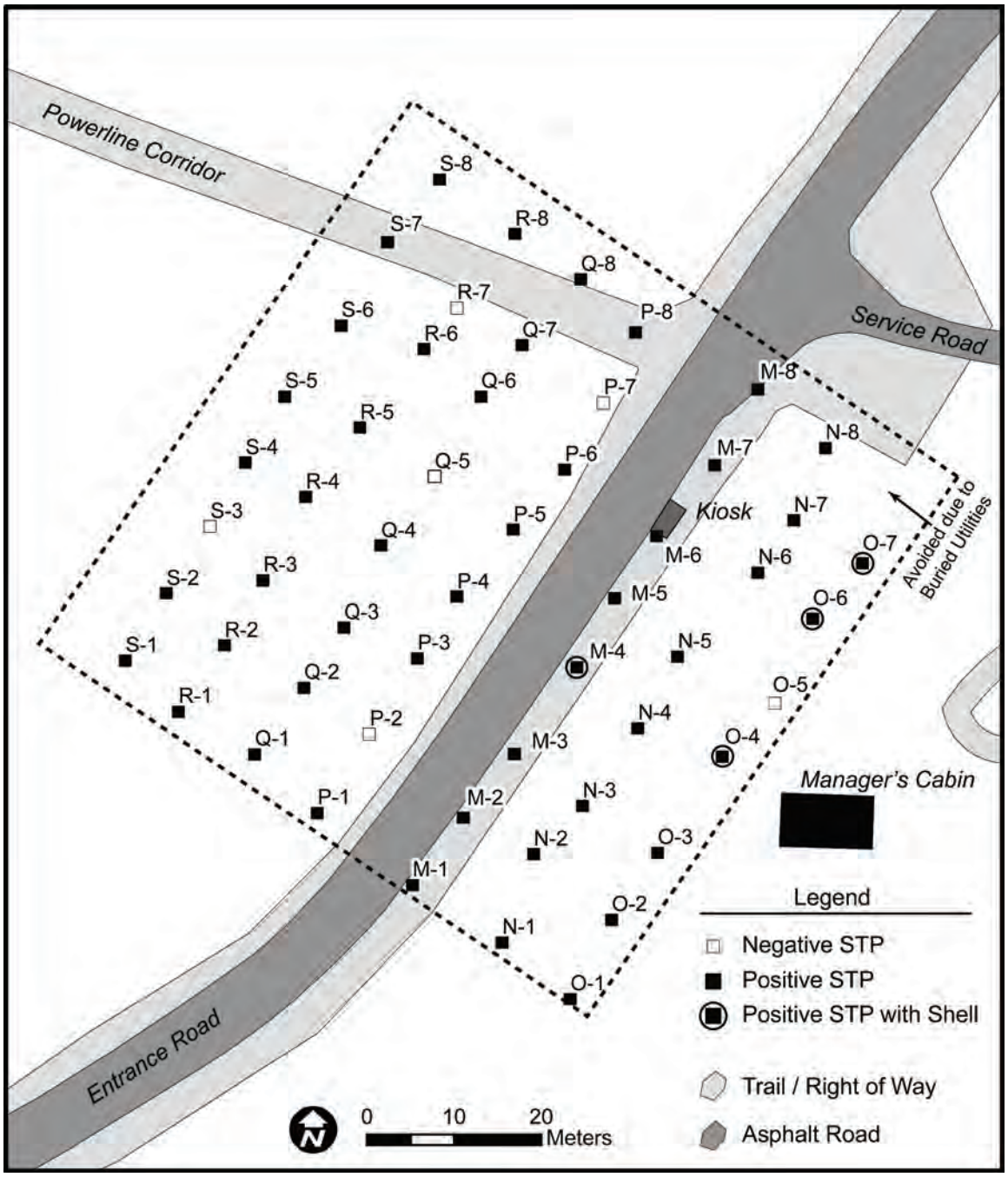

Figure 3-12. Map of shovel test pits excavated in Area B.

amounts than Area A to the east. On the basis of diagnostic artifacts, there are Mount Taylor through St. Johns period components within Area B. Early Holocene occupation is also suspected based on the morphology and patination of some stone tools. Vertebrate fauna was recovered with greater frequency than Area A, albeit still in small quantities. The majority of these bone fragments were calcined or highly mineralized, and came from the lower levels of shovel tests. Shell was encountered in only 4 STPs. However,

only STP M-4 yielded shell from intact contexts. Finally, disturbed contexts were identified in 12 STPs (Figure 3-13). These were clearly associated with the ROW, utilities corridor, or the southern boundary of the survey tract.

Cultural Deposit Character and Integrity: As in Area A, it is instructive to consider the relationship between profiles, cultural deposits, and ground cover. For the purposes of this discussion, STPs can be separated into areas that were *forested* (n = 41), *cleared* with grass, aggregate, or bare ground (n = 6), or within the *ROW* (n = 8). Table 3-3 presents a summary of the maximum depths of disturbed deposits observed during testing, in addition to the depths of pottery, lithic artifacts, and shell. As before, the logic of this classification is that forested areas are least likely to be disturbed, while cleared areas and the ROW are more likely to have suffered subsurface insults.

Forested areas are present north and south of the roadway, and none showed clear evidence for having been disturbed. During testing, scattered *Viviparus* shell and metal cables were observed on the surface of the westernmost portion of the forest. Based on

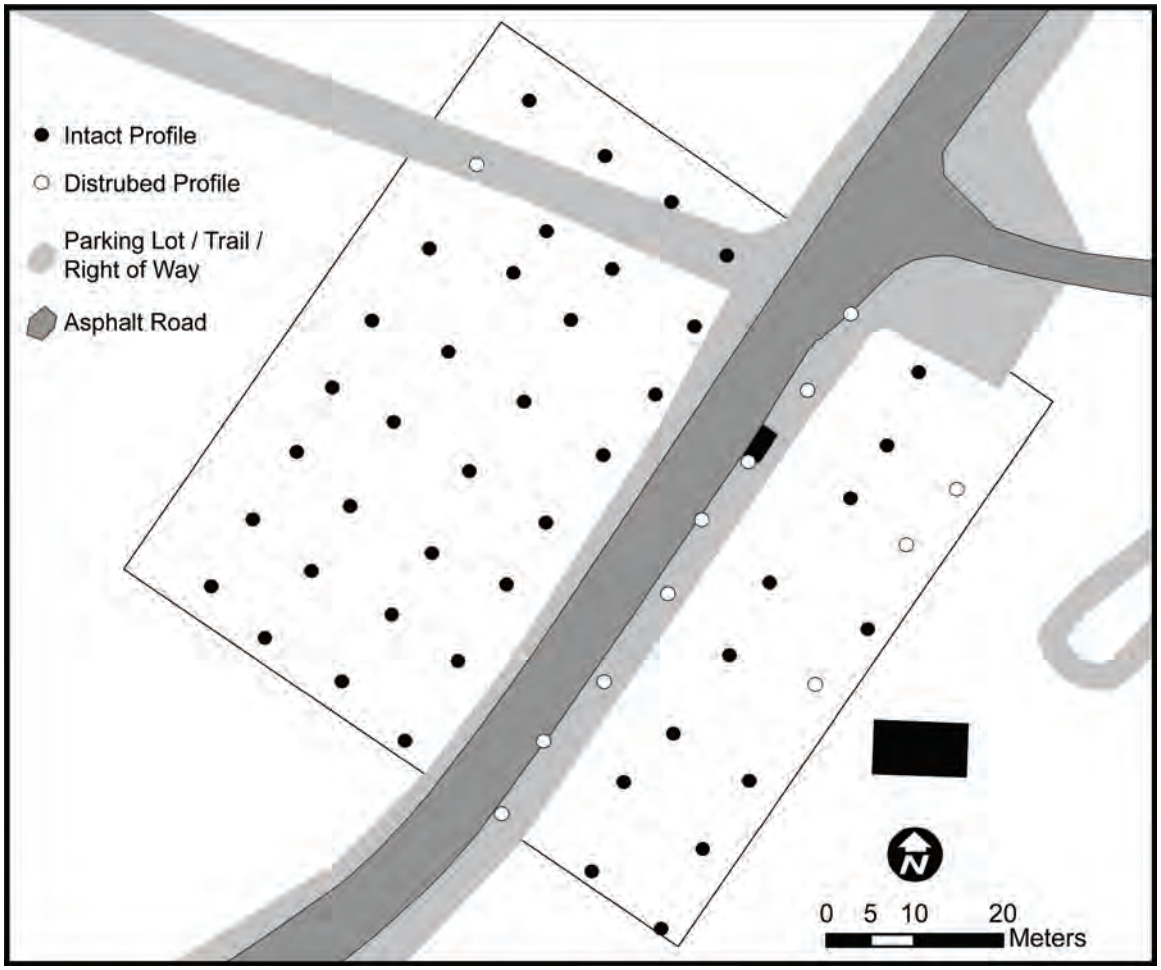

Figure 3-13. Distribution of shovel test pits with evidence for disturbances in Area B.

Table 3-3. Summary of Subsurface Depths for Disturbed and Artifact-bearing Deposits within Area B.

Disturbed Depth (cm)	Count	Mean	Median	Std. Dev.	Min.	Max.
Clearing (n = 6)	4	36.7	27	36.1	8	85
Forest (n = 41)	0	-	-	-	-	-
Right of Way (n = 8)	8	32.7	36	8.7	20	44
Total† (n = 55)	12					
Top of Pottery (cm)	**Count**	**Mean**	**Median**	**Std. Dev.**	**Min.**	**Max.**
Clearing	5	24.0	10	19.4	10	50
Forest	13	45.0	40	20.5	20	80
Right of Way	1	32.0	32	-	32	32
Total†	19					
Top of Lithics (cm)	**Count**	**Mean**	**Median**	**Std. Dev.**	**Min.**	**Max.**
Clearing	3	43.3	50	30.5	10	70
Forest	35	52.8	50	19.1	10	90
Right of Way	8	54.0	55	10.6	32	65
Total†	46					
Top of Shell (cm)	**Count**	**Mean**	**Median**	**Std. Dev.**	**Min.**	**Max.**
Clearing‡	3	0.0	0	0.0	0	0
Forest	0	-	-	-	-	-
Right of Way	1	32.0	32	-	32	32
Total†	4					

†Total includes only STPs for which explicit subsurface data was available.
‡ All shell in disturbed contexts.

historic aerials the placement of shell likely resulted from trail construction dating to the earlier half of the 20th century. Regardless, no subsurface disturbance was evident. Shovel tests in the forested project area have the following generalized profile: 0–25 cmbs light gray (10YR7/1) sand, 25–100 cmbs yellowish brown (10YR5/4) sand. Soils here tended to have less organic matter in the upper 10 cm or so than Area A. Although there is some variability in the depths of these horizons, the profile is generally consistent with the USDA-NRCS definition of Paola fine sand. Like Area A, the intact portion of this tract appears to be well stratified. On the balance pottery tended to be recovered between 40 and 45 cmbs, although there was a range between 20 and 80 cmbs. Lithics, on the other hand, tended to be found between 50 and 53 cmbs, with a range of 10 to 90 cmbs for the top depth. No shell was encountered within the forest below the occasional fragment found at the surface.

In cleared areas, 4 STPs yielded clearly disturbed profiles which ranged between 8 and 85 cmbs (O-4, O-5, O-6, S-7). Several kinds of disturbed profiles were noted. In

STP O-4, the upper 8 cm consisted of dense, organic shell midden with rusted nails. Below that was a dark brown organic sand, with pottery and lithics, down to 70 cmbs. It was unclear whether the shell-bearing stratum was redeposited or intact. A similar profile was witnessed in O-6, which contained shell in an organic sand down to 44 cmbs, as well as in O-7. Although historic objects were not recovered at depth, the nature of the shell deposit was consistent with a disturbed profile. Transect O, in fact, appears to have intercepted a grown-over trail visible on the 1941 aerial. Given that we know roads were being constructed with mined shell midden elsewhere along the St. Johns, it would not be surprising if the shell encountered in STPs O-4, O-6, and O-7 was emplaced during road construction. The other disturbed profile was documented in STP S-7. Situated within the utilities corridor, this STP did not immediately appear disturbed during excavation. However, at approximately 85 cmbs we encountered a buried telephone cable. This cable was severed during excavation. No trench was visible in the profile, and it is unclear how the cable was installed. It is likely the utility corridor is intact save for the immediate location of the telephone cable. As was the case in Area A, pottery tended to be recovered at higher elevations, typically between 10 and 24 cm, but with a range of 10 to 50 cmbs. Lithics were more likely to be found at greater depth, between 43 and 50 cmbs on average, but ranging between 10 and 70 cmbs. Shell was noted in three STPs at the surface, although it appears that the shell was derived from elsewhere.

All STPs within the ROW (Transect M) showed evidence for cutting and redeposition of fill materials. Depths of disturbance ranged between 20 and 44 cmbs, but clustered tightly between 32 and 36 cmbs. Typically, there was a layer of dark brown sand—frequently with banding—or dense limestone aggregate that contained historic objects. This fill was found lying on top of intact yellow/brown sand. The one deviation from this pattern was documented in STP M-4, which intercepted a shell-filled pit (Figure 3-14). The surface of the shell was below a lens of intact shell-free sand between 32 and 114 cmbs. This STP yielded three highly eroded St. Johns Plain, but is unclear if they came from the pit fill. Test Units 3 and 5 (Chapter 4) were excavated adjacent to STP M-4 with the express purpose of documenting this shell pit. Elsewhere in the ROW, lithics were first recovered between 32 and 65 cm, and averaging around 55 cmbs. Collectively, disturbances within the ROW appear to have been the product of clearance and construction of the current entrance road.

The relationship of intact and disturbed areas can be viewed through a comparison of absolute elevation, depth of cultural deposits, and depth of disturbed deposits (Figure 3-15). Most of the artifact-bearing deposits within the northwest portion of Area B are intact and stratified. However, the ROW and roadway appear to have been excavated to grade (approximately 30 to 40 cmbs), and then built back up with fill and aggregate. Archaeological deposits southeast of the ROW showed greater distributions in terms of depth. In part, this may reflect the impact of the earlier road construction (visible on the 1941 aerial). However, the presence of flakes and lithic tools at great depth suggests a deeply buried, and likely early, component in this area.

Figure 3-14. Photograph of Shovel Test Pit M-4, facing south.

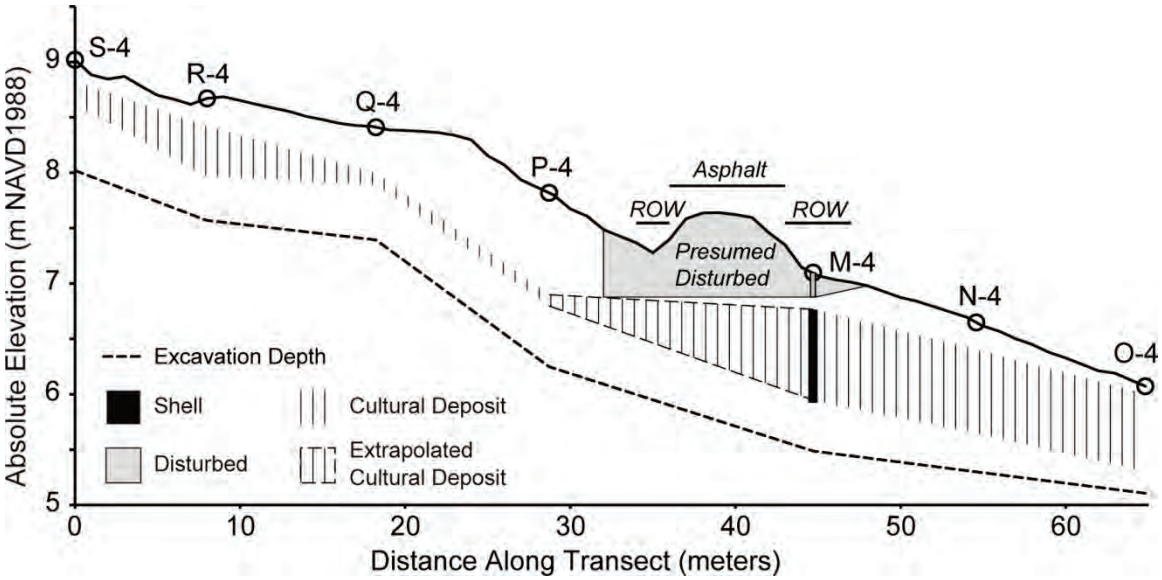

Figure 3-15. Comparison of Area B shovel test pit absolute elevation, ground cover, and depth of disturbed deposits from northwest to southeast (vertically exaggerated).

Spatial Patterning: The small size of Area B (and its central disturbed zone) precludes detailed investigation of spatial patterning (Figure 3-16). Debitage was distributed across the tract in varying density. As with Area A, the higher densities of lithic flakes by count tended to be associated with bifacial tools. Other chipped stone tools, including unifaces, microliths, and modified flakes, were found across the survey tract. Unlike Area A, there is more evidence for Early Holocene *and* Post-Archaic occupations on the basis of tool morphology and pottery, respectively. Pottery was also widely distributed, with little spatial differentiation in Archaic and Woodland varieties.

Area C - Trail to Spring Pool

Overview: Area C was tested in advance of trail rerouting and refurbishment. Currently, visitors enter the recreational area along a path which courses west of the primary concession stand down a steep slope to the spring. Future plans call for rerouting foot traffic along a lower gradient. Area C was the solution proposed at the time the agreement between the USFS and the LSA was finalized. As defined by the USFS, Area C was a ca. 350-m long corridor that began just south of the parking lot service entrance gate (Figure 3-17). This survey tract cross cuts a number of different vegetation zones and slopes. Based on the 1941 aerial, most of Area C was once cleared of vegetation. There is no doubt that the bare ground evident then was the result of extensive shell mining.

Today, the northern component of the survey area follows the asphalt service road for a distance of 60 m, and then turned south across an undeveloped tract before joining with an extant foot path. This path runs parallel to the top of the upland terrace, which is the relict escarpment left from shell removal. From there the corridor follows the path 80 m where it intersects with a north-south. At the top of the hill this path has been cut down into a shell deposit, and shell is eroding out within the path and alongside it (Figure 3-18A). The corridor turns to the south at this point, where it also drops in elevation from 5.0 to 1.0 m (Figure 3-18B). After ca. 50 m the path turns back to the west, rounding past a large tree tip-up with exposed shell (Figure 3-18C). Hereafter the ground is essentially flat, and covered with grass and aggregate (in the path) (Figure 3-18D).

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Shovel tests were excavated at 10-m intervals along the corridor, and were assigned to Transect L. STP placement within the corridor was judgmental, based on ground conditions. STPs L-1 through L-6 were placed east and north of the asphalt service road. STP L-7 and L-9 were tested in direct line between the service road and the trail. STP L-8 was erroneously placed outside the bounds of the corridor. STPs L-10 through L-16 were located on the north trail. STPs L-17 and L-20 were tested south of the trail, where the planned trail would take a more rounded course and connect with the extant north-south foot path. STP L-17 rapidly encountered buried barbwire and metal fencing. We decided to place STP L-20 to the west of this location, but also encountered

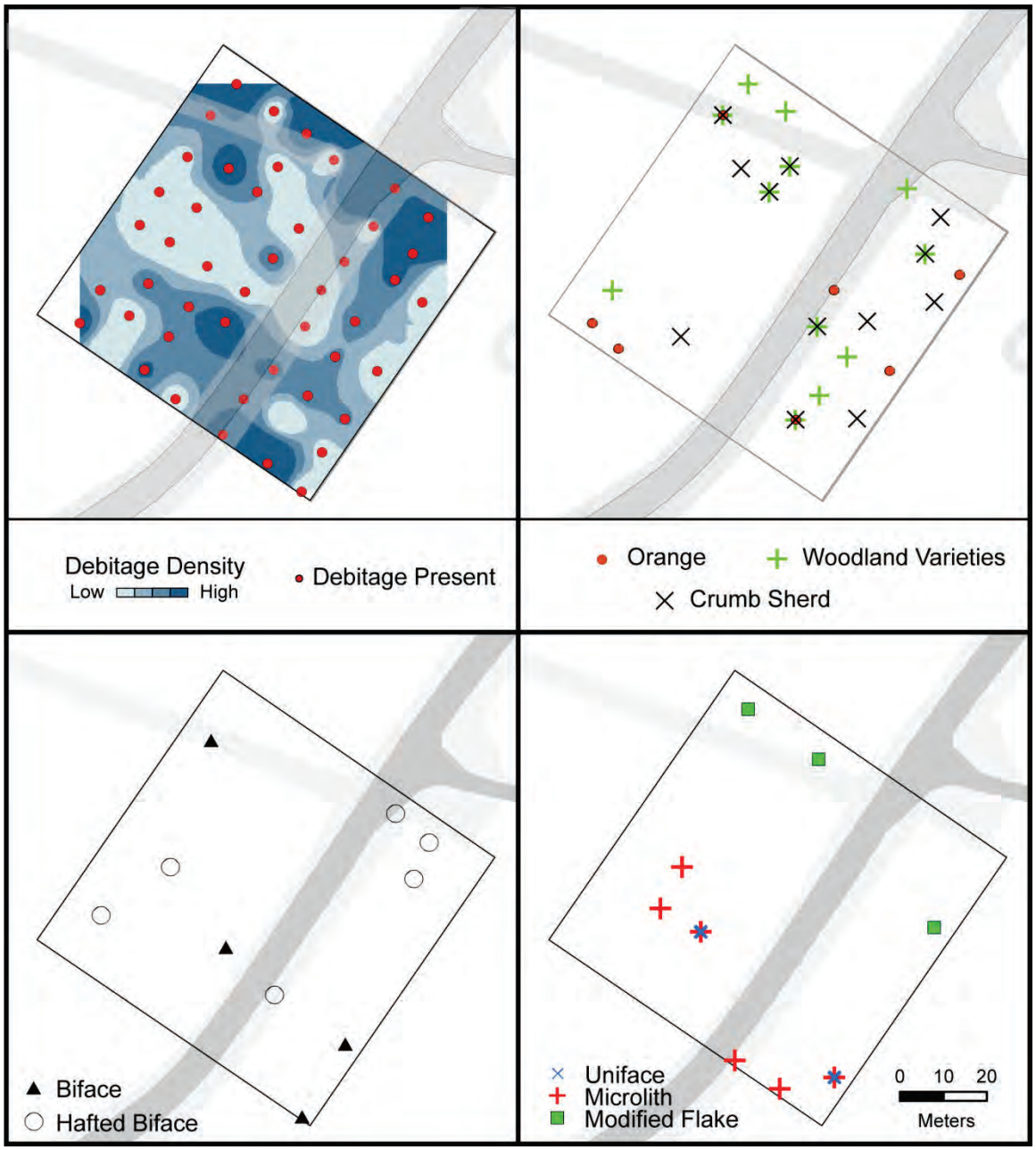

Figure 3-16. Distribution of artifact assemblages within Area B.

buried fence materials that we could not get through. STPs L-18 through L-25 were tested west of the trail, while STPs L-26 through L-30 were placed north of the trail. Shovel test pit excavation proceeded according to standard protocols. In several cases it was necessary to use a pick-axe or maul to penetrate concreted shell deposits (Figure 3-18D). At lower elevations the bucket auger was used to penetrate saturated deposits (typically below 60 to 70 cmbs).

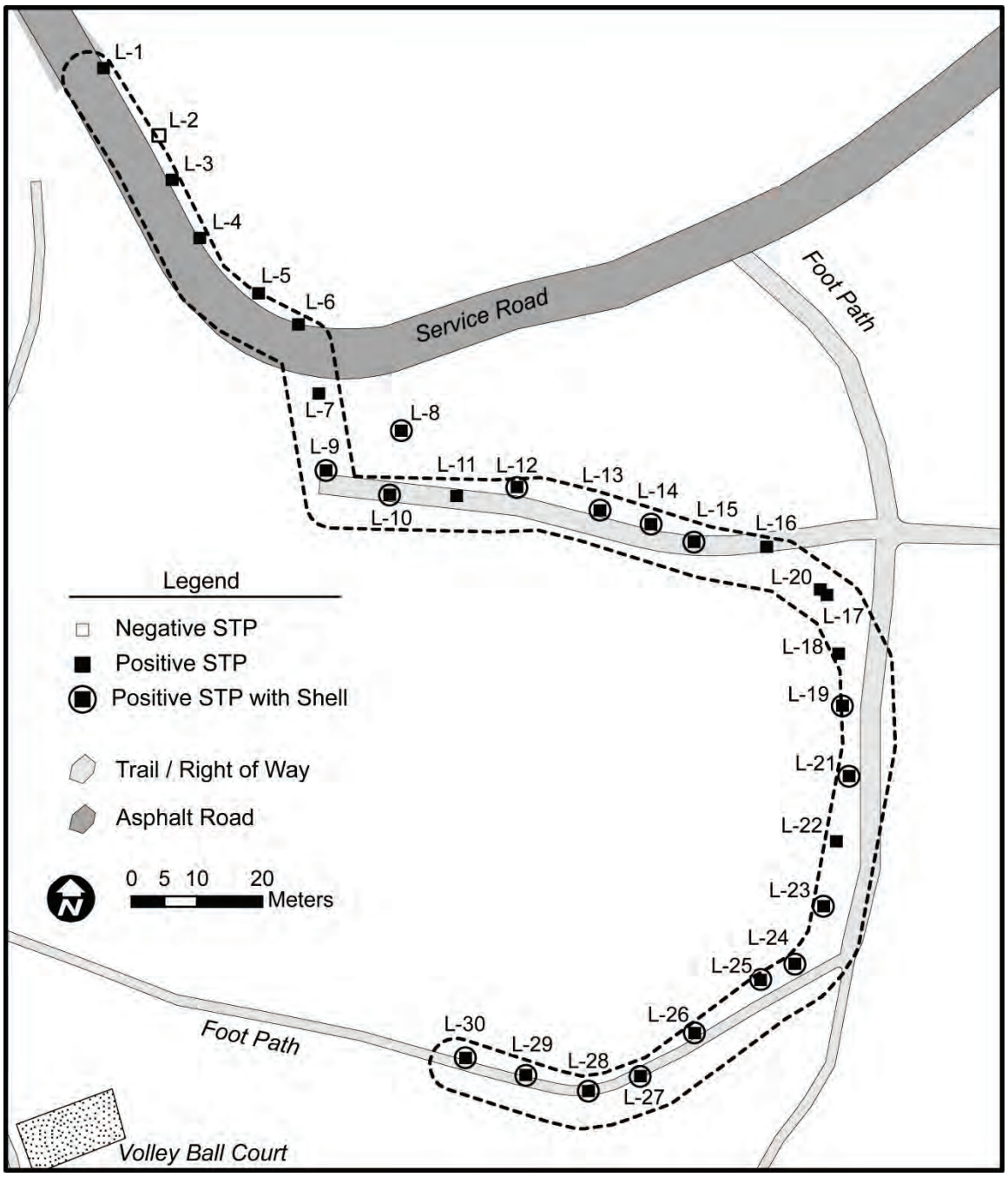

Figure 3-17. Map of shovel test pits excavated in Area C (note: shell identified in disturbed contexts only were not depicted on this map).

Results Summary: A total of 30 STPs were excavated along the trail. Of these, only STP L-2 was negative. Shell from intact contexts was encountered in many STPs south of L-7, but in none to the north. Excluding STP L-10, all STPs showed evidence

Figure 3-18. Photographs of Area C. A) exposed shell at intersection of foot paths, north of STP L-18, facing north. B) trail adjacent to STP L-22, facing north. C) Exposed shell in tree tip up next to STP L-24, facing southwest. D) grass-covered concreted shell in STP L-29, facing east.

for some post-depositional near-surface disturbances. A total of 1619 objects were recovered from Area C. Far and away the dominant category was vertebrate faunal remains (n = 1466), half of which came from STP L-8. This abundance is expected given that Area C intercepted shell deposits. Other organic classes, including paleofeces, unmodified marine shell, and bone tools were also recovered. The lithic assemblage included two Florida Archaic Stemmed hafted bifaces, one microlith, a uniface, 5 modified flakes, and 83 lithic waste flakes. Much of this assemblage fits comfortably within the Mount Taylor period. Pottery in general was rare, and was recovered from disturbed contexts. No fiber-tempered sherds were found within Area C. St. Johns series ceramics, including Plain and Check Stamped varieties, were found in limited quantities, as was sand tempered plain. Historic and recent objects, including aluminum pull tabs, glass, metal fragments, a tin-can opener, and various pieces of plastic were recovered throughout the survey tract. REDACTED

Cultural Deposit Character and Integrity: The landscape around Area C was changed dramatically from its pre-mining configuration. These ground-moving acts are reflected in the widespread cutting, filling, and redeposition of midden material. That

said, there are significant cultural resources present just below the surface across the survey tract. Shell mining exposed early components that would normally be obscured beneath meters of deposition. As before, for the purposes of discussion the survey area can be separated by ground coverage. In this case, *Road* (n = 6) versus *Trail* (n = 24). Road STPs are all those situated north of the asphalt entrance road, while Trail STPs are those to the south of the entrance road. Summaries for depths of disturbed strata, pottery, lithics, and shell are presented in Table 3-4. Indeed, given the complexities of the survey tract, it is easier to envision the relationship between basal sand deposits, shell deposits, and recent disturbances as a cross-sectional diagram (Figure 3-19). This figure will be referred to in the following discussion.

Roadside STPs exhibited a range of profiles with disturbed depths averaging 34 cmbs, and ranging between 21 and 100 cmbs. The STP profiles provide evidence for cutting and filling associated with roadway construction. Intact non-shell deposits are present below this disturbance. The profile presented in STP L-1 serves as a prime example: 0–10 cm dark brown organic soil and root mat; 10–51 cm gray sand with large aggregate clasts and concretions; 51–130 cmbs yellow brown sand. In this case, the ground was stripped down 50 cm and then filled. Below the fill zone was a typical soil pedon witnessed farther to the north in Area A. In this case, lithic flakes were recovered between 90 and 100 cmbs within intact sand. Within Area C, lithics were typically first recovered between 53 and 75 cmbs, although they ranged between 10 and 90 cmbs. No pottery was recovered from roadside STPs. Finally, shell was noted in 3 STPs near the road, but none was in primary context. To summarize, intact cultural deposits within roadside STPs are consistent with those identified in Area A. Construction of the road resulted in the reworking of at least the upper 20 cm.

Trail STPs also showed considerable variation in the depth of disturbance and character of intact deposits (Figure 3-20). Taken as a whole, STPs were disturbed down to 34 cmbs on average, although they ranged between 10 and 90 cmbs in total disturbance. Recent episodes of cutting and filling were registered in a variety of ways, including banded multi-colored sand, intercalated shell deposits with modern/historic objects, or a combination of the two. Pottery was only recovered in 6 STPs, and in each case was from areas that did not appear to be intact. Lithics tended to be found higher up in sequences, averaging 28 cmbs, and ranging between the surface and 60 cmbs.

To make sense of the trail patterning the STPs can be divided into different zones based on their position relative to the mined shell escarpment. Topside STPs include all those at high elevations, from STP L-8 to STP L-15 in the north. Slope STPs include those along the north–south trail from STP L-16 down to the flats at STP L-22. Lowland STPs are those at or near 1.0 m in elevation at the base of the slope, from L-24 to L-30.

Intact shell was noted in all topside STPs except for L-11. When found, shell was typically situated above shell-free sand (Figure 3-20). The thickness of shell ranged from 20 to 88 cm. The underlying cause of variability in shell thickness is unknown, although some STPs had the appearance of pit deposits (L-10 in particular). Alternatively,

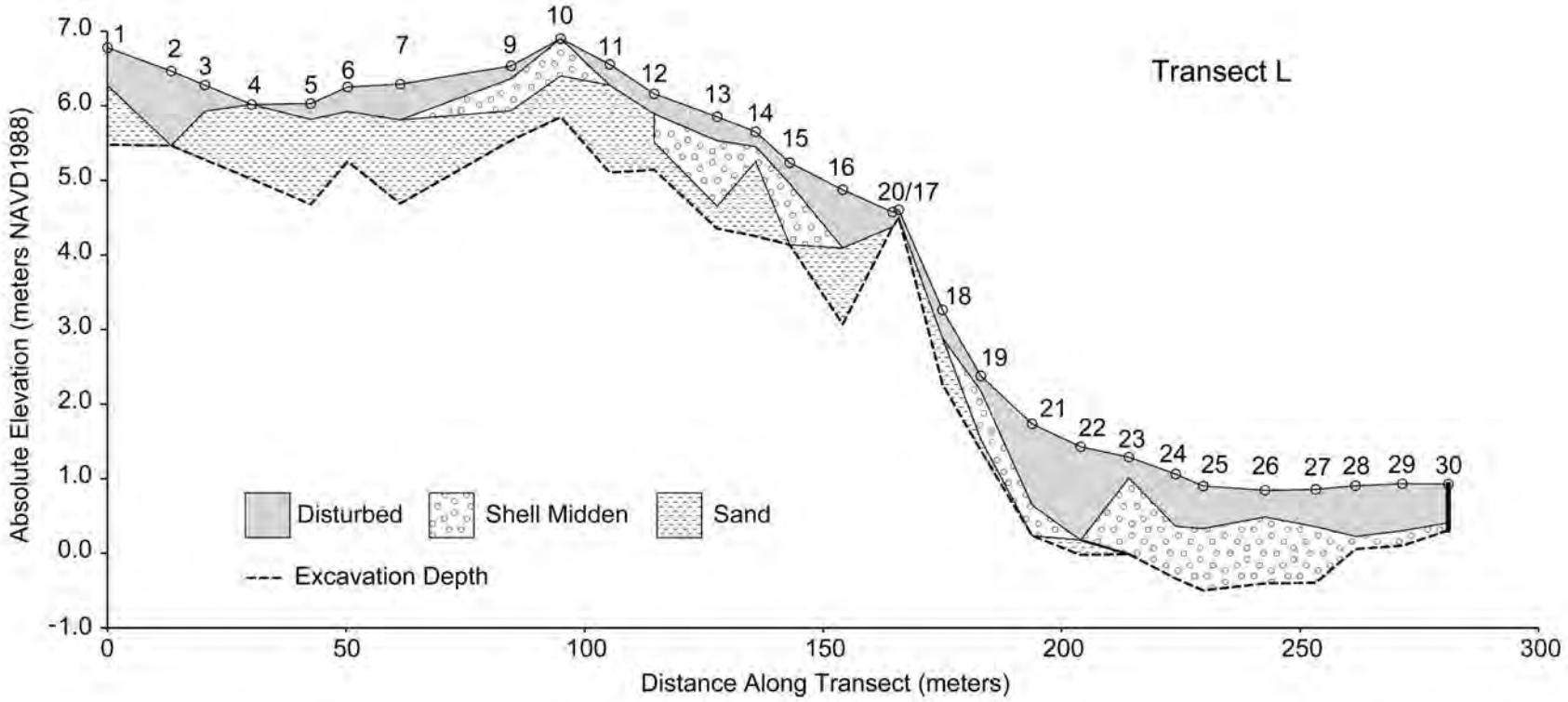

Figure 3-19. Comparison of Area C shovel test pit absolute elevation, depth of disturbance, and intact cultural deposits (vertically exaggerated).

Table 3-4. Summary of Subsurface Depths for Disturbed and Artifact-bearing Deposits within Area C.

Disturbed	Count	Mean	Median	Std. Dev.	Min.	Max.
Road (n = 6)	5	48	35	30.1	21	100
Trail (n = 24)	23	34.4	28	20.5	10	80
Total[†] (n = 30)	29					
Top of Pottery (cm)	Count	Mean	Median	Std. Dev.	Min.	Max.
Road	0					
Trail	6	32.0	30	25.4	0	65
Total	6					
Top of Lithics (cm)	Count	Mean	Median	Std. Dev.	Min.	Max.
Road	5	53.0	75	39.6	10	90
Trail	13	28.6	25	21.9	0	60
Total	18					
Top of Shell (cm)	Count	Mean	Median	Std. Dev.	Min.	Max.
Road[‡]	3	21.7	0	37.5	0	65
Trail	22	21.6	17	23.2	0	68
Total	25					

[†]Total includes only STPs for which explicit subsurface data was available.
[‡] All shell in disturbed contexts.

Transect L intercepted a number of finger ridges of shell that extended to the north away from the main shell ridge. Other shell mounds in the valley do have low-lying shell heaps associated with them (Randall 2010). Typically found above the shell was an organically enriched dark brown sand of unknown provenance. Based on the contact between shell and sand this deposit appears ancient. Indeed, it was remarkably similar to brown sand that was found at the base of TU2 (Chapter 4). These intact shell and sand strata were most often covered by fill materials, and did not show scalloping or mottling characteristic of cut-and-fill sequences elsewhere in Area C (Figure 3-20A). The implication is that the northern aspect of the mound remains largely intact save for the deposition of materials when the trail was established. Examination of STP L-8 is instructive in this regard. As previously noted, STP L-8 was tested outside the planned survey corridor. However, the results of excavation there revealed intact shell deposits that would have been situated at the northernmost extent of the 8MR123 shell ridge. The upper 15 cm consisted of a root mat with dark yellow brown sand. The presence of one nail indicates that some historic disturbance did occur here, but did not penetrate deeply into the lower strata. Between 15 and 59 cm we excavated a brown sand. Although no artifacts were recovered from this stratum, it is likely anthropogenic based on the apparent organic enrichment of the soil. Indeed, it was unlike any soil excavated in either Area A or B in that regard. Below this sand we intercepted a very dense shell deposit composed of mostly whole *Pomacea*, bivalve, and *Viviparus* shell. This shell deposit contained an astounding 861 vertebrate fauna fragments weighing 426.9 g, in addition to

Figure 3-20. Photographs of selected Shovel Test Pit profiles within Area C. A) STP L-12, B) STP L-21, C) STP L-23, D) STP L-25.

marine shell fragments. No other artifacts were recovered, suggesting that this deposit dates to the Mount Taylor period. Below 100 cmbs we used the bucket auger. Dense shell continued to 125 cmbs, where it was found to lie on top of the typical yellow brown sand. This STP provides a glimpse of shell deposition on the margins of the shell mound, and provides a model of intact stratigraphy in this area in general. Moreover, it drives home the point that intact and significant cultural resources are still present within the bounds of 8MR123.

In contrast to the topside STPs, those along the slope bear evidence of deep cutting, as well as extensive filling and reworking of deposits. Given that these STPs lie along the escarpment left from shell mining operations, this should come as no surprise. Beginning at the north end, STP L-16 did not have any intact shell based on the presence of metal and glass throughout. This pattern of recent materials persisted in L-17 and L-20 where the barbed wire and fence materials precluded excavation there. No shell was observed in STP L-18. However, STP L-19 contained 80 cm of shell midden in gray brown sand sitting on top of a culturally sterile gray sand. This was situated beneath 20 cm of banded fill. At lower elevations, between 40 and 100 cm of fill composed of sand (STP L-2, Figure 3-20B)) or intercalated sand and shell (L-22) were deposited upon the surface. Ostensibly this fill was emplaced to build up the mined surface that had been taken down close to or below grade.

Beginning with STP L-23 the ground surface becomes relative flat (ca. 1.0 m), and STPs shared similar profiles (Figure 3-20C, D). In all STPs here the upper stratum was composed of mottled sand, which contained recent or historic objects. This fill ranged in depth between 28 and 70 cmbs. Directly beneath this fill was a very organic A horizon, typically only 5 cm thick or so. It was from this organic zone that we recovered St. Johns pottery, numerous aluminum pull tabs, shingle fragments, metal cables, and a tin can opener. Based on our experience at other shell mounds like Hontoon Island North (8VO202) (Randall and Sassaman 2009), we are confident that this stratum reflects the post-mining surface of the relict shell mound. Beneath this buried A we routinely intercepted extremely dense shell deposits which were frequently concreted. In general they were composed of *Viviparus* shell, in addition to bivalve and *Pomacea*. Artifact counts are generally low for these deposits, in large part due their concreted and often saturated nature. Indeed, due to the presence of standing water we frequently could not excavate past 70 cmbs or so. Based on these results, it appears that much of the flat portion of the trail was created by filling in the post-mining surface, no doubt to make it more attractive and hospitable. The depth of shell in this area could not be ascertained from shovel test results. Based on the bucket auger testing conducted nearby (see below), it is likely that they extend another meter or so below where testing stopped.

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Spatial Patterning: Given the low artifact count little can be said about the distribution of specific cultural components or discrete land use practices based on artifact classes. What is evident, however, is that the vast majority of Transect L intercepted deposits of Mount Taylor affiliation. Not only were Orange sherds absent, but St. Johns sherds were found only in near-surface deposits. This finding corroborates Marrinan (1990) and Stanton's (1995) description of mounded deposits to the west of Transect L. To be sure, much of the Mount Taylor component was removed during mining operations in the 1930s and 1940s. In spite of this destruction, significant resources remain. The northern boundary of the shell ridge appears to be intact. The

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limited testing we conducted there identified possible pit features, while variations in shell thickness may relate to sub-surface shell architecture. Furthermore, much shell remains at lower elevations, despite having been truncated. REDACTED

SPRING-SIDE BUCKET AUGER SURVEY

The LSA conducted a bucket auger survey in the spring-side portion of site 8MR123. The survey tract was defined by the arcuate shell escarpment between 4.0 and 6.0 m in absolute elevation, which slopes down to 1.0 m at the spring (Figure 3-21). Prior to mining, shell works surrounding the spring pool and abutting the run were the defining feature of site 8MR123. Today, the ghostly footprint of the mound can be seen in the mining escarpment away from the pool as well as in shell eroding at the water's edge. Although intact shell deposits of Mount Taylor age were identified by FSU and the LSA to the east of the spring, virtually nothing was known of the remaining deposits. With the present survey we hoped to collect stratigraphic data and materials for radiocarbon assays that would place near-shore occupation of site 8MR123 into context.

At the time of the LSA's investigations, the USFS did not have specific development plans for this area. However, it was reasoned that knowing where intact resources remain, and to what depth, will be critical in guiding future land stabilization efforts. Furthermore, documenting the age and character of deposits will aid in historical reconstructions of this landform. In particular, it was hoped that several questions could be answered by the survey: (1) What was the geomorphology of the spring prior to shell deposition? (2) To what extent is the current configuration of the spring and run the product of ancient practices? (3) When did shell accumulate adjacent to the spring? (4) Are there non-shell-bearing components present? Descriptions of the survey methods and findings are presented in the following sections.

Methods

The reconnaissance methods were designed to identify and characterize the depth, integrity, and age of deposits within the survey tract. The goal was not full coverage survey, but instead to sample locations across the landform. We used a 4-inch bucket auger, which can reach more than 2 meters below the surface with extensions. Although shovel tests are the standard for horizontally extensive surveys, they were not a suitable option for several reasons. First, we wanted to limit impact to sensitive cultural deposits. The small diameter of the auger was judged to be an adequate compromise that would enable us to witness major stratigraphic breaks while limiting the amount of disturbance. Secondly, shovel testing along Transect L had identified wet shell deposits within 60 cm of the current surface. Saturated deposits were suspected closer to the spring based on comparisons with similar sites in the region and local informant testimony. Due to their saturated nature we could not test too far below the current ground water level with a

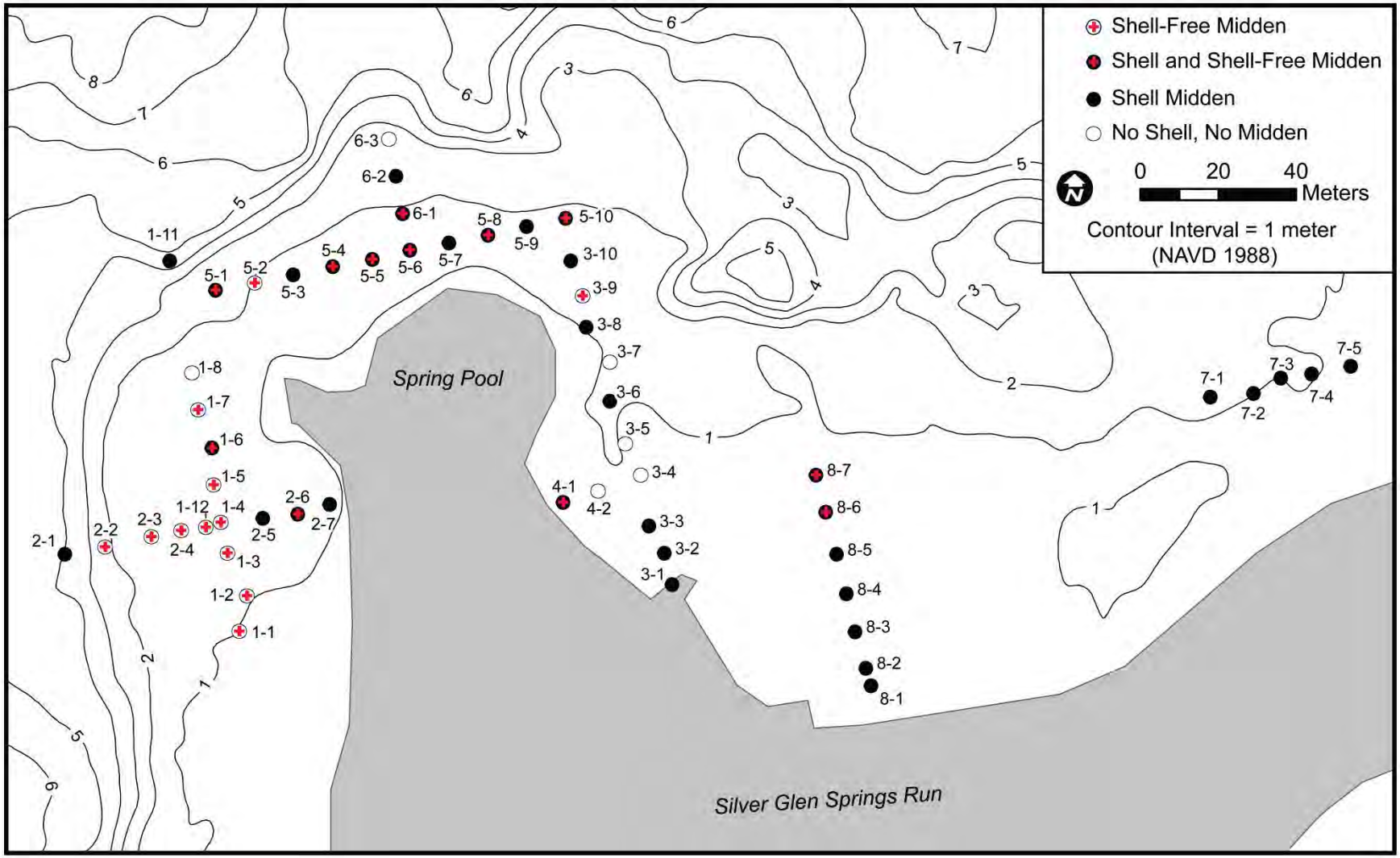

Figure 3-21. Map of bucket augers excavated around the spring pool and along the spring run.

shovel. Bucket augers, to the contrary, are not as limited by saturation. Finally, the potential for deeply stratified sequences in this area is extremely high, but shovel tests cannot be effectively excavated in excess of 1 meter below surface.

Bucket augers were generally excavated at 10-m intervals along transects of varying length (Figure 3-21). Bucket augers were given unique designations: transects were given a serial number from 1 to 8, while individual augers were given a numeric designation which repeated for each transect. For example, bucket auger (BA) 8-1 was the first auger excavated on Transect 8. The location of each auger was acquired with a Magellan MobileMapper CX GPS. Transects were arranged to provide coverage that was either parallel or perpendicular to the spring pool or run. Transects 1, 3, and 5 surrounded the boil, while Transects 2, 4, and 6 were perpendicular to the spring pool. Transect 7 was emplaced to the east of STP Area C, with the goal of finding the lateral extent of shell deposits. Transect 8 was placed perpendicular to the spring run. In the best case scenario, auger excavation continued until sterile subsoil was encountered. This was the case with most augers on the west side of the spring. In many cases, however, excavation ceased when we could no longer extract the auger due to saturation. In practice, the effective maximum depth for augers was 2 meters, although in several cases were able to test close to 3 m below surface.

Auger extraction followed a standard protocol. During excavation, descriptions and depth below surface of major stratigraphic changes were recorded. All materials were passed through 1/4-inch hardware cloth. Only chronologically diagnostic artifacts or tools were retained from the screen, while the presence of other items such as lithic flakes or vertebrate fauna was noted on excavation forms. We also collected sediment samples from particular strata with the goal of securing materials suitable for radiocarbon dating. In the field, the sample was extracted from the auger after the top 5 cm of fill (which could have come from the walls of the auger hole) was removed. The sample was then placed in a gallon sized plastic bag.

Results

A total of 55 bucket augers were tested along eight transects within the survey tract (Figure 3-21). Several planned auger locations were avoided (BA 1-9, and 1-10) so as to not intercept buried water lines in the area. Bucket Auger 1-12 was placed adjacent to BA 1-4 in order to obtain a sample of the saturated shell-free midden. A total of 15 artifacts were recovered from eight augers (Table 3-6). The assemblage includes St. Johns plain sherds, one Orange plain sherd, a Florida Archaic Stemmed hafted biface, a microlith, a modified flake, 2 unmodified marine shell fragments, and one square-cut nail. This assemblage, while quite small, conforms with finds elsewhere within the SGSRA. In addition, sediment samples were retrieved from five augers for further analysis (BA 1-12, 4-1, 7-3, 8-5, and 8-6). Although no diagnostics were recovered from these, well-preserved botanicals were abundant in most. Radiocarbon assays were acquired from three samples, all dating to the later Mount Taylor and Orange period.

Table 3-6. Artifacts Recovered from Bucket Augers.

Bucket Auger	Hafted Biface		Modified Flake		Microlith		St. Johns Plain		Orange Plain		Marine Shell		Nail	
	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt
1-2					1	1.2								
2-1									3	6.3				
2-2							3	2.2						
2-4			1	6.5										
2-5							2	4.6						
2-7							4	11.1					1	2.0
5-5	1	9.0												
7-1											2	33.3		
Total	1	9.0	1	6.5	1	1.2	9	17.9	3	6.3	2	33.3	1	2.0

The survey documented a wide range of anthropogenic deposits, from organic-free sands to well-preserved and diverse organic wetsite deposits (Figure 3-22). The vast majority were either at or below the present-day water table. As to be expected in such an extensively mined and reworked landscape, we did encounter significant variation in the location and disposition of these cultural deposits. However, there is enough consistent stratigraphic and spatial patterning in these remnant deposits to reconstruct a partial history of shell deposition. What follows is a description of the cultural deposits we encountered with an examination of their stratigraphic and horizontal associations. These relationships are illustrated in interpolated form using the auger logs in Figure 3-23.

Disturbed deposits were present throughout much of the survey tract. Like the STPs previously described, evidence for disturbance included very organic soil with low to moderate density shell, the inclusion of historic objects or aggregate, or mottled or marled shell-free sediments. Overall, they were consistent with the kinds of earth-moving activities documented along STP Transect L. Depths of disturbance ranged between 10 and 75 cmbs. Variation in the depth of disturbance was most variable to the west and north of the spring pool (Figure 3-23). A persistent pattern of historic objects such as nails and ceramic drain fragments, concretions, or limestone aggregate was noted on the east side along Transect 3. Due to these hard surfaces (in BA 3-3, 3-4, 3-5, 3-6, 3-7, and 3-8) we could not test below a meter in depth. Some of the subsurface concretion may be in primary context, as it is present along the spring pool margin just to the west. It is notable, however, that there used to be structures along this transect. Some of the aggregate is no doubt a result of building construction, which is further supported by the nails and other historic objects. Depth and type of disturbance were much more consistent across Transect 8 (Figure 3-23). This transect cuts across a flat lawn. It appears that after the shell was mined below grade, the surface was built back up with fill. A similar pattern was identified in the nearby STPs in Transect L.

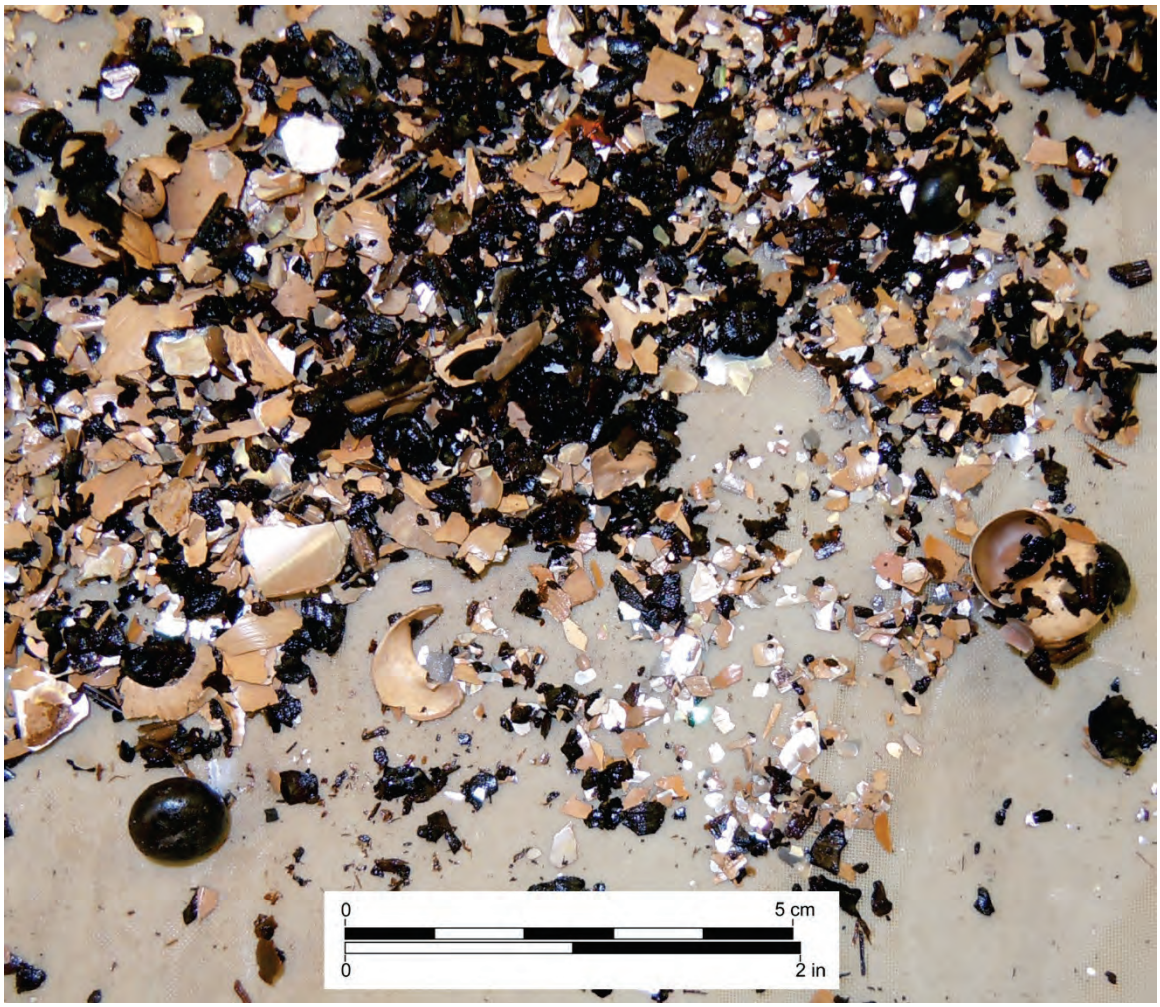

Figure 3-22. Photograph of saturated organics recovered from Bucket Auger 8-6 between 205 and 215 cm below surface.

Definitively intact surfaces were in the minority, and were located at or near the presumed margins of the shell mining operations, including Transect 7 (except for 7-1) on the east side of the tract in the wetlands, BA 1-11 on top of the mined shell escarpment, and BA 3-1 along the southern shoreline. Potentially intact shell was also noted just south of the secondary boil in BA 2-6. This is in the area of a small topographic rise with St. Johns pottery present on the surface or in augers. BA 2-6 had shell of variable composition between 0 and 150 cmbs. It was unclear if this variability was due to recent alteration, or simply registers different strata within the mound. In BA 2-7 we noted that the upper 37 cm contained dark gray brown sand with moderate amounts of *Viviparus* shell. St. Johns plain sherds and one square-cut nail were found near the surface in this layer. Although the current rise between 2-6 and 2-7 may represent a pre-mining surface, it is also quite possible that mining activities only included cutting and not filling here. Finally, a 65-cm deep sequence of dark gray sand

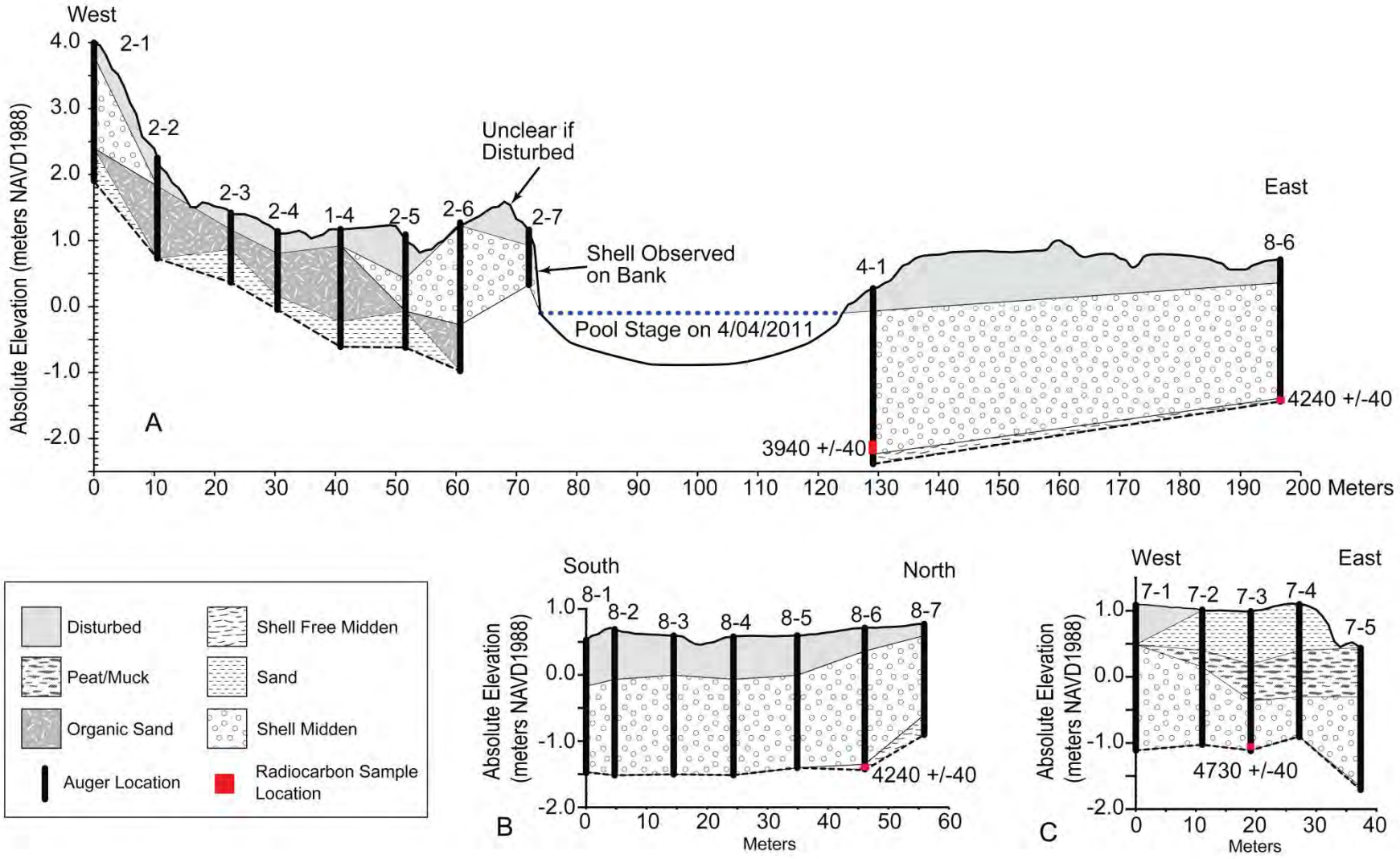

Figure 3-23. Comparison of absolute elevation, depth of disturbance, and intact cultural deposits around the spring pool and run (vertically exaggerated).

with *Viviparus* shell was documented in the upper portion of BA 1-6. Based solely on the auger record we could not determine if this shell is in primary context. It is notable, however, that all augers within 20 m to the north and south lack intact shell.

Three varieties of shell-free deposits were observed across the tract. Within many of the western and northern augers we encountered a light gray to white basal sandy soil from which most organics had been stripped. In the northern augers this sand was frequently underlain by a clayey and impenetrable soil between 110 and 150 cmbs. Artifacts were rare in the gray/white sand, but flakes and the occasional calcined bone fragment did occur, much like they did in STPs at higher elevations. In addition, we recovered a complete Florida Archaic Stemmed hafted biface from BA 5-5 at a depth of 140 to 150 cmbs (FS 273.1). Given that the object was recovered from an auger we should be careful with extrapolating too far. For example, the biface may have originally been deposited in a pit. However, it is also possible that the biface was recovered from a buried surface. The lack of associated organics suggests too that at the time of deposition the surface was terrestrial and not submerged, although it is now below the modern water table.

West of the spring pool and south of BA 1-8 we routinely intercepted a saturated dark gray to almost black sand that contained abundant vertebrate faunal remains and lithic artifacts. Particulate organics and charcoal were present, although darker sediments were noted in augers with lower surface elevations (BA 1-1, 1-2). A sample of this stratum was recovered from BA 1-12 in the hopes of characterizing the organics and securing a radiocarbon assay. Unfortunately, no charcoal was identified after the sample had been processed through a 1 mm sieve back in the lab. The depositional context of this deposit, whether terrestrial or subaqueous, remains unclear. Based on the LSA's experiences excavating at Salt Springs (O'Donoughue et al. 2011) several factors argue against a subaqueous depositional context. First, no internal structure, such as banding or alternating lenses of organics, was observed in the field. Admittedly, identifying these features in a bucket auger is problematic at best. Perhaps more telling is that the vertebrate fauna that was recovered was poorly preserved with eroded and dulled surfaces. In a continuously wet deposit we would expect well preserved vertebrate fauna, in addition to burned and unburned seeds, nuts, and other botanicals. It is also possible that the organic enrichment of this sand was derived from overlying shell deposits. As noted above, BA 1-1 and 1-2 had better organic preservation, and may have been saturated more consistently or for a longer period of time than to the north. The chronological placement of the deposit is also in question. In several augers we recorded the occasional lithic waste flake. This stratum also yielded a modified flake in BA 2-4 and a complete microlithic tool in BA 1-2. The vertebrate fauna, flakes, and modified flakes do not provide any sense of the chronological affiliation of the deposit. The microlith, on the other hand, is a tool form consistently found in preceramic Thornhill Lake phase components elsewhere in the valley. Given all the factors involved, this stratum likely represents a near-shore occupational surface that was exposed for some time prior to inundation or the subsequent deposition of shellfish (see below). Based on the debitage density and microlith, as well as a lack of pottery, the occupation dates as early as 5600 cal BP, if not earlier.

Another organically enriched shell-free deposit was noted in east-side augers BA 4-1, 8-6, and 8-7 (Figure 3-23A, B). Unlike the aforementioned dark gray soil on the west side, these deposits were evidently laid down in a subaqueous context based on the extremely good preservation. That is, organic preservation was on par with continuously saturated deposits documented at Salt Springs and Grove's Orange Midden. The deposit is characterized by very abundant botanicals and vertebrate fauna fragments. BA 4-1 also showed evidence for banding, a characteristic noted in lower shell-free deposits at Salt Springs. In the field it was described as "alternating gray/brown sand with organics." Figure 3-22 is a close-up photograph of a processed sample taken from the contact between a basal shell-free stratum and the overlying shell. In addition to preserved twigs and leaves, the deposit also contains well-preserved and uncarbonized hickory nut, acorn, and what appear to be palmetto seeds. In all cases, this sediment was noted beneath saturated (and well preserved) shell midden, between -0.6 and -2.2 m in absolute elevation. No diagnostic artifacts were recovered from these augers (or in the shell above them). However, we were able to secure samples for radiocarbon assays. A seed fragment from the contact between shell and non-shell sediment in BA 8-6 yielded an age estimate of 4240 ± 40 (4870–4620 cal BP), while a seed fragment from BA 4-1 yielded an age estimate of 3940 ± 40 (4520–4240 cal BP). These assays place the onset of shell deposition in this location somewhere between the end of the Mount Taylor period and the beginning of the Orange period.

Terrestrial and saturated shell-bearing deposits were present across the survey tract. All saturated shell was found on the east side of the spring pool, in BA 4-1, and along Transects 7 and 8 (Figure 3-23A, B). In general, two shell-bearing zones were evident in the augers. The lower shell stratum was mucky, with abundant charred and uncharred botanicals. The upper shell stratum was largely devoid of organics, and was composed primarily of whole *Viviparus* shell in a very fine gray matrix. It is unclear what these different zones represent. Given the level of preservation, the lower mucky shell-bearing zones were no doubt deposited in or near water, and have been continuously saturated ever since. The low density of organics and great abundance of clay-like or silty matrix and shell in the upper unit suggests different depositional practices or taphonomic processes were at work. One possibility is that the fine particulates in the upper zone accumulated from the downward movement of materials from overlying shell strata. Moreover, the lack of organics at a consistent elevation would also suggest a different hydrological regime. Unlike shell at lower elevations, the upper unit would be subject to frequent saturation and drying out. Indeed, concreted shell was encountered nearby in STP Transect L and along BA Transect 5.

Although there are structural similarities across the survey tract, each subarea deserves a closer inspection. Farthest away from the spring was Transect 7, which traversed east away from STP L-24 into cypress swamp. Predictably BA 7-1 encountered a profile similar to STP L-24. The upper 60 cm were characteristically disturbed. Below that we noted a saturated fine gray sand with dense, mostly whole *Viviparus* shell. No vertebrate fauna was observed in the screen. This same composition was witnessed along Transect L at this low elevation. Beginning around 125 cmbs there was a stratigraphic break, and we recorded a very dark gray "mucky" sand with a moderate amount of whole

and crushed *Viviparus* and bivalve shell, in addition to abundant vertebrate fauna and charcoal. We did not excavate below 205 cmbs, and we did not reach shell free sand at the bottom.

Once we entered the woods to the east, we found no further evidence for near surface disturbance. The stratigraphy we encountered suggests that this portion of the site was not affected by shell mining at all. Furthermore, it likely represents the lateral margin of the shellworks (Figure 3-23C). In all but BA 7-5, the surface stratum is composed of a culturally sterile brown sand that ranges in depth between 60 and 80 cm thick. The origin of the sand is unclear, although it may ultimately be derived from higher elevations. Below this sand (and on the surface of BA 7-5) was a fibrous peat deposit that ranged in thickness between 25 cm in the west to 75 cm in the east. This peat is significant because it must have formed underwater. By extension, the swamp was once an open body of water, a pattern noted at many sites along the St. Johns (Wheeler et al. 2000). The well preserved nature of the peat would also indicate that this area has not undergone significant wet-dry cycles over its lifetime, which would have degraded the vegetable fibers. This peat layer effectively capped a lower shell deposit with abundant botanicals that was similar in composition to the base of BA 7-1 to the west. During testing of BA 7-5 we glimpsed a possible shell-free peaty muck horizon between 210 and 215 cmbs. However, we were at the limit of our ability to extract the auger, and could not test any deeper. No diagnostic artifacts were recovered. However, a bulk sample was retrieved from 200–210 cmbs from BA 7-3. Nutshell from this sample was submitted for radiometric assay and returned a corrected age estimate of 4730 ± 40 (5590–5320 cal BP). Although we do not know when shell deposition ceased here—and when peat began to form—intensive deposition of shell and other organics apparently began as early as 5500 years ago. That materials were deposited into near shore environments is indicated by the superb organic preservation of the samples. We ceased testing of Transect 7 at 7-5 because we realized that deposits could extend all the way down the run. Indeed, there was shell within a tree tip-up approximately 15 m east of BA 7-5. At a minimum, testing demonstrated that there are dense organic-rich wetsite deposits on the margins of the site, away from mounded terrestrial deposits.

Farther to the west along Transect 8 we intercepted a similarly composed and well-preserved basal shell deposit (Figure 3-22, 3-23B). The upper portion of Transect 8 was disturbed, increasing in depth from 20 cm to the north down to 70 cm in BA 8-2 in the south. Below this fill zone we noted a horizon composed primarily of gray clayey sand and abundant whole *Viviparus* shell. Vertebrate faunal fragments were quite rare. As in augers to the east, a mucky botanical laden zone was present across the transect. The basal shell-free deposits (described previously) were noted in BA 8-7 and 8-6. These appear to decrease in elevation from north to south, while shell thickness presumably increases. We did not excavate much deeper than 2 meters, and never hit any shell-free zones south of BA 8-6. Based on the assay from BA 8-6, shell began to accumulate here at least 4800 years ago.

Saturated shell was found closest to the spring in BA 4-1, which was situated just to south of Test Unit 1 (Chapter 4). The surface of the auger test was only 50 cm or so

above the spring pool height. The upper 30 cm was composed of brown sand and aggregate, a recent addition to the landform that was emplaced above intact shell. Between 30 and 95 cmbs the deposit was characterized by crushed and whole *Viviparus* and bivalve shell in a clayey wet sand, consistent with the upper shell horizon to the east. Vertebrate faunal fragments and organics were infrequent, suggesting this zone was deposited at elevations that were not constantly saturated. Between 95 and 250 cmbs we documented an extremely organic (described as "black muck" in the field) shell-bearing stratum. Shell was of moderate density, but vertebrate fauna and carbonized and uncarbonized seeds, nuts, and other botanicals were very abundant (see Chapter 5). The preservation and density of organics was on par with the near shore shell-bearing strata documented by the LSA at Salt Springs (O'Donoughue et al. 2011). No diagnostic artifacts were recovered from this stratum. As previously noted, however, the base of the shell within BA 4-1 (between 240 and 260 cmbs) was dated to 3940 ± 40 (4520–4240 cal BP). This basal date fits coherently with the age estimate from TU 1 to the north. This assay from Str. V was dated slightly later at 3810 ± 40, although calibrated at 2 sigmas the dates overlap (4410–4080 cal BP). These two assays bracket approximately 2 meters of shell deposits. The base of TU1 was situated at an absolute elevation of 0.5 m, while the auger date came from between -2.0 and -2.2 m. The implication is that shellfish and other materials were deposited rapidly—in massive quantities—along the spring's margin. Based on organics in BA 4-1 the earliest deposition occurred in water, possibly as midden prograded out towards the spring. Later deposition may very well have occurred in a terrestrial context once shell had been laid down in the water.

Unlike the consistent findings on the east side, the record of shell deposition to the north and west of the spring pool is spotty at best. Although shell is visibly eroding along the northern pool margin, much of the upslope deposits appear to have been truncated by mining. Moreover, there is no evidence for saturated shell where we tested, although it is likely present closer to the spring pool. The only intact sequence encountered was in BA 1-11, which was located on top of the mining escarpment. Down from the surface we intercepted a 130-cm thick sequence composed of varying amounts of whole and crushed *Viviparus*, *Pomacea*, and bivalve shell in a brown sand. This was found lying upon a gray to white culturally sterile sand, identified elsewhere at similar elevations. This sequence is not entirely unlike that exposed in Test Unit 2 (Chapter 4). Nearby in BA 5-1 we located a 90-cm thick shell-bearing sequence consistent with BA 1-11. From here to the end of Transect 5 we met with mixed results. Intact shell was completely missing from BA 5-2. To the west, the upper portions were all disturbed, with intact shell deposits ranging in thickness between 15 and 60 cm. Although it is frustrating that much of the shell has been removed, the depth of shell along the spring margin is quite revealing. Absolute elevations for the base of shell were significantly higher than those to the southeast, ranging between 1.3 and 0.9 m. The implication is that unlike the south and east sector of the spring pool tract, this segment of the landform was always elevated above the water.

Terrestrial shell deposits were also preserved to the west of the spring pool (Figure 3-23A). A mostly intact sequence dating to at least the Orange period was present on the escarpment margin in BA 2-1. The upper 20 cm was recently disturbed

sand with shell. Beneath that was the following sequence: 20–50 cmbs whole and crushed shell with little sandy matrix; 50–60 cmbs whole and crushed shell in brown sand that yielded an Orange plain sherd; 60–85 cmbs brown sand with abundant burned bivalve; 85–120 brown sand with some whole and crushed *Viviparus* shell; 120–160 cmbs light brown sand with sparse shell and vertebrate fauna; and 160–210 cmbs light gray sand which became moist but not saturated near the bottom. Between BA 2-1 and BA 2-6 all overlying shell deposits appear to have been removed. As previously noted BA 2-6 contains upwards of 150 cm of shell on top of a dark gray sand. However, it was unclear during excavation whether this shell was in primary context or the result of mining operations. In contrast, shell within BA 2-7 was clearly intact below 37 cmbs. This upper zone is notable, however, due to the presence of elongated *Viviparus* shells. These shells have a unique morphology, including a long central axis and flattened bodies, which has been recognized only one other time in the LSA's research on the St. Johns. They are present in great quantities on the southern side of the spring run in association with St. Johns Plain pottery. In BA 2-7 they were found with St. Johns Plain pottery, although a square-cut nail was also recovered. Further testing will be required to confirm the chronological and spatial association of these anomalous forms. Moreover, their ecological significance remains to be determined as well (for further discussion see Sassaman et al. [2011a]). Regardless, below this deposit we encountered a matrix-free shell stratum composed of whole large *Viviparus* and *Pomacea* shell. The shell was so loose, in fact, that we could not excavate beyond 120 cmbs. The auger whole kept filling in as there was no matrix to keep the shells together. A similar deposit of shell dating to the St. Johns period was identified near the apex of the Hontoon Island North south ridge (Randall and Sassaman 2009). In the case of BA 2-7 no St. Johns pottery was found in association with the whole shell. However, St. Johns Plain pottery was observed in cursory examination of the nearby slope towards the spring. Dense shell is present all the way down the slope into the water. How deep shell extends below the pool surface is unknown.

DISCOVERY AND PRELIMINARY ASSESSMENT OF SITE 8LA4242

The LSA discovered a previously unrecorded shell mound during a pedestrian survey west of Area C. Crew members spread out and walked along the footpath and through the swamp adjacent to the run looking for exposed shell or other cultural materials on the surface. Approximately 100 m east of STP L-20 they encountered shell on the trail. Continued searching revealed extensive shell deposits including surface exposures, 2-m high escarpments, and borrow pits (Figure 3-24, 3-25). These are all unmistakable signatures of a mined shell mound. In addition, the crew identified an overgrown road, 1 m thick or more, constructed out of shell (Figure 3-26). The road courses from the mining area down to the water's edge. This feature appears to be a tram road, likely constructed to facilitate shell removal by barge along the run. On the basis of these finds and in consultation with USFS, the LSA declared all associated surface features as a new site. It is now known in the FMSF as site 8LA4242 (NF Site #11-12,

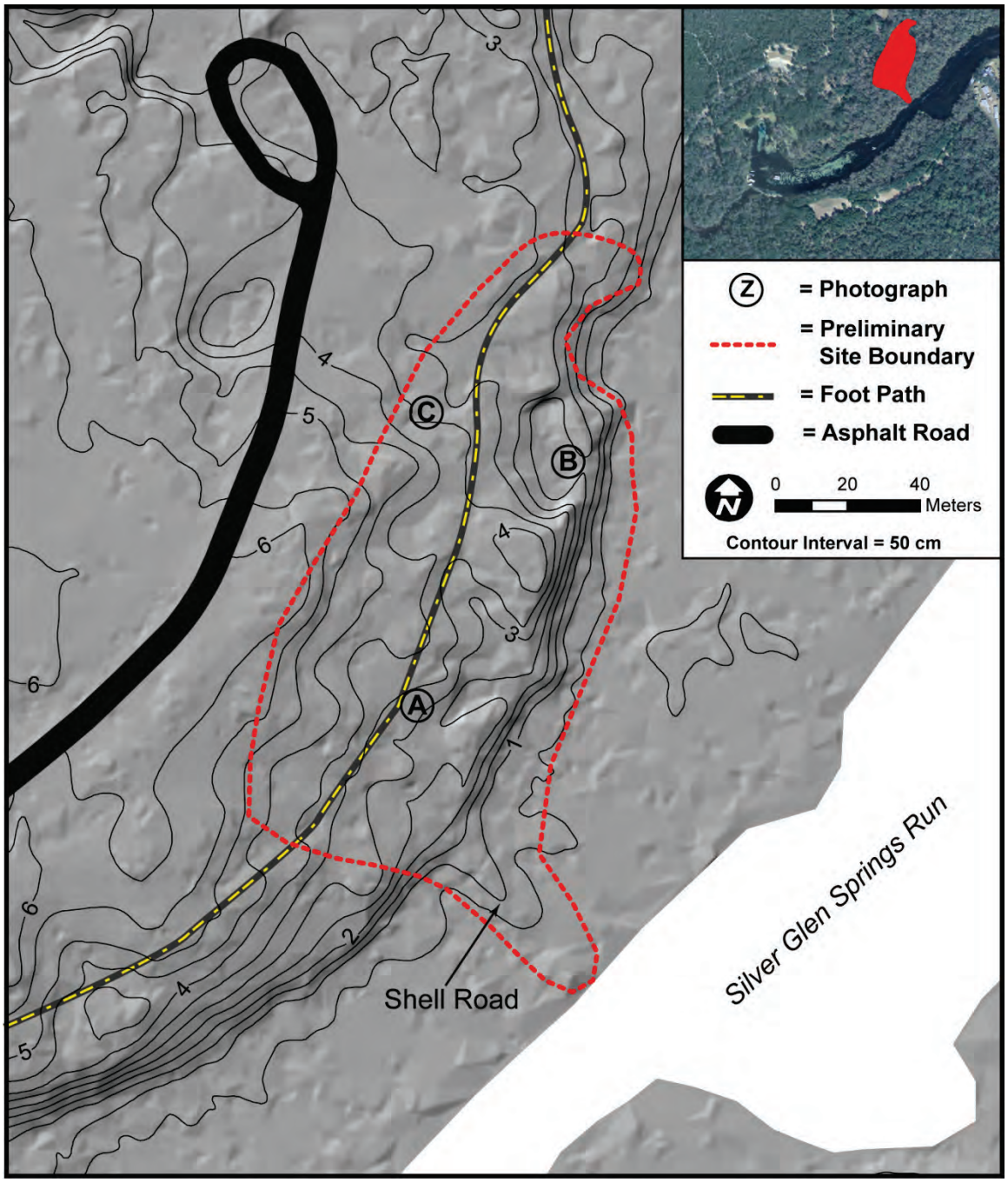

Figure 3-24. Preliminary boundary of site 8LA4242, the Silver Glen Spring Run North Mound.

Figure 3-25. Photographs of remnant shell deposits within site 8LA4242. A) facing east along trail. B) facing south towards mining escarpment. C) facing west towards borrow pit. Note: alphabetic designations are keyed to locations in Figure 3-24.

Figure 3-26. Photograph of shell road within site 8LA4242 (provided courtesy of Ray Willis). A) facing south. B) facing north.

Ocala), the Silver Glen Spring Run North Mound. The preliminary boundaries of the site are based on the distribution of shell on the surface. The main portion of the shell ridge measures 185 m long and 85 m wide. The ramp is roughly 45 m long and 6 m wide. All told, this site as currently defined covers 1.3 ha.

The primary feature of site 8LA4242 is a remnant shell mound. Unfortunately, mining has eradicated most of the mound surface. As a result, the original configuration of site 8LA4242 remains hard to discern from the available LiDAR elevation data. In general, however, it approximates the familiar linear shell ridge that many shell mounds attained throughout the St. Johns valley. The mound may have shared a very similar shape and size with the shell ridge directly across the spring run (8LA1W-Locus A). At site 8LA4242 the deepest shell deposits are situated on the terrace edge facing the run (Figure 3-25B). Here there is a relict mining escarpment that is approximately 2 m above the floodplain. At higher elevations the trail bisects a ca. 1.5 m high shell remnant (Figure 3-25A). It is unclear whether this shell deposit is intact or a push pile. The shell deposits thin considerably to the east (Figure 3-25C). In fact, this area is characterized by numerous shallow borrow pits. A similar pattern is evident at both 8MR123 and 8LA1W-Locus A where thinner and more diffuse shell deposits are situated on the backside of the main ridge (upland facing). The culture-historical association of 8LA4242 remains unknown. A few fiber-tempered sherds were present in the vicinity of Photograph B (Figure 3-25), but otherwise no ancient pottery was noted on the surface. It is likely, however, that the majority of the mound dates to the Mount Taylor period.

The second above-ground feature of significance at site 8LA4242 is a shell road (Figure 3-26). This was constructed by depositing mined shell (presumably from the adjacent mound) on the steeply sloping terrace edge. Indeed, this road is perhaps better defined as a ramp. It begins level and on the same elevation as the foot path on top of the terrace. From there the feature slopes down southward where it terminates in the lowland swamp just a few meters inland from the run (Figure 3-26A). It is thickest south of the footpath, and thins as it approaches the wetlands. The surface of this feature is currently covered in low lying vegetation (mostly palmetto), with several small diameter hardwood trees growing up through it. At the northern end there is a large tree tip-up which is filled with metal debris and 20th century ceramics such as plates and coffee cup fragments.

Unfortunately, there is no record of site 8LA4242 prior to shell mining in the historical accounts of Wyman, Moore, and others. However, the mound's imminent destruction and the construction of the shell ramp in the 1920s was recorded in Lake County probate court documents. Probate records indicate that on March 23, 1923 land owner Calvin Long sold rights to the shell on his property for $1000 to C. W. Perkins (Lake Co. Misc. Book 6, pp. 314–315). The property on "Silver Glenn Creek" was described as "west half of lot 2 and 3 Section 30, Township Fourteen, Range twenty seven." This description is consistent with the boundary documented by the LSA as compared with the original 1852 GLO survey plat (Figure 3-27). The mound straddles the western portions of lots 2 and 3. Just four days earlier (March 19, 1923) Perkins had also secured permission from the Juniper Club to remove shell down to the water level along the southern side of Silver Glen Run. This mining was to occur over a ten year period, and included shell at the intersection of the run with "Lake George and the other shells near the southwardly side of said creek [Silver Glen Spring run]" (Lake Co. Misc. Book 6, pp. 315–316).

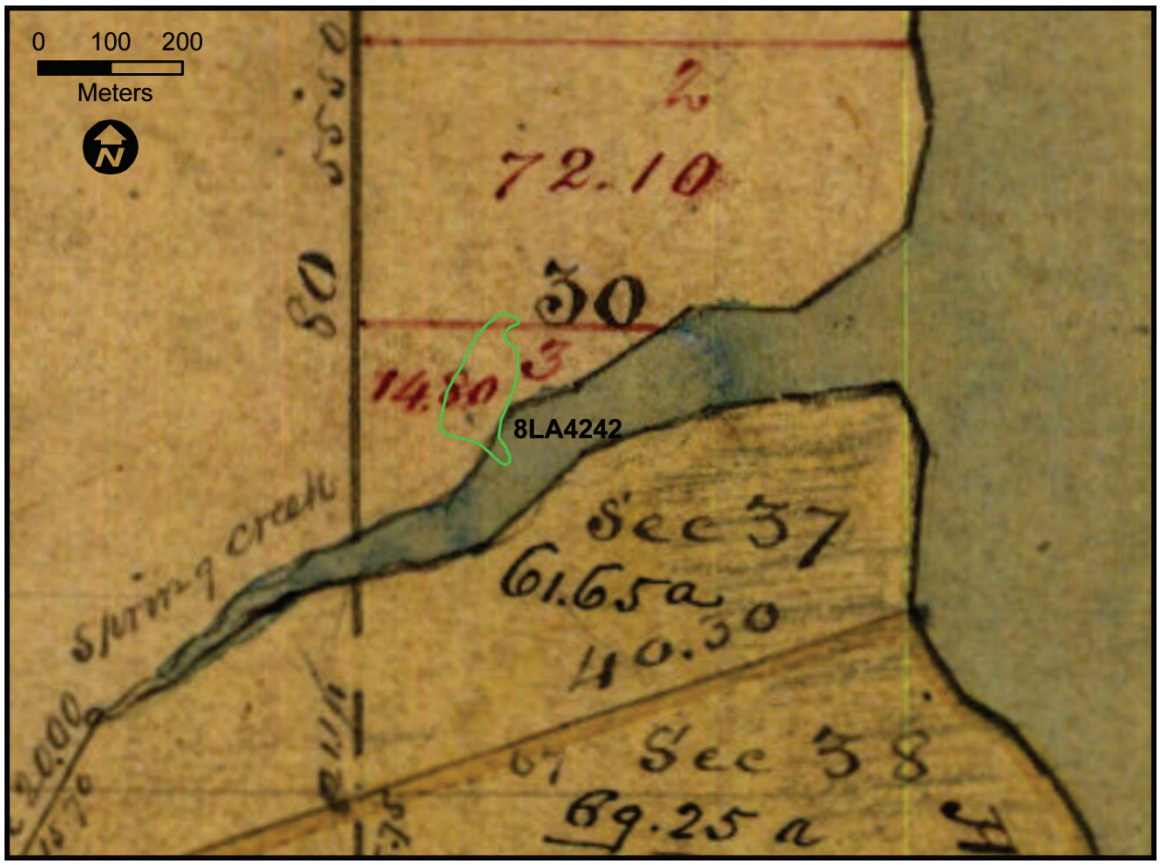

Figure 3-27. Close up of original (1852) GLO survey plat of Township 14 South, Range 17 East with the location of site 8LA4242 illustrated.

The documents further reveal the kinds of activities that would occur during mining. Calvin Long gave Perkins permission to "dredge in Silver Glen Creek adjacent to" his property. The Juniper Club also granted Perkins the right to "dredge in Lake George and Silver Glenn Creek adjacent to [the Juniper Club] property such channel or channels as may be necessary for barges or water craft engaged in the removal of said shells." Finally, Perkins was granted permission to "construct such hauling and loading facilities as may be necessary or convenient for the removal of the shell with right upon completion of such removal to remove such buildings or structure erected for such purpose." Based on these documents, the mining operations on both sides of the run occurred sometime after March of 1923. Similarly, the shell ramp at 8LA4242 was likely constructed soon after this date to facilitate removal of the shell via barges situated on the run. Contrary to their agreement, Perkins apparently did not demolish the road after mining had ceased.

The scale and tempo of early 20th-century landscape modification in and along the run is spelled out as well. Curiously, there is scant evidence for shell mining or road construction at site 8LA4242 in the USDA's 1941 aerial photograph (Figure 3-28).

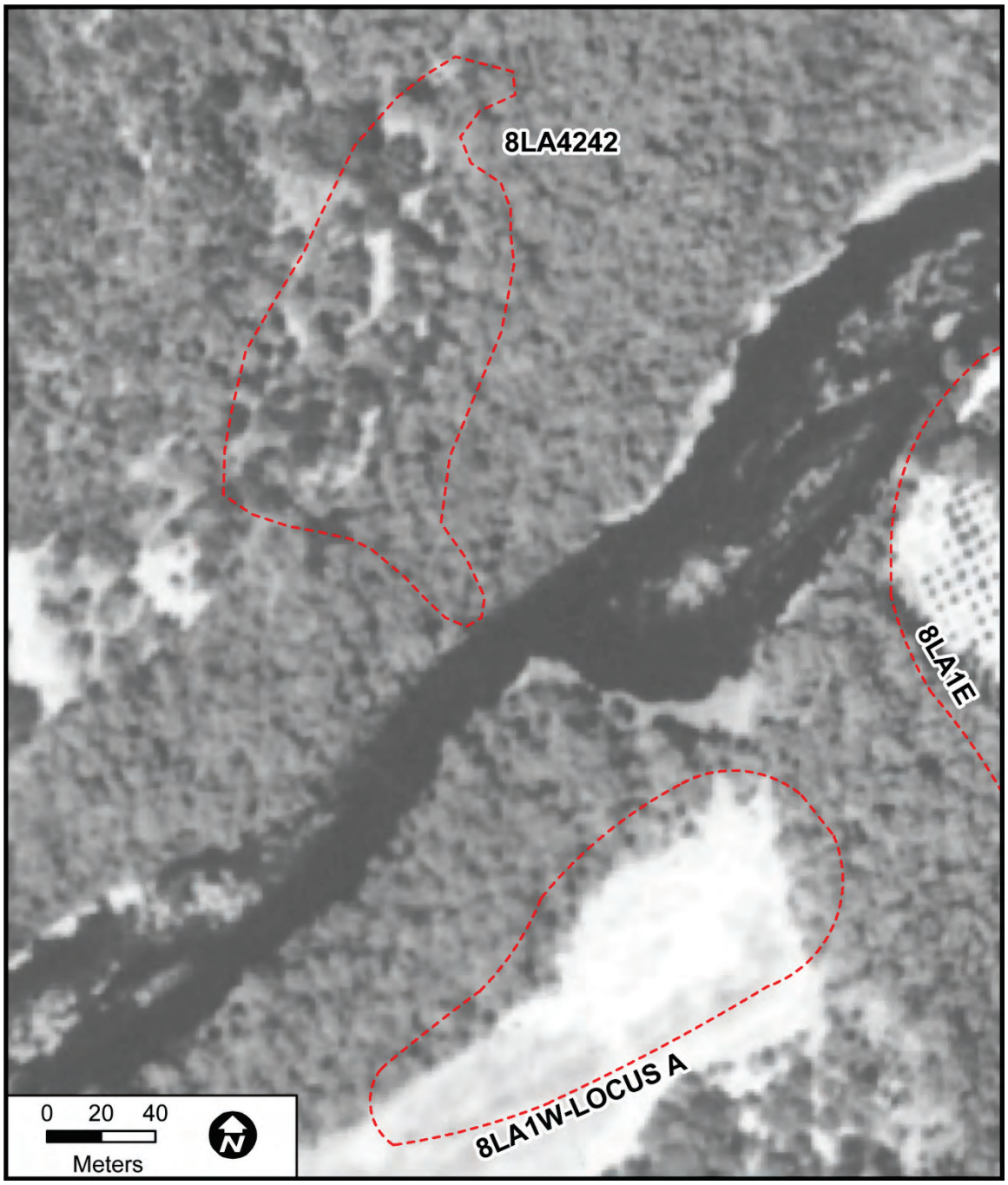

Figure 3-28. Known shell mound boundaries superimposed on the USDA 1941 aerial photograph.

There is some indication of thinned trees and bare ground on the higher, northern side of the site. However, the road and the southern half of the site was already re-vegetated at this point. This stands in stark contrast to the south side of the run, where bare ground evident as very bright patches are present across the landform. The difference in ground cover may be related to a lag in operations on the south side. In 1932, the Juniper Club

and the miners (now the Lake George Shell Corporation) reworked their contract over a disagreement relating to the removal of shell below the water table (Lake Co. Misc. Book 12, pp. 480–481). The miners were given a 5-year extension to mine shell. This means that up to 18 years may have passed between the cessation of activities at 8LA4242 and the 1941 USDA flight. By extension, shell was potentially mined only 3 years prior to 1941. The court filings also shed light on some anomalies in the organization of the spring channel. At the point where the shell road intersects with the run, the channel width increases from 33 m upstream to 95 downstream. This expanded channel is also one of the deeper sections of the spring run (Pandion Systems 2003). Without a doubt this channel segment was expanded by Perkin's dredgework. Not only would it have enabled him to load barges at the shell road, but he could also maneuver barges to the south side of the run and load shell from mining operations at the ridge there. The run suffered significant collateral damage during the removal process.

Although there is no secure way to know the shape and size of the 8LA4242 mound, the probate records do provide a means to derive a rough estimate. In the 1923 agreement with the Juniper Club, Perkins was to pay a total of $17,000 dollars for the shell, at a rate of 15 cents per yard. Perkins also paid Long $1000 for shell on the north side of the run. Assuming that Perkins paid the same rate to Long for shell at site 8LA4242, then he planned to remove 6666 $yards^3$, or 5096 m^3, of shell. Other than being a large quantity of material, this figure means little in itself. However, volume estimates have been derived using LiDAR for several intact shell ridges in the valley (Randall 2010). At the lower end of the scale are sites such as Bowyer's Bluff-1 (8LA88A), which measures 45 x 24 m in plan and is 4.2 m high. This mound contains a minimum of 2011 m^3 of materials. Higher on the scale are sites such as the Hontoon Dead Creek Mound (8VO214), which measures 155 x 55 m in plan and is 5.5 m high. This ridge contains roughly 7602 m^3. Larger still are multi-mound complexes such as Thornhill Lake (8VO58–60), which measures 191 x 109 m on the ground, is up to 5.3 m high, and contains two burial mounds. This site is conservatively estimated to contain 8366 m^3 of materials. Volumetrically, 5096 m^3 would place 8LA4242 somewhere in the middle of the known range. Calculating the actual size of the ridge, including its original height, is entirely dependent on its horizontal extent. As mapped on the ground the shell deposits extend over an area 185 m long and 85 m wide. If this was the base of the entire ridge, then the height of the mound would likely be significantly lower than those mounds cited above. If, however, the ridge was confined to a smaller portion of the landform, then it could have risen well over 4 meters above the floodplain. As previously discussed, the primary area of shell mining (based on deep escarpments) was on the terrace edge facing the spring run. This area measures approximately 150 by 100 m, between photographs A, B, and C (Figure 3-25). If this was the area for which Perkins estimated shell to come from, then the ridge may have been quite high. Further testing will be required to assess where shell was mined, how far shell extends beyond surface escarpments, and whether the current escarpments are indeed intact.

There is much to be learned about the history of occupation at site 8LA4242. By itself, the ridge would be significant as it forms a portion of a much larger built landscape. We now know that there were two ridges opposing each other on either side

of the run, in addition to numerous larger and smaller shellworks. Similarly, the shell ramp is significant as well, as it stands as an exemplary architectural feature representative of the shell removal period. It is with some irony, however, that site 8LA4242's significance is derived from the fact that the full spectrum of shell removal activities—mining, installation of facilities, channel dredging—are preserved in one complex. It is this relationship between surface features that needs to be protected and conserved. Site 8LA4242 stands as one of the best preserved examples of this important, albeit destructive, era along the St. Johns.

SUMMARY

The LSA's reconnaissance survey has significantly increased knowledge of the distribution, diversity, chronology, and integrity of cultural resources across the SGSRA. It is important to note that the testing strategies employed in this project were not designed to locate the boundaries of cultural resources within the SGSRA. In fact, based on the documented distribution of surface and subsurface finds it is highly likely that cultural deposits extend beyond those identified in this survey.

Shovel testing north of the shell ridge identified evidence for stratified and well preserved intense habitation dating at least as far back as the Mount Taylor period, if not earlier. Practices on the upland terrace did not involve significant deposition of shellfish. However, the distribution and diversity of lithic tools suggests that two or more discrete activity areas dating to the preceramic Archaic are present on the terrace. Similarly, Orange period pottery is dispersed in what appears to be an arcuate pattern. On the basis of comparisons with other Late Archaic sites, this portion of the site may contain a circular compound or village arranged around an interior plaza. Shovel testing around the proposed fee station to the west also identified well-preserved cultural resources. In this location of the upland terrace preceramic Archaic and post-Archaic St. Johns components were most prevalent. Upslope, shell bearing deposits were limited to pit features. Shovel testing around the main shell deposits of 8MR123 defined the contact between shell- and non-shell bearing components. Although much of the shell deposits have been removed, intact and largely unadulterated components were identified north of the mining escarpment. At lower elevations, dense and intact shell-bearing deposits of Mount Taylor age were found below a cut-and-fill sequence. REDACTED

The bucket auger survey has significantly increased knowledge of the distribution and history of different components in the vicinity of the 8MR123 shell works at lower elevations. Bucket augers along the run and east side of the spring pool showed that the current shape and extent of this landform is entirely anthropogenic. Today, close to 3 m of saturated wetsite deposits are present below the surface. These would have been situated beneath shell of unknown depth. Radiocarbon assays indicate that shell deposition occurred near the spring starting at least 5500 years ago in near-shore or open water conditions. The distribution of age estimates suggests that the manufactured shoreline prograded out towards the run and spring pool as large volumes of materials were deposited rapidly. In contrast, augers to the west and north of the spring pool

identified a basal shell-free occupation zone that likely dates to the Late Mount Taylor period. Although currently saturated, these surfaces were at a higher elevation than those to the east, likely above the current water table. Shell has been all but removed throughout this portion of the spring basin. However, remnants are found along the mining escarpment to the west and north, and directly along the spring margin. Through the deposition of shell, earth, and other materials Archaic and later groups terraformed the entire SGS basin. Given the extent of shell-bearing deposits identified around the spring pool, there is a high likelihood of deeply buried deposits extending far into the spring pool and run.

Pedestrian survey to the east of 8MR123 located a previously undocumented shell mound. Evidence of shell removal was well preserved along the terrace edge, and included mining escarpments in addition to architecture related to the mining process itself. This site has been recorded as the Silver Glen Run North Mound, site 8LA4242. In addition to revealing the further extent of ancient occupation along the run, the discovery of 8LA4242 helps explain variations in the channel and landform. A review of available probate court documents indicates that the SGS watershed attained its current configuration sometime between 1923 and 1941. Not only was shell removed from the land, but so too was a large quantity of channel bed materials. These sources attest to mining activities in the eastern half of the watershed, as well as terrestrial sources on the southern side of the run (Figure 3-29). The signature of mining is evident around the spring pool as well. Based on the descriptions of Taylor (1935) and Potter (1935) we know that shell was being excavated around the slope of the spring pool in the 1930s,

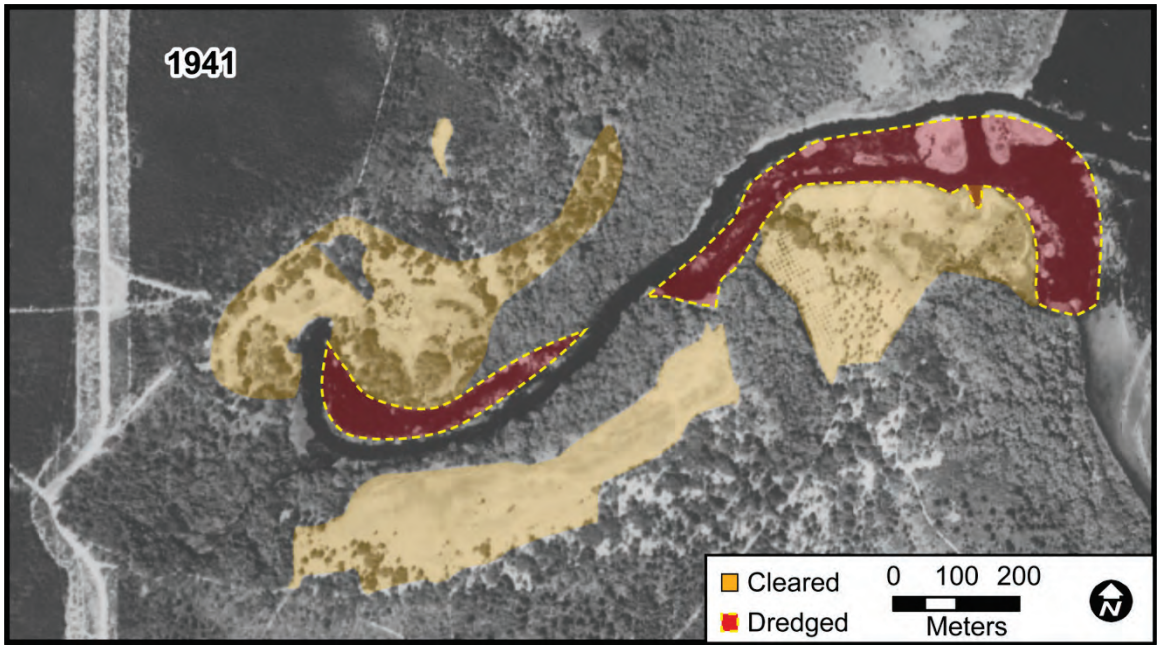

Figure 3-29. Probable areas of land clearing and channel dredging between 1923 and 1941.

presumably by the then-owner, Henry Henderson. Potter's (1935) map further suggests that the channel just downstream of the main spring was significantly narrower. Indeed, augers near the spring and run margin documented two or more meters of shell. Mining and dredging may have removed portions of the bank, effectively expanding what would have once been a channel of equal width (roughly 30 m) along its entire length (Figure 3-29). If this is the case, the only undredged portion of the run may be just to the west of the shell road at 8LA4242. Closer to the spring, the original northern shoreline may have extended well into the run. Today there is a noticeable linear bank in the middle of the channel on which boats routinely anchor. Future work will be needed to determine whether this feature is the original shoreline. The bigger point is that ancient inhabitants of the SGS created the configuration of the spring and run. Working in reverse of pre-Columbian communities, Perkins and his laborers expanded and deepened the spring run channel.

Although much destruction was wrought in the early 20th century, significant cultural resources remain across the SGSRA. There can be no doubt that the current morphology of the spring and run is entirely anthropogenic. Intensive habitation not only occurred by the spring, however. Ancient communities engaged in a wide array of activities on the upland terrace as well. Unlike the lowland components, cultural deposits are well preserved even in developed areas. While extensive testing has revealed the big-picture of life around the spring, many questions remain to be answered. It is to the details revealed in stratigraphic excavations that we turn to next in Chapter 4.

CHAPTER 4
STRATIGRAPHIC EXCAVATIONS

Asa R. Randall

The Laboratory of Southeastern Archaeology (LSA) conducted stratigraphic excavations at site 8MR123. These investigations were executed to provide details necessary to place the large-scale reconnaissance survey results into context. At low elevations, remnant basal and lateral deposits of the "amphitheater" of shell define the spring pool. Test Units 1 and 2 were excavated in this locality. Stratigraphic details from these tests will be necessary for future erosion mitigation and stabilization programs. We also tested in the upland unit, away from the spring pool. Shovel testing in these zones outlined deeply stratified sequences and possible subsurface architecture. Test units were placed in areas likely to provide significant knowledge of the distribution and integrity of these resources. This chapter describes the methods and results of these stratigraphic excavations in detail.

EXCAVATION METHODS

Test units were excavated according to standard protocols. After the test unit was laid out we cleared the surface of debris and vegetation. From there, excavation generally proceeded in 10-cm arbitrary levels, with natural stratigraphy excavated and bagged separately as "zones" when possible. After recording observations regarding variations in artifact assemblages and soils encountered, we mapped the distribution of natural strata at the bottom of each level. Excluding concreted shell, all excavated sediment was passed through 1/4-inch hardware cloth. All prehistoric cultural materials were retained, and a representative sample of recent materials was also collected. On occasion, artifacts would be recorded *in situ*, given a field specimen number, and recorded in three dimensions. These were then bagged separately. When recognized, features were first cleaned off, photographed, and drawn in plan. They were then sectioned by excavating one half of the feature. The profile of the feature was drawn and photographed, and then the remaining matrix was excavated. The fill from both sections was kept separate and placed into plastic bags, and retained as bulk samples for further processing in the lab. We also had the opportunity to retrieve a 50 x 50-cm column sample from TU2. Within the column the entire stratum was bagged and brought back to the lab. If a stratum was greater than 10-cm in thickness, it was divided into levels no greater than 10-cm thick. Once excavation was complete the profiles were cleaned, photographed, and documented. The test units were then backfilled.

SHELL MOUND REMNANTS

Spring Pool Margin – Test Unit 1

Test Unit 1 (TU1) was excavated in the location of a proposed water entrance ramp footer (Figure 4-1, 4-2). The goal was to determine the composition and integrity

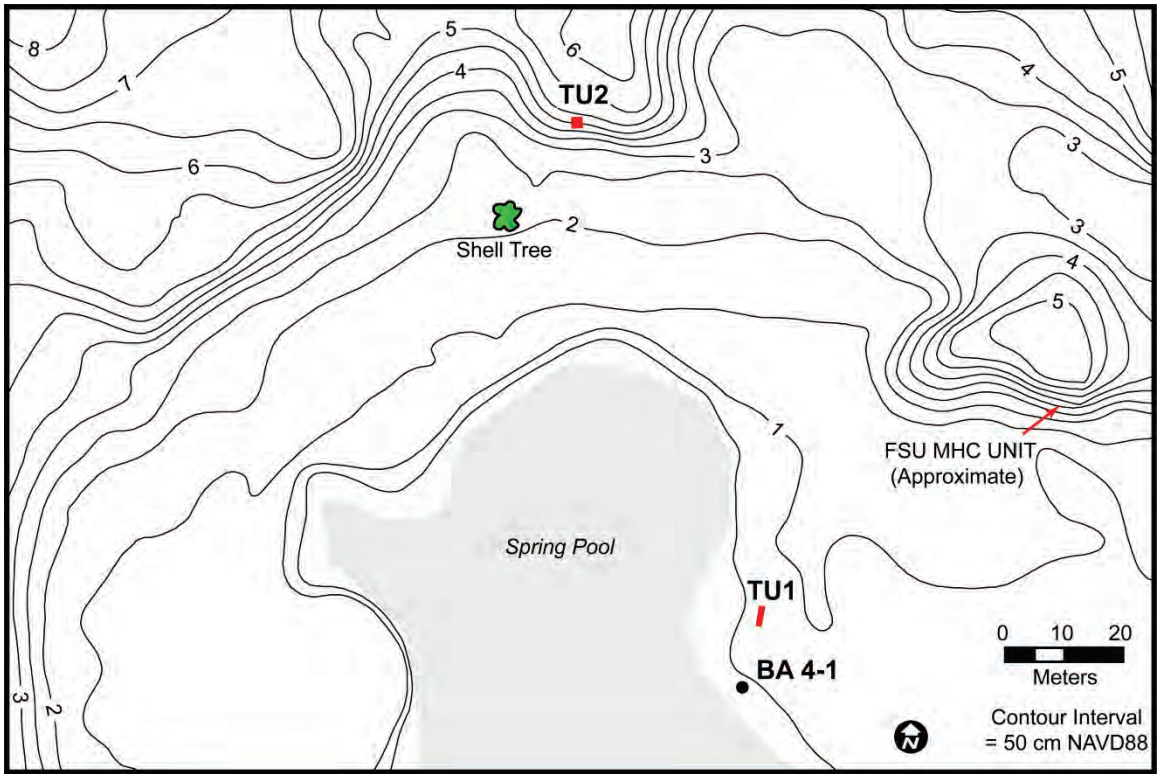

Figure 4-1. Topographic map of spring pool area showing the location of test units excavated by the LSA and FSU.

Figure 4-2. Eroded shoreline adjacent to the spring boil. The black tarp to the right of the photo marks the approximate location of Test Unit 1 (facing northeast).

of subsurface cultural resources that would be disturbed during footer installation. Because the LSA excavated the entire extent of the footer, there will be no need to further disturb subsurface deposits. Excavation revealed that intact shell deposits are present 15 cm below the surface. Much of this deposit is extensively concreted. Other potentially intact deposits are present adjacent to this stratum, up to a depth of 34 cm below surface. Recent deposits — likely post-dating 1950 — are present across the entire test unit. This fill, composed of mottled sand as well as cemented crushed lime rock, is present from the surface down to a maximum depth of 27 cmbs in some places.

Test Unit 1 was located next to one of two "beaches" within the recreational area (Figure 4-1). The bank around most of the spring run rises abruptly 50 cm to 1 m above the water level. This bank is composed of consolidated, and often concreted, shell deposits. However, the shoreline in the test area is an arcuate incision with a gently sloping gradient towards the water (Figure 4-2). This beach is a high traffic zone, and is the primary point for visitors entering the boil from the recreation area. During periods of high water stages, particularly during the summer, this area is a favorite spot for children to play. Farthest away from the water, and at higher elevations, the surface of the beach is characterized by sand, shell, and compacted limestone aggregate. Towards the water, and beneath the spring pool, are large clasts of concreted shell. As is typical of shell mounds in the region, the base of this mound is extensively concreted (Wheeler et al. 2000). Although not revealed in stratigraphic excavations, there is likely two or more meters of non-concreted wetsite deposits below this surface (Chapter 3). The current surface configuration of the beach reflects the history of mining and more recent attempts to stabilize erosion.

The location, dimensions, and maximum excavation depth of TU1 were defined by engineering needs. Prior to our fieldwork USFS Engineer Steve Cromer outlined the proposed location of the walkway footer. As requested by Cromer, the eastern margin of TU1 was aligned with the easternmost border of the footer. We also added a buffer (approximately 30 cm [12 in]) to the north, south, and west of the footer. In plan, TU1 measured 3.5 m along a north–south axis and 1 m along an east–west axis. The planned depth of the footer was 20 cm, but we excavated to roughly 30 cm below surface to provide options during installation. After laying out TU1, we established an arbitrary elevation datum midway along the eastern profile of the unit (Figure 4-3). All elevation measurements were taken from this point (recorded as cm below datum [hereafter cmbd]), which was 7 cm above the ground surface. Excavation proceeded in arbitrary levels, but we kept natural layers separate during processing and bagging. In general, flat shovels and trowels were used to remove sediment. However, a pick-maddox was required to excavate the concreted shell we encountered. Once we reached the bottom of level C—the maximum depth to which we were asked to test—we documented stratigraphy within TU1 by drawing and photographing (excluding the south profile) each profile. Stratigraphic descriptions are provided in Table 4-1, and a stratigraphic drawing and photograph of the east profile is presented in Figure 4-4.

Table 4-1. Test Unit 1 Stratigraphic Descriptions.

Stratum	Munsell	Top (cm)	Bottom (cm)	Description
I	10YR7/1, 10YR5/2	0	27	mottled sand, with abundant roots, modern artifacts (aluminum pull tabs), lithic flakes, limestone gravel, and rare shell fragment (likely fill placed on top of mined shell surface)
Ia	10YR8/4	10	16	concreted crushed lime rock (likely placed on top of sandy fill to mitigate erosion, only present in northwest corner of unit)
II	10YR3/2	18	33	abundant crushed and whole shell (mostly *Viviparus)* and abundant roots in a sandy loam. Appears organically enriched (likely the post-mining shell surface)
III	10YR4/2	16	30	whole and crushed *Viviparus*, occasional bivalve, rare *Pomacea* shell in ashy fine sand
IVa	10YR4/2	20	34	mostly crushed shell (burned bivalve and *Viviparus*) with some medium sand
IVb	10YR5/2	18	32	mostly crushed shell (burned bivalve and *Viviparus*) with abundant ash.
V	10YR5/2	15	35+	concreted whole and crushed *Viviparus*, some bivalve and *Pomacea* shell in gray sand (more whole bivalve and *Pomacea* than in Stratum III) [BETA-295208, 3810 ± 40 BP]

Table 4-2. Artifacts recovered from Test Unit 1, site 8MR123.

Level	Debitage		Vert. Fauna		Modified Bone		Historic	
	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt
A			2	3.9			6	10.4
B	3	2.2	5	7.6				
B - Zone B	1	0.1	1	0.2			1	10.0
C			11	14.9	1	3.0	1	35.5
Total	4	2.3	19	26.6	1	3.0	8	55.9

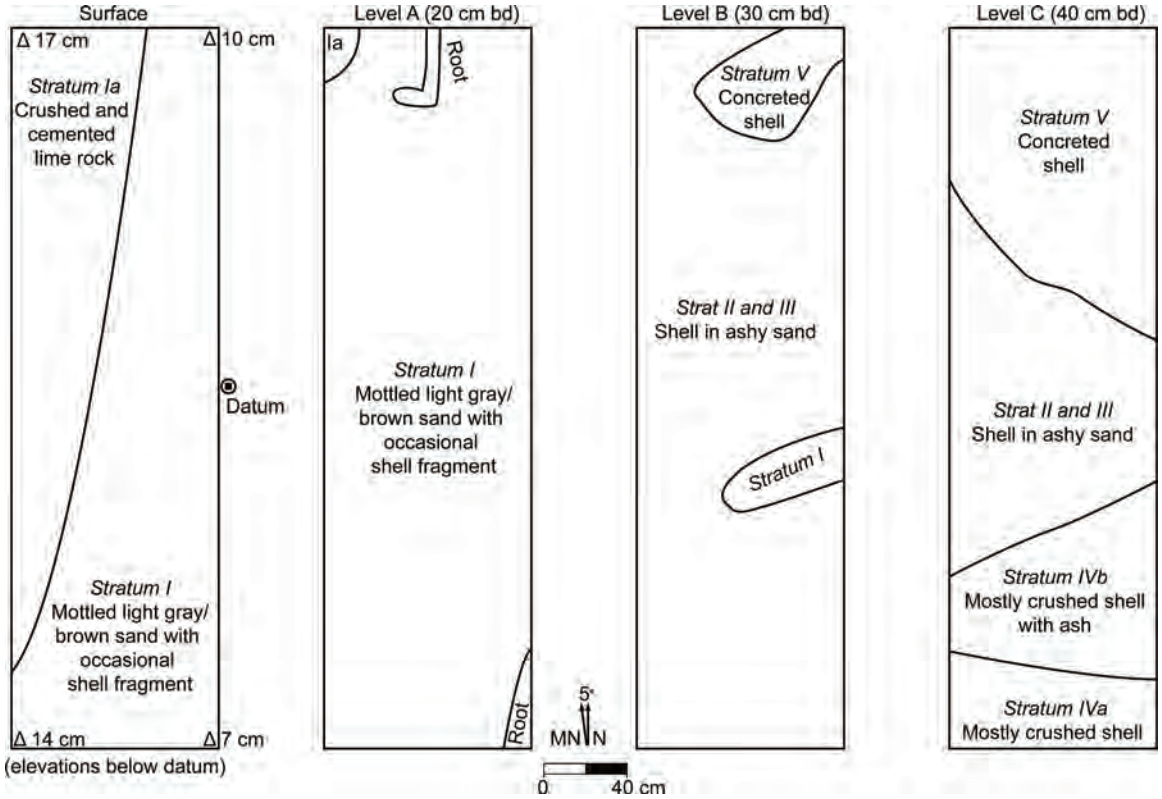

Figure 4-3. Test Unit 1 level plan view maps.

We excavated three levels. Level A was between 0 and 20 cmbd, although the effective thickness of the level was 13 cm. Level A was a "wedge cut" due to the slope of the surface, which trends downward from east to west. Elevations in the eastern half of TU1 vary between 7 and 10 cmbd, while the western elevations are between 14 and 17 cmbd. Two strata were encountered in Level A (Figure 4-3). Stratum I was present throughout the level, and consisted of heavily mottled light/gray brown sand which contained the occasional shell fragment. An interesting material culture assemblage was recovered in this stratum. The majority was of recent origin, and included aluminum pull tabs, a possible metal button, and a 1972 penny. All are consistent with the history of recreational use in the area. We also recovered several lithic flakes and animal bone fragments from this stratum in Levels A and B. These were likely included within the sand which was emplaced upon the mining surface. The source of the sand, then, could be one of the borrow pits in the uplands. The western third of TU1 was also covered with a Stratum Ia, a crushed and cemented lime rock deposit. This layer was likely emplaced to mitigate erosion at the beach.

Excavation continued with Level B, between 20 and 30 cmbs. By the end of the level almost all of Stratum I had been removed, save for a linear pocket (Figure 4-3). At approximately 25 cmbd we began encountering a dense shell deposit, composed primarily of whole and broken *Viviparus* shell, with some bivalve and *Pomacea* shell.

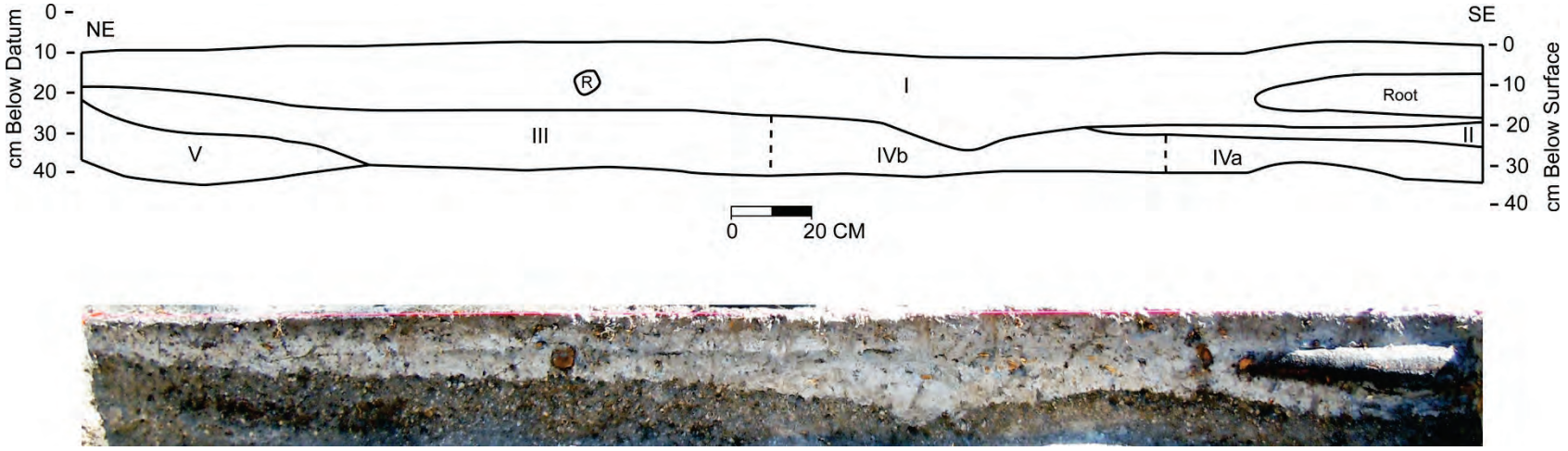

Figure 4-4. Test Unit 1 East Profile illustration (top) and photograph (bottom).

Several brick fragments were recovered from this shell deposit (one in Level B and C). During excavation it was not possible to discriminate multiple strata. Upon inspection of the profiles, it was clear that we had excavated both Stratum II, an organically enriched shell deposit, and Stratum III, an ashy shell deposit. Both brick fragments appear to have come from Stratum II, which likely represents the post-mining shell surface upon which sand was later deposited. Only a few prehistoric mammal bone fragments were recovered from either stratum. By the end of the level we encountered Stratum V in the northeast corner of the unit.

Level C (30–40 cmbs) was the last level we excavated. After removing the remainder of Stratum I we continued excavation of the shell deposits. In the northern half of the unit these quickly became concreted (Stratum V), necessitating the use of a pick-maddox to break apart the matrix. No artifacts were noted within the concreted shell. A grab sample of concretion clasts was retained with the goal of acquiring charcoal for a radiocarbon assay. In the southern half of the unit we encountered a variable crushed shell layer, which we later subdivided into Strata IVa and IVb. Stratum IVa was composed primarily of crushed *Viviparus* and bivalve shell with some medium coarse sand. Stratum IVb was similarly composed of crushed shell, but included a greater abundance of ash. Bulk samples were acquired from both strata for further analysis in the lab.

The shallow depth of TU1 limits what we can infer from the stratigraphic profile. However, several patterns are evident. The only stratum that we can state with complete confidence to be intact is Stratum V. The concreted nature of this deposit precludes it having been mined. On this basis we secured a charcoal sample from concretions within this unit, and submitted it for an AMS assay. The sample returned a corrected age estimate of 3810 ± 40 B.P. (4410–4080 cal BP at 2 sigma), which places this stratum well within the Orange period. As the first radiocarbon date acquired for this project, it was initially thought that this assay was too young. At the time of excavation, the going hypothesis was that near-spring deposits would date to the Mount Taylor period. Moreover, no Orange period artifacts were recovered from this stratum. A consideration of radiocarbon assays from the bucket augers, however, suggests that this assay is correct. The sample from Bucket Auger 4-1, situated only 10 m or so from TU1, returned an age estimate of 3940 ± 40 (4520–4240 cal BP). This assay is slightly older but overlaps the age of Str. V. The surface of BA4-1 and the base of Str. V are approximately the same. The bucket auger sample was recovered from a depth between 240–260 cmbs. While no fiber-tempered pottery was recovered here by the LSA, there is a large assemblage of Orange incised and plain pottery housed at the Florida Museum of Natural History in Gainesville. The implication is that two or more meters of shell were deposited rapidly during the Orange period.

The integrity of Strata III, IVa, and IVb is less assured. Strata IVa and IVb are highly crushed and filled with ash, a pattern that is present at intact shell mounds elsewhere. In addition, we did not recover any historic or modern artifacts from these layers during excavation. Stratum III may be intact, although in the field it was difficult to discriminate between Stratum II and III. On the basis of stratigraphic inference,

Stratum II would appear to be the post-mining surface. Not only is the stratum organically enriched like an incipient A horizon, we recovered at least two brick fragments from it. This being the case, it may be that Stratum III is unconsolidated midden that was spoil from the mining operation, and Stratum II is the surface of this spoil that was exposed prior to it being capped by sand. Finally, we can state with utmost confidence that Strata I and Ia are recent additions. The presence of aluminum pull tabs, a 1972 penny, and a metal button fragment attest to it having been emplaced sometime after the middle of twentieth century, no doubt to increase the comfort of visitors. The presence of several lithic flakes suggests that this sand was ultimately derived from upslope, potentially in the vicinity of the parking lot. As related in Chapter 3, numerous lithic flakes and tools were recovered by the LSA during shovel testing.

After completion of excavation and documentation, we lined TU1 with Geo-fabric. We then backfilled the unit, leaving a 2-inch long border of the fabric exposed above the ground surface (Figure 4-5).

Figure 4-5. Photographs of Test Unit 1 lined with Geo-fabric (left)and backfilled (right).

Mining Escarpment – Test Unit 2

Test Unit 2 (TU2) was a 2 x 2-m unit placed along the mining escarpment north of the spring pool (Figure 4-1). This escarpment is characterized by a steep slope that rises ca. 3 m above the recreational area lawn, 40 m north of the spring margin (Figure 4-6). Shell deposits two or more meters in thickness were removed from this vicinity, based on the "shell tree" only 20 m to the south. The base and exposed roots of this tree retain shell left over from mining operations (Figure 4-7). The base of the trunk, which is at the same elevation as the mining escarpment, is presumably close to the original pre-mining surface. Along the escarpment, dense shell deposits are visibly eroding downslope (Figure 4-8). One goal of TU2 investigations was to determine whether the shell deposits within the escarpment were intact, and to inform how best to stabilize and mitigate erosion. A second concern was documenting the history of deposition along the backside of the shell ridge.

TU2 was oriented parallel to the escarpment (approximately magnetic north), and situated where mining operations had left a right angle cutout. This configuration afforded the opportunity to capture at least two deep intact profiles (west and north). The unit was placed roughly 10 cm north and west over the escarpment line to ensure the entire profile would intercept intact deposits. Due to the nature of the surface of the escarpment and its relationship to mining, excavations of TU2 followed a slightly different protocol than elsewhere. The strategy was to rapidly remove materials until we were sure that we were excavating intact strata. Because of the slope each level was a "wedge cut." Level A was a profile cut excavated through shell to a depth of 60 cmbd. We ceased Level A when we intercepted a brown sand layer (Str. IV). At the time, this was an unexpected result. We were operating under the premise that shell deposits here were thick. At this elevation, roughly one third of the unit was intact brown sand, while the remainder was unexcavated post-mining fill. In Level B we continued cutting the profile down to a depth of 75 cmbd, when approximately half the unit was either intact sand or mining fill.

Realizing that the brown sand underlying the shell was undisturbed, we shifted strategies in Level C to excavating in 10-cm levels. Three zones were recognized. Zone A was spoil left over from mining, Zone B was the Str. IV brown sand, and Zone C was an area of dense whole *Viviparus* shell that appeared below the brown sand. At the top of Level D, Zone C was excavated as Feature 1. We continued Level D with the same zone designations. REDACTED he west, north, and east profiles were photographed and recorded, and then we removed bulk samples in a 50 x 50-cm column from the north profile. Profile illustrations and photographs are provided in Figure 4-11, while stratigraphic descriptions are provided in Table 4-3. Tallies of artifacts recovered during

Figure 4-6. Photograph (facing north) of Test Unit 2 before excavation (above) and after backfilling and stabilization with clean fill (below, courtesy of Ray Willis).

Figure 4-7. Photographs of "shell tree," left over from the removal of shell. Left: facing west, titled "Tree Growing 7 Ft. above ground Silver Glen Springs, Florida," undated, courtesy of Jerry Boyer. Right: same tree, facing south, July 2010.

Figure 4-8. Close up of mined escarpment within Test Unit 2 (facing north).

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level excavation are provided in Table 4-4. The bulk sample analysis is presented in Chapter 6. The unit was backfilled by the field crew, and the USFS deposited clean sandy fill on top of our excavations (Figure 4-6).

Excavation of TU2 revealed a stacked sequence of sand and shell layers that was truncated by shell mining (Figure 4-11). Excluding mined deposits, all artifacts are consistent with the Mount Taylor period, no sherds of later traditions were recovered (Table 4-4). Stratum I consists of an equal mix of crushed shell (*Viviparus*, *Pomacea*, and bivalve) and fine, almost ashy, sand. Stratum I is approximately 12 cm thick in the north profile, where it has an undulating contact with Str. III. In the west profile, however, Str. I thickens downslope, where it eventually overlies both Str. III and IV. In the east, Str. I is found only above Str. IV. During excavation, Str. I was noted across the surface of the Test Unit and separated as Zone A. The only recent objects from TU2 were recovered from this stratum, including a glass fragment in Level A and an asphalt chunk in Level D. Otherwise, a variety of materials consistent with Mount Taylor occupation were recovered, including marine shell fragments, vertebrate fauna, modified bone, and a modified flake. The downslope component of Str. I definitely relates to mining activities. It is unclear, however, if the stratum ultimately reflects the un-mined surface of shell deposits that were exposed on the surface for long periods of time.

Figure 4-10. Photograph of excavated Test Unit 2, facing northwest.

In contrast to the Str. I overburden, Str. II provides better evidence for long term exposure and disturbance unrelated to shell mining. Stratum II is present only in the northeast corner of the unit, and is characterized by fine sand and crushed shell (principally *Viviparus* and bivalve) that are highly concreted. In profile, this stratum is intrusive to Str. III and Str. IV. The lateral contact between Str. II and III is quite sharp, while the base of Str. II is irregular and terminates in a long tendril in the east profile (Figure 4-11, visible only in the photograph). Although basin-like near the surface, this stratum is consistent with surface disturbances seen at other shell sites, including 8LA1W-Locus A and Locus B on the other side of the run (Sassaman et al. 2011a). Furthermore, the base of Str. II is consistent in composition and texture to Str. V, which is defined as elongated and irregular patches of very fine ashy sand with small shell fragments throughout. The bulk of the stratigraphic data suggests that Str. II and V represent the remnants of a tree or animal burrow. The majority of the disturbance occurred within Str. III which was laterally truncated, while roots or possible small burrows intruded into Str. IV. Collectively, Str. I and II would seem to reflect both long-term near surface exposure and associated taphonomic processes, in concert with recent mining.

Intact shell deposits were encountered within Str. III, which was excavated entirely within Level A. This 30-cm thick unit consists primarily of undifferentiated

Table 4-3. Test Unit 2 Stratigraphic Descriptions.

Stratum	Munsell	Top (cm) †	Bottom (cm) †	Description
I	10YR3/2	0	12	ashy/loamy fine sand with abundant crushed shell (probable mined surface)
II	10YR5/1	20	65	concreted fine sand and crushed shell (mostly *Viviparus* and bivalve)
III	10YR4/3	12	42	abundant whole *Pomacea* shell and bivalve (numerous paired examples) with rare *Viviparus* shell in fine ashy sand, abundant charcoal throughout, very little non-shell matrix [BETA-295210, 4730 ± 40 BP]
IV	10YR3/3, 10YR6/6	42	95+	medium–fine sand with rare shell fragment, abundant charcoal throughout, occasional patch of light colored sand [BETA-296262, 4950 ± 40 BP]
V	10YR5/3	60	85+	very fine ashy sand, small shell fragments throughout

† Maximum depth below NW corner of test unit

Table 4-4. Artifacts recovered from Test Unit 2, site 8MR123.

Level	Debitage		Mod. Flake		Misc. Rock		Marine Shell		Vert. Fauna		Mod. Bone		Historic	
	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt.	Ct	Wt	Ct	Wt	Ct	Wt
A	1	0.7							134	141.6	2	1.2	1	1.5
B							1	71.6	72	41.1				
C- Zone A			1	6.9			1	11.0	28	13.4	1	2.1		
C- Zone B							2	42.8	103	48.5				
C- Zone C									21	8.5				
D- Zone A									2	3.4			1	62.9
D- Zone B					1	1.1			95	51.8	1	1.7		
Total	1	0.7	1	6.9	1	1.1	4	125.4	455	308.3	4	5	2	64.4

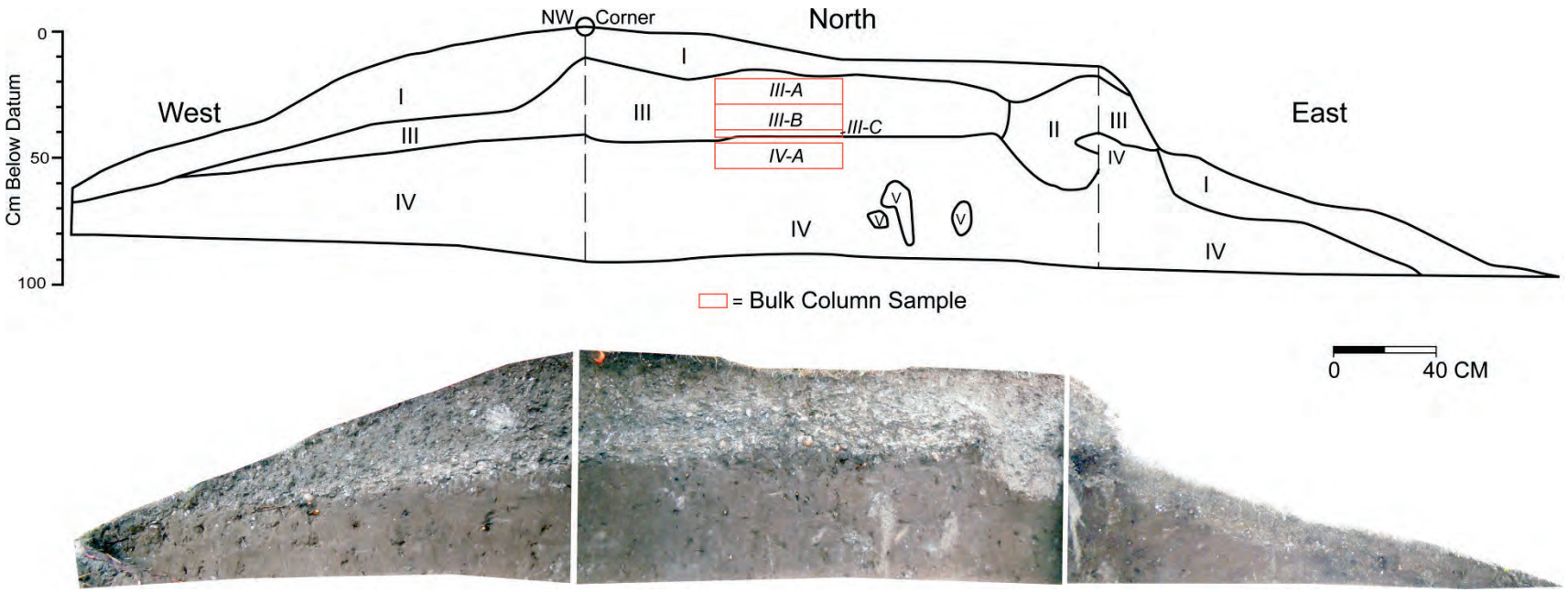

Figure 4-11. Test Unit 2 composite profile illustration (top) and photograph (bottom).

whole *Pomacea* and bivalve shell with some *Viviparus* shell. During excavation, it was noted that many of the bivalves were paired and closed. There was very little non-shell ashy fine sand matrix amongst the shell. Abundant charcoal was noted throughout the deposit, which also contained numerous vertebrate fauna fragments. A charcoal fragment was collected from the Str. III-Level B bulk sample and submitted for AMS assay, which returned a conventional age estimate of 4730 ± 40 BP (5590–5320 cal BP at 2 sigma). This date places shell deposition on the backside of the shell ridge at the start of the Thornhill Lake phase. The composition and preservation of shell within Str. III suggests that it was deposited rapidly, and not subject to significant taphonomic processes such as trampling that would have resulted in widespread crushing. Because of extensive alteration due to mining, the structure and scale of the deposit remains poorly understood. In the north profile, this unit lies flat on top of the underlying basal sand. In the western profile, the stratum can be seen sloping gently down towards the water. The implication is that shell was deposited on top of a sloping, and potentially domed surface. I will return to this point below.

Underlying shell throughout TU2 is the mostly shell-free Str. IV. REDACTED

tratum IV consists primarily of brown-colored medium to fine sand, with rare shell fragments and abundant charcoal throughout. A charcoal fragment was pulled from the Str. IV-Level A bulk sample and submitted for AMS assay, which returned a conventional age estimate of 4950 ± 40 BP (5850–5590 cal BP at 2 sigma). At two sigmas, this estimate shares a boundary with the overlying Str. III. These dates place the sand and shell deposits at the start of the Thornhill Lake phase, and coeval with the Bluffton Burial mound. At 8MR123 brown sand was noted only in several cases during shovel testing, particularly on the margins of the shell mound. Although the sand may simply be organically enriched from overlying deposits, light-colored stringers of sand, mostly white or yellow in color, were seen during excavation. REDACTED

A second line of evidence for purposeful mound construction are the associations between Str. III and IV. As noted above, the age estimates at 2 sigma for these strata share a boundary, but do not overlap. If they did overlap then it would suggest contemporaneity between the emplacement of sand and the deposition of shell. As it is,

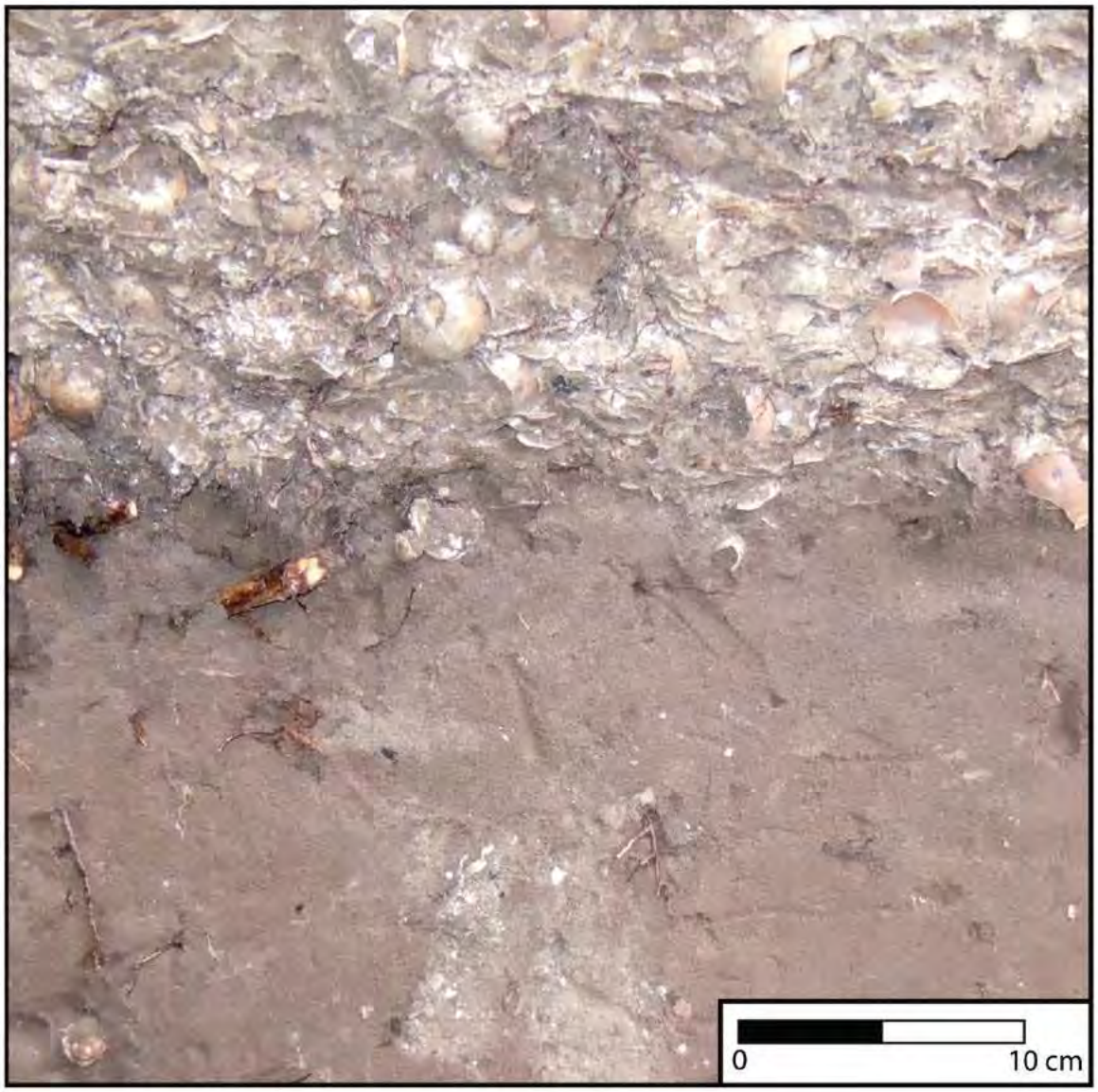

Figure 4-12. Close up of Test Unit 2 north profile, showing the contact between Stratum IV (sand) and Stratum III (shell). Scale is approximate.

the age estimates are serial and close in age. Furthermore, there is a hint of slope inflection typical of a mounded deposit. The contact between sand and shell in the north profile is level. To the west, however, the slope dips down to the south, towards the water. Although subtle, the slope would suggest that the brown sand was built up upon the surface, with shell laid down above. The contact between Str. III and IV is sharp (Figure 4-12). There is no visible soil development at the top of Str. IV, suggesting it was not exposed for long prior to shell deposition.

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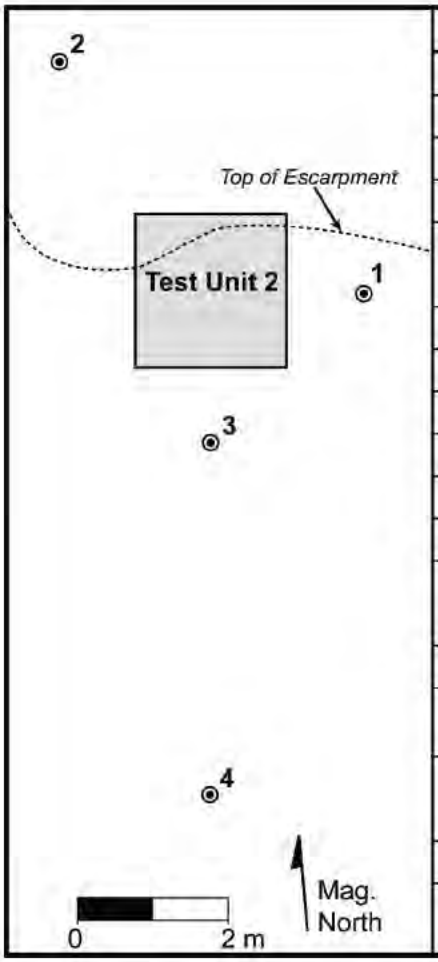
We did, however, place several augers near TU2 to clarify these stratigraphic relationships (Figure 4-13). These augers were tested prior to the bucket auger survey, and as such, we did not realize that much of the shell to the north of the spring pool had been removed (see Chapter 3). In this case, we used a 2-inch open-tube Dutch gouge auger, that has a maximum length of 120 cm. As we were seeking only stratigraphy, we did not screen the excavated material. After the auger was extracted fully we carefully backfilled the hole. The auger testing met with mixed results. Auger 2 was placed two meters north of TU2, and was the only auger to penetrate a non-truncated surface. The results closely mirror those in the TU2 north profile. The upper 36 cm were likely disturbed. A layer of dense *Pomacea* and bivalve, consistent with Str. III, was present between 36 and 50 cmbs. Below this we encountered a dark brown sand down to 120 cmbs. Within this dark sand there was a pocket of crushed shell between 70 and 90 cmbs. It is notable that Feature 1 in TU2 was encountered at this same elevation (see below). At the very base of the auger we encountered a light brown sand. Auger 1 to the



Depth (cm)	Description
Auger 1	
0–60	Brown Sand
60–80	Yellow Sand
80–120	Light Yellow Sand
Auger 2	
0–36	Dark Brown/Gray Sand with Loose Shell
36–50	Dense Shell (*Pomacea*/Bivalve)
50–70	Dark Brown Sand
70–90	Gray/Brown Sand with Sparse Crushed Shell
90–120	Dark Brown Sand
120+	Light Brown Sand
Auger 3	
0–30	Crushed Shell
30–100	Gray Sand, Becoming Lighter with Depth to White Sand
Auger 4	
0–30	Dark Brown Sand with Sparse Shell
30–100	Gray Sand, Becoming Lighter with Depth to White Sand

Figure 4-13. Augers tested in the vicinity of Test Unit 2.

east of TU2 (roughly 50 to 60 cm below the TU2 datum) provided mixed results. Brown sand was present down to 60 cm, and was situated on top of a yellow sand. Based on the depth of brown sand in Augers 1 and 2, the brown sand mantle likely extends no further than 120 cmbs (as measured from the NW corner of TU2). That would make the deposit roughly 80 to 90 cm thick. Augers 3 and 4 at lower elevations failed to find intact shell or brown sand deposits, meaning that all shell and brown sand had likely been removed from here during the removal of shell.

It is important to note that the Str. IV sand deposit was not devoid of artifacts or other inclusions. During excavation, numerous vertebrate faunal fragments were noted, including several large deer bones. In Chapter 6, Meggan Blessing provides a full characterization of the zooarchaeological assemblage from the bulk samples. Artifacts were few, but included a lithic flake, fragments of marine shell, and a fragment of modified animal bone. One marine shell fragment appears to represent a portion of a vessel or cup manufactured from a *Busycon contrarium* shell (FS 224.1). The vessel is represented by an apex section, which is truncated and smoothed on one margin consistent with a vessel. All of these materials fit comfortably within the Mount Taylor period. Marine shell vessels date as early as 6000 cal BP (O'Donoughue et al. 2011).

Feature 1: At approximately 80 cmbd (Level C) we encountered an irregularly shaped concentration of shell. This was found below the top of the Str. IV sand, and was vertically separated from Str. III. At 85 cmbd the concentration became a well-defined circular patch of shell, and we designated it Feature 1. The west half was excavated first, down to a total depth of 119 cmbd. In retrospect, this was far too deep. In cross section (Figure 4-14) it was evident that the fill was confined to a shallow basin, between 85 and 97 cmbd. The fill is a brown sand with mostly whole *Viviparus* and bivalve shell and some charcoal present. Chapter 6 provides a full description of the fill constituents. Below 97 cmbd the matrix was predominately a light brown sand with occasional shell flecks that had irregular shapes and direction. On this basis, the east half of the feature was excavated to only 97 cmbd. A charred nutshell fragment from the east half of the feature was submitted for an AMS assay, and returned a convention age estimate of 5850 ± 40 BP (6780–6550 cal BP). This places the pit feature significantly earlier (up to a millennium) than the deposition of Str. III and IV.

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We lacked sufficient exposure in the auger to determine if the shell was in a pit or a surface. Regardless, the correspondence between the test unit and auger hints at persistent, if dispersed, presence of shell below or amongst Str. IV. An alternative is that preexisting shell was collected from elsewhere on the landform, and deposited in basins or heaps on the surface REDACTED Neither scenario is without analog during the Thornhill Lake phase. At Tomoka, for example, Piatek (1994) reported that shell deposits mined in antiquity were used as mound fill. A better

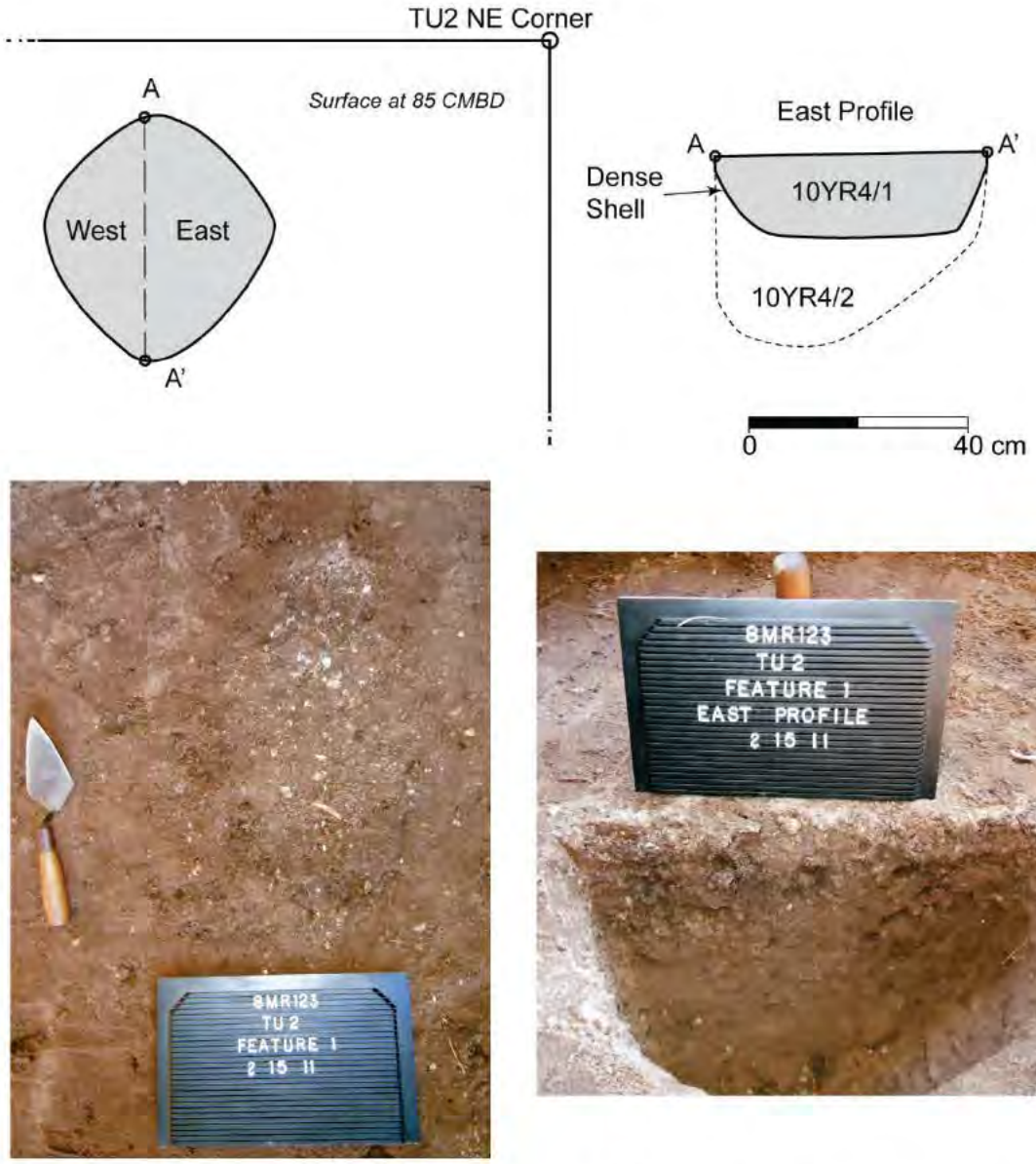

Figure 4-14. Plan and cross section illustrations and photographs of Feature 1 within Test Unit 2.

example may be the Bluffton Burial Mound documented by Sears (1960). This sand and shell mound was constructed on top of a preexisting shell deposit. The primary interment was placed on top of the shell deposit after it was burned. The burial was then covered with a meter of sand, and then alternating layers of sand, shell, and other materials.

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When the area was selected for testing, it was presumed that shell deposits would be quite thick. Shell is still adhering to the base of the nearby shell tree, roughly 2 m above the ground, and it is piled up around the bottom of the roots as well. The top of the escarpment is essentially at the same elevation as the original ground surface of the tree. Somewhere between the shell tree and TU2 was the likely interface between the emplaced sand and the overlying shell. It is possible that the shell tree deposits were similar to those exposed by FSU in the shell ridge remnant (test unit MHC) (Figure 4-1). It was here that they documented visibly intact preceramic deposits to a depth of 3 meters below surface. Unfortunately, radiocarbon samples from the MHC unit and nearby FSU-TU2 were problematic. Not only did they have very large errors, but the corrected age intercepts from the top and bottom of each unit were reversed. The large errors may be due to the use of bulk samples to satisfy the large initial carbon requirements of radiometric testing. In that case, the combination of multiple charcoal pieces could lead to the mixing of different aged materials. Although the intercepts were reversed, three of the assays overlapped, providing a range between 5650 and 4620 cal BP. On this basis, the bulk of the deposits that FSU documented were associated with Thornhill Lake phase occupation, and that is certainly born out in the material assemblage. This would make the remnant ridge coeval with TU2. The fourth FSU sample, from the upper levels of FSU-TU2, is not easily explained. At two sigma, the assay has a calibrated range of 7160–5890, which makes the sample coeval with the origins of shellfishing along the St. Johns all the way to near the beginning of the Thornhill Lake phase. Although this may just be a "bad" date, it is interesting that TU2 excavations also produced a very early age estimate on shell that may have been displaced. The possibility arises that communities at 8MR123 were actively excavating shell deposits and using them as mound fill or architectural elements. Further support for this assertion is provided by the Test Unit 6 excavations.

UPLAND UNITS

Three areas in the upland survey tract were selected for stratigraphic testing. Unlike the lowland portions of 8MR123, shovel testing here identified occupations spanning the Early Archaic through St. Johns periods. Test unit locations were selected in places that would provide data regarding the integrity of cultural resources, and stratigraphic relationships of various components.

Right of Way: Test Units 3 and 5

Test Units 3 and 5 were excavated on the southern Right of Way (ROW) of the entrance road (Figure 4-15). They were placed adjacent to STP M-4 which intercepted a shell-filled pit (Chapter 3, Figure 3-14). The goal of excavation was to document this pit (designated as Feature 2) and locate any associated architectural features.

Test Unit 3 was situated south of STP M-4 (Figure 4-16), but was stopped only 30 cm down due to an aggregate filled utility trench (Figure 4-17). Level A was a 20-cm deep cut. Soil here consists of a crushed limestone in a brown sand (Figure 4-18, Table 4-5). By the base of Level A the crushed aggregate was becoming denser in the middle of the unit. Recent or historic objects such as metal fence staples and aluminum pull tabs were also recovered throughout this level (Table 4-6). Excavation continued with Level B, removed as a 10-cm thick layer. As above, we recovered metal fence staples. By the base of the level it was clear that we had intercepted a filled-in trench, possibly containing utilities. At the request of the USFS we stopped excavation of TU3.

In order to determine where to place an additional unit we sunk an auger in the northeast corner of TU3, outside of the aggregate zone (Figure 4-16, 4-17). We did not find any shell within it. Using the auger and STP results we projected the location of the

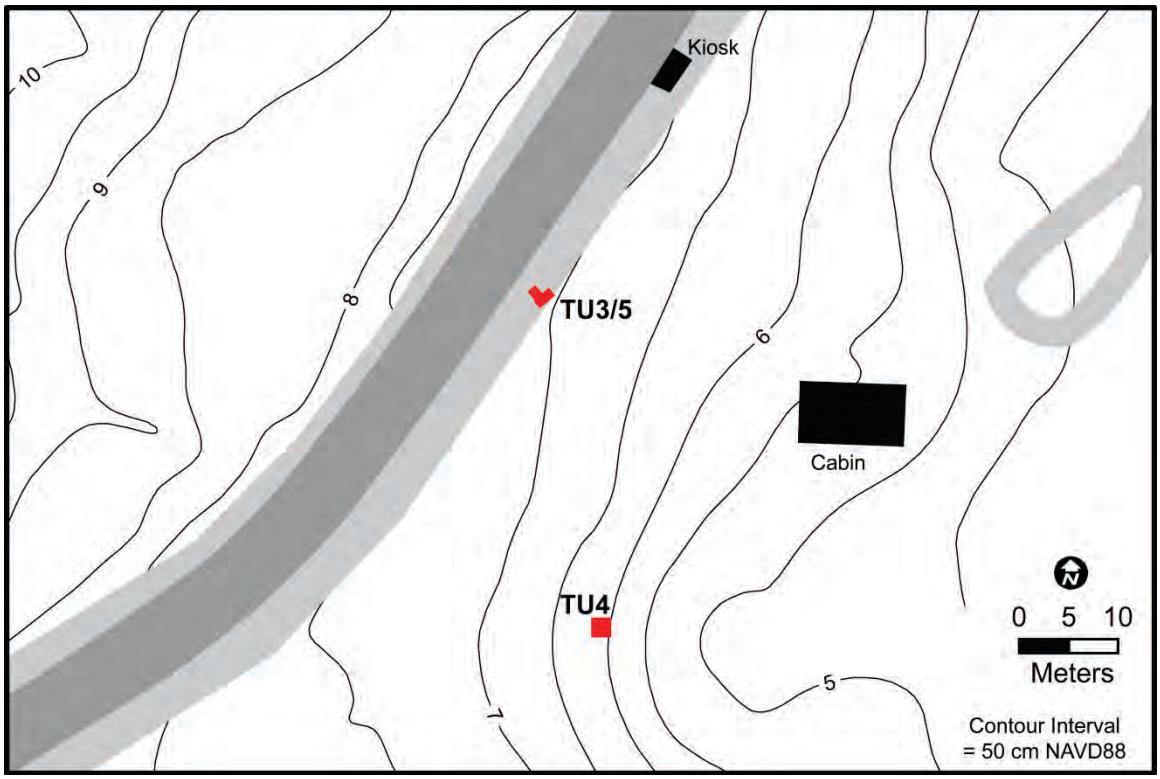

Figure 4-15. Map showing the location of upland test units near the entrance road.

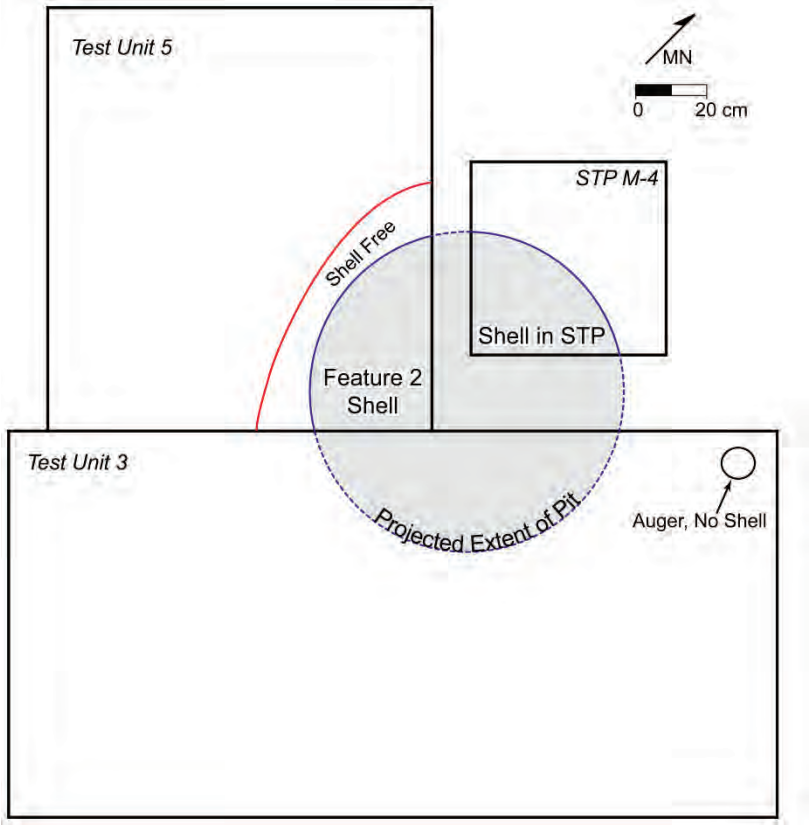

Figure 4-16. Projected location of Feature 2 in Test Units 3 and 5 and STP M-4.

Figure 4-17. Photograph of the base of Level A in Test Unit 3, showing the aggregrate filled utility trench.

Table 4-5. Test Unit 5 Stratigraphic Descriptions.

Stratum	Munsell	Top (cm) †	Bottom (cm) †	Description
I	10YR3/2	0	8	organic root mat
II	10YR6/3	8	12	clayey sand with abundant limestone aggregate
III	10YR4/3, 10YR4/4, 10YR5/4	12	25	banded lenses of fine sand
IV	10YR5/6, 10YR6/4	25	125+	medium sand mottled with 2 to 3 cm diameter irregularly shaped patches of lighter colored medium sand
IVa	10YR4/6, 10YR6/4	60	100	medium sand mottled with 2- to 3-cm diameter irregular patches of lighter colored medium sand
IVb	10YR4/2	62	92	fine sand with sparse shell fragments
Feature 2	10YR4/2	38	120	predominantly whole *Viviparus* and bivalve shell in ashy fine sand [BETA-295207, 3220 ± 30 BP]

† Maximum depth below NE corner of test unit

Table 4-6. Artifacts recovered from Test Units 3 and 5, site 8MR123.

Level	Debitage		Uniface		Orange Incised		Vert. Fauna		Historic	
	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt
Test Unit 3										
A	5	17.2					1	2.8	4	18.6
B	2	9.8							2	12.5
Test Unit 5										
C- Zone B	1	1.0								
F- Zone B	1	4.0								
G	2	0.9								
H	2	0.5								
I	5	1.7								
J	1	0.1	1	0.3						
K	6	2.3								
Feature 2 (85 to 90 cmbd)					1	4.8				
Total	25	38	1	0.3	1	4.8	1	2.8	6	31.1

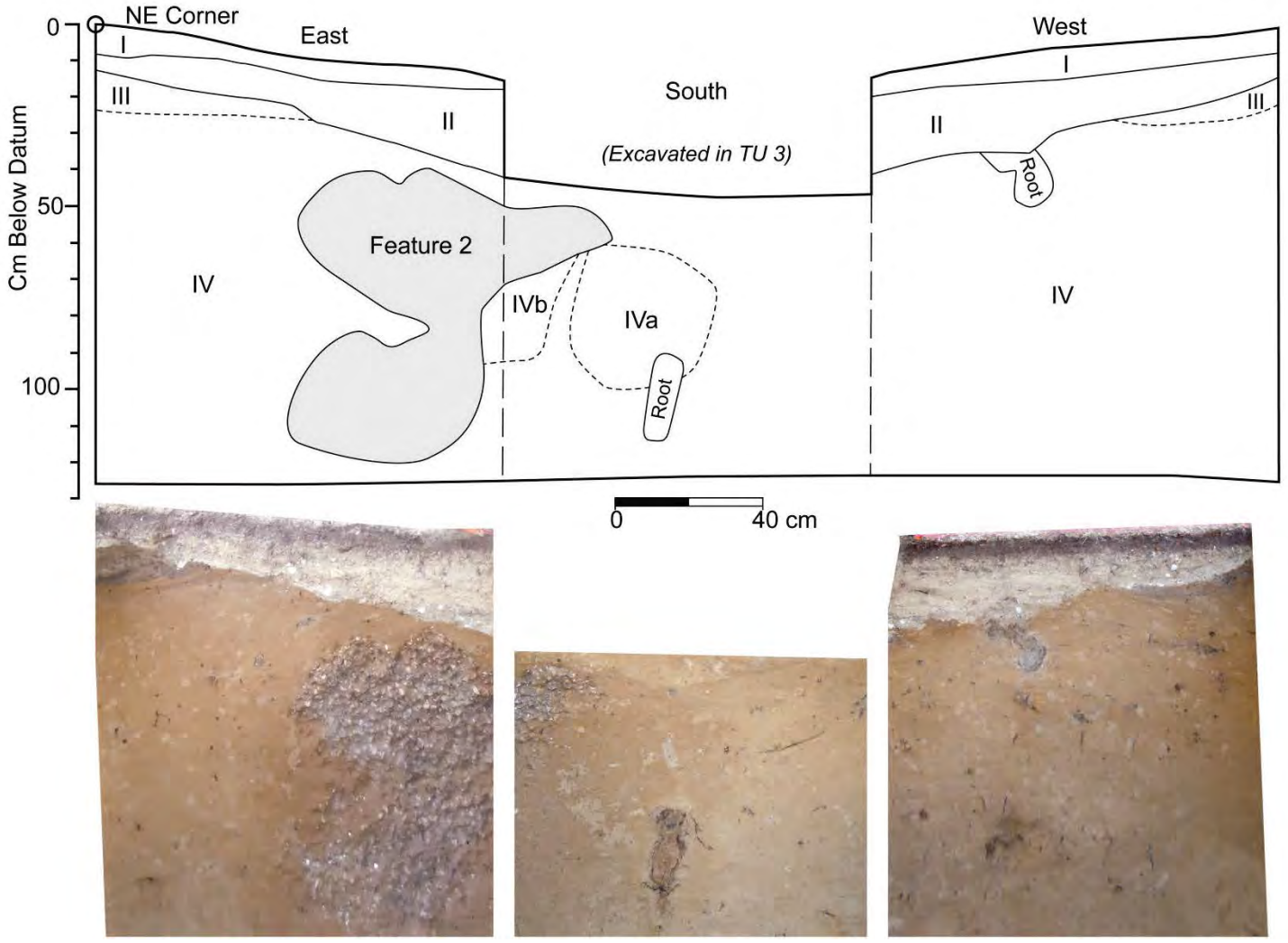

Figure 4-18. Test Unit 5 composite profile illustration (top) and photograph (bottom).

pit to fall somewhere to the west of STP M-4. Test Unit 5 was a 1 x 1.2-m unit sited north of TU3, west of STP M-4, and oriented north-south along its long axis. Beneath near-surface disturbances associated with road and trench construction, excavation of TU5 exposed a shell pit preserved below intact sand (Figure 4-18, Table 4-5). Stratum I is an thin A horizon that developed above the ROW after it was apparently stripped (Str. III) and covered with aggregate (Str. II). Strata I through III were removed in levels A through C (0 to 35 cmbd). Aggregate and associated fill was treated as Zone A, while intact sand was treated as Zone B. Stratum IV is the intact sand unit present throughout the remainder of the unit down to 125 cmbd. Level D, below the zone of modern disturbance, was excavated as a 10-cm cut. Shell from the top of the pit was evident at the bottom of this level. We excavated another 5 cm into Level E, when shell was persistent in the southeast corner of the unit. At this time the shell was designated Feature 2, and the top 35 cm (between 50 and 85 cmbd) were excavated and retained as a bulk sample.

Levels F through J were excavated in 10-cm levels. Between 85 and 90 cmbd we noted the reappearance of shell in the vicinity of the excavated bottom of Feature 2. A small incised fiber-tempered sherd (FS 248.1) was recovered from this zone as we cleaned the sand away from the top of more shell. Although not found within the shell pit fill, this sherd was most certainly associated with Feature 2. At this point we excavated the remaining shell down to 120 cmbd, and designated it as Feature 2-Base. All shell removed from this lower section of the feature was kept separate from the upper unit. Finally, Level K was excavated rapidly as a 25-cm thick cut to expose the entire depth of Feature 2 in profile. Although flakes were still encountered with depth, the unit was prohibitively small for further excavation. Tallies of recovered artifacts for both TU3 and 5 are presented in Table 4-6. Flakes were the dominant artifact recovered from intact deposits in the shell-free sand. One lithic tool, a probable formal uniface fragment (FS 246.1) was recovered from Level J. This tool likely dates to the Early Archaic period.

Feature 2: The shell filled pit first recognized in STP M-4 is designated Feature 2. The feature is actually composed of two kinds of matrix. The core of the feature contains predominantly *Viviparus* and bivalve shell in a brown sand. Meggan Blessing's chapter provides a complete description of the pit contexts in Chapter 6. The pit also contains a darkened sand that is mostly shell free (Str. IVb). The relationship between these matrices is complex, but may be related to a post-depositional disturbance that intruded into the wall of the pit. Alternatively, the pit collapsed part-way as it was being filled, resulting in the intercalation of shell and sand layers. As described previously, the feature was intercepted in the southeastern corner of TU5 at 50 cmbd (Figure 4-19), where it was expressed as a ca. 30 x 50 cm patch of shell. At this elevation the top of the pit undulates, possibly due to ancient near-surface disturbance. The feature was excavated down to 85 cmbd, at which time shell disappeared into the profile. This retraction of shell is evident in the east profile as an indentation into the pit. At 90 cmbd shell from the pit reappeared within TU5 (Figure 4-19). As seen in plan, there is an arcuate patch of darkened sand surrounding the pit fill at this level. This dark matrix

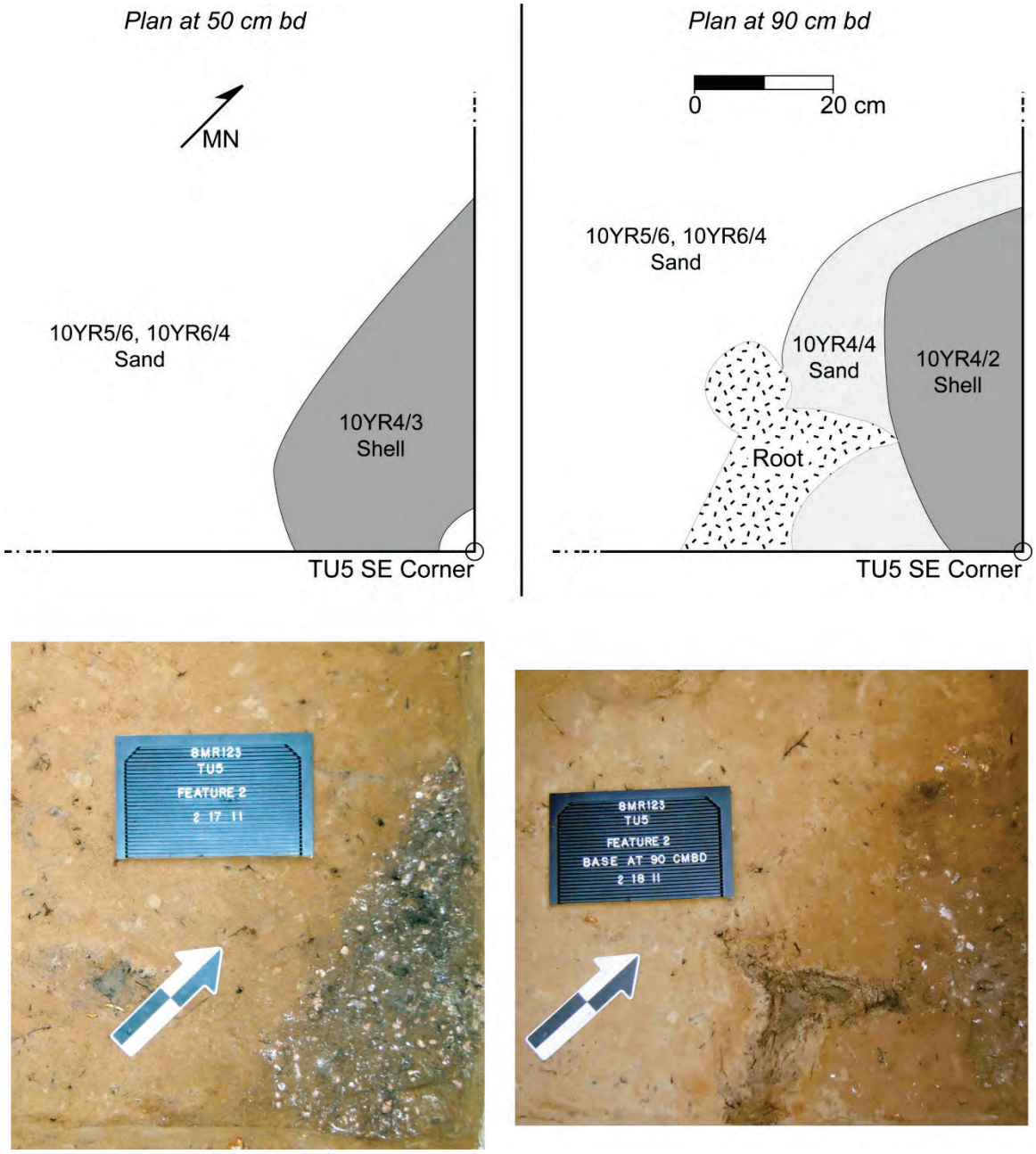

Figure 4-19. Plan illustrations and drawings of Feature 2 at 50 and 90 cmbd.

roughly corresponds with the boundary of the overlying shell matrix. In profile, the darker matrix contains shell fragments, and was designated Str. IVb. Higher up the profile is Str. IVa, slightly darker than Str. IV, but otherwise similarly composed and without shell. The relationship between Str. IVa and Feature 2 remains poorly understood.

In sum, Feature 2 is a ca. 80-cm-deep pit. Assuming the pit is circular in plan, it measures roughly 90 cm in diameter (Figure 4-16). The estimate is based on the curvature of the feature in TU5, its extent in STP M-4, and the lack of shell within the auger. In addition to shellfish remains, the pit also contained fiber-tempered pottery. An Orange Incised sherd was recovered from Str. IVb during level excavations. In addition, fiber-tempered crumb sherds, one of which is incised, were found in the Feature 2-Base bulk sample during processing. The crumb sherds actually contain a great abundance of sponge-spicules with only some burned-out fiber vesicles. A charcoal fragment from the base of the feature (ca. 90–120 cmbd) was submitted for an AMS assay, and returned a convention age estimate of 3220 ± 30 BP (3560–3360 cal BP at 2 sigmas). Based on recent dates from fiber-tempered pottery bearing features at Locus B across the run (Gilmore 2011), Feature 2 is considerably younger than would be expected given the associated pottery. However, the inclusion of sherds with abundant spicules and few fibers is not necessarily outside the range of variation for early St. Johns ceramics. Indeed, this time period (between 3500 and 2500 radiocarbon years ago) remains poorly documented in the archaeological record of the St. Johns. Finally, the dated charcoal may have been from intrusive material, as the pit was clearly subjected to some kind of disturbance in antiquity. Without further contexts or materials it is difficult to assess the reliability of this assay, unfortunately.

Old Roadway: Test Unit 4

Test Unit 4 was sited just south of the southwest corner of Area B. This location was selected because some of the objects recovered from shovel testing in the vicinity were technologically consistent with Early Archaic assemblages, particularly a biface in STP O-8 (FS 181.1) and STP O-3 (FS 183.2). A second concern was that based on the 1941 USDA aerial, the southwestern border of Area B intercepted one of the original trails entering the recreational area.

We placed TU4 two meters east of STP O-8, just beyond the Area B boundary, and south of the road (Figure 4-15). Test Unit 4 was laid out as a 2 x 2-m unit oriented to magnetic north. Level A was removed as a 20-cm cut, while B and C were 10-cm levels. At the base of Level C we noted a plastic-coated small gauge cable coursing through the unit (Figure 4-20). In order to avoid damaging the cable of unknown purpose we stopped excavating the west half of the unit, and stepped TU4 down to a 1 x 2-m unit. The eastern half of TU4 was designated TU4A (Figure 4-20). We continued excavation in 10-cm levels in Level D (40–50 cmbd) down to Level N (140–150 cmbd). We stopped excavating at 150 cmbd because the unit was becoming unsafe to excavate.

Excavation of TU4 and TU4A revealed an uncomplicated soil profile consisting of three horizons (Figure 4-21, Table 4-7). No cultural stratigraphy was present, nor was there evidence for trail construction activities here. Str. I is a well-developed organic A horizon. Str. II yellowish brown sand that grades to a yellow sand towards the base at 150 cmbd. Excavation of TU4 failed to find clear evidence for Early Archaic occupation (Table 4-8). Although no cultural stratigraphy was visible, the deposits in TU4 are

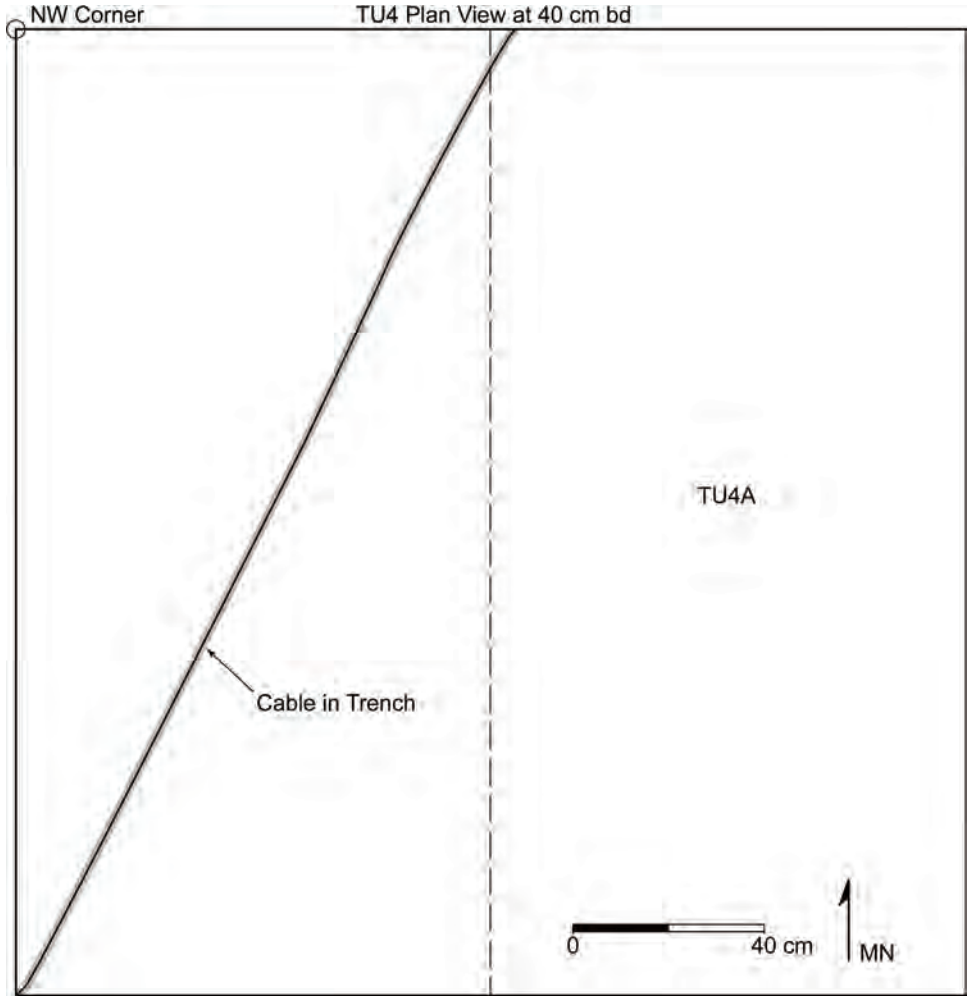

Figure 4-20. Plan view of Test Unit 4 at 40 cm below datum.

Table 4-7. Test Unit 4 Stratigraphic Descriptions.

Stratum	Munsell	Top (cm)	Bottom (cm)	Description
I	10YR6/3	0	17	medium sand with abundant roots
II	10YR5/4	17	129	medium sand
III	10YR7/6	129	150+	medium sand

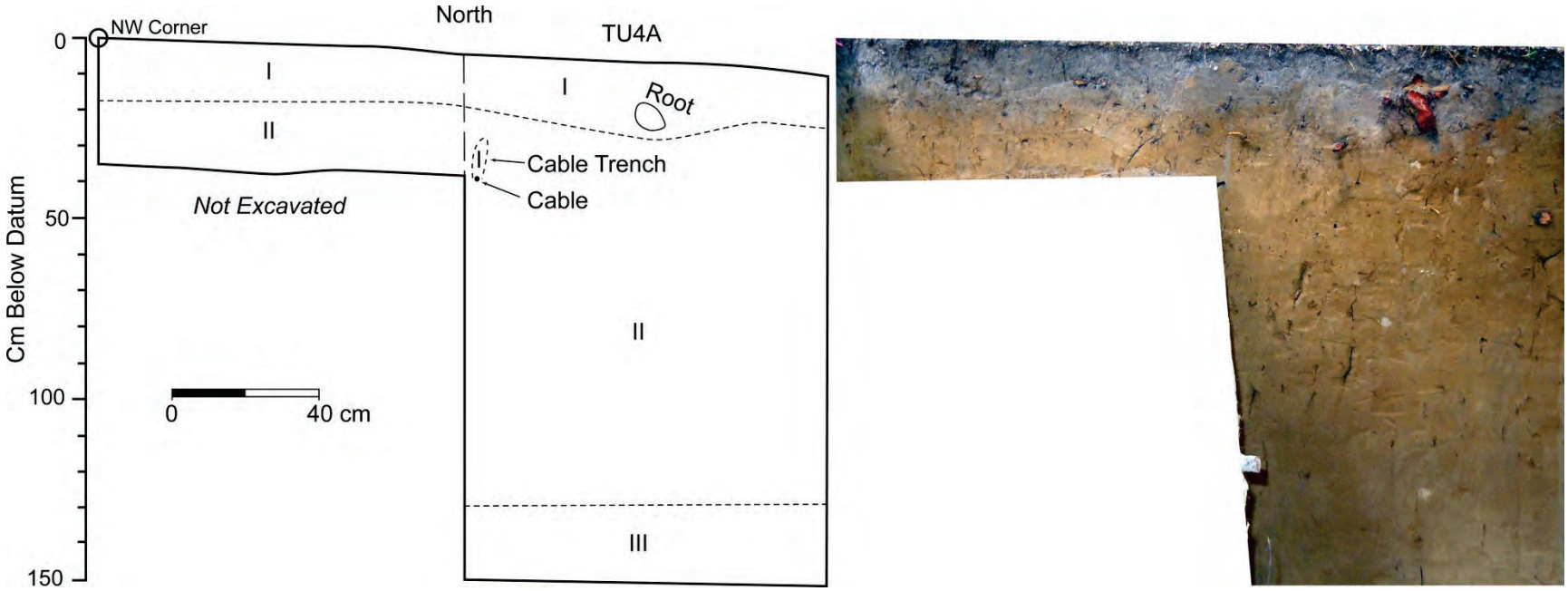

Figure 4-21. Test Unit 4/4A profile illustration (left) and photograph (right).

Table 4-8. Artifacts recovered from Test Units 4 and 4A, site 8MR123.

Level	Microlith		Mod. Flake		Debitage		Abrader		Misc. Rock		Saint Johns Plain		Crumb Sherd†		Vert. Fauna	
	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt
TU 4																
B					3	0.3							2	1.7		
C					1	2.2					4	9.6	5	2.6		
TU4A																
D					5	0.5					3	3.4	3	1.7		
E	1	0.4			1	0.3					10	35.0				
F					7	5.4					5	24.7	1	0.2		
G	1	0.7			6	1.5									2	0.3
H	1	0.2			4	1.8			1	46.8						
I					6	0.8									1	0.4
J	1	0.4			5	0.9									1	0.3
K					6	2.6										
L					3	1.0			1	5.5						
M					6	1.1										
N			1	1.1			1	100.9								
Total	4	1.7	1	1.1	53	18.4	1	100.9	2	52.3	22	72.7	11	6.2	4	1.0

†Sherds less than ½" in maximum size.

stratified. Pottery of the St. Johns period, all St. Johns Plain or spiculate crumb sherds, was found in the upper 70 cm. The highest density (n = 10) was from Level E (50–60 cmbd). In contrast, microlithic tools thought to date to the Thornhill Lake phase were recovered in Levels E, G, H, and K (50–110 cmbd). No other diagnostic tools were recovered within the unit. Debitage (n = 53) was the dominate artifact class, and flakes were found from the surface all the way to the 140 cmbd in relatively equal quantities. In the final level excavated we also recovered a modified flake that is likely thermally altered (FS 252.1) and a double-grooved sandstone abrader (FS 252.2). A probable abrader was also recovered in Level H (FS 240.1) but it lacks clear grooves or differential patination indicative of use as an abrader. Based on artifact densities it is likely that cultural deposits continue below 150 cmbd.

North of the Parking Lot: Test Unit 6

Shovel testing in Area A indicated that cultural deposits north of the parking lot were intact and stratified. Similarly, the distribution of artifacts was suggestive of discrete activity areas. In particular, an arcuate Orange period compound was tentatively inferred based on the spatial distribution of Orange period pottery. Test Unit 6, a 2 x 2-m unit, was placed north of the parking lot in order to test these large-scale observations and inferences with a larger stratigraphic window (Figure 4-22). The test unit was sited two meters north of STP B-9, which yielded shell and Orange plain sherds (n = 17). Shell was also encountered 10 m to the west in STP B-8, while Orange Incised (n = 1) and a fiber-tempered crumb sherd were recovered in STP A-9.

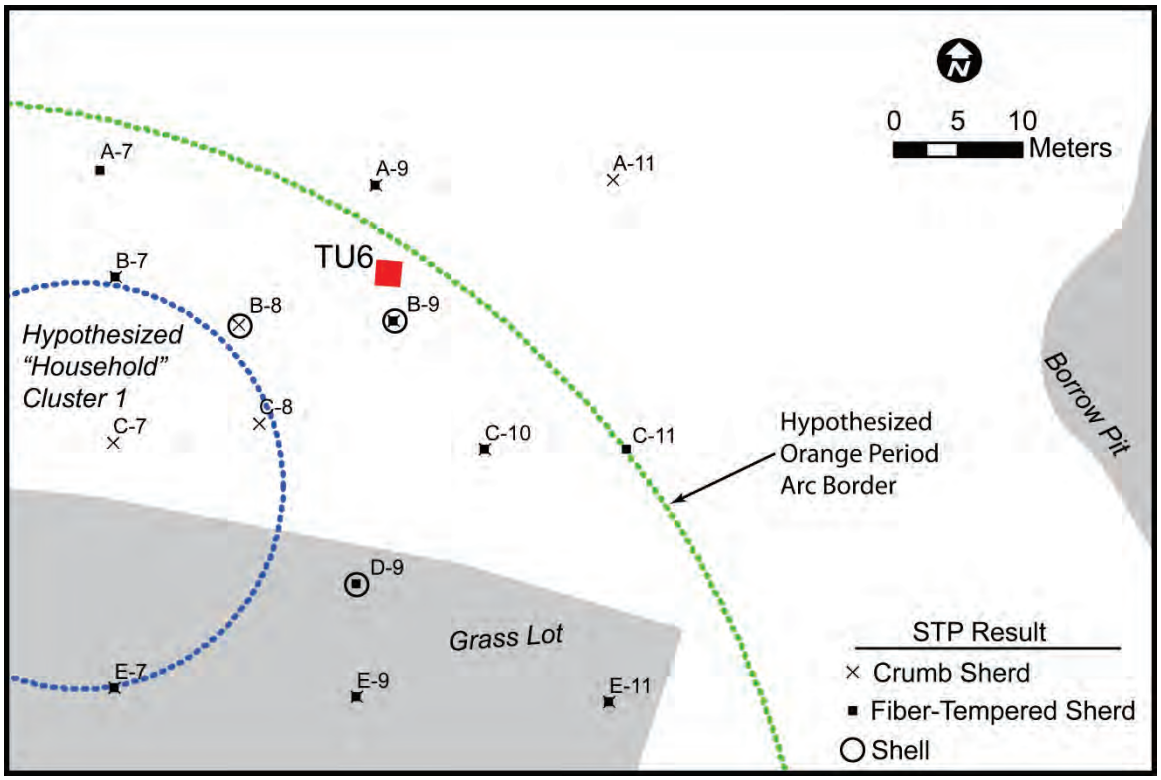

Figure 4-22. Location of Test Unit 6, showing shovel test pits bearing fiber-tempered pottery and hypothesized Orange Period habitation area.

Excavation of TU6 confirmed many of the patterns outlined in the shovel test results, and provided further tantalizing evidence for Orange period architecture. As expected, we documented an uncomplicated soil profile, lacking any visual evidence of cultural strata (Figure 4-23, Table 4-9). Three soil horizons were identified. Stratum I is an organic A horizon. Beneath that is Str. II a very pale brown medium sand and Str. III, a brownish yellow fine to medium sand with frequent roots down to 55 cmbd. Unlike previous test units described, excavation of TU6 went without major deviation from the research protocol. Level A was excavated as a 20-cm thick layer. All subsequent levels (B–K) were removed in 10-cm thick cuts to a maximum depth of 120 cmbd. Our intent was to continue excavation below Level K. Overnight, however, three walls (north, east, and south) collapsed (Figure 4-24). The deposits were very dry at the time, and apparently had little to hold them together (they collapsed below the roots in upper Str. III). The wall spoil was screened and only a fiber-tempered crumb sherd was recovered (Table 4-10). The remaining wall was too unstable to continue excavation in the unit. While preparing the remaining west wall for profiling we recovered one Orange Plain sherd. Once we had documented the profile, we sunk a 50 x 50 cm shovel test in the bottom of the unit down one meter. Four lithic waste flakes were recovered within the top 40 cm (a maximum of 160 cmbd).

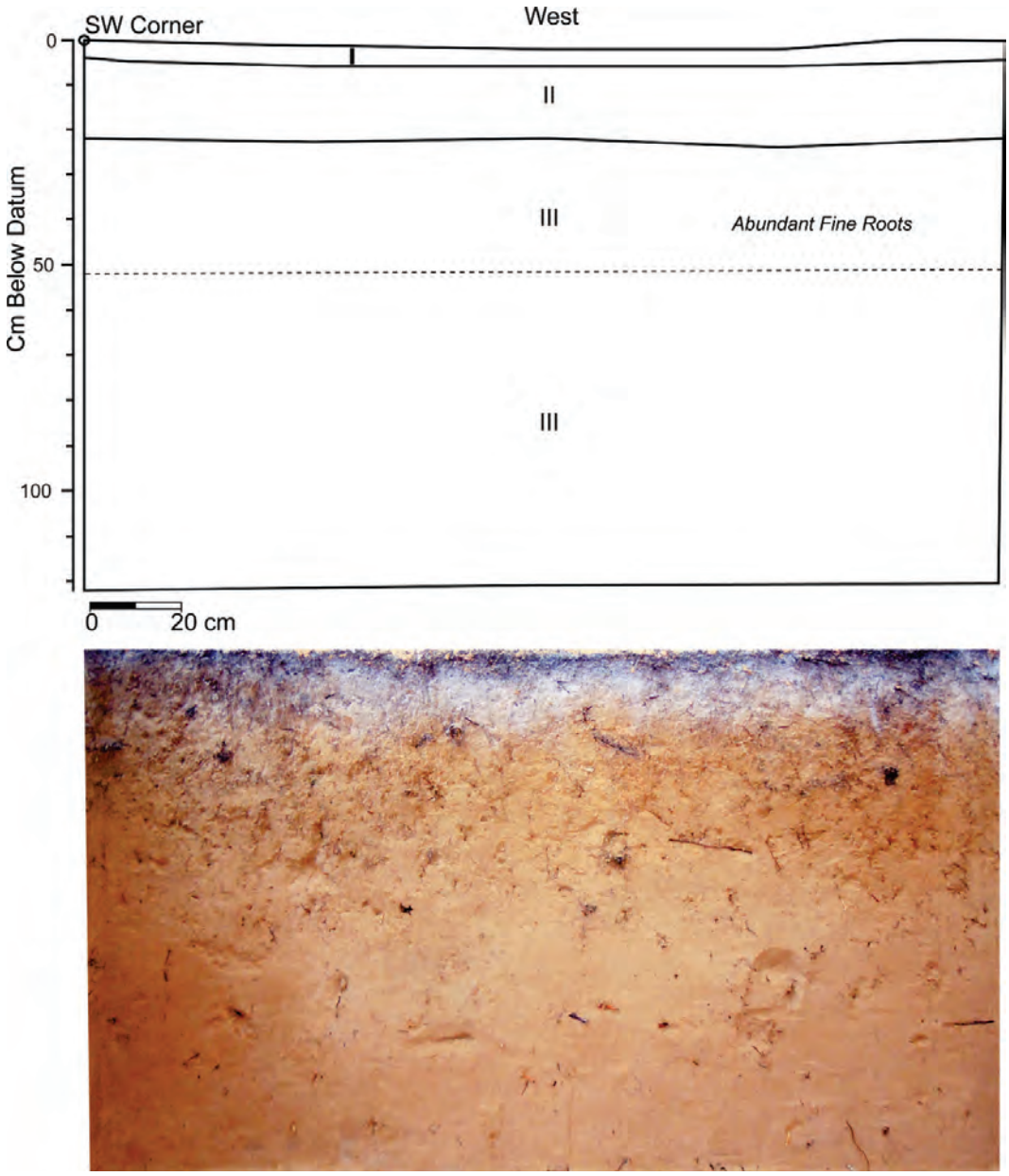

Figure 4-23. Test Unit 6 west profile illustration (top) and photograph (bottom).

Table 4-9. Test Unit 6 Stratigraphic Descriptions.

Stratum	Munsell	Top (cm)	Bottom (cm)	Description
I	10YR8/2	0	7	fine sandy loam
II	10YR8/2	7	22	fine sand with abundant roots
III	10YR6/8	22	120+	fine to medium fine sand

Table 4-10. Artifacts recovered from Test Unit 6, site 8MR123.

Level	Abrader		Biface		Hafted Biface		Debitage		Mod. Flake		Misc. Rock		Orange Incised		Orange Plain		Crumb Sherd†		Vert. Fauna	
	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt
A							5	1.1	1	0.3										
B															5	4.2				
C							1	0.3	1	3.8					1	1.6	27	9.0		
D							3	3.0	1	2.3					18	52.7	125	45.3		
PP-1															11	46.5	263	38.2		
PP-2															6	34.2	32	11.5		
E							8	2.6	1	0.2			1	5.6	9	37.4	70	34.2	1	1.9
F							15	7.5	1	0.3					1	1.7	15	8.4		
G							13	2.1	1	3.0	2	51.6			1	0.9				
H	1	34.1					13	4.7	2	4.1	3	4.9							1	0.7
I			1	9.4	1	0.9	17	3.9												
J							11	2.6												
PP-1					1	27.6														
K			1	0.6			6	2.0			1	5.1								
STP (120 to 220 cm)							4	0.5												
Wall Collapse																	1	0.4		
West Wall									1	3.1					1	2.0				
Total	1	34.1	2	10.0	2	28.5	96	30.3	9	17.1	6	61.6	1	5.6	53	181.2	533	147.0	2	2.6

†Sherds less than ½" in maximum size.

Figure 4-24. Photograph of collapsed north and east walls of Test Unit 6, facing northeast.

Artifacts were recovered in their expected chronological sequence. Again, this verifies the shovel test data that documented at least two stratified Archaic components in Area A. Fiber-tempered sherds were found between 20 and 70 cmbd, but cluster between 20 and 60 cm. The pottery assemblage includes 53 plain sherds, 1 incised sherd, and 533 crumb sherds. The decorated Orange sherd is both incised and punctuated, typical of the Tick Island variety. In contrast, Florida Archaic Stemmed hafted bifaces typically associated with the Mount Taylor period were found well below the Orange pottery. One hafted biface (FS 290.1) was found in Level I (90–100 cmbd), and is represented by a stem fragment (which was reworked into a scraper). The other (FS 291.1) was found at a depth of 105 cmbd, and is represented by a distal fragment missing the stem. The rest of the artifacts are non-diagnostic but diverse. Debitage (n = 96) was distributed throughout, but increases in density between Level F and K. This is notably below the concentration of Orange pottery, and consistent with the STP results. Modified flakes (n = 9) were also recovered, and they clustered in the upper half of TU6. Vertebrate faunal bone is quite rare, and included only one fragment each from Level E and H. Sandstone fragments were also recovered at lower levels. One (FS 288.7) may be an abrader fragment. The diversity of the artifact assemblages is interesting, and indicates a variety of practices occurred in this area.

Feature 3: At the base of Level E (60 cmbd) we recognized an oval-shaped concentration of shell. After cleaning off the surface, this patch was designated Feature 3 (Figure 4-25). Feature 3 is sub-triangular in shape, and measures 25 cm long and 14 cm wide. The margins are diffuse. In profile, the feature is only 5 cm thick, and has a slight basin shape. The feature matrix is composed primarily of worn, almost degraded *Viviparus* and bivalve shell in a brown sand. The sandy matrix is notable because it is unlike any other on the landform here. This distinctiveness, coupled with the condition of the shell, suggests that this deposit may have been dug up from a preexisting shell deposit elsewhere and deposited here, in a shallow pit. That is, the shellfish were not collected fresh and placed here. No charcoal was preserved amongst the bulk samples acquired from this feature. Even if charcoal was preserved, it would date the shell deposit from which the matrix was derived. Below the shell the sand was darkened and slightly concreted.

What this feature represents is unclear, but there are several lines of evidence that would support an architectural use dating to the Orange period. There was no indication of this feature at higher elevations, such as stains or shell flecks, and so it is unclear if the shell was emplaced at the bottom of a deeper pit, possibly for a post, or simply on the surface. Save for the shell, this feature never would have been preserved in the first place, given that pedogenesis has stripped all evidence of anthropogenic strata. Regardless, the discrete nature of this shell deposit explains why, during shovel testing, we could never visually identify shell in profile, even though it was noted in the screen.

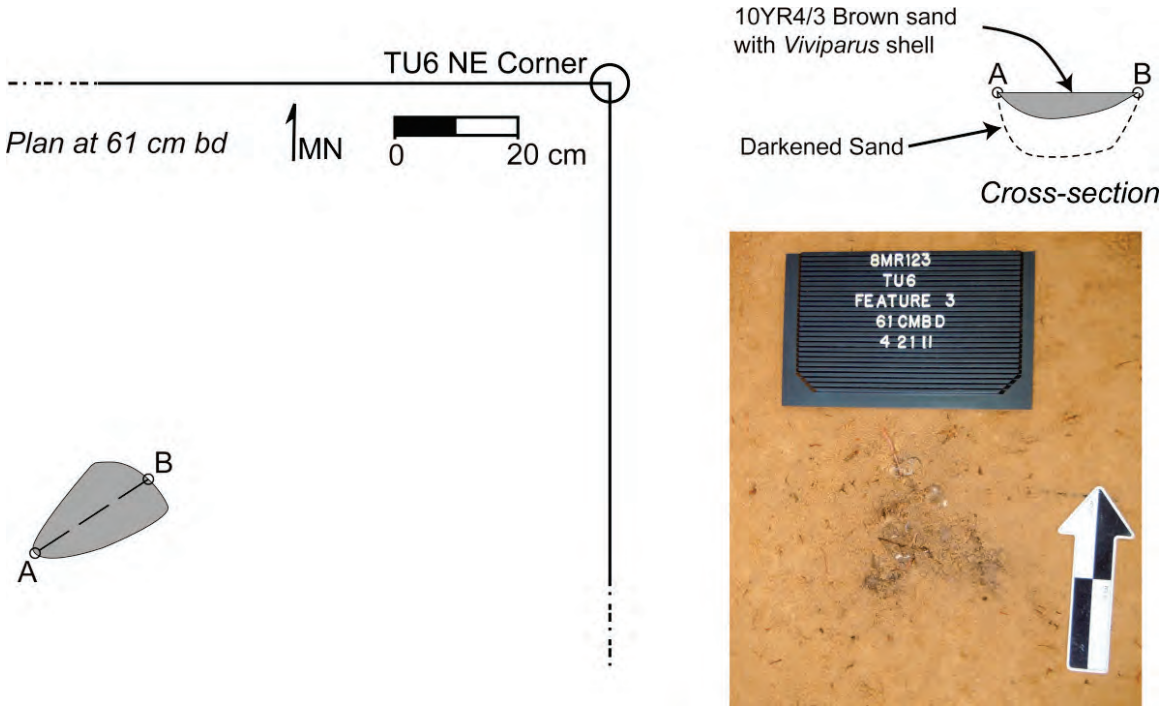

Figure 4-25. Plan and cross-section views of Feature 3, Test Unit 6.

The implication of this patterning is that all shell deposits in Area A were similarly discrete. Shell was noted two meters away in STP B-9, and roughly 10 meters away in STP B-8. The clusters suggest that shell pits could be closely associated with each other. What is more, the bulk of Orange pottery was recovered between 20 and 60 cmbd in TU6. Thereafter one sherd and 15 crumb sherds were recovered between 60 and 70 cmbd, while only one sherd was encountered between 70 and 80. In the field it was noted that this last sherd came from near the base of Feature 3. Thus, fiber-tempered pottery was concentrated above or at the same elevation as Feature 3. Finally, during excavation it was noted that sherds were preferentially recovered on the west side of the unit. In Level D (40 to 50 cmbd), two sherd concentrations were mapped as piece plots 1 and 2 (Figure 4-26). Each concentration appears to represent at least one larger sherd. The high number of crumb sherds attests to the friable nature of the pottery. It is notable that these sherd concentrations were both found west of Feature 3. Feature 3 formed a dividing line of sorts, with large sherds on one side of the unit and virtually no sherds noted on the other. At a larger scale, excavation of TU6 lends further support for the residential clusters inferred from the shovel test results (Figure 4-22). That is, the balance of data suggest that the deposition of pottery and shell was structured. The extent to which this patterning reflects actual houses, and furthermore, that the houses were arranged in an arc remains to be tested with further excavation.

CONCLUSIONS

Stratigraphic excavations across 8MR123 replicated and expanded upon the reconnaissance survey results. Intact shell and sand deposits remain around the spring pool, despite extensive mining here. Although limited to near-surface exposures, TU1 demonstrated that shell deposits dating to the Orange period are present along the spring pool margin. Coupled with the bucket auger results, it is evident that over two meters of terrestrial and subaqueous shell-bearing deposits are preserved. These deep sequences also speak to the rapid and extensive deposition of materials adjacent to the spring during the fourth millennium BP. Test Unit 2 operations along the mining escarpment revealed stratified shell and sand deposits dating to the Thornhill Lake phase. REDACTED

Test units sited in the upland tract supported the stratification and presence of features suggested by reconnaissance work. In the western portion of 8MR123, TU3 and 5 intercepted a terminal Archaic shell-filled pit. Whether this feature is isolated or part of a larger program of pit-digging in this area cannot be determined from the available data. It is likely, though, that more features remain outside the main shell deposit. TU4 did not intercept any features. The distribution of artifact classes within TU4, however, followed the expected pattern. A St. Johns I component is present near surface, while a Mount Taylor (likely Thornhill Lake phase) component is present down to 150 cm below surface. Similarly, TU6 verified that cultural resources around the parking lot are

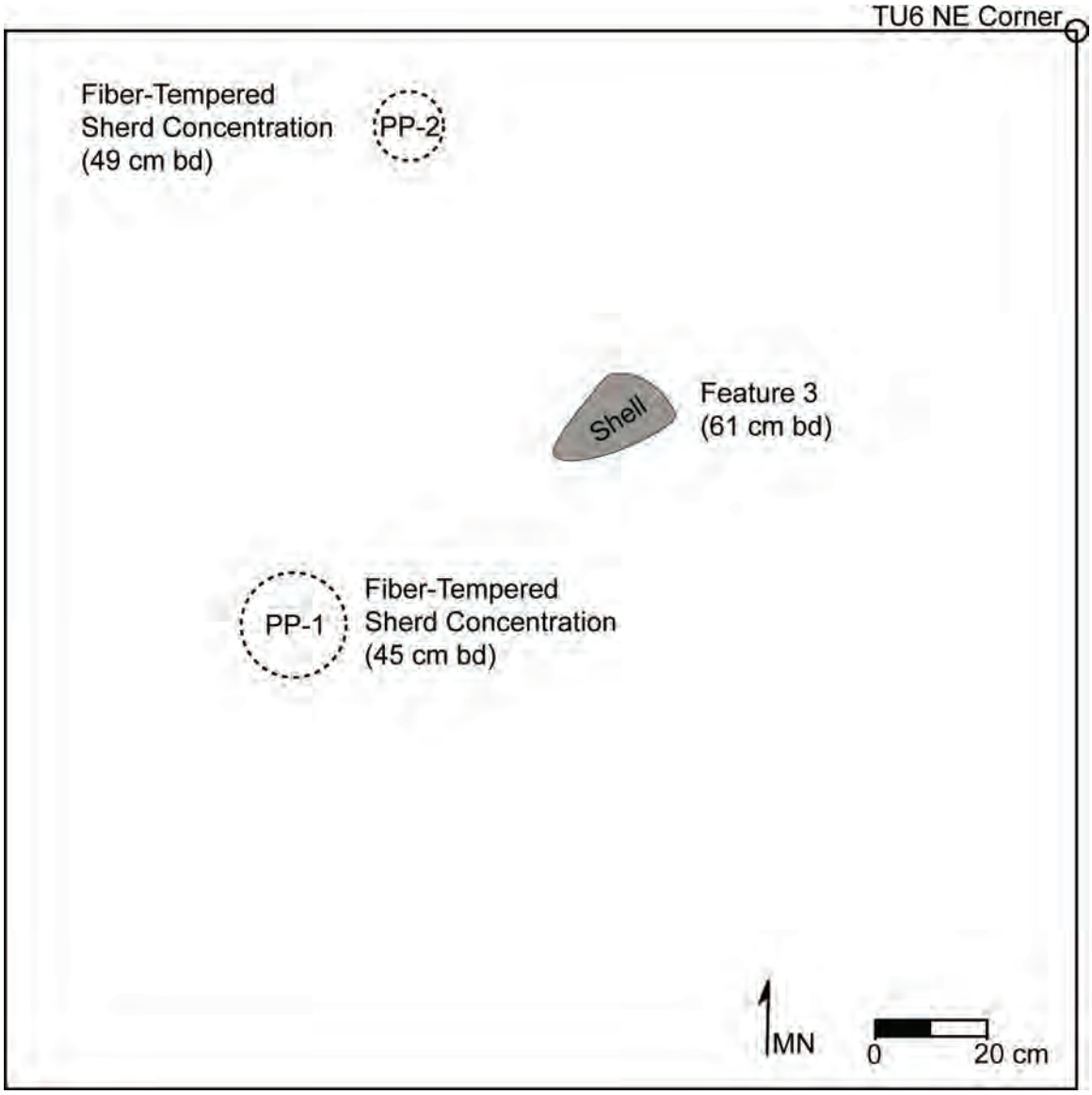

Figure 4-26. Composite plan map showing the distribution of fiber-tempered pottery clusters and Feature 3.

stratified. In this portion of the upland tract, a dense Orange habitation area is stratigraphically superior to a Mount Taylor component. Furthermore, Orange period architecture may be preserved as well, based on the relationship between a shell-filled pit and fiber-tempered sherds.

CHAPTER 5
MATERIAL CULTURE ASSEMBLAGE

Asa R. Randall, Jon C. Endonino, and Meggan E. Blessing

This chapter describes the material culture recovered during testing within the SGS watershed by the LSA. A total of 2699 objects were recovered from excavated contexts (excluding the subsistence column and pit features) (Table 5-1). The lithic assemblage comprises the majority of the material culture assemblage (58.9%). Debitage dominates the lithic assemblage, which also includes whole and fragmentary modified flakes, hafted bifaces, microliths, bifaces, unifaces, cores, and abraders. Pottery comprises the next most abundant class (37.6%), and is dominated by Orange Plain and Incised body and crumb sherds, but also includes St. Johns Plain and Check Stamped sherds. A minority of other sherd types was also recovered. Organic tools were rare (0.3%), and include one modified marine shell fragment and seven bone tool fragments. The material culture assemblage is rounded out by objects of the historic and modern eras (3.2%). The objects recovered from 8MR123 are consistent with occupations dating to the Paleoindian/Early Archaic, Mount Taylor, Orange, and St. Johns periods. The majority, however, are attributable to the Mount Taylor and Orange periods. Successive sections of this chapter describe these assemblages and include metric and technological characterization when warranted.

During excavation, all collected objects were placed in plastic bags with the provenience information written on the bag and on paper tags. Back in the laboratory, the contents of each bag were placed in water and lightly cleaned with a toothbrush. After air drying, the objects were cataloged according to the USFS system. These data were written on analysis sheets and subsequently entered into an excel spreadsheet. During the cataloging process, each category of objects placed in new, archival 4-mil plastic bags labeled with provenience and accession information. Selected object classes were subjected to secondary analyses, whose methods are described in respective sections below.

LITHICS

A total of 1589 lithic artifacts and production debris was recovered during testing. The majority (87%) was recovered during reconnaissance testing. Similarly, the assemblage was concentrated within the upland, shell-free component of 8MR123 (94%). Lithic objects were first separated into chipped and ground stone classes. Chipped stone objects were further subdivided using technological characteristics into subcategories including bifacial tools, flake cores, microliths, unifaces, modified flakes, and debitage. The ground stone tool category was populated exclusively with sandstone abraders. Metric, morphological, and technological attributes were recorded for each class.

In addition, lithic raw material sources were determined for all chipped stone objects (Table 5-2). Source determination was accomplished using techniques developed

Table 5-1. Summary of Material Classes Recovered during Testing at 8MR123.

Class	Count	% of Total	Weight (g)	% of Total
Lithic				
Abrader	2	0.1	135.0	4.1
Hafted Biface	21	0.8	143.8	4.4
Biface	19	0.7	109.2	3.3
Microlith	21	0.8	9.5	0.3
Uniface	11	0.4	68.3	2.1
Modified Flake	30	1.1	102.6	3.1
Core	4	0.1	39.9	1.2
Debitage	1481	54.9	833.6	25.4
Total	1589	58.9	1441.9	44.0
Organic				
Bone Tool	7	0.3	14.2	0.4
Modified Marine Shell	1	0.1	71.6	2.2
Total	8	0.3	85.8	2.6
Pottery[†]				
Orange Incised	13	0.5	59.5	1.8
Orange Plain	852	31.6	683.8	20.9
St. Johns Plain	115	4.3	248.2	7.6
St. Johns Check Stamped	10	0.4	213.3	6.5
Sand Tempered Plain	6	0.2	12.8	0.4
Unidentified	18	0.7	50.3	1.5
Total	1014	37.6	1267.9	38.7
Historic/Modern	88	3.2	482.7	14.7
Total, Table	2699	100.0	3278.3	100.0

[†]Includes crumb sherds

by Upchurch et al. (1982) and is called the “quarry cluster” method. This method utilizes a suite of visual characteristics such as rock fabric, fossil content, and secondary inclusions to discriminate chert from different geological formations (Upchurch et al. 1982). Qualities that make this method attractive are the low cost, volume of material that can be studied, and the relative accuracy in assignment (Austin and Estabrook 2000). The availability of a comparative collection, such as the one curated at the Florida Museum of Natural History, facilitates correct assignment of archaeological specimens to a specific quarry cluster. Provenance determination of artifacts analyzed during this research was accomplished using a Bausch and Lomb stereoscopic microscope with magnification of 10-40X and an independent fiber optic light source. Analysis proceeded in a hierarchical fashion beginning with the identification of geologic formation followed by a specific quarry cluster or, in some cases, the most likely quarry cluster. Fossil content of the stone was the principal criterion for determining provenance as these are

Table 5-2. Raw Material Provenance of Chipped Stone Objects.

Material/Quarry	Biface		Hafted Biface		Wedge		Microlith		Uniface		Modified Flake		Core		Flake		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Chert																		
Brooksville	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	1	0.1
Gainesville	2	10.5	3	14.3	0	0.0	0	0.0	1	9.1	3	10.0	0	0.0	64	4.3	73	4.6
Hillsborough River	1	5.3	0	0.0	0	0.0	0	0.0	0	0.0	3	10.0	0	0.0	4	0.3	8	0.5
Indeterminate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	12	0.8	12	0.8
Ocala	8	42.1	3	14.3	1	100.0	13	61.9	6	54.5	9	30.0	2	50.0	818	55.2	860	54.2
Ocala Limestone Formation	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	25	1.7	25	1.6
Ocala, Tampa/St Marks Limestone Residuum	2	10.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.1
Peace River	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	1	0.1
Santa Fe	3	15.8	6	28.6	0	0.0	2	9.5	4	36.4	8	26.7	2	50.0	325	21.9	350	22.0
Suwannee Limestone Formation	1	5.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	22	1.5	23	1.4
Upper Withlacoochee River	0	0.0	2	9.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	18	1.2	20	1.3
Upper Withlacoochee, Green Swamp Area	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	3.3	0	0.0	19	1.3	20	1.3
Silicified Coral	2	10.5	7	33.3	0	0.0	6	28.6	0	0.0	6	20.0	0	0.0	171	11.5	192	12.1
Rhyolite(?)	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	1	0.1
Total	19	100.0	21	100.0	1	100.0	21	100.0	11	100.0	30	100.0	4	100.0	1481	100.0	1588	100.0

most diagnostic of both formation and quarry cluster. For an accounting and discussion of diagnostic microfossils (as well as rock fabric and secondary inclusions) diagnostic of the various quarry clusters in peninsular Florida the reader is referred to Upchurch et al. (1982), Austin (1997), Austin and Estabrook (2000), and Endonino (2007). Rock fabric and secondary inclusions were also considered and became the primary criteria when fossil content was non-diagnostic.

Bifaces

Chipped stone tools exhibiting flake scars on both the ventral and dorsal surfaces were initially classified as bifaces (n = 40). This category was further subdivided into classes based on flake scar removal patterns and secondary shaping.

Preforms: A total of 19 bifaces were classified as preforms (examples presented in Figure 5-1). These chipped stone tools exhibit extensive flake removal indicative of late-stage production. Only one bifacial preform is complete (FS 181.1, Figure 5-1). The base was thinned by a combination of percussion and pressure flaking.

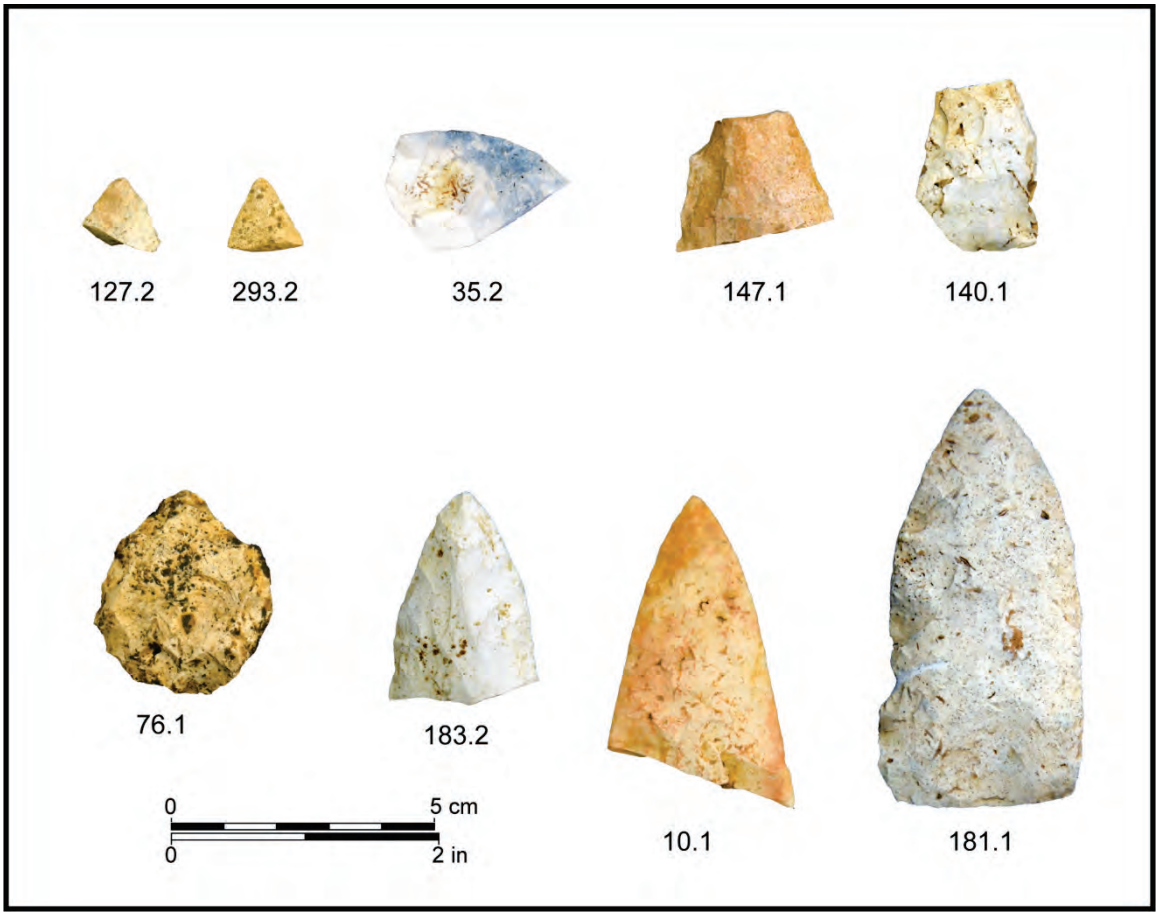

Figure 5-1. Select bifaces recovered during testing of 8MR123.

Table 5-3. Attributes of Bifaces Recovered during testing of 8MR123.

FS	Type	Material	Quarry	Condition	Thermal Alteration	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
10.1	Preform	Coral	Indeterminate	Distal	Present	57.2	36.0	8.5	12.4
20.2	Preform	Chert	Ocala	Marginal	Present	10.6	7.2	5.3	0.1
26.2	Preform	Chert	Suwannee Limestone Formation	Marginal	Present	15.4	9.9	5.7	0.6
34.1	Preform	Chert	Gainesville	Marginal	Present	30.9	14.4	8.6	2.8
35.2	Preform	Chert	Santa Fe	Marginal	Present	34.3	22.4	8.8	7.1
76.1	Wedge	Chert	Ocala	Complete	Absent	37.4	32.8	15.0	14.9
127.2	Preform	Chert	Ocala	Distal	Present	12.7	14.9	4.5	0.5
130.2	Preform	Chert	Ocala, Tampa/St. Marks	Marginal	Indeterminate	12.5	8.0	3.4	0.2
140.1	Preform	Chert	Ocala, Tampa/St. Marks	Medial	Present	32.0	23.7	7.7	6.4
143.1	Preform	Chert	Gainesville	Distal	Present	45.3	33.3	8.7	8.8
144.3	Preform	Chert	Ocala	Medial	Indeterminate	20.0	9.0	5.8	0.6
147.1	Preform	Chert	Santa Fe	Medial	Present	23.2	30.4	7.7	5.1
150.1	Preform	Chert	Santa Fe	Marginal	Present	14.2	6.0	6.6	0.4
173.3	Preform	Chert	Ocala	Distal	Present	14.5	8.4	3.5	0.2
181.1	Preform	Chert	Ocala	Complete	Absent	78.1	38.1	10.1	22.8
183.2	Preform	Chert	Ocala	Distal	Indeterminate	38.7	27.9	12.9	11.3
191.1	Preform	Chert	Hillsborough River	Marginal	Present	18.2	6.4	4.8	0.3
213.1	Preform	Coral	Indeterminate	Marginal	Present	31.8	25.7	11.2	4.9
290.2	Preform	Chert	Ocala	Medial	Absent	32.4	26.9	11.3	9.4
293.1	Preform	Chert	Ocala	Distal	Absent	13.8	14.3	5.3	0.6

There is no evidence of grinding. The blade and margins are roughly symmetrical, and were shaped with percussion and pressure flaking. The dorsal and ventral surfaces show evidence for extensive flake removal, and no cortex is present. A few small hinge fractures are evident along incipient planes, but none would have precluded use of this biface as a tool. It may have been used as a cutting tool, but could also be a true preform for a hafted biface.

Five fragments represent distal segments of late-stage preforms. One example (FS 10.1) is a thin distal fragment broken along an incipient fracture plane. In overall morphology it is consistent with the distal portions of complete Florida Archaic Stemmed hafted bifaces found within the SGS. The margins of the tool have extensive retouch. FS 183.2 (Figure 5-1) is a relatively thick distal portion that has steeply retouched margins. The biface exhibits a transverse break that may have been initiated along an incipient fracture plane. In addition to these larger objects, three fragments represent distal tips. Two examples (FS 127.2, 293.1; Figure 5-1) exhibit transverse fractures, while a third (FS 173.3) has a bending fracture.

Other preform fragments show a range of morphology and breakage types. For example, FS35.2 broke along two fracture planes with a point of impact in the middle of the object. This possible radial fracture may have been induced by an impact to the body of the tool. There is no evidence, however, that this fragment was repurposed after it was broken. Tools were also subjected to post-production thermal alteration, as evidenced by one non-orientable preform fragment with numerous potlids (FS 213.1). Others (FS 140.1, 143.1, 147.1,) broke along multiple transverse planes. Finally, seven bifacial fragments were too small to classify by formal or technological attributes. This class includes five fragments of bifacially worked lateral tool margins, a medial fragment with two lateral edges present (FS 144.3), and one medial fragment lacking a margin (FS 150.1).

Wedge: One bifacial tool (FS 76.1) was classified as a "wedge" (Figure 5-1, Table 5-2). This tool is ovoid in shape, and has steep and wide retouch scars on the margins, likely from hard hammer reduction and is made of untreated Ocala chert. The presumed distal end of the tool (pointing up in Figure 5-1) is shaped to a blunted point. The point surface has numerous small impact fractures that are parallel with the main axis of the tool. Although the function of the tool is unknown, it apparently experienced repeated battering on the distal margin, perhaps during working on wood or marine shell.

Hafted Bifaces: A total of 21 whole or fragmentary bifaces have basal modifications for hafting (Figure 5-2, Table 5-3). One basally-notched example (FS 211.2) is consistent with the Hernando type (FS 211.2, Figure 5-2) (Bullen 1975: 24). The biface was manufactured from unaltered coral, and is missing the stem. This type is associated with Woodland period occupation. The remainder of the assemblage is characterized by stemmed variants consistent with the Florida Archaic Stemmed (FAS) type. These bifaces have straight to tapered haft elements that range between 8 and 17 mm in length and 6 to 22 mm in width. The stem bases are either squared or rounded.

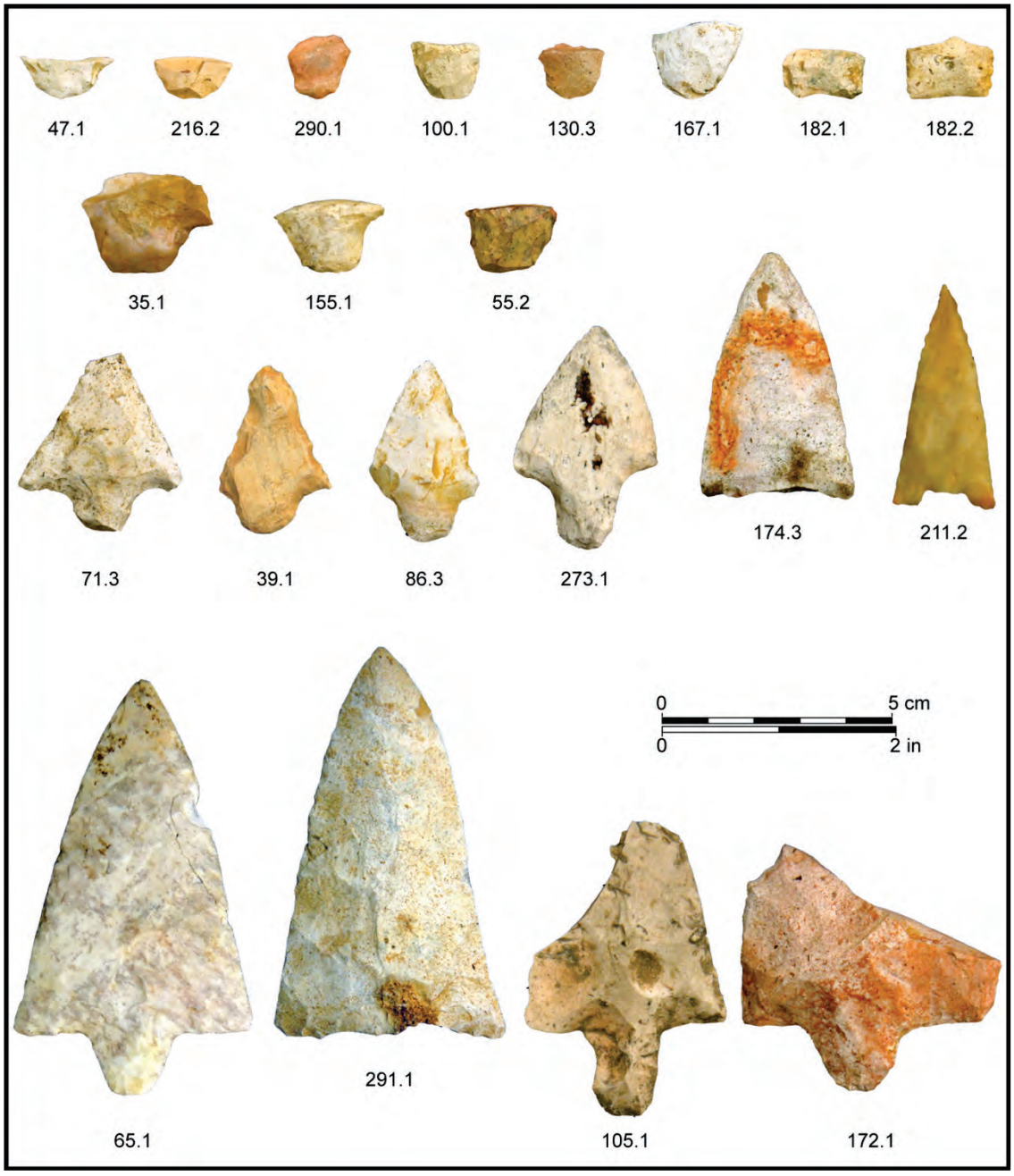

Figure 5-2. Hafted bifaces recovered during testing of 8MR123.

Five complete FAS examples were recovered, and four of these (FS#39.1, 71.3, 86.3, 273.1) appear to have been significantly reduced from their original form by flake removal along the blade margins. All have asymmetrical blades that tend to exhibit comparatively steep edge angles, typical of use as a cutting tool and repeated sharpening. One other example (FS 65.1) is a classic Newnan type. The specimen was slightly damaged during excavation. The stem has contracting margins with a flat base which is

Table 5-4. Attributes of Hafted Bifaces Recovered during testing of 8MR123.

FS	Type	Material	Quarry	Condition	Thermal Alteration	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
35.1	FAS†	Chert	Gainesville	Stem	Present	21.5	28.5	9.5	4.4
39.1	FAS†	Coral	Indeterminate	Complete	Absent	36.4	24.6	7.2	4.1
47.1	FAS†	Chert	Gainesville	Stem	Indeterminate	9.0	20.0	6.1	0.8
55.2	FAS†	Chert	Santa Fe	Stem	Present	15.0	20.6	9.6	2.8
65.1	FAS†	Coral	Indeterminate	Complete	Present	89.7	51.0	8.5	27.4
71.3	FAS†	Chert	Santa Fe	Missing Tip	Present	38.3	35.4	10.0	7.3
86.3	FAS†	Chert	Santa Fe	Complete	Present	38.9	24.2	6.9	4.2
100.1	FAS†	Chert	Upper Withlacoochee River	Stem	Present	13.0	14.5	5.5	0.9
105.1	FAS†	Chert	Gainesville	Proximal	Present	63.2	43.3	9.9	17.7
130.3	FAS†	Chert	Santa Fe	Stem	Present	11.6	14.5	6.5	0.8
155.1	FAS†	Chert	Upper Withlacoochee River	Stem	Present	15.7	23.1	6.7	1.7
167.1	FAS†	Coral	Indeterminate	Stem	Present	18.6	19.4	6.4	1.8
172.1	FAS†	Chert	Ocala	Proximal	Present	55.0	55.6	11.5	24.6
174.3	FAS†	Chert	Ocala	Missing Stem	Present	53.3	33.2	6.0	1.1
182.1	FAS†	Coral	Indeterminate	Stem	Present	10.7	17.7	6.1	1.1
182.2	FAS†	Chert	Ocala	Stem	Absent	13.5	18.8	6.5	1.1
211.2	Hernando	Coral	Indeterminate	Distal	Indeterminate	48.2	22.4	4.5	3.7
216.2	FAS†	Coral	Indeterminate	Stem	Present	9.2	16.9	5.5	0.6
273.1	FAS†	Coral	Indeterminate	Complete	Indeterminate	48.2	31.6	7.6	9.0
290.1	FAS†	Chert	Santa Fe	Stem	Present	13.5	14.0	6.2	0.9
291.1	FAS†	Chert	Santa Fe	Missing Stem	Indeterminate	85.3	50.1	11.1	27.6

†FAS = Florida Archaic Stemmed

in line with the axis of the blade. The blade is slightly excurvate. The surfaces of the biface exhibit broad flake scars, while the edges have numerous small flakes removed, indicative of late-stage finishing and possibly slight retouch and resharpening. The material is a patinated silicified coral with a low luster. It is likely that this tool was heat treated. All signs point to this being a completely finished tool that may have witnessed limited use, but is otherwise pristine.

The remainder of the FAS assemblage consists of broken objects. Two examples retain both the stem and a portion of the blade. One (FS 105.1) may have been deposited whole, but has extensive potlids and a possible expansion fracture typical of post-depositional thermal alteration. The other example (FS 172.1) is the basal portion of a broad bladed stemmed hafted biface that likely failed during production. The material is fossiliferous chert which is reddened and has high luster, suggesting it is thermally altered. The working edges of the blade do not show evidence for tertiary flaking or resharpening. There is minimal patination evident on the surface of the tool. The broken distal edge of the blade terminates in a perverse fracture, which may have been precipitated by an incipient fracture plain within the chert. In addition, there is a large flake scar and hinge fracture on the surface of the tool that is bisected by the lateral fracture plane. Further support of this tool breaking during late-stage manufacture is provided by the abundant debitage recovered from the shovel test. Two hafted bifaces (FS 174.3, 291.1) are represented by blade elements lacking a stem. In each case, the proximal end of the tool retains a fracture plane typical of a haft snap. The blades tend to be wide relative to the haft element width, consistent with an FAS type attribution. Finally, the remaining 10 hafted bifaces are represented by haft elements. These exhibit haft snaps, which are transverse breaks at the point of articulation between the stem and shoulder. One example (FS47.1) also has potlids on the fractured surface, and may have resulted from post-depositional thermal alteration.

The distribution of raw material types (Table 5-2, 5-4) shows that there was a preference for producing hafted bifaces from chert from the Gainesville, Santa Fe, and Ocala clusters. More distant sources are represented by Upper Withlacoochee River chert as well as those made from silicified coral.

Microliths

Microlithic tools (n = 21) were found in contexts across 8MR123. Objects in this class are small, formal flake tools (between 14 and 20 mm in length based on two complete examples) that are characterized by wide bases that taper or rapidly contract into elongated distal shafts (Figure 5-3, Table 5-5). In this report we defined all formal microliths that retained a basal portion as an “expanded base microlith,” while all distal portions were classified as “shafts” (Table 5-4). Similar tools along the St. Johns have been classified using the typology developed for Late Archaic Poverty Point related sites in Louisiana and Mississippi (Ford et al. 1955: 137–150; Ford and Webb 1956: 76-82) (e.g., ACI and Janus Research 2001). Despite morphological similarities, the St. Johns and Poverty Point technologies are quite different. In particular, the Poverty Point

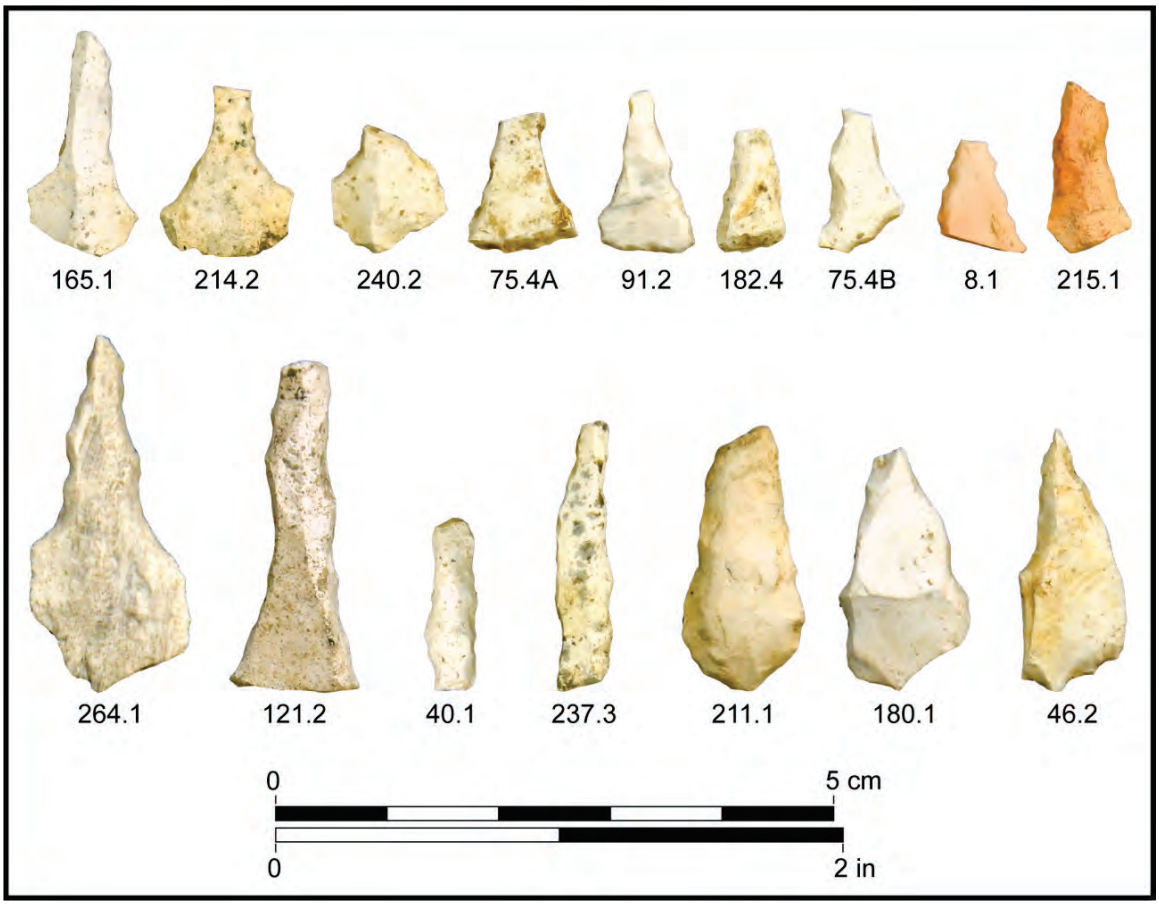

Figure 5-3. Select microliths recovered during testing at site 8MR123.

specimens were derived from prepared blade cores. Moreover, the Poverty Point classification scheme (i.e., Jaketown perforator, blunt perforator, needle) can lead to further confusion regarding the function of this class of tool (see below).

Microliths at 8MR123 were likely manufactured from bifacial thinning flakes. Although the characteristics of the original flake type have been altered by subsequent flake removal, 15 specimens had one or more features typical of bifacial thinning flakes (wide or lipped platforms, overall thickness and curvature, and overlapping or sub-parallel flake scars on the dorsal surface). The bases were manufactured by removing small flakes along the margin. In most cases, bases exhibit steep edges where flakes have been removed unifacially (ex. FS 75.4A, 75.4B, 91.2, 182.4 in Figure 5-3). Some specimens, however, had unworked or acutely retouched basal margins (ex. FS 46.2, 211.1, 264.4). In either case, blunting of the basal edge likely strengthened the tool and facilitated use either by hand or in a haft. The distal shafts are characterized by very steep (often approaching 90 degrees) edges that resulted in square to rhomboidal cross sections. Shaping flakes could be removed unifacially, bifacially, or alternately. The platforms for these flakes tend to be blunted, with numerous striae evident at low magnification. Whether or not the striae resulted from tool production or

Table 5-5. Attributes of Microliths Recovered during Testing of 8MR123.

FS	Type	Material	Quarry	Thermal Alteration	Condition	Length (mm)	Width (mm)	Thickness (mm)	Bit Width (mm)[F]	Weight (g)
6.3	XB?[‡]	Chert	Ocala	Indeterminate	Distal	11.0	7.5	4.5	-	0.3
8.1	XB[†]	Coral	Indeterminate	Present	Medial	9.0	7.9	2.0	4.4	0.1
40.1	Shaft[¥]	Chert	Santa Fe	Absent	Distal	15.4	4.7	3.4	4.0	0.2
46.2	XB?[‡]	Chert	Ocala	Indeterminate	Medial	23.0	9.4	3.6	2.6	0.6
57.3	XB?[‡]	Coral	Indeterminate	Indeterminate	Marginal	15.7	6.4	2.5	-	0.2
75.4A	XB[†]	Chert	Ocala	Indeterminate	Proximal	12.4	9.6	3.6	4.7	0.3
75.4B	XB[†]	Chert	Ocala	Indeterminate	Proximal	12.8	8.6	2.4	4.0	0.1
91.2	XB[†]	Coral	Indeterminate	Present	Complete	14.5	8.6	3.0	3.0	0.2
121.2	XB[†]	Chert	Ocala	Present	Medial	29.3	11.2	5.3	5.5	1.3
165.1	XB[†]	Chert	Ocala	Indeterminate	Complete	19.9	10.2	2.8	4.0	0.3
180.1	XB[†]	Chert	Ocala	Indeterminate	Proximal	21.7	11.0	4.6	4.1	0.6
182.4	XB[†]	Chert	Ocala	Absent	Proximal	11.0	6.0	3.4	4.0	0.1
211.1	XB?[‡]	Chert	Ocala	Absent	Proximal	23.6	11.2	5.5	7.0	1.1
214.1	XB?[‡]	Chert	Ocala	Present	Medial	21.4	13.8	3.6	-	0.6
214.2	XB[†]	Chert	Ocala	Absent	Medial	15.2	11.8	3.1	4.0	0.3
215.1	XB[†]	Coral	Indeterminate	Present	Proximal	14.7	7.4	2.4	4.5	0.3
237.3	Shaft[¥]	Chert	Ocala	Absent	Distal	24.4	5.2	4.0	3.0	0.4
239.1	XB?[‡]	Chert	Ocala	Indeterminate	Medial	17.6	9.8	5.2	-	0.7
240.2	XB[†]	Chert	Santa Fe	Indeterminate	Proximal	11.5	10.2	3.5	4.8	0.2
242.2	Shaft[¥]	Coral	Indeterminate	Present	Medial	18.0	8.8	3.7	-	0.4
264.1	XB[†]	Coral	Indeterminate	Absent	Proximal	31.3	14.2	3.5	4.3	1.2

[†]XB = expanded base
[‡]XB? = possible expanded base
[¥]Shaft = distal microlith fragment, likely from expanded base type
[F]Measured on all examples with an extant shaft

subsequent use cannot be determined without high-power microscopy. Two shaft examples (FS 40.1, 237.3) retained intact distal points. In both cases, the distal working edges exhibited significant crushing and flake scars emanating from the tip. There was no clear evidence of rotary tool motion, as would be expected if the tool was used as a drill. However, the broken shaft elements of basal fragments often have what appear to be bending fractures that could have been caused by rotational forces. Measured widths of shaft elements near the distal tip (n = 16) ranged from 2.6 mm to 7 mm, and average 4.2 mm. These measurements should be considered maximum widths, as they were recorded mostly on tools with broken tips. Finally, microliths at SGS were preferentially manufactured from thermally altered flakes (71.4%) of chert or coral.

Microlithic tools have been identified in Archaic through late prehistoric contexts in Florida. Sassaman et al. (2011a) recovered several examples from a shell-free basal deposit at 8LA-1-East. Elsewhere, they have been reported in Thornhill Lake Phase contexts. At the Thornhill Lake Complex (8VO58–60), Endonino (2010: 292–294) recovered three microliths that were technologically consistent with those from the SGS. A very large assemblage (n ≥137) was recovered at the Lake Monroe Outlet Midden site (8VO53). Microliths have also been recovered from sites on the margins of Lake Apopka to the south. At the predominantly St. Johns I period Montverde site (8LA243), Austin (2004: 22–24) reported four expanded base microliths. One was triangular in shape, mimicking the morphology of a Pinellas point. The others had rounded proximal ends with truncated distal shafts. Endonino and Hosford (2007:35–37) described a small assemblage (n = 10) of microliths recovered during Phase II testing of site 8OR487/507. This site is characterized by near-shore wet deposits with and without shell, in addition to a shell-free upland component. Microliths were apparently all recovered in the near-shore area. Radiocarbon dates and diagnostic artifacts place the majority of occupation within the St. Johns period (A.D. 60–240 and A.D. 1010–1180), although the microliths appear concentrated in St. Johns II deposits. These tools are quite similar to the expanded base MLs recovered at SGS. The tools were manufactured on bifacial thinning flakes through steep retouch which could be either unifacial or alternate. They noted that use-wear in the form of rounding, step fractures, and polish were present along the lateral and distal margins, but is concentrated at the bit end. Several examples have retained the distal tip which contracts to a point, unlike many of those recovered at 8MR123. Bit widths, which range between 0.9 and 2.1 mm, are on the whole significantly smaller than those recovered at 8MR123. This may be due to the fact that the SGS specimens are mostly broken. Farther to the west, microliths produced by varying technologies have been reported throughout the central and southern Gulf Coast (Austin 2000b).

The function of this class of tools remains poorly understood, particularly as regards whether they were used to simply perforate soft materials or drill harder materials, such as bone, shell, or wood. We would note that microlith function was vexing for Ford et al. (1955: 140) as well, who noted that “there is little evidence that the Jaketown objects were used to produce holes.” They continue (Ford et al. 1955: 140–141) by noting that while one object did bear heavy polish, “several thousand of these awls bear no evidence of polish as the result of a rotating motion. The ends of the points on most of them are blunted, almost battered, and it seems certain that this tapered end

was the working end and not the haft." They conclude that they may have been used for incising. Although the 8MR123 may have been used for incising or graving, there is some evidence that suggests the microliths were used as drills. Most notably, the few intact distal tips did exhibit heavy crushing, if not clear polish, that could have been produced during drilling of a hard substance. Similarly, several tools had flakes emanating from the tip, suggesting that pressure was applied to the distal tool. In the absence of high-powered microscopy, the function of these tools at 8MR123 remains indeterminate. The recovery of large quantities of microliths and unfinished, but perforated, shell beads at Lake Monroe Outlet Midden suggests that the two industries are linked. In their description of shell beads from 8VO53, ACI notes that the majority of the 266 marine shell disc beads recovered had interior hole diameters slightly above or below 4.2 mm (1/6 inch), while a small number had interior bore diameters of approximately 1.9 mm (5/64 inch). The shaft widths of the microlithic sample was not published. However, width measurements were acquired from 45 specimens illustrated in a figure. Interestingly, the widths of microliths at Lake Monroe Outlet Midden ranged between 1.5 mm and 3.8 mm with a mean of 2.6 mm. That suggests that they were at least small enough to have produced many, if not all, of the interior perforations of the shell beads. Unfortunately, no marine shell beads were recovered during the present 8MR123 during the present survey, and so testing this hypothesis with local data is not yet possible. However, based on tip width alone it is possible that the 8M123 assemblage was used to make marine shell beads.

Unifaces

Eleven unifacial endscraper and sidescraper tools and fragments were recovered during testing (Figure 5-4, Table 5-6). Each has steeply retouched margins, and may have been hafted. Three specimens are represented by edge fragments (FS 27.5, 201.5B, 214.6). One side scraper (FS 201.5A) is manufactured from a thermally altered chert bifacial thinning flake. One lateral margin is steeply retouched while the other is unaltered.

Six specimens were likely manufactured from core-derived flakes or blades based on the presence of parallel flake scars on the dorsal surface. These tools are all heavily patinated. They share many formal and technological characteristics with Late Paleoindian or Early Archaic unifaces found elsewhere in Florida and the lower Southeastern United States (e.g., Daniel and Wisenbaker 1987). The smallest complete object (FS 22.1) is a tear-shaped endscraper measuring just 17.5 mm in length. The distal edge is concave, and may have resulted from breakage during use. Another possible tear-shaped endscraper is represented by FS 246.1, a small fragment with two steeply retouched margins. FS 74.4 is trapezoidal in cross-section, and is missing the distal and proximal margins. Both lateral margins are steeply retouched, although whether these present working edges is unknown. The largest example (FS 114.1) measures 82.4 in length. The dorsal surface has at least one parallel flake scar, and this tool was likely derived from a large core. The lateral margins have steep flake scars, many of which terminate in hinge and step fractures. The distal and presumed working edge of the tool is characterized by steep flakes that appear to be rounded, possibly by abrasion. The size

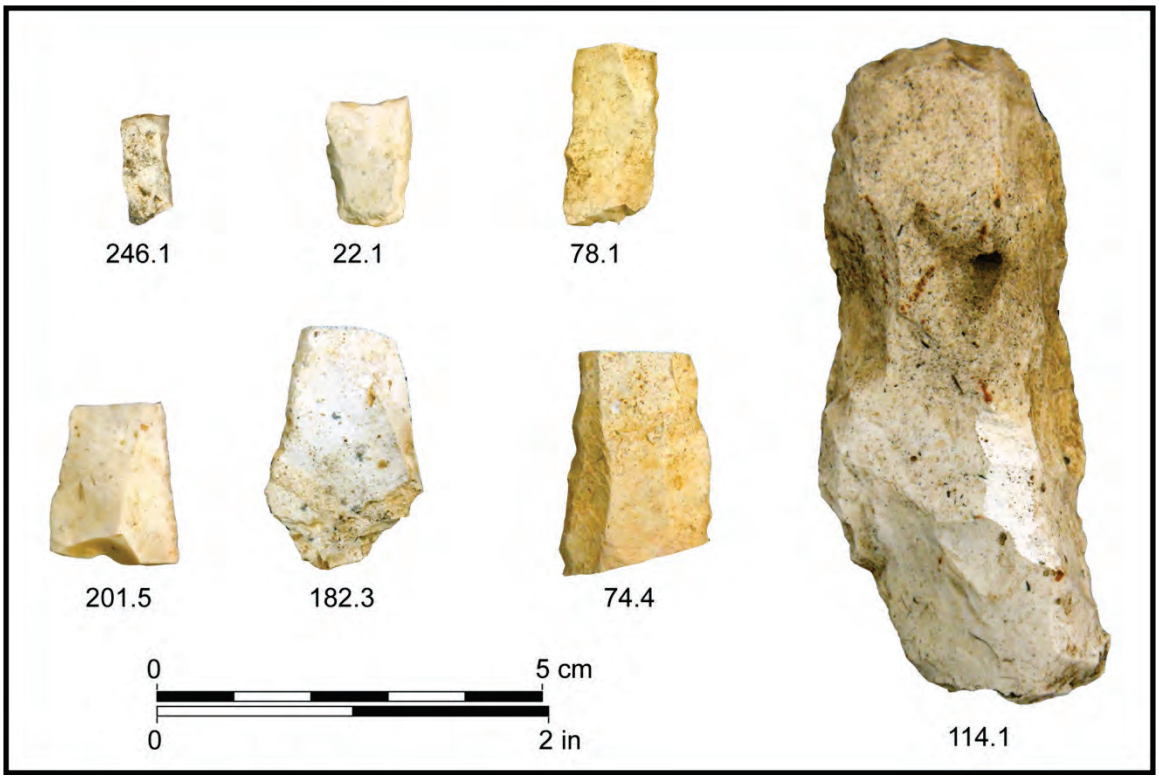

Figure 5-4. Select unifaces recovered during testing at site 8MR123.

and morphology of the tool suggest that it may have been used as either a large scraper or possibly an adze or gouge. This particular object was recovered from a shell-bearing deposit (STP L-19), but likely came from a disturbed context. In addition to these more formal examples, three fragments (FS 78.1 154.1, 182.3) have at least one steeply retouched margin with parallel dorsal scars.

Modified Flakes

Thirty lithic flakes show evidence for marginal modification (Figure 5-5, Table 5-7). In general, this class contains whole and fragmentary waste flakes with small flake scars along one or two lateral margins. One deviation from this pattern are two notched flakes (FS 188.1, 79.1), each with a deeply concave margin. The function of the modified flake tools remains unknown without microscopic determination, but could have included cutting, scraping, or slicing. Only seven examples are complete, and these range between 30.5 and 66.9 mm in total length. Based on morphological characteristics, bifacial thinning flakes were preferentially chosen for subsequent modification (n = 22, 73.3%). The remainder of flakes appear to be derived from hard hammer reduction or are of indeterminate technological origin. Modified flakes were dominated by chert as a raw material (80%), in particular chert from the Ocala or Santa Fe quarries. However, three examples were derived each from the Hillsborough River and the Gainesville quarries, and one was from the Upper Withlacoochee, Green Swamp Area.

Table 5-6. Attributes of Unifaces Recovered during Testing of 8MR123.

FS	Type	Material	Quarry	Thermal Alteration	Condition	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
22.1	Endscraper	Chert	Ocala	Indeterminate	Complete	17.5	11.1	3.3	0.6
27.5	Endscraper?	Chert	Santa Fe	Present	Marginal	14.8	8.6	3.4	0.2
74.4	Side Scraper	Chert	Ocala	Indeterminate	Medial	28.6	18.5	6.2	4.5
78.1	Side Scraper	Chert	Ocala	Absent	Distal	22.8	10.8	4.0	0.9
114.1	Endscraper	Chert	Ocala	Indeterminate	Complete	82.4	34.0	18.3	53.6
154.1	Side Scraper	Chert	Santa Fe	Absent	Marginal	34.1	15.5	8.6	3.6
182.3	Side Scraper	Chert	Ocala	Indeterminate	Distal	31.3	20.4	5.5	2.3
201.5A	Side Scraper	Chert	Gainesville	Present	Medial	21.1	16.0	4.5	1.7
201.5B	Side Scraper	Chert	Santa Fe	Indeterminate	Medial	9.2	8.5	2.5	0.2
214.6	Side Scraper?	Chert	Ocala	Present	Medial	15.5	10.1	3.3	0.2
246.1	Endscraper?	Chert	Santa Fe	Indeterminate	Distal	14.1	6.2	3.4	0.3

Table 5-7. Attributes of Modified Flakes Recovered during Testing at 8MR123.

FS	Type	Material	Quarry	Condition	Thermal Alteration	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
5.2	Modified BTF†	Coral	Indeterminate	Proximal	Present	21.5	15.6	2.2	1.3
38.1	Modified BTF†	Chert	Santa Fe	Marginal	Present	31.3	16.1	4.3	2.2
40.2	Modified HHF‡	Chert	Hillsborough river	Complete	None Present	49.9	13.6	9.4	4.9
70.2	Modified HHF‡	Chert	Santa Fe	Complete	Indeterminate	36.1	18.8	5.6	3.1
79.1	Notched BTF†	Chert	Ocala	Marginal	Indeterminate	15.5	8.8	3.8	0.5
85.1	Modified UID Flake¥	Chert	Ocala	Medial	Indeterminate	14.9	8.4	3.6	0.3
87.1	Modified UID Flake¥	Chert	Ocala	Medial	None Present	31.1	28.4	9.8	9.4
90.2	Modified BTF†	Chert	Gainesville	Medial	Present	38.8	20.6	2.8	1.7
109.5	Modified BTF†	Chert	Ocala	Proximal	Indeterminate	35.7	25.5	4.7	3.4
113.5	Modified BTF†	Chert	Gainesville	Medial	Present	37.3	22.0	3.3	2.2
115.4	Modified BTF†	Chert	Upper Withlacoochee, Green Swamp Area	Proximal	Indeterminate	22.9	17.0	3.7	1.2
121.4B	Modified BTF†	Chert	Ocala	Distal	None Present	17.7	11.1	3.2	0.7
121.4A	Modified HHF‡	Chert	Gainesville	Complete	Present	40.5	36.3	12.7	19.5
126.1	Modified BTF†	Chert	Hillsborough river	Proximal	Present	29.9	18.7	4.7	2.0
133.2	Modified HHF‡	Chert	Santa Fe	Distal	Indeterminate	38.1	25.5	7.3	6.8
185.1	Modified BTF†	Coral	Indeterminate	Whole	Indeterminate	66.9	22.8	8.0	9.3
188.1	Notched BTF†	Chert	Santa Fe	Distal	Present	23.2	20.1	4.5	1.4
190.1	Modified BTF†	Coral	Indeterminate	Distal	Present	32.7	16.4	2.4	1.1
225.1	Modified HHF‡	Chert	Hillsborough river	Complete	Present	38.7	33.6	7.6	6.9
252.1	Modified UID Flake¥	Chert	Ocala	Proximal	Present	21.3	15.0	4.7	1.1
267.1	Modified BTF†	Chert	Ocala	Complete	Indeterminate	42.8	26.0	6.5	6.5
278.1	Modified BTF†	Coral	Indeterminate	Distal	Present	13.4	9.5	4.1	0.3
280.3	Modified BTF†	Coral	Indeterminate	Medial	Indeterminate	32.5	19.5	5.8	3.8
283.4	Modified BTF†	Chert	Ocala	Proximal	None Present	26.3	21.9	6.8	2.3
284.5	Modified BTF†	Chert	Santa Fe	Marginal	Indeterminate	15.5	6.6	2.9	0.2
287.5	Modified BTF†	Chert	Santa Fe	Distal	Present	13.4	11.0	2.7	0.3
288.1	Modified BTF†	Chert	Santa Fe	Proximal	Indeterminate	28.2	19.1	5.5	3.4
288.2	Modified BTF†	Coral	Indeterminate	Distal	Present	18.5	14.2	3.5	0.7
289.3	Modified BTF†	Chert	Ocala	Proximal	Present	27.3	26.9	5.1	3.0
294.2	Modified BTF†	Chert	Santa Fe	Complete	Present	30.5	24.0	5.4	3.1

†BTF = Bifacial thinning flake
‡HHF= Hard hammer or core reduction flake
¥UID = Indeterminate flake type

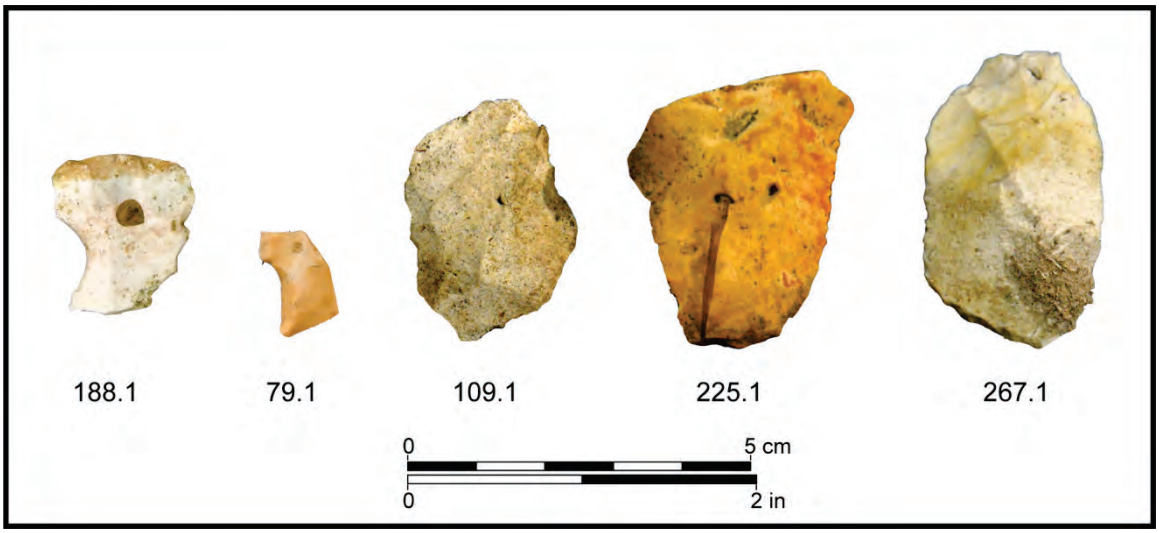

Figure 5-5. Select modified flakes recovered during testing at site 8MR123.

Modified flakes were also likely to be thermally altered (63%). This selection pattern mimics the overall pattern of debitage documented at 8MR123 (see below).

Cores

Four small chert objects with multiple flake scars are classified as cores (Figure 5-5). Three of these objects have opposed platforms with flake scars removed from multiple directions, suggesting that they were expedient, and possibly bipolar cores. FS 82.1 is a medial chert flake with square edges. One edge has battered platforms at both ends, and may have been used as an expedient bipolar core. Another (FS 62.1) is bifacially worked, and has prepared platforms at either end of the tool. Flakes were removed from both platforms. Likewise, FS 88.1 is a proximal bifacial thinning flake with impact points emanated from the broken distal margin. A fourth core is represented by a non-orientable cortex-bearing fragment that has multiple flake removals.

Debitage

A total of 1481 lithic waste flakes, or debitage, were analyzed from 8MR123. The majority of the specimens was recovered from shovel tests. The remainder were derived from excavation units and auger tests. Although not temporally diagnostic, debitage constitutes the most abundant object class recovered within the SGS. Detailed technological characterization of individuals flakes provides important insights into lithic reduction strategies, and can better inform the interpretation of the formal tool categories.

Flake forms observed at 8MR123 include all those proposed by Sullivan and Rozen (1985) (Table 5-9). Medial/distal flake fragments (n = 680, 45.9%) are most frequent followed by proximal fragments (n = 445, 30.1%). Complete flakes (n = 291, 19.6%) are third in abundance with non-orientable fragments (n = 65, 4.4%), composed

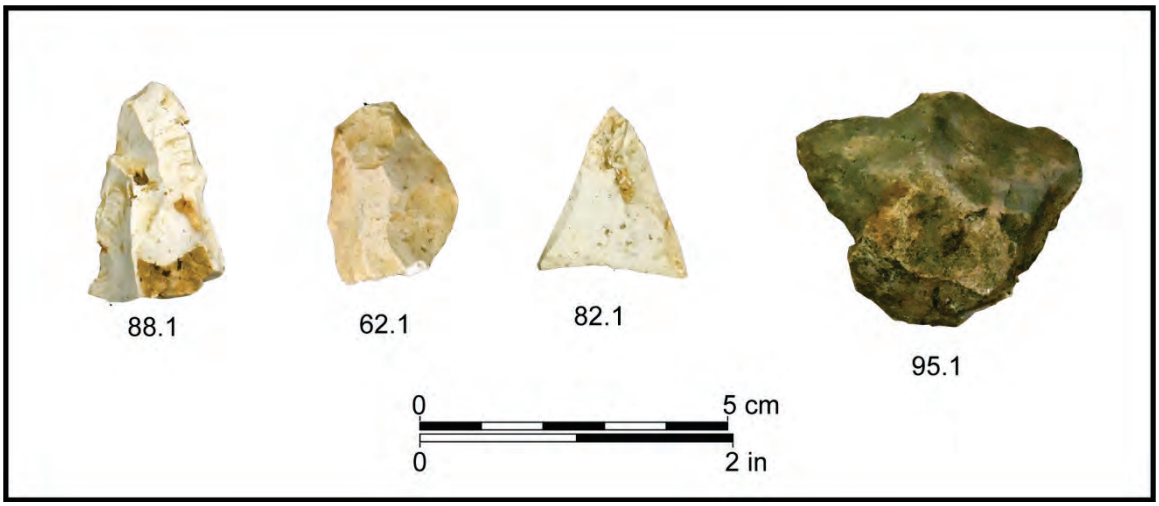

Figure 5-6. Cores recovered during testing at site 8MR123.

Table 5-8. Attributes of Lithic Cores Recovered during Testing at 8MR123.

FS	Material	Quarry	Thermal Alteration	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
62.1	Chert	Ocala	Indeterminate	28.5	21.1	11.1	3.6
82.1	Chert	Santa Fe	Indeterminate	29.5	23.1	6.5	2.8
88.1	Chert	Santa Fe	Present	35.1	22.0	10.1	5.3
95.1	Chert	Ocala	Present	42.6	38.8	25.1	28.2

largely of angular shatter and thermally damaged fragments (potlids), are the least frequent. Experimental data on flake forms produced through tool production vs. core-reduction activities using Florida lithic materials provided by Austin (1997: Table 13) offers a basis for interpreting the frequencies in flake forms observed for this assemblage. Biface and unifacial tool production display similarities in the proportions of flake forms produced. For both tool types medial/distal flake fragments are most frequent, typically 43–47% of the assemblage, followed by complete flakes at 31–33%. Proximal flakes account for 19–23% of the experimentally produced waste flakes with non-orientable fragments accounting for less than two% of the experimental assemblages. Contrast this with core reduction activities for both large and small cores where non-orientable fragments account from 14–15% of the experimental assemblages. Because of the variability observed between large and small cores with respect to the other flake forms, the proportion of non-orientable fragments is most useful in discriminating between core and tool production activities.

Table 5-9. Sullivan and Rozen (1985) Flake Form Categories for Debitage from 8MR123.

Sullivan and Rozen Category	Count	Percent
Complete	291	19.6
Proximal	445	30.1
Medial/Distal	680	45.9
Non-orientable	65	4.4
Total	1481	100.0

The debitage assemblage from 8MR123, when compared to the experimental data provided by Austin (1997), both agrees with, and diverges from, expectations based on the experimental data. The frequency of medial/distal flake fragments is exactly what would be expected for tool production. However, complete flakes are more numerous and proximal flakes fewer in the 8MR123 assemblage than the experimental data predict. Lastly, non-orientable fragments constitute only a small percent of the assemblage as might be expected for tool production activities, but occur at a higher percent than expected based on the experimental dataset, just over 4%. However, when the thermally produced non-orientable fragments are excluded, the frequency of non-orientable fragments drops to 3.2%. This contribution is higher than the experimental assemblages, but still closer to the expected proportion. The number of non-orientable fragments is likely explained by the occurrence of limited small core reduction activities, a fact borne out by the recovery of a few small cores from this site. Considering the above information, it appears that flake forms from 8MR123 overall indicate tool production activities, probably bifaces, but other tool forms as well.

Technological flake types (ex. bifacial thinning, retouch, notching) were determined along with the Sullivan and Rozen flake form data (Table 5-10). More than two-thirds of the waste flakes have been characterized as biface thinning flakes, based largely on flake curvature, thinness, and feather terminations in addition to striking platform and bulb of percussion characteristics (discussed below). Other tool production-related flake types include notching flakes and retouch flakes. Retouch flakes can be produced during the final stages of tool production or subsequent maintenance, but are always associated with finished or nearly finished tools. Core reduction is minimally represented and probably associated with the reduction of small cores. Angular and thermal shatter are also present, and the former occurs in quantities most typical of tool production. Finally, a large number of flakes were determined to be “Indeterminate” with regard to their technological associations, many of which are medial/distal flake fragments. On the whole, the technological flake categories present in the 8MR123 waste flake assemblage are indicative of tool production and maintenance activities with the limited occurrence of core reduction.

Variations in specific flake attributes are also illuminating. Striking platform preparation is typical in later stages of biface production. Platforms were categorized as either being prepared, unprepared, or indeterminate (Table 5-11). Just over half of the waste flakes analyzed from Silver Glen Springs were assigned to the indeterminate

Table 5-10. Technological Flake Types for 8MR123.

Technological Type	Count	Percent
Angular Shatter	21	1.4
Thermal Shatter	29	2.0
Core Reduction	2	0.1
Biface Thinning Flake	990	66.9
Notching Flake	4	0.3
Retouch	32	2.2
Indeterminate	403	27.2
Total	1481	100.0

Table 5-11. Striking Platform Types Identified for Debitage from 8MR123.

Platform Type	Count	Percent
Prepared	580	39.2
Unprepared	147	9.9
Indeterminate	754	50.9
Total	1481	100.00

category and consist entirely of medial/distal flake fragments and non-orientable fragments which lack striking platforms and thus cannot be evaluated. Of those flakes with striking platforms present, just over 39% display evidence of intentional preparation. The balance, nearly 10%, was entirely lacking in evidence for preparation of striking platforms and these flakes are the best examples of earlier stages of reduction. Frequently core reduction activities result in debitage assemblages where unprepared and minimally prepared platforms are frequent. The high occurrence of prepared striking platforms is indicative of the predominance of later stage tool production activities at Silver Glen.

In much the same way that striking platforms are useful in discerning between early-, middle-, and late-stage reduction activities, so too are bulbs of percussion (Table 5-12). Generally speaking, early stage reduction results in debitage with salient or pronounced bulbs of percussion. Later stage reduction using soft hammers such as antler, as well as antler pressure flakers, result in bulbs of percussion that are diffuse. In addition, biface reduction frequently results in with lipped striking platforms, where part of the edge of the biface is removed. Salient bulbs were fairly common among the waste flakes from 8MR123 at just over 22%. Surprisingly diffuse bulbs were less frequent at just over 20%. Lipped flakes were present but constituted the smallest number of bulb types identified at slightly over 6%. As with platform type, indeterminate bulbs of percussion make up more than 50% of the assemblage. Given that the primary lithic reduction activity appears to be tool production away from stone sources, it might be expected that there would be fewer salient and more diffuse bulbs of percussion. One possible explanation for the high frequency of salient bulbs is the use of hard hammers (i.e. hammerstones) in later stages of biface production at this site.

Table 5-12. Bulb of Percussion Types Identified for Debitage from 8MR123.

Bulb of Percussion	Count	Percent
Salient	330	22.3
Diffuse	302	20.4
Lipped	94	6.4
Indeterminate	755	51.0
Total	1481	100.00

The amount of cortex present on the dorsal surface of waste flakes can be used as an indicator of where in the reduction process a particular flake was removed (Table 5-13). Core reduction and early stage tool production debris will possess the greatest amount of cortex with lesser amounts present later in the process. The great majority of the debitage from this site are entirely lacking in cortex. Of those flakes possessing cortex, flakes with cortex covering only 1–25% are most frequent. Higher frequencies of exterior cortex are not common and all other categories account for less than 2% of the assemblage. A general dearth of cortex of the waste flakes from 8MR123 supports late-stage tool production as the primary lithic reduction activity at this site.

Thermal alteration is generally thought to occur late in the reduction process and typically occurs subsequent to initial reduction of quarry blanks into early stage preforms. Middle and Late Archaic populations employed this technique widely in the production of hafted bifaces in Florida (Ste. Claire 1987). Nearly 49% of the waste flakes from 8MR123 display characteristics indicative of thermal alteration (Table 5-14), particularly luster, but coloration as well, although this latter characteristic is less reliable. Just over 43% of the flakes were not thermally altered. A small portion of the waste flake assemblage was determined to possibly have been thermally altered, possessing some characteristics of this process, but lacked convincing evidence one way or the other. A significant number of waste flakes were classified as indeterminate for thermal alteration because their exterior was patinated to such an extent that evidence, either color or luster, frequently both, was obscured. The frequency of thermal alteration generally supports the occurrence of late-stage tool production, but the presence of a significant amount of debitage that was not thermally altered may be indicating that some of the material was arriving at this site in an unaltered state and was either worked raw or was further reduced and then thermally altered on-site.

Patination as it relates to the determination of the presence or absence of thermal alteration was just mentioned above. In a number of cases patination was so heavy that it obscured evidence of thermal alteration. The degree of patination varied from heavy to very light (Table 5-15). Some waste flakes appeared very chalky and were much lighter than similarly sized flakes with only light patination or no patination at all. In fact, only 17% of the flakes from this site were not patinated at all where most, nearly 83%, were patinated. Such a predominance of patination across the site assemblage no doubt lead to quite a few flakes classified as not having been thermally altered. Interestingly, the majority of the debitage was recovered from a very dry and acidic sandy matrix. Possibly

Table 5-13. Cortex Amount and Frequency Identified on Debitage from 8MR123.

Cortex	Count	Percent
0%	1371	92.6
1-25%	43	2.9
26-50%	19	1.3
51-75%	14	1.0
76-99%	17	1.2
100%	17	1.2
Total	1481	100.0

Table 5-14. Thermal Alteration Frequency for Debitage from 8MR123.

Thermal Alteration	Count	Percent
Yes	724	48.9
No	640	43.2
Possible	4	0.3
Indeterminate	113	7.6
Total	1481	100.0

Table 5-15. Frequency of Patination on Debitage from 8MR123.

Patination	Count	Percent
Yes	1224	82.7
No	255	17.2
Indeterminate	2	0.1
Total	1481	100.0

the environment into which these materials were deposited is responsible for the degree of patination witnessed. Furthermore, some specimens are so heavily patinated that is entirely possible, if not likely, that some debitage dates to the Early Archaic or possibly Paleoindian periods although this is difficult to prove in the absence of temporally diagnostic tools, none of which were found during work at this site. However, diagnostic Early Archaic and Paleoindian points have been recovered from Silver Glen in the past (Endonino 1996).

Flake size is a relatively good indicator of the reduction activities occurring at a site. Typically, smaller flakes indicate later stage reduction although it must be noted that even the earliest stages of reduction also produce small flakes. However, small flakes in the absence of larger ones may be safely interpreted as being indicative of late-stage tool production and maintenance. Flakes were size-graded by placing them on graph paper marked in 0.5 cm increments. Flake size at Silver Glen ranges from 0.5 cm to 7.5 cm (Figure 5-7). Overwhelmingly, flakes measure less than 3.0 cm with over 95% of the assemblage falling between 0.5 cm and 2.5 cm. Most of the flakes fall into the 1.0–2.0

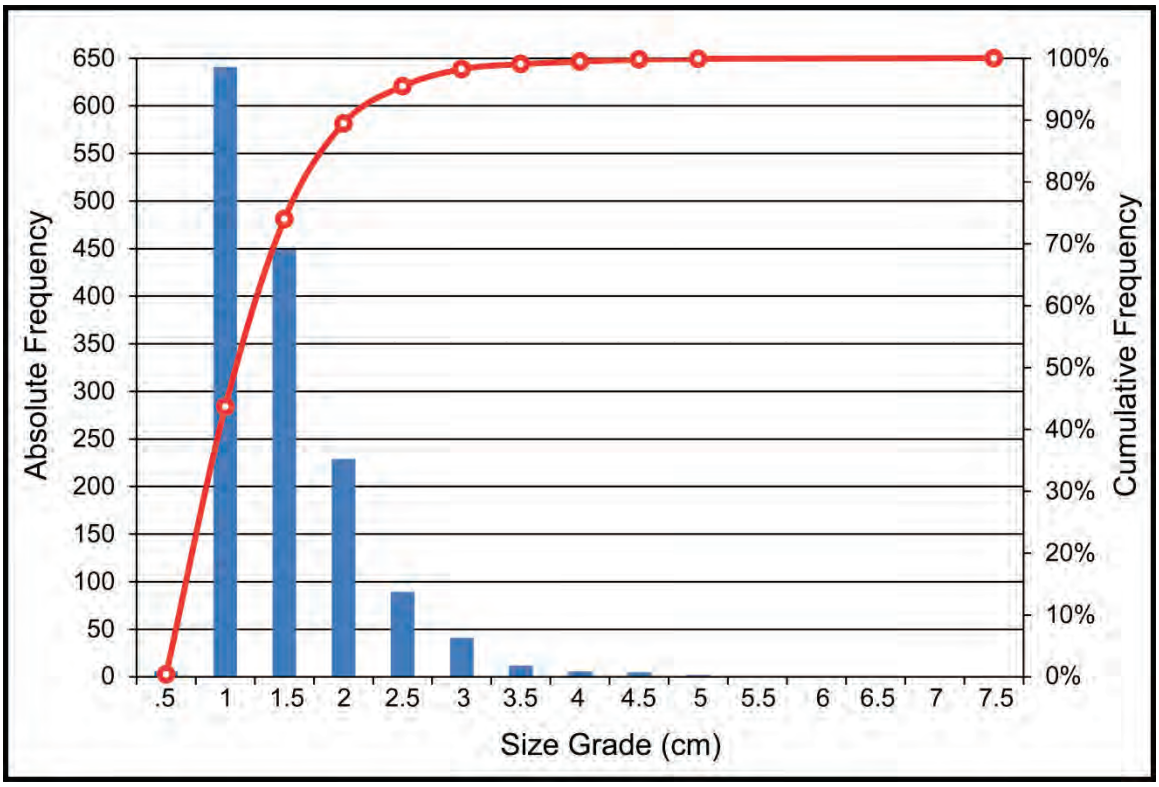

Figure 5-7. Absolute and relative cumulative frequencies of debitage by size grade.

cm size categories. Flake frequency decreases dramatically in size classes larger than 1.5 cm. Larger flake sizes, those in excess of 2.5 cm, possibly represent the reduction of larger preforms at 8MR123. They form only a small portion of the assemblage, a total of 4.5% of all waste flakes. The largest size grade present is an anomaly with only a single flake to represent, accounting for less than 0.1% of the assemblage. On the whole, flake size data support the occurrence of late-stage lithic reduction activities and is evidenced by the high proportion of small waste flakes and the lower frequencies of larger sized flakes.

Three lithic raw material types were observed among the waste flakes from 8MR123 (Table 5-2). Chert is by far the primary raw material type used for tool production and constitutes more than 88% of the assemblage. Following a distant second is silicified coral at over 11%. The last raw material type has been identified as rhyolite and ultimately has its origins in the Appalachian Mountains. However, this specimen was recovered from a context that appears disturbed and possibly was introduced as road fill. It is worth noting that non-artifact lithics identified as road fill from Silver Glen Springs is crushed chert and limestone from sources derived from the Ocala Limestone Formation and if the rhyolite flake recovered from Silver Glen was introduced as road fill it is singular in its occurrence at this location. The prevalence of chert as the lithic raw material used at 8MR123 is at least in part a function of the site's proximity to significant sources of this material in the Gainesville, Ocala, and Santa Fe quarry clusters of north-

central Florida. Silicified coral also occurs as residua within these quarry clusters but is particularly abundant farther south.

A source determination for the debitage from Silver Glen Springs has demonstrated that there are seven distinct quarry clusters represented in this assemblage (Table 5-2). Two quarry clusters contributed the majority of the lithic materials used in tool production at 8MR123: Ocala and Santa Fe quarry cluster chert and these sources together account for over 77% of the waste flakes. Two other source areas also contributed a notable amount of lithic material to this assemblage. Gainesville Quarry cluster chert accounts for just over 4% of the lithic material while the Upper Withlacoochee River Quarry Cluster (including the Green Swamp sub-area) contributes 2.5%. The Brooksville, Hillsborough River, and Peace River quarry clusters each contributed 0.3% or less of the lithic material. Varying amounts of lithic material could be attributed only to the parent limestone formation and not to a specific quarry cluster and together account for a total of 3.2%. Less than 1% of the chert waste flakes could not be attributed to either a parent limestone formation or a specific quarry cluster and were simply classified as indeterminate chert, typically owing to their very small size. Silicified coral is not attributable to a specific quarry cluster, although most frequently this material is associated with Suwannee and Tampa limestone formations. The most prolific source of silicified coral in peninsular Florida is the Upper Withlacoochee River Quarry cluster around the area of Wesley Chapel in Pasco County (Upchurch et al. 1982). The Suwannee and Santa Fe rivers are also sources of this material and it is also sometimes found as residua in association with the Ocala Limestone in the Gainesville, Ocala, and Lake Panasoffkee quarry clusters (Endonino 2008). Silicified coral from Silver Glen Springs may well have originated from any one of these sources. One type of coral, frequently called “pinhead” coral by flintknappers most frequently occurs in the Upper Withlacoochee Quarry Cluster. Thirteen flakes of this material were observed in this assemblage.

Ground Stone Abraders

Two water-worn sandstone objects show modification from use as abraders. The most formal example is FS 252.2 (Figure 5-8). This object has two, approximately 1-cm wide, grooves oriented parallel and sub-parallel to its axis. The surface of this area of the tool is lighter in color than the rest of the object, likely the product of the original cortex being worn off during the production and use of the tool. Another abrader example (FS 288.1) has an area of differential patination, but no groove is evident. Objects like these could have served as hones or abraders for bone tool manufacturing.

POTTERY

Ancient pottery was the second-most frequent artifact class encountered during testing (Table 5-1). Unfortunately, most sherds were too small or eroded for characterization beyond temper and surface treatment. With a few exceptions, all sherds were of types associated with traditions along the St. Johns River.

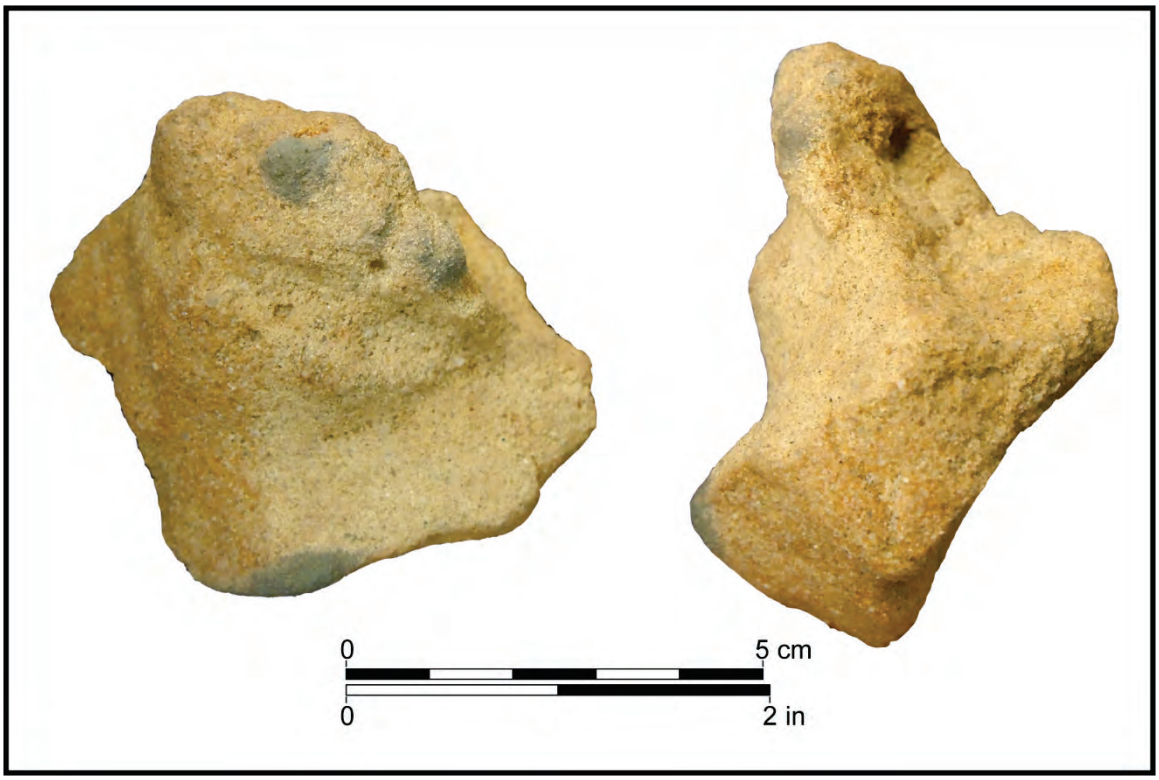

Figure 5-8. Two views of a sandstone abrader (FS 252.2) recovered from 8MR123.

The Late Archaic Orange series assemblage, typified by fiber temper, is composed of 865 sherds (Table 5-16). The assemblage is dominated by plain sherds lacking surface treatment. Most sherds of this type (n = 727) were classified as crumb sherds (less than 0.5 inch in minimum dimension). The dominance of crumb sherds is not unexpected, as fiber-tempered pottery tends to fragment easily as a consequence of post-depositional processes and excavation. Moreover, it is possible that some crumb sherds were derived from incised wares. Plain body sherds were next most abundant (n = 115), only 10 rim sherds were recovered (Figure 5-9). In general, the plain sherds are relatively thin-walled. Orange Incised body (n = 12) and rim (n = 1) sherds were the second most abundant fiber-tempered ware recovered. Surface treatments of these sherds ranges from thin, sub-parallel incisions to wide and deep incisions that intersect (Figure 5-9). Although heavily eroded, at least one of the sherds (FS 284.1) is punctuated and incised, typical of the Tick Island Incised variety. No soot was noted on any Orange sherds. In general, this assemblage fits comfortably within the range of variation noted on the south side of the run, particularly in the vicinity of Locus B, where excavations have yielded a dense Orange pottery assemblage predominantly in pits (Gilmore 2011). Age determinations at Locus B suggest a sequence of Orange Plain followed by the addition of Tick Island Incised after ca. 4400 cal BP. Missing from the present 8MR123 assemblage are the earlier, and technologically distinct, Orange Incised wares that date as early as 4800 cal BP. However, examples of this earlier variety are present in 8MR123 collections housed at the Florida Museum of Natural History.

Table 5-16. Pottery Types Recovered from 8MR123.

Type	Portion	Count	Weight (g)
Orange Incised	Body	11	50.5
	Rim	1	3.4
Tick Island Incised	Body	1	5.6
Orange Plain	Body	115	396.4
	Crumb	727	240.2
	Rim	10	47.2
St. Johns Plain	Body	73	224.0
	Crumb	41	23.2
	Rim	1	1.0
Sand Tempered Plain	Body	3	8.1
	Crumb	3	4.7
St. Johns Check Stamped	Body	10	213.3
Unknown Type	Body	18	50.3

The remainder of the pottery assemblage is composed of post-Archaic varieties. The second most abundant pottery type was populated with St. Johns Plain sherds, which could date to either the St. Johns I or II periods. This assemblage includes body sherds (n = 115), a rim sherd, and crumb sherds (n = 41). The St. Johns II period was evidenced by only 10 St. Johns Check Stamped sherds. Most were quite small, although one large body sherd was recovered from a disturbed context (Figure 5-10). Another six sherds were classified as Sand Tempered Plain, which could date to any time after the Archaic. Finally, 18 small sherds could not be classified to a known type. These plain sherds have a relatively fine paste with large mineral inclusions. The clasts may be limestone, but we could not determine that in the laboratory. If they are limestone, then these sherds are likely Pasco Plain, as defined by Goggin (1952:110). Sherds of this type have been identified at the nearby Spaulding's Lower Store-Stokes Landing. The precise chronological position of this type remains poorly understood, but is likely coeval with the St. Johns I and II components.

BONE

Seven modified bone specimens and one shark tooth were recovered from proveniences processed through .25-inch screen (Figure 5-11, Table 5-17). Four of the seven pieces are from mounded deposits along the mining escarpment. Artifact classes include bone pins, bone awls, a bone splinter, and one bipoint. Most, if not all, of these specimens were manufactured from deer bones, and metapodials appear to be the element of choice. Length and width measurements were taken on all of the pieces, regardless of condition.

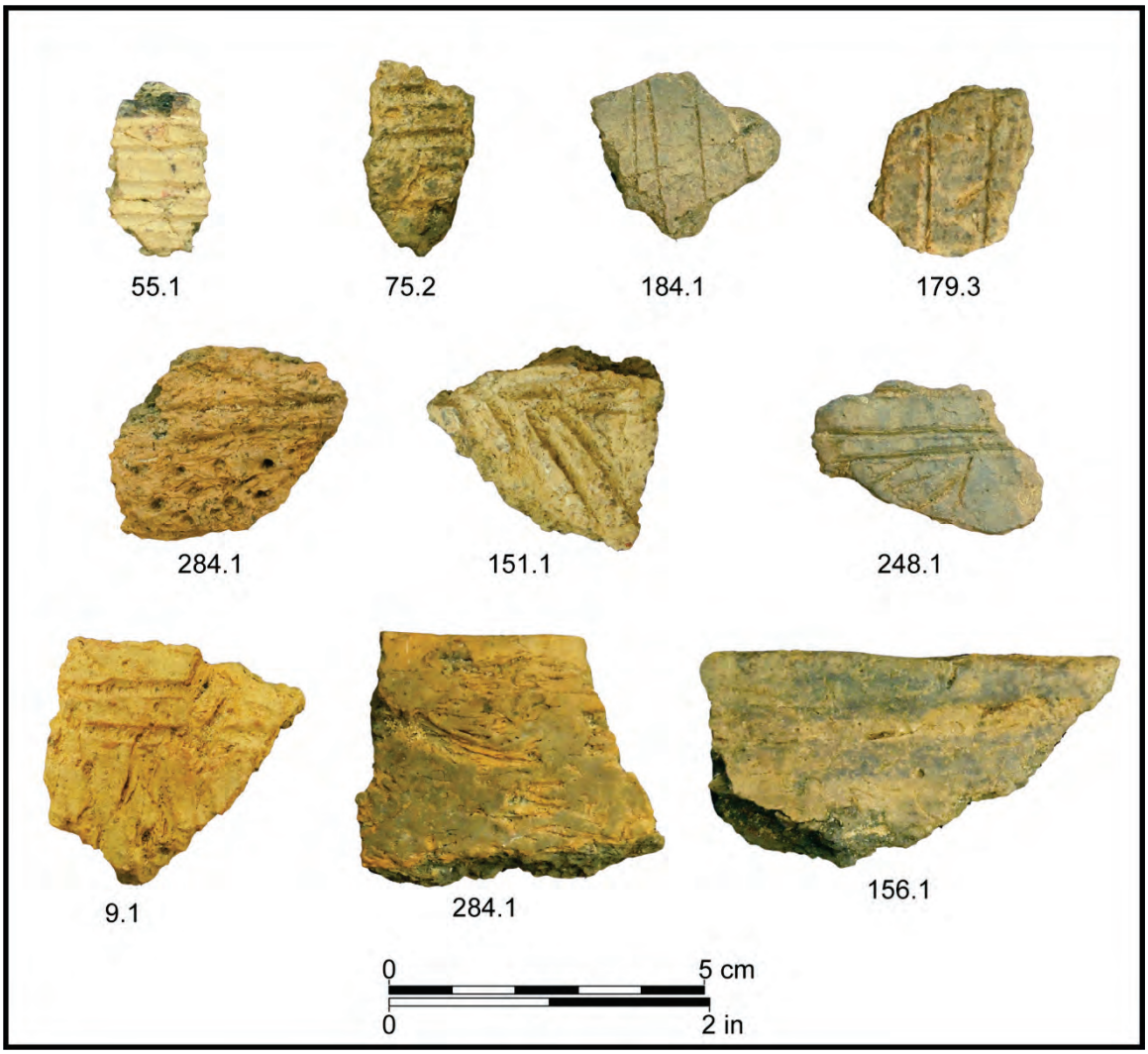

Figure 5-9. Select Orange series sherds recovered during testing at site 8MR123: Incised (9.1, 55.1, 75.2, 151.1, 179.3, 184.1, 248.1), Plain (284.1, 156.1), and Tick Island Incised (284.1).

Two bone pin medial fragments were recovered, one each from STP L-24 (FS 118.2) and TU2 (FS 223.3). Following Sassaman et al. (2011b: 57), pins retain little to none of the cortical surface, are highly polished, and usually circular in cross-section. These fragments are not decorated, but could represent areas of zoning within an incised pin. Test Unit 2 contained three awl fragments. A medial fragment from the profile cut is flattened on one side, producing a semi-circular cross-section (FS 223.3). The piece is finished, with some signs of polish, which probably covered the entire surface at one point. Another awl fragment (Level D, FS 229.1) retains the morphology of the medullary cavity, resulting in an irregular cross-section. It was probably polished along its entire surface, but appears weathered, and shows evidence of rodent gnawing. Level C contained the end and partial shaft of an awl (FS 225.2) similar to one described by Wheeler and McGee (1994: 353) from Groves' Orange Midden. The piece is "waisted,"

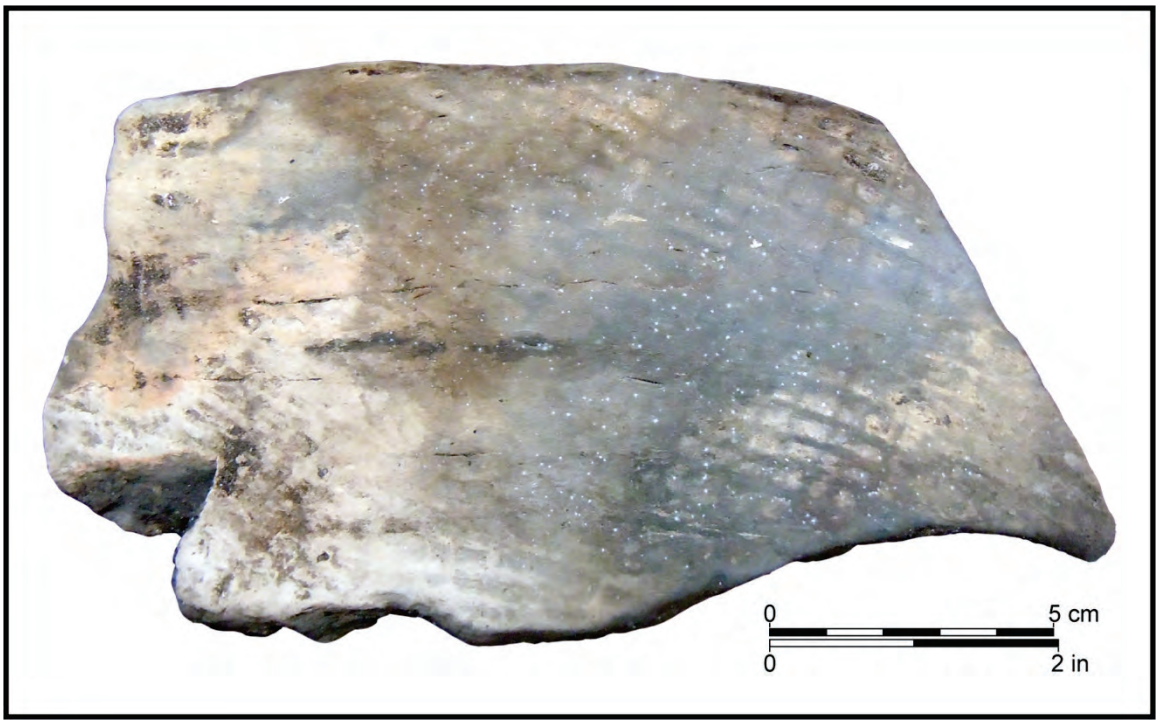

Figure 5-10. St. Johns Check Stamped sherd (FS 120.1) recovered from STP L-26.

Figure 5-11. Select modified bone (FS 105.3, 223.2, 229.1) and a shark tooth (181.4) recovered from 8MR123.

Table 5-17. Attributes of Modified Bone Recovered from 8MR123.

FS	Type	Condition	Length (mm)	Width (mm)	Weight (g)
105.3	Bipoint	Distal	84.4	8.9	5.3
118.2	Pin	Medial	16.8	6.3	0.8
197.2	Splinter	Proximal	36.9	10.0	3.0
223.3	Pin	Medial	20.0	5.2	0.7
223.3	Awl	Medial	25.9	5.6	0.6
225.2	Awl	Medial	44.4	8.2	2.1
229.1	Awl	Distal	35.3	7.3	1.7

with a flattened shaft whose cross-section tapers into an ellipse moving towards the other end. One splinter fragment was identified in TU1 (FS 197.2). The specimen is broken, but the working end could have been pointed or gouge-like (see Wheeler and McGee 1994: 356). The shaft is unfinished, retaining most of the original fracture planes. Some shaping is present, and the smooth outer surface bears evidence of polishing. The bone tool from STP L-12 (FS 105.3) closely resembles one of the types listed in Wheeler et al. (2000: 138), designated a "bipoint." Only one of the points is intact, as the other end was snapped off. The shaft's cross-section is sub-rectangular due to retention of the medullary cavity on the split side of the tool. It is polished along its entire surface and consists of three articulating pieces, all old breaks.

Shark teeth are routinely found in Mt. Taylor deposits, and many of them display wear patterns that suggest their use as cutting and drilling implements (Wheeler and McGee 1994:354). One tiger shark tooth (*Galeocerdo curvier*) was recovered from STP O-1 (FS 181.4, Figure 5-11). This example is fragmented and highly degraded, erasing any signs of modification that may have been present. It does not appear to have been perforated either.

MARINE SHELL

Given the quantities of marine shell recovered by collectors and FSU's investigations, comparably few marine shell fragments and objects were recovered during the LSA's investigations. One piece excavated from Stratum IV in TU2 (FS 224.1, Figure 5-12) was clearly modified, and is an apex fragment of *Busycon contrarium*. The columella was removed, as was a portion of the outer whorl. The margin where the whorl was removed appears to have been ground down. Based on the morphology of the fragment, and the fact that it is from a left opening whelk, it is likely that this fragment is a portion of a vessel.

HISTORIC/MODERN OBJECTS

During the course of excavation we recovered 88 objects dating to the past century or so of inhabitation within the SGS (Table 5-18). A wide range of activities, most no doubt relating to the development of the watershed into a visitor destination, are in evidence here. Several items related to housing and construction, including an asphalt

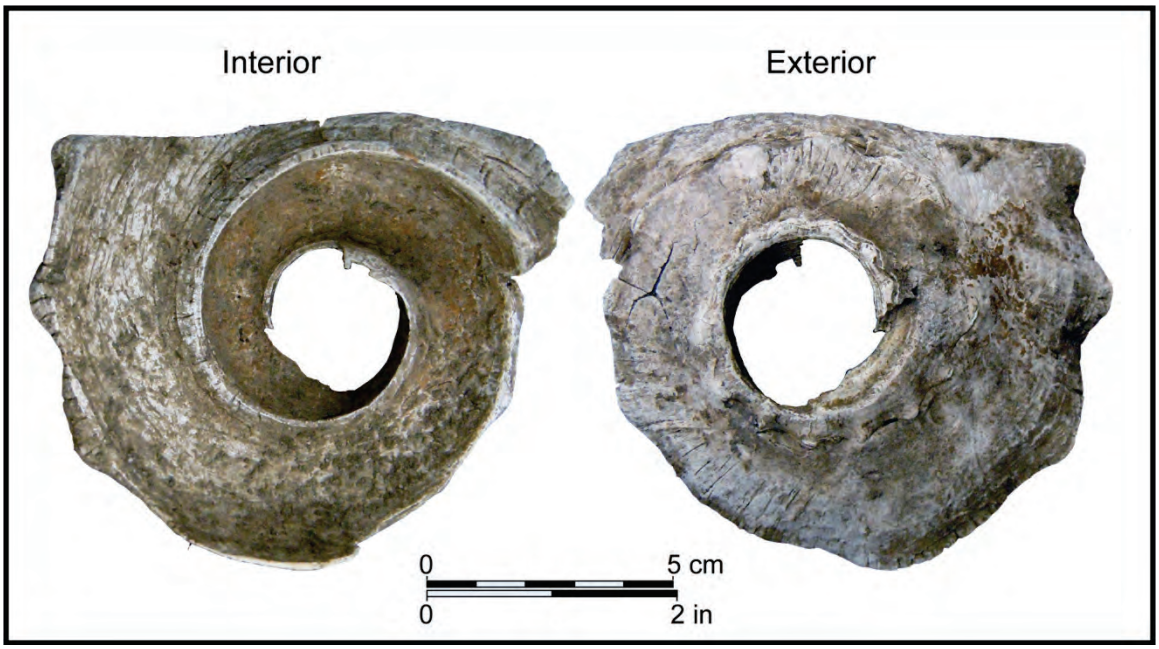

Figure 5-12. Two views of a probable *Busycon contrarium* vessel fragment (FS 224.1) recovered from Stratum IV, Test Unit 2, 8MR123.

Table 5-18. Historic and Modern Material Recovered from 8MR123.

Material	Count	Weight (g)
.22 cal rimfire cartridge	1	0.5
Aluminum pull tab	6	3.4
Asphalt shingle	1	62.9
Brick	3	50.7
Button	1	4.9
Can opener	1	97.5
Coin (penny)	2	6.1
Concrete	1	4.3
Cut nails	3	30.9
Fence staples	5	30.5
Glass fragment	39	59.7
Glass marble	1	5.7
Metal fragment	17	51.0
Plaster	1	1.1
Plastic	3	1.2
Spark plug	1	58.6
Whiteware sherds	2	13.7

shingle (n = 1), bricks (n = 3), concrete (n = 1) and plaster (n = 1) fragments, nails (n = 3), and fence post staples (n = 5). The remainder of the assemblage is typical of picnicking and recreation. Clear or brown glass fragments (n = 38), all of which are likely beverage container fragments, are pervasive. These likely date to the last fifty years. One additional amethyst glass fragment could date to the early 20th century. Similarly, two Whiteware sherds could date to the early 20th century. Metal beverage containers were well represented by aluminum pull tabs (n = 6). A very eroded metal can opener also provides evidence for the consumption of canned goods. Several objects provide evidence for other recreational activities, including a .22 rimfire cartridge, a glass marble, a metal button backing, and a sparkplug. Finally, two US pennies (dated to 1972 and 1977) were recovered during testing.

CONCLUSIONS

A consideration of the material culture recovered during testing indicates that the SGS experienced repeated, and at times intensive, habitation dating back to the Late Pleistocene. No hafted bifaces diagnostic of the Late Paleoindian or Early Archaic period were encountered in this study, but they are present in other collections. However, several unifacial end- and sidescrapers typical of this era were found. There is a significant increase in Mount Taylor period diagnostics, most notably Florida Archaic Stemmed hafted bifaces and microlithic tools. An equally dense Orange period occupation is suggested by Orange Plain and Incised wares. Significantly, we did not encounter any fiber-tempered sherds consistent with the earlier Orange Incised variety that is so prevalent in shell mound deposits at the mouth of Silver Glen Run (8LA1-East). This may be a sampling issue, as the majority of Orange period shell deposits that we intercepted at 8MR123 were underwater. Indeed, much of this component around the spring was likely removed during shell mining operations. Woodland and late-period occupation was less well represented in the excavated assemblage. Like the Orange Incised pottery, the low frequency of post-Archaic pottery may be due in part to preservation issues. Moreover, those late period sherds that we did encounter tended to be clustered in the western aspect of the recreational area, where a small portion of our reconnaissance efforts were expended.

Determination of lithic raw material provenance hints at activities occurring far away from the SGS, and can inform us about 8MR123's position within the larger social landscape As noted above, the 8MR123 assemblage was dominated by Ocala and Santa Fe quarry cherts. This is not necessarily surprising, given the relative proximity of these sources to the SGS (Figure 5-13). However, a variety of other sources were identified amongst the tools and debitage, including the Gainesville, Upper Withlacoochee River, Brooksville, Hillsborough River, and Peace River quarries. The inhabitants of the SGS were apparently well connected to other regions of Florida, near and far away. Due to the testing methods used at 8MR123 it is impossible to know what time period the majority of the debitage and tools date to. Given the overall abundance of Mount Taylor-era hafted bifaces, however, it seems likely that much of the assemblage dates to this era. There are two other Mount Taylor period assemblages to which the SGS can be compared, Lake Monroe Outlet Midden and Thornhill Lake (Figure 5-13). Like the SGS,

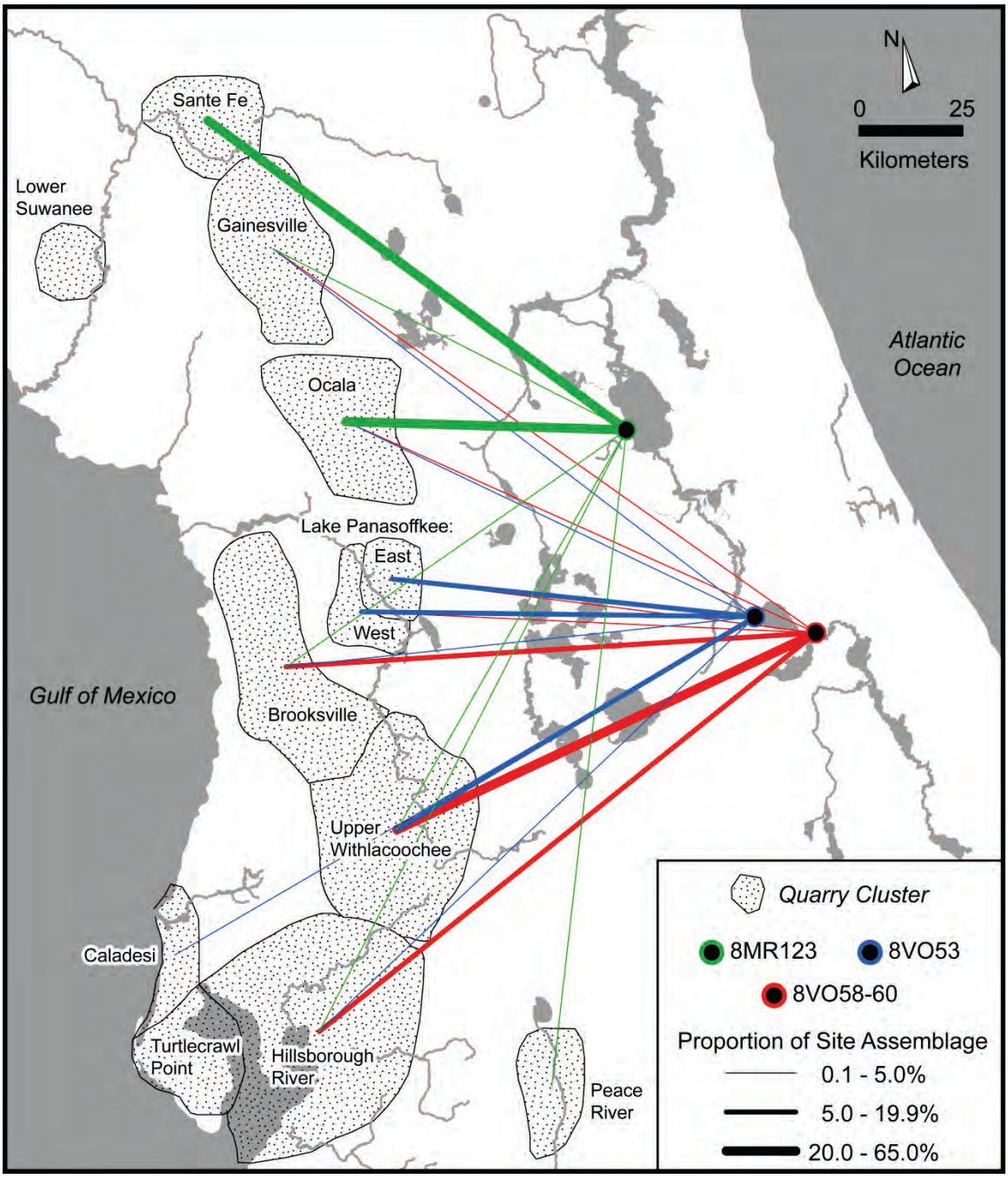

Figure 5-13. Comparison of lithic source exploitation for Silver Glen Springs (8MR123, all tools), Lake Monroe Outlet Midden (8VO53, Thornhill Lake phase), and Thornhill Lake (8VO58-60, Mount Taylor period) (Endonino 2007, 2010). Line thickness varies by a quarry's proportion within each site assemblage.

these assemblages are dominated by toolstone that is derived from the most proximate sources. However, flintknappers at both sites also acquired either finished tools or raw material from a number of quarries to the north and south, approximating the lithic

catchment area of the SGS. Interestingly, the Gainesville quarry is underutilized in all three cases. There is abundant evidence for Middle Archaic habitation around the Gainesville quarry area, and so there may have been social circumstances preventing the dissemination of material out of this region. Given the lack of chronological specificity across this sample, it is impossible to say exactly how practices within the SGS or Lake Monroe Outlet Midden and Thornhill Lake may have articulated. At the same time, the patterns highlighted here demonstrate that the communities involved had knowledge of places and persons much farther afield. Any consideration of the significance of practices within the SGS must take into account these many horizons of experience beyond the watershed.

Finally, the diversity of chipped stone and other material classes indicate that an array of activities were occurring within the SGS. The debitage analysis revealed that most of the lithic reduction occurring onsite was late-stage production and maintenance of stone tools. This corresponds well with the biface assemblage, which was dominated by late-stage examples that broke during production or use. The abundance of hafted biface stems also suggests that lithic toolkits were being replenished after they had broken in the haft. Early stage bifaces (typified by large shaping flakes, cortex, and overall thickness) were absent from the assemblage, as were large cores. Indeed, few tools showed evidence for early stage production failures. The relatively large number and diversity of non-bifacial tools (e.g., modified flakes, unifaces, and microliths) indicate that numerous practices were engaged in, including organic tool production, food processing, and possibly craft production (in the form of shell beads). Collectively these suggest that activities at 8MR123 extended well beyond resource extraction.

CHAPTER 6
ZOOARCHAEOLOGICAL ASSEMBLAGE

Meggan E. Blessing

This chapter reports the methods and results of zooarchaeological assemblages from selected bulk samples secured from 8MR123. Samples were obtained from the shell mining escarpment (TU2), feature fill, and bucket augers. These samples were chosen to examine changes in depositional practices across time and space, and compare saturated and terrestrial bone preservation. The results will be placed in a regional context by considering other spring and lake-side zooarchaeological assemblages.

METHODS

The zooarchaeological assemblage from Silver Glen Springs was recovered from a total of nine bulk samples that crosscut a number of spatial and temporal contexts. The materials within these samples were fractionated through .25-in and .125-in screens. All materials less than the .125-in fraction were bagged for future analysis. The samples vary volumetrically by recovery (column, bucket auger, feature fill), but are comparable within a particular recovery method (Table 6-1).

Analysis of vertebrate zooarchaeological material followed the guidelines of Reitz and Wing (1999). Samples were sorted into six classes, Chondricthyes, Actinopterygii, Amphibia, Reptilia, Aves, and Mammalia. Unidentifiable fragments were assigned to the order Vertebrata. Identifications to lower taxonomic levels were facilitated by the comparative collection in the Environmental Archaeology Laboratory at the Florida Museum of Natural History. Taxon, element, portion, side, modification, presence of burning, fusion, count, and weight were recorded for all identified material. Individual elements were taken to the lowest taxonomic level possible, but the degree to which this was achievable varied across the different classes. Identification depended on several factors including the degree of completeness of individual elements, the number of genera and species within a particular family, and their representation in the museum's comparative collection, ideally encompassing a range of sizes.

In tabulating the number of individual specimens (NISP), bones that cross-mended were counted as a single element. The minimum number of individuals (MNI) was quantified independently for each sample, as the potential for counting the same individual twice was not an issue. Paired elements were the basis for calculating the minimum number of individuals (MNI), but size and condition were factors as well. Multiple comparative specimens of the same species, exhibiting a range of sizes, were used to attain as accurate a number of individuals as possible. In several instances individuals were tabulated for taxonomic levels higher than genus or species. One example includes the freshwater catfishes, which are represented by a number of conspecifics in the middle St. Johns River valley. Able to differentiate between the two genera only on a handful of elements, I kept all others at Ictaluridae. Despite my inability

Table 6-1. Density of Vertebrate and Invertebrate Fauna by Provenience, Silver Glen Springs (8MR123).

Provenience	Strat./Feat./Depth	Volume (L)	Bone/L	Shell/L
TU 2	Feat. 1-East Half	9.0	59.6	63.0
	Str. III-B	24.5	84.3	198.0
	Str. IV-A	25.0	50.4	11.9
BA 1-12	80-100 cm	1.3	191.2	0.0
BA 7-3[†]	200-210 cm	0.8	583.8	67.5
BA 8-5	170-190 cm	1.0	106.0	319.0
BA 8-6[†]	205-215 cm	0.2	1250.0	120.0
BA 4-1[†]	240-260 cm	0.8	135.0	327.5
TU 5	Feat. 2-Base	18.5	0.8	124.2

[†]Based on volume smaller than 1 liter

to verify species at this level, I could discern different individuals (mainly through size differences), accounting for elements that may have paired with lower taxa. A similar logic was used for the sunfish family, and particularly bream (*Lepomis sp*.). Fragmentary bones that could be assigned to a particular class (e.g., Aves, Mammalia), but lacked the landmarks necessary for identification to lower taxonomic levels were separated into small, medium, and large categories. Diversity and equitability were calculated using the Shannon-Weaver (1949) and Sheldon (1969) formulae, respectively.

Invertebrates were quantified separately from the vertebrate species. When dealing with shell-rich samples composed primarily of whole shells, invertebrates tend to greatly exceed contributions made by vertebrate species across several quantitative measures. In so doing, they effectively mask the importance of these different classes in Mount Taylor and Orange Period foodways. Additionally, we cannot confidently assume that all the freshwater invertebrates deposited at Silver Glen Springs, or elsewhere, were the direct result of consumption, both within and across species. For example, it is unknown whether the typically less frequent but ever-present species such as rasp Elimia and mesa rams-horns are the result of incidental or targeted collection. Similar concerns surround the three main species of shellfish (bivalves, mystery snails, apple snails). In these cases there is no guarantee that shellfish were always gathered live for consumption (Blessing 2010), despite being specifically targeted for collection.

Only non-repeating elements were counted (whole, apex, columella/umbilicus, aperture), so weight is the only measure available for shell fragments. Burning was not quantified for this category either. When banded mystery and apple snail shells are highly fragmented, they are often difficult to distinguish from one another, particularly if a sample is composed of thin-shelled mystery snails. At the same time, their shell morphologies are distinct enough to discriminate against other aquatic species of gastropod. Thus, a category labeled "*Viviparus* and *Pomacea*" was created. Again, fragments were weighed in lieu of counting.

RESULTS

The zooarchaeological assemblage from Silver Glens Springs is centered on species that could be readily procured from the spring run and Lake George. The Mount Taylor vertebrate assemblage contains 4696 elements, from which 39 taxa were identified, and subsequently sorted into 140 individuals (Table 6-2). Fishes are the most dominate class in terms of NISP (48.2%) and MNI (72.3%). Turtles contribute 11.3% (n = 16) of the individuals, followed by mammals (7.1%), snakes (3.5%), and birds (2.8%). The vertebrate assemblage for the Orange Period component is noticeably smaller, in part due to the limited samples. Two samples contained 108 elements, nine different taxa, and seven individuals (Table 6-3). The sample NISP is composed primarily of unidentifiable vertebrate fragments (45.9%). Fishes account for the majority of the individuals identified (75%), while the remaining 25% is evenly divided between one turtle, and one mammal.

Table 6-4 delineates the invertebrate assemblages by component for the five most commonly represented species of freshwater molluscs. The sample NISP for the Mount Taylor component is 6044, from which 2712 individuals were identified. Freshwater bivalves make up the majority of the shellfish individuals (46.2%), followed by banded mystery snails (33.0%), apple snails (14.9%), and nearly equal amounts of rasp Elimia and mesa rams-horn. The Orange Period invertebrate assemblage contains 2560 pieces of shellfish, with 2255 individuals. Banded mystery snails comprise 86.3% (n = 1945) of the sample MNI. Bivalves account for 8.3% (n = 188), while apple snail, rasp Elimia, and mesa rams-horns are divided rather evenly among the remaining individuals. An additional two pieces of marine bivalve, five Physid snails, eight unidentifiable small gastropods and 103 terrestrial snails were also analyzed, but not included in tabulation of MNI.

The land snails were confined to terrestrial samples, save for one Polygyrid in Bucket Auger 8-5. Generally, these snails can be instrumental in providing paleoenvironmental data, in addition to deciphering site formation processes (e.g., Peacock et al. 2005). Five different families are represented in the Str. III-B, Str. IV-A, and Feature 2 deposits, and include Helicinidae, Polygyridae, Pupillidae, Spiraxidae, and Zonitidae. Their numbers for any given sample are small however, and never comprise more than 2% of the NISP. As such, we hesitate to draw any concrete conclusions regarding their presence within the sample matrices.

Mining Escarpment -TU 2

Feature 1. The NISP of this early Mount Taylor phase deposit is nearly evenly divided between vertebrates (48.5%) and shellfish (51.5%). Only the eastern half of the shallow basin was analyzed. Despite the relatively small volume of the sample (Table 6-1), it has a moderate vertebrate diversity index (H´ = 2.46) (Table 6-5), as thirteen different species were included in the deposit's matrix. The vertebrate component of the feature is dominated by fish, which account for 12 of the feature's 20 individuals and

Table 6-2. Absolute and Relative Frequencies of Vertebrate Fauna for Mount Taylor Component, Silver Glen Springs (8MR123).

Scientific Name	Common Name	Number of Individual Specimens (NISP)		Minimum Number of Individuals (MNI)	
		n	%	n	%
Vertebrata	UID Vertebrate	2148	45.7	0	0.0
Dasyatus Sabina	Atlantic Stingray	1	0.0	1	0.7
Pogonias cromis	Black Drum	1	0.0	1	0.7
Scianops ocellatus	Red Drum	3	0.1	1	0.7
Actinopterygii	Ray-Finned Fish	1754	37.4	0	0.0
Lepisosteus sp.	Gar	12	0.3	7	5.0
Amia calva	Bowfin	118	2.5	13	9.2
Anguilla rostrata	American Eel	12	0.3	4	2.8
Clupeidae	Shad/Herring	2	0.0	2	1.4
Esox sp.	Pickerel	9	0.2	5	3.5
Cypriniformes	Minnow	4	0.1	0	0.0
Notemigonus crysoleucas	Golden Shiner	16	0.3	9	6.4
Erimyzon sucetta	Lake Chubsucker	25	0.5	10	7.1
Ictaluridae	Catfish	9	0.2	7	5.0
Ameiurus sp.	Bullhead	5	0.1	4	2.8
Fundulidae	Topminnow	1	0.0	1	0.7
Centrarchidae	Sunfish	192	4.1	4	2.8
Micropterus salmoides	Large-Mouth Bass	9	0.2	5	3.5
Lepomis sp.	Bream	30	0.6	12	8.5
Lepomis microlophus	Shellcracker	58	1.2	13	9.2
Mugil spp.	Mullet	4	0.1	3	2.1
Caudata	Salamander	2	0.0	2	1.4
Anura	Frog	1	0.0	1	0.7
Reptilia	Reptile	3	0.1	1	0.7
Testudines	Turtle	168	3.6	10	7.1
Kinosternidae	Mud/Musk Turtle	3	0.1	1	0.7
Kinosternon sp.	Mud Turtle	1	0.0	1	0.7
Sternotherus sp.	Musk Turtle	1	0.0	1	0.7
Emydidae	Pond Turtle	11	0.2	1	0.7
Apalone ferox	Soft-Shelled Turtle	2	0.0	2	1.4
Serpentes	Snake	25	0.5	4	2.8
Colubridae	Colubrid Snake	1	0.0	1	0.7
Aves	Bird	2	0.0	2	1.4
Anatidae	Swan, Duck, Geese	3	0.1	2	1.4
Mammalia	Mammal	28	0.6	0	0.0
Mammalia (Sm.-Med.)	Sm.-Med. Mammal	1	0.0	1	0.7
Mammalia (Med.-Large)	Med.-Large Mammal	5	0.1	3	2.1
Mammalia (Large)	Large Mammal	24	0.5	4	2.8
Rodentia	Rodent	1	0.0	1	0.7
Sigmodon hispidus	Hispid Rat	1	0.0	1	0.7
Total		4696	100.0	141	100.0

Table 6-3. Absolute and Relative Frequencies of Vertebrate Fauna for Orange Component, Silver Glen Springs (8MR123).

Scientific Name	Common Name	Number of Individual Specimens (NISP)		Minimum Number of Individuals (MNI)	
		n	%	n	%
Vertebrata	UID Vertebrate	50	45.9	0	0.0
Actinopterygii	Ray-Finned Fish	22	20.2	0	0.0
Lepisosteus sp.	Gar	15	13.8	1	12.5
Esox sp.	Pickerel	1	0.9	1	12.5
Erimyzon sucetta	Lake Chubsucker	1	0.9	1	12.5
Micropterus salmoides	Large-Mouth Bass	1	0.9	1	12.5
Lepomis microlophus	Shellcracker	4	3.7	2	25.0
Testudines	Turtle	14	12.8	1	12.5
Mammalia	Mammal	1	0.9	1	12.5
Total		109	100.0	7	100.0

Table 6-4. Absolute and Relative Frequencies of Invertebrate Fauna by Component, Silver Glen Springs (8MR123).

Scientific Name	Common Name	Number of Individual Specimens (NISP)		Minimum Number of Individuals (MNI)	
		n	%	n	%
Mount Taylor					
Unionidae	Freshwater Bivalve	4215	69.7	1253	46.2
Planorbella scalaris	Mesa Rams-Horn	82	1.4	82	3.0
Elimia floridensis	Rasp Elimia	79	1.3	79	2.9
Viviparus georgianus	Banded Mystery Snail	970	16.0	894	33.0
Pomacea paludosa	Florida Apple Snail	698	11.5	404	14.9
Total		6044	100.0	2712	100.0
Orange Period					
Unionidae	Freshwater Bivalve	409	16.0	188	8.3
Planorbella scalaris	Mesa Rams-Horn	27	1.1	27	1.2
Elimia floridensis	Rasp Elimia	52	2.0	52	2.3
Viviparus georgianus	Banded Mystery Snail	2025	79.1	1945	86.3
Pomacea paludosa	Florida Apple Snail	47	1.8	43	1.9
Total		2560	100.0	2255	100.0

encompass a relatively wide range of species (Table 6-6). The remaining individuals are represented by turtles, a few birds, and one snake and large mammal. Only 22.2% (n = 119) of the vertebrate fauna shows signs of thermal alteration, with the majority of this confined to the fishes. Moderate amounts of concretion were noted adhering to bone surfaces. Two fragmented bone tools were also identified in this sample.

Table 6-5. Relative Frequencies of Vertebrate Fauna Species by MNI and Component, Silver Glen Springs (8MR123).

Prov.	Str./Sec./dbs	Fish	Amphibian	Reptile	Turtle	Snake	Bird	Mammal	MNI	Diversity
Early Mount Taylor										
TU2	F.1 E 1/2	60.0	0.0	0.0	20.0	5.0	10.0	5.0	20	2.46
Thornhill Lake Phase										
TU 2	III-B	81.1	0.0	0.0	5.4	2.7	5.4	5.4	37	2.90
	IV-A	73.0	8.1	0.0	8.1	2.7	0.0	8.1	37	2.85
	Total	77.0	4.1	0.0	6.8	2.7	2.7	6.8	74	3.04
BA 1-12	80-100 cm	66.7	0.0	6.7	6.7	6.7	0.0	13.3	15	2.52
BA 7-3	200-210 cm	78.9	0.0	0.0	15.8	0.0	0.0	5.3	19	2.65
BA 8-5	170-190 cm	57.1	0.0	0.0	28.6	14.3	0.0	0.0	7	1.95
BA 8-6	205-215 cm	60.0	0.0	0.0	20.0	0.0	0.0	20.0	5	1.61
Thornhill Lake Phase Total		74.2	2.5	0.8	10.0	3.3	1.7	7.5	140	3.16
Orange Period										
TU 5	F.2 Base	100.0	0.0	0.0	0.0	0.0.	0.0	0.0	1	n/a
BA 4-1	240-260 cm	71.4	0.0	0.0	14.3	0.0	0.0	14.3	7	1.95
	Total	75.0	0.0	0.0	12.5	0.0	0.0	12.5	8	1.91

Table 6-6. Relative Frequencies of Fish MNI by General Taxa, Silver Glen Springs (8MR123).

Prov.	Str./Sec./dbs	MNI	Shark	Ray	Drum	Gar	Bowfin	Eel	Shad	Pike	Shiner	Sucker	Catfish	Sunfish	Mullet
Early Mount Taylor															
TU2	Feat. 1 East 1/2	12	0.0	0.0	0.0	25.0	8.3	8.3	8.3	16.7	0.0	0.0	8.3	25.0	0.0
Thornhill Lake Phase															
TU 2	Str. III-B	30	0.0	0.0	3.3	6.7	3.3	3.3	3.3	6.7	10.0	6.7	20.0	30.0	6.7
	Str. IV-A	26	0.0	3.8	0.0	7.7	11.5	3.8	0.0	3.8	7.7	19.2	7.7	34.6	0.0
	Total	56	0.0	1.8	1.8	7.1	7.1	3.6	1.8	5.4	8.9	12.5	14.3	32.1	3.6
BA 1-12	80-100 cm	10	0.0	0.0	0.0	20.0	10.0	0.0	0.0	0.0	10.0	10.0	10.0	40.0	0.0
BA 7-3	200-210 cm	15	0.0	0.0	0.0	13.3	6.7	6.7	0.0	0.0	13.3	13.3	6.7	33.3	6.7
BA 8-5	170-190 cm	4	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	50.0	0.0
BA 8-6	205-215 cm	3	0.0	0.0	33.3	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0
	TLP Total		0.0	1.1	2.3	11.4	6.8	3.4	1.1	3.4	10.2	11.4	11.4	34.1	3.4
Orange Period															
BA 4-1	240-260 cm	5	0.0	0.0	0.0	20.0	0.0	0.0	0.0	20.0	0.0	20.0	0.0	40.0	0.0

Amongst the invertebrates, banded mystery snails comprise more than 76% (n = 354) of the feature's 465 shellfish individuals. They are followed by bivalves (12.5%), mesa rams-horns (5.8%), rasp Elimia (3.4%), and small amounts of apple snail (1.9%) (Table 6-7). Excepting apple snails and bivalves, which are prone to fragmentation, the remaining three species of shellfish are generally represented by complete individuals. Concretion is prevalent on all the species of shellfish in this sample. Based on visual observation, burning is confined to 10.5% (n = 60) of the invertebrate component, occurring mainly on bivalves (28.5%) and mystery snails (5.1%). It is also possible, however, that lower frequencies of burning are associated with the mesa rams-horns and rasp Elimia. The outer surfaces of some of these species appear to be altered, but it is not clear if this is due to thermal or chemical processes. One degraded piece of a marine bivalve fragment was noted in the sample. The degree of weathering precluded a definitive identification, but it could be a valve from a hard clam (*Mercenaria sp.*).

Stratum IV-A. The sample from Str. IV-A was recovered from a mostly shell-free brown sand. REDACTED With a radiometric assay of 4950 ± 40 (5850-5590 cal BP), Str. IV-A falls within the Thornhill Lake phase.

Despite an overall lack of shellfish within this stratigraphic unit, vertebrate fauna are well-preserved and relatively dense, accounting for more than 80% of the entire sample. Fishes encompass 73% (n = 27) of the unit's 37 individuals (Table 6-5), and 13 of the 21 species identified. Overall, the fishes are dominated by members of the sunfish family (Table 6-6). Amphibians, turtles, and mammals are represented in equal proportions, followed by one snake. The sample is diverse (H′ = 2.85), yet somewhat biased towards smaller species. Deer elements were noted in the field, but as described in Chapter 4, all large mammal fragments from the 1/4-in fraction were reinterred. A little more than 6% of the vertebrate matrix is burned. The majority of thermal alteration is confined to unidentifiable vertebrates (53.8%), followed by fishes (33.8%), turtles (10.0%) and mammals (2.5%). Very little concretion was noted on the outer surfaces of the bones in this stratum.

Banded mystery snails are the most common invertebrate species, representing 63.2% (n = 127) of the 201 shellfish individuals (Table 6-7). Bivalves are the second most numerous taxon (22.4%), followed to a lesser extent by apple snails (7.0%). Mesa rams-horns and rasp Elimia constitute the remaining 8% of the sample MNI. Burning is virtually absent, save for one bivalve fragment. Very few, if any, of the shells bear evidence of surface concretions.

Stratum III-B. Also falling within the Thornhill Lake phase, Str. III was emplaced shortly after Str. IV. The matrix analyzed here is from the middle of the

Table 6-7. Relative Frequencies of Invertebrate Fauna Species by MNI and Component, Silver Glen Springs (8MR123).

Prov.	Str./Sec./dbs	Bivalve	*P. scalaris*	*E. floridensis*	*V. georgianus*	*P. paludosa*	MNI	Diversity
Early Mount Taylor								
TU 2	F.1 E 1/2	12.5	5.8	3.4	76.3	1.9	464	0.82
Thornhill Lake Phase								
TU 2	III-B	62.7	1.6	2.2	8.6	20.4	1731	0.98
	IV-A	22.4	3.5	1.0	63.2	7.0	195	0.97
	Total	61.4	1.9	2.2	14.7	19.9	1296	1.06
BA 7-3	200-210 cm	7.7	30.8	12.8	46.2	2.6	39	1.27
BA 8-5	170-190 cm	3.4	2.6	5.3	84.2	3.4	263	0.62
BA 8-6	205-215 cm	4.3	0.0	8.7	65.2	8.7	20	0.83
Thornhill Lake Phase Total		53.2	2.4	2.8	24.0	17.6	2248	1.18
Orange Period								
TU 5	F.2 Base	8.5	0.9	1.1	86.7	1.3	2035	0.47
BA 4-1	240-260 cm	5.9	3.6	13.2	69.5	7.7	220	1.01
	Total	8.3	1.2	2.3	86.3	1.9	2255	0.55

stratum, and dates to 4730 ± 40 BP (5590-5320 cal BP). Individual specimens of freshwater shellfish account for 69.9% (n = 4790) of the layer's contents, whereas vertebrate specimens make up the remaining 30.1% (n = 2067). Even so, the density of bone per unit volume is higher in Str. III-B than Str. IV-A (Table 6-1).

As is the case for Str. IV-A, the vertebrate component of this sample is saturated with fishes (81.1%), which denotes a slight increase in the relative frequency of individuals from the underlying stratum (Table 6-5). Species of sunfish continue to be important, but changes are evident in the distribution of others when compared to Str. IV-A (Table 6-6). Turtles, birds, and mammals occur in the same frequencies, followed by trace amounts of snake. Twenty-one species and 37 individuals were identified, resulting in a relatively high diversity index (H´ = 2.90). Burning is confined to 5.3% (n = 109) of the vertebrate matrix, and is distributed across the classes in nearly the same manner as Str. IV-A. Unidentifiable vertebrates encapsulate most of the burned specimens (67.9%), followed by fishes (26.6%), turtles (3.7%), and equal amounts of snake (0.9%) and mammal (0.9%). Concretion was not observed adhering to bone surfaces.

The invertebrate component of the Str. III-B sample consists of 1813 individuals. Bivalves are the most prevalent species, representing 62.7% (n = 1137) of the shellfish MNI (Table 6-7). Several paired and closed individuals (n = 12) were recovered intact from this stratigraphic unit. Noted in Chapter 4, more paired bivalves were identified in the field, but were subsequently fragmented during excavation. Apple snails account for 20.4% of the individuals, increasing in frequency from Str. IV-A. In contrast, the proportion of banded mystery snails decreases significantly to only 8.6% of the sample. Rasp Elimia and mesa rams-horns comprise less than 4% of the MNI. The frequency of burned shellfish is 0.8% (n = 56). With the exception of one apple snail, all of the thermal alteration is confined to the freshwater bivalves. Again falling in line with Str. IV-A, few if any of these shells bore evidence of concretions. One marine shell fragment, tentatively identified to the scallop family, was also identified.

Bucket Augers

All but one of the bucket auger (BA) samples fall within the Thornhill Lake phase. BA 4-1 intercepted an Orange Period deposit. These samples encompass both shell-free and shell-bearing matrices, lending insight towards depositional practices and preservation regimes across time and space. It is important to note that the samples are small, and typically have volumes less than 1 L. Even so, the extrapolated bone and shell densities per unit volume for each of these samples indicate that the intercepted deposits tend to be bone and shell rich (Table 6-1).

Bucket Auger 1-12. This sample from Transect 1 is composed entirely of vertebrate fauna, containing 13 species represented by 15 individuals. No absolute date was obtained from this sample, but it most likely is associated with the Thornhill Lake phase (Chapter 3). For such a small sample, the diversity index is moderate (H´ = 2.52). As is the case elsewhere across the site, fishes are the most prevalent class of animals representing 66.7% (n = 10) of the MNI (Table 6-5), which is distributed across 10

species. Sunfish dominate the sample (Table 6-6). Mammals account for 13.3% (n = 2) of the MNI, while a turtle, snake, and unidentified reptile each contribute one individual. Burning is evident in 4.6% (n = 11) of the sample, occurring most frequently among the fishes. The individual bones from BA 1-12's matrix are differentially preserved. Some of the elements mimic the condition of those from the saturated deposits at Salt Springs (O'Donoughue et al. 2011), while others are bleached, suggesting that the material was not continuously saturated through time. The only other artifacts recovered from this sample are two small flakes, one made of chert and the other of silicified coral.

Bucket Auger 7-3. The faunal remains from this sample are potentially coeval with those from Str. III-B based on the radiometric assay from BA 7-5. Freshwater shellfish account for 10.4% of the matrix NISP with vertebrates composing the remaining 89.6%. Individuals were identified for only three of the vertebrate classes (n = 19), with fishes comprising the majority (78.9%). The distribution of fish species is similar to that of Str. III-B, with sunfishes being the most common (Table 6-5). Turtles are responsible for 15.3% (n = 3) of the sample MNI, while a mammal is the remaining individual. A total of 19 vertebrate species were identified in this sample, giving a diversity index of H´ = 2.65. Burning is evident on 13.5% of the bone, and confined to unidentified vertebrates (63.5%) and fishes (36.5%).

Of the 39 shellfish individuals identified in BA 7-3, 18 of them (46.2%) are banded mystery snails (Table 6-7). Notably, mesa rams-horns are the second most prevalent species, claiming 30.8% (n = 12) of the total MNI. The remaining individuals are divided amongst rasp Elimia, bivalves, and apple snails, in that order. Burning is virtually absent in this sample, save for one bivalve fragment.

Bucket Auger 8-5. The sample NISP is dominated by invertebrates (74.9%). Vertebrates account for the remaining 25.1% (n = 106), and are represented by a total of three classes. The MNI for the vertebrate component is small (n = 7), and fish account for 57.1% (n = 4) of these individuals (Table 6-5), and include a gar, a shiner, and two sunfish. Two turtles and one snake complete the sample MNI. The diversity index is relatively low (H´ = 1.95), particularly compared to the other samples. Burning is evident on 5.7% (n = 6) of the bone.

The invertebrate component of BA 8-5 is dominated by banded mystery snails, which make up 82.4% (n = 224) of the sample's 263 shellfish individuals (Table 6-7). The other 39 individuals belong to rasp Elimia (5.3%), bivalve (3.4%), apple snails (3.4%) and mesa rams-horns (2.6%). Only five of the shells are burned, and four of these are bivalves.

Bucket Auger 8-6. The sample from BA 8-6 is located approximately 10 m north of BA 8-5. Dating to 4240 ± 40 BP (4870–4620 cal BP), these deposits fall within the Thornhill Lake phase. This small sample was extracted from a mostly shell-free deposit. The NISP is nearly evenly divided between vertebrates (n = 25) and shellfish (n = 21). Only five individuals were identified in this sample, and fish account for 60% of them (n = 3) (Table 6-5). These species include a black drum, gar, and sunfish. One

turtle and a mammal represent the other two individuals. Only one piece of bone, a gar scale, was burned. Similar to BA 8-5, this sample has a low diversity index (H´ = 1.61). Bone preservation is good, mimicking that from the saturated deposits at Salt Springs. These findings further support the argument that the bones were deposited in water.

The invertebrate MNI for BA 8-6 is composed of 20 individuals. Banded mystery snails make up the majority the sample, claiming 65.2% (n = 15) of the MNI (Table 6-7). Two rasp Elimia (8.7%), two apple snails (8.7%), and one bivalve (4.3%) round out the rest of the individuals. None of the shellfish are burned.

Bucket Auger 4-1. The sample from BA 4-1 characterizes the interface between the shell-bearing deposit located east of the boil, and an underlying shell-free, organically enriched midden with abundant botanicals (see Chapter 4). With a radiocarbon assay of 3940 ± 40 (4520–4240 cal BP), the shell matrix falls squarely within the Orange Period. Invertebrates constitute 70.8% (n = 262) of the sample NISP and vertebrates 29.2% (n = 108). The vertebrate component is small, containing seven individuals, each represented by a different species. As is the case for deposits elsewhere throughout the site, fishes dominate the vertebrates comprising 71.4% (n = 5) of the MNI (Table 6-5). The two other individuals belong to a turtle and mammal. Only 4.6% (n = 5) of the sample bears evidence of burning. The condition of the bone, coupled with the abundance of preserved organics, supports the subaqueous deposition of this material.

The invertebrate MNI is composed of 220 individual shellfish, with banded mystery snails taking the lead (69.5%) (Table 6-7). Rasp Elimia is the second most numerous taxon contributing 13.3% of the sample MNI (n = 29). They are followed in similar proportions by apple snails (7.7%) and bivalves (5.9%). Eight mesa rams-horns account for the remaining 5.9% of the individuals. One fragment each of bivalve and apple snail was burned.

Right of Way- TU 5

One sample was analyzed from Feature 2, a shell-bearing pit in the right-of-way. The sample analyzed here was extracted from the base of the feature. Vertebrate fauna are virtually absent from this deposit, and contribute only 15 pieces of bone (0.6%) to the sample NISP. Six of these are fishes, while the others are unidentifiable to class. One individual, a red ear sunfish, was identified.

Banded mystery snails comprise 86.7% of the pit's 2068 shellfish individuals (Table 6-7). Bivalves are responsible for 8.5% of the sample MNI, while apple snails (1.3%), rasp Elimia (1.1%), and mesa rams-horns (0.9%) account for the remainder. Only one bivalve fragment was thermally altered.

Thirty two terrestrial snails from three different families were also recovered from this feature. These include members of Helicinidae, Polygyridae, and Zonitidae. This sample is similar in species composition to the land snails from Str. III-B and Str. IV-A. All three families contain snails that tend to co-occur in similar habitats, suggesting that

the feature was not exposed for a long period of time. This is further bolstered by the small sample size.

DISCUSSION

Overall the composition of the faunal assemblage from Silver Glen Run fits comfortably within the regional database (Table 6-8) (e.g., Blessing 2011; Quitmyer 2001; Sassaman 2003c). Deposits range from the early Mount Taylor phase through Orange periods, but the bulk of the matrices examined at 8MR123 fall within the Thornhill Lake phase. Figure 6-1 displays the diversity and equitability indices for Salt Springs, Silver Glen Springs, Blue Spring Midden B, and Lake Monroe Outlet Midden. These values, along with the diversity indices of the available shellfish samples, are given in Table 6-9. Indices were tabulated for each component represented at the four sites, and in some cases, do not take into account differences in depositional context. Diversity and equitability was recalculated for the Lake Monroe Outlet Midden fauna (see Quitmyer 2001) so that separate values could be obtained for the vertebrate and invertebrate species, and facilitate comparisons with the other three sites. The invertebrate assemblage from Salt Springs is currently unanalyzed, while the assemblage from Blue Spring Midden B awaits secondary analyses.

The early Mount Taylor and Orange samples from 8MR123 are noticeably less diverse than the assemblages of equal age from Salt Springs and Blue Spring Midden B. This disparity can most likely be attributed to sample size differences. All of the Thornhill Lake phase samples accord well with one another, yet they do fall into two

Table 6-8. Relative Frequencies of General Taxa by MNI and Component for Selected Archaic Shell-Bearing Sites in the Middle St. Johns River Valley, Florida.

Site	Component	Fish	Amphib.	Reptile	Turtle	Snake	Bird	Mammal
8MR2322	Early Mount Taylor	75.4	1.4	0.7	13.3	1.8	1.7	5.8
8MR123	Early Mount Taylor	81.1	0.0	0.0	5.4	2.7	5.4	5.4
8MR123	Thornhill Lake Phase	74.2	2.5	0.8	10.0	3.3	1.7	7.5
8VO43	Thornhill Lake Phase	69.7	2.4	0.6	14.9	3.2	2.8	6.3
8VO53	Thornhill Lake Phase	67.2	0.8	0.8	15.2	6.4	1.6	8.0
8MR123	Orange Period	75.0	0.0	0.0	12.5	0.0	0.0	12.5
8VO43	Orange Period	80.8	1.3	0.7	6.8	3.1	1.5	5.9

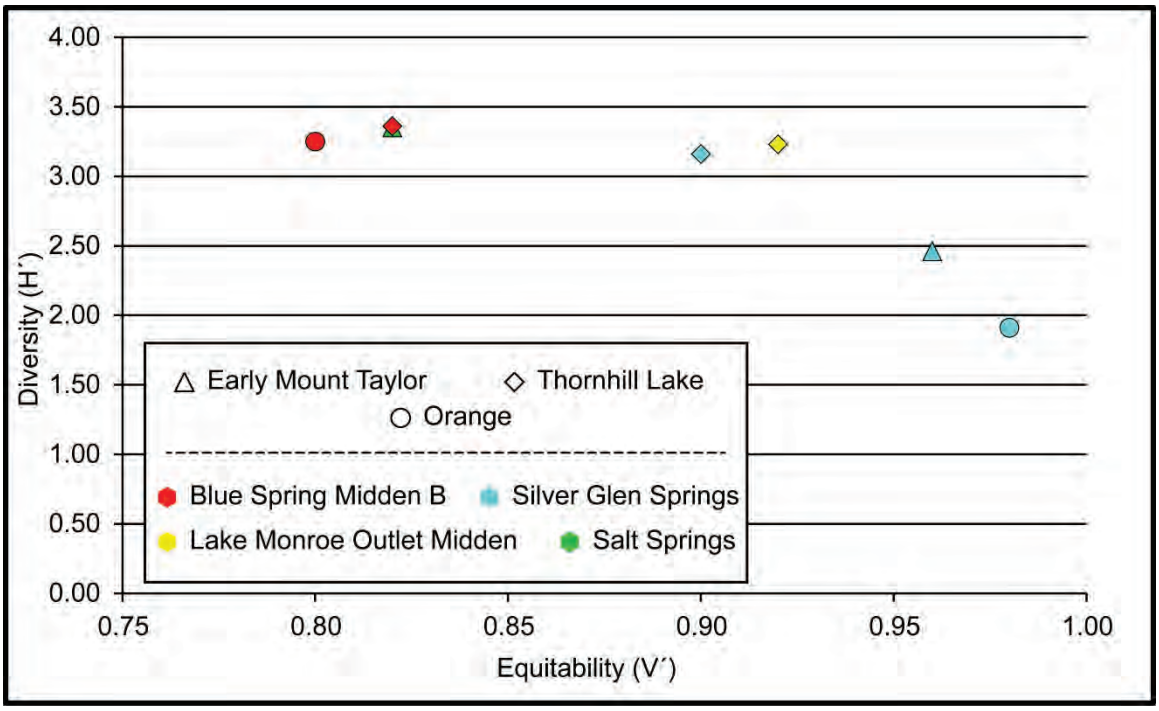

Figure 6-1. Vertebrate diversity and equitability of selected Archaic shell-bearing assemblages, middle St. Johns River valley, Florida.

Table 6-9. Diversity and equitability for vertebrate and invertebrate fauna by component for selected Archaic shell-bearing sites in the middle St. Johns River valley, Florida

Site	Component	Order	H´	V´
Salt Springs (8MR2322)	Early Mount Taylor	Vertebrata	3.35	0.82
		Invertebrata	n/a	n/a
Silver Glen Springs (8MR123)	Early Mount Taylor	Vertebrata	2.46	0.96
		Invertebrata	0.82	0.51
	Thornhill Lake Phase	Vertebrata	3.16	0.90
		Invertebrata	1.18	0.73
	Orange Period	Vertebrata	1.91	0.98
		Invertebrata	0.55	0.34
Blue Spring Midden B (8VO43)	Thornhill Lake Phase	Vertebrata	3.36	0.82
		Invertebrata	n/a	n/a
	Orange Period	Vertebrata	3.25	0.80
		Invertebrata	n/a	n/a
Lake Monroe Outlet Midden (8VO53)	Thornhill Lake Phase	Vertebrata	3.23	0.92

groups. Blue Spring Midden B has a higher diversity and lower equitability value than Silver Glen Springs and Lake Monroe Outlet Midden. Again, sample size is likely a factor, as the volume of fill examined from Blue Spring Midden B is considerably larger than the other two sites. The Orange assemblage from Blue Spring Midden B is nearly identical to that from the earlier Thornhill Lake phase deposits.

Despite differences in the representation and distribution of different species, fishes are the most important vertebrate class regardless of time or space. A large range of species was routinely procured, but individual samples tend to be dominated by members of the sunfish family. No other class of vertebrates comes close to the contribution made by fishes, although turtles usually are the second most numerous taxon, and are typically centered on aquatic species. These are followed by mammals, which tend to include deer, raccoon, opossum, and rabbit. Amphibians, snakes, and birds occur in similar frequencies, but their particular distribution within an assemblage is site-specific.

One noticeable difference in the Silver Glen assemblage compared to other affiliated sites is the small number of turtle species identified and the fragmented nature of their remains. Turtle individuals are generally represented at 8MR123 by unidentifiable carapace and plastron pieces, while crania and longbones are missing. This may not be surprising for the bucket auger samples given their small volumes, yet is harder to explain for the mining escarpment (TU2) deposits. What these differences mean is not entirely clear, but they are potentially attributable to variations in depositional contexts. Deer are also absent from the Silver Glen fauna assemblages, but were noted in the field and likely account for most, if not all, of the “large mammal” fragments.

Even though Lake Monroe Outlet Midden was the only other invertebrate assemblage available for direct comparison with that from Silver Glen Springs, it is known that the same five species of mollusc are routinely represented at shell-bearing sites throughout the region. The representation and distribution of these species varies with depositional context, as does the content of associated materials (e.g., vertebrate fauna, artifacts), but the species utilized are generally stable through time.

In lieu of larger samples and a better understanding of contextual differences, it is hard to place much weight on the changes in shellfish diversity among the different time periods represented at Silver Glen Springs (Table 6-7). It is notable that the Thornhill Lake phase assemblage as a whole is similarly composed to that from Lake Monroe Outlet Midden (Quitmyer 2001), wherein apple snails and bivalves outnumber banded mystery snails. Even so, when the Silver Glen sample is broken down according to depositional context, the distribution of these three species varies considerably within this time period, and in some cases banded mystery snails dominate. Trends witnessed at one site cannot necessarily be transposed on assemblages from elsewhere. Despite the regional extent of modern, controlled excavations, zooarchaeological samples have nonetheless been small windows into what are complex deposits.

Overall, the deposits examined from Silver Glen Springs are not necessarily amenable to examining changes in foodways across time and space. As stated above, the bucket auger samples are small, and the contexts of these deposits are not completely understood. So while they are useful for establishing the presence and absence of certain species and the manner of deposition (e.g., underwater, terrestrial), it is not necessarily possible to characterize the practices responsible for their creation. While this is not the case for the samples from the mining escarpment, their association with mounded fill and a mortuary event also places them outside the direct purview of daily subsistence. Rather, they provide an opportunity to examine the structure of faunal assemblages associated with ritual practices.

This point is realized when considering that the fill from Feature 1 is older than the overlying deposits, and may have been mined from elsewhere in the site. REDACTED The fill's original context of deposition is unknown, but the proportion of individuals across the vertebrate classes is different compared to the later deposits. Unidentified vertebrates also comprise a smaller percentage of the sample NISP than the two overlying strata, pointing to lower frequencies of fragmented bone. It is possible that these disparities could be attributed to volumetric differences alone (Table 6-1), but in realizing that the contents of the pit are not in their original place of deposition, it is easy to imagine that they underwent a selective process. Perhaps the matrix was sorted with a preference for certain types of species and relatively intact bone prior to being encased within the shallow basin.

REDACTED the strata overlying Feature 1 stand out from the rest of the site in a number of ways. For one, the density of bone is relatively low compared to the bucket auger samples of similar age. This observation holds even as bone density increases significantly from Str. IV-A to Str. III-B. In addition, apple snails and bivalves occur in frequencies unmatched in other depositional contexts, and this is particularly the case for the uppermost stratum. Concomitant with the increase in the frequency of apple snail and bivalve is a rise in the amount of unidentified fish, more than twice the amount as that from Str. IV-A. The predominance of whole shell in Str. III-B suggests that it was covered rapidly and not subjected to trampling. As such, the increase in unidentifiable fish is probably not due to taphonomic processes. What is more, it was noted upon excavation that a number of bivalves were paired and closed, although many of these were fragmented during their removal. In general, the number of right and left valves in the analyzed sample accord well with one another, as do the weights. These findings support the observation that the sample was originally composed of intact individuals, many of which were probably similarly sized. With the exception of one apple snail fragment, only the bivalves in this sample are burned. That valves were found paired and closed in the field suggests that the remains were not being moved around extensively. Thus, it is possible that this layer of shell was burned in place. The presence of closed valves also suggests that at least some of the bivalves in this deposit were not consumed.

The context of deposition is also an important consideration for evaluating differences in snail shell width across time and space. Measurements were taken on banded mystery snail shells in order to document any changes in the size of the individuals being collected (Table 6-10), and the implications these changes could have for shellfish procurement and consumption. The number of shells measured per sample was predicated on the availability of whole snails (those with intact apertures and apices), so while samples of at least 100 shells were ideal, this goal was not possible with several of the proveniences. Each of the snails was measured for maximum height and width, but only the latter variable is reported here. Because shell apices tend to be eroded, some researchers advocate the use of shell diameter in lieu of height for examining banded mystery snail population dynamics.

All the Mount Taylor contexts, regardless of time period, have shells whose diameters average ≤ 16.2 mm. The Thornhill Lake phase averages are within fractions of a millimeter to one another, but the mean width of snails from the early Mount Taylor phase are slightly smaller. Figures 6-2 and 6-3 illustrate the frequency distribution of banded mystery snail diameter for Str. III-B and BA 8-5. The range of values

Table 6-10. Summary Statistics of Shell Width (mm) for *Viviparus georgianus*, Silver Glen Springs (8MR123).

Prov.	Str./Sec./dbs	Component	Mean	Median	Stdev	CV	Min	Max	n
¼"									
TU 2	Feat. 1 East 1/2	Early Mount Taylor	13.7	13.7	2.2	0.2	6.6	18.9	100
	STR. III-B	Thornhill Lake Phase	15.1	16.0	3.7	0.2	4.8	20.6	69
	STR. IV-A	Thornhill Lake Phase	15.3	15.6	1.9	0.1	11.4	18.0	26
BA 8-5	170-190 cm	Thornhill Lake Phase	16.2	16.5	2.9	0.2	4.9	24.1	78
BA 8-6	205-215 cm	Thornhill Lake Phase	15.5	15.6	0.5	0.0	14.9	16.2	6
TU 5	Feat. 2 Base	Orange Period	19.3	19.6	2.0	0.1	3.1	23.6	100
BA 4-1	240-260 cm	Orange Period	15.2	15.7	3.1	0.2	6.0	19.3	14
TU 39*	Feat. 33 North 1/2	Orange Period	19.6	19.5	2.6	0.1	11.9	26.3	100
⅛"									
TU 2	Feat. 1 East 1/2	Early Mount Taylor	4.5	4.4	0.9	0.2	3.6	6.0	6
	STR. III-B	Thornhill Lake Phase	5.8	5.7	2.1	0.4	2.7	9.9	7
BA 8-5	170-190 cm	Thornhill Lake Phase	4.6	4.6	0.7	0.1	3.6	5.8	11
TU 5	Feat. 2 Base	Orange Period	5.3	5.3	0.8	0.2	3.0	6.8	87
TU 39*	Feat. 33 North 1/2	Orange Period	5.0	5.2	0.7	0.1	3.1	6.7	137

*From 8LA1, Locus B, Silver Glen Run.

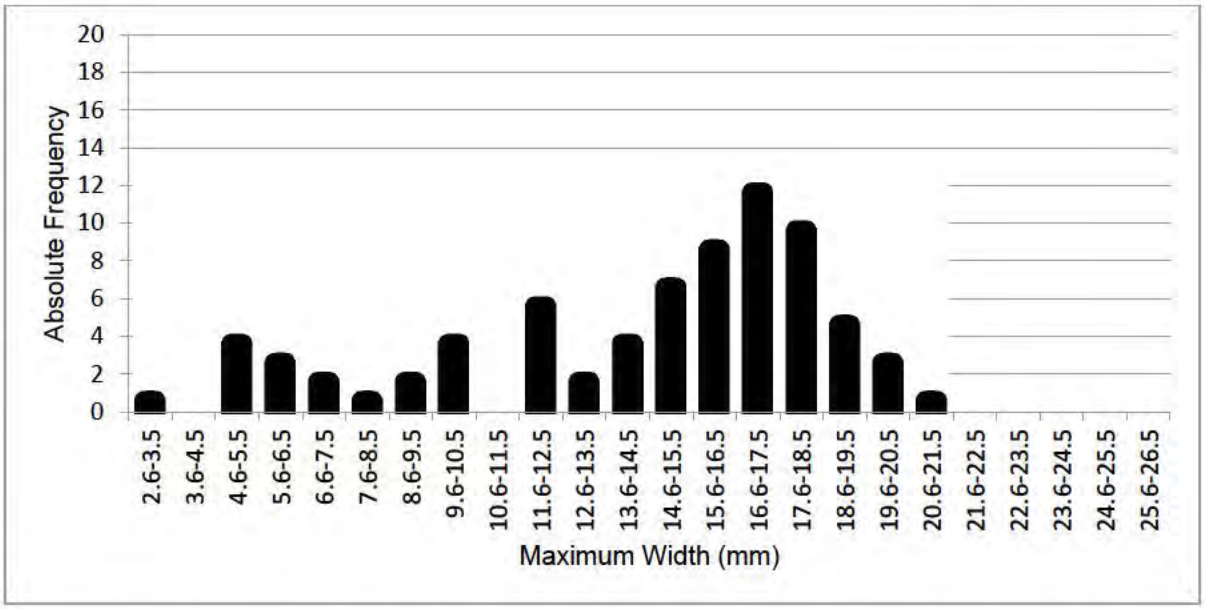

Figure 6-2. Frequency distribution of values for shell width (mm) for *Viviparus georgianus* from Str. III-B in TU 2, Silver Glen Springs (8MR123).

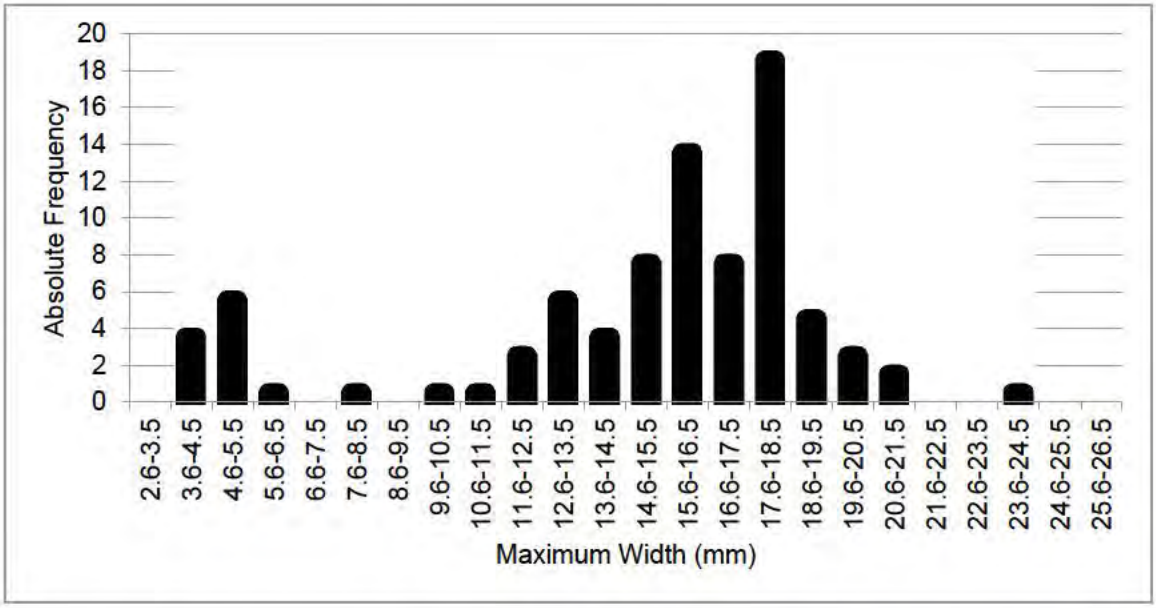

Figure 6-3. Frequency distribution of values for shell width (mm) for *Viviparus georgianus* from BA 8-5, Silver Glen Springs (8MR123).

encompasses several different age classes. Generally, little is known about the collection of snails, or how these practices could have varied over the course of a year, but the age profiles of a particular deposit can potentially speak to these issues. The presence of a wide range of sizes suggests collection en masse through the use of a technology that facilitated the retention of the smallest individuals possible. It is important to note, however, that some of the mystery snails in these samples are probably too small to have been collected as hatched snails. Vail's (1978) work in the Florida panhandle demonstrated that embryonic banded mystery snails tend to be $\leq$ 7.5 mm in diameter. Thus, at least some of the individuals from both Str. III-B and BA 8-5 were encountered in gravid females. Vail's analysis suggested that reproduction is unsynchronized among banded mystery snails, with fertilizations and births taking place throughout the year. With this in mind, it is likely that gravid females were routinely encountered while collecting snails. Overall, Str. III-B suggests a more continuous distribution than BA 8-5, encompassing a number of snails larger than newborns, but probably less than one year in age. Based on comparative morphometric data from Vail (1978) and others (Jokinen et al. 1982), BA 8-5 is largely composed of snails assumed to be of reproductive age, which likely include two age classes.

Snail shell widths in the Orange deposits are more variable than those witnessed during the earlier periods (Table 6-10). Figures 6-4 and 6-5 illustrate the frequency distributions of mystery snail shell width for the base of Feature 2, and Feature 33's north half. Bi-modal, they fall into two distinct groups of very small and generally large snails. The individuals from these two pits are considerably wider and taller than the largest individuals from the mining escarpment (TU 2) and bucket auger samples. Again, the smallest individuals were potentially unborn. Their numbers are greater than what was found in the Mount Taylor contexts, but I hasten to point out that they would nonetheless account for an extremely small percentage of the total number of snails in the two deposits. On average, adult female mystery snails contain approximately 11 individuals per brood (Vail 1978). In light of this, the 87 potentially unhatched snails in Feature 2 would only account for 7.9 gravid females at the most. Feature 33 could have contained slightly more with a maximum of 12.5 gravid females.

Notably, the structure and content of these two features are strikingly similar to one another. This point is particularly salient given that Feature 33 is actually located on the other side of the run in the area designated Locus B within site 8LAI (see Gilmore 2011). Both of the pits are dominated by shellfish, which consists mostly of whole banded mystery snails. The size of snails, and particularly those from the smaller fraction, accord well with one another. It is important to note, however, that Orange Period snails are not larger across the board, and size seems to be contextually based. BA 4-1 revealed snails whose average width is on par with those from Mount Taylor

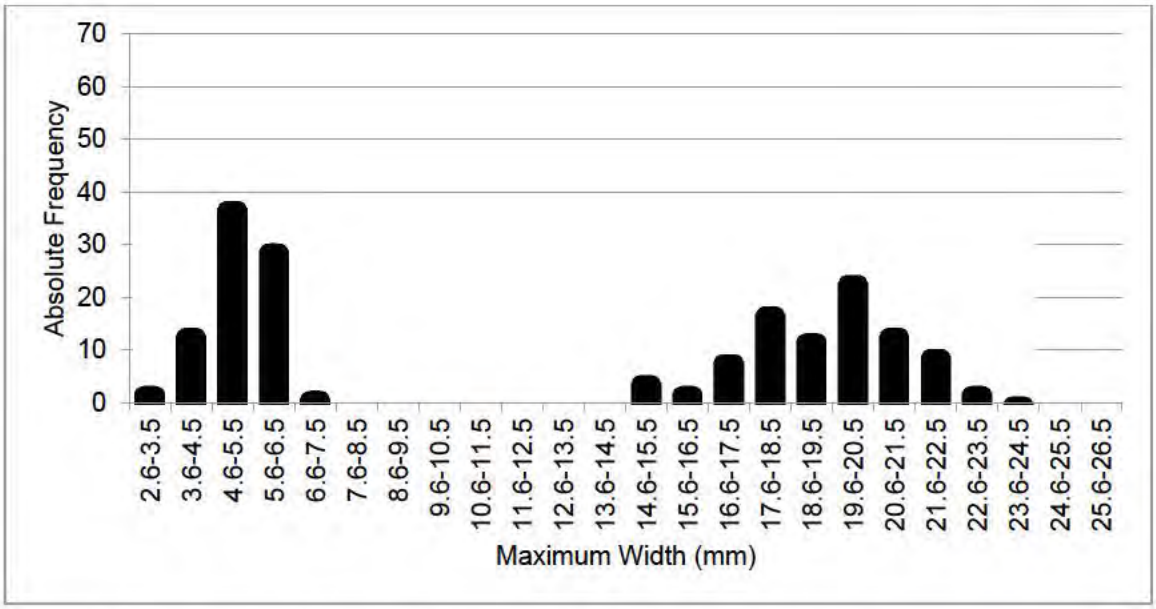

Figure 6-4. Frequency distribution of values for shell width (mm) for *Viviparus georgianus* from Feature 2-Base, in TU 5, Silver Glen Springs (8MR123).

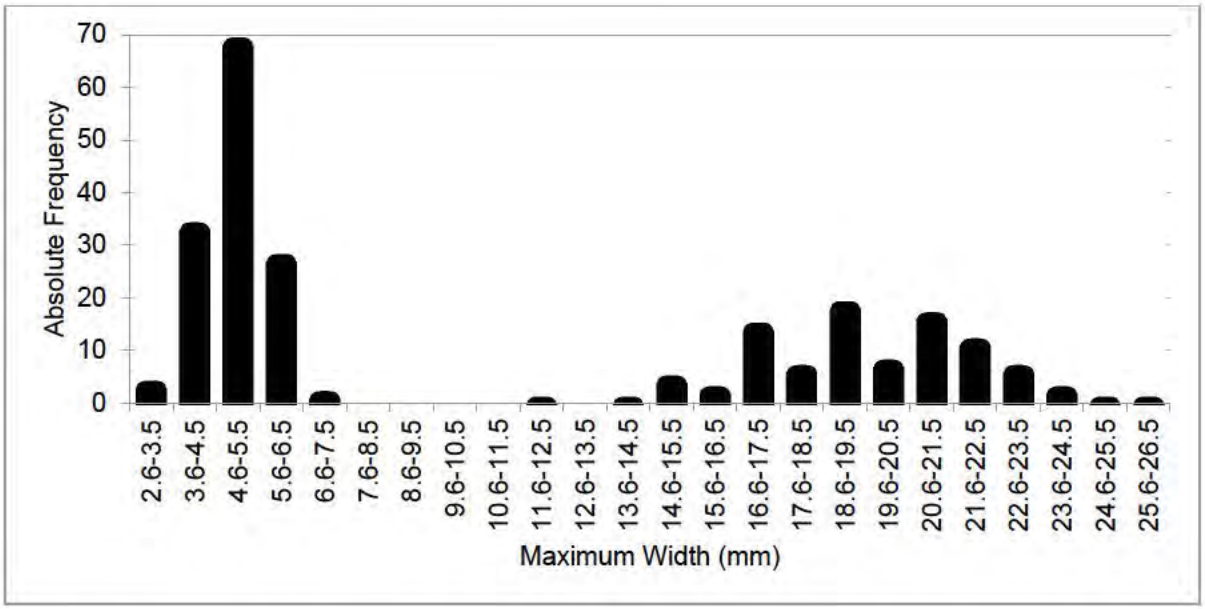

Figure 6-5. Frequency distribution of values for shell width (mm) for *Viviparus georgianus* from Feature 33, North 1/2, in TU 39, Locus B, Silver Glen Run (8LA1).

contexts. The sample size is small, but not necessarily for a lack of shell. Only a handful of snails were completely intact, limiting the number of measurements that could be taken. Even so, it is clear that the majority of the remaining snails in the sample have widths that approximate the mean. The snails from BA 4-1 came from deposits near the eastern side of the spring pool. They were associated with a decent amount of vertebrate fauna, and likely deposited directly into the water.

Variation in shell width across time and space could be due to a number of different factors, including procurement practices, intended use of snails, and changes in snail population demographics. Unfortunately, snail size is not an indicator of seasonality. Despite all of these unknowns regarding shellfish procurement, it is possible to document morphological variations in snail shells within and across contexts that, at the very least, may speak to the exploitation of different snail populations. In turn, this information can potentially be used to assess the discreteness and duration of a particular depositional episode.

Katoh and Foltz (1994) found that the morphological variation within and across species in the *Viviparus georgianus* species complex was best explained through environmental rather than genetic factors. Snails within the same species, but from different habitats, were morphologically distinct from one another. Summarizing data from a number of different authors, they (Katoh and Foltz 1994: 87) also point out that variables such as shell thickness may be the result of differential growth rates, and that the erosion of snail shell apices is a chemical process. Acidic waters are known to dissolve mollusc shell calcium, resulting in a pitted shell (Mäkelä and Oikari 1992; Ribi et al. 1986). BA 8-5 is one sample from Silver Glen Springs that displays a mixture of snails with sharp, intact apices, and ones that are dull and eroded. Importantly, eroded apices are found on both large and small individuals, suggesting that age is not a factor in susceptibility to erosion. For samples that represent a single depositional event, the presence of eroded and intact apices would suggest that the snails were collected from waters with variable pH levels. Otherwise, their co-presence in a sample could be attributable to the gradual accumulation of snails over an extended period, situating erosional variation as a product of time rather than space. Teasing apart the nuances of shellfish procurement and deposition requires considerably larger samples that capture the range of spatial and temporal variation, and currently the BA 8-5 sample is too small to adequately address this issue.

CONCLUSION

The faunal remains from Silver Glen Springs are consistent with other Mount Taylor and Orange Period assemblages from the middle St. Johns River valley. A combination of samples from stratigraphic excavations, feature fill, and bucket augers has revealed a variety of depositional contexts, both shell-rich and shell-free, in addition to examples of terrestrial and subaqueous deposition. The results reported here are preliminary, and would ultimately benefit from larger samples. Nevertheless, contextual differences provide some intriguing results. Certainly, they bring to attention the need for more analyses of mounded deposits, and particularly those that treat fauna remains as

something more than the by-product of subsistence practices. Not surprisingly, the same animals that were a part of everyday life were also incorporated into ritual practices, as Mt. Taylor peoples routinely blurred the line between the sacred and mundane.

Measurements on banded mystery snail shell width demonstrate noticeable size differences between the Mount Taylor and Orange periods. The larger snails associated with Orange deposits are not simply a product of time, however, and are spatially differentiated between upland and spring-side contexts. The meaning of this variation is currently unknown, but nothing in the data presented here supports the hypothesis proffered by Cumbaa (1976:57) that snail size decreased through time due to the effects of overharvesting. Nonetheless these findings highlight the potential of morphometrics for delineating patterning that may help not only to distinguish distinct populations of shellfish, but also potentially characterize how and where shellfish were collected, and the potential duration of depositional events.

CHAPTER 7
CONCLUSIONS AND RECOMMENDATIONS

Asa R. Randall

The Laboratory of Southeastern Archaeology's (LSA) multifaceted investigations within the Silver Glen Springs (SGS) Recreational Area during 2010 and 2011 provided many insights into the disposition, extent, and character of cultural resources on USFS managed lands. At the coarsest scale, we refined the boundaries of 8MR123 and documented a relict shell mound (8LA4242) along the run (Figure 7-1). Spring-side efforts within 8MR123 encountered intact terrestrial shell-bearing deposits dating to the early Mount Taylor through St. Johns II periods, in addition to well-preserved saturated components dating to the Thornhill Lake phase and Orange period. Survey and excavation in the upland landform documented an intensive habitation area dating to the Paleoindian through St. Johns periods. A structured community, dating to the Orange period and possibly arranged in a semi-circle facing the spring, was also inferred from the distribution of diagnostic ceramics. In this chapter, these finds are reviewed and placed into a broader context. The chapter concludes with specific recommendations for cultural resource protection and mitigation.

NEW INSIGHTS INTO THE ANCIENT HISTORY OF SILVER GLEN SPRINGS

Prior to mining operations in the 1920s, shell mounds were defining features of the SGS watershed, as they were throughout much of the middle St. Johns River basin. On the basis of 19th-century antiquarians and recent excavations (e.g., Sassaman et al. 2011a) we have some sense of the scale and diversity of ancient deposits here. We know that at least four large shell mounds were situated along the run. The largest was the U-shaped mound at the mouth of the run (8LA1-East), followed closely in size by the spring-side deposits within 8MR123. In addition, two linear shell ridges (8LA4242 and 8LA1W-Locus A) were situated across the run from each other. Other cultural deposits are known, including at least one sand mound and various smaller shell heaps associated with Archaic and later habitation. Not as obvious, but no less important, are the many buried contexts along the upland terrace. In sum, this landscape was intensively occupied and extensively modified by ancient communities. Data acquired during this survey allows us to consider several aspects of this history.

Scale, Structure, and Chronology of Shell Deposition

Studies of shell mounds in the lower Southeast (Endonino 2010; Randall 2010; Russo 2004; Schwadron 2010) suggest that mound scale and arrangement can provide important insights into community planning. When coupled with detailed chronologies, the sequence and tempo of shell mound construction can also reveal how ancient communities incorporated social and environmental change into land-use practices and even their social histories (Randall 2010). Delimiting the pre-mining contours of 8MR123 has proven to be a vexing process, and a final determination of how the mound

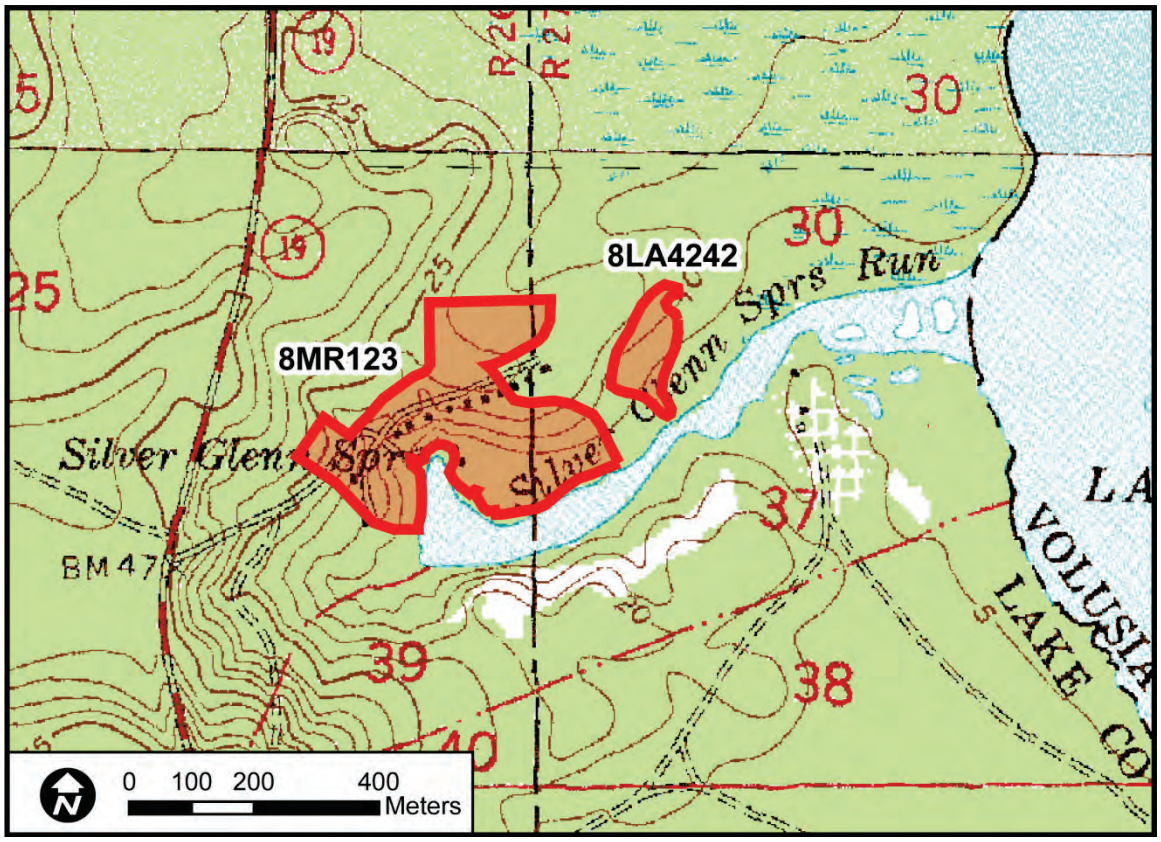

Figure 7-1. Updated boundaries for sites within US Forest Service jurisdiction in the Silver Glen Springs watershed.

appeared prior to the 1920s eludes us still. Unlike 8LA1-East, Wyman neither sketched nor described 8MR123 in detail. Potter (1935) did provide a basemap of the site as it was in the process of being mined. However, the annotations on his map are cryptic, and relate to a site that was already half gone. That said, testing and historic documentation does provide a sense for the extent and configuration, if not the precise topographic arrangement, of the shell mound.

The distribution of surface and subsurface shell within 8MR123 is confined primarily to the remnant shell mound. This deposit forms an irregular arc around the spring pool that extends into a ridge along the run (Figure 7-2). Limited shell deposits were also documented on the upland terrace within pits (see below). On the western side of the spring, shell extends approximately 80 m from the pool margin. The northern boundary of the shell was not tested, although surface exposures are present some 70 to 80 m away from the spring pool. Shell extends for another 200 m along the run, and it may connect with deposits within 8LA4242 as well. Northeast of the spring, the margins remain poorly defined, but shell deposits are present at least 150 m from the pool and run. At a minimum, the mound measured 350 x 200 m, and covered roughly 4.3 hectares. The shell tree and shell escarpment north of the spring pool provides the best evidence for the

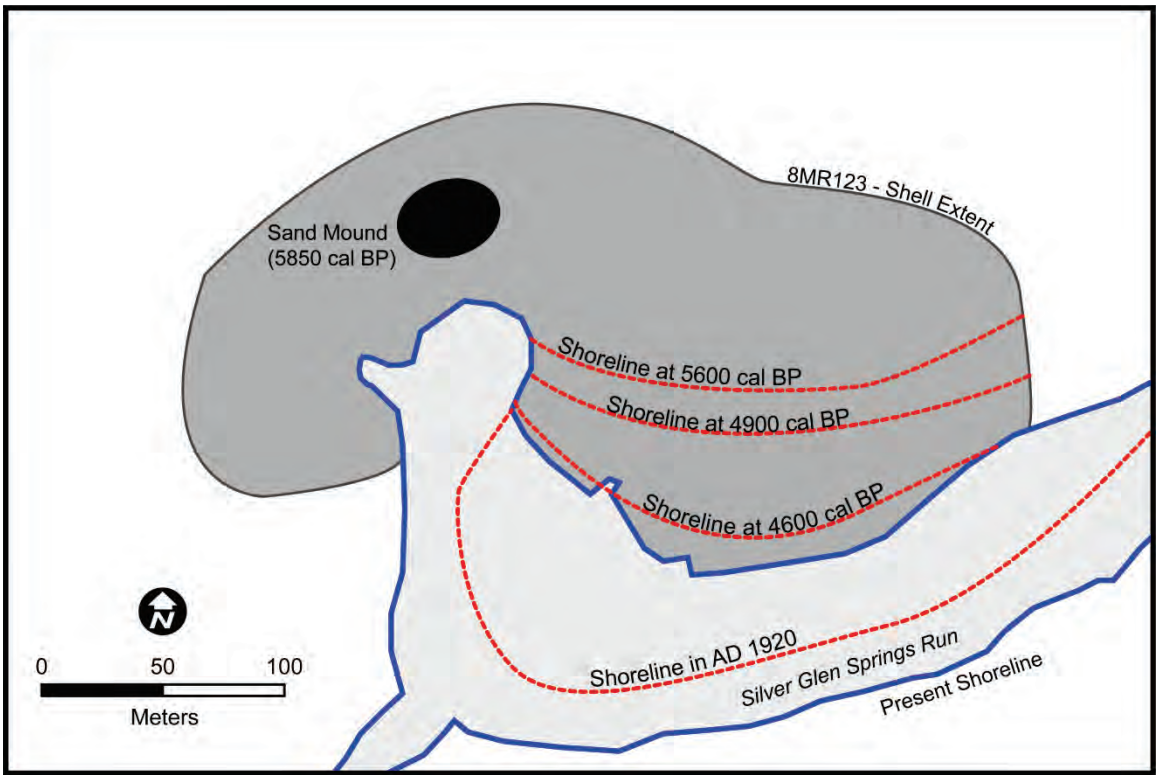

Figure 7-2. Projected extent and chronology of shell deposition within 8MR123.

maximum height of the mound. The base of the shell tree and the top of the escarpment are situated 4 m above the spring pool, and 2 m above the current shell-free ground surface. The mound likely attained an absolute elevation of 4 m or more. In this location shell was likely no more than 2 m thick, but at the margins of the pool it may have been significantly thicker. Although 8MR123 was of average height in relationship to other mounds of the middle St. Johns basin, it was one of the most horizontally extensive in the region.

Although impressive, mound size means nothing if the site's chronology is unknown. Indeed, a long-held assumption regarding the history of shell mounds is that their large size was attained gradually, over long stretches of time, particularly in areas of high ecological productivity (Milanich 1994). Models of human settlement in the St. Johns basin have emphasized the apparent relationship between the onset of a near-modern hydrological regime and riverine exploitation (e.g. Miller 1998). In this standard model, Paleoindian and Early Archaic populations would be constrained to well-watered locations, such as first-magnitude springs (Thulman 2009). The Middle Holocene increase in surface water elevation, enabled in part by higher flow from springs connected to the Floridan Aquifer, aided the development of lakes, sloughs, and wetlands. Once available, Middle Archaic communities began exploiting shellfish and other aquatic resources intensively.

Recent investigations have begun to erode this model: the onset of shellfishing was neither regionally instantaneous, nor did shell sites accumulate gradually. Along the St. Johns, the earliest age estimates on shell-bearing deposits come from two sites, the Hontoon Dead Creek Mound and Live Oak Mound, situated near present day Deland in Volusia County (Sassaman and Randall n.d.). Basal dates there place initial shellfish exploitation as early as 7400 cal BP. This date is roughly coeval with a significant shift in atmospheric water availability, such that the St. Johns would have experienced a rapid change in hydrology associated with increased surface water availability (Randall 2010). Importantly, however, neither of these sites is situated on a spring. Instead, they are located up to 200 m away from present-day channel segments. In at least the case of the Hontoon Dead Creek Mound, the site may have been situated on a lagoon that has since filled in with sediment (Sassaman 2005). As regards the tempo of shellfish deposition, radiocarbon assays from throughout these two mounds (each roughly 100-m long, 70-m wide, and 5-m high) demonstrate that they were constructed rapidly, likely in less than 500 years. Similarly rapid sequences have been identified for younger mounds, including 8LA1W-Locus A (Sassaman et al. 2011a) and Hontoon Island North (Randall 2010). Furthermore, assays from spring-side deposits at Salt Springs and Groves' Orange Midden (at the confluence of Lake Monroe and Green Spring) highlight the variability in the onset of shellfishing adjacent to springs. For example, at Groves' definitive shell deposition began at roughly 6900 cal BP, although the deposits may date as early as 7300 cal BP (McGee and Wheeler 1994). At Salt Springs, shell deposits date to roughly 6300 cal BP, although earlier facies may not have been intercepted by the LSA's excavations (O'Donoughue et al. 2011). Again, the timing and tempo of shell deposition cannot be assumed to have been gradual or regionally synchronous.

In the standard model, the SGS watershed would be expected to attract shellfishers early and often. Not only is it centered on a first-magnitude spring in proximity to a large lake, but the watershed is bounded by uplands (including several interior wetlands) that would have provided numerous opportunities for hunting and foraging. The presence of Paleoindian and Early Archaic tools within the SGS, as well as at the inundated Georgetown Point site within Lake George, do attest to early occupation of unknown intensity or frequency. These communities did not engage in shellfishing, however. Indeed, the inhabitation of the SGS becomes much more visible with the onset of shellfishing, as demonstrated by radiocarbon assays from the north and south sides of the run (Figure 7-3). Taking the age estimates at face value, shellfishing commenced as early as 7100 years ago and continued as late as 600 cal BP. The database is dominated by assays from Archaic contexts, reflecting the research focus of investigations on the south side of the run, and the history of shell mining on the north side of the run. Future work will no doubt fill in the post-3000 cal BP record. Although inhabited repeatedly throughout the past 6500 years, it is important to note that the contexts of occupation changed significantly through time (Figure 7-4). That is, landforms within the SGS were differentially occupied.

In considering the onset and history of shellfishing within the SGS several patterns are of note. Perhaps the most surprising result of testing is the limited evidence

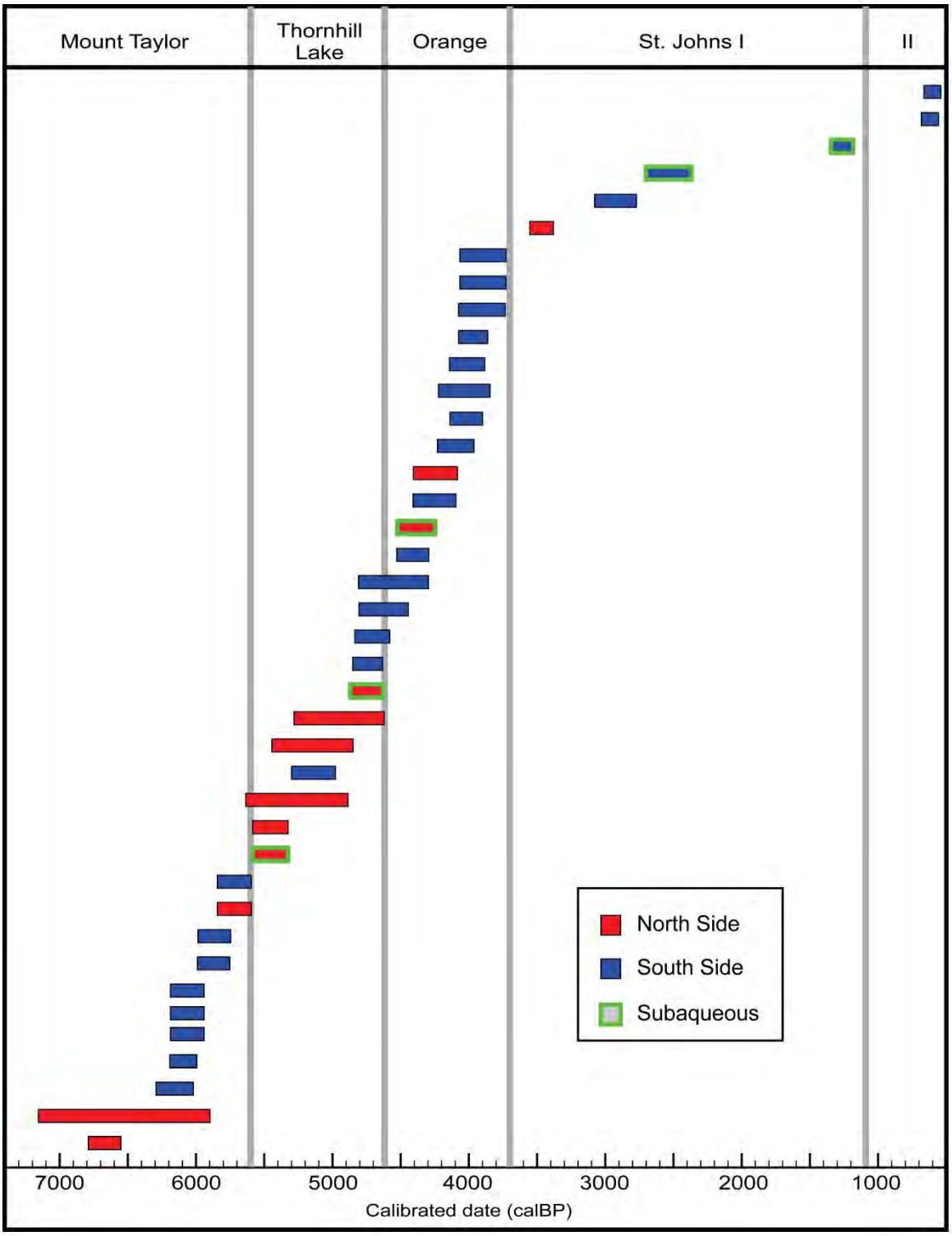

Figure 7-3. Calibrated radiocarbon assays (2 sigma range) from the Silver Glen Springs watershed, ordered by median age.

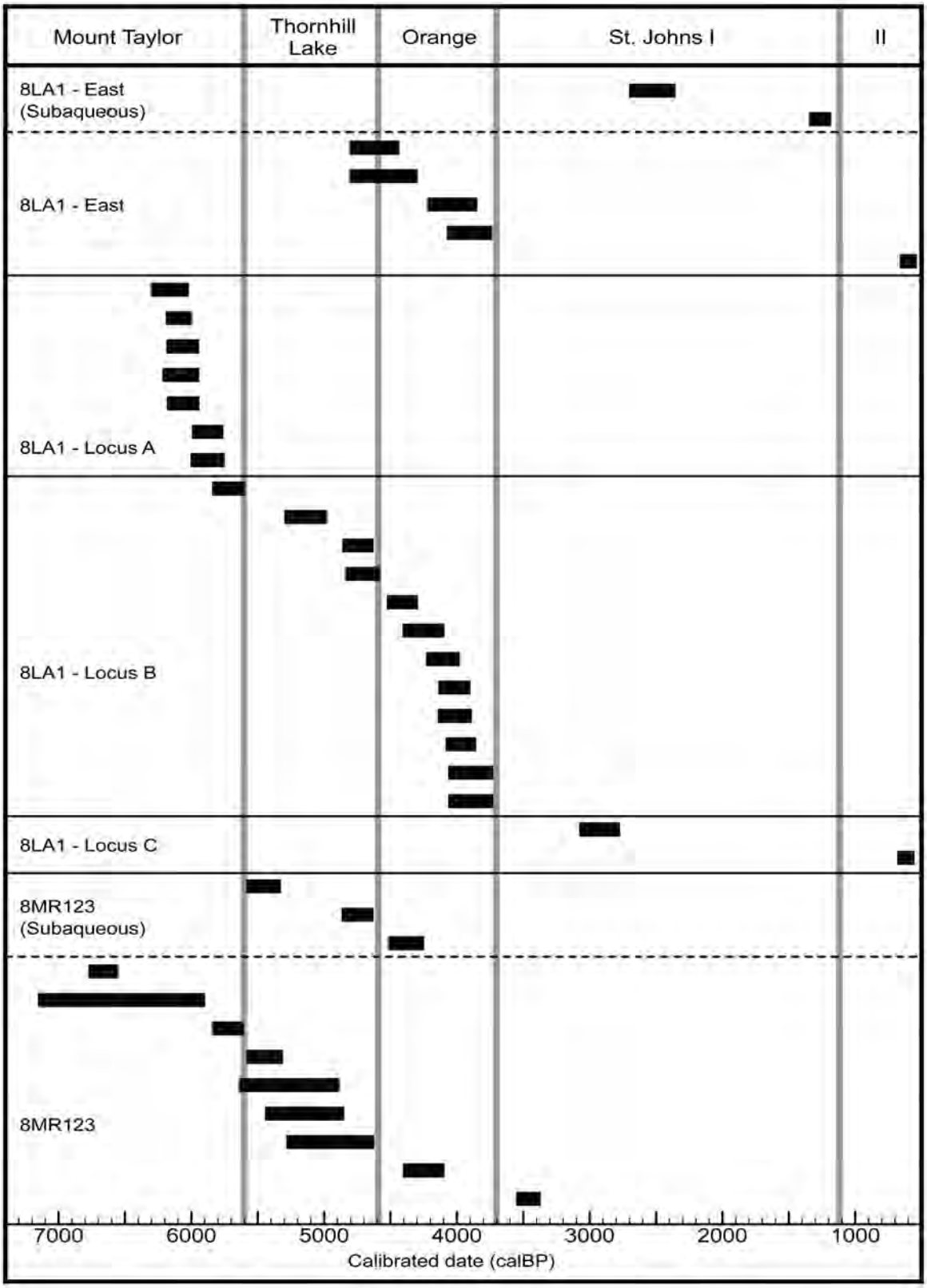

Figure 7-4. Calibrated radiocarbon assays (2 sigma range) from the Silver Glen Springs watershed, ordered by loci from west (bottom) to east (top).

for pre-6500 cal BP shellfish deposition, during the Early Mount Taylor period. There are two samples from 8MR123 that place shellfishing between 7200 and 6500 cal BP. Both, however, are potentially derived from disturbed contexts. The earliest date is the most problematic, as it has a high error and was derived from near-surface deposits (Marrinan et al. 1995). The other three assays acquired during Florida State University's investigations (Marrinan et al. 1990) place deposition in this location between ca. 5600 to 4600 cal BP. The material culture from FSU's excavations is consistent with the Thornhill Lake phase. The second early age estimate (ca. 6780–6550 cal BP) was acquired from a shell pit (Feature 1) within a mortuary sand deposit (TU2, Str. IV-B) dated to the beginning of the Thornhill Lake phase (5850–5590 cal BP). It is harder to argue that this context was recently disturbed. REDACTED

Where pre-6500 deposits would be located within the SGS remains unknown. Bucket augering across 8MR123 encountered only Thornhill Lake phase and Orange period basal shell deposits. Much of the southern extent of the mound was evidently emplaced after 6000 cal BP, although it is possible that earlier shell deposits were present farther south, under the current spring channel. An alternate location would be the shell mound at 8LA4242, or possibly the preceramic shell ridge at 8LA1-East. Regardless, intensive habitation after 6300 cal BP was apparently centered away from the spring pool at 8LA1W-Locus A. Over the course of 600 years (ca. 6300–5700 cal BP), a 200-m long, 3-m high ridge was emplaced through the deposition of shellfish and earth (Sassaman et al. 2011a). This ridge was transformed from a place of arguably infrequent, low-intensity occupation to a structured space with discrete household and discard areas. The location of this ridge along the run and away from the main spring pool is intriguing. There is a seep spring in the linear embayment just to the east of the ridge. Whether or not this spring experienced higher flow six thousand years ago remains to be tested. Similarly, the lack of occupation around the main Silver Glen Springs pool may indicate that these vents experienced significantly lower flow than they do today. Regardless, the location of the Locus A ridge may have had more to do with the placement and siting of 8LA4242, a similarly configured linear mound situated directly across the run. Furthermore, there is circumstantial evidence that the north ridge of 8LA1-East was constructed during the Mount Taylor period (Sassaman et al. 2011a). Lacking radiocarbon assays from 8LA4242, however, we do not know if any of these mounds were coeval, and so this possibility will have to await further testing.

Beginning sometime between 5800 and 5600 cal BP there were dramatic changes within the SGS, as there were throughout the St. Johns basin. This was the beginning of

the Thornhill Lake phase, characterized by a new mortuary sand and shell mound program and extra-regional exchange networks (Beasley 2008; Endonino 2010). This was also a time of hydrological change, evidenced primarily by the initiation of peat formation at Groves' Orange Midden. Peat forms as emergent vegetation dies and then accumulates in standing water, and is not subsequently subjected to extended draw-downs that would oxidize or wash away organic matter. McGee and Wheeler (1994) argued that the peat at Groves' developed during a low water stand, based on their assumption that deposition was occurring in deep water. More recently, however, it has been argued that water levels were higher at this time. Beasley (2008), for example, suggested that this period witnessed higher-than-present surface water due to sea-level change (based on Balsille and Donoghue's [2004] Gulf of Mexico sea-level curve). An alternative perspective is that the region began experiencing longer and more stable hydroperiods (less annual variation in surface water) due to increased atmospheric moisture. Long hydroperiods enabled the development of bottomland swamps and fostered emergent vegetation growth within shallow bodies of water (Randall 2010). Within the SGS, peat deposition occurred sometime during or after the Thornhill Lake phase. The saturated shell encountered in Bucket Auger (BA) 7-3 dates to ca. 5600 cal BP, and it was subsequently capped by a fibrous peat and sand deposit. It is important to note, however, that surface water ca. 5600 cal BP was likely lower than or equal to the present day. This inference is based on the recovery of microlithic tools at both 8LA1-East and 8MR123 in wet or saturated shell-free contexts. Moreover, terminal Thornhill Lake phase terrestrial shell deposits at Hontoon Island North are situated at and above the present water table (Randall and Sassaman 2005). Just as the onset of shell deposition varied regionally, the timing of wetlands characterized by emergent vegetation was apparently asynchronous throughout the basin. The new mortuary program and extensive social interaction of the Thornhill Lake phase cannot be reduced to ecological change alone.

Within the SGS, Thornhill Lake phase occupation is evident in a variety of locations and elevations. On the south side of the run, shell deposition was situated within Locus B on the upland terrace, where stacked sequences attest to repeated occupations (Gilmore 2011). Microlithic tools in the shell-free basement of 8LA1-East attest to Thornhill Lake phase occupation there as well. The bulk of evidence for this period comes from 8MR123.

REDACTED

However, by 5600 cal BP shellfish and other materials were being deposited in great quantities within the confines of

8MR123. FSU's excavations of the remnant shell ridge documented up to 3 m of Thornhill Lake phase deposits. That the three assays all overlap at 2 sigma implies that deposition was rapid. REDACTED

Shellfish was deposited not only on the terrestrial aspect of 8MR123, however. Indeed, bucket augering across the eastern aspect of 8MR123 provides details on the comparably rapid expansion of the mound during the Thornhill Lake phase and Orange period. Age estimates from basal and near-basal shell lenses attest to the outward growth of the mound, beginning sometime around 5600 cal BP in a ridge abutting the terrace edge, and continuing south and west to the current spring pool margin as early as 4600 cal BP (Figure 7-2). That these and other wet-site deposits we encountered in bucket augers were initially deposited within a persistently saturated context is demonstrated by well-preserved uncarbonized organics (nutshells, seeds, and other plant remains) coupled with a virtual lack of terrestrial gastropods. Over the course of 1000 years the site's margins were expanded by at least 60 m along a 250-m long shoreline segment. This figure should be considered a minimum, however, as the possibility remains that shellfish extended much further into the spring run (Figure 7-2). The volumetric rate of accumulation is hard to estimate because we do not know the height of shell in this region.

Massive quantities of shellfish were processed and emplaced within the SGS during the Orange period as well. At 8MR123, the focus of shell deposition was the spring pool and run. This inference is based solely on radiocarbon assays, as few diagnostic ceramics were recovered during the LSA's investigations. We do know that upwards of 2.5 m of shell was deposited at the current spring pool edge ca. 4520–4080 based on assays from BA 4-1 and TU1, Str. V. An equally impressive amount of shell was deposited at the mouth of Silver Glen Springs run (8LA1-East), as were many thick and technologically distinct Orange Incised vessels. This particular ware was produced early in the Orange period, and appears to be restricted to only a few large shell mounds within the St. Johns. Although missing from the LSA's 8MR123 sample, they are present in the Florida Museum of Natural History's collection, and have been illustrated in collector's assemblages (e.g. Norman 2010). Due to shell mining, the structure and sequence of deposition in either locality at the onset of the Orange period remains poorly understood (see also Sassaman et al. 2011a). That these vessels are typically restricted to large shell deposits, however, indicates they may have been deposited during feasting events involving diverse communities who aggregated at mounds. Shellfish was also processed and deposited in large pits within the uplands, away from mounds (Figure 7-5). The most dramatic example of this practice is on the south side of the run at Locus B, where scores of Orange-era pits have been documented (Gilmore 2011). At least one Orange period pit (Feature 2) was documented on the north side of the run, and there may

be others. This is not to say that Orange occupation was limited to shellfish processing and deposition, as a large sample of fiber-tempered pottery was documented in the upland component. This aspect of 8MR123 may very well represent a semi-circular Orange period village in which shell was sparsely (but strategically) emplaced (see below).

Investigations within the shell mound at 8MR123 failed to document extensive post-Archaic deposits. This finding does not mean that St. Johns era communities avoided the area. Excavations on the southern terrace by Sassaman and colleagues encountered what may be a St. Johns period village, and St. Johns sherds are routinely encountered along the southern shore of the run. Within 8MR123, the lack of extensive post-Archaic occupation is likely due to shell mining operations that truncated and removed this component. Sherds of the St. Johns series were recovered from disturbed contexts along the eastern, low-lying aspect of the site. Moreover, they have been found by numerous visitors of the recreational area, particularly along the run. The only intact terrestrial remnants of this era within the mound are situated west of the spring pool and south of the secondary vent. A few small sherds were noted on the surface here, and BA 2-7 likely intercepted intact St. Johns mounded shell. Interestingly, this location is the only place where we noted elongated *Viviparus* shells. On the south side of the run they appear to be concentrated in St. Johns I deposits. The significance of these shells remains to be determined. A temporal association could indicate that their morphology reflects a genetically distinct sub-population that was exploited during the St. Johns period. Alternatively, the elongated shells may have resulted from temporarily increased flow velocities (Sassaman et al. 2011a). More examples from well-dated contexts will be necessary to understand their significance.

Any discussion of shell mounds along the St. Johns cannot fail to make mention of mining operations. Indeed, the devastation visited upon these cultural resources in the 20th century defines how archaeologists investigate and interpret ancient culture history. Evidence for shell mining is widespread within the SGS. Beginning in the 1920s, shell was extracted from around the spring pool, all along the south side and mouth of the run, and in the vicinity of 8LA4242 on the north side of the run. Although mostly a process of subtraction, some surface features were constructed at this time as well. Most notable is the shell ramp within 8LA4242, likely constructed to facilitate shell removal via barge. This feature remains on the landscape today as an important testament to a period of widespread destruction.

Community Organization Beyond the Mound

Investigations into St. Johns communities have tended to focus on shell bearing components. Not only are they ideal contexts for recovering organic assemblages, but these loci have been most in need of mitigative efforts due to shell mining. However, the recognition that at least some of these larger shell sites were not places of daily living (Aten 1999, Endonino 2010, Randall 2010, Sassaman 2005) has brought the limited extent of non-shell archaeology into stark relief. In this regard, one of the most significant results of the LSA's survey was the discovery of stratified and horizontally

differentiated occupation in the upland terrace north and west of the spring pool that did not involve the widespread deposition of shell.

Evidence for Late Paleoindian or Early Archaic occupation is pervasive across the landform. Although no diagnostic hafted bifaces were encountered, several formal side- and endscrapers, each heavily patinated, were recovered. Similarly, heavily patinated debitage was routinely encountered below Middle Archaic diagnostic tools. Other hints of this era are provided by chance finds. During fieldwork, a local collector showed the field crew the base of a fluted biface that was purportedly found within the SGS in the 1970s. This may represent a Clovis or post-Clovis fluted variant. Norman (2010) illustrates at least one example of an Early Archaic side-notched Bolen hafted biface, and several side- and corner-notched examples have been found on the south side of the run in surface collections. Due to the low frequency of occurrence of these objects, little can be said about land-use practices within the SGS at this early age. Suffice it to say, the SGS was an important place beginning at least 10,000 years ago.

The visibility of occupation upon the upland terrace increases dramatically during the Middle–Late Archaic. Of the 21 whole and fragmentary hafted bifaces recovered during testing, 95% (n = 20) are examples of the Florida Archaic Stemmed type. This form dates to the Mount Taylor period, although stemmed hafted bifaces were produced through the later Orange period as well. In addition to hafted bifaces, the assemblage includes a variety of tools such as late-stage bifaces and preforms, expanded base microliths, and informal flake tools. The recovery of at least two sandstone abraders hints at the production of bone tools in this area of the site as well. Debitage was also found in large quantities during shovel testing. Although the entire debitage assemblage likely dates from throughout the site's history, at least 48.9% (n = 724) of the flakes were thermally altered, a practice most closely associated with the Middle and Late Archaic (Ste. Claire 1987). Analysis of the waste flake assemblage determined that lithic reduction was geared primarily towards late-stage tool production and maintenance. Raw material for this assemblage was acquired predominantly from the Santa Fe and Ocala chert quarries, but also included examples from as far away as the Tampa Bay region. The diversity of these tool classes implies that a wide array of practices were engaged in during the preceramic Archaic. Moreover, at least two dense clusters of production debris were evident in the vicinity of the parking lot. Interestingly, bifaces and other tools tended to be found on the margins of the flaking debris. Lacking more expansive stratigraphic testing, it is unclear whether these depositional patterns simply resulted from different activity areas away from living areas during the Mount Taylor period, or if they represent a residential encampment.

Within the recreational area, Orange period upland occupation was centered on the parking lot north of the spring. The bulk of the Plain and Incised wares are consistent with the post-4600 cal BP assemblage documented at Locus B on the south side of the run by Zack Gilmore (2011). Unlike the suggestive evidence for structured deposition during the preceding Mount Taylor period, the Orange period occupation may represent an arcuate or circular village (Figure 7-5). This village has been inferred from the

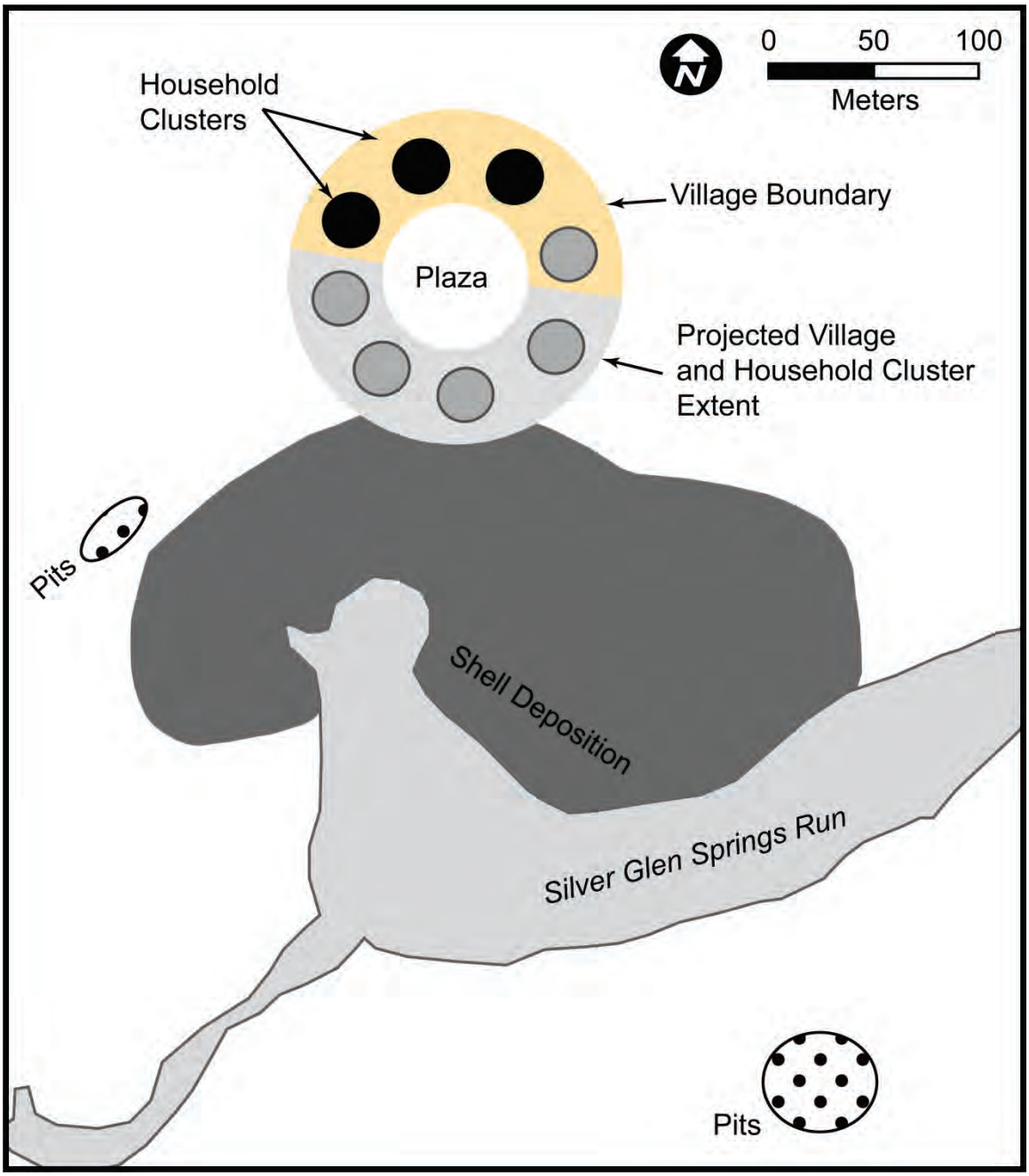

Figure 7-5. Schematic representation of Orange period loci adjacent to Silver Glen Springs, including spring-side shell deposits, upland shell pits, and an arcuate village inferred and extrapolated from diagnostic ceramics.

distribution of diagnostic Orange pottery from shovel tests, and from stratigraphic excavations (TU6). In general, Orange sherds were clustered in the western two thirds of the parking lot. When Orange sherds were separated by size (greater or less than 0.5 inch), it became apparent that large sherds were concentrated in arc with an interior diameter of ca. 70 m and an exterior diameter of ca. 160 m. The interior of the arc is

characterized by only small crumb sherds, implying that this area may have been a plaza that was purposefully kept clean.

A closer examination of the Orange component also revealed highly suggestive evidence for architecture. Within the arc there were at least three voids approximately 25 to 30 m in diameter. Excavation of TU6 outside of one void revealed large, flat-lying fiber-tempered sherds that were clustered on one side of the test unit. Discovered nearby and at a slightly lower elevation was a small (ca. 20-cm wide and 5-cm deep) shell-filled pit. The matrix and character of the pit contents was consistent with shell midden documented elsewhere. The shell may have been gathered from a preexisting deposit and emplaced within a post hole. A similar shell deposit was encountered in a shovel test just 2 m to the south of TU6. The implication is that TU6 intercepted an Orange-period structure of unknown dimensions. The presence of voids (lacking large sherds) that were ca. 30-m wide may indicate there were multiple structures arranged around small plazas, which were further organized around one large plaza. Although this scenario may seem overly elaborate, there is precedence for such spatial patterning amongst affiliated Orange communities along the St. Johns (Sassaman 2003) and at Late Archaic shell rings on the coast (e.g., Russo 2004).

One striking aspect of the upland Orange component at 8MR123 is the virtual absence of shellfish. As discussed previously, radiocarbon assays from around the spring pool demonstrate that Orange communities did gather and deposit shellfish in great quantities. Moreover, the U-shaped shell mound at the mouth of Silver Glen Springs run was likely erected during the Orange period as well (Sassaman et al. 2011a). In the case of 8LA1-East, it remains to be determined whether an Orange village was present there. Regardless, the fact that shellfish were not deposited in the residential area at 8MR123 implies that shellfishing cannot be reduced to domestic consumption and discard alone. In this regard, the presence of large steaming pits at Locus B, as well as at least one shell filled pit within the confines of 8MR123 (Feature 2) is of great significance (Figure 7-5). One plausible explanation is that such pits were excavated and used to process shellfish during feasting events (Gilmore 2011). In this case, shellfish remains and associated pottery were then intentionally deposited as mound fill. Keeping this point in mind, one potential avenue of research relates to whether the proposed upland village was (a) inhabited for extended periods of time by a large community, or (b) reflects a short term aggregation of households from throughout the St. Johns basin. If the latter case, one would expect the pottery to be derived from various sources through the region. Zackary Gilmore is currently investigating whether the pottery from the south side of the run was from local or extra-local sources for his dissertation research.

One additional note regarding the placement of the Orange occupation on the upland terrace is warranted. Throughout the middle St. Johns basin there is a pervasive pattern of Orange sites situated at relatively high elevations. For example, at Blue Spring Midden B, Sassaman (2003c) documented an Orange compound situated on the hillside overlooking Blue Springs run. Closer to the SGS watershed, an Orange component (8MR3557) was located overlooking Sweetwater Spring on Juniper Creek (Shanks 2009). Furthermore, Sassaman (2003a) determined that Orange deposits were set back from the

modern day margins of Crescent Lake. One possible cause could be an increase in surface water during the Orange period, such that lower elevations would not be suitable for habitation. Indeed, a desire to avoid the water table may have been part of the logic for digging pits at higher elevations within Locus B and at 8MR123. That said, the pattern of shellfish deposition adjacent to the spring and along the run suggests at least one alternative explanation. Just as there was an apparent abandonment of earlier shell ridges at the beginning of the Thornhill Lake phase, the siting of Orange occupations above springs may have had more to do with cultural preference and notions of proper place than pure hydrology. Significantly more research will be necessary to elucidate the complexities of Orange period occupation. Orange communities—like in the preceding Mount Taylor period—created a complex landscape in which shell mounds, residential sites, processing areas, and aggregation points were articulated.

Archaic Subsistence and Society

As noted above, work regarding shell mound composition has traditionally emphasized the importance of riverine resources to communities inhabiting the St. Johns basin. A central tenet of this research is that shell deposits directly reflect repeated small-scale collection, consumption, and deposition within habitation areas. While there is no doubt that the river was a critical resource for ancient communities, the latter assumption is no longer tenable. Although some shell mounds were apparently places of residence (e.g. 8LA1W-Locus A), others are composed primarily of shellfish without evidence for living surfaces (e.g. Hontoon Dead Creek Mound and Live Oak Mound). Shellfish remains were the primary construction medium for Early Mount Taylor mortuary mounds (e.g. Harris Creek), and were incorporated in Thornhill Lake phase mortuary mound stages REDACTED . During the Orange period, shellfish were processed in large pits, presumably for supra-domestic feasts, and perhaps deposited away from the processing area. Moreover, within the SGS it is unlikely that the spring pool and run would have been ideal sources of shellfish due to water chemistry (O'Donoughue 2010). By extension, Archaic inhabitants transported large quantities of shellfish from where they were collected and purposefully deposited them in a few key places on the landscape. Finally, it is possible that some shellfish assemblages were collected purely for the purposes of mound construction, and never entered into the sphere of human consumption (Blessing 2010). Far from representing a single process, the composite elements of Archaic-aged zooarchaeological assemblages were amassed in a variety of social contexts for diverse reasons.

In the present study, we secured bulk samples from two features, a column sample, and five bucket augers. These span the Early Mount Taylor phase, Thornhill Lake phase, and Orange period. The zooarchaeological samples analyzed from 8MR123 fall comfortably within the known range of variation for Archaic components. These samples were dominated by vertebrate and invertebrate aquatic species. Amongst the vertebrates, fishes and reptiles were most abundant, followed by mammals and birds. All the invertebrate species known to be of import to Archaic communities were documented in varying quantity, including mystery snail, apple snail, and bivalve. In addition to composition analysis, measurements of *Viviparus* shell width were used to track changes

in shell size across space and through time. In general, shell size increased from the Mount Taylor to the Orange period. This contradicts Cumbaa's (1976) assertion that shell size decreased through time as a consequence of overexploitation. Moreover, the size of shells varied by context. *Viviparus* shells found within Orange period pits at 8MR123 and across the run at Locus B were both larger than those found within shoreline deposits. If these pits were created for the purpose of feasting, it may be that larger snails were purposefully selected. Future work involving snail measurements from a variety of temporal, social, and ecological contexts will be necessary to unravel the complexities of shellfish collection strategies.

As noted by Meggan Blessing (Chapter 6), many of the samples we recovered were not necessarily deposited in domestic contexts. We do know that most of the bucket auger samples were initially deposited in standing water. Beyond that, however, it is unknown what social contexts surrounded their collection and deposition. REDACTED

The remainder of the samples from TU2 are likely ritual-related. The main portion of the mound (Str. IV) is composed of sand, vertebrate fauna, and limited shell. This mounding event was capped by a dense shell-bearing deposit (Str. III) composed primarily of bivalve and apple snail. Importantly, the vertebrate fauna from Str. IV are consistent with Archaic assemblages encountered elsewhere. REDACTED

Objects recovered from 8MR123 also highlight Archaic community practices beyond daily subsistence tasks. Marine shell was rarely encountered in the LSA's investigations, but was found in appreciable quantities by FSU. Collectively, this sample included two *Busycon contrarium* vessels, one of which was found within mortuary mound fill. Sassaman et al. (2011b) have argued that these vessels likely had special significance, and may have been used to brew medicinal beverages. The presence of these vessels indicates that similar practices were engaged in at 8MR123. Other insights are gained from the chipped stone tool assemblage. As noted above, inhabitants of the SGS used raw materials derived from quarries throughout Peninsular Florida. The presence of extra-local toolstone implies that communities either acquired the raw material during exchange, or actually traveled to sources and extracted the materials themselves. Either way, inhabitants of the SGS were likely knowledgeable of, and had experience with, other peoples throughout Florida. Moreover, one of the more abundant chipped stone tool types recovered from the upland units were microliths. Without detailed use wear analysis, it is impossible to know what these tools were used to produce. One possibility, based on the width of their presumed working edge, is that they

were involved in the production of marine shell beads, which appear to have been exchanged with groups throughout the lower Southeast. We may not yet understand the intensity or character of such interactions, but we do know that the SGS watershed remained an important node within a complex social landscape.

MANAGEMENT RECOMMENDATIONS

As planned, the results of reconnaissance and stratigraphic excavations provided abundant data regarding the significance and integrity of subsurface remains. On the basis of these finds, we defined zones of disturbance coupled with specific recommendations to mitigate potential impacts to cultural resources. The zones are applicable to only the four tracts that we have surveyed (Figure 7-6). Impact to tracts outside the survey bounds are not included in our recommendations, and would require reconnaissance and potentially secondary testing or full-scale data recovery prior to ground-disturbing activities. In addition to these specific comments, we recommend that all construction or maintenance-related activities be monitored by personnel trained in cultural resource identification.

Parking Lot

Work within the parking lot documented well stratified and preserved cultural deposits of Archaic age, which likely represents a structured habitation space. A total of four zones of disturbance were delineated based on shovel testing and stratigraphic excavations (Figure 7-7).

Zone I is situated around the grass parking lot and away from the service road. It is presently forested. No regular disturbances were recognized within this zone, and cultural deposits were persistently recovered between 30 and 40 cmbs. Material culture in this zone includes lithic tools and waste flakes and fiber-tempered pottery. The arrangement of the artifact finds, coupled with the presence of scattered shellfish remains, suggest that this area likely represents an intensive living area, possibly an arcuate Orange period village. Subsurface architecture is also possible. These cultural resources are very significant. Preservation of this zone is recommended. If necessary, subsurface impact should be limited to a depth of 30 cm and monitored. If planned actions will impact greater depths, then secondary testing in the areas of potential effect are recommended. Full-scale data recovery may be required as a result.

Zone II corresponds with the grass covered lot and land manager RV residential zone. This area is systematically disturbed to depths between 20 and 30 cm on average. However, well stratified deposits consistent in age and disposition with Zone I are preserved below the surface disturbance. These cultural resources are significant. It is recommended that impacts involving cutting and filling be limited to the upper 20 to 30 cm and monitored, otherwise secondary testing and full-scale data recovery may be required.

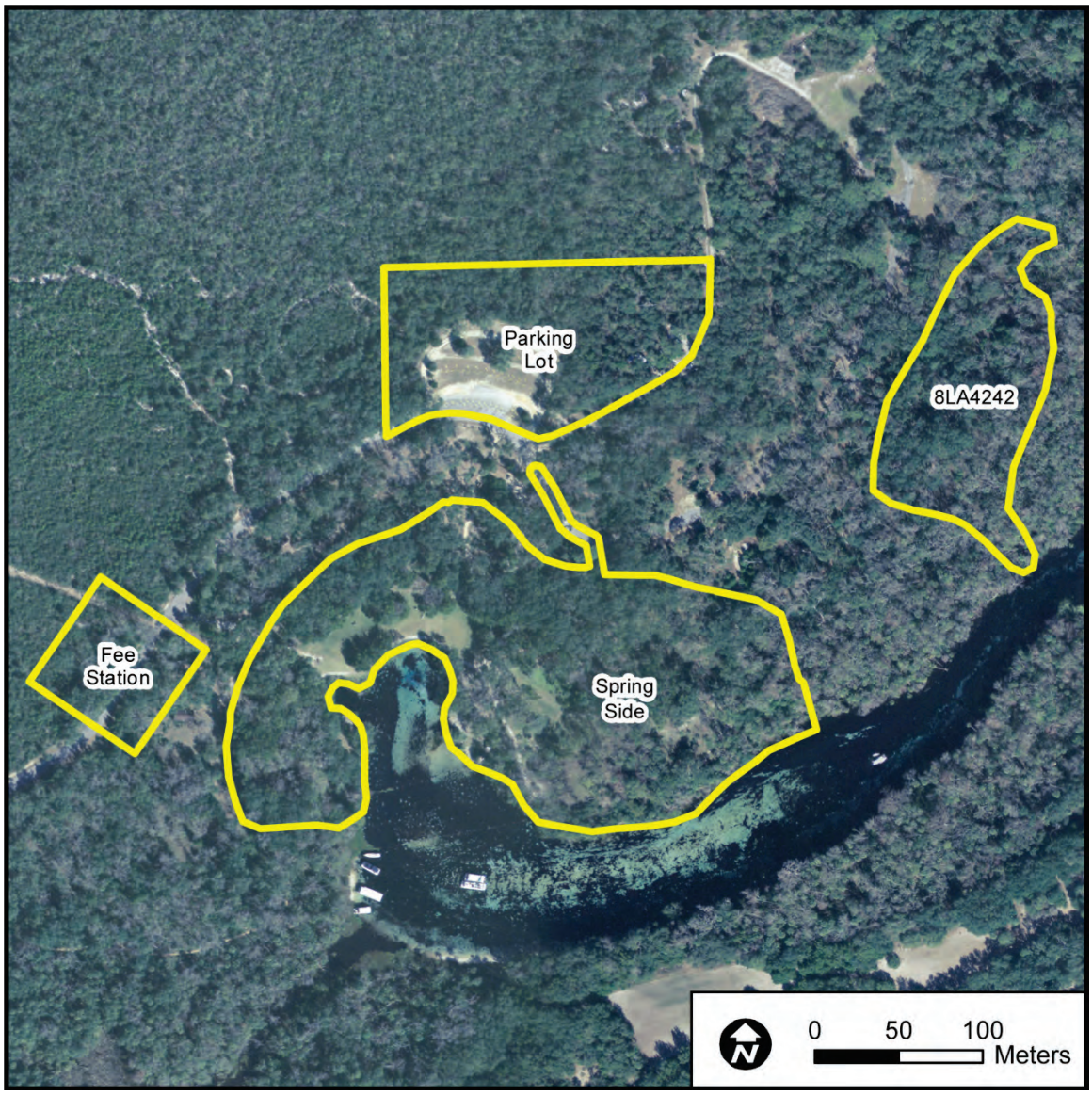

Figure 7-6. Recommendation tract boundaries.

Zone III is associated with the asphalt service road. Depths of disturbance varied between 40 cmbs and over 100 cmbs. The extant cultural resources have been irreparably altered, and likely are not significant as a result. It is recommended that all ground-disturbing activities be monitored.

Zone VI is a borrow pit in the northeast corner of the parking lot tract. Shovel tests determined that all cultural resources have been removed within the pit, although intact deposits are present on the margins. It is recommended that fill operations be monitored.

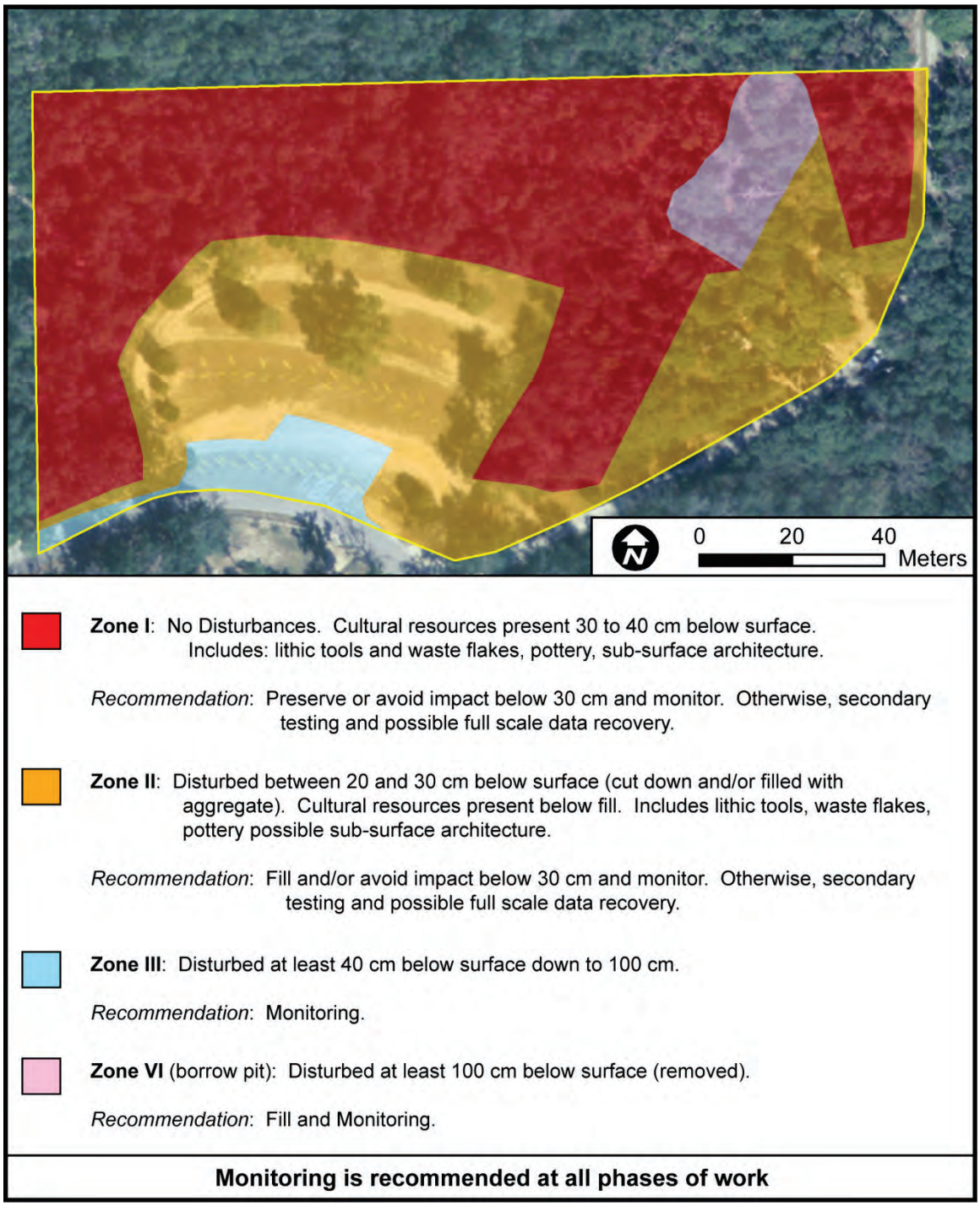

Figure 7-7. Recommendations for zones within the parking lot tract.

Fee Station

Work within the fee station tract intercepted well stratified and preserved Archaic and St. Johns components. A total of three zones of disturbance were delineated based on shovel testing and stratigraphic excavations (Figure 7-8).

Zone I is present on either side of the entrance road. It is presently forested. No regular disturbances were recognized in this zone, and cultural deposits were persistently recovered between 30 and 40 cmbs. Material culture recovered in Zone I includes lithic tools and waste flakes, Orange fiber-tempered pottery, and St. Johns pottery. The small size of the tract precluded the delineation of activity areas. Given the similarities in artifact densities in comparison with the parking lot tract, it is likely that similarly structured habitation areas are present here. These cultural resources are significant. Preservation of this zone is recommended. If ground-disturbing activities are necessary, impacts should be limited to a depth of 30 cm and monitored. Otherwise, secondary testing, and full-scale data recovery may be required.

Zone II corresponds with the right of way on either side of the entrance road. This area is systematically disturbed to depths between 20 and 40 cm on average. However, well stratified deposits consistent in age and disposition with Zone I are preserved below this. Moreover, one shell-filled pit was identified, and based on similar finds at Locus B across the run there are likely others here as well. These cultural resources are significant. It is recommended that impacts involving cutting and filling be limited to the upper 30 cm and monitored. Deeper impacts would require secondary testing and possibly full scale data recovery.

Zone III is associated with the asphalt service road. Because we did not test below the asphalt we cannot state with certainty what the disposition of cultural resources are here. However, given the history of road construction here, it is likely that this areas is disturbed to depths between 40 cm and over 100 cmbs. It is recommended that all ground disturbing activities be monitored.

Spring-side

The spring-side tract corresponds with the extent of significant shell deposition within 8MR123 (Figure 7-9). Only one zone (IV) was identified in the vicinity of the spring. This tract was heavily impacted by shell mining activities that removed large quantities of cultural deposits and reworked others. That said, shovel testing, bucket augering, and stratigraphic testing documented significant cultural resources across the survey area. In many cases they are present within 10 cm of the surface. These include saturated and well preserved deposits up to 2 meters thick, saturated shell-free deposits, intact mining escarpments with dense vertebrate fauna, shell, and artifacts. REDACTED

Because of the significance of these deposits, it is recommended that these areas be subjected to only filling activities and not

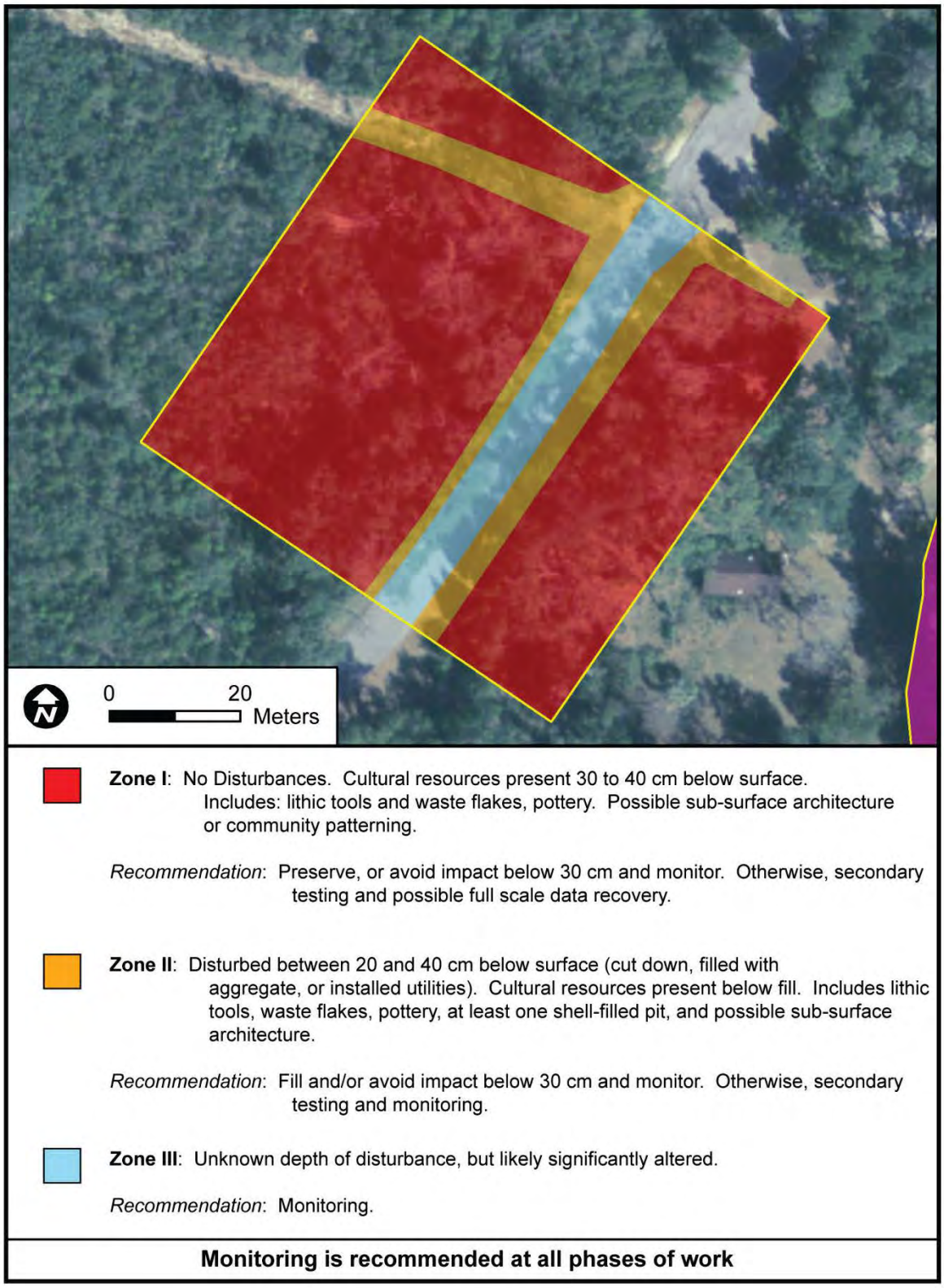

Figure 7-8. Recommendations for zones within the fee station tract.

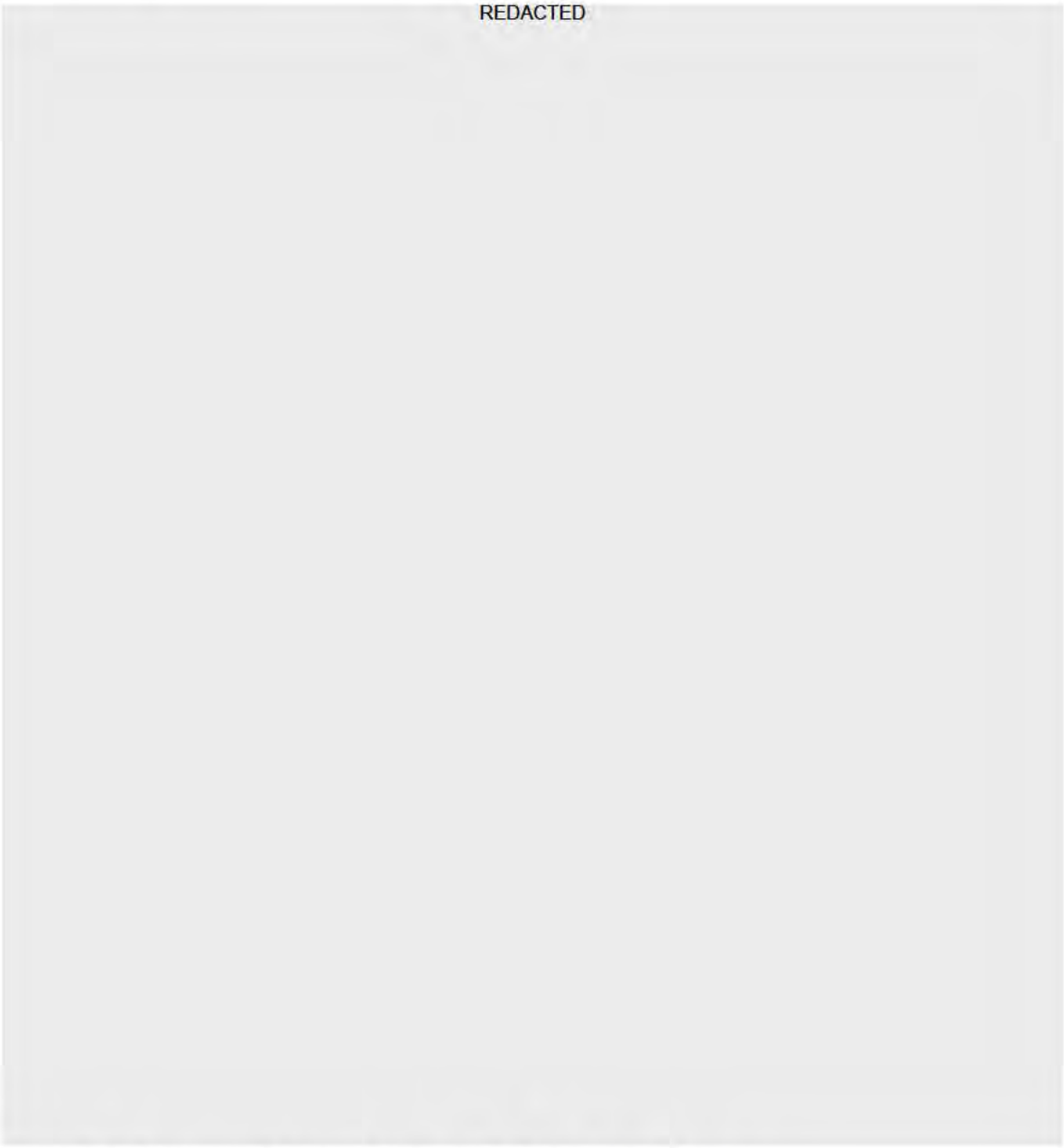

Figure 7-9. Recommendations for zones within the spring-side tract.

excavation. If small-scale excavations are necessary (such as for vegetation or infrastructure installation) it is recommended that personnel trained in cultural resource identification utilize a bucket-auger or similar low impact technique in conjunction with the details provided in this report. If planned actions will significantly alter cultural resources then secondary testing is recommended. Full-scale data recovery is a likely consequence of significant planned impacts within this zone.

Site 8LA4242

Site 8LA4242 was documented by pedestrian survey only (Figure 7-10). We have no knowledge of the depth, integrity, or culture-historical affiliations of deposits within the site boundaries. The site represents a mined shell mound, and retains surface architecture dating to the period of shell mining, likely 1923. On the basis of our findings we delineated two zones.

Zone IV corresponds with the surface extent of exposed shell deposits associated with the mined shell mound. Aside from shell, the only material culture noted here was fiber-tempered pottery. Based on our experiences at 8MR123 and across the run, it is likely that this tract includes stratified and preserved shell and sand deposits. Moreover, these no doubt contain abundant vertebrate fauna, and lithic and ceramic artifacts. Saturated deposits are suspected along the spring run. REDACTED It is recommended that the only actions that occur here involve filling. Because the area remains undocumented through subsurface testing, any planned ground disturbance activities need to be preceded by reconnaissance, secondary testing, and potentially full scale data recovery. Regardless, any action here should be monitored.

Zone V represents the well preserved tram road constructed as part of mining operations. This is a very significant resource, whose importance is derived from its association with the mined shell mound and its expression on the surface. It is recommended that this zone be preserved and completely avoided. Any subsequent modification, including the emplacement of fill, would affect this feature's eligibility for inclusion on the National Register of Historic Places.

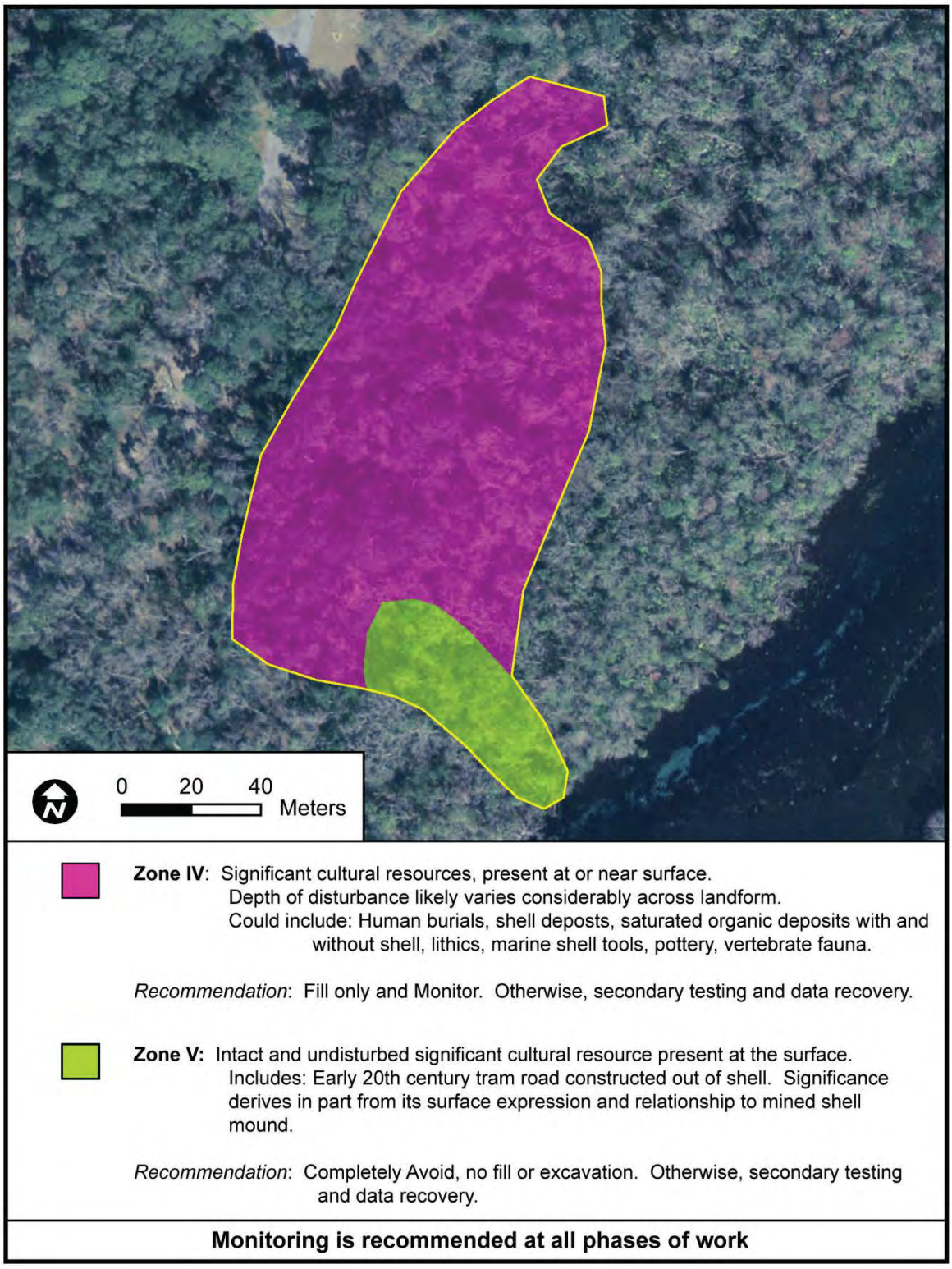

Figure 7-10. Recommendations for zones within the 8LA4242 tract.

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APPENDIX A
SHOVEL TEST DATA

Table Heading Definitions:

STP: Shovel Test Pit Identification

FS: Field Specimen Number

NORTH: Northing in UTM, Zone 17N, NAD1983

EAST: Easting in UTM, Zone 17N, NAD1983

AREA: Shovel Test Reconnaissance Area

Z: Surface elevation derived from Volusia County LiDAR (meters NAVD 1988)

MAX: Maximum excavation depth, meters below surface

DISTURBED: Depth of disturbed deposits, meters below surface

CULTURAL: Depth range of cultural deposits, centimeters below surface

SHELL: Depth range of shell-bearing deposits, centimeters below surface

POTTERY: Depth range of pottery-bearing deposits, centimeters below surface

LITHICS: Depth range of lithic artifact-bearing deposits, centimeters below Surface

VERTFAUNA: Depth range of vertebrate fauna-bearing deposits, centimeters below surface

STP	FS	NORTH	EAST	AREA	Z	MAX	DISTURBED	CULTURAL	SHELL	POTTERY	LITHICS	VERTFAUNA
A-1	2	3235632.2	437470.6	A	8.00	1.65		100 TO 100 CM				
A-2	1	3235630.2	437480.5	A	7.77	1.04		80 TO 80 CM				
A-3	3	3235631.8	437488.7	A	7.57	1.50		90 TO 110 CM				
A-4	4	3235631.3	437499.2	A	7.50	1.55		80 TO 100 CM				
A-5	5	3235629.6	437510.3	A	7.39	1.00		25 TO 65 CM			25 TO 65 CM	
A-6	6	3235630.3	437520.6	A	7.27	1.60		30 TO 130 CM		83 TO 83 CM	30 TO 130 CM	
A-7	7	3235630.3	437528.7	A	7.18	1.40		40 TO 110 CM		50 TO 60 CM	40 TO 110 CM	
A-8	8	3235629.6	437540.4	A	7.09	1.10		30 TO 90 CM			30 TO 90 CM	
A-9	9	3235629.2	437550.2	A	6.98	1.20		50 TO 110 CM		50 TO 65 CM	100 TO 110 CM	
A-10	10	3235628.1	437560.1	A	7.20	1.00		77 TO 77 CM			77 TO 77 CM	
A-11	11	3235629.6	437568.7	A	6.94	1.05		56 TO 56 CM		56 TO 56 CM		
A-12	12	3235628.1	437580.4	A	6.90	1.00		50 TO 50 CM			50 TO 50 CM	
A-13		3235627.2	437589.9	A	6.99	1.00						
A-14	13	3235627.6	437598.2	A	6.94	1.70		67 TO 120 CM			67 TO 120 CM	
A-15		3235626.2	437609.4	A	6.38	1.02						
A-16		3235626.6	437619.3	A	4.76	1.00						
A-17	14	3235627.8	437628.2	A	5.93	1.50		50 TO 150 CM			50 TO 150 CM	
A-18	15	3235626.9	437640.6	A	6.48	1.00		52 TO 100 CM			52 TO 100 CM	
A-19	16	3235626.4	437649.9	A	6.01	1.00		10 TO 90 CM			10 TO 90 CM	
B-1		3235621.9	437470.4	A	7.88	1.00						
B-2	21	3235621.2	437480.2	A	7.57	1.10		60 TO 98 CM			60 TO 98 CM	
B-4	22	3235621.4	437500.7	A	7.48	1.00		100 TO 100 CM			100 TO 100 CM	
B-5	23	3235621.6	437510.0	A	7.41	1.05		90 TO 90 CM			90 TO 90 CM	
B-6	25	3235621.9	437519.2	A	7.44	1.60		35 TO 90 CM			35 TO 90 CM	
B-7	24	3235622.0	437529.9	A	7.09	1.00		70 TO 80 CM		70 TO 80 CM	70 TO 80 CM	
B-8	26	3235618.3	437539.5	A	7.23	1.00		50 TO 90 CM	50 TO 90 CM	50 TO 90 CM	50 TO 90 CM	
B-9	27	3235618.6	437551.6	A	6.93	1.35		45 TO 85 CM	45 TO 75 CM	45 TO 75 CM	75 TO 85 CM	
B-10	28	3235618.2	437560.3	A	7.15	1.65		100 TO 103 CM			100 TO 103 CM	
B-11	29	3235618.8	437568.6	A	7.06	1.40		100 TO 103 CM			100 TO 103 CM	
B-12	30	3235618.0	437580.7	A	6.93	1.00		85 TO 85 CM			85 TO 85 CM	
B-13	31	3235618.7	437590.7	A	7.17	1.00		50 TO 50 CM			50 TO 50 CM	
B-14		3235618.6	437600.1	A	6.99	1.00						
B-15	33	3235617.5	437610.4	A	5.05	1.07		43 TO 43 CM				
B-16	32	3235617.5	437620.5	A	5.92	1.00		0 TO 0 CM				

STP	FS	NORTH	EAST	AREA	Z	MAX	DISTURBED	CULTURAL	SHELL	POTTERY	LITHICS	VERTFAUNA
B-17		3235617.0	437628.3	A	6.76	1.10						
B-18	35	3235617.2	437639.7	A	6.58	1.01		36 TO 90 CM			36 TO 90 CM	
B-19	34	3235618.0	437651.0	A	6.39	1.08		60 TO 60 CM			60 TO 60 CM	
C-1	48	3235611.7	437468.9	A	7.64	1.00		60 TO 90 CM			60 TO 90 CM	
C-2		3235610.3	437480.3	A	7.63	1.10						
C-4	47	3235610.1	437499.6	A	7.46	1.70		60 TO 100 CM		90 TO 100 CM	60 TO 100 CM	
C-5	46	3235609.4	437509.7	A	7.33	1.00		50 TO 90 CM		60 TO 75 CM	50 TO 90 CM	
C-6	45	3235609.8	437519.0	A	7.21	1.10		60 TO 85 CM			60 TO 85 CM	
C-7	44	3235609.1	437529.7	A	7.19	1.70		60 TO 100 CM			60 TO 100 CM	
C-8	43	3235610.6	437541.1	A	7.25	1.04		50 TO 100 CM		50 TO 100 CM	50 TO 100 CM	
C-9	40	3235609.2	437548.8	A	7.16	1.00		60 TO 90 CM			60 TO 90 CM	
C-10	42	3235608.6	437558.7	A	7.14	1.70		0 TO 110 CM		60 TO 70 CM	0 TO 110 CM	
C-11	41	3235608.6	437569.8	A	7.06	1.71		20 TO 100 CM		50 TO 60 CM	20 TO 100 CM	
C-12	38	3235607.9	437578.4	A	6.95	1.75		100 TO 110 CM			100 TO 110 CM	
C-13	39	3235607.2	437588.7	A	7.16	1.85		60 TO 100 CM			60 TO 100 CM	
C-14		3235607.3	437598.8	A	7.02	1.00						
C-15	36	3235609.7	437608.7	A	5.39	1.00		17 TO 17 CM				
C-16		3235607.9	437620.5	A	6.66	1.00						
C-17		3235607.7	437629.5	A	6.78	1.00						
C-18	37	3235607.9	437638.7	A	6.59	1.00		90 TO 90 CM			90 TO 90 CM	
C-19		3235607.2	437648.5	A	6.32	1.00	0.16					
D-1	49	3235601.4	437469.8	A	7.60	1.00		57 TO 90 CM		57 TO 57 CM	80 TO 90 CM	
D-2	63	3235599.3	437477.9	A	7.88	1.05		40 TO 80 CM		40 TO 80 CM	40 TO 80 CM	
D-3	62	3235600.6	437489.2	A	7.56	2.00		20 TO 105 CM			20 TO 105 CM	
D-4	57	3235600.7	437499.3	A	7.36	1.00	0.30	30 TO 90 CM			30 TO 90 CM	
D-5	55	3235599.8	437507.9	A	7.23	1.05	0.14	60 TO 100 CM		80 TO 90 CM	60 TO 100 CM	
D-6	56	3235599.9	437519.1	A	7.17	1.00	0.35	30 TO 90 CM			30 TO 90 CM	
D-7	58	3235600.3	437529.1	A	7.14	1.00	0.25	10 TO 80 CM			70 TO 80 CM	
D-8	59	3235599.9	437539.9	A	7.17	2.05	0.19	30 TO 120 CM			30 TO 120 CM	
D-9	60	3235598.1	437548.7	A	7.10	1.02	0.17	50 TO 80 CM	30 TO 70 CM	50 TO 80 CM	50 TO 80 CM	
D-10	61	3235598.4	437559.3	A	7.13	1.80		60 TO 160 CM			60 TO 160 CM	

STP	FS	NORTH	EAST	AREA	Z	MAX	DISTURBED	CULTURAL	SHELL	POTTERY	LITHICS	VERTFAUNA
D-11	66	3235599.0	437569.2	A	7.05	1.00		40 TO 90 CM			40 TO 90 CM	
D-12	64	3235599.6	437581.3	A	6.99	1.05		60 TO 90 CM			60 TO 90 CM	
D-13	65	3235600.1	437589.1	A	7.00	1.05		30 TO 90 CM			30 TO 90 CM	
D-14	67	3235599.1	437598.6	A	7.08	1.00		50 TO 90 CM			50 TO 90 CM	
D-15	68	3235598.3	437611.6	A	6.32	1.70		55 TO 110 CM			55 TO 110 CM	
D-16	79	3235597.7	437620.0	A	6.78	1.00	0.19	70 TO 90 CM			70 TO 90 CM	
E-1	50	3235591.0	437468.9	A	7.84	1.10		60 TO 90 CM		60 TO 90 CM	60 TO 90 CM	
E-2	77	3235590.2	437479.1	A	7.92	1.05	0.20	40 TO 100 CM		40 TO 100 CM	50 TO 100 CM	
E-3	70	3235590.9	437489.8	A	7.57	1.00	0.20	0 TO 90 CM			40 TO 90 CM	
E-4	71	3235590.2	437498.7	A	7.40	1.55	0.17	5 TO 100 CM		55 TO 55 CM	5 TO 100 CM	
E-5	69	3235590.2	437509.5	A	7.34	1.50	0.10	70 TO 100 CM			70 TO 100 CM	
E-6	72	3235591.4	437518.4	A	7.28	1.65	0.15	20 TO 100 CM		60 TO 80 CM	60 TO 100 CM	60 TO 100 CM
E-7	74	3235590.0	437529.8	A	7.27	1.70	0.23	55 TO 100 CM		55 TO 100 CM	75 TO 85 CM	
E-8	73	3235589.2	437540.3	A	7.31	1.00	0.10	5 TO 5 CM			5 TO 5 CM	
E-9	75	3235589.3	437548.7	A	7.22	1.00	0.18	50 TO 90 CM		50 TO 65 CM	70 TO 90 CM	
E-10	76	3235589.6	437557.3	A	7.09	1.03	0.26	60 TO 70 CM			60 TO 70 CM	
E-11	86	3235588.9	437568.4	A	6.98	1.65	0.20	50 TO 100 CM		50 TO 70 CM	50 TO 100 CM	
E-12	81	3235587.7	437579.1	A	6.77	1.00	0.20	30 TO 60 CM			30 TO 60 CM	
E-13	78	3235587.2	437590.9	A	6.97	1.00	0.22	70 TO 90 CM			70 TO 90 CM	
E-14	83	3235588.3	437596.9	A	6.88	1.00		50 TO 60 CM			50 TO 60 CM	
F-1	51	3235580.7	437468.8	A	8.07	1.55		70 TO 106 CM			70 TO 105 CM	
F-2	142	3235580.4	437479.6	A	7.94	1.65	0.23	23 TO 145 CM			23 TO 145 CM	
F-3	143	3235581.2	437489.0	A	7.58	1.00		33 TO 90 CM			33 TO 90 CM	
F-4	145	3235580.7	437499.3	A	7.40	1.00	0.17	20 TO 80 CM		20 TO 80 CM	20 TO 80 CM	
F-5	146	3235580.4	437509.4	A	7.35	1.00	0.25	85 TO 90 CM			85 TO 90 CM	
F-6	148	3235580.8	437518.9	A	7.28	1.50	0.20	50 TO 90 CM			50 TO 90 CM	
F-7	149	3235579.4	437529.1	A	7.28	1.30	0.32	36 TO 100 CM		36 TO 100 CM	36 TO 100 CM	
F-8	151	3235580.3	437539.3	A	7.35	1.50	0.20	0 TO 90 CM		0 TO 90 CM	0 TO 90 CM	
F-9	152	3235579.8	437550.3	A	7.31	1.35	0.25	75 TO 100 CM			75 TO 100 CM	
F-10	153	3235578.5	437560.4	A	7.14	1.13	0.29	65 TO 90 CM			65 TO 90 CM	
F-11	127	3235578.5	437567.8	A	7.10	1.65		57 TO 100 CM	80 TO 93 CM	80 TO 90 CM	50 TO 100 CM	
F-12	128	3235578.9	437579.5	A	7.01	1.40		40 TO 140 CM			40 TO 140 CM	

STP	FS	NORTH	EAST	AREA	Z	MAX	DISTURBED	CULTURAL	SHELL	POTTERY	LITHICS	VERTFAUNA
F-13	82	3235578.1	437589.0	A	6.97	1.50	0.20	50 TO 95 CM			50 TO 95 CM	
F-14	84	3235577.9	437598.6	A	6.95	1.00		50 TO 80 CM			50 TO 80 CM	
G-1	52	3235571.5	437466.0	A	8.07	1.10		50 TO 100 CM		50 TO 100 CM	50 TO 100 CM	
G-2	94	3235570.9	437477.4	A	8.00	1.36	1.03	19 TO 103 CM			19 TO 103 CM	
G-3	88	3235571.0	437489.8	A	7.66	1.40	0.23	25 TO 90 CM			25 TO 90 CM	
G-4	87	3235571.1	437498.2	A	7.57	1.40	0.30	70 TO 100 CM			70 TO 100 CM	
G-5		3235571.5	437508.2	A	7.44	1.05	0.28					
G-6	89	3235570.6	437517.9	A	7.35	1.00	0.50	20 TO 90 CM			20 TO 90 CM	
G-7	90	3235570.7	437528.0	A	7.27	1.57	0.45	0 TO 100 CM		45 TO 100 CM	0 TO 100 CM	
G-8	91	3235569.3	437538.9	A	7.31	1.50	0.16	20 TO 80 CM		60 TO 75 CM	20 TO 80 CM	
G-9	92	3235569.4	437548.0	A	7.30	1.00	0.20	35 TO 90 CM			35 TO 90 CM	
G-10	93	3235569.2	437559.2	A	7.22	1.00	0.17	50 TO 100 CM		50 TO 100 CM	50 TO 100 CM	
G-11	126	3235565.8	437570.6	A	7.14	1.00		50 TO 90 CM	30 TO 100 CM	50 TO 60 CM	60 TO 90 CM	
G-12	125	3235568.1	437578.9	A	7.09	1.60		90 TO 160 CM			90 TO 160 CM	
G-13	80	3235567.3	437590.9	A	6.99	1.12		60 TO 100 CM		60 TO 70 CM	60 TO 100 CM	
G-14	85	3235571.4	437595.6	A	6.96	1.05		30 TO 90 CM			30 TO 90 CM	
G-15	161	3235568.8	437606.3	A	6.98	1.82		80 TO 135 CM	80 TO 100 CM		80 TO 135 CM	
H-1	53	3235561.5	437468.8	A	7.92	1.54		65 TO 100 CM		65 TO 100 CM	65 TO 100 CM	
H-2	140	3235561.3	437479.1	A	7.98	1.70		40 TO 150 CM			40 TO 150 CM	
H-3	130	3235561.8	437490.8	A	7.91	1.50	0.27	50 TO 130 CM			50 TO 130 CM	
H-4	131	3235563.5	437498.6	A	7.80	1.50	0.26	60 TO 100 CM		90 TO 90 CM	60 TO 100 CM	
H-5	132	3235562.7	437508.6	A	7.75	1.55	0.46	30 TO 100 CM			30 TO 100 CM	30 TO 100 CM
H-6	133	3235561.2	437518.7	A	7.67	1.50	0.68	45 TO 100 CM		98 TO 98 CM		
H-7	136	3235560.8	437528.8	A	7.53	1.65	0.58	45 TO 100 CM		80 TO 100 CM	45 TO 100 CM	
H-8	144	3235561.4	437538.5	A	7.45	1.10	0.41	50 TO 80 CM		50 TO 60 CM	50 TO 80 CM	
H-9	147	3235559.6	437548.7	A	7.45	1.10	0.27	50 TO 90 CM			50 TO 90 CM	
H-10	150	3235559.7	437557.2	A	7.37	1.00	0.30	60 TO 80 CM			60 TO 80 CM	
H-11	156	3235556.5	437568.0	A	7.24	1.55		50 TO 100 CM		50 TO 80 CM	50 TO 100 CM	
H-12	129	3235557.6	437576.9	A	7.06	1.10		85 TO 95 CM			85 TO 95 CM	
H-13		3235558.9	437588.2	A	6.93	1.00						
I-1	54	3235552.2	437468.3	A	7.84	1.05		50 TO 90 CM		50 TO 73 CM	50 TO 90 CM	
I-2	159	3235550.5	437479.6	A	7.92	1.00	0.44	60 TO 90 CM			60 TO 90 CM	

STP	FS	NORTH	EAST	AREA	Z	MAX	DISTURBED	CULTURAL	SHELL	POTTERY	LITHICS	VERTFAUNA
I-3	154	3235550.9	437489.2	A	8.12	1.90	0.43	40 TO 155 CM			40 TO 155 CM	
I-4	135	3235551.4	437499.1	A	8.14	1.10	1.10	60 TO 104 CM			60 TO 104 CM	
I-5	134	3235550.8	437508.5	A	8.14	1.10	0.62	30 TO 90 CM			30 TO 90 CM	
I-6	137	3235550.5	437518.3	A	7.98	1.00	0.60	45 TO 90 CM			65 TO 90 CM	
I-7	138	3235550.0	437528.6	A	7.76	1.43	0.47	50 TO 100 CM		90 TO 100 CM	50 TO 100 CM	
I-8	139	3235551.5	437537.4	A	7.58	1.00	0.20	47 TO 80 CM			47 TO 80 CM	
I-9	158	3235549.4	437547.9	A	7.52	1.00	0.15	55 TO 90 CM		55 TO 90 CM	55 TO 90 CM	
I-10	157	3235547.5	437559.7	A	7.47	1.25	0.37	70 TO 80 CM			70 TO 80 CM	
I-11	155	3235547.4	437569.5	A	7.37	1.00	0.36	75 TO 90 CM			75 TO 90 CM	
J-1	141	3235540.5	437539.5	A	7.51	1.00	0.46	5 TO 90 CM			5 TO 90 CM	
J-2	160	3235538.5	437548.8	A	7.38	1.78	0.08	40 TO 100 CM		40 TO 40 CM	40 TO 100 CM	
K-1	17	3235637.2	437618.6	A	5.16	0.10		0 TO 10 CM			0 TO 10 CM	
K-2	18	3235637.5	437629.3	A	6.65	1.70		66 TO 140 CM			66 TO 105 CM	105 TO 170 CM
K-3	20	3235636.5	437639.2	A	6.49	1.00		53 TO 83 CM			53 TO 83 CM	
K-4	19	3235636.9	437649.4	A	6.04	1.00		45 TO 90 CM			45 TO 90 CM	
K-5	162	3235638.5	437591.3	A	6.90	1.00		65 TO 90 CM			65 TO 90 CM	
K-6	164	3235637.2	437599.1	A	6.85	1.00		65 TO 90 CM			65 TO 90 CM	
K-7	163	3235637.2	437608.8	A	6.62	1.00		60 TO 75 CM			60 TO 75 CM	
L-1	96	3235517.4	437551.8	C	6.77	1.30	0.51	90 TO 100 CM			90 TO 100 CM	
L-2	97	3235507.0	437560.2	C	6.46	1.00	1.00	0 TO 0 CM				
L-3	95	3235500.3	437562.3	C	6.28	1.00	0.35	10 TO 50 CM			10 TO 50 CM	
L-4	98	3235491.4	437566.5	C	6.01	1.00		10 TO 50 CM			10 TO 50 CM	
L-5	99	3235482.9	437575.5	C	6.03	1.35	0.21	75 TO 100 CM			75 TO 100 CM	
L-6	101	3235478.2	437581.6	C	6.28	1.00	0.33	80 TO 90 CM			80 TO 90 CM	
L-7	100	3235467.6	437584.7	C	6.30	1.60	0.48	60 TO 95 CM			60 TO 95 CM	
L-8	104	3235461.9	437597.3	C	6.71	1.55	0.15	50 TO 125 CM	59 TO 100 CM		50 TO 125 CM	50 TO 125 CM
L-9	102	3235455.8	437585.8	C	6.58	1.00	0.17	25 TO 60 CM	17 TO 60 CM		25 TO 35 CM	35 TO 60 CM
L-10	103	3235452.1	437595.5	C	6.90	1.05		10 TO 90 CM	30 TO 50 CM		30 TO 90 CM	30 TO 90 CM
L-11	106	3235451.9	437605.8	C	6.54	1.45	0.28	15 TO 95 CM			15 TO 95 CM	
L-12	105	3235453.3	437615.0	C	6.17	1.02	0.27	10 TO 65 CM	27 TO 65 CM		10 TO 65 CM	10 TO 65 CM
L-13	107	3235449.7	437627.7	C	5.84	1.50	0.32	10 TO 100 CM	32 TO 120 CM			10 TO 90 CM
L-14	108	3235447.6	437635.5	C	5.65	1.40	0.20	20 TO 100 CM	20 TO 40 CM			20 TO 100 CM

STP	FS	NORTH	EAST	AREA	Z	MAX	DISTURBED	CULTURAL	SHELL	POTTERY	LITHICS	VERTFAUNA
L-15	109	3235444.9	437642.1	C	5.23	1.10	0.28	20 TO 90 CM	28 TO 110 CM	30 TO 60 CM	30 TO 90 CM	30 TO 90 CM
L-16	110	3235444.1	437653.2	C	4.88	1.80	0.78	15 TO 165 CM			60 TO 165 CM	10 TO 78 CM
L-17	111	3235436.8	437662.4	C	4.62	0.10	0.10	0 TO 10 CM	0 TO 10 CM			0 TO 10 CM
L-18	113	3235427.8	437664.2	C	3.26	1.00	0.38	0 TO 38 CM		0 TO 38 CM	0 TO 38 CM	0 TO 38 CM
L-19	114	3235419.8	437664.8	C	2.38	1.00	0.20	25 TO 85 CM	20 TO 85 CM		25 TO 85 CM	40 TO 85 CM
L-20	112	3235437.6	437661.4	C	4.58	0.20	0.20	0 TO 20 CM	0 TO 20 CM			0 TO 20 CM
L-21	115	3235409.1	437665.8	C	1.73	1.50	1.09	66 TO 100 CM	109 TO 150 CM			
L-22	117	3235399.1	437663.9	C	1.43	1.45	1.25	30 TO 105 CM		30 TO 54 CM		30 TO 105 CM
L-23	116	3235389.2	437661.9	C	1.30	1.30	0.28	15 TO 90 CM	28 TO 130 CM			15 TO 90 CM
L-24	118	3235380.4	437657.5	C	1.06	1.40	0.70	50 TO 100 CM	70 TO 140 CM			50 TO 140 CM
L-25	121	3235377.9	437652.3	C	0.94	1.40	0.57	15 TO 140 CM	57 TO 140 CM	57 TO 140 CM	57 TO 140 CM	17 TO 140 CM
L-26	120	3235369.8	437642.2	C	0.85	1.25	0.36	35 TO 80 CM	36 TO 125 CM	65 TO 75 CM		35 TO 80 CM
L-27	119	3235363.2	437633.9	C	0.86	1.25	0.50	10 TO 65 CM	50 TO 125 CM	10 TO 50 CM	10 TO 50 CM	10 TO 65 CM
L-28	124	3235360.9	437625.9	C	0.90	0.85	0.68	30 TO 85 CM	68 TO 85 CM			30 TO 85 CM
L-29	122	3235363.4	437616.4	C	0.93	0.83	0.63	0 TO 45 CM	63 TO 83 CM		0 TO 45 CM	
L-30	123	3235366.0	437607.1	C	0.93	0.62	0.52		48 TO 62 CM			0 TO 62 CM
M-1	165	3235363.5	437290.1	B	7.65	1.46	0.38	50 TO 90 CM			50 TO 90 CM	
M-2	166	3235371.7	437294.9	B	7.74	1.15	0.28	60 TO 115 CM			60 TO 115 CM	
M-3	167	3235378.5	437301.8	B	7.41	1.30	0.20	55 TO 95 CM			55 TO 95 CM	
M-4	168	3235388.5	437309.0	B	7.09	1.60	0.21	32 TO 114 CM	32 TO 114 CM	32 TO 114 CM	32 TO 114 CM	32 TO 114 CM
M-6	170	3235397.2	437312.4	B	7.35	1.10	0.38	65 TO 80 CM			65 TO 80 CM	
M-6	170	3235404.0	437318.8	B	7.16	1.10	0.38	65 TO 80 CM			65 TO 80 CM	
M-7	171	3235411.5	437324.9	B	6.93	0.75	0.35	50 TO 60 CM			50 TO 60 CM	
M-8	172	3235420.2	437329.8	B	6.81	1.63	0.44	55 TO 100 CM			55 TO 100 CM	
N-1	180	3235356.9	437300.4	B	7.24	1.35		60 TO 135 CM			60 TO 135 CM	
N-2	179	3235367.0	437304.0	B	7.15	1.00		20 TO 80 CM		20 TO 80 CM		
N-3	178	3235372.6	437309.7	B	6.84	1.40		25 TO 100 CM		25 TO 28 CM	28 TO 100 CM	
N-4	177	3235381.5	437316.0	B	6.65	1.35		25 TO 100 CM		25 TO 70 CM	70 TO 100 CM	100 TO 100 CM
N-5	176	3235389.7	437320.6	B	6.59	1.55		75 TO 130 CM			75 TO 130 CM	
N-6	175	3235399.3	437329.8	B	6.28	1.00		50 TO 90 CM			50 TO 90 CM	
N-7	174	3235405.3	437333.9	B	6.06	1.65		55 TO 100 CM		55 TO 100 CM	55 TO 100 CM	
N-8	173	3235413.6	437337.5	B	6.17	1.60		40 TO 100 CM		80 TO 100 CM	40 TO 100 CM	

STP	FS	NORTH	EAST	AREA	Z	MAX	DISTURBED	CULTURAL	SHELL	POTTERY	LITHICS	VERTFAUNA
O-1	181	3235350.4	437308.3	B	6.46	1.00		75 TO 95 CM			75 TO 95 CM	
O-2	182	3235359.5	437313.0	B	6.42	1.70		70 TO 105 CM			70 TO 105 CM	
O-3	183	3235367.2	437318.3	B	6.17	1.20		70 TO 100 CM			70 TO 100 CM	
O-4	184	3235378.2	437325.7	B	6.11	1.00	0.08	10 TO 80 CM	0 TO 8 CM	10 TO 20 CM	70 TO 80 CM	
O-5		3235384.4	437331.7	B	6.11	1.00						
O-6	185	3235394.0	437336.0	B	5.85	1.80	0.44	10 TO 100 CM	0 TO 44 CM	10 TO 100 CM	10 TO 100 CM	10 TO 100 CM
O-7	186	3235400.3	437341.8	B	5.53	1.00	0.10	10 TO 70 CM	0 TO 30 CM	10 TO 30 CM		10 TO 70 CM
P-1	219	3235371.8	437279.2	B	8.07	1.00		80 TO 85 CM			80 TO 85 CM	
P-2		3235380.8	437285.2	B	8.04	1.30						
P-3	213	3235389.5	437290.7	B	8.02	1.80		80 TO 140 CM			80 TO 140 CM	
P-4	209	3235396.5	437295.2	B	7.80	1.55		90 TO 100 CM			90 TO 100 CM	
P-5	208	3235404.2	437301.7	B	7.61	1.70		50 TO 150 CM			50 TO 150 CM	
P-6	202	3235411.1	437307.6	B	7.79	1.05		40 TO 40 CM			40 TO 40 CM	
P-7		3235418.8	437312.1	B	7.89	0.65						
P-8	187	3235426.8	437315.7	B	7.51	1.15		60 TO 70 CM			60 TO 70 CM	
Q-1	220	3235378.5	437272.1	B	8.40	1.60		75 TO 100 CM			75 TO 100 CM	
Q-2	218	3235386.1	437277.7	B	8.19	1.00		75 TO 100 CM		75 TO 75 CM	75 TO 100 CM	
Q-3	214	3235393.0	437282.3	B	8.16	1.60		50 TO 120 CM			50 TO 120 CM	
Q-4	210	3235402.4	437286.5	B	8.39	1.00		40 TO 50 CM			40 TO 50 CM	
Q-6	203	3235419.5	437298.1	B	8.47	1.50		30 TO 100 CM		30 TO 70 CM	50 TO 90 CM	80 TO 100 CM
Q-7	201	3235425.3	437302.8	B	8.56	1.40		35 TO 100 CM		35 TO 50 CM	35 TO 80 CM	80 TO 100 CM
Q-8	188	3235432.9	437309.4	B	8.44	1.50		10 TO 100 CM			10 TO 100 CM	50 TO 100 CM
R-1	221	3235383.4	437263.3	B	8.81	1.10		75 TO 85 CM		75 TO 85 CM		
R-2	217	3235391.0	437268.6	B	8.34	1.00		75 TO 90 CM			75 TO 90 CM	
R-3		3235398.4	437273.0	B	8.50	1.00						
R-4	211	3235407.9	437277.9	B	8.67	1.10		25 TO 70 CM			25 TO 70 CM	
R-5	207	3235415.9	437284.1	B	8.89	1.00		50 TO 80 CM			50 TO 80 CM	
R-5	207	3235410.3	437292.7	B	8.49	1.00		50 TO 80 CM			50 TO 80 CM	
R-6	204	3235424.9	437291.5	B	8.84	2.20		50 TO 150 CM		50 TO 50 CM	50 TO 150 CM	
R-7		3235429.6	437295.3	B	8.72	1.40						
R-8	189	3235438.1	437301.9	B	9.08	1.05		40 TO 90 CM		40 TO 60 CM	40 TO 90 CM	
S-1	222	3235389.2	437257.2	B	9.15	1.00		40 TO 70 CM		40 TO 50 CM	40 TO 70 CM	

STP	FS	NORTH	EAST	AREA	Z	MAX	DISTURBED	CULTURAL	SHELL	POTTERY	LITHICS	VERTFAUNA
S-2	216	3235396.9	437261.9	B	9.09	1.60		35 TO 100 CM		35 TO 50 CM	50 TO 100 CM	
S-3	215	3235404.6	437266.9	B	9.48	1.80		40 TO 150 CM			40 TO 150 CM	
S-4	212	3235411.9	437271.0	B	9.02	1.00		20 TO 40 CM			20 TO 40 CM	
S-5	206	3235419.5	437275.5	B	9.57	1.05		50 TO 80 CM			50 TO 80 CM	
S-6	205	3235427.6	437282.0	B	8.86	1.10		30 TO 90 CM			30 TO 90 CM	80 TO 90 CM
S-7	191	3235437.2	437287.3	B	9.00	0.85	0.85	40 TO 85 CM		40 TO 85 CM		
S-8	190	3235444.4	437293.3	B	9.30	1.60		50 TO 140 CM		50 TO 80 CM	50 TO 140 CM	

APPENDIX B
CATALOG

FS	Provenience	Description	Size Grade	Count	Weight (g)
1 1	ST02, D 80 CM; Transect A	Debitage, Chert	>0 25"	1	2 1
2 1	ST01, D 90 TO 100 CM; Transect A	Debitage, Chert	>0 25"	1	0 4
3 1	ST03, D 90 TO 100 CM; Transect A	Debitage, Chert	>0 25"	2	0 4
4 1	ST04, D 80 TO 100 CM; Transect A	Debitage, Chert	>0 25"	3	2 2
4 2	ST04, D 80 TO 100 CM; Transect A	Debitage, Silicified Coral	>0 25"	2	0 5
5 1	ST05, D 25 TO 65 CM; Transect A	Debitage, Chert	>0 25"	3	0 8
5 2	ST05, D 25 TO 65 CM; Transect A	Modified Flake	>0 25"	1	1 3
6 1	ST06, D 30 TO 130 CM; Transect A	Debitage, Chert	>0 25"	4	0 6
6 2	ST06, D 30 TO 130 CM; Transect A	Orange Plain, Body	>0 25"	1	1 8
6 3	ST06, D 30 TO 130 CM; Transect A	Microlith	>0 25"	1	0 3
7 1	ST07, D 49 TO 110 CM; Transect A	Debitage, Silicified Coral	>0 25"	28	3 8
7 2	ST07, D 49 TO 110 CM; Transect A	Debitage, Chert	>0 25"	9	2 9
7 3	ST07, D 49 TO 110 CM; Transect A	Orange Plain, Body	>0 25"	1	0 5
8 1	ST08, D 30 TO 90 CM; Transect A	Microlith	>0 25"	1	0 1
8 2	ST08, D 30 TO 90 CM; Transect A	Debitage, Silicified Coral	>0 25"	14	2 9
8 3	ST08, D 30 TO 90 CM; Transect A	Debitage, Chert	>0 25"	1	0 1
9 1	ST09, D 50 TO 110 CM; Transect A	Orange Incised, Body	>0 25"	1	8 0
9 2	ST09, D 50 TO 110 CM; Transect A	Orange Plain, Crumb	>0 25"	1	0 3
9 3	ST09, D 50 TO 110 CM; Transect A	Debitage, Silicified Coral	>0 25"	1	0 1
9 4	ST09, D 50 TO 110 CM; Transect A	Debitage, Chert	>0 25"	1	0 1
10 1	ST10, D 70 TO 80 CM; Transect A	Biface, Fragment	>0 25"	1	12 4
11 1	ST11, D 56 CM; Transect A	St Johns Plain, Body	>0 25"	1	2 0
11 2	ST11, D 56 CM; Transect A	St Johns Plain, Crumb	>0 25"	1	0 1
12 1	ST12, D 50 TO 60 CM; Transect A	Debitage, Chert	>0 25"	1	0 1
13 1	ST14, D 40 TO 120 CM; Transect A	Debitage, Chert	>0 25"	19	5 5
14 1	ST17, D 50 TO 110 CM; Transect A	Debitage, Chert	>0 25"	6	2 3
15 1	ST18, D 60 TO 80 CM; Transect A	Debitage, Chert	>0 25"	2	0 8
16 1	ST19, D 10 TO 90 CM; Transect A	Debitage, Chert	>0 25"	12	4 8
16 2	ST19, D 10 TO 90 CM; Transect A	Debitage, Silicified Coral	>0 25"	1	0 1
17 1	ST01, D 10 CM; Transect K	Debitage, Chert	>0 25"	1	0 4
18 1	ST02, D 66 TO 140 CM; Transect K	Debitage, Chert	>0 25"	3	1 1
18 2	ST02, D 66 TO 140 CM; Transect K	Vertebrate Fauna, Unmodified	>0 25"	3	1 6
19 1	ST04, D 45 TO 90 CM; Transect K	Debitage, Chert	>0 25"	3	1 0
20 1	ST03, D 53 TO 83 CM; Transect K	Debitage, Chert	>0 25"	4	2 9
20 2	ST03, D 53 TO 83 CM; Transect K	Biface, Fragment	>0 25"	1	0 1
21 1	ST02, D 60 TO 98 CM; Transect B	Debitage, Chert	>0 25"	4	1 0
22 1	ST04, D 100 CM; Transect B	Uniface	>0 25"	1	0 6
23 1	ST05, D 90 CM; Transect B	Debitage, Chert	>0 25"	1	0 1
24 1	ST07, D 70 TO 80 CM; Transect B	Orange Plain, Crumb	>0 25"	1	0 2
24 2	ST07, D 70 TO 80 CM; Transect B	Orange Plain, Body	>0 25"	1	1 6
24 3	ST07, D 70 TO 80 CM; Transect B	Debitage, Silicified Coral	>0 25"	1	0 1
24 4	ST07, D 70 TO 80 CM; Transect B	Debitage, Chert	>0 25"	1	0 1
25 1	ST06, D 35 TO 90 CM; Transect B	Debitage, Chert	>0 25"	4	0 3
26 1	ST08, D 50 TO 90 CM; Transect B	Orange Plain, Crumb	>0 25"	1	0 9
26 2	ST08, D 50 TO 90 CM; Transect B	Biface, Fragment	>0 25"	1	0 6
26 3	ST08, D 50 TO 90 CM; Transect B	Debitage, Chert	>0 25"	2	2 0
27 1	ST09, D 45 TO 85 CM; Transect B	Orange Plain, Body	>0 25"	16	61 9
27 2	ST09, D 45 TO 85 CM; Transect B	Orange Plain, Rim	>0 25"	1	3 1
27 3	ST09, D 45 TO 85 CM; Transect B	Debitage, Silicified Coral	>0 25"	1	2 7
27 4	ST09, D 45 TO 85 CM; Transect B	Debitage, Chert	>0 25"	2	0 2
27 5	ST09, D 45 TO 85 CM; Transect B	Uniface	>0 25"	1	0 2
27 6	ST09, D 45 TO 85 CM; Transect B	Orange Plain, Crumb	>0 25"	33	17 9
28 1	ST10, D 100 TO 103 CM; Transect B	Debitage, Silicified Coral	>0 25"	6	7 1
28 2	ST10, D 100 TO 103 CM; Transect B	Debitage, Chert	>0 25"	4	27 0
29 1	ST11, D 70 TO 105 CM; Transect B	Debitage, Chert	>0 25"	2	2 5
30 1	ST12, D 85 CM; Transect B	Debitage, Silicified Coral	>0 25"	1	0 1
30 2	ST12, D 85 CM; Transect B	Debitage, Chert	>0 25"	1	0 3
31 1	ST13, D 50 CM; Transect B	Debitage, Chert	>0 25"	1	0 2
32 1	ST16, D 50 TO 80 CM; Transect B	Vertebrate Fauna, Unmodified	>0 25"	1	0 1
32 2	ST16, D 50 TO 80 CM; Transect B	Debitage, Chert	>0 25"	1	0 1
33 1	ST15, D 40 TO 50 CM; Transect B	22 Cal Rimfire Cartridge	>0 25"	1	0 5
34 1	ST19, D 50 TO 60 CM; Transect B	Biface, Fragment	>0 25"	1	2 8
35 1	ST18, D 36 TO 90 CM; Transect B	Hafted Biface Fragment	>0 25"	1	4 4
35 2	ST18, D 36 TO 90 CM; Transect B	Biface, Fragment	>0 25"	1	7 1
35 3	ST18, D 36 TO 90 CM; Transect B	Debitage, Chert	>0 25"	56	21 4
36 1	ST15, D 17 CM; Transect C	Debitage, Chert	>0 25"	1	1 8

FS	Provenience	Description	Size Grade	Count	Weight (g)
37 1	ST18, D 90 CM; Transect C	Debitage, Chert	>0 25"	1	0 5
38 1	ST12, D 100 TO 110 CM; Transect C	Modified Flake	>0 25"	1	2 2
38 2	ST12, D 100 TO 110 CM; Transect C	Debitage, Silicified Coral	>0 25"	1	0 4
39 1	ST13, D 60 TO 100 CM; Transect C	Hafted Biface	>0 25"	1	4 1
39 2	ST13, D 60 TO 100 CM; Transect C	Debitage, Chert	>0 25"	6	3 5
40 1	ST09, D 60 TO 90 CM; Transect C	Microlith	>0 25"	1	0 2
40 2	ST09, D 60 TO 90 CM; Transect C	Modified Flake	>0 25"	1	4 9
40 3	ST09, D 60 TO 90 CM; Transect C	Debitage, Silicified Coral	>0 25"	4	0 3
40 4	ST09, D 60 TO 90 CM; Transect C	Debitage, Chert	>0 25"	3	0 3
41 1	ST11, D 20 TO 100 CM; Transect C	Orange Plain, Body	>0 25"	1	2 2
41 2	ST11, D 20 TO 100 CM; Transect C	Debitage, Chert	>0 25"	1	5 1
41 3	ST11, D 20 TO 100 CM; Transect C	Debitage, Chert	>0 25"	2	0 2
42 1	ST10, D 0 TO 110 CM; Transect C	Orange Plain, Body	>0 25"	1	2 8
42 2	ST10, D 0 TO 110 CM; Transect C	Orange Plain, Crumb	>0 25"	1	1 4
42 3	ST10, D 0 TO 110 CM; Transect C	Debitage, Silicified Coral	>0 25"	3	1 0
42 4	ST10, D 0 TO 110 CM; Transect C	Debitage, Chert	>0 25"	10	2 3
43 2	ST08, D 50 TO 100 CM; Transect C	Orange Plain, Crumb	>0 25"	2	4 4
43 3	ST08, D 50 TO 100 CM; Transect C	Debitage, Chert	>0 25"	1	0 5
44 1	ST07, D 60 TO 100 CM; Transect C	Orange Plain, Crumb	>0 25"	1	0 3
44 2	ST07, D 60 TO 100 CM; Transect C	Debitage, Silicified Coral	>0 25"	1	0 7
44 3	ST07, D 60 TO 100 CM; Transect C	Debitage, Chert	>0 25"	4	0 2
45 1	ST06, D 60 TO 85 CM; Transect C	Debitage, Silicified Coral	>0 25"	1	3 3
45 2	ST06, D 60 TO 85 CM; Transect C	Debitage, Chert	>0 25"	2	0 2
46 1	ST05, D 50 TO 90 CM; Transect C	Orange Plain, Body	>0 25"	1	2 3
46 2	ST05, D 50 TO 90 CM; Transect C	Microlith	>0 25"	1	0 6
46 3	ST05, D 50 TO 90 CM; Transect C	Debitage, Chert	>0 25"	6	1 4
47 1	ST04, D 60 TO 105 CM; Transect C	Hafted Biface Fragment	>0 25"	1	0 8
47 2	ST04, D 60 TO 105 CM; Transect C	Debitage, Chert	>0 25"	9	4 2
47 3	ST04, D 60 TO 105 CM; Transect C	Debitage, Silicified Coral	>0 25"	1	0 1
48 1	ST01, D 60 TO 90 CM; Transect C	Debitage, Silicified Coral	>0 25"	1	0 1
48 2	ST01, D 60 TO 90 CM; Transect C	Debitage, Chert	>0 25"	2	0 2
49 1	ST01, D 50 TO 90 CM; Transect D	Orange Plain, Body	>0 25"	1	2 3
49 2	ST01, D 50 TO 90 CM; Transect D	Debitage, Chert	>0 25"	1	0 1
50 1	ST01, D 60 TO 90 CM; Transect E	Orange Plain, Crumb	>0 25"	2	0 8
50 2	ST01, D 60 TO 90 CM; Transect E	Debitage, Chert	>0 25"	7	1 2
51 1	ST01, D 70 TO 105 CM; Transect F	Debitage, Silicified Coral	>0 25"	1	0 1
51 2	ST01, D 70 TO 105 CM; Transect F	Debitage, Chert	>0 25"	11	3 4
52 1	ST01, D 50 TO 100 CM; Transect G	Orange Plain, Crumb	>0 25"	2	0 7
52 2	ST01, D 50 TO 100 CM; Transect G	Debitage, Chert	>0 25"	7	0 6
53 1	ST01, D 65 TO 100 CM; Transect H	Orange Plain, Crumb	>0 25"	1	0 8
53 2	ST01, D 65 TO 100 CM; Transect H	Debitage, Chert	>0 25"	3	1 3
54 1	ST01, D 50 TO 90 CM; Transect I	Orange Plain, Body	>0 25"	3	8 6
54 2	ST01, D 50 TO 90 CM; Transect I	Orange Plain, Crumb	>0 25"	4	2 0
54 3	ST01, D 50 TO 90 CM; Transect I	Debitage, Chert	>0 25"	10	1 9
54 4	ST01, D 50 TO 90 CM; Transect I	Debitage, Silicified Coral	>0 25"	1	0 4
55 1	ST05, D 60 TO 100 CM; Transect D	Orange Incised, Body	>0 25"	1	2 9
55 2	ST05, D 60 TO 100 CM; Transect D	Hafted Biface Fragment	>0 25"	1	2 8
55 3	ST05, D 60 TO 100 CM; Transect D	Debitage, Chert	>0 25"	5	1 4
56 1	ST06, D 30 TO 90 CM; Transect D	Debitage, Chert	>0 25"	2	0 4
56 2	ST06, D 30 TO 90 CM; Transect D	Debitage, Silicified Coral	>0 25"	1	0 1
57 1	ST04, D 30 TO 90 CM; Transect D	Plastic Fragment	>0 25"	1	0 7
57 2	ST04, D 30 TO 90 CM; Transect D	Concrete Fragment	>0 25"	1	4 3
57 3	ST04, D 30 TO 90 CM; Transect D	Microlith	>0 25"	1	0 2
57 4	ST04, D 30 TO 90 CM; Transect D	Debitage, Chert	>0 25"	2	0 3
58 1	ST07, D 10 TO 80 CM; Transect D	Brick	>0 25"	1	5 2
58 2	ST07, D 10 TO 80 CM; Transect D	Debitage, Chert	>0 25"	1	0 1
58 3	ST07, D 10 TO 80 CM; Transect D	Debitage, Silicified Coral	>0 25"	1	0 3
59 1	ST08, D 30 TO 120 CM; Transect D	Debitage, Chert	>0 25"	8	2 9
59 2	ST08, D 30 TO 120 CM; Transect D	Debitage, Silicified Coral	>0 25"	2	0 2
60 1	ST09, D 50 TO 80 CM; Transect D	Orange Plain, Rim	>0 25"	1	0 4
60 2	ST09, D 50 TO 80 CM; Transect D	Debitage, Chert	>0 25"	5	0 6
61 1	ST10, D 60 TO 160 CM; Transect D	Debitage, Chert	>0 25"	31	6 4
61 2	ST10, D 60 TO 160 CM; Transect D	Debitage, Silicified Coral	>0 25"	2	0 3
62 1	ST03, D 30 TO 105 CM; Transect D	Core	>0 25"	1	3 6
62 2	ST03, D 30 TO 105 CM; Transect D	Debitage, Chert	>0 25"	80	43 0
63 1	ST02, D 40 TO 80 CM; Transect D	Orange Plain, Crumb	>0 25"	18	9 7

FS	Provenience	Description	Size Grade	Count	Weight (g)
63 2	ST02, D 40 TO 80 CM; Transect D	Debitage, Chert	>0 25"	3	1 6
63 3	ST02, D 40 TO 80 CM; Transect D	Debitage, Silicified Coral	>0 25"	1	0 1
64 1	ST12, D 60 TO 90 CM; Transect D	Debitage, Chert	>0 25"	5	1 4
65 1	ST13, D 30 TO 95 CM; Transect D	Hafted Biface	>0 25"	1	27 4
65 2	ST13, D 30 TO 95 CM; Transect D	Debitage, Silicified Coral	>0 25"	2	0 5
65 3	ST13, D 30 TO 95 CM; Transect D	Debitage, Chert	>0 25"	3	0 3
66 1	ST11, D 40 TO 90 CM; Transect D	Debitage, Chert	>0 25"	9	5 1
67 1	ST14, D 50 TO 90 CM; Transect D	Debitage, Chert	>0 25"	8	7 4
68 1	ST15, D 55 TO 110 CM; Transect D	Debitage, Chert	>0 25"	5	3 6
69 1	ST05, D 70 TO 100 CM; Transect E	Debitage, Chert	>0 25"	8	1 8
70 1	ST03, D 0 TO 90 CM; Transect E	Debitage, Chert	>0 25"	18	4 4
70 2	ST03, D 0 TO 90 CM; Transect E	Modified Flake	>0 25"	1	3 1
71 1	ST04, D 5 TO 105 CM; Transect E	Orange Plain, Rim	>0 25"	1	6 0
71 2	ST04, D 5 TO 105 CM; Transect E	Orange Plain, Crumb	>0 25"	18	9 7
71 3	ST04, D 5 TO 105 CM; Transect E	Hafted Biface	>0 25"	1	7 3
71 4	ST04, D 5 TO 105 CM; Transect E	Debitage, Chert	>0 25"	27	10 0
71 5	ST04, D 5 TO 105 CM; Transect E	Debitage, Silicified Coral	>0 25"	1	0 1
72 1	ST06, D 20 TO 100 CM; Transect E	Orange Plain, Crumb	>0 25"	6	2 6
72 2	ST06, D 20 TO 100 CM; Transect E	Debitage, Chert	>0 25"	5	0 9
72 3	ST06, D 20 TO 100 CM; Transect E	Vertebrate Fauna, Unmodified	>0 25"	2	0 3
72 4	ST06, D 20 TO 100 CM; Transect E	Glass, Fragment	>0 25"	2	2 6
73 1	ST08, D 5 TO 10 CM; Transect E	Debitage, Chert	>0 25"	2	1 2
74 1	ST07, D 55 TO 100 CM; Transect E	Orange Plain, Body	>0 25"	3	7 1
74 2	ST07, D 55 TO 100 CM; Transect E	Orange Plain, Rim	>0 25"	2	1 1
74 3	ST07, D 55 TO 100 CM; Transect E	Orange Plain, Crumb	>0 25"	5	2 2
74 4	ST07, D 55 TO 100 CM; Transect E	Uniface	>0 25"	1	4 5
74 5	ST07, D 55 TO 100 CM; Transect E	Debitage, Chert	>0 25"	1	0 1
74 6	ST07, D 55 TO 100 CM; Transect E	Historic Ceramic	>0 25"	1	7 8
75 1	ST09, D 50 TO 90 CM; Transect E	Orange Plain, Body	>0 25"	4	52 6
75 2	ST09, D 50 TO 90 CM; Transect E	Orange Incised, Body	>0 25"	1	2 6
75 3	ST09, D 50 TO 90 CM; Transect E	Orange Plain, Crumb	>0 25"	45	16 9
75 4	ST09, D 50 TO 90 CM; Transect E	Microlith	>0 25"	2	0 4
75 5	ST09, D 50 TO 90 CM; Transect E	Debitage, Chert	>0 25"	6	1 5
75 6	ST09, D 50 TO 90 CM; Transect E	Debitage, Silicified Coral	>0 25"	1	1 3
75 7	ST09, D 50 TO 90 CM; Transect E	Misc Rock	>0 25"	1	22 7
76 1	ST10, D 60 TO 70 CM; Transect E	Biface, Fragment	>0 25"	1	14 9
76 2	ST10, D 60 TO 70 CM; Transect E	Debitage, Chert	>0 25"	5	0 6
77 1	ST2, D 40 TO 100 CM; Transect E	Orange Plain, Body	>0 25"	4	18 3
77 2	ST2, D 40 TO 100 CM; Transect E	Orange Plain, Crumb	>0 25"	6	2 2
77 3	ST2, D 40 TO 100 CM; Transect E	Debitage, Chert	>0 25"	22	3 1
78 1	ST13, D 70 TO 90 CM; Transect E	Uniface	>0 25"	1	0 9
78 2	ST13, D 70 TO 90 CM; Transect E	Debitage, Chert	>0 25"	6	2 1
79 1	ST16, D 70 TO 90 CM; Transect D	Modified Flake	>0 25"	1	0 5
79 2	ST16, D 70 TO 90 CM; Transect D	Debitage, Chert	>0 25"	1	0 1
80 1	ST13, D 60 TO 100 CM; Transect G	St Johns Plain, Body	>0 25"	1	2 8
80 2	ST13, D 60 TO 100 CM; Transect G	St Johns Plain, Crumb	>0 25"	1	0 5
80 3	ST13, D 60 TO 100 CM; Transect G	Debitage, Chert	>0 25"	2	0 5
81 1	ST12, D 30 TO 80 CM; Transect E	Debitage, Silicified Coral	>0 25"	4	1 0
81 2	ST12, D 30 TO 80 CM; Transect E	Debitage, Chert	>0 25"	9	2 8
82 1	ST13, D 50 TO 95 CM; Transect E	Core?	>0 25"	1	2 8
82 2	ST13, D 50 TO 95 CM; Transect E	Debitage, Silicified Coral	>0 25"	1	0 4
82 3	ST13, D 50 TO 95 CM; Transect E	Debitage, Chert	>0 25"	5	0 6
83 1	ST14, D 50 TO 60 CM; Transect E	Debitage, Chert	>0 25"	1	2 4
84 1	ST14, D 50 TO 80 CM; Transect F	Debitage, Silicified Coral	>0 25"	1	0 1
84 2	ST14, D 50 TO 80 CM; Transect F	Debitage, Chert	>0 25"	3	0 5
85 1	ST14, D 50 TO 80 CM; Transect G	Modified Flake	>0 25"	1	0 3
85 2	ST14, D 50 TO 80 CM; Transect G	Debitage, Chert	>0 25"	3	0 8
86 1	ST11, D 50 TO 100 CM; Transect E	Orange Plain, Body	>0 25"	2	4 4
86 2	ST11, D 50 TO 100 CM; Transect E	Orange Plain, Crumb	>0 25"	3	1 0
86 3	ST11, D 50 TO 100 CM; Transect E	Hafted Biface	>0 25"	1	4 2
86 4	ST11, D 50 TO 100 CM; Transect E	Debitage, Silicified Coral	>0 25"	2	0 7
86 5	ST11, D 50 TO 100 CM; Transect E	Debitage, Chert	>0 25"	8	4 6
87 1	ST04, D 70 TO 100 CM; Transect G	Modified Flake	>0 25"	1	9 4
87 2	ST04, D 70 TO 100 CM; Transect G	Vertebrate Fauna, Unmodified	>0 25"	2	3 7
87 3	ST04, D 70 TO 100 CM; Transect G	Debitage, Silicified Coral	>0 25"	2	0 3
87 4	ST04, D 70 TO 100 CM; Transect G	Debitage, Chert	>0 25"	2	0 2

FS	Provenience	Description	Size Grade	Count	Weight (g)
88 1	ST03, D 25 TO 90 CM; Transect G	Core	>0 25"	1	5 3
88 2	ST03, D 25 TO 90 CM; Transect G	Debitage, Chert	>0 25"	6	3 1
88 3	ST03, D 25 TO 90 CM; Transect G	Debitage, Silicified Coral	>0 25"	1	0 6
89 1	ST06, D 20 TO 90 CM; Transect G	Debitage, Silicified Coral	>0 25"	2	3 1
89 2	ST06, D 20 TO 90 CM; Transect G	Debitage, Chert	>0 25"	4	4 7
90 1	ST07, D 0 TO 100 CM; Transect G	Orange Plain, Crumb	>0 25"	2	0 4
90 2	ST07, D 0 TO 100 CM; Transect G	Modified Flake	>0 25"	1	1 7
90 3	ST07, D 0 TO 100 CM; Transect G	Debitage, Chert	>0 25"	2	4 3
91 1	ST08, D 20 TO 80 CM; Transect G	Orange Plain, Crumb	>0 25"	1	0 3
91 2	ST08, D 20 TO 80 CM; Transect G	Microlith	>0 25"	1	0 2
91 3	ST08, D 20 TO 80 CM; Transect G	Debitage, Chert	>0 25"	3	0 9
92 1	ST09, D 35 TO 90 CM; Transect G	Debitage, Chert	>0 25"	4	0 4
93 1	ST10, D 50 TO 100 CM; Transect G	Orange Plain, Body	>0 25"	3	5 8
93 2	ST10, D 50 TO 100 CM; Transect G	Debitage, Chert	>0 25"	5	18 1
93 3	ST10, D 50 TO 100 CM; Transect G	Misc Rock	>0 25"	1	61 2
94 1	ST02, D 19 TO 103 CM; Transect G	Orange Plain, Body	>0 25"	1	2 6
94 2	ST02, D 19 TO 103 CM; Transect G	Debitage, Chert	>0 25"	13	1 7
95 1	ST03, D 10 TO 50 CM; Transect L	Core	>0 25"	1	28 2
95 2	ST03, D 10 TO 50 CM; Transect L	Debitage, Silicified Coral	>0 25"	1	1 9
95 3	ST03, D 10 TO 50 CM; Transect L	Debitage, Chert	>0 25"	1	0 2
96 1	ST01, D 90 TO 100 CM; Transect L	Debitage, Chert	>0 25"	2	0 4
98 1	ST04, D 10 TO 50 CM; Transect L	Debitage, Chert	>0 25"	4	14 2
99 1	ST05, D 75 TO 100 CM; Transect L	Debitage, Chert	>0 25"	5	11 6
100 1	ST07, D 60 TO 95 CM; Transect L	Hafted Biface Fragment	>0 25"	1	0 9
100 2	ST07, D 60 TO 95 CM; Transect L	Debitage, Silicified Coral	>0 25"	3	2 8
100 3	ST07, D 60 TO 95 CM; Transect L	Debitage, Chert	>0 25"	2	0 1
101 1	ST06, D 80 TO 90 CM; Transect L	Debitage, Chert	>0 25"	3	0 2
102 1	ST09; Transect L	Debitage, Chert	>0 25"	3	0 6
102 2	ST09; Transect L	Vertebrate Fauna, Unmodified	>0 25"	1	0 3
102 3	ST09; Transect L	Plaster Fragment	>0 25"	1	1 1
103 1	ST10, D 10 TO 90 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	24	49 0
103 2	ST10, D 10 TO 90 CM; Transect L	Debitage, Silicified Coral	>0 25"	1	1 1
103 3	ST10, D 10 TO 90 CM; Transect L	Debitage, Chert	>0 25"	2	0 9
103 4	ST10, D 10 TO 90 CM; Transect L	Historic Ceramic	>0 25"	1	5 9
104 1	ST08, D 50 TO 125 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	860	419 7
104 2	ST08, D 50 TO 125 CM; Transect L	Debitage, Chert	>0 25"	3	5 0
104 3	ST08, D 50 TO 125 CM; Transect L	Debitage, Silicified Coral	>0 25"	1	0 1
104 4	ST08, D 50 TO 125 CM; Transect L	Marine Shell, Unmodified	>0 25"	1	4 5
104 5	ST08, D 50 TO 125 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	1	7 2
104 6	ST08, D 50 TO 125 CM; Transect L	Antler, Unmodified	>0 25"	22	36 0
104 7	ST08, D 50 TO 125 CM; Transect L	Paleofeces	>0 25"	4	10 5
105 1	ST12, D 10 TO 75 CM; Transect L	Hafted Biface	>0 25"	1	17 7
105 2	ST12, D 10 TO 75 CM; Transect L	St Johns Plain, Crumb	>0 25"	1	1 7
105 3	ST12, D 10 TO 75 CM; Transect L	Vert Fauna, Modified	>0 25"	1	5 4
105 4	ST12, D 10 TO 75 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	48	35 7
105 5	ST12, D 10 TO 75 CM; Transect L	Misc Rock	>0 25"	1	0 4
106 1	ST11, D 15 TO 95 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	2	0 7
106 2	ST11, D 15 TO 95 CM; Transect L	Marine Shell, Unmodified	>0 25"	1	0 6
106 3	ST11, D 15 TO 95 CM; Transect L	Debitage, Chert	>0 25"	5	37 4
107 1	ST13, D 10 TO 100 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	112	76 0
107 2	ST13, D 10 TO 100 CM; Transect L	Debitage, Chert	>0 25"	6	8 9
107 3	ST13, D 10 TO 100 CM; Transect L	St Johns Plain, Crumb	>0 25"	1	0 9
108 1	ST14, D 20 TO 100 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	24	12 9
109 1	ST15, D 20 TO 90 CM; Transect L	St Johns Check Stamped, Body	>0 25"	1	4 8
109 2	ST15, D 20 TO 90 CM; Transect L	St Johns Plain, Crumb	>0 25"	2	1 8
109 3	ST15, D 20 TO 90 CM; Transect L	Glass, Fragment	>0 25"	2	1 9
109 4	ST15, D 20 TO 90 CM; Transect L	Debitage, Chert	>0 25"	10	11 7
109 5	ST15, D 20 TO 90 CM; Transect L	Modified Flake	>0 25"	1	3 4
109 6	ST15, D 20 TO 90 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	78	30 6
110 1	ST16, D 10 TO 160 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	79	36 8
110 2	ST16, D 10 TO 160 CM; Transect L	St Johns Plain, Crumb	>0 25"	2	1 3
110 3	ST16, D 10 TO 160 CM; Transect L	Debitage, Chert	>0 25"	10	17 5
110 4	ST16, D 10 TO 160 CM; Transect L	Misc Rock	>0 25"	2	65 0
111 1	ST17, D 0 TO 10 CM; Transect L	Debitage, Chert	>0 25"	7	19 6
111 2	ST17, D 0 TO 10 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	8	2 0
112 1	ST20, D 0 TO 20 CM; Transect L	Orange Plain, Crumb	>0 25"	1	0 2

FS	Provenience	Description	Size Grade	Count	Weight (g)
112 2	ST20, D 0 TO 20 CM; Transect L	Debitage, Chert	>0 25"	1	0 2
112 3	ST20, D 0 TO 20 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	38	20 6
113 1	ST18, D 0 TO 38 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	21	8 4
113 2	ST18, D 0 TO 38 CM; Transect L	Antler, Unmodified	>0 25"	1	0 5
113 3	ST18, D 0 TO 38 CM; Transect L	Marine Shell, Unmodified	>0 25"	1	0 2
113 4	ST18, D 0 TO 38 CM; Transect L	Debitage, Chert	>0 25"	4	0 9
113 5	ST18, D 0 TO 38 CM; Transect L	Modified Flake	>0 25"	1	2 2
113 6	ST18, D 0 TO 38 CM; Transect L	St Johns Plain, Crumb	>0 25"	1	1 0
113 7	ST18, D 0 TO 38 CM; Transect L	Misc Rock	>0 25"	1	9 7
114 1	ST19, D 25 TO 85 CM; Transect L	Uniface	>0 25"	1	53 6
114 2	ST19, D 25 TO 85 CM; Transect L	Debitage, Chert	>0 25"	2	9 6
114 3	ST19, D 25 TO 85 CM; Transect L	Marine Shell, Unmodified	>0 25"	2	28 5
114 4	ST19, D 25 TO 85 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	5	1 5
114 5	ST19, D 25 TO 85 CM; Transect L	Glass, Fragment	>0 25"	1	0 3
115 1	ST21, D 66 TO 100 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	33	32 7
115 2	ST21, D 66 TO 100 CM; Transect L	Antler, Unmodified	>0 25"	7	22 1
115 3	ST21, D 66 TO 100 CM; Transect L	Debitage, Chert	>0 25"	1	1 1
115 4	ST21, D 66 TO 100 CM; Transect L	Modified Flake	>0 25"	1	1 2
115 5	ST21, D 66 TO 100 CM; Transect L	Metal, Nail	>0 25"	1	7 4
115 6	ST21, D 66 TO 100 CM; Transect L	Orange Plain, Crumb	>0 25"	1	0 8
116 1	ST23, D 15 TO 90 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	9	8 1
116 2	ST23, D 15 TO 90 CM; Transect L	Marine Shell, Unmodified	>0 25"	2	28 5
117 1	ST22, D 30 TO 105 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	39	25 1
117 2	ST22, D 30 TO 105 CM; Transect L	Debitage, Chert	>0 25"	2	2 3
117 3	ST22, D 30 TO 105 CM; Transect L	Sand Tempered Plain, Crumb	>0 25"	2	4 0
117 4	ST22, D 30 TO 105 CM; Transect L	St Johns Plain, Crumb	>0 25"	1	0 9
117 5	ST22, D 30 TO 105 CM; Transect L	Misc Rock	>0 25"	1	3 9
118 1	ST24, D 50 TO 100 CM; Transect L	Marine Shell, Unmodified	>0 25"	1	5 0
118 2	ST24, D 50 TO 100 CM; Transect L	Vert Fauna, Modified	>0 25"	1	0 8
118 3	ST24, D 50 TO 100 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	13	26 8
118 4	ST24, D 50 TO 100 CM; Transect L	Metal, Can Opener	>0 25"	1	97 5
119 1	ST27, D 10 TO 65 CM; Transect L	Debitage, Chert	>0 25"	1	2 0
119 2	ST27, D 10 TO 65 CM; Transect L	St Johns Plain, Body	>0 25"	2	11 6
119 3	ST27, D 10 TO 65 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	20	21 4
120 1	ST26, D 35 TO 80 CM; Transect L	St Johns Check Stamped, Body	>0 25"	6	165 7
120 2	ST26, D 35 TO 80 CM; Transect L	Marine Shell, Unmodified	>0 25"	1	15 1
120 3	ST26, D 35 TO 80 CM; Transect L	Debitage, Chert	>0 25"	1	9 7
120 4	ST26, D 35 TO 80 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	14	24 3
121 1	ST25, D 15 TO 140 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	6	28 2
121 2	ST25, D 15 TO 140 CM; Transect L	Microlith	>0 25"	1	1 3
121 3	ST25, D 15 TO 140 CM; Transect L	Debitage, Chert	>0 25"	1	8 1
121 4	ST25, D 15 TO 140 CM; Transect L	Modified Flake	>0 25"	2	20 2
121 5	ST25, D 15 TO 140 CM; Transect L	St Johns Check Stamped, Body	>0 25"	3	42 8
122 1	ST29, D 0 TO 45 CM; Transect L	Debitage, Chert	>0 25"	1	26 2
124 1	ST28, D 30 TO 85 CM; Transect L	Metal, Fragment	>0 25"	3	46 4
124 2	ST28, D 30 TO 85 CM; Transect L	Vertebrate Fauna, Unmodified	>0 25"	2	3 8
124 3	ST28, D 30 TO 85 CM; Transect L	Glass, Fragment	>0 25"	5	3 0
125 1	ST12, D 90 TO 160 CM; Transect G	Debitage, Silicified Coral	>0 25"	1	0 4
125 2	ST12, D 90 TO 160 CM; Transect G	Debitage, Chert	>0 25"	7	0 7
126 1	ST11, D 50 TO 90 CM; Transect G	Modified Flake	>0 25"	1	2 0
126 2	ST11, D 50 TO 90 CM; Transect G	Debitage, Silicified Coral	>0 25"	2	4 6
126 3	ST11, D 50 TO 90 CM; Transect G	Debitage, Chert	>0 25"	6	3 6
127 1	ST11, D 57 TO 100 CM; Transect F	Orange Plain, Crumb	>0 25"	1	0 3
127 2	ST11, D 57 TO 100 CM; Transect F	Biface, Fragment	>0 25"	1	0 5
127 3	ST11, D 57 TO 100 CM; Transect F	Debitage, Silicified Coral	>0 25"	5	1 1
127 4	ST11, D 57 TO 100 CM; Transect F	Debitage, Chert	>0 25"	7	7 0
128 1	ST12, D 40 TO 140 CM; Transect F	Debitage, Silicified Coral	>0 25"	13	2 3
128 2	ST12, D 40 TO 140 CM; Transect F	Debitage, Chert	>0 25"	7	1 8
129 1	ST12, D 85 TO 95 CM; Transect H	Debitage, Chert	>0 25"	2	0 1
130 1	ST03, D 50 TO 130 CM; Transect H	Debitage, Chert	>0 25"	11	1 7
130 2	ST03, D 50 TO 130 CM; Transect H	Biface, Fragment	>0 25"	1	0 2
130 3	ST03, D 50 TO 130 CM; Transect H	Hafted Biface Fragment	>0 25"	1	0 8
130 4	ST03, D 50 TO 130 CM; Transect H	Misc Rock	>0 25"	1	6 0
131 1	ST04, D 60 TO 100 CM; Transect H	Orange Plain, Crumb	>0 25"	1	0 3
131 2	ST04, D 60 TO 100 CM; Transect H	Debitage, Chert	>0 25"	5	1 0
132 1	ST05, D 30 TO 100 CM; Transect H	Debitage, Chert	>0 25"	7	3 0

FS	Provenience	Description	Size Grade	Count	Weight (g)
132 2	ST05, D 30 TO 100 CM; Transect H	Vertebrate Fauna, Unmodified	>0 25"	4	0 6
133 1	ST06, D 71 TO 100 CM; Transect H	Orange Plain, Crumb	>0 25"	9	3 0
133 2	ST06, D 71 TO 100 CM; Transect H	Modified Flake	>0 25"	1	6 8
133 3	ST06, D 71 TO 100 CM; Transect H	Debitage, Chert	>0 25"	5	9 2
133 4	ST06, D 71 TO 100 CM; Transect H	Debitage, Silicified Coral	>0 25"	1	0 2
133 5	ST06, D 71 TO 100 CM; Transect H	Misc Rock	>0 25"	1	7 5
133 6	ST06, D 71 TO 100 CM; Transect H	Metal, Sparkplug	>0 25"	1	58 6
133 7	ST06, D 71 TO 100 CM; Transect H	Metal, Aluminum Pull Tab	>0 25"	1	0 3
134 1	ST05, D 30 TO 90 CM; Transect I	Debitage, Chert	>0 25"	9	14 2
134 2	ST05, D 30 TO 90 CM; Transect I	Glass, Fragment	>0 25"	3	4 7
135 1	ST04, D 60 TO 104 CM; Transect I	Antler, Unmodified	>0 25"	1	7 7
135 2	ST04, D 60 TO 104 CM; Transect I	Glass, Fragment	>0 25"	2	6 0
135 3	ST04, D 60 TO 104 CM; Transect I	Metal, Fragment	>0 25"	12	4 1
136 1	ST07, D 45 TO 100 CM; Transect H	Orange Plain, Crumb	>0 25"	2	1 8
136 2	ST07, D 45 TO 100 CM; Transect H	Debitage, Chert	>0 25"	4	1 9
136 3	ST07, D 45 TO 100 CM; Transect H	Misc Rock	>0 25"	5	5 5
136 4	ST07, D 45 TO 100 CM; Transect H	Glass, Fragment	>0 25"	2	1 8
137 1	ST06, D 45 TO 90 CM; Transect I	Debitage, Chert	>0 25"	1	0 4
137 2	ST06, D 45 TO 90 CM; Transect I	Misc Rock	>0 25"	3	0 9
137 3	ST06, D 45 TO 90 CM; Transect I	Metal, Fragment	>0 25"	1	0 2
137 4	ST06, D 45 TO 90 CM; Transect I	Glass, Fragment	>0 25"	3	1 7
138 1	ST07, D 50 TO 100 CM; Transect I	Orange Plain, Crumb	>0 25"	4	2 1
138 2	ST07, D 50 TO 100 CM; Transect I	Debitage, Chert	>0 25"	2	2 3
138 3	ST07, D 50 TO 100 CM; Transect I	Metal, Fragment	>0 25"	1	0 3
139 1	ST08, D 55 TO 80 CM; Transect I	Debitage, Chert	>0 25"	2	1 1
139 2	ST08, D 55 TO 80 CM; Transect I	Glass, Marble	>0 25"	1	5 7
140 1	ST02, D 40 TO 150 CM; Transect H	Biface, Fragment	>0 25"	1	6 4
140 2	ST02, D 40 TO 150 CM; Transect H	Debitage, Silicified Coral	>0 25"	1	0 1
140 3	ST02, D 40 TO 150 CM; Transect H	Debitage, Chert	>0 25"	15	3 8
140 4	ST02, D 40 TO 150 CM; Transect H	Misc Rock	>0 25"	1	57 0
141 1	ST01, D 5 TO 90 CM; Transect J	Metal, Nail	>0 25"	1	21 5
142 1	ST02, D 23 TO 145 CM; Transect F	Debitage, Chert	>0 25"	7	1 3
142 2	ST02, D 23 TO 145 CM; Transect F	Glass, Fragment	>0 25"	1	2 4
143 1	ST03, D 33 TO 90 CM; Transect F	Biface, Fragment	>0 25"	1	8 8
143 2	ST03, D 33 TO 90 CM; Transect F	Orange Plain, Body	>0 25"	2	4 1
143 3	ST03, D 33 TO 90 CM; Transect F	Orange Plain, Crumb	>0 25"	3	1 5
143 4	ST03, D 33 TO 90 CM; Transect F	Debitage, Silicified Coral	>0 25"	4	1 4
143 5	ST03, D 33 TO 90 CM; Transect F	Debitage, Chert	>0 25"	11	3 6
143 6	ST03, D 33 TO 90 CM; Transect F	Vertebrate Fauna, Unmodified	>0 25"	1	0 1
143 7	ST03, D 33 TO 90 CM; Transect F	Misc Rock	>0 25"	1	11 8
144 1	ST08, D 50 TO 80 CM; Transect H	St Johns Plain, Body	>0 25"	1	13 8
144 2	ST08, D 50 TO 80 CM; Transect H	Orange Plain, Crumb	>0 25"	1	0 3
144 3	ST08, D 50 TO 80 CM; Transect H	Biface, Fragment	>0 25"	1	0 6
144 4	ST08, D 50 TO 80 CM; Transect H	Debitage, Chert	>0 25"	1	1 1
145 1	ST04, D 20 TO 80 CM; Transect F	Orange Plain, Crumb	>0 25"	5	1 1
145 2	ST04, D 20 TO 80 CM; Transect F	Debitage, Chert	>0 25"	1	0 3
145 3	ST04, D 20 TO 80 CM; Transect F	Glass, Fragment	>0 25"	3	3 0
146 1	ST05, D 85 TO 90 CM; Transect F	Plastic Fragment	>0 25"	2	0 5
146 2	ST05, D 85 TO 90 CM; Transect F	Debitage, Chert	>0 25"	2	0 1
147 1	ST09, D 60 TO 90 CM; Transect H	Biface, Fragment	>0 25"	1	5 1
147 2	ST09, D 60 TO 90 CM; Transect H	Debitage, Chert	>0 25"	1	0 1
148 1	ST06, D 50 TO 90 CM; Transect F	Debitage, Chert	>0 25"	4	0 6
149 1	ST07, D 36 TO 100 CM; Transect F	Orange Plain, Crumb	>0 25"	1	0 8
149 2	ST07, D 36 TO 100 CM; Transect F	Debitage, Chert	>0 25"	5	1 8
150 1	ST10, D 60 TO 80 CM; Transect H	Biface, Fragment	>0 25"	1	0 4
150 2	ST10, D 60 TO 80 CM; Transect H	Debitage, Chert	>0 25"	1	0 4
151 1	ST08, D 0 TO 90 CM; Transect F	Orange Incised, Body	>0 25"	1	6 7
151 2	ST08, D 0 TO 90 CM; Transect F	Orange Plain, Body	>0 25"	1	1 9
151 3	ST08, D 0 TO 90 CM; Transect F	Orange Plain, Crumb	>0 25"	3	1 6
151 4	ST08, D 0 TO 90 CM; Transect F	Debitage, Chert	>0 25"	6	3 1
151 5	ST08, D 0 TO 90 CM; Transect F	Glass, Fragment	>0 25"	8	5 0
152 1	ST09, D 0 TO 100 CM; Transect F	Orange Plain, Body	>0 25"	1	5 2
152 2	ST09, D 0 TO 100 CM; Transect F	Debitage, Silicified Coral	>0 25"	1	0 1
152 3	ST09, D 0 TO 100 CM; Transect F	Debitage, Chert	>0 25"	6	1 8
152 4	ST09, D 0 TO 100 CM; Transect F	Glass, Fragment	>0 25"	4	1 5
153 1	ST10, D 65 TO 90 CM; Transect F	Debitage, Silicified Coral	>0 25"	2	7 4

FS	Provenience	Description	Size Grade	Count	Weight (g)
153 2	ST10, D 65 TO 90 CM; Transect F	Debitage, Chert	>0 25"	2	3 6
154 1	ST03, D 40 TO 190 CM; Transect I	Uniface	>0 25"	1	3 6
154 2	ST03, D 40 TO 190 CM; Transect I	Debitage, Chert	>0 25"	18	14 8
154 3	ST03, D 40 TO 190 CM; Transect I	Debitage, Silicified Coral	>0 25"	1	0 3
154 4	ST03, D 40 TO 190 CM; Transect I	Glass, Fragment	>0 25"	1	0 4
155 1	ST11, D 75 TO 90 CM; Transect I	Hafted Biface	>0 25"	1	1 7
155 2	ST11, D 75 TO 90 CM; Transect I	Debitage, Chert	>0 25"	6	0 7
156 1	ST11, D 50 TO 100 CM; Transect H	Orange Plain, Rim	>0 25"	1	30 7
156 2	ST11, D 50 TO 100 CM; Transect H	Debitage, Silicified Coral	>0 25"	1	0 1
156 3	ST11, D 50 TO 100 CM; Transect H	Debitage, Chert	>0 25"	5	1 8
157 1	ST10, D 70 TO 80 CM; Transect I	Debitage, Chert	>0 25"	2	0 6
158 1	ST09, D 55 TO 90 CM; Transect I	Orange Incised, Body	>0 25"	4	17 8
158 2	ST09, D 55 TO 90 CM; Transect I	Orange Incised, Rim	>0 25"	1	3 4
158 3	ST09, D 55 TO 90 CM; Transect I	Orange Plain, Body	>0 25"	3	5 2
158 4	ST09, D 55 TO 90 CM; Transect I	Debitage, Chert	>0 25"	7	2 1
158 5	ST09, D 55 TO 90 CM; Transect I	Misc Rock	>0 25"	1	7 4
159 1	ST02, D 60 TO 90 CM; Transect I	Debitage, Chert	>0 25"	6	1 7
159 2	ST02, D 60 TO 90 CM; Transect I	Vertebrate Fauna, Unmodified	>0 25"	1	0 1
160 1	ST02, D 40 TO 100 CM; Transect J	Debitage, Chert	>0 25"	37	11 3
160 2	ST02, D 40 TO 100 CM; Transect J	Orange Plain, Crumb	>0 25"	1	0 4
161 1	ST15, D 80 TO 135 CM; Transect G	Debitage, Chert	>0 25"	5	4 3
162 1	ST05, D 65 TO 90 CM; Transect K	Debitage, Chert	>0 25"	5	3 5
163 1	ST07, D 60 TO 75 CM; Transect K	Debitage, Chert	>0 25"	4	1 6
164 1	ST06, D 65 TO 90 CM; Transect K	Debitage, Chert	>0 25"	10	4 2
165 1	ST01, D 50 TO 90 CM; Transect M	Microlith	>0 25"	1	0 3
165 2	ST01, D 50 TO 90 CM; Transect M	Debitage, Chert	>0 25"	8	4 4
166 1	ST02, D 60 TO 115 CM; Transect M	Debitage, Silicified Coral	>0 25"	1	0 2
166 2	ST02, D 60 TO 115 CM; Transect M	Debitage, Chert	>0 25"	5	2 8
167 1	ST03, D 55 TO 95 CM; Transect M	Hafted Biface	>0 25"	1	1 8
167 2	ST03, D 55 TO 95 CM; Transect M	Debitage, Silicified Coral	>0 25"	1	1 4
167 3	ST03, D 55 TO 95 CM; Transect M	Debitage, Chert	>0 25"	6	0 9
168 1	ST04, D 32 TO 114 CM; Transect M	Debitage, Chert	>0 25"	1	1 5
168 2	ST04, D 32 TO 114 CM; Transect M	St Johns Plain, Body	>0 25"	3	8 6
168 3	ST04, D 32 TO 114 CM; Transect M	St Johns Plain, Crumb	>0 25"	4	0 7
168 4	ST04, D 32 TO 114 CM; Transect M	Vertebrate Fauna, Unmodified	>0 25"	2	2 7
169 1	ST05, D 80 TO 100 CM; Transect M	Debitage, Chert	>0 25"	2	0 1
169 2	ST05, D 80 TO 100 CM; Transect M	Orange Plain, Body	>0 25"	1	2 2
170 1	ST06, D 65 TO 80 CM; Transect M	Debitage, Silicified Coral	>0 25"	1	1 4
170 2	ST06, D 65 TO 80 CM; Transect M	Debitage, Chert	>0 25"	3	0 9
171 1	ST07, D 50 TO 60 CM; Transect M	Debitage, Chert	>0 25"	2	0 2
172 1	ST08, D 55 TO 100 CM; Transect M	Hafted Biface	>0 25"	1	24 6
172 2	ST08, D 55 TO 100 CM; Transect M	Debitage, Chert	>0 25"	40	21 6
172 3	ST08, D 55 TO 100 CM; Transect M	Sand Tempered Plain, Body	>0 25"	1	2 5
173 1	ST08, D 40 TO 100 CM; Transect N	Orange Plain, Crumb	>0 25"	1	0 2
173 2	ST08, D 40 TO 100 CM; Transect N	Vertebrate Fauna, Unmodified	>0 25"	1	0 5
173 3	ST08, D 40 TO 100 CM; Transect N	Hafted Biface Fragment	>0 25"	1	0 2
173 4	ST08, D 40 TO 100 CM; Transect N	Debitage, Chert	>0 25"	28	11 4
174 1	ST07, D 55 TO 140 CM; Transect N	Orange Plain, Crumb	>0 25"	1	0 5
174 2	ST07, D 55 TO 140 CM; Transect N	St Johns Plain, Rim	>0 25"	1	1 0
174 3	ST07, D 55 TO 140 CM; Transect N	Hafted Biface	>0 25"	1	1 1
174 4	ST07, D 55 TO 140 CM; Transect N	Debitage, Chert	>0 25"	8	5 9
175 1	ST06, D 50 TO 90 CM; Transect N	Debitage, Silicified Coral	>0 25"	1	0 1
175 2	ST06, D 50 TO 90 CM; Transect N	Debitage, Chert	>0 25"	6	2 0
176 1	ST05, D 75 TO 130 CM; Transect N	St Johns Plain, Crumb	>0 25"	6	2 3
176 2	ST05, D 75 TO 130 CM; Transect N	Debitage, Chert	>0 25"	6	0 9
177 1	ST04, D 25 TO 100 CM; Transect N	St Johns Plain, Body	>0 25"	1	6 7
177 2	ST04, D 25 TO 100 CM; Transect N	Vertebrate Fauna, Unmodified	>0 25"	1	0 7
177 3	ST04, D 25 TO 100 CM; Transect N	Debitage, Chert	>0 25"	5	0 7
178 1	ST03, D 25 TO 100 CM; Transect N	St Johns Plain, Body	>0 25"	1	6 1
178 2	ST03, D 25 TO 100 CM; Transect N	Debitage, Chert	>0 25"	6	2 0
179 1	ST02, D 20 TO 80 CM; Transect N	St Johns Plain, Body	>0 25"	5	9 1
179 2	ST02, D 20 TO 80 CM; Transect N	Sand Tempered Plain, Crumb	>0 25"	1	0 7
179 3	ST02, D 20 TO 80 CM; Transect N	Orange Incised, Body	>0 25"	1	3 8
180 1	ST01, D 60 TO 135 CM; Transect N	Microlith	>0 25"	1	0 6
180 2	ST01, D 60 TO 135 CM; Transect N	Debitage, Silicified Coral	>0 25"	2	0 3
180 3	ST01, D 60 TO 135 CM; Transect N	Debitage, Chert	>0 25"	15	8 3

FS	Provenience	Description	Size Grade	Count	Weight (g)
181 1	ST01, D 75 TO 95 CM; Transect O	Biface	>0 25"	1	22 8
181 2	ST01, D 75 TO 95 CM; Transect O	Debitage, Chert	>0 25"	1	0 1
181 3	ST01, D 75 TO 95 CM; Transect O	Vertebrate Fauna, Unmodified	>0 25"	1	0 1
181 4	ST01, D 75 TO 95 CM; Transect O	Shark Tooth	>0 25"	1	0 4
182 1	ST02, D 70 TO 105 CM; Transect O	Hafted Biface	>0 25"	1	1 1
182 2	ST02, D 70 TO 105 CM; Transect O	Hafted Biface	>0 25"	1	1 1
182 3	ST02, D 70 TO 105 CM; Transect O	Uniface	>0 25"	1	2 3
182 4	ST02, D 70 TO 105 CM; Transect O	Microlith	>0 25"	1	0 1
182 5	ST02, D 70 TO 105 CM; Transect O	Debitage, Chert	>0 25"	3	0 3
183 1	ST03, D 70 TO 100 CM; Transect O	St Johns Plain, Crumb	>0 25"	2	1 4
183 2	ST03, D 70 TO 100 CM; Transect O	Biface	>0 25"	1	11 3
183 3	ST03, D 70 TO 100 CM; Transect O	Debitage, Chert	>0 25"	5	1 0
184 1	ST04, D 10 TO 80 CM; Transect O	Orange Incised, Body	>0 25"	1	3 9
184 2	ST04, D 10 TO 80 CM; Transect O	Debitage, Chert	>0 25"	2	0 1
185 1	ST06, D 10 TO 100 CM; Transect O	Modified Flake	>0 25"	1	9 3
185 2	ST06, D 10 TO 100 CM; Transect O	Debitage, Chert	>0 25"	1	2 8
185 3	ST06, D 10 TO 100 CM; Transect O	Debitage, Silicified Coral	>0 25"	1	0 7
185 4	ST06, D 10 TO 100 CM; Transect O	Vertebrate Fauna, Unmodified	>0 25"	10	7 1
185 5	ST06, D 10 TO 100 CM; Transect O	Orange Plain, Crumb	>0 25"	2	0 7
185 6	ST06, D 10 TO 100 CM; Transect O	St Johns Plain, Crumb	>0 25"	2	2 2
186 1	ST07, D 10 TO 70 CM; Transect O	Glass	>0 25"	1	23 9
186 2	ST07, D 10 TO 70 CM; Transect O	Penny	>0 25"	1	3 1
186 3	ST07, D 10 TO 70 CM; Transect O	Vertebrate Fauna, Unmodified	>0 25"	5	6 3
186 4	ST07, D 10 TO 70 CM; Transect O	Orange Plain, Body	>0 25"	3	5 4
187 1	ST08, D 60 TO 70 CM; Transect P	Debitage, Silicified Coral	>0 25"	1	0 2
188 1	ST08, D 10 TO 100 CM; Transect Q	Modified Flake	>0 25"	1	1 4
188 2	ST08, D 10 TO 100 CM; Transect Q	Debitage, Chert	>0 25"	10	7 0
188 3	ST08, D 10 TO 100 CM; Transect Q	Vertebrate Fauna, Unmodified	>0 25"	2	0 1
189 1	ST08, D 40 TO 90 CM; Transect R	St Johns Plain, Body	>0 25"	4	8 5
189 2	ST08, D 40 TO 90 CM; Transect R	Debitage, Chert	>0 25"	1	0 1
189 3	ST08, D 40 TO 90 CM; Transect R	Debitage, Silicified Coral	>0 25"	1	0 1
190 1	ST08, D 50 TO 140 CM; Transect S	Modified Flake	>0 25"	1	1 1
190 2	ST08, D 50 TO 140 CM; Transect S	Debitage, Chert	>0 25"	12	6 1
190 3	ST08, D 50 TO 140 CM; Transect S	Debitage, Silicified Coral	>0 25"	2	1 3
190 4	ST08, D 50 TO 140 CM; Transect S	St Johns Plain, Body	>0 25"	1	0 9
190 5	ST08, D 50 TO 140 CM; Transect S	Pottery, Unknown Type	>0 25"	5	25 3
191 1	ST07, D 40 TO 85 CM; Transect S	Biface	>0 25"	1	0 3
191 2	ST07, D 40 TO 85 CM; Transect S	Debitage, Silicified Coral	>0 25"	1	0 5
191 3	ST07, D 40 TO 85 CM; Transect S	Debitage, Chert	>0 25"	1	0 2
191 4	ST07, D 40 TO 85 CM; Transect S	Orange Plain, Body	>0 25"	1	0 8
191 5	ST07, D 40 TO 85 CM; Transect S	St Johns Plain, Body	>0 25"	6	12 0
191 6	ST07, D 40 TO 85 CM; Transect S	Sand Tempered Plain, Body	>0 25"	1	2 3
192 1	ST07, South, D 40 TO 80 CM; Transect S	Pottery, Unknown Type	>0 25"	6	9 8
192 2	ST07, South, D 40 TO 80 CM; Transect S	Pottery, Unknown Type	>0 25"	6	9 8
192 3	ST07, South, D 40 TO 80 CM; Transect S	St Johns Plain, Crumb	>0 25"	1	0 9
192 4	ST07, South, D 40 TO 80 CM; Transect S	St Johns Plain, Body	>0 25"	5	23 9
192 5	ST07, South, D 40 TO 80 CM; Transect S	Debitage, Chert	>0 25"	1	0 1
193 1	ST07, North, D 50 TO 80 CM; Transect S	Sand Tempered Plain, Body	>0 25"	1	3 3
193 2	ST07, North, D 50 TO 80 CM; Transect S	Debitage, Chert	>0 25"	2	0 5
194 1	TU01, LV A	Button	>0 25"	1	4 9
194 2	TU01, LV A	Metal, Aluminum Pull Tab	>0 25"	4	2 5
194 3	TU01, LV A	Penny	>0 25"	1	3 0
194 4	TU01, LV A	Vertebrate Fauna, Unmodified	>0 25"	2	3 9
195 1	TU01, LV B	Debitage, Chert	>0 25"	3	2 2
195 2	TU01, LV B	Vertebrate Fauna, Unmodified	>0 25"	5	7 6
196 1	TU01, LV B, Zone B	Brick	>0 25"	1	10 0
196 2	TU01, LV B, Zone B	Vertebrate Fauna, Unmodified	>0 25"	1	0 2
196 3	TU01, LV B, Zone B	Debitage, Chert	>0 25"	1	0 1
197 1	TU01, LV C	Brick	>0 25"	1	35 5
197 2	TU01, LV C	Vert Fauna, Modified	>0 25"	1	3 0
197 3	TU01, LV C	Vertebrate Fauna, Unmodified	>0 25"	11	14 9
201 1	ST07, D 35 TO 100 CM; Transect Q	Vertebrate Fauna, Unmodified	>0 25"	2	0 5
201 2	ST07, D 35 TO 100 CM; Transect Q	Debitage, Chert	>0 25"	2	0 3
201 3	ST07, D 35 TO 100 CM; Transect Q	St Johns Plain, Crumb	>0 25"	3	1 1
201 4	ST07, D 35 TO 100 CM; Transect Q	Pottery, Unknown Type	>0 25"	1	5 4

FS	Provenience	Description	Size Grade	Count	Weight (g)
201 5	ST07, D 35 TO 100 CM; Transect Q	Uniface	>0 25"	2	1 9
202 1	ST06, D 40 CM; Transect P	Debitage, Chert	>0 25"	1	3 1
203 1	ST06, D 30 TO 100 CM; Transect Q	Debitage, Chert	>0 25"	5	1 3
203 2	ST06, D 30 TO 100 CM; Transect Q	St Johns Plain, Body	>0 25"	7	17 4
203 3	ST06, D 30 TO 100 CM; Transect Q	St Johns Plain, Crumb	>0 25"	4	2 1
204 1	ST06, D 50 TO 150 CM; Transect R	St Johns Plain, Crumb	>0 25"	1	0 2
204 2	ST06, D 50 TO 150 CM; Transect R	Debitage, Chert	>0 25"	9	2 4
205 1	ST06, D 30 TO 90 CM; Transect S	Vertebrate Fauna, Unmodified	>0 25"	1	0 1
205 2	ST06, D 30 TO 90 CM; Transect S	Debitage, Chert	>0 25"	3	5 3
206 1	ST05, D 50 TO 80 CM; Transect S	Debitage, Chert	>0 25"	2	0 5
206 2	ST05, D 50 TO 80 CM; Transect S	Debitage, Silicified Coral	>0 25"	1	4 9
207 1	ST05, D 50 TO 80 CM; Transect R	Debitage, Chert	>0 25"	2	0 3
208 1	ST05, D 50 TO 150 CM; Transect P	Debitage, Chert	>0 25"	6	0 6
209 1	ST04, D 90 TO 100 CM; Transect P	Debitage, Chert	>0 25"	2	1 3
210 1	ST04, D 40 TO 50 CM; Transect Q	Debitage, Chert	>0 25"	2	0 2
211 1	ST04, D 25 TO 70 CM; Transect R	Microlith	>0 25"	1	1 1
211 2	ST04, D 25 TO 70 CM; Transect R	Hafted Biface	>0 25"	1	3 7
211 3	ST04, D 25 TO 70 CM; Transect R	Debitage, Silicified Coral	>0 25"	1	0 1
212 1	ST04, D 20 TO 40 CM; Transect S	Debitage, Chert	>0 25"	3	2 8
213 1	ST03, D 80 TO 140 CM; Transect P	Biface	>0 25"	1	4 9
213 2	ST03, D 80 TO 140 CM; Transect P	Debitage, Chert	>0 25"	9	3 0
214 1	ST03, D 50 TO 120 CM; Transect Q	Microlith	>0 25"	1	0 6
214 2	ST03, D 50 TO 120 CM; Transect Q	Microlith	>0 25"	1	0 3
214 3	ST03, D 50 TO 120 CM; Transect Q	Cobble, Quartzite	>0 25"	2	20 2
214 4	ST03, D 50 TO 120 CM; Transect Q	Debitage, Chert	>0 25"	6	0 8
214 5	ST03, D 50 TO 120 CM; Transect Q	Cobble, Hematite	>0 25"	1	0 1
214 6	ST03, D 50 TO 120 CM; Transect Q	Uniface	>0 25"	1	0 4
215 1	ST03, D 40 TO 150 CM; Transect R	Microlith	>0 25"	1	0 3
215 2	ST03, D 40 TO 150 CM; Transect R	Debitage, Chert	>0 25"	6	2 8
216 1	ST02, D 35 TO 100 CM; Transect S	Debitage, Chert	>0 25"	4	2 8
216 2	ST02, D 35 TO 100 CM; Transect S	Hafted Biface	>0 25"	1	0 6
216 3	ST02, D 35 TO 100 CM; Transect S	St Johns Plain, Body	>0 25"	4	10 0
217 1	ST02, D 75 TO 90 CM; Transect R	Debitage, Chert	>0 25"	2	0 5
218 1	ST02, D 75 TO 100 CM; Transect Q	Debitage, Chert	>0 25"	5	0 4
218 2	ST02, D 75 TO 100 CM; Transect Q	Orange Plain, Crumb	>0 25"	1	0 8
219 1	ST01, D 80 TO 85 CM; Transect P	Debitage, Chert	>0 25"	2	0 6
220 1	ST01, D 75 TO 100 CM; Transect Q	Cobble, Quartzite	>0 25"	1	39 2
220 2	ST01, D 75 TO 100 CM; Transect Q	Debitage, Silicified Coral	>0 25"	1	0 1
220 3	ST01, D 75 TO 100 CM; Transect Q	Debitage, Chert	>0 25"	6	0 7
221 1	ST01, D 75 TO 85 CM; Transect R	Orange Plain, Body	>0 25"	4	8 5
222 1	ST01, D 40 TO 70 CM; Transect S	Orange Plain, Body	>0 25"	4	6 7
222 2	ST01, D 40 TO 70 CM; Transect S	Debitage, Chert	>0 25"	9	1 6
223 1	TU02, Profile Cut, LV A	Vertebrate Fauna, Unmodified	>0 25"	126	94 7
223 2	TU02, Profile Cut, LV A	Antler, Unmodified	>0 25"	8	46 9
223 3	TU02, Profile Cut, LV A	Vert Fauna, Modified	>0 25"	2	1 2
223 4	TU02, Profile Cut, LV A	Debitage, Chert	>0 25"	1	0 7
223 5	TU02, Profile Cut, LV A	Glass	>0 25"	1	1 5
224 1	TU02, Profile Cut, LV B	Marine Shell, Modified	>0 25"	1	71 6
224 2	TU02, Profile Cut, LV B	Vertebrate Fauna, Unmodified	>0 25"	72	41 1
225 1	TU02, LV C, Zone A	Modified Flake	>0 25"	1	6 9
225 2	TU02, LV C, Zone A	Vert Fauna, Modified	>0 25"	1	2 1
225 3	TU02, LV C, Zone A	Marine Shell, Unmodified	>0 25"	1	11 0
225 4	TU02, LV C, Zone A	Vertebrate Fauna, Unmodified	>0 25"	28	13 4
226 1	TU02, LV C, Zone B	Marine Shell, Unmodified	>0 25"	2	42 8
226 2	TU02, LV C, Zone B	Vertebrate Fauna, Unmodified	>0 25"	103	48 5
227 1	TU02, LV C, Zone C	Vertebrate Fauna, Unmodified	>0 25"	21	8 5
228 1	TU02, LV D, Zone A	Asphalt	>0 25"	1	62 9
228 2	TU02, LV D, Zone A	Antler, Unmodified	>0 25"	1	2 8
228 3	TU02, LV D, Zone A	Vertebrate Fauna, Unmodified	>0 25"	1	0 6
229 1	TU02, LV D, Zone B	Vert Fauna, Modified	>0 25"	1	1 7
229 2	TU02, LV D, Zone B	Cobble, Hematite	>0 25"	1	1 1
229 3	TU02, LV D, Zone B	Vertebrate Fauna, Unmodified	>0 25"	95	51 8
230 1	TU03, LV A	Vertebrate Fauna, Unmodified	>0 25"	1	2 8
230 2	TU03, LV A	Debitage, Chert	>0 25"	5	17 2
230 3	TU03, LV A	Staple, Fence	>0 25"	3	18 0
230 4	TU03, LV A	Metal, Aluminum Pull Tab	>0 25"	1	0 6

FS	Provenience	Description	Size Grade	Count	Weight (g)
231 1	TU03, LV B	Debitage, Chert	>0 25"	2	9 8
231 2	TU03, LV B	Staple, Fence	>0 25"	2	12 5
232 1	TU05, LV C, Zone B	Debitage, Chert	>0 25"	1	1 0
233 1	TU05, LV F, Zone B	Debitage, Chert	>0 25"	1	4 0
234 1	TU04, LV B	Debitage, Chert	>0 25"	3	0 3
234 2	TU04, LV B	St Johns Plain, Crumb	>0 25"	2	1 7
235 1	TU04, LV C	Debitage, Chert	>0 25"	1	2 2
235 2	TU04, LV C	Orange Plain, Crumb	>0 25"	1	0 8
235 3	TU04, LV C	St Johns Plain, Body	>0 25"	4	9 6
235 4	TU04, LV C	St Johns Plain, Crumb	>0 25"	4	1 8
236 1	TU04A, LV D	Debitage, Chert	>0 25"	4	0 4
236 2	TU04A, LV D	Debitage, Silicified Coral	>0 25"	1	0 1
236 3	TU04A, LV D	Orange Plain, Crumb	>0 25"	1	1 1
236 4	TU04A, LV D	St Johns Plain, Body	>0 25"	3	3 4
236 5	TU04A, LV D	St Johns Plain, Crumb	>0 25"	2	0 6
237 1	TU04A, LV E	St Johns Plain, Body	>0 25"	10	35 0
237 2	TU04A, LV E	Debitage, Silicified Coral	>0 25"	1	0 3
237 3	TU04A, LV E	Microlith	>0 25"	1	0 4
238 1	TU04A, LV F	Debitage, Chert	>0 25"	7	5 4
238 2	TU04A, LV F	Orange Plain, Crumb	>0 25"	1	0 2
238 3	TU04A, LV F	St Johns Plain, Body	>0 25"	5	24 7
239 1	TU04A, LV G	Microlith	>0 25"	1	0 7
239 2	TU04A, LV G	Vertebrate Fauna, Unmodified	>0 25"	2	0 3
239 3	TU04A, LV G	Debitage, Chert	>0 25"	6	1 5
240 1	TU04A, LV H	Cobble, Sandstone	>0 25"	1	46 8
240 2	TU04A, LV H	Microlith	>0 25"	1	0 2
240 3	TU04A, LV H	Debitage, Chert	>0 25"	4	1 8
241 1	TU04A, LV I	Vertebrate Fauna, Unmodified	>0 25"	1	0 4
241 2	TU04A, LV I	Debitage, Chert	>0 25"	6	0 8
242 1	TU04A, LV J	Vertebrate Fauna, Unmodified	>0 25"	1	0 3
242 2	TU04A, LV J	Microlith	>0 25"	1	0 4
242 3	TU04A, LV J	Debitage, Chert	>0 25"	5	0 9
243 1	TU04A, LV K	Debitage, Chert	>0 25"	6	2 6
244 1	TU05, LV H	Debitage, Chert	>0 25"	2	0 5
245 1	TU05, LV I	Debitage, Silicified Coral	>0 25"	1	0 4
245 2	TU05, LV I	Debitage, Chert	>0 25"	4	1 3
246 1	TU05, LV J	Uniface	>0 25"	1	0 3
246 2	TU05, LV J	Debitage, Chert	>0 25"	1	0 1
247 1	TU05, LV K	Debitage, Chert	>0 25"	6	2 3
248 1	TU05, FEAT 2, D 85 TO 90 CM	Orange Incised, Body	>0 25"	1	4 8
249 1	TU05, LV G	Debitage, Chert	>0 25"	2	0 9
250 1	TU04A, LV L	Debitage, Chert	>0 25"	3	1 0
250 2	TU04A, LV L	Cobble, Limestone	>0 25"	1	5 5
251 1	TU04A, LV M	Debitage, Chert	>0 25"	6	1 1
252 1	TU04A, LV N	Modified Flake	>0 25"	1	1 1
252 2	TU04A, LV N	Abrader, Sandstone	>0 25"	1	100 9
256 1	TU05, FEAT 2 - Base	Freshwater Invertebrate, Unmodified	>0 25"	1418	2797 5
256 2	TU05, FEAT 2 - Base	Terrestrial Gastropod, Unmodified	>0 25"	1	<0 1
256 3	TU05, FEAT 2 - Base	Concretion	>0 25"		1 9
256 4	TU05, FEAT 2 - Base	Uncharred Botanical	>0 25"		0 3
256 5	TU05, FEAT 2 - Base	Vertebrate Fauna, Unmodified	>0 25"	2	2 0
256 6	TU05, FEAT 2 - Base	Orange Plain, Crumb	>0 25"	13	9 5
256 7	TU05, FEAT 2 - Base	Gastropod, Unmodified	>0 125"	1	<0 1
256 8	TU05, FEAT 2 - Base	Freshwater Invertebrate, Unmodified	>0 125"	162	234 1
256 9	TU05, FEAT 2 - Base	Terrestrial Gastropod, Unmodified	>0 125"	32	0 3
256 10	TU05, FEAT 2 - Base	Concretion	>0 125"		37 5
256 11	TU05, FEAT 2 - Base	Orange Plain, Crumb	>0 125"	44	2 3
256 12	TU05, FEAT 2 - Base	Charcoal	>0 125"		0 1
256 13	TU05, FEAT 2 - Base	Vertebrate Fauna, Unmodified	>0 125"	12	0 2
256 14	TU05, FEAT 2 - Base	Quartz Pebble, Unmodified	>0 125"		0 1
256 15	TU05, FEAT 2 - Base	Sample, Unprocessed	N/A		
257 1	TU02, FEAT 1, East	Vertebrate Fauna, Unmodified	>0 25"	23	20 9
257 2	TU02, FEAT 1, East	Marine Bivalve, Unmodified	>0 25"	1	1 2
257 3	TU02, FEAT 1, East	Freshwater Invertebrate, Unmodified	>0 25"	475	529 2

FS	Provenience	Description	Size Grade	Count	Weight (g)
257 4	TU02, FEAT 1, East	Concretion	>0 25"		34 7
257 5	TU02, FEAT 1, East	Mineralized Root	>0 25"		1 6
257 6	TU02, FEAT 1, East	Freshwater Invertebrate, Unmodified	>0 125"	71	161 9
257 7	TU02, FEAT 1, East	Terrestrial Gastropod, Unmodified	>0 125"		0 1
257 8	TU02, FEAT 1, East	Concretion	>0 125"		79 2
257 9	TU02, FEAT 1, East	Mineralized Root	>0 125"		3 3
257 10	TU02, FEAT 1, East	Hackberry Seed	>0 125"		<0 1
257 11	TU02, FEAT 1, East	Charcoal	>0 125"		0 2
257 12	TU02, FEAT 1, East	Hematite	>0 125"		0 1
257 13	TU02, FEAT 1, East	Vertebrate Fauna, Unmodified	>0 125"	476	17 4
257 14	TU02, FEAT 1, East	Sample, Unprocessed	N/A		
259 1	TU02, COL, STRA IV, LV A	Freshwater Invertebrate, Unmodified	>0 25"	262	240 0
259 2	TU02, COL, STRA IV, LV A	Terrestrial Gastropod, Unmodified	>0 25"	2	0 1
259 3	TU02, COL, STRA IV, LV A	Sample, Unprocessed	N/A		
259 4	TU02, COL, STRA IV, LV A	Concretion	>0 25"		0 8
259 5	TU02, COL, STRA IV, LV A	Mineralized Root	>0 25"		0 8
259 6	TU02, COL, STRA IV, LV A	Quartz Pebble, Unmodified	>0 25"		0 2
259 7	TU02, COL, STRA IV, LV A	Vertebrate Fauna, Unmodified	>0 25"	113	20 1
259 8	TU02, COL, STRA IV, LV A	Freshwater Invertebrate, Unmodified	>0 125"	31	20 8
259 9	TU02, COL, STRA IV, LV A	Terrestrial Gastropod, Unmodified	>0 125"	11	0 1
259 10	TU02, COL, STRA IV, LV A	Quartz Pebble, Unmodified	>0 125"		0 3
259 11	TU02, COL, STRA IV, LV A	Charcoal	>0 125"		0 7
259 12	TU02, COL, STRA IV, LV A	Hackberry Seed	>0 125"		0 1
259 13	TU02, COL, STRA IV, LV A	Concretion	>0 125"		3 3
259 14	TU02, COL, STRA IV, LV A	Mineralized Root	>0 125"		0 5
259 15	TU02, COL, STRA IV, LV A	Debitage, Chert	>0 125"	2	0 1
259 16	TU02, COL, STRA IV, LV A	Vertebrate Fauna, Unmodified	>0 25"	1144	35 3
260 1	TU02, COL, STRA III, LV B	Freshwater Invertebrate, Unmodified	>0 25"	985	1584 3
260 2	TU02, COL, STRA III, LV B	Terrestrial Gastropod, Unmodified	>0 25"	3	0 2
260 3	TU02, COL, STRA III, LV B	Charcoal	>0 25"		0 3
260 4	TU02, COL, STRA III, LV B	Hackberry Seed	>0 25"		<0 1
260 5	TU02, COL, STRA III, LV B	Concretion	>0 25"		16 2
260 6	TU02, COL, STRA III, LV B	Possible Bone Meal Or Mineralized Root	>0 25"		9 0
260 7	TU02, COL, STRA III, LV B	Freshwater Invertebrate, Unmodified	>0 125"	400	2147 5
260 8	TU02, COL, STRA III, LV B	Terrestrial Gastropod, Unmodified	>0 125"	59	0 7
260 9	TU02, COL, STRA III, LV B	UID Mollusc, Unmodified	>0 125"	1	<0 1
260 10	TU02, COL, STRA III, LV B	Vertebrate Fauna, Unmodified	>0 125"	1853	39 3
260 11	TU02, COL, STRA III, LV B	Concretion	>0 125"		26 4
260 12	TU02, COL, STRA III, LV B	Possible Bone Meal Or Mineralized Root	>0 125"		2 5
260 13	TU02, COL, STRA III, LV B	Charcoal	>0 125"		1 6
260 14	TU02, COL, STRA III, LV B	Hackberry Seed	>0 125"		0 4
260 15	TU02, COL, STRA III, LV B	Quartz Pebble, Unmodified	>0 125"		0 1
260 16	TU02, COL, STRA III, LV B	Sample, Unprocessed	N/A		
260 17	TU02, COL, STRA III, LV B	Marine Bivalve, Unmodified	>0 25"	1	0 1
260 18	TU02, COL, STRA III, LV B	Vertebrate Fauna, Unmodified	>0 25"	214	37 0
264 1	BA01, D 70 CM; Transect 1	Microlith	>0 25"	1	1 2
265 1	BA05, D 10 TO 60 CM; Transect 2	St Johns Plain, Body	>0 25"	2	4 6
266 1	BA07, D 0 TO 20 CM; Transect 2	St Johns Plain, Body	>0 25"	4	11 1
266 2	BA07, D 0 TO 20 CM; Transect 2	Metal, Nail	>0 25"	1	2 0
267 1	BA04, D 80 TO 100 CM; Transect 2	Modified Flake	>0 25"	1	6 5
268 1	BA02, D 120 TO 130 CM; Transect 2	St Johns Plain, Body	>0 25"	3	2 2
269 1	BA01, D 50 TO 60 CM; Transect 2	Orange Plain, Body	>0 25"	3	6 3
270 1	BA12, D 80 TO 100 CM; Transect 1	Vertebrate Fauna, Unmodified	>0 25"	6	1 0
270 2	BA12, D 80 TO 100 CM; Transect 1	Vertebrate Fauna, Unmodified	>0 125"	233	5 4
270 3	BA12, D 80 TO 100 CM; Transect 1	Misc Rock	>0 125"		0 2
270 4	BA12, D 80 TO 100 CM; Transect 1	Debitage, Chert	>0 125"	1	<0 1
270 5	BA12, D 80 TO 100 CM; Transect 1	Debitage, Chert	>0 125"	1	0 1
270 6	BA12, D 80 TO 100 CM; Transect 1	Sample, Unprocessed	N/A		
272 1	BA01, D 240 TO 260 CM; Transect 4	Freshwater Invertebrate, Unmodified	>0 25"	189	157 5
272 2	BA01, D 240 TO 260 CM; Transect 4	Vertebrate Fauna, Unmodified	>0 25"	13	1 9
272 3	BA01, D 240 TO 260 CM; Transect 4	Charcoal	>0 25"		3 1
272 4	BA01, D 240 TO 260 CM; Transect 4	Concretion	>0 25"		2 9

FS	Provenience	Description	Size Grade	Count	Weight (g)
272 5	BA01, D 240 TO 260 CM; Transect 4	Debitage, Chert	>0 25"	1	0 1
272 6	BA01, D 240 TO 260 CM; Transect 4	Freshwater Invertebrate, Unmodified	>0 125"	73	81 0
272 7	BA01, D 240 TO 260 CM; Transect 4	Vertebrate Fauna, Unmodified	>0 125"	95	2 4
272 8	BA01, D 240 TO 260 CM; Transect 4	Concretion	>0 125"		0 9
272 9	BA01, D 240 TO 260 CM; Transect 4	Charcoal	>0 125"		1 1
272 10	BA01, D 240 TO 260 CM; Transect 4	Uncharred Botanical	>0 125"		0 5
273 1	BA05, D 120 TO 130 CM; Transect 5	Hafted Biface	>0 25"	1	9 0
274 1	BA01, D 90 TO 125 CM; Transect 7	Marine Shell, Unmodified	>0 25"	2	33 3
275 1	BA03, D 200 TO 210 CM; Transect 7	Freshwater Invertebrate, Unmodified	>0 25"	12	3 8
275 2	BA03, D 200 TO 210 CM; Transect 7	Vertebrate Fauna, Unmodified	>0 25"	28	8 8
275 3	BA03, D 200 TO 210 CM; Transect 7	Charcoal	>0 25"		0 1
275 4	BA03, D 200 TO 210 CM; Transect 7	Sample, Unprocessed	N/A		
275 5	BA03, D 200 TO 210 CM; Transect 7	Freshwater Invertebrate, Unmodified	>0 125"	42	21 6
275 6	BA03, D 200 TO 210 CM; Transect 7	Vertebrate Fauna, Unmodified	>0 125"	439	8 7
275 7	BA03, D 200 TO 210 CM; Transect 7	Charcoal	>0 125"		0 3
276 1	BA05, D 170 TO 190 CM; Transect 8	Freshwater Invertebrate, Unmodified	>0 25"	251	249 6
276 2	BA05, D 170 TO 190 CM; Transect 8	Charcoal	>0 25"		1 3
276 3	BA05, D 170 TO 190 CM; Transect 8	UID Botanical	>0 25"		1 7
276 4	BA05, D 170 TO 190 CM; Transect 8	Freshwater Invertebrate, Unmodified	>0 125"	79	83 6
276 5	BA05, D 170 TO 190 CM; Transect 8	Vertebrate Fauna, Unmodified	>0 125"	106	1 9
276 6	BA05, D 170 TO 190 CM; Transect 8	Charcoal	>0 125"		3 7
276 7	BA05, D 170 TO 190 CM; Transect 8	UID Botanical	>0 125"		1 6
276 8	BA05, D 170 TO 190 CM; Transect 8	UID Seed, Burned	>0 125"		<0 1
276 9	BA05, D 170 TO 190 CM; Transect 8	Sample, Unprocessed	N/A		
276 10	BA05, D 170 TO 190 CM; Transect 8	Terrestrial Gastropod, Unmodified	>0 125"	1	<0 1
277 1	BA06, D 205 TO 215 CM; Transect 8	Freshwater Invertebrate, Unmodified	>0 25"	15	11 4
277 2	BA06, D 205 TO 215 CM; Transect 8	Vertebrate Fauna, Unmodified	>0 25"	1	1 1
277 3	BA06, D 205 TO 215 CM; Transect 8	Palm Seed	>0 25"		1 2
277 4	BA06, D 205 TO 215 CM; Transect 8	Acorn Fragment	>0 25"		<0 1
277 5	BA06, D 205 TO 215 CM; Transect 8	UID Botanical	>0 25"		0 2
277 6	BA06, D 205 TO 215 CM; Transect 8	Charcoal	>0 25"		0 8
277 7	BA06, D 205 TO 215 CM; Transect 8	Freshwater Invertebrate, Unmodified	>0 125"	8	15 4
277 8	BA06, D 205 TO 215 CM; Transect 8	Vertebrate Fauna, Unmodified	>0 125"	24	0 7
277 9	BA06, D 205 TO 215 CM; Transect 8	Charcoal	>0 125"		1 3
277 10	BA06, D 205 TO 215 CM; Transect 8	Palm Seed	>0 125"		1 6
277 11	BA06, D 205 TO 215 CM; Transect 8	UID Botanical	>0 125"		0 9
277 12	BA06, D 205 TO 215 CM; Transect 8	Misc Rock	>0 125"	1	<0 1
277 13	BA06, D 205 TO 215 CM; Transect 8	Sample, Unprocessed	N/A		
278 1	TU06, LV A	Modified Flake	>0 25"	1	0 3
278 2	TU06, LV A	Debitage, Chert	>0 25"	3	0 9
278 3	TU06, LV A	Debitage, Silicified Coral	>0 25"	2	0 2
278 4	TU06, LV A	Cobble, Limestone	>0 25"	1	6 5
279 1	TU06, LV B	Orange Plain, Body	>0 25"	5	4 2
280 1	TU06, LV C	Orange Plain, Body	>0 25"	1	1 6
280 2	TU06, LV C	Orange Plain, Crumb	>0 25"	27	9 0
280 3	TU06, LV C	Modified Flake	>0 25"	1	3 8
280 4	TU06, LV C	Debitage, Chert	>0 25"	1	0 3
281 1	TU06, LEV D, PP-1	Orange Plain, Body	>0 25"	11	46 5
281 2	TU06, LEV D, PP-1	Orange Plain, Crumb	>0 25"	263	38 2
282 1	TU06, LEV D, PP-2	Orange Plain, Body	>0 25"	6	34 2
282 2	TU06, LEV D, PP-2	Orange Plain, Crumb	>0 25"	32	11 5
283 1	TU06, LV D	Orange Plain, Body	>0 25"	15	47 7
283 2	TU06, LV D	Orange Plain, Rim	>0 25"	3	5 0
283 3	TU06, LV D	Orange Plain, Crumb	>0 25"	125	45 3
283 4	TU06, LV D	Modified Flake	>0 25"	1	2 3
283 5	TU06, LV D	Debitage, Chert	>0 25"	3	3 0
284 1	TU06, LV E	Orange Incised, Body	>0 25"	1	5 6
284 2	TU06, LV E	Orange Plain, Body	>0 25"	9	37 4
284 3	TU06, LV E	Orange Plain, Crumb	>0 25"	70	34 2
284 4	TU06, LV E	Vertebrate Fauna, Unmodified	>0 25"	1	1 9
284 5	TU06, LV E	Modified Flake	>0 25"	1	0 2
284 6	TU06, LV E	Debitage, Chert	>0 25"	8	2 6
287 1	TU06, LV F	Orange Plain, Body	>0 25"	1	1 7

FS	Provenience	Description	Size Grade	Count	Weight (g)
287 2	TU06, LV F	Orange Plain, Crumb	>0 25"	15	8 4
287 3	TU06, LV F	Debitage, Chert	>0 25"	12	6 8
287 4	TU06, LV F	Debitage, Silicified Coral	>0 25"	3	0 7
287 5	TU06, LV F	Modified Flake	>0 25"	1	0 3
288 1	TU06, LV H	Modified Flake	>0 25"	1	3 4
288 2	TU06, LV H	Modified Flake	>0 25"	1	0 7
288 3	TU06, LV H	Vertebrate Fauna, Unmodified	>0 25"	1	0 7
288 4	TU06, LV H	Debitage, Silicified Coral	>0 25"	5	2 0
288 5	TU06, LV H	Debitage, Chert	>0 25"	8	2 7
288 6	TU06, LV H	Cobble, Quartzite	>0 25"	3	4 9
288 7	TU06, LV H	Abrader, Sandstone	>0 25"	1	34 1
289 1	TU06, LV G	Orange Plain, Rim	>0 25"	1	0 9
289 2	TU06, LV G	Cobble, Quartzite	>0 25"	1	1 1
289 3	TU06, LV G	Modified Flake	>0 25"	1	3 0
289 4	TU06, LV G	Debitage, Silicified Coral	>0 25"	2	0 2
289 5	TU06, LV G	Debitage, Chert	>0 25"	11	1 9
289 6	TU06, LV G	Concretion, Sand	>0 25"	1	50 5
290 1	TU06, LV I	Hafted Biface	>0 25"	1	0 9
290 2	TU06, LV I	Biface, Fragment	>0 25"	1	9 4
290 3	TU06, LV I	Debitage, Silicified Coral	>0 25"	4	1 8
290 4	TU06, LV I	Debitage, Chert	>0 25"	13	2 1
291 1	TU06, LV J, PP-1	Hafted Biface	>0 25"	1	27 6
292 1	TU06, LV J	Debitage, Chert	>0 25"	11	2 6
293 1	TU06, LV K	Biface, Fragment	>0 25"	1	0 6
293 2	TU06, LV K	Debitage, Chert	>0 25"	6	2 0
293 3	TU06, LV K	Cobble Sandstone	>0 25"	1	5 1
294 1	TU06, West Wall Cleanup	Orange Plain, Body	>0 25"	1	2 0
294 2	TU06, West Wall Cleanup	Modified Flake	>0 25"	1	3 1
295 1	TU06, Wall Collapse	Orange Plain, Crumb	>0 25"	1	0 4
296 1	TU06, STP at Base, D 120 TO 220 CM	Debitage, Chert	>0 25"	3	0 4
296 2	TU06, STP at Base, D 120 TO 220 CM	Debitage, Silicified Coral	>0 25"	1	0 1

APPENDIX C
RADIOCARBON DATA

Beta Lab Number	Provenience	Assay Type	Material	Measured 14C Age BP	Conventional 14C Age BP	12/13 ratio	Calibrated Age BP (2 Sigma)	Depositional Context
295207	Test Unit 5 - Feature 2 (Base)	AMS	Charcoal	3210 ± 30	3220 ± 30	-24.5	3560–3360	Terrestrial
Description: Base of shell-filled pit (Feature 2) with Orange Incised pottery sherd in association.								
295208	Test Unit 1, Stratum V	AMS	Charcoal	n/a	3810 ± 40	n/a	4410–4080	Terrestrial
Description: Shell exposure on east shore of spring pool, characterized by concreted whole and crushed *Viviparus*, some bivalve and *Pomacea* shell in gray sand.								
295210	Test Unit 2, Stratum III-B	AMS	Charcoal	4740 ± 40	4730 ± 40	-25.4	5590–5320	Terrestrial
Description: Shell layer REDACTED characterized by abundant whole *Pomacea* shell and bivalve (numerous paired examples) with rare *Viviparus* shell.								
296262	Test Unit 2, Stratum IV-A	AMS	Charcoal	4960 ± 40	4950 ± 40	-25.5	5850–5590	Terrestrial
Description: REDACTED medium–fine brown sand with rare shell fragments, abundant charcoal throughout, and occasional patches of light colored sand.								
296263	Test Unit 2, Feature 1, East Half	AMS	Charred Nutshell	5820 ± 40	5850 ± 40	-23	6780–6550	Terrestrial
Description: Shallow, shell-filled pit REDACTED characterized by brown sand and mostly whole *Viviparus* and bivalve shell with some charcoal.								
297933	Bucket Auger 4-1 (240-260 cmbs)	AMS	Uncharred Seed	3880 ± 40	3940 ± 40	-21.2	4520–4240	Subaqueous
Description: Base of saturated shell midden with abundant *Viviparus* and bivalve shell, charred and uncharred botanicals, and vertebrate fauna.								
297934	Bucket Auger 7-3 (200-210 cmbs)	AMS	Charred Nutshell	4740 ± 40	4730 ± 40	-25.5	5590–5320	Subaqueous
Description: Base of saturated shell midden with abundant *Viviparus* and bivalve shell, charred and uncharred botanicals, and vertebrate fauna situated below a fibrous peat deposit.								
297935	Bucket Auger 8-6 (205-215 cmbs)	AMS	Uncharred Seed	4270 ± 40	4240 ± 40	-26.8	4870–4620	Subaqueous
Description: Base of saturated midden, mostly shell-free with abundant charred and uncharred botanicals and vertebrate fauna, possibly deposited on a buried A horizon.								

APPENDIX D
FLORIDA MASTER SITE FILE FORMS

SITE FILE FORMS NOT INCLUDED