APALACHICOLA VALLEY
ARCHAEOLOGICAL SURVEY AND SYNTHESIS, NORTHWEST FLORIDA

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Cover photo: view facing north of middle Apalachicola River meander, taken from west bank blufftop at Nameless Creek site, 8Li195, showing Alum Bluff in the background, July 2017.

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Abbreviations used in this report:

AGENCIES AND GENERAL TERMS

ANERR	Apalachicola National Estuarine Research Reserve, Eastpoint
BAR	Florida Bureau of Archaeological Research, Tallahassee
CRM	Cultural Resources Management
DHR	Florida Division of Historical Resources, Department of State, Tallahassee
FLMNH	Florida Museum of Natural History, Gainesville
FMSF	Florida Master Site File, part of BAR
NMAI	National Museum of the American Indian, Smithsonian Institution
NMNH	National Museum of Natural History, Smithsonian Institution
pXRF	portable X-ray fluorescence analysis (to determine trace elements)
SJBSPB	St. Joseph Bay State Buffer Preserve, Port St. Joe
UTM	Universal Transmercator (locational coordinates)

ARCHAEOLOGICAL TERMS

Arch	Archaic
Carr	Carrabelle Incised, Punctate
ch-st	check-stamped
char	charcoal
ChattBr	Chattahoochee Brushed
comp-st	complicated-stamped
Dept	Deptford
DHR	Division of Historical Resources
decort	decortication flake (chert)
EArch	Early Archaic
EWd	Early Woodland
frag	fragment
FWInc	Fort Walton Incised
g	grams
hist	historic-period
inc	incised
indet	indeterminate
Keith	Keith Incised
km	kilometers
LJ	Lake Jackson
Lam	Lamar
LArch	Late Archaic
LWd	Late Woodland
MArch	Middle Archaic
mi	miles
Miss	Mississippi period
MWd	Middle Woodlad
pl	plain (surface of sherd)
prehist	prehistoric
pt	projectile point
punc	punctate
PWI	Point Washington Incised
SwCrC-St	Swift Creek Complicated-Stamped
-t	-tempered
unident	unidentified
WI	Weeden Island

1. INTRODUCTION, PROJECT GOALS, AND ACKNOWLEDGMENTS

The archaeological work reported here has been done with the support of Historic Preservation Small Matching Grant SM18_0014 - 2018 from the Florida Department of State, Bureau of Historic Preservation. It is not a typical archaeological survey required for compliance with cultural resources regulations or aimed at discovering archaeological evidence slated to be destroyed because of imminent construction. The research goals of this project have been 1. to synthesize my work and that of my students over three decades in the Apalachicola-lower Chattahoochee valley region of northwest Florida; 2. to make as much information as possible available to the Florida Master Site File and wider archaeological community; 3. to update details on many known sites discovered decades ago; and 4. to research archaeological collections, including those in private hands, before they are lost to professional archaeology. The investigations included checking out newly reported sites, radiocarbon dating excavated materials from several sites, and scientific analyses of coprolites from the Otis Hare site (8Li172) and of ceramics from many different sites. Additional knowledge has been gained for the research area on nearly all prehistoric time periods, as well as historic times including the first Spanish period and the pre-Civil War nineteenth-century.

The organization of this volume is different from that of the typical survey report. Instead of describing the culture history of the region first, that section comes at the end, in order to incorporate all the new data and interpretations accumulated, and to present a current summary archaeological synthesis for the region. Earlier chapters briefly present the environmental background, a summary of previous archaeological work in the region, and the survey methods, including areas scrutinized without finding any archaeological materials. The largest chapter then provides details for the sites investigated, both newly discovered and updated, by county. The last chapter integrates the new data into a comprehensive summary of the estimated 14,000-year archaeological record in the region.

The work also includes research efforts begun over the last several years to address specific sites and survey areas, and which are finally completed, along with all their archaeological site forms, thanks to support from this grant project. These are submitted together with this final report and all those forms to the Division of Historical Resources so they can be attached to individual site records in the Florida Master Site File. The seven pieces of additional work are as follows:

1). *Archaeological Survey and Testing on St. Vincent Island, Northwest Florida* (White and Kimble 2017). Fieldwork for the archaeological survey of St. Vincent Island (National Wildlife Refuge) in western Franklin County, had been completed years ago. It was supported only by $700 in small private donations. A preliminary research article on the work was published (White and Kimble 2016), but the final report was delayed in order to process a huge artifact collection donated after the fieldwork was done, and then further delayed while under review by the Regional Historic Preservation Office & Regional Archaeologist, U.S. Fish and Wildlife Service, Southeast Region. The current grant project supported a student worker's time for processing some of the collection and completion of the 19 archaeological site forms (3 new sites and 16 updates).

2). *Collecting the Past: Using a Private Collection of Artifacts to Assess Prehistoric Occupation of the Chipola River Valley in Northwest Florida* (Kreiser 2018). One collector's large amount of materials and data from sites in Jackson and Calhoun County, most from the bottom of the Chipola River, and most Paleo-Indian and Archaic in cultural affiliation, have been documented by this Master's thesis. The current grant project partially supported processing of the information, visiting the collector a couple times, and completing a total of 86 new and updated site forms; all these materials are submitted to accompany the present report.

3). *The Paleoindian Chipola: A Site Distribution Analysis and Review of Collector Contributions in the Apalachicola River Valley, Northwest Florida* (Tyler 2008). This M. A. thesis project studied materials in several private collections, including documenting some Paleo-Indian sites. New site forms and updates were never done for them, and this project has supported the labor of completing those 16 forms (8 newly recorded sites), which are submitted here along with a copy of that thesis.

4). *Porter's Bar: A Coastal Middle Woodland Burial Mound and Shell Midden in Northwest Florida* (Knigge 2018). The Porter's Bar mound and shell midden site (8Fr1) and Green Point mound (8Fr 8), on the shore of Apalachicola Bay in Eastpoint, have undergone intensive field, archival, and collections study for Knigge's Master's thesis. The current survey project allowed one more field search for the lost Green Point mound, examination of materials in the DHR collections, and preparation of the two site update forms, which are submitted with a copy of the thesis.

5). *New Archaeological Data from the Deal Collection, Richardson's Hammock, St. Joseph Bay, Northwest Florida* (Presto 2013). Richardson's Hammock site (8Gu10), a Fort Walton and Middle Woodland shell midden and burial mound on St. Joseph Bay, has been test-excavated in the past (White et al. 2002; White 2005). However, we continue the research, and additional information on the site came to light during this project, as documented in this report, when collectors allowed study of their materials. Presto's undergraduate honors thesis investigating an additional private collection from the site, completed a few years ago, is also submitted, as well as the site update form.

6). *Archaeology of the Early Eighteenth-Century Spanish Fort San José, Northwest Florida* (Saccente 2013). The historic site of Fort San José (8Gu8), an early seventeenth-century Spanish outpost on St. Joseph Bay, has reasonably good documentation and has had some archaeological work. Based on extensive documentary and collections work, as well as analysis of a newly available and very large private archaeological collection, Saccente's M.A. thesis and also a book chapter (7), "Fort San José, a Remote Spanish Outpost in Northwest Florida, 1700-1721" (Saccente and White 2015) have been completed to tell a fuller story of the fort. As part of the current project, further research was done among the Florida State University collections. A summary of that latest work and the additional two documents and a site update form are submitted with this project.

In sum, with this entire project, we are able to document a total of 90 newly recorded archaeological sites, and update records on 63 others (Appendix A), with all the submitted materials. Given the additional research beyond field survey, many previously-investigated sites yielded new and exciting information, sometimes contradicting previous interpretations. Details are given with each site description in Chapter 5, and the overall big picture is described in Chapter 6. Appendix A lists all sites newly discovered or updated by the whole group of research projects, for which site forms are submitted with this final report.

The fieldwork for this project conducted over a total of 30 days (in July, August, and December 2017, and February and May, 2018) by a crew averaging 4 workers, and joined by many friendly avocational archaeologists and other helpers. We tallied a total of 5647 miles driven over the 6 counties, and 35 miles by boat. Lab work, materials and data processing, and specialized analyses such as radiocarbon-dating, coprolite analysis, and pXRF analysis of ceramics, were conducted throughout the year. Many people donated time, expertise, machinery, and labor to the project, as well as food and lodging for the crew. All materials recovered are curated at the USF archaeology lab, except for those studied in private collections and at the Bureau of Archaeological Research collections, as indicated in the materials tabulations for each site.

Thanks are extended to my field crew, consisting at various times of students Ryan Harke, Chris Hunt, Kerri Knigge Klein, Kelsey Kreiser, and Mike Lockman, who also did much of the lab work. USF archaeology colleague Rob Tykot donated pXRF analyses. Help was provided by many fellow archaeologists (professional and avocational), community members, and local residents, including Kristen Anderson, Dale Cox, Lisa Johnston, Herman and Pam Jones, Suella McMillan, Brian Rucker, Janie Shealy, and Jeff Whitfield. Engineer Tony White did drone videos and aerial photography. Tamara Allen and Joan Matey of the Carrabelle Historical Museum shared site information. Archaeologists Karen Smith and Keith Stephenson visited the project from South Carolina. Foresters Phil McMillan and David Dyson helped locate sites on private land. St. Joseph Bay State Buffer Preserve Director Dylan Shoemaker and staff, especially Sandra Chafin, Jeff Loschiavo, and volunteer Tim Nelson, helped with sites on the preserve and additional locations in Gulf and Franklin Counties. Apalachicola National Estuarine Research Reserve staff also assisted work in Franklin County. The Friends of St. Vincent Island donated some lodging and meals.

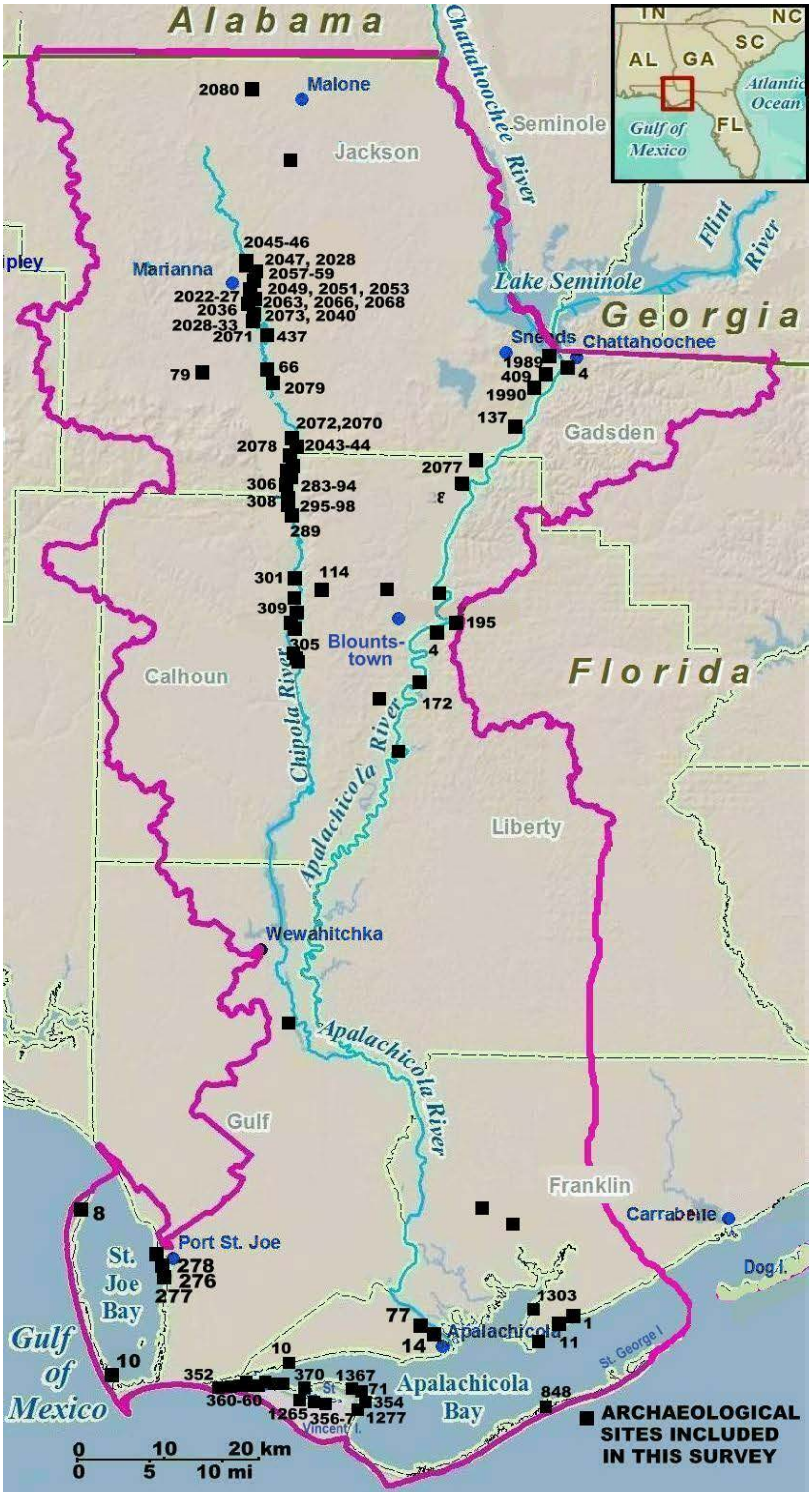


Figure 1. The Apalachicola-lower Chattahoochee Valley region of Florida, showing survey/ drainage boundaries (in red-violet and locations of sites discussed in this report.

2. PROJECT AREA DESCRIPTION AND ENVIRONMENTS

RESEARCH REGION

The Chattahoochee River flows out of a cold Appalachian spring in the Blue Ridge mountains in northeast Georgia, southward toward the Gulf of Mexico. Its lowest 25 miles (40 km) make up the Florida-Georgia border (river or navigation miles are used here because this is the convention for describing U.S. navigable rivers, with mile markers posted on the banks and indicated on most maps). Having run down a total of 436 miles (702 km), the Chattahoochee meets with the Flint River, which originates near the Atlanta airport; from this confluence or forks of the two rivers flows the Apalachicola, some 110 miles (177 km) to the Gulf.

The area of concern for this report is approximately the lowest 25 miles of the west bank (Florida side) of the Chattahoochee and the entire Apalachicola, a valley system totaling about 135 river miles (260 km) long, and between 2 and 20 miles (3 – 50 km) wide (Figure 1). This segment of the drainage basin is a geographic zone with some environmental consistency and archaeological continuity and integrity as a distinct region. It includes also some 40 linear miles (65 km) of Apalachicola Bay shore, over 35 linear miles (56 km) of barrier islands, and the 15-mile-long (24 km) St. Joseph barrier peninsula around St. Joseph Bay. Although today St. Joseph Bay and Peninsula are strictly not within the drainage system of the river valley, in the past they were connected, both geographically and culturally. In the middle valley Torreya Ravines region, the elevations of some archaeological sites on the riverbanks can be over 50 m above sea level, while sites at the south end, on Apalachicola Bay and the barrier islands, can be less than .5 m above sea level. Indeed, this valley traverses both some of the highest and the lowest land in Florida (Hine 2013:2).

The big river is wide and swift, with dangerous currents and bends, muddy, silt-laden waters, banks of pale sand flecked with glittering mica particles brought downstream from the mountains; prehistoric ceramics are distinctive for the mica flecks in the clay. Today the Chattahoochee and Apalachicola mark the boundary between Eastern and Central time zones, as well as states, counties, and other modern entities. But probably in prehistoric time, when most of the important travel and interaction was along waterways, even the big rivers were not barriers or boundaries, but easily crossed and navigated daily. In the wall-to-wall forest that characterized much of the eastern U.S., except for cleared paths and settlements, the riverbanks must have afforded people a rare view of a horizon.

Much of the riverbank has natural levees on both sides, often 5 m high on the Apalachicola (Clewell 1991), where people preferred to live for many thousands of years. Behind and paralleling the levees are extensive alluvial river swamps or backswamps replenished during winter flood season, then dry bottomlands and upland terraces. The forested bottom of the basin harbors amazing ecological diversity; one researcher identified over 1000 plant species within 200 acres of floodplain (Johnson 1993:23). The Chipola River, the Apalachicola's largest tributary, is even more distinctive, with spring-fed, brilliant "blue" waters cutting into the stark white limestone channel. The rivers and their hundreds of tributaries and distributaries are natural corridors for human movement, communication, and settlement, as are the bay shores, with the barrier islands and peninsula providing good stopover places for travelers and campgrounds for fishers and shellfishers. The modern landscape of the research region has been mostly sculpted by water, and until very recently in human time, was most efficiently traversed by water.

The unusual geomorphological characteristics of this valley region, from the big, meandering river to the high, un-Florida-like eastern bluffs that continue from south Georgia into the middle Apalachicola, have also resulted in enormous ecological diversity. The Nature Conservancy recently singled out the Apalachicola valley as one of six biodiversity hotspots in the nation, because it is replete with rare habitats and species, and especially because it retains the largest amount of longleaf pine forest left in the world and one of the country's most pristine estuaries (Edmiston 2008:50).

Past human settlement all through time is often concentrated on immediate riverbanks, elevated levees. The pattern of prehistoric midden being thickest on the immediate bank and tapering off moving away from the river has long been recognized (e.g., Bullen 1958:343), but has meant enormous site loss in recent times. Agriculture, cutting timber for logging, and especially dam construction, dredging, and other alterations have meant that riverbank sites have disappeared at a hugely accelerated rate in the past half-century. The Jim Woodruff Dam and Reservoir (now called Lake Seminole) constructed in the 1950s at the forks of the Flint and Chattahoochee have severely affected both the valley ecosystems and the archaeological record. Reservoirs back up water and act as sediment traps, so water comes out below the dam cutting more sediment out of the banks. A huge percentage of linear riverbank sites are completely gone. The following briefly describes sub-areas within the research region.

LOWER CHATTAHOOCHEE

The Chattahoochee is one of the most dammed (damned?) rivers of the South. The portion of the lower Chattahoochee included in this research, today part of Lake Seminole, drowned many archaeological sites and is far wider than the unmodified river used to be before 1950. This area sits within the Southern Red Hills and Dougherty Plain geological districts, with rolling hills ranging in elevation from 250 to 50 feet (15 to 76 m) above sea level, some dark red soils with a high clay component, and many sinkholes, marshes and ponds, though some streams disappear from the surface in the permeable ground and soluble limestone bedrock (Couch et al 1996; Hubbell et al. 1956:8–11). The river is muddy here, especially from agricultural field runoff, and the bottomlands are thickly forested where they are not cleared for pastures or agriculture. There are outcrops of limestone chunks containing usable chert on the riverbank (Figure 2), and occasional piles of rock that include quartzite cobbles, also usable as tools. When the dam backed up the waters, expanding the river, creeks turned into sloughs and made islands out of hilltops. Levee segments were also made into islands, and backswamps behind them into channels paralleling the main river (Livingston 1991). Opinions vary on whether hunting or fishing a particular animal, or even the appearance of the landscape, has been better or worse "after the dam," but the U.S. Army Corps of Engineers' manipulations of this river system, usually at the behest of politicians, industrialists, and developers upriver, continue. Their dredging, straightening, dike construction, and other actions, are not always favorably received, and do have often unexpected and negative consequences. Corps operations manuals (e.g., USACOE 2015) discuss water control effects upon wildlife and endangered species but not upon cultural resources.

Figure 2. The lower Chattahoochee River west bank, flooded as part of the Jim Woodruff Reservoir (Lake Seminole), showing area of drowned caves and rock outcrop that would have been attractive to prehistoric people.

The vast low area west of the lower Chattahoochee is the Marianna Lowlands, a large karst formation extending also down the west side of the upper Apalachicola. It is scarred with many curves of former river channels, as the river has moved east through time. Sometimes these channels still contain water as small streams or oxbow lakes, and they often have archaeological sites on the banks. The landscape here is also dotted with several sinkhole ponds and springs that were equally good places to live. Few such springs do not have prehistoric artifacts lying around on their banks. They are popular for recreation today, and were enormously important during the late Pleistocene and early Holocene, when the colder, dryer climate and low sea levels meant they were rare and dependable water sources. So far the deeper sinkhole springs and ponds have not been explored by professional underwater archaeologists. However, there could be well-preserved Archaic or Paleo-Indian cultural remains in these springs and sinks just as there are in so many others in Florida. Of the many caves on dry land, most are too small to offer habitation areas to creatures much larger than bats, but some do have evidence for prehistoric occupation (e.g., Bullen 1949; Tesar and Jones 2009) and some are associated with outcrops of potentially usable rock (Figure 2).

The river bottomlands support thick hardwood forests with cypress wetlands and plentiful wildlife. Aquatic species abound, from jumping fish to playing otters, though some riverine shellfish and other species (such as sturgeon) have become diminished or extinct in modern times. General erosion and water-level fluctuations due to the dams cause portions of the banks to wash away regularly. Trees are always falling into the river, often taking with them large chunks of bank containing dark midden soils. Dredging to maintain navigation channels may have accelerated this process, though it has been stopped in recent years.

Soil runoff from deforestation for agriculture since the nineteenth-century plantation days means that there is usually at least one meter of alluvium on top of the prehistoric cultural deposits that seem to line the entire riverbank. Finding sites on alluvial banks of the lower Chattahoochee and Apalachicola by shovel testing is rather futile since a 50-cm square test cannot physically be excavated deep enough to encounter those buried sites. Coring into the bottom of a shovel test or expanding its area is crucial in order not to miss deeper cultural deposits that are buried under recent soils. Or, one can simply observe the exposed, eroding bank face where it is not obscured by vegetation to see what is washing out. To the west within the karst territory of the Marianna Lowlands is the drainage basin of the Chipola River, the largest tributary of the Apalachicola, whose floodplain merges with that of the lower Chattahoochee.

UPPER APALACHICOLA

The Apalachicola River is is wholly encompassed within the state of Florida. It is the largest of Florida's 17,000 rivers in terms of discharge or flow (Light et al. 1998), and the only one with headwaters in the southern Appalachians, meaning its water contains melted snow. Its drainage basin of 6200 square km really is naturally divisible into three geographic segments, upper, middle, and lower. This river flows unimpeded by dams, but has had a lot of dredging in the past to maintain channel depth, with spoil piled on the banks. The river bottom is mostly sand, with some gravel, and shifting sandbars are typical along the banks. Because of the dam, as noted, the erosion of archaeological sites on the natural levees is hastened. I have seen bank areas cut back over 25 m (80 feet) over the last 30 years.

Today most sandbars on the river are made of dredged material, which usually contains many prehistoric artifacts and fossils (confusing the archaeological record). Past natural sandbars, however, usually forming inside bends (Edmiston 2008:53), would have offered solid ground (at least temporarily), shallow water, perhaps access to shellfish beds, a distant view and horizon, and probably other advantages for past peoples. In times of high water usually late winter and early spring, flood conditions connect various habitats with the river channel, probably making many different types of resources more available to prehistoric native foragers. Dry-season loss of this connectivity might have been equally important for structuring seasonal adaptations. Such dry-season disconnection is now more common because of modern manipulation (Light et al. 1998), setting the stage for the "water wars" that carry on to this day (e.g., Leitman et al. 1991; Southern Environmental Law Center 2016), as Alabama, Florida, and Georgia fight over control of the rivers. Far up the Chattahoochee the growth of Atlanta and other cities has spurred a need for more water than ever before, as has large-scale agro-business irrigation. At least 84% of the water flowing into Apalachicola Bay from the river originates in Georgia and Alabama (Johnson 1993). Siphoning off huge amounts upriver leaves less water (and more pollution) for the rest of the river and the estuary environment that produces bay and gulf seafood, an industry upon which lower valley livelihoods depend. Apalachicola-Chattahoochee-Flint ("ACF waterway" in current political lingo) disputes among the three states have been prolonged legal battles going back decades and now before the Supreme Court. Throughout the valley the changes in water regimes have meant loss of aquatic species and other serious changes and calls for dam removal to permit restoration of imperiled fish and shellfish (Williams et al. 2014:102-103). Human undertaking within the last century or more has probably changed the waterways and regional ecosystems more than anything else since the end of the Pleistocene.

The upper Apalachicola valley extends almost 30 river miles (47 river km) from the confluence of the Flint and Chattahoochee to the area of the towns of Blountstown and Bristol. It encompasses parts of Jackson and Calhoun Counties on the west, Gadsden and Liberty Counties on the east. Many tributary streams run perennially across the floodplain, which ranges from one to two miles (1.5 to 3 km) wide, and through which the river runs fairly straight, with only gentle bends (Leitman et al. 1983; Light et al. 1998:Plate 1, 2006:viii). In the upper valley, the river runs up against the high bluffs formation on the east side that are the westernmost extension of the Tallahassee Hills (Rupert 1990a). The ravines, here, as deep as 30 m (100 feet), may hold water year-round regardless of rainfall.

These Torreya Ravines and Bluffs, elevated above the shallow seas that covered the rest of Florida until two million years ago, were refugia that allowed a high proportion of more northerly, Appalachian species to survive (Bryan et al. 2008:111). Even the huge Mississippi River system does not bring as many northern plants down so near to the sea, and the temperate hardwood forests here have the greatest plant diversity north of Mexico. The list of at least 127 globally rare (and now often endangered) endemic species, from daisies to trees to turtles, in the Torreya Ravines include, mysteriously, a higher proportion of plants with close relatives in eastern Asia than anywhere else in the South (Means 1985:14. 1994:20), as well as Florida's only upland glade natural communities and, combined with the Middle Apalachicola, the area with the world's largest population of red-cockaded woodpeckers (Clewell 1977; Nature Conservancy 2000). The upper Apalachicola valley has the highest diversity and density of amphibians and reptiles north of Mexico, and rare species of flatwoods salamanders and crayfish (Means 1977). From the steephead ravines the seeps turn into creeks running down to the narrow floodplain strip at the banks. On the west side are flat broad lowlands rising gradually to the Grand Ridge elevation, a stream-incised remnant (Rupert 1990b:1) and then dropping slightly westward to the karst plain of the Marianna Lowlands (Clewell 1977). Continual eastward migration of the river widens the valley and leaves the west side with eroded remnants of former ridge areas. (So far little archaeological difference has been observed between the kinds of prehistoric occupation and activity of any time period from the low west bank to the high east bank).

There must have been many shellfish beds on the river, judging by the number of freshwater shell midden sites. The river has been nourished by countless springs, and some are still extant. Many of the creeks flowing into the river today probably began as spring runs that are now drowned or otherwise obscured. As with the lower Chattahoochee, on the Apalachicola prehistoric cultural deposits may be buried under a meter or two of material thrown up on the banks by recent floods, but components of the sites may be separated by only shallow alluvial strata showing far less soil erosion prehistorically. My survey after the 1994 record flooding demonstrated that many known sites were sliced away vertically by the floodwaters, while others were covered with up to a foot of new pale coarse sand; still other sites experienced both effects (White 1996).

MIDDLE APALACHICOLA

The middle valley of the Apalachicola is a smaller area, extending about 35 river miles (56 km) from the Chipola Cutoff at river mile 42 CHECK near the town of Wewahitchka to about river mile 75, not far below the towns of Bristol and Blountstown (see cover photo). It includes parts of Calhoun and Liberty Counties, and has large tributary lakes (Light et al. 1998:Plate 2, 2006:viii), low wetlands, and the continuation and petering-out of the high east-side bluffs of the Torreya Ravines. The floodplain here ranges from 3 to 5 km wide, and the river runs through it in large loops in the northern, more elevated portion and smaller, tighter bends in the south. Elevations range from 150 feet (45 m) above sea level near the Beacon Slope on the east side to less than 100 feet (30 m) on the flatter west side and south end (Leitman et al. 1983). Much of the middle valley landscape is the result of the formation of ancient barrier islands and marine terraces. Modern creeks occupy remnant floors of lagoons that were between those barrier formations. In its continual eastward migration, the river has doubtless obliterated or at least seriously altered and redeposited many older sites that we will never know about in such a complex landscape.

The east side of the middle valley is still characterized by high Torreya Ravines, which block the channel's further movement east. Alum Bluff and the Apalachicola Bluffs and Ravines Preserve are the farthest downstream of these striking formations, the last heights to climb for a breathtaking vista of high red and white valley sides and thick forest (see cover photo). Here is Florida's longest exposed geological section, the bluff face continually shaved open by the bending river, and one of the South's most significant fossil sites (Campbell 1985; Means 1985:13). In local lore this area has been called the "Garden of Eden" because the rare Torreya trees are also called stinking cedar or gopher wood, the latter name supposedly appearing in the bible as the raw material for Noah's ark (Jahoda 1967:68-75). These bluffs hosted the same rare species as the upper valley, in great stands of longleaf pine. Then they became planted-over with slash and other fast-growing pines for the paper industry in more recent times. While silviculture is still prominent, conservation zones are now undergoing renewal to revive the environment for the return of woodpeckers and other species.

Archaeological survey is aided in the middle valley by the many agricultural fields and stands of planted pine, with accompanying dirt roads, that provide much open ground for inspection. After so many years of research, as with the upper valley, I still cannot pinpoint any differences in the archaeological record on the high bluffs as compared with that on the low west side of the river. Small probably hunting-gathering-type camp sites occur on both sides, and there are Middle Woodland mounds on the bluffs just like there are in lowland settings.

Figure 3. Middle Apalachicola valley riverine backswamp slough in front of the Duncan McMillan site, 8Ca193, across which the crew and the forester in his ATV could not travel due to hidden depths.

LOWER APALACHICOLA

The lower valley extends up some 42 river miles (68 km) from the coast to the Chipola Cutoff area near the town of Wewahitchka, within the Gulf Coastal Lowlands and incorporating portions of Gulf and Franklin Counties. The river is the boundary between the counties until it meets with the large tributary Jackson River flowing in from the west, then it takes a southwesterly dive to the coast ignoring natural waterways (see straight diagonal in Figure 1). Political concerns dictated this unusual borderline, which is also the line between Central and Eastern time zones, and which puts the barrier islands in Franklin County. The lower valley, also including the bay and barrier islands, was designated a World Biosphere Reserve by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in 1983.

Myriad tributary and distributary lakes and streams thread across the lower valley. It is flat, wet territory with acidic Plio-Pleistocene sandy soils laid down by waves and currents from the time it was inundated by ancient oceans (Couch et al. 1996; Light et al. 2006:viii; Livingston 1983:10, 1984), with slightly raised areas that were once offshore bars. Elevation of the land here rarely reaches above 30 to 40 feet (10-12 m) and much of the floodplain is seasonally waterlogged (Leitman et al. 1983). Shallow, densely-wooded swamps and poorly-defined creeks are even called “bays” (Rupert 1991:1) and can have peat deposits. The floodplain widens to 4.8 to 8 km (Couch et al. 1996; Leitman et al. 1983). It is no surprise that the fewest number of archaeological sites in the region are known from the lower valley, given its heavily alluviated low land that the river created in building its delta, which has probably buried hundreds of sites.

The Apalachicola is tidally influenced as far as about 25 miles (40 km) upstream from its mouth, meaning boaters historically took advantage of incoming tides to go upstream and outgoing tides to go downstream. But today much of the lowest 25 river miles of immediate riverbank have been converted to sterile sand-bar habitat by dredging and dumping spoils in huge piles. Walking over these is like trekking through a desert. On the west side, the wetlands have been cut with long orderly canals for large-scale agricultural interests. Pine forests stretching westward to the shores of St. Joseph Bay, in prehistoric and historic time would have been more like open savannah that one could ride a horse through, until historic deliberate plantation and fire suppression made them denser. Lake Wimico, an old bay, is a major tributary channel. On the east side, pine flatwoods alternate with or overlap wetlands. Squishy seepage bogs feature carnivorous plants such as sundew, Venus flytraps, and pitcher plants.

Much of the lower valley is now actively conserved as public lands, within the Apalachicola National Estuarine Research Reserve, the western portion of the Apalachicola National Forest (the largest national forest east of the Mississippi), and the Tate's Hell State Forest. The many marsh clam (*Rangia* or *Polymesoda*) shell middens on the banks of lower-valley streams were often inhabited over thousands of years of prehistory. They contain some oyster shell too, and their faunal assemblages indicate subsistence continuity in these estuarine settings over the long term, even in the face of local environmental change, and even after farming developed inland. The shell middens are elevated places, white and easy to see amid the green of the forest, and would have been higher, drier land for good camping. Mounded shell middens of clam and oyster are usually ovoid, following meanders of streams banks. No ring-shaped or U-shaped middens are known, only curved or banana shapes, following stream meanders or occasionally created by "borrowing" shell for road and other construction, digging out the widest part and leaving the edges.

Understanding the geography of the lower valley is crucial to the interpretation of human settlement patterns, from aboriginal to historic. The river has been prograding, toward the sea as it dumps tons of alluvium. As the delta forms from sediment deposits, it blocks the river channel, causing the water to form additional distributary channels and the land to be low and swampy, with buildup of delta lobes (Sasser et al. 1994:3). The main river channel has shifted continually eastward because of constantly rising sea level since the end of the Pleistocene, dragging the river mouth along. This shift is archaeologically visible in shells at the midden sites. Marsh clams, which live in fresh and brackish water, are found in Woodland deposits of shell middens that overlie earlier Late Archaic deposits containing higher proportions of oyster and saltwater-fish bone (White 2014a). Oysters need saltier water, and do not live today in the estuarine areas where the shell middens exist today. Past environmental data might be gleaned from the fact that no prehistoric middens predominantly of marsh clam shell exist upriver from about navigation mile 10, and middens on the current bay shores are all of oyster.

Though moderns often shun them, Native Americans probably considered swamps and marshes prime real estate, with so many plant and animal species available for hunting, fishing, and gathering, the lower valley has fewer recorded archaeological sites than upriver or on the coast. Probably prehistoric habitation was just as dense, but the evidence is harder to find because of the difficulty of access, the heavy forest cover, lack of agricultural fields and other wide, exposed areas, and the heavy sedimentation processes that have buried and obscured (and protected) ancient cultural remains. Nearly all sites here are shell middens, very visible, white platforms amid the continuous green. This is also true on the bay shores, especially at creek mouths, such as at Porter's Bar on the east side of Apalachicola Bay. Along the river bank from the mouth to well above the city of Apalachicola, the west shoreline was probably a near-continuous shell midden ridge or set of ridges

CHIPOLA RIVER

The Chipola is formed by the convergence of Marshall and Cowart's Creeks, which originate in south Alabama. It flows 84 miles (136 km) to its mouth into the Apalachicola River at mile 28 or 45 km distance inland by water (Florida Division of Water Resources and Conservation 1966:21). It drains an area over 3200 square km (1237 square miles), nearly half the Apalachicola's drainage basin (Edmiston 2008:9), and boosts the bigger river's flow into the productive coastal estuaries. The Chipola's stunning clear blue-green waters come from the estimated 63 springs that flow into it (Barrios and Chelette 2004:3) and the lack of sediment content due to the hard limestone bottom. It occupies the mostly flat land west of the lower Chattahoochee and upper-middle Apalachicola, paralleling the bigger river for most of its length until it turns eastward toward its mouth. Some caves and rock outcrops occur along its banks, and at Florida Caverns State Park near Marianna, in its upper reaches, it dives underground into a solutional opening, reappearing on the surface a few hundred meters downstream. The Chipola is a major destination for canoeists and kayakers, hikers, wildflower afficionados, and others who love being outdoors.

It is famous for what is found under its waters also. The Chipola has produced for divers remarkable evidence of heavy Paleo-Indian occupation and Pleistocene fossils of extinct animals, as well as cultural remains of all other prehistoric time periods. Many of these collectors and avocational archaeologists have shared their materials, and these sites have been recorded by Tyler (2008) and Kreiser (2018) in their M. A. theses, which are submitted along with this report. Like the Aucilla River to the east, which has had a great deal of underwater archaeology (Dunbar 2016), the Chipola is a recent river formed after the Pleistocene (Ice Age) as rising sea level brought the water table up enough to connect lines of sinkholes formed by chains of springs. The sinkholes would have provided permanent water sources and attracted big and small game during the cold dry time of the Pleistocene, when the first humans got to Florida. The considerable number of Paleo-Indian sites along the Chipola and relative scarcity of them along the channel of the bigger river suggests the possibility that the lower Chattahoochee may have flowed in the channel inhabited by the Chipola today and then was possibly altered by a stream capture process farther upriver in late Pleistocene or early Holocene times. The other attraction for early human groups was the availability of stone raw material. Chert outcrops in the limestone exposed rock suitable for tool-making.

Most sites are on (or in) the upper and middle stretches of the Chipola. In the lower reaches of this river, the backup of sediment load from the larger river causes enough blockage at the mouth to create a very different environment. The small river opens out into various wide water paths together called Dead Lakes, a naturally dammed, cypress-filled watery stretch about 15 km (9 miles) long. Here the mirror-still water is dotted with stumps and Spanish moss-embroidered cypresses. Archaeological sites are harder to find because of the high water table and less-exposed ground.

Figure 4 . The Chipola River, at Magnolia Bridge site, 8Ja437, view facing northeast, showing winter vegetation and bluish, spring-fed waters, December 2017.

APALACHICOLA BAY, COASTS, AND BARRIER FORMATIONS

The barrier island chain around the mouth of the Apalachicola was formed about 4,000 to 5,000 years ago by the action of currents and waves (Twichell et al. 2013). It encloses Apalachicola Bay and the estuary system, offering a buffer protecting the mainland from general surf and storms. In the bay, fresh water from the river mixes with the salt water of the Gulf. Bayshores on the barrier islands and mainland, with dunes of pure white sand, have many shell middens, indicated by the striking contrast of black sand containing cultural deposits. Peat strata exposed after storms on Apalachicola barrier islands have produced fiber-tempered ceramics probably well over 3000 years old. Even older materials, including Paleo-Indian points on St. Vincent Island, indicate occupation probably on old riverbanks when the area was mainland and the Gulf was 30 miles away during the Pleistocene.

Apalachicola Bay is Florida's most productive estuary, in recent years supplying annually 6 million pounds of shrimp and 90% of Florida oysters, and 10% of the nation's oysters. Commercial and recreational fishing are also important. The bay averages only 2-4 m (6 -12 feet) deep and has between one and five tides daily of up to a meter height (Edmiston 2008). Indigenous peoples took great advantage of this natural bounty. The bayshores are packed with habitation sites, mostly shell middens, predominantly of oyster but often including some Rangia clam shell, with fish and turtle bone. Artifacts wash out of shorelines or are exposed by storms and low tides. As sea levels have risen and fallen through the last millennia (20 cm [8 inches] higher in the last 100 years), people must have changed and adapted.

Preferred habitations locations are near stream mouths feeding into the bay. For example, at Porter's Bar burial mound and shell midden (8Fr1; see below), a spring pours out into a creek that creates a delta forming a small point protruding into the bay. About a dozen old river channels in the bay are buried at least 2 m below the current bottom level and estimated to be up to 8000 years old. Offshore in the Gulf, other paleo channels and old delta formations are even older, up to 16 m below current sea level. Before the current barrier formations emerged, when sea levels were lower during the Pleistocene and early Holocene and shorelines were far out under today's Gulf, Paleo-Indian and Archaic settlements were probably along the banks of the now-buried waterways (Donoghue 2011:29). Hints of such sites have now come with the recovery of Paleo-Indian and Archaic points eroding out of the St. Vincent Island north shore (see Chapter). We have only just begun to correlate stages of geological development of the coast with the archaeological record (Donoghue and White 1995). Research on archaeological sites on St. Vincent Island has also contributed to the reconstruction of sea-level fluctuation curves, and helped confirm higher-than-present sea level between about 1500 and 500 years ago (Balsillie and Donoghue 2004; White and Kimble 2016).

Figure 5. Apalachicola Bay shore at Porter's Bar Mound and Shell Midden site (8Fr1), view facing east; photo taken from the east edge of the shell midden, by Kerri Knigge. Drowned tree stumps show how much bayshore erosion has taken of the mainland.

A chain of barrier formations surrounds the Apalachicola delta. The eastern islands, St. George (including Little or Cape St. George) and Dog Island, are thin strips with overwash zones, narrow places which periodically open into channels during storms. St. Vincent Island is triangular and wide, made by long-term progradation of beach ridges (Randazzo and Jones 1997:166-67). Its 4860 ha (12,000 acres) of parallel dune ridges and swales run at several angles due to marine processes of different times. It is now a national wildlife refuge, only accessible by boat. Our archaeological survey of St. Vincent (White and Kimble 2017) is submitted with this project. Some of its sites have produced Paleo-Indian and Archaic materials, changing settlement models for those time periods.

On the west side, St. Joseph peninsula is a thin barrier spit running north-south, 24 km (15 mi) long, <1 km wide, joining the mainland at Cape San Blas on the south end. It encloses St. Joseph Bay (Figure 6), which is unusually salty because it lacks freshwater tributaries, and has very different aquatic species. Most midden sites on its shores are characterized by large gastropods such as lightning whelk and horse conch, with smaller amounts of oysters and other saltwater shellfish, fish, and turtles. Two islands in the bay, close to shore on the southeast side. Conch Island (8Gu20) and Black's Island (8Gu11) are all shell midden and are probably drowned former elevated shoreline sections. Despite the unusual sites and atypical seafood, the prehistoric material culture around St. Joseph Bay does not differ from that of other areas in the lower valley, except to include more large shell tools. A Middle Woodland mound on this bay is at Richardson's Hammock (8Gu10); this report contains new information on that mound gleaned from a private collection. The incredible dynamism of barrier formations might suggest that human habitation was rare and brief. However, a large number of sites from all time periods are recorded on their shores. New evidence from shell chemistry suggests whelk collection by late prehistoric people at Richardson's Hammock was done during nearly all seasons (Harke 2012; Harke et al. 2015).

Figure 6. Sunset view of St. Joseph Bay, taken from State Buffer Preserve Center (where the crew for this project sometimes stayed) looking across to Richardson's Hammock site (8Gu10).

3. PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

As early as the late eighteenth century there are descriptions of archaeological remains in the Apalachicola valley. Field naturalist William Bartram wrote of an abandoned Native American village and mounds shown to him by Creek Indians during his travels, probably on the lower Chattahoochee (exact location unknown), which they well recognized as “the work of the ancients, many ages prior to their arrival” (Bartram 1955 [1791]:314). Artifact collecting probably began with later prehistoric people. In the early nineteenth-century, artifacts from around the city of Apalachicola (probably Pierce Mounds complex, 8Fr14) ended up at the New York Historical Society, where they were described by famous geographer/ethnographer Henry Schoolcraft (1847:127), who said some came from the collection of James R. Hitchcock of Florida, who got them from ancient burial mounds. Other materials certainly from Pierce ended up at the British Museum by 1875, where I studied them well over a century later, and by 1888, in the Florida State Museum (now Florida Museum of Natural History [FLMNH]) in Gainesville (White 2013). The Smithsonian Institution National Museum of Natural History (NMNH) collections contain chert and pottery pieces from near Chattahoochee Landing Mounds complex in Gadsden County, at the other end of the valley, collected by W. H. Dall in the 1890s.

Wealthy Philadelphia socialite and famous early archaeologist Clarence Bloomfield Moore reached the Apalachicola valley by 1901, and returned often (1902, 1918) especially because of the beauty of Middle Woodland pottery (Brose and White 1999). His specially-built steamboat, the *Gopher,* traveled all the major rivers of the South looking for mounds to dig. Though his methods were not those of modern archaeology, he did research and compare the sites he dug and the artifacts he found. Most important, he recorded information fairly carefully and also published his results. Thus much of modern southeastern U.S. archaeology has been concerned (obsessed?) with Moore for decades, and this report notes relocation of one of his site (Bristol Mound). Much of his huge artifact collection is now stored at the Smithsonian’s National Museum of the American Indian (NMAI). In 2017 I visited those collections and photographed some of the specimens included in this report to fill out the picture of some particular sites.

Professional archaeology in the region began with Gordon R. Willey, who visited the Florida panhandle and realized the huge archaeological potential there. Willey began survey in 1940, with the help of Richard Woodbury, trying to relocate some of Moore’s sites and discover new ones. He synthesized his data, described hundreds of sites, named time periods and ceramic series, and wrote what is still the “bible” for Florida archaeologists, *Archaeology of the Florida Gulf Coast* (Willey 1949). In the late 1940s and early 1950s, several archaeologists came to the Apalachicola-lower Chattahoochee valley region as part of the federal River Basin Surveys program organized by the Smithsonian NMNH. They surveyed in advance of the construction of the Jim Woodruff Dam at the Chattahoochee-Flint River confluence, from which the Apalachicola River flows. Completion of the dam flooded the Jim Woodruff reservoir, later renamed Lake Seminole, which drowned hundreds of archaeological sites. Ripley P. Bullen (1950, 1958) surveyed the Florida side of the Chattahoochee and first mile or so of the Apalachicola, and later tested a few sites.

From the 1950s onward, the closest professional archaeologists to the Apalachicola-lower Chattahoochee region were at the Department of Anthropology, Florida State University (FSU): Charles Fairbanks, Hale Smith, and David Phelps, who recorded many sites brought to their attention by local residents (data in the Florida Master Site File [FMSF]). One FSU graduate student, Glenn T. Allen, Jr. (1954) tested a few sites, including on Little St. George Island, and another, Bennie Keel (notes on file at the Florida Bureau of Archaeological Research [BAR]) dug at Yon mound and village site (8Li2) in the middle Apalachicola. Gardner (1966, 1969, 1971) excavated at Waddell's Mill Pond (8Ja65) site.

Other well-known archaeologists passed through the area and looked at sites, even picked up materials, but most of this work is unreported. By the 1970s there were more professional archaeologists from Tallahassee recording sites in the region. BAR staff Dan Penton, Louis Tesar, and Calvin Jones filed many reports with the FMSF, and FSU professor George Percy and his students were surveying in the Torreya Ravines area (e.g., Percy and Jones 1976), on St. Joseph Bay, and elsewhere. FLMNH's Jerald T. Milanich (1974) excavated the Sycamore site on the upper Apalachicola in the path of construction of Interstate 10. David S. Brose, of Case Western Reserve University (CWRU) and the Cleveland Museum of Natural History (CMNH) came to Florida with his students in 1973, becoming involved in many projects (e.g., Brose 1980; Brose and Percy 1974).

As one of those students, I have continued the work for the decades since. My work, and that of a multitude of other archaeologists too numerous to name over all those years, has included both research (site and survey reports) and cultural resources management (CRM) surveys and excavations required by law (some of which are listed in the References section). Some of what is reported here involves deeper investigation of sites and materials already known but not well reported, dated, or otherwise analyzed. Another important aspect of study in this region is that there are many more out there doing archaeology all the time. Farmers plowing, hunters trekking through the woods, fishers on their boats along the streams and bayshores, and other explorers have unearthed probably millions of artifacts annually. I have seen collections that have been in families for at least three generations. The rich material legacy of some 15 millennia of native inhabitants is hard to miss for anyone living in the region, and most long-time residents today are artifact collectors or know someone who has a collection. Thus, part of the work described in this report involves discovering new knowledge from some of these old collections and data carefully conserved by local knowledgeable individuals.

4. SURVEY AND DATA COLLECTION METHODS

Categories of Investigation

By design, this project was intended to fill knowledge gaps in understanding the archaeology of a whole comprehensive and very large geographical region. Measuring about 130 river or navigation miles long, the Apalachicola-lower Chattahoochee valley region of Florida, with all of its different environments (described in the previous section) probably encompasses tens of thousands of archaeological sites. Most of these sites may never be known, and probably over half already gone to erosion, development, or other destruction. Therefore the goals of the project included the following:

1. To target a few known significant sites for which there was inadequate information or great potential for further research, whether by fieldwork, laboratory analyses, or other specialized study.

2. To visit areas reported by local residents as containing sites not already recorded or poorly understood.

3. To explore at least a few particular areas thought to contain archaeological sites for which field survey had not been done.

Specialized Analyses

The grant funds supported the following specific analyses: radiocarbon dating, coprolite analyses, and portable X-ray fluorescence (pXRF) study of selected ceramic sherds. A total of 13 new radiocarbon dates on sites of all prehistoric periods, from Late Archaic through Fort Walton times, resulted in abundant new insights, such as the age of the imported steatite from the Appalachian mountains during the Late Archaic (at Thank-You-Ma'am Creek site, 8Fr755), tightly-dated levels and associated ceramics from Early through Late Woodland at the Otis Hare site (8Li172), and the first known apparently conical Fort Walton burial mound (Singer, 8Fr16, part of the Pierce complex). All dates obtained during the course of this project are tabulated in Appendix B, and each date is discussed in the section on the site from which it came.

The analyses of coprolites from the Otis Hare site (8Li172) were many and complex: pollen, phytolith, starch, macrofloral analyses and AMS radiocarbon dating by PaleoResearch Institute, Inc., of Golden, Colorado, and DNA analysis by University of California Santa Cruz Paleogenomics Lab, California. The individual(s) who left the samples were identified as dogs, and the findings are discussed within the summary of all the other new data on this site. While possibly disappointing in comparison to studying human coprolites, these analyses were able to show environmental details and DNA results may be valuable in the light of new canine genomic research. The findings are discussed in greater detail with the discussion of Otis Hare site, and the reports of the individual analyses are attached in Appendices C and D.

The pXRF analyses of prehistoric ceramics, a service donated to the project by USF archaeological materials expert Rob Tykot, identified trace elements in selected ceramic sherds in order to see if similar clays were used to manufacture pottery at different sites. Though this analysis is still ongoing, and will be part of a student's M. A. thesis work in the coming year, the results obtained so far are very interesting. The sherds at a single site are more often similar even from different temporal components, suggesting use of similar clay sources over time, whereas sherds of similar ages from different sites are made of different clays (Tykot et al. 2018). Quantitative data from this work are still being processed and will be part of another M.A. thesis.

Field Methods and Materials Processing

As this was not a formal survey of a specific project area of potential impact or other compliance project, the standard CRM procedures did not necessarily apply. As principal investigator, I was with the crew every single day in the field, digging shovel tests, surface collecting, and talking with local historians, collectors, and others. I also spent most days on the project in the lab, to assure quality control of materials and data processing according to state and federal guidelines and my own standards of work.

Paper maps, augmented by gps, aerial photography, Google-Earth and other imagery, and electronic maps and directional applications saved enormous amounts of time and labor for our targeted survey locales. LiDar maps by Chris Hunt also aided in locating and characterizing sites, as discussed in the next chapter with individual cases. Help from local people who know the land was crucial. A cheap hand-held gps device was mostly replaced by a phone application to get coordinates for different sites. Standard survey combined surface inspection of open areas such as plowed fields, dirt roads, firebreaks, gopher-turtle burrow/backdirt, borrow pits, exposed riverbank faces and bay shorelines, with shovel-testing in vegetated areas. We also had for five days of fieldwork the use of a drone and operator, donated by Tony White, to produce aerial photos and videos of wide landscapes in our search for different sites.

For areas without surface exposure but forested or overgrown, we dug shovel tests 50 cm square (with a square shovel), at least a meter deep unless prevented by shallower hardpan or the water table or roots too thick to chop. Occasionally we took soil cores with a quick-connect 4" (10-cm) bucket auger coring tool. Soils from shovel tests and cores were always screened through quarter-inch mesh. In this project, shovel tests were placed judgementally on the highest ground in an area, or off to the side of dirt road or plowed field where surface artifacts were present. There are still wide swaths of land in the region which have not been examined, but over the years the coverage has been good. After three decades, I estimate my archaeological coverage of the entire region to be around 15% to 20% of the 135 river miles of valley. So, there is much still to be discovered, but it is time to synthesize the massive body of information we do have. A huge part of it, especially for this project, has come from the data shared by local people.

Standard lab processing methods include bagging and labeling of all artifacts and ecofacts and assigning provenience numbers by site number, year, and then number in order of recovery. This becomes the official catalog in an Excel file in the lab. All materials recovered were cleaned, classified, tabulated, and stored in the required 4-mil plastic ziplock bags and stored in new boxes. Artifact classification was done according to the standard typologies for the region. Projectile point guides used are those of Alabama (Cambron and Hulse 1964; Johnson 2017), Florida (Bullen 1975), and Georgia (Whatley 2002). Lithic debitage is classified based on simple morphology (Odell 2004; White et al. 1963). Ceramic typologies used are those by Willey (1949) which I have standardized to allow non-overlapping definitions (White 2009). For most ceramics that do not clearly fall into recognizable types, generic names are used so as not to confuse the already complicated Florida ceramic picture.

Areas Targeted for Field Examination with Inconclusive Results

French Fort Creve Coeur

This is a lost French fort only occupied for a couple months in 1718. A day-long field search in several different places by a crew of historians and archaeologists, with aerial photos, and drone videos, did not result locating it, though we may have come close. The fort's background and colonial history is fascinating. The French were vying with the Spanish and English for control of New World lands from the very beginning of the sixteenth century. Many European adventurers, colonists, and military forces had sailed around the Gulf coast and knew of St. Joseph Bay, which appeared on maps as early as the 1584 Ortelius map of La Florida. Spanish explorers out of their fort at Pensacola had conducted reconnaissance around St. Joseph Bay in the late 1600s, and by 1701 had set up a small fort on the mainland across from the tip of the peninsula, but withdrew after a few months or possibly a year or two. They were not to return for another 13 years, but the French made it there first, if only briefly (Saccente 2013; Weddle 1985, 1991).

Jean-Baptiste Le Moyne, Sieur de Bienville, a colonist born in Montreal, and founder of New Orleans and of Mobile, was a younger brother of Pierre Le Moyne d'Iberville, who founded the French colony of Louisiana. Bienville was ordered in early 1718 to occupy St. Joseph Bay as a substitute for the French port of Dauphin Island, which had been blocked by a storm that threw up a sand barrier (Faye 1946a:184). Though the French knew that moving into St. Joseph Bay would be invading Spanish territory, they established a settlement by May 1 (Weddle 1991:208,216). Bienville's younger brother, Antoine Le Moyne, Sieur de Châteaugé, reported to Mobile that Fort Creve Coeur ("Broken-heart" or "Heartbreak" was constructed with four bastions and had a company of fifty men (Faye 1946a:185-186). The name could have come from the sadness of having to set it up in enemy territory, or from a possible death that occurred during its construction (Saccente 2013:34). USF archaeologist Diane Wallman, an expert in French colonial historic settlement, explained that that "crevecoeur" can also mean a real heart-attack-type experience such as climbing a big hill and ending up breathless; perhaps simply constructing the fort was a major effort on the shifting white beach sands.

Various early eighteenth-century maps (Beranger map of 1718, Bourguignon map of 1732), as well as other historic references, show this fort on the mainland across the bay from the point of St. Joseph peninsula (Weddle 1991:208; Saccente 2013). It appears as a typical 4-bastioned shape alongside a stream labeled “sweetwater” (“Eau douce,” as opposed to the only other stream shown entering the bay, farther to the south, labeled “Eau salée” or saltwater; White 2010). Since St. Joseph Bay is known for its saline waters, this location for the fort would have been the most advantageous, near the only available drinking water. But the conditions were not so great, and Bienville even said that the drinking water was bad (possibly from saltwater intrusion at high tide?). A description of the fort was given in St. Augustine, by 15 deserters (!), describing it as a wooden structure with five cannons and a warehouse with arms and provisions for 50 men (Hann 2006:172). Jesuit historian/explorer Pierre-François-Xavier de Charlevoix (1761:323) said the shores, the soil, the flat, exposed coast, the barren sand, everything in the fort’s environment made it a very poor choice of location (Saccente 2013:34-35).

The Spanish quickly sent spies to learn of the fort and then sent the acting governor of Pensacola to order Châteaugé to leave immediately. Châteaugé complained that the responsibility lay with his older brother Bienville, but the colonial council soon decided to abandon the fort. The French burned the structure and left St. Joseph Bay August 20, 1718, having stayed only two months. Rain may have extinguished some of the fire, such that the Spanish later found it still usable. A dozen of them returned to occupy it temporarily while they built a stronger Fort San José on the tip of the peninsula, augmented by 800 troops from Pensacola and Veracruz in March 1719. The occupation of Fort San José lasted several more years and is now well documented archaeologically (Faye 1946; Saccente 2013, Saccente and White 2015; Weddle 1991).

Fort Crevecoeur had to have been along the freshwater stream of Chicken House Branch, possibly somewhere not far from its mouth, according to the old maps. This stream originates as a water-filled swale between the dunes, and meanders south-southeast for at least 1.8 km. Local historian Herman Jones thought the fort would be farther up the stream behind the dune ridge, which could shelter it, and where bay waters are deeper, and directly opposite the peninsula tip, as shown on the maps (Figure 7). We drove around the new housing developments and roads, and inspected a recently cleared area prepared for construction along many areas of the creek, but found nothing. However, modern alteration of the landscape has probably obliterated any trace of the fort, if it was indeed close to where the maps show it, directly across from the peninsula tip (and if accretion has not changed the shape and length of the peninsula tip too much).

Historian Dale Cox suggested the fort was just at the mouth of the creek, because aerial images seem to show a fort-shaped elevation there. He said that he knew someone had obtained historic artifacts from the waters of the creek at the mouth. A field search included crawling all over this location as well. It could also be the correct place because of the higher elevation and perceived shape, though it is much farther down from opposite the peninsula tip, and no artifacts or historic features could be found. We will attempt to ask permission in the future from the private landowner to do some shovel testing before it is subjected to construction. For now, all we can do is suggest this location without archaeological verification. The likelihood is high that this French fort was on what is today Chicken House Branch, the only freshwater stream in the area. But this stream originates in a swale between dunes, possibly from a spring, and flows at least 3 km south-southeast until it empties into the bay, so there is still a large area to search.

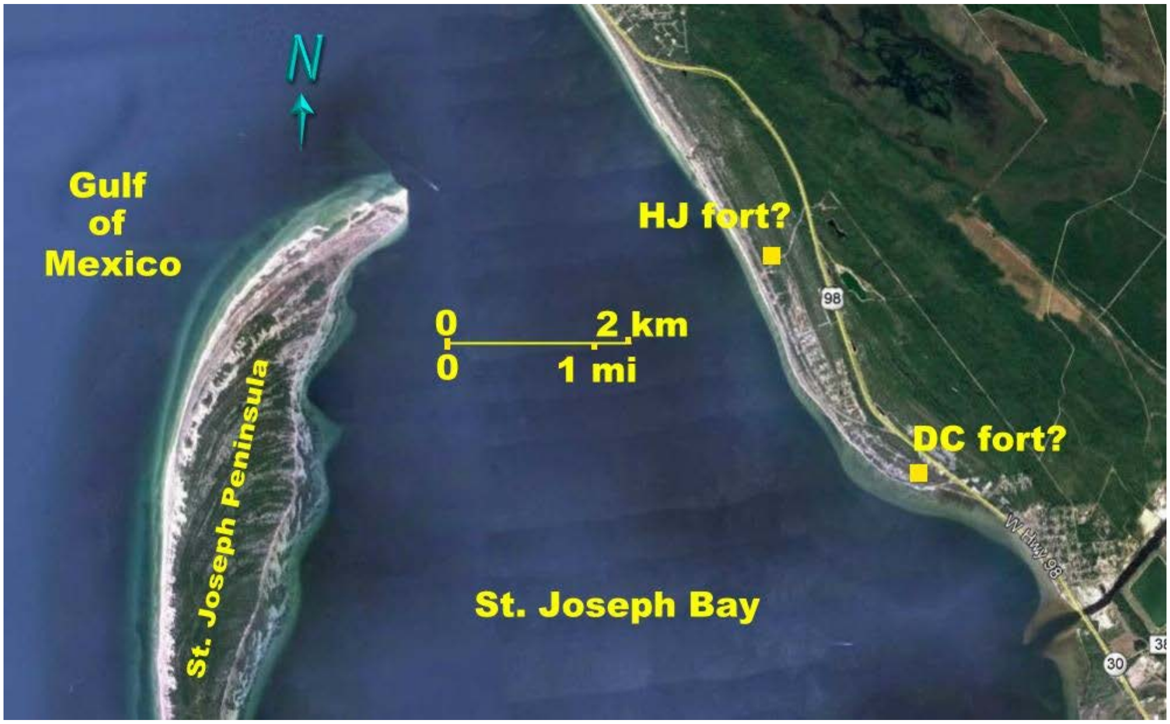


Figure 7. Possible locations of French Fort Crevecoeur, 1718: above, two different suggested locations (named after historians' initials) on mainland across from tip of St. Joseph Peninsula; below, southerly location with suggested fort-shaped outline, next to mouth of Chicken House Branch (scale bar 50 m long).

Reported Artifact and Human Skeleton Washout on West Bank, Middle Apalachicola Valley

This search targeted an area where a human skeleton was said to be washing out of eroded soils on the west bank of the Apalachicola River. In 2015, Charles "Chuck" Goins emailed me after meeting with archaeologist Rochelle Marrinan at Florida State University Department of Anthropology and archaeologists at the Division of Historical Resources in Tallahassee. Goins lives in Georgia and also in Tallahassee, but has some connection with the Blountstown area. He stated that he found pottery and also human skeletal remains in a remote area near Blountstown, exposed in the eroding river bank and uncovered by looters. The area was encompassed within the large meander loop between river miles 83 and 85. Though emails back to Goins remained unanswered, we used the geographical information he provided to visit the area as part of this project.

We met with Phil McMillan of Neal Land and Timber, and David Dyson of Larson & McGowin, LLC, who manage this Apalachicola River Timberlands property now for Forestland Group. McMillan loaned the boat to take us upriver since the road in by land (several miles) was probably inundated in some places during the summer season. We saw nothing eroding out of the bank slope, but climbed to the top and took a single 4"-diameter soil core to a depth of 125 cm. This location was just east of the logging road that parallels the river channel. No cultural materials were present in the core. We also excavated a small shovel test in the food plot clearing, on the north side of the land within the meander, to a depth of 63 cm, and then cored into it down to 108 cm, but recovered no cultural evidence. So nothing is evident in the location indicated by the informant. However, the heavy forest cover is probably concealing the site, so we got the forester to promise to call us when it is scheduled for timber cutting, as much more open space will be exposed. Walking from the possible site area northeast and down the riverbank to the water's edge, we discovered the Mile 85 site, 8Ca252, reported below.

St. Joseph Bay Shore East of Conch Island

St. Joseph Bay shores are notable for unusual prehistoric shell middens, with an abundance not of the typical oysters or clamshells but large-gastropod shells, such as lightning whelk (*Sinistrofulgur perversum*, once known as *Busycon contrarium* or *sinistrum*) and Florida horse conch (*Triplofusus papillosus*, previously known as *Pleuroploca gigantea*). Archaeological sites along this bay date from Early Woodland through protohistoric (White 2005; White et al. 2002). Previous surveys did not include investigation of the shoreline north of the St. Joseph Bay State Buffer Preserve, on the west side of highway 30A and on the mainland opposite (east of) Conch Island (8Gu20), itself a large-gastropod shell midden. So we targeted this stretch of land (Figure 8) 600 m north-south and then inspected an additional 300 m west to Conch Island. No cultural resources were found. Conch Island itself was heavily vegetated, and no large midden shells were even visible.

Figure 8. St. Joseph Bay shore on north side of St. Joseph Bay State Buffer Preserve, view facing north, showing fieldworkers Ryan Harke and Kelsey Kreiser surveying shoreline before walking westward out to Conch Island.

4. ARCHAEOLOGICAL SITES DOCUMENTED

This chapter summarizes each site that was visited during the project or had information updates from new analyses. First, newly-discovered sites are detailed, then sites previously documented for which there is new information. Both sections describe sites in alphabetical order by county prefix and then numerical order by site number. For sites already well-reported, the reasons for revisiting/updating are described instead of providing long repetitive descriptions (and adding to the length of this report).

NEWLY-RECORDED SITES

8Ca282, Mile 85 Site

Map Reference: USGS quadrangle *Bristol, FLA,* 2015.

Location: northwest of town of Bristol, W side of Apalachicola River, river mile 84.8 (400 m E of river mile 85), just past Alum Bluff if you are heading upriver; just NE of a food plot (clearing) that is visible on topo maps and Google Earth; T1N, R 6W, Section 24; lat-long coordinates 30.470220, 84.994631; UTM coordinates Zone 16, 692576 E, 3372605 N.

Physiography: riverbank; prehistoric ceramics eroding out 2 m from water's edge.

Area: estimated 10 m^2

Elevation: 55' (17 m).

Stratigraphy: yellowish-brown sandy silt loam (did not take Munsell color) on eroding sandy river bank (did not excavate).

Soils: Brickyard-Wahee-Ochlockonee unit; Wahee-Ochlockonee complex, often flooded.

Present Ground Cover: hardwood bottomland forest; sparse bushes and small oaks.

Discovery Method: surface inspection.

Time Period: indeterminate prehistoric (ceramic).

Site Type: riverbank prehistoric habitation.

Integrity: good? River bank may still have undisturbed deposits

Significance: Potentially high to medium; site was probably once much larger before erosion along this meander.

Impacts: river bank is eroding, subject to seasonal floods and storms; looting reported.

Recommendations: monitor during harvesting/planting; protect the area during hunting season so no more looting takes place. A return visit by archaeologists during fall/winter lower vegetation season should include more surface inspection and subsurface testing to see if intact subsurface cultural deposits remain, especially human bones!

Investigations: Previous archaeological work (1999) in this in area recorded the the Turtle Egg site (8Ca199), named after what else was present on the riverbank) was recorded, with 11 sherds of check-stamped and plain prehistoric pottery at river mile 83.6 on the west bank, at the southern edge of a large meander loop of the Apalachicola River, 1.4 miles downriver from the Mile 85 site. In searching for an area inside this meander loop reported to contain exposed artifacts and human skeletal remains (see discussion above), we continued looking along the riverbank and discovered this site. From the surface near the water's edge, at river navigation mile 85, we recovered a large prehistoric ceramic vessel body sherd broken into four pieces (Figure 9). Later we learned that avocational archaeologist Jeff Whitfield had picked up a large check-stamped sherd at the same site some time ago. Since the whole area was heavily vegetated, but scheduled to be harvested, and the foot plot replanted, we thought more evidence compatible with the original report suggesting a large prehistoric village and/or cemetery/mound might come out when these forestry activities happened or when foliage was reduced in winter. As of August 2018, the planned timber harvesting has not been done and the land is still heavily vegetated. The Mile 85 site is probably part of a larger village, probably Fort Walton.

Materials Recovered

Cat#	*Provenience*	*Materials*	*N*	*Wt(g)*
8Ca282-17-1	surface, eroding riverbank	grit-tempered plain sherd	1 (broken into 4 pieces)	112.6
JW collection	surface, eroding riverbank	check-stamped sherd	1	

Figure 9. Mile 85 site, 8Ca282 , view facing south, July 2017, showing steep riverbank, large sherd washing out (near trowel), archaeologist's blue-jeaned knee, yellow glove, and red pack.

8Gu276, Old St. Joseph Wharf site

Map Reference: USGS quadrangle

Location: underwater in St. Joseph Bay, next to shore near downtown

Physiography: bay bottom

Area: Estimated 10 m^2?

Elevation: 0.

Stratigraphy: Underwater site at wharf

Soils: N/A

Present Ground Cover: water

Discovery Method: informant data and fits within old plot maps of town of St. Joseph

Time Period: 1831 to 1846.

Site Type: historic shipping wharf for small port city.

Integrity: Good? Deposits all secondary, dropped during loading; some structural remains of wharf might be preserved

Significance: medium; site was part of historic town.

Impacts: urban activity.

Recommendations: monitor, preserve, prohibit further diving in state waters.

Investigations: The old town of St. Joseph was founded on St. Joseph Bay in 1836 as an alternative port to the town of Apalachicola. It was started by speculators and merchants who thought the deepwater access there, as opposed to narrow shallow passes required to get into Apalachicola, would make it easier to ship cotton and other commodities. Unfortunately, St. Joseph was ravaged by a severe yellow fever epidemic and hurricanes that essentially destroyed it by 1841, after which its remnants were abandoned. The romantic story of the lost town is covered in historical accounts, but archaeological data can tell us more about the daily life of its people and the global socioeconomic systems in which they participated. The Depot Creek Depot site, 8Gu199, which was the inland railroad depot for the town, was further investigated by Chris Hunt (2014), whose M.A. thesis and site update form are submitted separately with this project.

Research on old St. Joseph continued during the survey. Decades ago, a collector relocated the old wharf right on the bay shore. Diving below it, he recovered artifacts including large storage containers such as salt-glazed stoneware jugs, other crockery, glass bottles, and ceramic plates. He showed us the location on the map, and decided to donate his collection. The large box of materials has yet to be processed (we received it during the last couple weeks of the grant project). However it is enough to determine the significance of this site and allow us to record it. Hunt's work continues into doctoral research, of which further investigation of this site will be a part.

8Gu277, Old St. Joseph-Chafin Site

Map Reference: USGS quadrangle

Location: shore of St. Joseph Bay

Physiography: bay shore

Area: estimated 4 m^2

Elevation: 3' (1 m).

Stratigraphy: dark sand overlying gray sandy subsoil in garden (did not take Munsell color).

Soils: Leon Fine Sand

Present Ground Cover: urban garden, yard

Discovery Method: informant data and fits within old plot maps of town of St. Joseph

Time Period: 1831 to 1846.

Site Type: historic small city and port.

Integrity: good; undisturbed deposits

Significance: potentially high to medium; site was part of historic town.

Impacts: urban activity, landscaping.

Recommendations: private owner should monitor, preserve.

Investigations: This site is another integral part in the story of the lost town of Old St. Joseph (see above site description). Sandra Chafin, a resident of the area of the modern city of Port St. Joe who lives not far from what might have been the center of Old St. Joseph, had a collection of historic artifacts dug up in her garden, which she loaned us for study. We know only vaguely how the modern city overlaps with the footprint of the historic town, but her materials come from what must have been a residence near the center of it. So we begin by documenting these historic materials, some of which do date to the antebellum period (as tabulated below). Along with the Old St. Joseph Wharf site (see above) and the Depot Creek Depot site (8Gu199), the archaeological evidence of the lost town can begin to be pieced together. Chris Hunt's (2014) M.A. thesis on the town will be expanded with all these new site data as he begins his doctoral research.

Materials Recovered from Old St. Joseph-Chafin Site, 8Gu277

#	Item	Type	Category	Color	Wt. (g)	Manuf Mk	Country	Location	Dates	Pattern
18-1.1	?	blue feather edge	whiteware	blue	25.8					
18-1.2	?	green feather edge	whiteware	green	10.3					
18-1.3	?	transfer	whiteware	red	9.9		England			
18-1.4	?	transfer	whiteware	red	30.6					Canova
18-1.5	platter	transfer	whiteware	red	41.8					
18-1.6	?	transfer	whiteware	purple	27.6					
18-1.7	?	plain	stoneware	brown	2343.7					
18-1.8	?	plain	stoneware	brown and tan	40.3					
18-1.9	cup	transfer	whiteware	blue	33.3		England			
18-1.10	plate	transfer	whiteware	blue	2.2	T. Mayer	England	Longport, Dale Hall Pottery	1838-1842	Canova
18-1.11	cup	transfer	whiteware	blue	7.3					Abbey Ruins
18-1.12	?	transfer	whiteware	blue	3.0	William Ridgeway & CO.	England	Shelton, Hanley, Staffordshire	1834-1854	Peacock
18-1.13	plate	unknown	whiteware	white	4.3	Homer Laughlin	USA	Newell, West Virginia, Bell Works & Church Works	1940-1960	Tyrolean ?
18-1.14	plate	transfer	whiteware	blue	2.4	Thomas Mayer	England	Newell potteries, #8	1826-1835	
18-1.15	plate	unknown	whiteware		3.0	poss T. Mayer	poss England			Arms of New York
18-1.16	plate & cup	transfer	whiteware	blue	163.2					
18-1.17	plate	transfer	whiteware	gray	48.6					Crushed Rock
18-1.18	?	flow blue	whiteware	blue	15					Crushed Rock
18-1.19	plate	transfer	whiteware	blue	10.7					
18-1.20	plate	transfer	whiteware	gray/black	26.3					Standard Willow
18-1.21	plate	transfer	whiteware	blue	106.7					
18-1.22	bowl or plate	transfer	whiteware	blue	36.4					
18-1.23	bowl	transfer	pearlware	blue	8.5					
18-1.24	platter	transfer	whiteware	blue	56.6					
18-1.25	cup	transfer	whiteware	blue	43.4					
18-1.26	plate	transfer	whiteware	brown	51.9					
18-1.27	serving bowl	transfer	whiteware	blue	133.6					
18-1.28	jug	plain	stoneware	brown & red	160					
18-1.29	?	annular ware	whiteware	blue, brown, gray	50.1				1811-1900	
18-1.30	?	annular ware	whiteware	blue, brown, orange	46.6				1811-1900	common cable type
18-1.31	?	annular ware	whiteware	gray, red, black	8.5				1811-1900	common cable type
18-1.32	?	annular ware	whiteware	blue	5.3				1811-1900	common cable type
18-1.33	?	annular ware	whiteware	blue	4.3					

#	Item	Type	Category	Color	Wt. (g)	Manuf Mk	Country	Location	Dates	Pattern
18-1.34	?	annular ware	whiteware	white	4.6					rilling decoration
18-1.35	?	annular ware	pearlware	brown	1.3					rilling decoration
18-1.36	?	hand-painted	whiteware	green, red, black	4.4				1830-1870	rilling decoration
18-1.37	?	molded	ironstone	white	12.1				1840-1870	floral
18-1.38	plate	plain	porcelain	white	23.9					
18-1.39	?	plain	pearlware	white	36.8					
18-1.40	?	plain	whiteware	tan	5.4					
18-1.41	roof tile	stone	slate	gray	25.5					
18-1.42	bottle	wine Bordeaux style		green	127.3					
18-1.43	bottle	glass		clear	20.4					
18-1.44	?	glass		clear	14.2					
18-1.45	bottle	spirits		dark green/olive	90.7				mid-19 cen.	
18-1.46	?	glass		clear	40.6					
18-1.47	bottle	glass		brown	7.0					
18-1.48	?	glass		clear	0.6					
18-1.49		rock	chalk	white	9.4					
18-1.50		rock	quartz	red	44.5					
18-1.51		rock		white	52.4					
18-1.52	animal	bone	turtle	tan	6.7					
18-1.53	animal	shell	Busycon (whelk)	white	10.3					
18-1.54		clay	tile	white/tan	2.2					
18-1.55	?	plain	whiteware	white	497.6					
18-1.56	tea pot	plain, plated silver	holloware	gray	500.6	National Silver Co.	USA	New York	1904-1970	
18-1.57	?	molded	refined earthenware	brown, light blue	46.2				20 cen	

8Gu278, Tim Nelson Site

Map Reference: USGS quadrangle *Port St. Joe, Florida,* 1997.

Location: downtown Port St. Joe, 120 m west of intersection of highways 71 and 98, at waterfront bayshore; lat-long coordinates 29.811634º, 85.304681º; UTM coordinates Zone 16, 663839E, 3299125N.

Physiography: shore of St. Joseph Bay, 200 m from water's edge.

Area: approx. 10 m²

Elevation: 4' (1 m).

Stratigraphy: white dune sand (did not excavate).

Soils: Leon-Pickney-Mandarin.

Present Ground Cover: sod planted by the city, a few oaks, wetland vegetation

Discovery Method: informant data; he discovered it when city was moving earth behind his veterinary office.

Time Period: indeterminate prehistoric.

Site Type: bayshore prehistoric habitation.

Integrity: fair? Numerous good-sized shell tools.

Significance: potentially medium; site was probably once much larger before heavy earth disturbance.

Impacts: eroding shoreline, city landscaping.

Recommendations: city land managers should monitor during upkeep of parkland.

Investigations: Retired veterinarian Tim Nelson, who has recorded another site formally with the Florida Master Site File (see Fr1303, below), showed us the shell tools (Figure 10) he picked up when the city of Port St. Joe pushed earth around behind his office on U.S. highway 98 (also behind Hungry Howie's Pizza). Both his observations and our field visit seem to indicate that if it was a shell midden site, the oyster shell was not very dense. The shell tools in his collection from the site include a horse-conch hammer, lightning-whelk and conch scrapers/spatulas, and pointed columellae awls. The only other artifact is a small white limestone, which was probably a grinding implement.

Materials Recorded (in Tim Nelson collection)

Materials	***N***
horse conch (*Triplofusus papillosus*) shell hammer	1
scraper/spatula, probably lightning whelk (*Sinistrofulgur perversum*) shell; 2 with pointed side	5
columellae tools, whelk and conch shell, one bipointed (awl)	5
small limestone – grinding tool?	1

Figure 10. Artifacts from the Tim Nelson site, 8Gu278 : a, *horse conch hammer;* b-f, *whelk whorl scrapers/spatulas/scoops (d has point on one side);* g-k, pointed columella tools (awls, etc.); l, piece of smoothed limestone

KNOWN SITES UPDATED

CALHOUN COUNTY

8Ca64, Larson Site

On the west bank Apalachicola River at navigation mile 64.2, opposite the mouth of Outside Lake (a large creek that was an old river meander), this site was first described in 1985. It had a large complicated-stamped sherd eroding out of exposed bank face, 1.5 m above the waterline, suggesting intact and deep cultural deposits. No digging was done, but it was reported as being Lamar in cultural affiliation. At the time, Lamar was interpreted as a new ceramic series that appeared at the end of late prehistoric Fort Walton adaptation. Intensive research on Lamar ceramics in this valley over the past few years (see discussion in Chapter 6), including radiocarbon-dating of a couple sites, has meant getting out all those artifacts to review. The large vessel sherd (214.4 g) from this site (Figure 11) upon reexamination proved to be clearly of the type Swift Creek Complicated-Stamped. Thus the site's cultural affiliation should be changed to Early to Middle Woodland. The large sherd suggests there are still undisturbed deposits, though riverbank sites wash into the water continually.

Figure 11. Large Swift Creek Complicated-Stamped sherd from Larson site (#8Ca64-85-1)

8Ca8, Ocheesee Landing

The only site form for this riverbank habitation site is dated 1985, written by someone else for the late Calvin Jones. But the site must have been known before then because I visited it in 1983 and in my field notes called it an already-recorded site. Jones's form has scant data, listing in one place that he recovered 111 sherds and another page says 115, of which either 6 or 10 were brushed and the rest either check-stamped or plain. He also got historic pottery and brick. The assemblage suggests a Lower Creek/Seminole settlement.

The 1983 and 84 visits to the site produced abundant cultural materials (listed below) from the surface, which had washed out of the exposed riverbank face. The site extended for about 500 m downriver (south) from the landing (boat ramp), up to a point 400 m north of a nameless creek mouth. Materials included a large biface and a lot of plain pottery, but few diagnostics except one Chattahoochee Brushed sherd and a lot of check-stamped (which can range from Early Woodland through historic Indian). Another sherd was small and faintly complicated-stamped, and it could be anything from Swift Creek (Early through Late Woodland) to Lamar (historic unknown Indian). Below the sod and above the red clay subsoil, a dark midden stratum 20 to 50 cm thick was visible in the riverbank at that time.

During a visit this year to the Smithsonian National Museum of the American Indian, while examining many vessels from the C. B. Moore collections from dozens of mounds in this valley, I came across a nice check-stamped flattened globular bowl with folded rim and knocked-out (killed) base labeled simply “Ocheesee.” Moore’s work in this valley (1902, 1903, 1918) describes absolutely no site named after this old steamboat landing. His original notes (Notebook 45, entry for January 4, 1918), now on file at Cornell University library but loaned to me on microfilm for study a while back, says he stayed at Ocheesee for the night, less than 24 hours, and also got 3 cords of wood at $1.75 each (!) but nothing about any mound or pot. Possibly this check-stamped bowl (Figure 12) was given or sold to him at the landing by someone who knew he was interested, even though there was no mound there. It remains a mystery, but I add the photo to this site update for the benefit of future research.

On a return visit to Ocheesee Landing in December 2018, we found the dirt road covered with paving and the riverbank mostly in a sheer vertical configuration, cut away from its older, more gentle angle. Surface inspection as far downstream into the site as we could go on foot (about 200 m) produced no cultural materials. We were unable to follow a road going north from the landing, which we were told (at a local diner in Altha) led to a “little thing that might be an Indian mound,” as it was private hunt club land and we did not have permission. Despite the winter cold (48^{o} F) and bleak sky, a local father-and-son team appeared in all-terrain vehicles on their way to go hunting. Another father-and-son team from South Carolina were camping at the landing and fishing; they said they learned online that this was one of the best catfish spots in the South. Though most of the archaeological site, which had to have been along the immediate riverbank (natural levee) is gone, it appears to have had both Creek/Seminole and possibly Late Woodland components. Probably the native people also came here for the fishing. The site may retain some intact portions. It still has the ancient, majestic big oaks that once sheltered the historic Gregory House, which was moved from here to across the river, on the high bluff at Torreya State Park, to become a visitor attraction.

Figure 12. Check-stamped bowl recovered by C. B. Moore, labeled simply "Ocheesee" in NMAI collections (#075139)

Materials Recovered from Ocheesee Landing site, 8Ca8

Cat# 8Ca8-	Provenience	Materials	N	Wt(g)
-1.1	surface of roadcut bank by large tree, 1983	sand-t pl	3	3.5
		grit-t pl (some red grit)	1	.08
		lg chert biface (core/chopper?)	1	503.3
		secondary flake	1	1.5
-2.1	surface from exposed bank up to 500 m downriver (S) of boat ramp, 1984	Chattahoochee Brushed	1	5.6
-2.2		ch-st (sand-t)	4	42.1
-2.3		cordmk	1	12.2
-2.4		ch-st (sand and grit-t	4	27.7
-2.5		sand and grog-t pl	1	9.6
-2.6		grit-t pl	1	7.4
-2.7		grog-t pl	1	16.1
-2.8		sand and grit-t pl	9	55.2
-2.9		sand-t pl	9	69.4
-2.10		secondary flake w/poss use-wear	1	4.8
-3.1	surface of exposed bank S of landing	indet comp-st (St. Andrews? Lamar?)	1	7.1
-3.2		ch-st (sand and grit-t)	18	265.0
-3.3		sand and grit-t pl	4	18.7
-3.4		sand and grog-t pl	1	6.0
-3.5		sherd crumbs		.5
-4	surface of dirt rd N 60° W of ramp	chert block shatter (poss use wear)	1	13.1
-5	surface by boat ramp	sand-t pl	1	7.8

8Ca90, Parish Lake Road

This site was recorded in 1985 (Henefield and White 1986), when possible Paleo-Indian or Early Archaic points were found. A return visit in December 2017 showed us that a large borrow pit has now been dug on the site and it is essentially gone. One crummy chert chunk and a few tiny flakes were picked up in the short dirt driveway leading to the borrow pit. Avocational archaeologist Jeff Whitfield says he helped plant pine at this site in about 1990-91, and since then they also dumped limerock on the road, so no original soil is visible. The site is essentially destroyed. However, I include the photo below (Figure 13) of a Paleo-Indian Clovis or Suwanee point from a private collection that came from the site, so future research can include this information.

Figure 13. Paleo-Indian projectile point from Parish Lake Road site, 8Ca90 (private collection).

8Ca114, Gaston Spivey Mound

The 1986 survey of the Chipola Valley recorded the Gaston Spivey Mound near the residence of the man for whom it was named (White and Trauner 1987:41-43). It was located on a high bank above a creek (now dammed into a cypress pond) flowing into the Chipola River, and was one of the few Middle Woodland burial mounds known within the Chipola drainage. At the time of that survey, the mound was a very low rise of no discernible shape, heavily vegetated, and estimated to be less than 50 m in diameter. Materials recovered from the surface and two shallow shovel tests were consistent with a Middle Woodland occupation. However there was also a small triangular point that might be of the later prehistoric Pinellas type, although its one side near the base was spurred – meaning it could even be a reworked Late Archaic-style point. Spivey mentioned a local man who had dug up several pots from the mound, Bobby Yon, whom the crew visited to photograph and document his collection. He is now deceased, and the whereabouts of his artifacts are unknown, but they included classic Swift Creek Complicated-Stamped and early Weeden Island ceramic vessels, most broken or with kill holes (as tabulated in the 1987 report). Figure 14, adapted from the 1986 photo, shows the most notable of his pots, to add to the site file record.

During the current project, we attempted to relocate this mound, since it seemed to be marked in different locations on various USF and site file maps. We discovered the configuration of roads in the area completely changed from thirty years ago. Checking with local residents, we were told to talk with Joan Alderman, who lives on Gaston Spivey Rd., roughly across the road and a little south from the mound site. She knew of both Gaston Spivey (now deceased) and the Indian mound. The site is presently located in fenced private property. She pointed to the general location of the mound west of the old

Spivey house (just to the left, as one faces the house), about 320 m west of the now-paved and reconfigured Gaston Spivey Road. She said that long ago, Yon and his family excavated the mound and used a shaker screen to recover artifacts, large stone tools, even human remains, and now there was probably nothing left of the site. On 12 July 2017, the date of our visit, the crew could not verify whether the mound was still there, as the property was purchased by the Todds, who, she thought, might have been unfriendly and not allowed any further investigation. This update at least establishes a more accurate location for the mound (UTM coordinates Zone 16R 677925 E, 3375228; about 100 m west-southwest of house at 20486 Northwest Gaston Spivey Rd.) along an archaeologically rich stream (now dammed into a small pond).

Figure 14. Weeden Island Plain bird effigy vessel from Gaston Spivey Mound, 8Ca114, in private (BY) collection (photographed 1986); darker areas were reconstructed by the collector. Bird may be woodpecker, but many Florida species have crests on their heads.

Duncan McMillan Site, 8Ca193

This site was first recorded in 1998, when Duncan McMillan, son of Neal Land and Timber Co. manager Philip McMillan, saw artifacts there and took USF archaeologists to see it. We collected lithic debitage (chert flakes) from the road surface and excavated two 50-cm square shovel tests. The tests were located northeast of the road on the higher ground before the drop to the slough. They produced more flakes, pea gravel (natural?), a stemmed/corner-notched projectile point closest to Hamilton or Leon stemmed (Figure 15), fiber-tempered ceramic sherds, and clay bits typical of Late Archaic sites in the region (White 1999:35-38). Undisturbed Late Archaic sites, dating at to as much as 4000 years ago, are rare. Given this site's significance and also confusion about its locational coordinates, it was targeted for revisiting during the current project.

With David Dyson of Larson & McGowin, LLC, the new land manager, we returned to the site and confirmed its location on the west bank of a seasonally flooded cypress slough (see Figure 3) that is west of Rudy Slough and farther west of Iamonia ("Ammonia") Lake (which is now labeled as "Woods Branch" on the newest maps). Corrected GPS coordinates were recorded for this update; they mark placement of our single auger core, which reached a depth of 108 cm. While no cultural materials were obtained in the core, one tiny plain ceramic sherd and a chert flake were recovered from the surface of the dirt road leading into the site on its south side. The sherd is tempered with sand, grit, and grog (as seen in microscopic examination) and thus suggests a later component after Late Archaic. We attempted to cross the flooded slough/old channel on an ATV, but the water was too deep. The land on the other side of this seasonal channel, which is also old riverbank, bordering Rudy Slough and Iamonia Lake, probably has cultural materials as well and should be checked during dry season, when a log track seen in 1998 might be still usable. Materials recovered by all USF efforts are listed below.

Materials Recovered from the Duncan McMillan site, 8Ca193

Cat#8Ca193-	*Provenience*	*Materials*	*N*	*Wt(g)*
-98-1	surface	iron log road spikes	3	499.8
		secondary decortication flake	1	5.5
		secondary flakes	4	7.4
-98-2	Shovel Test 1, -22 to -30 cm	Hamilton or Leon stemmed (?) projectile point	1	5.6
		secondary flake	1	4.3
		quartz pea gravel	1	.4
98-3	Shovel Test 1, -40 to -60 cm	fiber-tempered plain sherd	1	.7
		secondary decortication flake	1	.5
		secondary flakes	7	3.5
		charcoal		3.2
98-4	Shovel Test 1, -80 to -90 cm	fiber-tempered plain sherd	1	15.5
		secondary flake	1	.5
		quartz pea gravel	1	1.4
98-5	Shovel Test 1, -90 to -100 cm	secondary flakes	6	1.3
		pea gravel	1	.6
98-6	Shovel Test 1, -100 to -107 cm	secondary flake	1	.3
		quartz pea gravel	2	.9
98-7	Shovel Test 2, -35 to -54 cm	secondary flakes	7	1.
		quartz pea gravel	2	.3
98-8	Shovel Test 2, -54 to -108 cm	fiber-tempered plain sherds	11	46.7
		fired clay frags	3	4.8
		primary decortication flakes	2	1.4
		secondary decortication flake	1	.4
		quartz pea gravel	2	2.9
		charcoal		.7
-17-1	surface of road, S side of site	sand, grit, and grog-tempered plain sherd	1	1.5
		secondary flake	1	.5

Figure 15. Late Archaic point from Duncan McMillan site, possible Hamilton or Leon Stemmed type

FRANKLIN COUNTY

8Fr1, Porter's Bar Mound and Village

First recorded by Moore (1902:238-249), this Middle Woodland burial mound and accompanying bayshore shell midden site was investigated during several seasons but finally subjected to intensive study by Kerri Knigge (2018) for her M. A. research. A copy of her thesis is also submitted with this report, and it includes data on other materials from the site, including Moore's elaborate ceramics from the mound, now in the Smithsonian National Museum of the American Indian (NMAI) in Washington, D.C., as well as other materials recovered by a collector and by USF's brief testing. While the burial mound is attributed to the Middle Woodland period, with exotic artifacts and Swift Creek and early Weeden Island ceramics, the shoreline shell midden had a Late Archaic and a Fort Walton component, and a historic nineteenth-century component including a well and two burials.

After Knigge's work was completed, collector Tim Nelson shared data on the materials he got from the shoreline shell midden area in the 1980s. He sent photos so we could add to the record. The only diagnostic items are Fort Walton ceramics (Figure 16) and a few historic artifacts. The rest are nondiagnostic prehistoric, historic, or natural objects. Interestingly, his collection contains nothing that is Middle Woodland or could be associated with the burial mound. His materials are listed below.

Materials documented from Porter's Bar shell midden area, 8Fr1, Tim Nelson collection, beach surface, 1980s

MATERIALS	*N*
Fort Walton Incised rims (1 = 6-pointed bowl)	10
Cool Branch Incised rims, 1 with handle	2
Point Washington Incised rim	1
Lake Jackson rims with handles (1=ticked)	2
Lake Jackson rims, plain	4
Lamar? or LJ? notched rims	3
Pensacola Plain rims	3
check-stamped rims	3
sand-tempered plain (5 + 18, 2 different photos)	23
shell-tempered plain	5
shell and grog-tempered (?) plain	13
grit-tempered plain (white and some red grit)	14
Busycon whelk shell scraper, smoothed edge, 5 x 4.5 cm	1
quartzite hammer, some use wear	1
pce browned limestone (?), 10 cm wide	1
chert biface	1
chert core/unifacial scraper (steeply retouched)	1
chert block shatter pieces	3
secondary decortication flake	1
cobbles/pebbles, some with use wear	7
unidentified rocks – some are sandstone? from fill brought in from elsewhere?	8
animal tooth – bear? pig? dog? (carnivore)	1
alligator scute? petrified? (black)	1
aqua glass bottleneck	1
purple glass sherd, raised pattern	1
salt-glazed stoneware	1
refined earthenware sherds: 1 light blue pattern, 1 yellow and white plate rim	2
black possible fossil or rock	1

Figure 16. Fort Walton-period sherds in collected in the 1980s by Tim Nelson from Porter's Bar shell midden, 8Fr1, 1980s: a, b, f-i, k, n, o, Fort Walton Incised; c, j, Cool Branch Incised; d,e, Lake Jackson; m, Lake Jackson handle, l, Point Washington Incised. Photo by Tim Nelson.

8Fr11, Green Point Mound

This Early Woodland burial mound, also recorded by Moore (1902:249-256) was described as being a short distance southwest of Porter's Bar mound and shell midden (8Fr1), and also had an accompanying bayshore shell midden. It was probably part of the same prehistoric ceremonial complex. The site has been investigated during several different seasons but finally subjected to intensive study by Kerri Knigge (2018) for her M. A. research. A copy of her thesis is also submitted with this report, and it includes data on the elaborate ceramics from the site stored now in the Smithsonian National Museum of the American Indian (NMAI) in Washington, D.C. The shell midden along the bayshore merges with that of Porter's Bar, and so is not distinguishable as a separate site (probably never has been). The Green Point burial mound has not been relocated since Moore's time. It was probably taken out by the construction of highway 98, long ago. However, artifacts labeled as being from Green Point are curated in the Bureau of Archaeological Research collections in Tallahassee. They may be from a visit by a BAR archaeologist who thought this mound was under a road into a development. The BAR materials are listed below to enhance data in the site file.

Materials documented from Green Point, 8Fr11, probably shell midden on the beach (since the mound has never been relocated), stored at the BAR

BAR cat #	*MATERIALS*	*N*	*WT*
74.237.1.7 labeled as "unid eroded decorated bodies"	plain grit+grog-tempered	2	4.6
	cordmarked	1	2.2
	Swift Creek Complicated-Stamped	2	8.2
	check-stamped	3	12.9
74.237.1.8 – labeled as "chips"	sand-tempered plain	6	7.1
74.237.1.6	Swift Creek Complicated-Stamped (largest = 26.8 g, has coil marks on interior; photographed)	3	31.5
74.237.1.9	chert (1 primary decortication flake, 1 tiny piece of block shatter)	2	32.9

8Fr10, Eleven Mile Point

This significant site was first recorded by Moore (1902:214-216), who described it as a burial mound 50 feet in diameter, 3 feet high, back in a cultivated field, with numerous shell deposits nearby and heaps of shell extending some distance along the shore. Moore did not say whether the burial mound was of sand or shell; by comparison with others in the region, it was probably of both. He excavated several burials in the central part of the mound. Not closely associated with graves, he also found Middle Woodland ceramics including both Swift Creek Complicated-Stamped and Weeden Island Plain, Incised, and Punctate types. He illustrated a couple complicated-stamped sherds, a compound vessel consisting of two small globular plain pots joined vertically (looking like a dumbbell), and a very long-necked bottle. I photographed some others of Moore's pots from this site in the Smithsonian National Museum of the American Indian (Figure 17). The squared plain jar with an almost lobed base has zig-zag incision around neck, and by definition must fit the type Weeden Island Incised. The jar with irregular lines of punctations (for which Moore [1902:Figure 153]) only illustrated a rollout drawing of the design) seems to have tiny tetrapodal supports, but must by definition be included in the type Weeden Island Punctated. A collared globular bowl with incised zones filled with rocker-stamped punctations can only be Alligator Bayou Stamped, a type rare in this region (also illustrated in Moore 1902:Figure 150). A small Weeden Island Plain bowl described by Moore but not illustrated in his article has "small protuberances at each upper corner of the body and companion ones on the rim immediately above"

The land is today owned by the Schoelles family, who have a large artifact collection, and a house next to the burial mound. The site is named after this point of land, 11 miles from downtown Apalachicola, which has been augmented over the years with shell fill from the site's shell midden and with modern oyster shell. At the end of the point was a seafood business that was in operation until recent years. We were told that workers there lived back from the point on the shore.

Our fieldwork was inspired when Lisa Johnston, who lives in a new home on the eastern edge of the shell midden, invited us to visit. Her land is adjacent on the east side to the long (north-south) narrow patch of land now owned by the St. Vincent National Wildlife Refuge (NWR), which borders the Schoelles land on its east side. A LiDar image (Figure 18) guided our fieldwork; it shows four higher elevations at the site (reddish areas), three on the shore and one back from the shore. The one back from the shore is the burial mound, and the three high areas on the shoreline are probably shell mounds (higher elevations within the shell midden or else deliberately constructed mounds). We were denied access to the Schoelles land at that time of survey, and so we could not check on any but the easternmost shoreline elevation, which is still there, on the NWR land. This elevation and all the rest of the NWR land is heavily covered in modern garbage, apparently from the now-disappeared seafood workers' homes. The shell midden continues eastward on the Johnston land, east of the augmented road that goes to the point and former seafood operation. This road marks the western boundary of the Johnston land. Lisa Johnston had an artifact collection from her beachfront yard that included plain and check-stamped sherds (Figure 19). A Carrabelle Punctate sherd was visible in the road at the time of our visit (its fingernail-pinched punctations might make it interpreted by some as being of the type Tucker Ridge Pinched). With this information, we could extend the eastern boundary of the site from what was already recorded in the site file.

With this report we also document several collections from the site. One collection stored in the BAR has two different provenience numbers, one from 1972 and another without information. These materials, apparently collected by Dan Penton and Robert Carr, are listed below. They are probably from the shoreline shell midden. A USF team's reconnaissance of the shore in 1996 during boat survey (Brose and White 1999:Figure 4) produced artifacts also listed below, and our 2017 survey visit recorded materials from Johnston's property, and photos of her collection from there as well. Finally, a massive private collection donated (by JC) to USF contained more interesting materials from Eleven Mile Point, which are also listed below. This site is another Middle Woodland burial mound, some 150 m or less from the St. Vincent Sound shore and 100 m or so from its accompanying shoreline shell midden, which has several elevated areas that themselves may be mounds or just higher ridges. It also has a later Fort Walton occupation, and a very small amount of potential Early Woodland evidence in the possible Deptford sherd.

Figure 17. Pots from Eleven Mile Point site (mound), recovered by C.B. Moore in 1902, photographed at the Smithsonian National Museum of the American Indian: a, possible Weeden Island Incised jar with almost lobed base (NMAI 174985); b, Weeden Island Punctate jar with strange design (NMAI 174984; c, Alligator Bayou Stamped collared bowl (NMAI 174986); d, Weeden Island Plain squared small bowl with 4 rim and body protuberances (NMAI 174070).

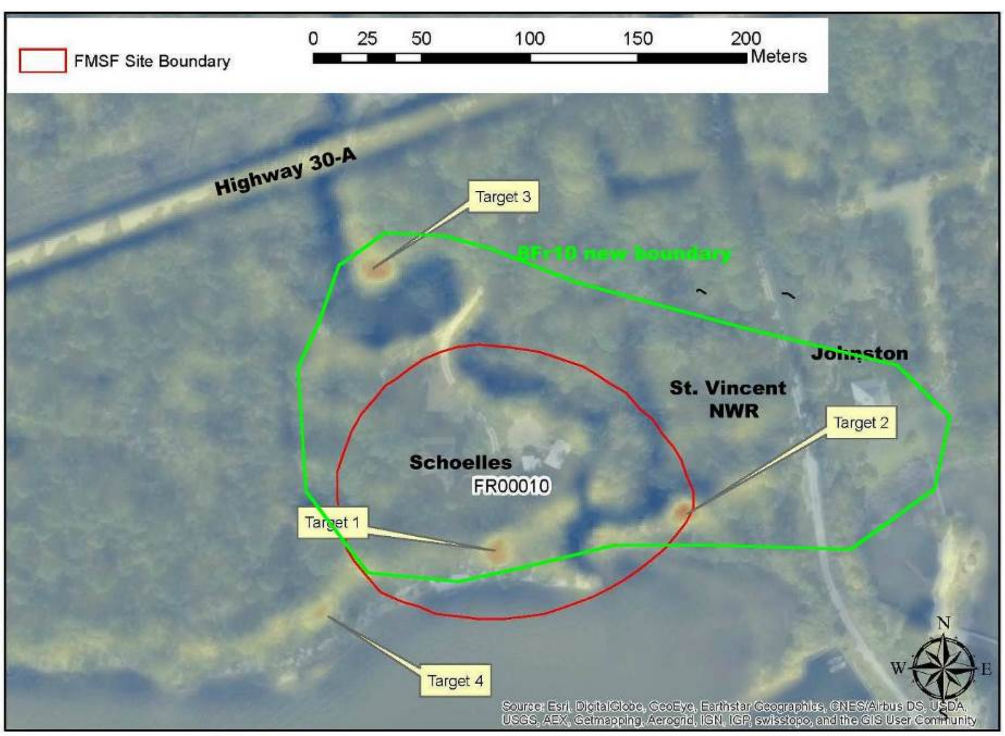


Figure 18. LiDar map by Chris Hunt of Eleven Mile site, 8Fr10, showing 3 elevations (reddish "Targets"), different property owners, previously-recorded site boundary (red) and newly established site boundary (green) including east side of Johnston property.

Figure 19. Ceramic sherds from Eleven Mile Point, 8Fr10, eastern part of shell midden, Lisa Johnston collection, from her yard. *Upper left*, check-stamped, *lower left*, plain, *above,* Carrabelle Punctate from road adjacent to her house.

Materials from Eleven Mile Point, 8Fr10, USF, BAR, and L. Johnston collections

Cat#	PROVENIENCE	TYPE	N	WT
BAR 74.236.1	"1-5-72, 1.3 mi from 98 to tooth site" [?]	2 oyster shells, crummy chert chunks, blunt-edge columella tool, blunt-edge bone tool, 1 primary decort flake (not weighed)		
		plain sherds (mostly sand-t, a few grog, grit-t, 1 LJ ticked rim	60	750.0
		check-stamped	28	300.0
		poss Dept Linear Ch-St: thin lines of rolled stamp	3	81.7
		SwCrC-St	7	52.6
		Pens Pl jar w loop handle	1	24.6
		indet punc (1=fingernail)	1	15.8
		limestone-tempered pl (chunky temper_	1	9.7
		red-painted	1	1.3
		For Walton Inc	1	8.8
		indet inc	3	19.8
BAR 01.16.1.4	none listed	red-painted	3	13.0
01.16.1.1		Carrabelle Punc rims	2	3.4
01.16.1.10, 11		check-st	22	224.8
01.16.1.3		Wl Inc (at least 2 = real; rest could be FW Inc	6	16.8
01.16.1.13		sand-t and grit-t plain	3	19.9
01.16.1.2		Carr Inc	2	14.8
01.16.1.8		SwCrC-S	8	58.6

Cat#	PROVENIENCE	TYPE	N	WT
01.16.1.12		LJ rims ticked	2	6.1
01.16.1.6		grog-and-shell-t rim	1	18.9
01.16.1.5		plain rims, 1 has v flattened, widened rim (30.7 g) photo	5	49.6
01.15.1.7		indet punc	1	11.3
01.16.1.14		hafted endscraper (maybe broken point	1	10.6
USF 96-1.1	surface of beach shell midden	FW Inc (1=6-pt bowl)	4	26.8
.2		L J rim	3	26.9
.3		L J or Lamar, notched broken rim, heavy grit temper	1	9.9
.4		indet st (complicated-st?)	3	17.3
.5		indet inc	7	49.7
.6		indet punc (fingernail punc; grog-t)	2	14.4
.7		ch-st (some grit, grog, sand tempers)	189	2440.7
.8		red-painted sand-t pl	1	4.7
.9		shell-t pl	1	2.7
.10		grog-t pl (mostly red grog but some tan; some may be worn check-stamped)	46	413.6
.11		sand-t pl (a couple with a few grog particles)	106	824.0
.12		grit-t pl	45	397.2
.13		unusual (?) oyster shell	1	24.6
USF 96-2	shoreline shell midden surface	sand-t pl (all same pot)	13	180.1
USF 96-3.1	shoreline shell midden surface	check-st (grit, grog, and sand tempers; 3=rims)	16	118.1
.2		grog-t pl	8	91.8
.3		sand-t pl	8	31.0
.4		grit-t pl	1	9.9
.5		indet incised (sand-t, at least 10 parallel straight-line incisions	1	21.3
USF JC13-1.1	surface (1970-2000s, private collection donated to USF)	FW Inc rim (ticked)	1	41.9
.2		ch-st rim	1	30.4
.3		indet inc rim (poss FW Inc)	1	11.1
.4		indet brushed (Chatt Br?)	1	9.4
.5		grog-t pl	1	15.0
.6		grit-t pl	1	2.2
.7		sand-t pl	1	5.9
.8		clay lumps, probable daub	2	31.5
.9		projectile pt midsection, 1 edge serrated	1	15.6
.10		chert secondary decort flake, gray	1	18.9
.11		chert secondary flake	1	1.4
.12		block shatter	1	2.0
.13		primary decort flake	1	16.6
.14		small steatite fragment	1	5.4
.15		quartz pebble with use wear	1	4.2
.16		agatized coral frag	1	7.0
.17		shell columella tool	1	12.1
Lisa Johnston collection	surface, shoreline shell midden, Johnston land	check-stamped	6	
		plain sand or grog or grit-tempered (3 rims; one notched – LJ?	13	
		Carr Punc rim	1	

8Fr14, Pierce Mounds

The Pierce Mounds group includes 13 mounds, several of which have been given other site numbers, and all but one (Cool Spring, Fr19) of which have been relocated (Figure 20). First recorded by Moore (1902), the site was recently subjected to extensive research (White 2013). For the current project, radiocarbon dating of materials from this significant prehistoric ceremonial and habitation center was a major goal, especially when it was discovered that so many mounds existed there and only six of the 13

(Mounds A, C, Cemetery [Fr21], Mound Near Apalachicola [Fr20A], Shell Mound Near Mound Near Apalachicola [Fr20B], and Cool Spring) were clearly Early to Middle Woodland burial mounds, some with additional overlays of later Fort Walton materials. In addition, Mound H, the temple mound built of shell, centers the Fort Walton component on the east side, while burial Mounds A and C on the west side sit amid Early and Middle Woodland occupational areas.

Mound F (White 2013:86-87) is an amorphous, roughly flat-topped construction about 100 m south of Mound H. So it is on the Fort Walton side of the site. Moore measured it at 80 yards long and 20-30 yards wide, 2 to 3 feet high, and said it was 20 yards north of Mound E. He did not even name Mound F but did put it on his sketch map in his original notes. After digging into it he wrote that "holes showed it to be a dwelling site," probably meaning he got no artifacts and so abandoned it. In 1996, Dan Penton did some work reported only to the landowner, shovel-testing at Pierce in advance of a planned housing development. Later landowner George Mahr shared Penton's map, which showed that one of Penton's tests had caught the lowest northwest slope of this mound, but he probably did not realize it since the property was heavily forested. Penton's test had produced two check-stamped and three sand-tempered plain sherds. Later, Mahr bush-hogged the whole place and Mound F and a few others popped out.

My 2011 testing at Pierce included a 1-x-1-m unit into Mound F, named TUA (or TU11A). It was excavated in 15-cm arbitrary levels until Floor 4, at 60 cm, where the soil was a very dark brown (10YR2/2) hardpan, and the cultural materials disappeared. The unit produced only numbingly non-diagnostic pottery that was either sand-tempered plain (8 sherds) or indeterminate incised (4 sherds), as well as one tiny shell fragment, hickory nutshell, and charcoal. However, since the whole east side of the site from the Mound H flat-topped platform south is covered with Fort Walton pottery, it seemed that Mound F was part of that occupation and deliberately built for some purpose, whether keeping structures above water during flood season or just making a dance ground. A 4" core taken in 1994 from a spot in the Pierce East Village habitation area 50 m southeast of Mound H determined that the shell midden there extended over 2 m deep; a charcoal sample from about a meter depth in this core was dated (in 2006) to 750±40 years B.P. or cal. A.D. 1220-1300 (Appendix B), a good middle Fort Walton date.

The Mound F sample sent for dating from TUA Level 3 (which had 2 of the plain sherds), returned a date of 930+30 B.P., or cal. A.D. 1025-1165 (Appendix B), fitting nicely into the Fort Walton characterization and expanding it into early Fort Walton, suggesting, along with the date reported from Singer Mound (below), that the transition from the latest Late Woodland into early Fort Walton saw indigenous peoples continuing to inhabit this site. Late Woodland, with its mostly check-stamped and plain ceramics, is notoriously hard to recognize archaeologically, since people from most other prehistoric time periods also made those ceramics (but others too). This is too bad because it was a time of huge transition, apparently when people were first starting to cultivate maize and possibly change lifestyles radically, perhaps becoming more sedentary and increasing in sociopolitical complexity. However, there is no evidence for either of these two cultural phenomena at Pierce, where the rich yield of aquatic resources from river and bay may have made the hard work of food production unnecessary.

Mound D at Pierce is more puzzling, described in Moore's notes as 20 inches high, 40 feet in diameter, and made of blackened sand with local layers of oyster and clam shells. He dug it half away and found it to be a dwelling site with mostly check-stamped pottery and also a few pieces with "pinched and lined decorations," which could refer to t several ceramic types. If not destroyed by Moore, Mound D was mostly taken out by construction of the railroad bed in the early twentieth century. The elevated shell midden ridge running at least 800 m along the old riverbank was the foundation for Mounds B and H, the Cemetery Mound, and probably a couple of the others at Pierce, as it apparently was for Mound D. This midden ridge was also the source of material for building the railroad bed, as is clear from the remnant of Mound H. A low portion of the ridge remains, at the north end of the West Village area; it has been surface-collected for many years, producing an abundance of ceramics of types common from Early Woodland through Fort Walton in cultural affiliation. A sample of shell midden from the West Village ridge area, from the top to about 10 cm depth, was taken in 2011, with gps coordinates. Later, after obtaining the map in Moore's notes, we learned that this sample location could be anywhere between 50 and 150 m west of where Mound D once stood. Flotation of this soil sample produced faunal remains and generic ceramics, but also charcoal. So a sample of it was sent for radiocarbon assay. The date returned was 900±30 B.P. or cal. A.D. 1039-1210. This is another good date that adds an earlier aspect to the Fort Walton occupation of the site, though it says little about what Mound D might have been, and is best understood as characterizing the Fort Walton overlay on top of the general Early to Middle Woodland occupation of the West Village. Continuing research at this site, including that reported for Singer Mound (8Fr16, below) is demonstrating how the Fort Walton occupation was far more extensive than realized, taking over what might have been thought of at that time as ancestral ceremonial grounds of existing Early and Middle Woodland mounds and shell midden.

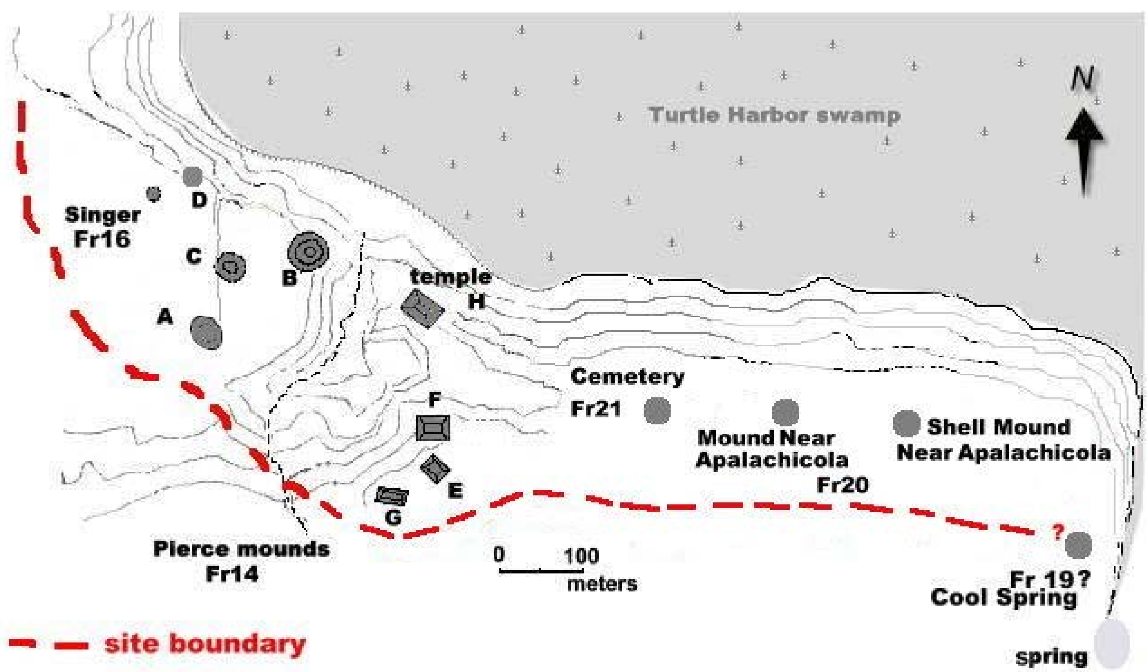


Figure 20. Pierce Mounds complex; contour interval = 1 foot (30 cm).

8Fr16, Singer Mound

The Pierce Mounds group (see above) includes several other mounds that have been given different site numbers (see Figure 20). Singer, a small, unobtrusive mound with a huge hole in the middle, today resembles a doughnut of shell midden. Since the current research project emphasized clarification of cultural affiliations through radiocarbon dating, a date on of materials from Singer was a goal in helping to understand the whole Pierce ceremonial and habitation center. At Singer, Moore's descriptions of the 19 burials he had excavated was brief, and noted rotten bones, 2 celts, and only plain and check-stamped pottery which he thought might have been scraped up from the surrounding midden.

This information was insufficient to determine the mound's age. It sits on the west side of the Pierce complex, about 340 m northwest of Mound A, which had yielded spectacular Early and Middle Woodland burials and grave goods (Moore 1902; White 2013). We explored Singer Mound during the 2007 fieldwork with a 1-x-2-m test unit (TUSing 1) placed into the lower slope of its west side. This rectangular unit had the long axis running upslope, and was dug in 20 cm arbitrary levels with flat floors, and so they did not reflect the mound slope (meaning that the west half had far less soil removed than the east half). Moore had said that above the mound base was fire-blackened sand, with strata of white and yellow sands as well. We found similar stratigraphy, including some grayish sand with oyster and rangia clam shells, and excavated to a depth of about 160 cm, reaching what appeared to be the original light yellowish-brown (10YR6/4) riverbank sand. Materials recovered, besides various faunal remains such as the shells and fish bone, were plain and check-stamped sherds, and from surface or shallow proveniences some indeterminate incised and punctate sherds.

All this indeterminate pottery might have indicated an Early Woodland burial mound, which is very rare in the region, or even a Late Woodland burial mound, which is even more rare, but either could be characterized by such a ceramic assemblage. Charcoal samples from three proveniences were sent for dating to two different companies (see Appendix B), with the hope of determining the mound's age. The sample from TU Sing1, Level 6, 120 cm below the mound surface, returned a date of cal 3341-3030 B.C., which is possibly incorrect. The sample was from what appeared to be the natural yellowish-brown riverbank sand, so it could also have been a non-cultural piece of charcoal, as nothing else was obtained from this level except a tiny plain grog-tempered sherd that might have traveled downward from later deposits. This date could also represent deposits from an earlier occupation (Middle Archaic) of the site that were churned up by later inhabitants. As part of the Pierce complex (8Fr14 and other numbers) the area of the mound before its construction may well have been a place inhabited early, setting the stage for the later expansion of both the ceremonial and domestic activity.

The second date, on a charcoal sample from Level 5 west half, only a few cm above L6 on that side of the unit, was cal. A.D. 983-1152, with an intercept of A.D. 1020. This indicates the very earliest Fort Walton or even Late Woodland-Fort Walton transition. Pottery recovered from this provenience was only two sherds of sand and grog-tempered plain. The third date, from the east half of the same level (thicker toward the mound interior), and from a different provider to insure accuracy, was cal. A.D. 1150-1260, with an intercept of A.D. 1205. This is significantly later and suggests continuing use of this mound through at least early Fort Walton times. Enormously significant is the fact that no other conical burial mound is known from any Fort Walton context in the region, so perhaps these late prehistoric peoples were setting up a new, localized tradition in imitation of the Woodland tradition of conical burial mounds which made up a part of their village.

8Fr77, Jackson Midden

This shell midden is associated with the Jackson Mound (8Fr15; Moore 1902:229-234). A developer scraped away most of the shell midden from the northeast side of the mound all the way to the surrounding creek, in order to build something that never got built. Artist Kristin Anderson has a home and studio at the north-northeast end of the site, and invited us to visit and see her artifact collection (which she donated). The collection mostly came from her garden, in which she had added red clay to the soil, but it still had shells and artifacts. She allowed us to excavate two shovel tests on her land, ST1 east of her house and ST 2 south of the house in her garden (Figure 21). Materials recovered and those documented in her collection are given below, some of them from modern activity.

The *Rangia* (marsh clam) shell midden reached the edge of the higher ground on the northeast side of her property (not all the way to Scipio Creek), thus extending the known site boundary to the northeast from what was already recorded (Figure 22). In total, the site extends about 225 m running northeast (UTM coordinates 691762E, 3292042N) to southwest (691637E, 3291840N); adjacent to the southwest end is the Jackson Mound. While our two shovel tests did not turn up any diagnostic artifacts, Anderson's collection had both Deptford (ca. 500 B.C.–A.D. 300) and Lamar-period (A.D. 1700) ceramics (Figure 23), adding Early Woodland and Protohistoric components to the site, already known for its Middle Woodland burial mound and habitation.

Figure 21. Fieldworkers Chris Hunt and Tony White excavate Shovel Test 2 at the Jackson Midden site, 8Fr77, in May 2018, while landowner Kristin Anderson observes.

Materials from Jackson Midden, Kristin Anderson property, #8Fr77-

CAT #	PROVENIENCE	MATERIALS	N	WT
18-1.1	Kristin Anderson collection, from her garden S of her house	Deptford Linear Check-Stamped	2	15.0
.2		Swift Creek Complicated-Stamped	1	7.4
.3		Leon Check-Stamped	1	56.2
.4		Fort Walton Incised	1	32.1
.5		LJ rims (1 ticked, 1 with parallel vertical incisions)	2	12.8
.6		WI Inc?	1	10.5
.7		indet inc (2=rims, 1 with parallel curved lines)	4	25.9
.8		indet punc	1	9.8
.9		ch-st (3 rims, 1 from 14-cm diam vessel)	21	286.7
.10		grit-t pl	7	69.1
.11		grog-t pl	14	182.6
.12		sand-t pl (1=rim)	30	331.9
.13		Herty cup frag	1	16.2
.14		sedimentary rock	1	23.7
18-2.1	Shovel Test 1, E of house, 0-15 cm	*Rangia* clamshell frags	2	5.4
.2		glass	3	4.6
18-3.1	Shovel Test 2, S of house in former garden, 0-38 cm	indet inc	1	.9
.2		grit-t pl	1	11.7
.3		*Rangia* clamshell	6	65.8
.4		unident animal bone	2	.9
.5		quartz pebble	1	27.7
.6		red brick frag	1	20.0
.7		iron nail	1	5.7
.8		bottle glass	1	5.6

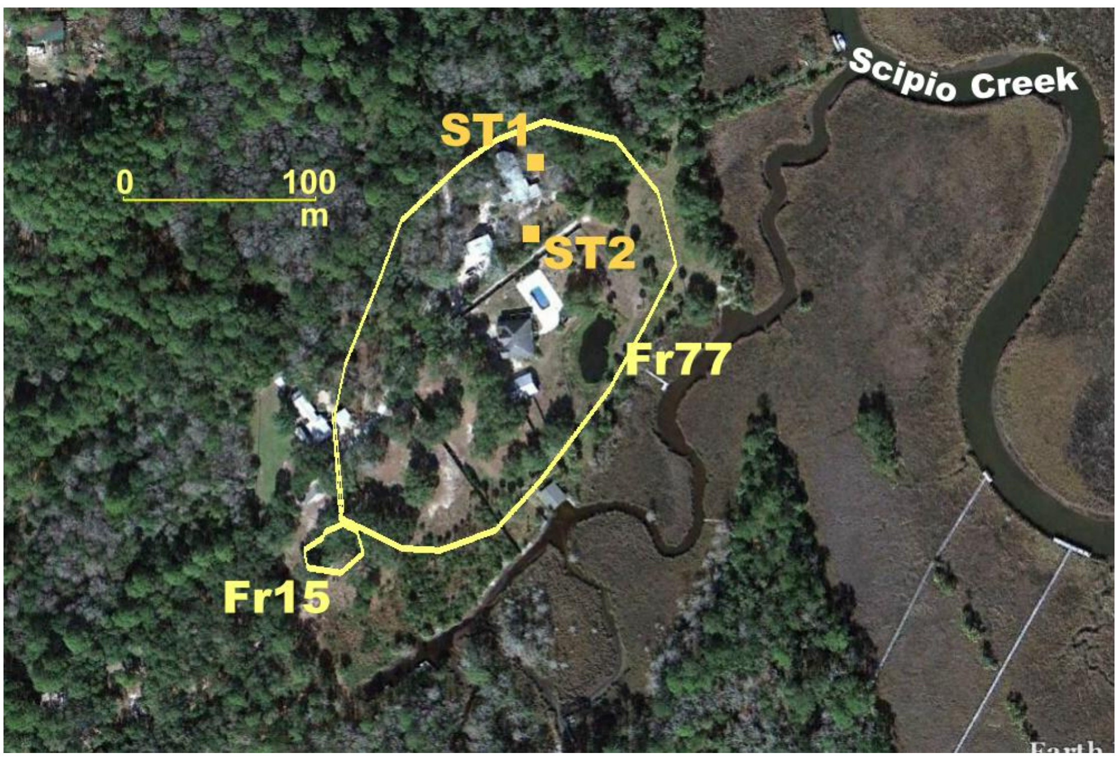


Figure 22. Extent of Jackson Midden site on Google-Earth map, showing relationship to Jackson Mound (8Fr15) and Shovel Tests 1 and 2 on Anderson property.

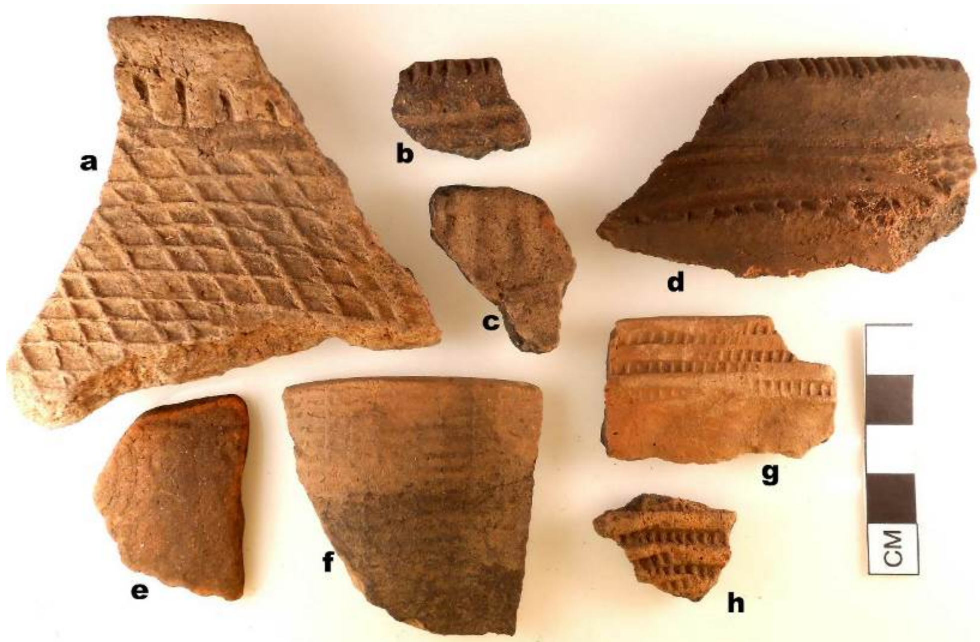


Figure 23 . Selected ceramics from 8Fr77, Kristin Anderson collection: a, Leon Check-Stamped rim; b, Lake Jackson rim, ticked lip; c, Lake Jackson rim, vertical parallel incisions on neck; d, Fort Walton Incised with ticked rim; e, Swift Creek Complicated-Stamped; f, check-stamped rim of 17-cm diameter vessel; g, h, Deptford Linear Check-Stamped.

8Fr755, Thank-You-Ma'am Creek Site

This long, curving, mounded shell midden site, sits along the East River, a distributary of the lower Apalachicola River, just north-northeast (downstream) of its confluence with the much smaller Thank-You-Ma'am Creek near its mouth into the larger East River. It is about 400 m west of the intersection of the Butcher Pen Landing dirt road with the East River. The elevated shell debris runs about 210 m long by 30 m wide, sitting almost perpendicular to the channel of the East River and probably reflecting the bank configuration of an earlier stream that has now meandered away. It has also reportedly been damaged by removing shell for road construction. The site was first recorded (from informant's data) in 1985 (Henefield and White 1986:35-36). It was then tested in 1986 and 1993, when a profile of the highest (northern) end was cut and three excavation units opening approximately 5 square meters of area at the north end, center, and southern end were dug (Parker 1995).

This shell midden is a trash accumulation, with oyster and marsh clam (both *Rangia* and *Polymesoda*) shell, animal bone, other species of shell, and ceramic, lithic, and shell artifacts. The northern end deposits date to as early as possibly the preceramic Late Archaic. At the south end, later Woodland and Fort Walton deposits, as seen in typical ceramics, appear to overlie materials from the ceramic Late Archaic, which indicated by the fiber-tempered sherds (both plain and simple-stamped) and a typical steatite (soapstone) vessel sherd. However, many earlier artifacts, such as some fiber-tempered sherds and the steatite, were apparently disturbed by later prehistoric (or historic/recent) activity, and thus appeared on the surface, despite their known great ages.

We revisited this site in July 2017 and saw that the adjacent land had been slightly developed with camping and recreational areas and improvement of the dirt road. During this visit, our hike from the road to the site was interrupted by killer yellowflies, which were apparently attracted by the piles of garbage left by visitors to this campsite, and turned to attack new food walking in. A return visit in February 2018 confirmed that the site has not been much disturbed since the 1990s testing, despite the nearby campsite "improvement." The important data for this report is that the project allowed for a radiocarbon date for the Late Archaic occupation of the site. A date was obtained on burned, black material encrusted on the exterior of a steatite sherd (Figure 24). Typical for this time period, the sherd is from a straight-sided vessel with carved or scratched vertical lines on the exterior, a smoothed interior, and a notched lip. Though it was a surface find, the charred residue on it was expected to be roughly contemporaneous with the time of the bowl's use. The conventional AMS date (Appendix B)) returned on this black organic material is 2760±B.P., which is calibrated at 94.5% probability to a range of 980-830 B.C., with an intercept of 905 B.C. This age of nearly 3000 years is a good one for the later part of the Late Archaic, when steatite was imported into the region probably from the north-Georgia mountains.

Figure 24. Steatite rim sherd from surface of Thank-you-ma'am Creek site (#8Fr755-7), showing notches on lip and dots of black soot on exterior roughened surface; soot was dated to 905 B.C.

8Fr806, Gardner Landing Shell Midden

This site is a shell midden visible in the bank to boaters coming up the East River, an Apalachicola River tributary, toward the boat landing. It was recorded in 1987, when shell and ceramic sherds were (apparently) collected, according to the site file records. But no time period is indicated for these materials. A visit to the site in February 2018 showed it still exposed in the eroding bank of this small stream, right under a camping area with a roofed dining area and an old van/recreational vehicle (Figure 25). Shells of two species of marsh clam (*Rangia* and *Polymesoda*) were visible in the black midden stratum exposed in the bank along with check-stamped potsherds. We did not dig here but took from the exposed midden in the bank a small soil sample, which contained 2 check-stamped, 2 indeterminate punctate, and two sand-tempered plain sherds, possible turtle bone, and marsh clam and oyster shell.

Figure 25. Gardner Landing Shell Midden site, 8Fr806: above*, view of site facing south, showing exposed bank with shell midden stratum (in the distance) and old camper van and dining shelter over the site;* below*, closeup of exposed midden stratum in stream bank with black soil packed with marsh clam shells. Red-handled trowel points north.*

8Fr848, Harry A's Northwest Site

On the bayshore of St. George Island directly west of the bridge to the mainland and across the street from Harry A's Bar, this site was seriously damaged and bulldozed when first recorded (White 1996:72-73). It produced only a cut lightning whelk shell, and a check-stamped sherd. A later survey was unable to find the site and it may be totally gone. However, in 1995 someone did find a diagnostic artifact, probably after that record storm that generated my post-flood survey. The person reportedly found a good-sized portion of a large Fort Walton Incised jar. It was exposed at the base of a tree stump at low tide, fragmented into seven pieces because someone had shot at it. The person donated it to the Carrabelle Museum of History, on the condition that it be displayed. Museum director Tamara Allen told me about it and we made the visit to the museum during the survey project, to document this artifact. Curator Joan Matey provided photos of the larger pieces, and Figure 26 shows the least barnacle-encrusted piece. This ceramic vessel has a handle and rim points over the handle area, as well as 4 parallel incisions around the neck, and a scroll-like pattern of incisions and zoned punctations. It allows the site to be characterized as a Fort Walton habitation.

Figure 26. Fort Walton Incised jar with handle and rim point, from Harry A's Northwest site, 8Fr848, displayed in the Carrabelle History Museum; photo by Joan Matey.

Millender Tract Site, 8Fr915

This shoreline Fort Walton shell midden site in Eastpoint is only updated because of an interesting new find. At its south end, near Cat Point on Apalachicola Bay, an unusual artifact was collected by staff member Caitlin Snyder of the Apalachicola National Estuarine Research Reserve. The object (Figure 27) is a small solid cylinder of grog-tempered fired clay, with one rounded end and the other end flat, circular, and ridged around the edge. Though this could be a small pestle, the rather soft clay is not suited for pounding anything very hard. So the function of this object remains unknown. Snyder gave it to be stored with USF collections.

Figure 27. Cylindrical ceramic object from Millender Tract site, 8Fr915, showing side view and bottom with raised ridge around flat surface about 2.4 cm diameter.

8Fr1303, Poor Man's Creek Site

This site, on the east shore of East Bay, 4 km up (north-northeast) from the highway 98 bridge in Eastpoint, was reported to the DHR in 2015 by avocational Tim Nelson, who at the time lived nearby. It is at the mouth of Poor House Creek, we later learned. The site was classified by the DHR as Fort Walton, possibly a burial mound. Nelson brought his artifact collection to show us during our May 2018 fieldwork. Though the photos of his materials accompanied his original site form, it was apparently not noticed that they included not only prehistoric Fort Walton sherds, but also Spanish olive jar fragments (Figure 28). These are recognizable by their interior parallel ridges that are the result of wheel-thrown pottery manufacture; Native Americans did not have the potter's wheel. These artifacts are highly significant, as the known Spanish settlement in this valley is very meager, consisting of only one other site, Fort San José, 8Gu8 (Saccente 2013, Saccente and White 2015; see discussion of French Fort Crevecoeur, above, and 8Gu8, below), and brief mission sites near the forks. Nelson's collection includes at least one olive jar with a handle and a partial black glaze or paint.

The olive jar, descended from the classical Roman and Greek amphora in the Mediterranean, was a large, utilitarian, ubiquitous, often recycled shipping container with a raised, thickened lip, narrow neck, and curved, wide shoulders. It could contain liquids such as olive oil, water, honey, wine, or solids such as olives or beans (Boyd, Smith, and Griffin 1951:163; Goggin 1960)). It could be glazed or unglazed, and sherds of the latter resemble simple, thick-walled grit-tempered plain aboriginal ceramics, except that interior surfaces show those uniform encircling parallel grooves indicating production on a potter's wheel. Also olive jar pastes, whether they were manufactured in Spain, Mexico, or wherever else, seem to be whiter or to have a thin white slip, unlike most Native

American pottery. Interior-glazed olive jars were less porous and contained lighter liquids such as wine, while unglazed examples were for everything else, even including tar. The jars would have been closed and sealed with a cork and other materials, and many have been found at Spanish colonial sites in the Americas and the Caribbean. The sherds from Poor Man's Creek could represent a separate early Spanish archaeological component superimposed upon and later than the Fort Walton component. Or they could indicate a few items obtained by Indians from a shipwreck or a passing encounter with the Narváez or other expedition, or some brief settlement of Old-World individuals with indigenous peoples. No professional excavation has been done there, but the olive jar with the handle is of a style thought to be the earliest in the New World, dating from 1500-1580, which is very early in the Contact-Period for this region.

Figure 28: Some materials in Tim Nelson collection from Poor Man's Creek site, 8Fr1303, including check-stamped aboriginal potsherds and Spanish olive jar sherds (right side) including one with handle and black paint/slip.

GADSDEN COUNTY

8Gd4, Chattahoochee Landing Mounds

This major mound group at the head of the Apalachicola River, on the east bank, at one time consisted of seven mounds. Moore (1903) investigated it only briefly because it was not a Middle Woodland site full of elaborate pottery, but a Fort Walton temple mound center, with some suggestion of a Late Woodland occupation and more definite evidence of Early Woodland habitation. There is no Middle Woodland evidence here, which is curious for this strategic spot right below the confluence of the Flint and Chattahoochee Rivers, from which flows the Apalachicola. The site is on the National Register of Historic Places, and the city of Chattahoochee continues sensitive development of it as a park, including restoring Mound 3, which was bulldozed by a looter in the 1980s.

Recent work at Chattahoochee Landing (White 2011) has characterized the small Mound 1, right on the riverbank and mostly washed away, as either Early or Late Woodland, or possibly constructed during Fort Walton times. The current grant project has permitted acquiring a couple more radiocarbon dates (Appendix B) to characterize other mounds of this group (see Appendix B). Mound 2, the largest, is the most impressive, a flat-topped platform 3 meters or more above the surrounding landscape, even though most of it is also washed away. As I have been monitoring this site for decades, I knew of stored materials suitable for dating. From the backdirt of a boy's small tunnel into the base of Mound 2 in 1978 (Figure 29), which also contained check-stamped and plain ceramics, I chose an animal bone fragment for radiocarbon dating. The hole he dug (now covered with rip-rap and soil) was less than a meter above the base of the mound, so only within about the first 20% of its deposition; the date should represent the earliest stages of mound construction. The returned date of cal A.D. 1030-1210, with an intercept at A.D. 1155, is quite suitable to document early Fort Walton establishment of a temple mound.

Figure 29. Chattahoochee Landing (8Gd4) Mound 2 in 1978, view facing southeast, from river side, showing looter excavation (black oval) tunneling into bottom slope, and heavy erosion undercutting trees.

Mound 4, today a small remnant under a large oak tree next to the road to the boat ramp and behind Mound 2, back from the river, produced more ambiguous evidence. In January 1975 a profile of it had been cut to examine strata. The top layer produced a Lake Jackson sherd, confirming Fort Walton affiliation, but a deep lower layer had only lithic flakes and a Cotaco Creek projectile point, which could be Archaic or Woodland in age. Charcoal from that dark lower layer produced a date of cal. A.D. 1160-1270, with an intercept of A.D. 1225, indicating that this mound was also a Fort Walton construction. The point may have simply been incorporated into the deposits since it was already there, or may have been deliberately included as some kind of offering during mound construction. With this date, Mound 4 can now be more reliably seen as a probable platform mound, probably originally rectangular, but radically altered in shape by road and park construction. I even once heard a story that this mound was trimmed to be a platform for loading wagons in earlier historic times. The site, just outside the town of Chattahoochee, has had continuing occupation, use as a staging area, ferry launch, and base for many commercial and military operations; Mound 2 once had a tavern on top and retains a brick structure of a well embedded in its summit.

GULF COUNTY

8Gu3, Burgess Landing Mound

C.B. Moore (1903:363-65) recorded this mound, and I revisited it several different times over the years since 1983. It is still extant, though dug down by local looters. It sits in wildly tangled, thorny vine-infested forest next to the road to the landing. The actual Burgess landing where steamboats once docked and more recent folks launched boats from a ramp is now blocked off by a previous landowner, who did not want all the noise of partying boaters and other such disturbances. But Jim Bozeman (son of the previous landowner), who lives nearby and owns the land, was quite hospitable in allowing us to walk through the woods to the mound. He said local people had been looting it for years. The mound GPS coordinates are 676304 3324717. Boseman said the mound was L-shaped, which we did not observe, though we actually could see little given the heavy ground cover. The L shape could have come from looting or road construction.

Moore recovered both Swift Creek and early Weeden Island ceramics from this mound, typical of Middle Woodland in this valley. He illustrated a Weeden Island Plain, red-painted conical jar with a bird-head effigy adorno, and also said there was a lot of check-stamped as well. The check-stamped tetrapodal vessel support recovered in the 1983 brief survey suggests an Early Woodland cultural affiliation, at least for the area surrounding the mound (village?). This may be one of the increasing number of burial mounds recognized to have been initiated during Early Woodland times and continued in use through the height of Middle Woodland burial ritual. The February, 2018 visit during the current research project produced no cultural materials, as we did not dig. However the mound remains. Though it has been looted for over a century and pushed down, it may retain intact portions and also have sub-mound features.

Materials recovered from Burgess Landing Mound site and area, 8Gu3, at USF

Cat #	*Provenience*	*Materials*	*N*	*Wt (g)*
-83-1.1	surface around landing	ch-st podal support	1	33.8
-1.2		ch-st, sand-t	2	16.5
-1.3		indet engraved?	1	13.2
-1.4		indet punc (sand-t)	1	3.1
-1.5		grog-t pl	1	5.5
-1.6		grit-t pl; 1 has poss red pt	5	12.8
-1.7		sand-t pl; 1 has poss red pt	17	54.7
-1.8		turtle carapace frags	2	8.3
-1.9		limestone frag	1	16.5
-85-2.1	surface of dirt road	SwCrC-St	1	2.7
-2.2		grit&grog-t brushed or incised	2	14.8
-2.3		ch-st; sand&grit-t	3	17.2
-2.4		sand&grog-t pl w/ single scratch marks	2	8.5
-2.5		sand-t pl w/ single scratch marks	3	13.6
-2.6		sand&grit-t pl	11	33.3
-2.7		grit-t pl	2	15.7
-2.8		indet punc, sand&grog-t	2	9.6
-2.9		indet punc, sand-t	1	2.6
-2.10		indet inc, sand&grog-t	2	6.4
-2.11		indet inc, sand-t (1 w/poss interior inc)	2	20.4

Cat #	Provenience	Materials	N	Wt (g)
-2.12		indet inc, grit&grog-t (2=rims)	4	14.7
-2.13		sand&grog-t pl	12	28.7
-2.14		sand-t pl	56	243.4
-2.15		chert block shatter	1	1.9
-85.3.1	surface	comp-st?	1	2.0
-3.2		indet punc rim	1	4.1
-3.3		sand&grog-t pl	4	8.9
-3.4		indet inc, sand-t	2	5.0
-3.5		sand&grit-t pl	4	14.4
-3.6		sand-t pl (2=rim)	18	54.1
-85-4.1	shovel test, 0-43 cm	sand-t pl (some soot)	1	5.2
-85-5.1	surface of graded rd	Keith Inc, sand-t	1	5.2
-5.2		SwCrC-St	1	1.9
-5.3		sand&grit-t pl	2	12.8
-5.4		sand-t pl	8	21.4
-85-6.1	surface	Keith Inc, sand&grit-t	1	2.1
-6.2		indet punc, sand&grit-t	2	3.6
-6.3		indet inc, sand-t	5	10.9
-6.4		sand-t pl	32	57.5
-6.5		sand&grog-t pl	12	27.8
-6.6		grit&grog-t pl	3	17.1
-6.7		sand, grog&grit-t pl	5	10.8
-6.8		sand&grit-t pl	27	66.6
-6.9		indet st, sand&grit-t	2	4.7
-6.10		indet inc, sand&grit-t	5	20.3
-6.11		indet st, sand-t	112.5	
-6.12		indet inc, grit-t	1	3.2
04-1.1	surface in driveway	sand-t pl	1	3.1
		grog-t pl	1	2.0
04-2.1	surface, NE corner Burgess and Poplar Rds.	fabric-mk	1	2.9
-2.2		indet punc, sand-t	3	5.0
-2.3		sand&grog-t pl	1	3.9
-2.4		grit-t pl	2	5.3
-2.5		sand-t pl	7	15.0
-2.6		sand-t pl?	1	8.4
-2.7		indet punc, grog-t	1	2.8

8Gu8, Fort San José

This fort, located at the tip of St. Joseph Peninsula, has been historically documented. The Spanish first established a post there in 1701, quickly abandoned it, then returned in 1718 after chasing out the French from their Fort Crevecoeur (see discussion below), and stayed several years. Past work at this early eighteenth-century Spanish fort included investigations by Hale Smith of FSU in the 1960s (never reported), a summary of his materials stored at FSU (Azzarello 1996), and a reconnaissance by a later survey (Benchley and Bense 2001). Our investigations over the last decade have added information from a huge private collection.

Today a small amount of looting continues at the site, but it is both protected in the state park and mostly washed away/looted away, so that there is little left to pick up. While our last field visit was in 2012, we update the site file records with the thorough research document of Julie Rogers Saccente's (2013) USF M.A. thesis, and also the published account (Saccente and White 2015) resulting from presenting the research at the Society for Historical Archaeology annual meeting in Leicester, England, in 2013. These documents are also submitted with this report. In addition, a study of the artifacts stored at FSU from 8Gu10, Richardson's Hammock (see discussion below), showed that one bag labeled with this site number is actually from 8Gu8, Fort San José, since it has Spanish materials that could not have come from Richardson's or anywhere else in the region, and we learned from former owners of Richardson's Hammock that Hale Smith abruptly left his investigations there to go to the Spanish fort. Finally, the large private collection studied by Saccente was donated by the collector to the Bureau of Archaeological Research, and during this project, in May 2018, we brought it to the collections facility in Tallahassee.

As a postscript to the documentation of the fort, an earlier survey recorded it as being possibly in Franklin County and assigned it the number 8Fr76, and another research document in the site file apparently gives the number 8Gu26 to this Spanish fort. Since we now know its location and far more information, the Fr number should be voided and the Gu26 should probably be migrated over to Gu8 in the site file.

Materials Newly Recorded from Fort San José, 8Gu8 *(recovered by H. Smith, 1960s, stored at FSU, not previously documented because bag is labeled 8Gu10), probably from surface*

MATERIALS	N	WT (g)
grit-temp, indet stamped sherds (cobmk?)	5	80.1
sand & grog-temp rim, notched below collar	1	8.9
grit-temp plain sherds	7	91.8
brushed sand-temp (prob Chattahoochee Brushed)	5	50.9
prob Lamar Complicated-Stamped, gritty	4	55.5
Lamar notched rim, grit-temp sherd	1	95.0
poss Lamar appliqué strip rim, sand-temp		
Spanish olive jar sherds	5	160.0
wheel-thrown plain unglazed sherds, sand, grit, and grog-temp, Spanish/Mexican	7	537.0
wheel-thrown plain sherds, glazed, sand, grit, and grog-temp, Spanish/Mexican	7	85.6
El Morro ware rim with applique strip and lug, yellow, glazed exterior and interior	1	69.4
aboriginal rim sherd, sand-tempered plain, unusual right angle lip	1	150.6
blue-on-white majolica sherds	3	10.6
mortar frags (with shell, consistent with Spanish construction at 8Gu10[8Gu8?]	5	132.1
sand-temp dark sherd labeled GU-9 (probably really meant 8Gu8?]	1	4
green glass frags (2= Dutch/French case bottle bases, as already known from Gu8)	5	163.7
worked rock, probably basalt (5+6 on mohs scale); reddish-gray; imported from Mexico?	1	20.8
small sphere segment - probably lead shot	1	8
rusted metal frags (1 prob hinge)	3	56.7
modern bullet jacket, "wcc 62 +"	1	14

8Gu10, Richardson's Hammock

This site is a well-known large-gastropod Fort Walton and Middle Woodland shell midden and burial mound on the shores of St. Joseph Bay. It was briefly investigated by Hale Smith of FSU in the 1960s, and later by local resident R. Wayne Childers, who did excavations and wrote two reports for the wealthy landowner, Troy Deal. After the state bought it as the Deal Tract of the St. Joseph Bay State Buffer Preserve, I conducted test excavations on the midden but not the burial mound, which had already been looted, apparently in the 1970s and early 1980s (White et al. 2002; White 2005).

Additional Documentation in Recent Years

Since those investigations several additional research areas have been documented. First, an interview with Deal was done apparently by a state worker (Daniels 2001). In it, he reflects on his "years of stewardship" of the land, but he makes several historical mistakes, either deliberately or because of forgetting the past during his long life. He says it was a hammock with tremendous, beautiful oaks and tremendous pine trees, "which is very unusual in that part of the country" though such hammocks are fairly common. He recounts how he invited FSU archaeologist Hale Smith to visit the property, and thought the artifacts looked Mayan (Daniels 2001:13). Whatever archaeological competence Smith might have had, he certainly would know prehistoric ceramics of the region and not consider them Mayan, though he might have told Deal there could have been relationships between the prehistoric Southeast and Mesoamerica. When Deal's daughter showed some "old English pottery" from the tip of the peninsula, Smith left to investigate the "Old English Fort" there (Daniels 2001:7); later he notes it was a Spanish fort (Fort San José, 8Gu8; see above) from which Smith later found Spanish helmets and buttons (Daniels 2001:8). It is important to note that no English occupation is known from the site or the area, and neither Smith's nor anyone else's investigations found helmets or buttons, though brass buckles and other interesting items did come from that Spanish fort (Saccente 2013, and see 8Gu8, above). Deal also said he had built his lookout tower at the site in about 1997 or 96 (Daniels 2001:8), but it was in existence in 1985 when he briefly contacted me about research there. He also noted in the interview that he found some kind of Indian statue of clay at Richardson's Hammock (a "little doll") that then got lost.

In 2011, I was contacted by Troy Deal III, son of the former landowner, who retained a keen interest in the site, where he had spent much pleasant time. He loaned his artifact collection and photographs for study, which resulted in an undergraduate student honors thesis (Presto 2013, submitted with this report and the site update file). He visited the site with us and noted how the beach he remembered was essentially gone. He confirmed how Hale Smith had quickly left the site when presented with evidence of the Spanish fort and how his father did find a human effigy figurine, a female form, which is now lost, though there might be a photo of it somewhere. His father had left a pot from the site in the care of the Fort Walton Temple Mound Museum in Fort Walton Beach. I also heard a version of this story elsewhere, and that the pot had contained a skeleton. Troy told the me he had heard from Wayne Childers that Wayne went to that museum in the mid-80s but they could not find this pot. My 2017 inquiries of museum director Gail Meyer resulted in the information that they had nothing from the site, and indeed, only a small bag of sherds from anywhere in Gulf County. Finally, Troy and I gathered the evidence to come to the conclusion that the Middle Woodland burial mound with intrusive Fort Walton burials at the north end of the site must not have been discovered until dug into by Wayne Childers and the other diggers in the late 1970s-early 80s. Hale Smith must not have known about it or he certainly would have investigated it.

Additional Documentation by the Current Project

The 2017-2018 work included several areas of research on Richardson's Hammock: 1. study of Smith's FSU collection; 2. a field visit to the site; and 3. study of a newly-available artifact collection from the burial mound.

1. The Richardson's Hammock materials stored at Florida State University are listed below; they were borrowed from the lab there to study at USF, and then returned in 2017. They do include some relatively recent fragments of brick, slate, and iron, as well as a whiteware sherd. These recent materials might have been from an occupation by someone named Richardson (I have for all these years been unable to determine the origin of the name, and local people I ask who have long lived there do not know either). More likely these modern materials are from some structure left by John, Dave, or Fred Maddux, who were said to have run cattle at Richardson's Hammock in the late 1800s-early 1900s and possibly later. Among the prehistoric materials are the standard check-stamped and Fort Walton ceramics and shell artifacts resembling the others that have come from the south end of the site (White et al. 2002), and nothing from the Middle Woodland north end. The only provenience for these materials is "Trench 2A L2 SQ. 0.50-1.0," suggesting Smith dug at least two trenches of unknown dimensions, in 6" (.50 foot) levels, and possibly divided into individual (probably 5-foot) squares. Where or if any other materials from his excavations may exist is unknown. Perhaps his Trench 1 was in a culturally-sterile area just off the beach ridge that holds the site. One other bag at FSU, labeled simply "8Gu10" is clearly from Smith's work at 8Gu8, Spanish Fort San José, since it has majolica and olive jar sherds, Mexican basalt fragments, and other items not characteristic of Richardson's Hammock, and we know the story of his quickly moving from that site to the fort. Since these materials are not included in any of the summaries of Fort San José, they are also described in this report (above, with that site's other new data).

2. On 17 May 2018, we visited Richardson's Hammock site with St. Joseph Bay State Buffer Preserve director Dylan Shoemaker and some of his staff members, to inspect its condition in general and also to see a spot where a supposed human bone was eroding out of the bank, in the southerly midden area. Though a photo of the bone was taken and the state archaeologist notified, before the bone could be recovered it disappeared (though of photo of its imprint in the sandy shore was also taken). The site was so heavily eroded and the bank cut back that there were hardly any whelk and conch shells to indicate its presence, washing out of the exposed shoreline. But the burial mound seemed undisturbed. Later, the bone was identified from the photo as a deer tibia. As far as known from all research, the only human bones were obtained from the burial mound by local collectors. Meanwhile, the present project also produced a short drone video of the site.

3. In early 2018, one of the original diggers (JS) who worked with Wayne Childers on the Richardson's Hammock mound contacted me, since she had moved back into the region. I had photographed some of her artifacts in 1985. We visited her in Wewahitchka in May, and she loaned most of her artifact collection for study, though many items had gotten lost or stolen over 35 years. It is all supposed to have come from the burial mound. As far as known, she said, she and others who dug with Childers kept all the materials they unearthed. She said she did not deal with any skeletons, but knew some others had, and they were all at the north end of the site where the burial mound is. Her artifacts, listed below, included both classic Weeden Island Incised and Punctated (Figure 30) and Swift Creek Complicated-Stamped of the Middle Woodland period (the original builders of the burial mound) and Fort Walton ceramics (from the intrusive, later burials). The Weeden Island Incised included a conical jar with red paint and an outflaring rim with triangular flanges that have parallel straight-line incisions and a globular bowl with red paint and external appliqué portions broken off. Two Weeden Island punctate bowls each had punch-and-drag lines but one in a rectilinear (diamond-shaped) pattern and one in a curvilinear (teardrop-shaped) design. A Fort Walton vessel was a nearly intact Cool Branch Incised jar (Figure 31). Ten shell beads of graduated sizes might have been associated with either component (sizes give in table below). Any of these artifacts could have been burial offerings.

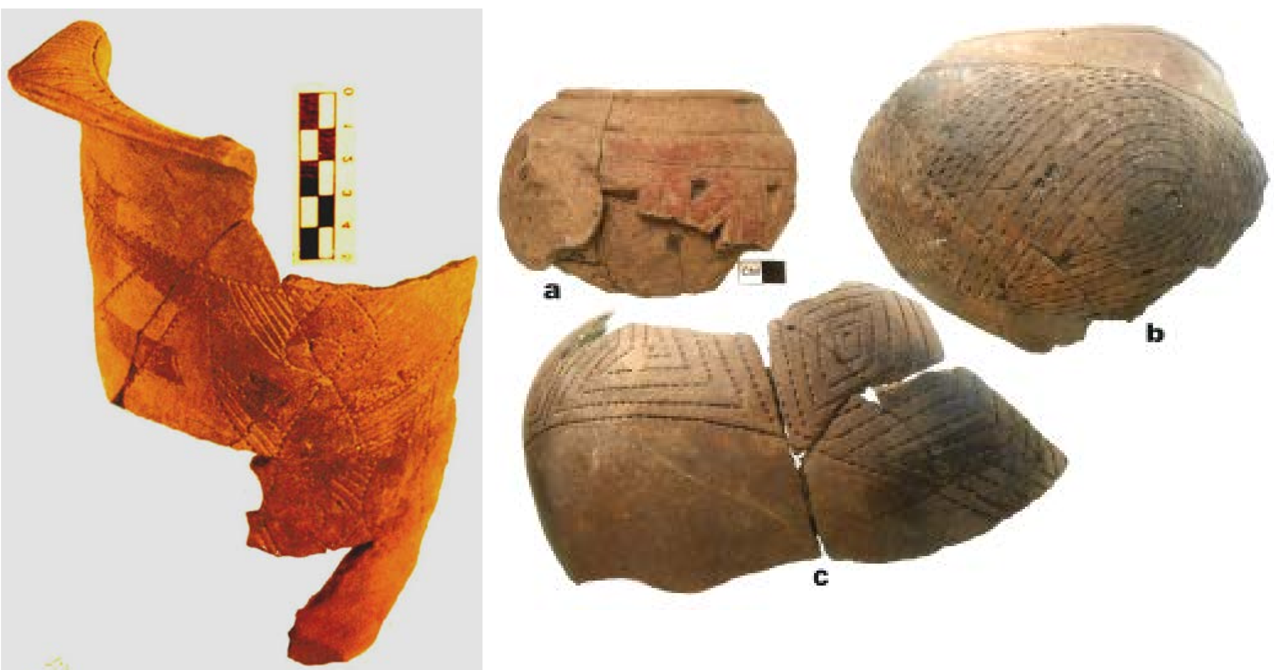


Figure 30. Ceramics from burial mound at Richardson's Hammock, 8Gu10, JS collection: left, *Weeden Island Punctate wide-mouth conical jar with red paint in wide horizontal stripes and irregularly across body;* right, a, *Weeden Island Incised globular bowl with applied cutouts and red paint;* b, c, *Weeden Island Punctate globular bowls with punch-and-drag lines.*

Figure 31. Marine shell beads and Fort Walton-period Cool Branch Incised jar from burial mound, Richardson's Hammock, 8Gu10, JS private collection.

4. An additional radiocarbon date was obtained with support from the current project. Since we did not know the age of the earlier prehistoric occupation at the north end of the site near the mound, this area was chosen, specifically Test Unit E, not far from the mound. Charcoal recovered from flotation of a 9-liter soil sample from TUE, Level 4 (60 to 80 cm depth, containing Swift Creek Complicated-Stamped sherds) was sent for AMS radiocarbon dating. The resulting date (and see Appendix B) of cal. A.D. 890-1020 (midpoint, A.D. 955) suggest even deeper deposits from Middle Woodland times might have been mixed by later occupants of the site. It also somewhat suggests that there may be a Late Woodland component at Richardson's Hammock.

5. Visiting the Bureau of Archaeological Research collections in Tallahassee, we observed the materials there from Richardson's Hammock. Apparently some bags are FSU materials dug by Hale Smith, and labeled "Sq2, FS#2." Some have misnamed types, and some significant sherds are listed below. Important is that a sherd labeled Lamar Bold Incised is not of that type (which would be a different, protohistoric time period) but really just a standard indeterminate incised, probably Point Washington type. There were several sherds of the type Cool Branch Incised, and one Fort Walton Incised sherd was from a 6-pointed bowl, a distinctive regional form.

Thus a good amount of additional data have been added to the record for this important site, and research continues on what happened to Childers collection, since he is now said to be in an assisted-living home and his home has been emptied and the artifact collections apparently sold or thrown out.

Materials Newly Recorded from Richardson's Hammock, 8Gu10

Florida State University Collection, 1960s: no catalog numbers or provenience on bags except for "Trench 2A L2 SQ. 0.50-1.0"

MATERIALS	N	WT (g)
shell-temp plain	5	21.9
Pensacola Incised shell-temp rim	1	7.4
Fort Walton incised (3 rims, ticked)	10	101.2
Lake Jackson plain (3 notched rim, 3 ticked rim, 2 bi-noded lugs)	8	79.2
Lake Jackson incised, 1 ticked rim	3	26.2
Marsh Island incised	1	12.6
Point Washington Incised	1	15.2
indet incised	2	10.5
check stamped, 1 rim	17	131.7
grog-temp plain	13	158
grog and grit-temp plain	8	90.4
grog and sand-temp plain	3	18.6
grit-temp plain (5 rims)	76	678.7
sand-temp plain (5 rims)	62	371
Busycon shell columella awl bipointed	1	29.3
juvenile Busycon shell columella awl, part of apex and whorl remaining (handle?)	1	5.5
sandstone frags	2	55.5
rusted iron objects	2	11.9
red brick frags, 5 1/4" x 1" thick (lengths unknown	5	2253.2
modern mortar frags	150	256.2
Fort Walton incised	6	35.9
Lake Jackson plain (2 ticked, 1 smooth)	3	10
Lake Jackson incised (ticked)	1	2.7
Lake Jackson lugs	2	20.3
indet incised	9	55.7
indet punctate, prob FW Incised	1	5.1
check stamped	19	112.7
indet stamped	6	33.8
indet stamped or incised-grit-temp	2	13.3
shell-temp plain	11	45.7
grog-tempered plain	13	72.3
grog and sand-temp plain	16	65.3
grog and grit-temp plain	11	68.2
sand-temp plain	100	414.7
grit-temp plain	122	667.2
expedient chert scraper	1	11.5
shell fragment	1	1.8
columella tools, bipointed	2	13.8
turtle shell	1	5.3
fish bone - skull?	1	1.5
sandstone concretion	1	5.3
slate-modern building	4	16.1
crayon or carpenter's wax pencil fragment	1	0.4
whiteware plate rim	1	16.6

Private (JS) collection, loaned for analysis (no wt. available for those not loaned)

MATERIALS	N	WT (g)	COMMENTS
FW Inc	12	138	1=6-pt bowl
Cool Br Inc	2	34	1=rim
Cool Br Inc jar	1		nearly whole vessel with 4 lugs on neck
LJ rim	12	140	all but 1 ticked
WI Inc	1	140.5	w red pt - rim - layered break shows mfg tech (4 sherds glued+taped)
WI Inc	1		cylindrical/conical jar, expanded rim and rim flanges with parallel straight incisions
WI Inc	1		globular bowl
WI Inc	1		globular bowl, diagonal incised and punctated design might resemble fingers of a hand, overlaid by vertical elements, triangular horizontal rim flanges
Keith Inc	1	6	
SwCrC-St	4	83	sloppy, hard to ID
LJ rim	1	38	D-lug
LJ rim	1	19	B-lug
LJ rims	4	112	nodes
WI Punc	1	>250	1 teardrop-shaped curvilinear pattern, punch-and-drag, rim widely scalloped; many pcs glued/taped
WI Punc	1	>250	rectilinear pattern, also punch-and-drag, many pieces glued, rim not present
WI Punc	1		globular bowl with vertical, triangular, curvilinear elements in punch-and-drag; rim missing
indet st	2	27	
grog-t pl	1	16	w black paint
indet punc	4	32	1 has line of interior punctations
indet inc	7	45	1 has parallel curvilinear incisions
sand-t pl	1	18	w red pt
ch-st	1		lg globular bowl, complete, with kill hole
ch-st	71	1345	1=rim, many have plain areas
indet st rim	5	80	
grog-t pl	15	222	
shell-t pl	2	11	
sand-t pl	84	1424	burnished
sand-t pl	173	2247	
grit-t pl	2	19	
greenstone celt	1		about 21 cm long, ave. 9 cm wide
shell beads	10		lengths/diameters (mm): 16/6, 14/6, 4/6, 3/6, 4/4, 3/5, 3/4, 4/4, 2.5/4, 2.5/4
whelk shell columella tool	1	23	awl
whelk scraper	1		rectilinear
whelk perversum shell	2	747	lightning whelk shells w holes punched to get shellfish; individual wts: 346 g, 401 g
oyster shell	2	169	1 frag; 1=17 cm long, 104 g
bone frag	2	2	poss turtle

DHR collections, sherds excavated by Hale Smith (?), FSU, 1960s, labeled "Sq2, FS#2"

DHR#	TYPE	N	WT	COMMENTS
74.243.04	FW Inc	9	97.9	1=6-pointed bowl rim
74.243.04	Pens Pl [sh-t]	9	74.6	
74.243.04	ch-st	8	61.8	labeled Wakulla
74.243.02	rim w 6 // incis	1	11.4	3 sherds taped tog – should be Lake Jackson
74.243.01	sh-t pl	31	400	
74.243.12	FW Inc			several; not all typed correctly
	Cool Br Inc	1	33.8	Cool Branch Incised, labeled correctly
74,243.09	Cool Br Inc	1	52.3	labeled FW Inc, 2 glued, rim ticked
74.243.08	Cool Br Inc	1	9	

JACKSON COUNTY

8Ja437, Magnolia Bridge

Magnolia Bridge, which crosses the Chipola River (see Figure 4), is known by locals as a good place to dive for artifacts. This underwater site was recorded decades ago by a professional archaeologist who examined a diver's collection of Paleo-Indian and Archaic points. The site's data are expanded in Tyler's (2008) and Kreiser's (2018) theses (also submitted to the site file with this report and site update forms), that carefully document additional collections information, such as Simpson and other points. Therefore, here I simply present a couple additional details beyond their work. Visiting the (riverbank over) the site on 15 December in the company of avocational archaeologist Jeff Whitfield, we learned that artifacts have been found on land on the east bank of the river, possibly indicating that materials on the river bottom have fallen in from a terrestrial portion of this site. The deepest water here is about 12 feet (4-5 m). Whitfield also sent a photo of a tiny pot he got from the site (Figure 32) long ago, and mentioned that several divers have recovered ceramic vessels from the Chipola River.

Figure 32. Tiny prehistoric plain bowl from underwater at Magnolia Bridge site, 8Ja437, private (JW) collection.

LIBERTY COUNTY

8Li4/196, *Bristol Mound*

The Under the Nose site was originally recorded during our 1985 survey (Henefield and White 1986: 87-88), when plain, cordmarked, and Swift Creek Complicated-Stamped sherds, chert flakes, and a clay ball were recovered from the surface. The site is on a high bluff overlooking the Apalachicola River on the east side, 155 feet (47 m) above sea level and 600 m inland from the river at Mile 80.4. A return visit in 1999 produced additional artifacts, some donated by landowner Carol Ramsey (who said she was a cousin of Andrew Ramsey, chief of the northwest Florida Creek Indians), including Swift Creek Complicated-Stamped pottery with unusual patterns. The site area at that time was covered by a dog pen and a garden. There was once a line of 15-cm thick shell midden stratum running east-west along Ramsey Rd (graded) and Central St. (paved). A volunteer with the crew at that time, Terry Mercer, a member of the Chipola Archaeological Society (now defunct), found two notable artifacts (Figure 33), a complicated-stamped sherd and a small point, probably a Baker's Creek type, common during the Middle Woodland period. A shovel test excavated 30 m southeast of the USGS benchmark (x134' on *Bristol, Florida*, 1945 USGS quadrangle map) and 5 m southeast of the dog pen had the stratigraphy noted above and produced the sherds and flakes listed below.

We returned to the blufftop area of the site in 2017, finding no artifacts but hearing the story of its destruction from avocational archaeologist Jeff Whitfield. He said that in about 1980-81 the land was owned by a man named Fason (pronounced "Fayson") who thought the mound contained Confederate gold. Fason was a collector and had found a historic sword at Alum Bluff (the next high bluff upriver). Looking for the supposed gold, he bulldozed the mound. Later he hired 18-year-old Whitfield to move azaleas, during which activity he found a human head effigy (of clay) with a snake-shaped headband (he thought at the time it looked almost Egyptian). No bones were evident but they might have been bulldozed away. Mr. Ramsey, who lived across the road from the mound, had collected a large amount of Swift Creek Complicated-Stamped pottery. The land is now owned by Copeland. The disposition/location of any of the collections are presently unknown. Fason's house (and presumably the sword and anything else) burned up a while ago.

The location of the site, its Middle Woodland contents, and the fact that it was a Middle Woodland mound, makes it just about certain to have been C. B. Moore's (1903:474-480) Mound at Bristol. Research in the collections of the Smithsonian NMAI included photographing original materials collected by Moore from this site. Some of the ceramics include Swift Creek Complicated-Stamped and Weeden Island Incised bowls and jars. A Weeden Island Red jar with bird head and a red-painted large bird-head adorno are pictured in Figure 34, along with two check-stamped jars of unusual shapes. Many of these vessels have undergone restoration over the years, visible as differently-colored pastes holding together the broken pieces of the sides. From this Bristol Mound, Moore got 14 burials, most very deep, but with not many bones; 10 were either single skulls or skulls with just a few other bones. Burial goods besides ceramics were shell beads, a piece of mica carved into a spear-point shape, and shell cups. An east-side deposit consisted of check-stamped vessels, presumably including the two still extant in the NMAI. These pots, if broken, would produce only generic sherds that could be classified only as Woodland, since check-stamping began with Early Woodland about 1000 B.C. and continued through historic times. However, the interesting, probably unusual (to the potters) shapes may have related to their ceremonial use in the mound deposit.

Testing at this site may produce yet-undisturbed deposits such as sub-mound features. Other collections in private or even public locations might be located. Meanwhile, the site number 8Li196 should be vacated, and the name "Under the Nose" site should be removed, combining the records with the site listing for 8Li4, Bristol Mound, and the following UTM coordinates: UTM Zone 16, E 693701 N 3368804. This site update is done to consolidate the record for the two sites, list materials recovered since the 1985 survey, and illustrate some materials from the Bristol Mound.

Materials Recovered/Documented, Bristol Mound, 8Li4/Li196:

Cat#8Li196	Provenience	Materials	N	Wt (g)
-85-1	Surface	sand-tempered plain rim	1	1.9
		sand-tempered plain	8	42.4
		cordmarked sherd	1	3.3
		Swift Creek Complicated-Stamped	3	41.4
		possible clay ball	1	
		secondary retouched chert flakes	2	1.2
-99-1	Ramsey Rd. and property [surface]	Swift Creek Complicated-Stamped	13 (4 glued)	95.8
		grit-tempered plain	6	35.7
		sand-tempered plain (1=rim)	21	149.1
		chert secondary flakes	2	2.0
		clear quartz chip	1	3.8
		sandstone frag, smooth	1	2.0
		burned bone frags	2	2.8
		historic brick frags	3	8.6
-99-2	Donated by Carol Ramsey	Swift Creek Complicated-Stamped (2=rims)	3	41.3
		check-stamped	1	17.7
		sand-tempered plain	3	104.7
-99-3	Ramsey Rd. and property, Shovel Test 1, 30 m SE of USGS benchmark, 5 m SE of dog pen	Swift Creek Complicated-Stamped	5	29.6
		grit-tempered plain	8	48.8
		sand-tempered plain (2=rims)	13	78.7
		chert primary decort chunk	1	8.4
		chert secondary flakes	8	1.7
TM collection	surface?	complicated-stamped sherd		
		Baker's Creek (?) point		
NMAI	C.B. Moore excavations	many vessels		

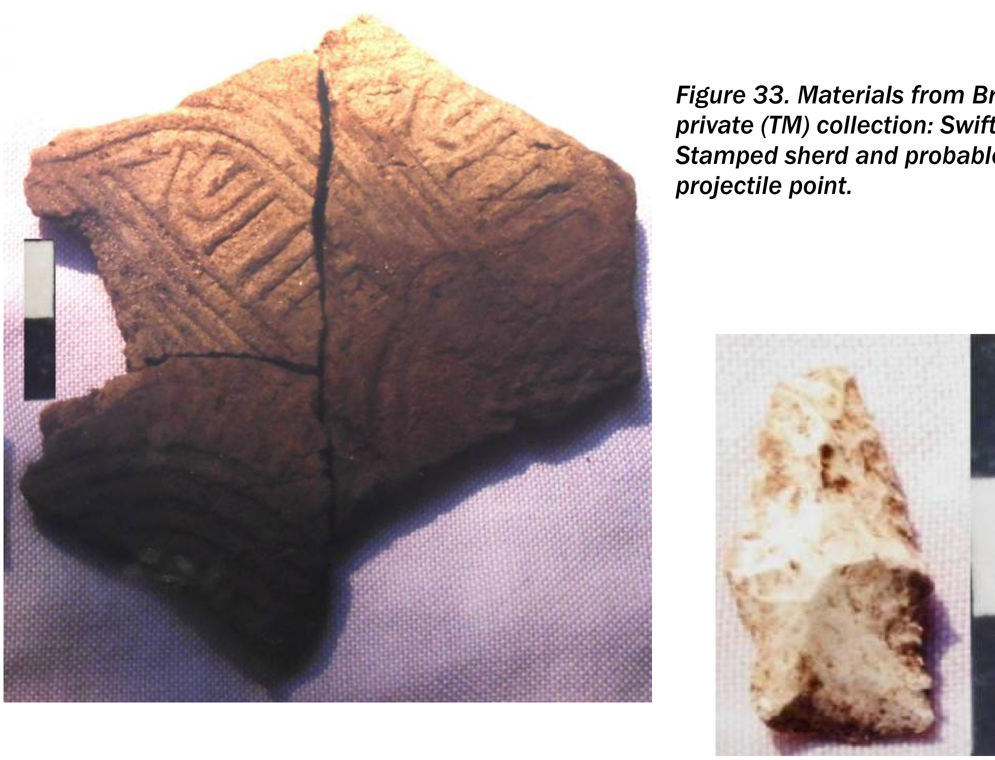


Figure 33. Materials from Bristol Mound, 8Li4, in private (TM) collection: Swift Creek Complicated-Stamped sherd and probable Baker's Creek projectile point.

Figure 34. Materials from Bristol Mound, 8Li4, recovered by C. B. Moore, in NMAI collections: red-painted bird head adorno (rim effigy) from ceramic pot (170276); Weeden Island Red cutout vessel with bird head effigy (173955); two unusually-shaped check-stamped vessels, a globular jar with long neck (173415) and a conical jar with repair holes drilled on either side of a crack (173954).

Otis Hare site, 8Li172

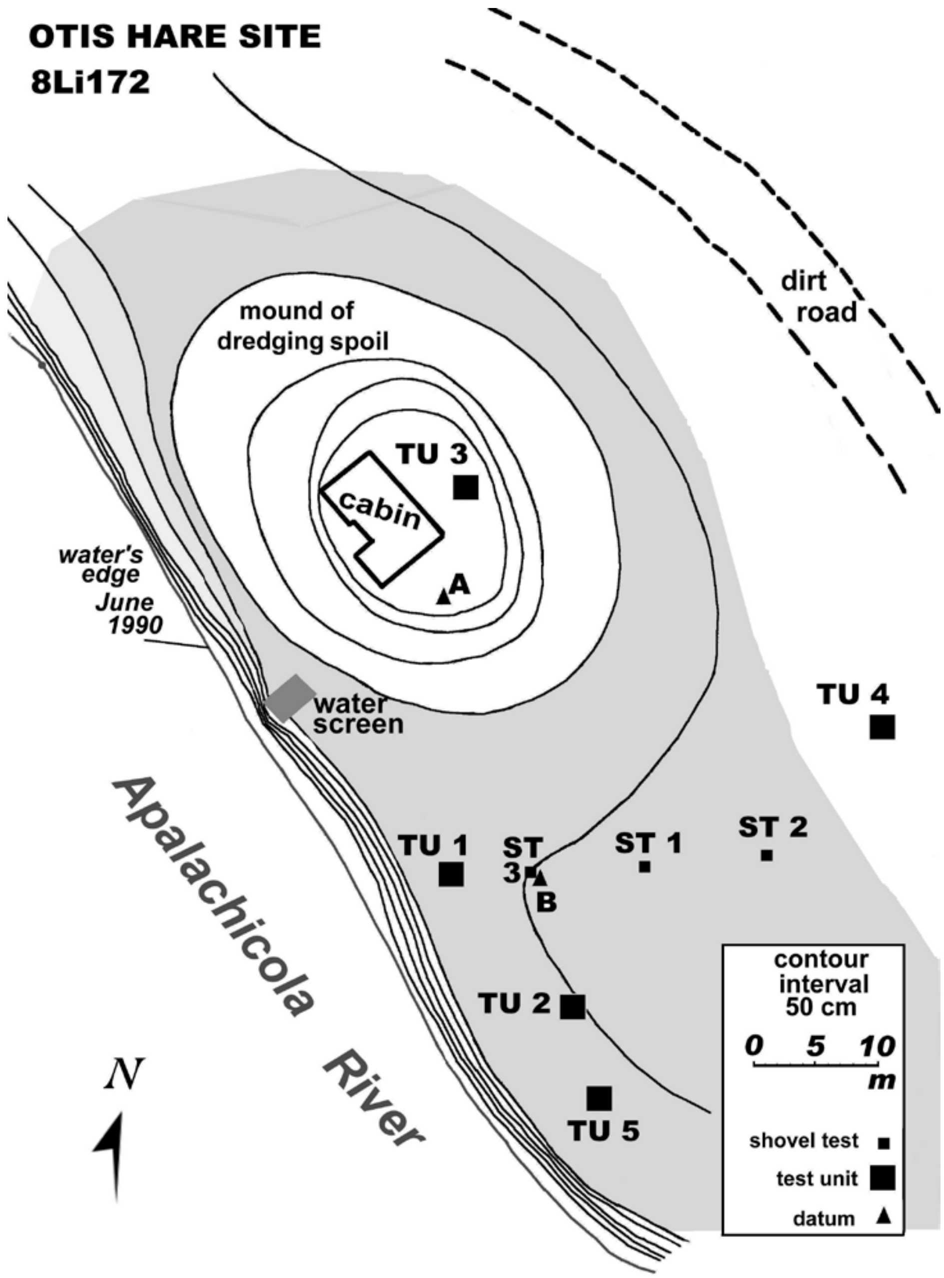
The Otis Hare site is a deeply-stratified riverbank freshwater shell midden occupation on the west bank of the middle Apalachicola River (Figure 35). It was recorded in 1985 by Kathy Jones, then the director of the Florida site file, and placed on the National Register of Historic Places in 1989 by DHR archaeologists for its significance in understanding prehistoric Woodland chronology. Most of the site had undoubtedly washed away as the riverbank eroded due to dam construction and other human and natural action. People from three states and 6 counties were looting it for decades . In 1990, I conducted test excavations at the site (Hutchinson et al. 1991). Five 2-x-2-m test units and three 50-cm square shovel tests were dug, demonstrating the narrow width of the habitation zone along the bank. Test Unit 3, into a large raised area suspected to be a mound, which had a decaying old hunting cabin on top of it, was not only culturally sterile, but proved that the mound was made of the coarse sands and gravels of dredging spoils. Test Unit 4 also had no cultural materials, as it was too far back from the river.

The other units showed that, under over a meter of modern alluvium, the site had a meter-thick midden stratum of black, greasy soil packed with river molluscs, gastropods, abundant other faunal remains, and artifacts, with multiple features at the bottom. Tight stratigraphic control was achieved with excavation in arbitrary levels, usually of 5 cm and sometimes 10 cm. Ceramics of both Swift Creek and Weeden Island series (early and late) as well as special items such as a possible shell bead preform and a cut-mica piece in an arrowhead shape were recovered. Many coprolites were preserved, and also fragments of cut river cane, known to be a raw material for prehistoric woven mats and other artifacts. A few Fort Walton-period sherds from disturbed contexts testified to a light overlay of late prehistoric occupation.

While no new fieldwork was done at this site for the current project, prior research is still being evaluated and the massive amount of materials and data continue to be processed. The historic preservation grant allowed for two distinct areas of investigation: radiocarbon dates and multiple analyses of some coprolites. As with any research project, there are successes, failures, and results somewhere in between. The radiocarbon dating provided good insights into changes in ceramic type frequency throughout the Woodland period. The coprolite analyses were only partially successful in characterizing, as it turns out, what late Middle Woodland canines left (!).

Though all radiocarbon dates obtained during this grant project are noted in Appendix B, all the dates from the Otis Hare site, whenever they were obtained, are tabulated below, so as to show the great sequence of ceramic stratigraphy. The careful excavation allows good association of ceramic frequencies with radiocarbon dates. As a professional courtesy, Beta Analytic recalibrated dates obtained on this site in the 1990s to current standards so that all are comparable. The occupational (and thus ceramic) sequence at the site began in Middle Woodland times, with the earliest dates of between 430 and 545 on the deepest cultural levels. An earlier date at cal. A.D. 220-570 on a shallow Level 5 in TU1 may be either erroneous or recording older charcoal stirred up by later inhabitants. An undisturbed Feature 22, at the bottom of the midden in TU1, intruding down into the soft yellowish-brown sand of the original riverbank, dated to A.D.

Figure 35. Map of the Otis Hare site, 8Li172, showing extent of site (shaded) and locations of excavated units.



595. Above that, the smooth transition from Middle through Late Woodland and Fort Walton times is nicely documented. The Swift Creek Complicated-Stamped pottery (an example is shown in Figure 36), which emerges late in Early Woodland times in the region, continues to be a time marker through Middle Woodland, when the early Weeden Island types Weeden Island Incised, Punctated, and Red appear. By the Late Woodland, diagnostic types in the Weeden Island series disappear, with only Keith Incised and Carrabelle Incised and Punctate, as well as a little complicated-stamped, hanging on, and the small percentage of check-stamped sherds always present increases to nearly half the assemblage. The cane fragments, however, proved to be modern, probably dragged down by rodents, whose burrows into the midden were observed during excavation.

Otis Hare site, 8Li172, all radiocarbon dates.

Culture	*Year dated*	*Proven-ience*	*Material dated*	*Associated materials (frequencies of diagnostics)*	*Conventional radiocarbon age (yrs B.P.)*	*Uncorrected calendar date*	*Calibrated date range**	*Intercept(s)*	*Lab #***
MWd?	1991	TU1 L5	~15 g pine char	340 ch-st, 3 Keith, 1 WI Inc, 1 Carr	1660±80	A.D. 290	A.D. 220-570	A.D. 395 (incorrect?)	46704
MWd	1991	TU2 F15	char	4 SwCrC-St; originates in L13, which had 82% pl, 5% SwCrC-S, 7% ch-st, indet inc, WI red	1580±80	A.D. 370	A.D. 261-640	A.D. 430 A.D. 590 A.D. 510 A.D. 515 A.D. 530	46706
MWd	1991	TU1 L14	~35 g pine char	29 SwCrC-St, 2 ch-st	1530±50	A.D. 420	A.D. 415-640	A.D. 545	46705
MWd	1991	TU1 F22	char	1 SwCrC-St, 2 pl sherds	1480±70	A.D. 470	A.D. 420-665	A.D. 595	46703
MWd	2018	TU1 L13 -183-186	conifer char in dog coprolite	163 SWCrC-St	1370±23	A.D. 580	A.D. 620-690	A.D. 655	PRI 5859
MWd/ LWd	2018	TU1 L9	char	30 ch-st, 15 SWCrC-St; 1 WI Red; 2 Carr; 2 Keith	1350±30	A.D. 600	A.D. 630-720; 740-770	A.D. 675 A.D. 755	ICA 18C/ 0626
LWd	1992	TU1 L6-149	14.5g wood char	218 ch-st, 10 SwCrC-St; 3 WI Inc; 9 Keith, 3 Carr	1210±80	A.D. 740	A.D. 657-1015	A.D. 789	51841
FW	1992	TU1 L4 -83-90	9.6 g wood char	44% ch-st, 55% pl	1010±60	A.D. 940	A.D. 895-1160	A.D. 1020	50729
modern	2018	TU2 L4	1.9 g cane frags	47 ch-st, 1 Carr; modern rodent burrow (expected LWd)	1.244 ± .004	modern		modern	ICA18O/ 0203

* dates given at = 2σ (95% probability); ** all dates and calibrations done by Beta Analytic unless indicated; those done before 1992 could be up to 200 years in error because no correction was done then for Carbon-13 ($\delta^{13}C$) ratios that differ based on what living plant or animal produced the carbon.

Figure 36. Interesting materials from from Otis Hare site, 8Li172: left, *Swift Creek Complicated-Stamped sherd pattern resembles a bird head with eye, or might be an eroded version of Design #101 through 111 (lens-shaped eye) in Snow's (2007) database;* right, *coprolites identified by the zooarchaeologist.*

Earlier research on zooarchaeological samples from the Otis Hare site identified remains of 33 species of animals, including deer, small mammals, turtles, frogs, fish and shellfish. Fish such as bowfin, catfish, gar, suckers, pike, redear sunfish, and largemouth bass represented over 62% of the usable meat mass. Shellfish comprised over 22%, with Unionid mussels and several species of snails included. Mammals and reptiles each constituted a little over 7% and birds only .1%. However duck bone indicated a fall occupation for at least the earliest campers at the site (Shockey 1991). This seasonal interpretation was enhanced by the finding of ethnobotanist Elisabeth Sheldon (report on file in USF archaeology lab) of a charred fragment of dried persimmon rind among the macrofloral remains, also indicating fall habitation. A coprolite sample (Figure 36) examined by Elizabeth Wing and her zooarchaeology staff at the Florida Museum of Natural History was thought to be either dog or human, and contained crunched-up fish-head and vertebral bones.

The new coprolite analyses done as part of this grant project were complex (Appendices C, D). One sample sent to PaleoResearch Institute in Colorado was from TU1 L13, which had abundant Swift Creek Complicated-Stamped sherds. Chemical dissolution processing indicated this sample was probably from a canine. It contained charcoal that was AMS dated to A.D. 655, near the end of Middle Woodland. But it may have been deposited on top of sherds left there far earlier. The coprolite's pollen contents included pine and knotweed, the latter a wetland plant that might have been introduced in drinking water, and the low amount of pollen grains suggested winter deposition. No starches were present in the sample, but phytoliths of grasses and sedges were, again, possibly eaten and/or ingested in drinking water. Macrofloral contents identifiable were conifer charcoal fragments, possibly also ingested in river water, and providing material for the radiocarbon date. The Fourier Transform Infrared Spectroscopy results suggested proteins and carbohydrates, thus the individual producing this dried feces ate lean meat.

The DNA analyses on three coprolite samples produced results as follows: Sample –233 was from TU1 L11, in which there were 64 Swift Creek Complicated-Stamped sherds, or over 80% of the diagnostic pottery, as well as 3 check-stamped, 2 Carrabelle, 7 Keith, and 1 Tucker Ridge Pinched. This sample probably dates to around A.D. 600-700, and was identified as dog (domestic, gray wolf, or red fox). The canine probably left the deposit at some indefinite time after the midden materials upon which it sat were laid down. Sample 203 was from TU2 L11, in which over 50% of the diagnostic sherds were check-stamped, over 30% complicated-stamped, and the others a few Keith, Carrabelle, and Tucker. This coprolite, probably also dating to the late seventh century, was identified as indeterminate but not dog. Sample 270, from TU1 L13, from the same sample studied by PaleoResearch, (see above), and thus also dating to A.D. 655, was too degraded to extract species data.

The hope is for more analysis and comparison with growing genomic databases on pre-contact dogs in North America. The latest DNA research (Goodman and Karlsson 2018) shows that, while domesticated dogs came to the New World with people at least 10,000 years ago, the native varieties died out after European exploration and colonization in the sixteenth century, possibly for the same reasons (introduced diseases and trauma) that so many Native Americans also perished. Meanwhile, the deposition of dog feces in the shell midden deposits at Otis Hare site might have taken place as these canines roamed earlier areas of the site covered with already stinky deposits of shellfish and other food garbage, while people set up a clean new camping grounds downriver. As analyses continue on the Otis Hare site we will send in more site information. Meanwhile, this update is done to describe the special studies and preliminary research.

8Li195, Nameless Creek Site

Discovered during boat survey in 1985, the Nameless Creek site, produced lithic debitage and an Early Archaic Bolen Beveled point from a deeply buried component exposed during low water at the riverbank edge (Henefield and White 1986:86-87). It is at river mile 80.7, about 4.5 miles downstream from Alum Bluff. During the 2017 fieldwork for this project, the high bluff above the river here was inspected, with avocational archaeologist Jeff Whitfield helping. The blufftop area of the site is bordered at the south end by the (nameless) creek, with its steep valley walls. In the field of pine planted the previous winter, a chert flake and a plain sherd were found on the surface. Nearby was a dammed spring used as a baptismal hole. At the southwest center of the field, at the bluff edge overlooking the river, under a large oak, was an unusual feature (left in place), a cluster of 8 chunks of flat sandstone (Figure 37), possibly one or two with hone marks. They did not show use wear or burning, and could have been modern (a kid playing?). Whitfield said old maps call this area Prison Bluff or, today, Bristol Bluff, and near here was a historic site named Fort Preston, and/or a plantation owned by Carnahan. Some old maps name the place Riddle's or Ridleyville. Though no historic artifacts were found, a little farther west under a cluster of big old oaks right on the bluff edge was a raised oval of very black soil (UTM coordinates 693930, 3369563), at least 40 cm thick, as shown in a shallow shovel test. The oval stretched about 30 m along the bank and about about 20 m wide, and was surrounded by a shallow trench. It slightly resembled the raised areas surrounded by trenches at Fort Gadsden/ Prospect Bluff which are interpreted as Seminole War-period camp kitchens, though those are only about 4 meters in diameter. This raised oval seemed artificially constructed and could be some kind of historic feature. A slanted, wide cut into the top of it could have been something like a canoe slide, though it is at least 24 m (80 feet) above the water. This site update is done to add a blufftop historic component (nineteenth or early twentieth-century) to the record

Figure 37. Nameless Creek site, 8Li195, blufftop feature of 8 flat sandstones, with fieldworker Kelsey Kreiser's arm and red trowel pointing north.

PRELIMINARY SYNTHESIS OF
APALACHICOLA VALLEY PREHISTORIC AND EARLY HISTORIC ARCHAEOLOGY

This section briefly relates the current culture history of the region, from the time of the first human inhabitants through the early nineteenth century, as illuminated by the archaeological record. Conventional time periods are listed below; though arbitrary, they at least provide for organization of information chronologically. The discussion highlights how the information generated by this grant research has advanced the interpretation of the human past here in many ways. It is hoped that this work can be expanded into a more comprehensive volume in the future. We have already completed a website resulting from all these efforts, on *Apalachicola River Valley Archaeology* (Prendergast and White 2017).

Time periods/cultural categories in the Apalachicola-lower Chattahoochee region

PERIOD	DATES	DIAGNOSTICS	SOCIETIES
Paleo-Indian	14,000? -8000? B.C.	Clovis, Suwanee points, Waller knife	hunter-gatherer small groups, cold Pleistocene environments
Early Archaic	8000?-6000? B.C.	Bolen Beveled and Plain points, Kirk, other corner-notched and side-notched points, bola stone	hunter-gatherer small groups in warming environments; fishers?
Middle Archaic	6000?-3500? B.C.	various stemmed points, bannerstone	hunter-gatherer small groups; fishers?
Late Archaic	3500?-650? B.C.	preceramic portion? fiber-tempered ceramics, chert microtools, Poverty-Point-related artifacts	seasonal fishing-gathering-hunting, small groups
Early Woodland	650? B.C.-A.D. 300?	Deptford, early Swift Creek ceramics, early burial mounds	seasonal foraging? larger? groups? social ranking?
Middle Woodland	A.D. 300?-650	Swift Creek, early Weeden Island ceramics, Baker's Creek points, exotics, burial mounds	seasonal foraging? gardening? larger? groups; social ranking
Late Woodland	A.D. 650-950	late Weeden Island ceramics, few or no burial mounds, exotics or fancy artifacts	seasonal? foragers with gardens; maize introduced
Mississippian: Fort Walton	A.D. 950-1500	Fort Walton ceramics, negligible shell tempering, platform mounds	small farmsteads, large villages, temple mound centers; agricultural inland, seasonal? foragers on coast
Protohistoric: Contact-Mission, Spanish colonial	A.D. 1500-1700	Fort Walton ceramics with European metal, glass beads	disruption, depopulation from Old World invasion
Protohistoric Lamar, Spanish colonial	A.D. 1700-1730s?	Lamar ceramics	missionized Indians? migrating Indians, brief occupations?
Historic Lower Creek/Seminole; colonial Spanish, British 1763-83	A.D. 1730s?-1830s	Chattahoochee Brushed ceramics, Euro-American artifacts; some written records	in-migrating Indians from the north; dispersed agricultural villages
Historic American	A.D. 1822 - present	Euro-American artifacts, written or oral records	Euro-American settlement, Indian removal, industry, plantations, trade, towns

Over 2000 prehistoric archaeological sites are known in the research region, as shown on Figure 38 which, the astute observer will notice, encompasses small portions of Alabama and Georgia as well as the lower Chattahoochee and Apalachicola valley in Florida. The region as so defined, by drainage basins, has good geographical continuity and also well-documented archaeological coherence (notwithstanding modern state boundaries). The Georgia side of the lower Chattahoochee does not have prehistoric cultural differences from the Florida side, and the continuities within the wider drainage basin in material culture for all time periods make this an all-encompassing comprehensive study unit. Beyond these boundaries, northward up the Chattahoochee, west toward Choctawhatchee Bay, or eastward toward the Telogia, Carrabelle, New, and Ochlockonee River basins, the archaeological record becomes very different, as I have seen after years of survey. Our USF site database and the Florida Master Site File now have over 2000 sites within this region, and probably thousands more remain to be discovered.

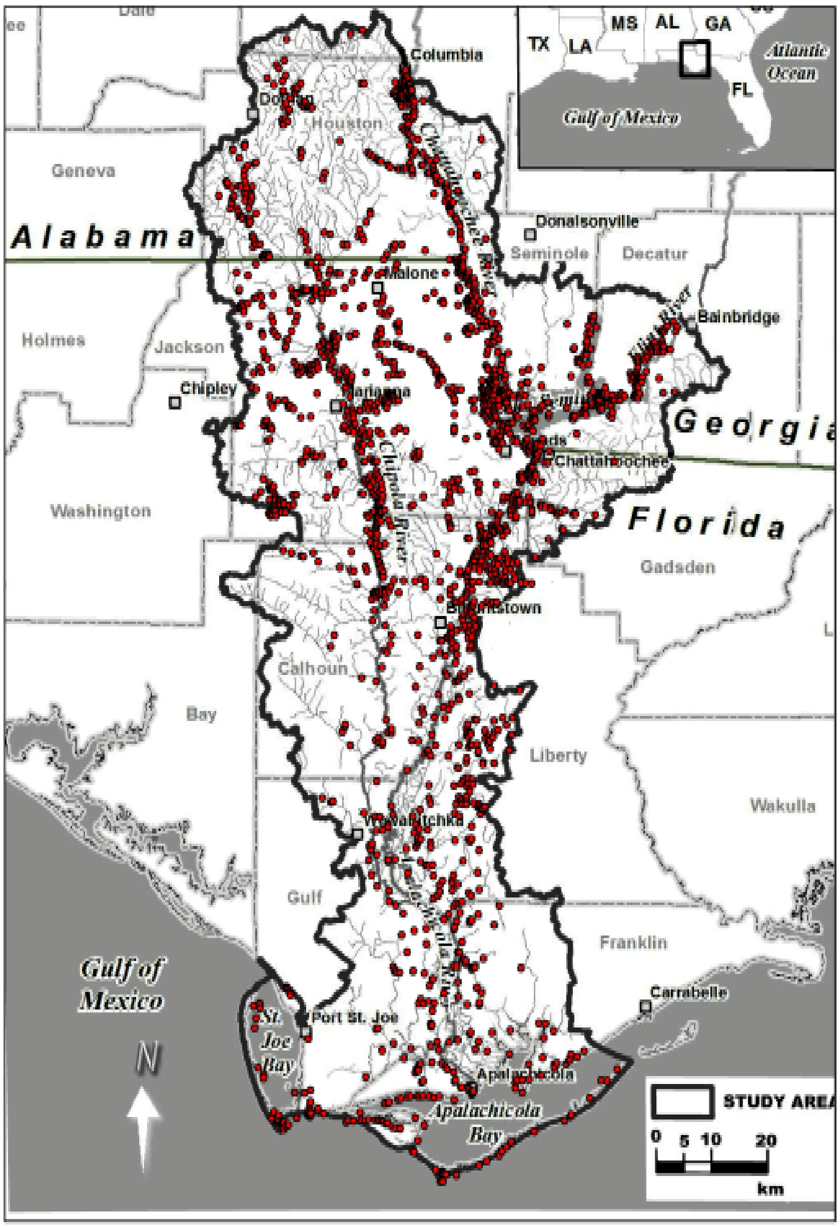


Figure 38. Known prehistoric and protohistoric archaeological sites (red dots) in the research region.

Obvious survey biases are seen on the map. The lowest site density is in the lower valley segment away from the coast. This is where the fewest people live today, the water table is the highest, and the landscape is mostly river swamp and other wetlands. Also here the river has dumped the most sediment, burying sites deeper than anywhere else. I have surveyed much of this lower valley area over the years (e.g., White 1987, 1999), coring into the shovel tests, targeting patches of even 10-cm-higher ground, with limited success. The patterns of known site distribution in this valley reflect the logistics of such traditional survey, and also and the geological processes that expose or conceal sites, but not necessarily the results of prehistoric decision making. Just the difference in coverage from the open, plowed fields of the upper valley to the watery lower-valley estuarine forests makes comparisons highly suspect. Especially important is the ever-changing configuration of the land, whether long-term, from sea-level rise and fluvial migration, or short-term, from rearrangement of coasts and barrier formations by storms.

Despite survey shortcomings and knowledge gaps, the remarkable bounty of the archaeological record in the region allows for some reconstruction of how humans occupied and utilized the landscape from the time they first arrived and through all prehistoric periods, protohistoric times, and even the early historic era. The following summaries relate a little of what we know and what has changed in modeling the past with the new data from this survey project and the related research.

PALEO-INDIAN (14,000?-8000? B.C.)

Researchers in northwest Florida on the Aucilla River and other valleys east of the Apalachicola basin are contributing fascinating data to the expanding picture of the first Americans (e.g., Dunbar 2012, Halligan et al. 2017), who arrived over 14,000 years ago. However, in the Apalachicola research region, information is more limited. No site has had any controlled excavation. But collectors have been generous with their materials and knowledge, and therefore some 21 new Paleo-Indian sites are recorded by the research encompassed within this project, and at least four others updated, as well as some isolated finds documented (Kreiser 2018, Tyler 2008). Most of these are underwater, in the Chipola River. Figure 39 is a rough map presented simply to show the distribution of known Paleo-Indian sites in the region, recognized by the presence of one or more diagnostic lanceolate points.

An interesting settlement pattern emerges: Paleo-Indian sites are concentrated in the Chipola River valley, the Apalachicola's largest tributary, on the west side. Though there are far fewer along the main valley, lately more have been discovered, especially (and unexpectedly) on the bay shores. There is probably a much wider distribution of sites, but they are just harder to find, since they are deeply buried. The main river was farther to the west, and may have flowed in what is today the Chipola's channel during the late Pleistocene, then shifted eastward during the more recent geologic past (Donoghue 1993:188; Vernon 1942). Bands of (so far undated) old meanders and oxbows occur all along the west side of the Apalachicola and lower Chattahoochee, documenting this eastward movement. The heavy sedimentation rate results in burial of early sites so deep and over so much time that they are not found with current methods, only exposed by accident.

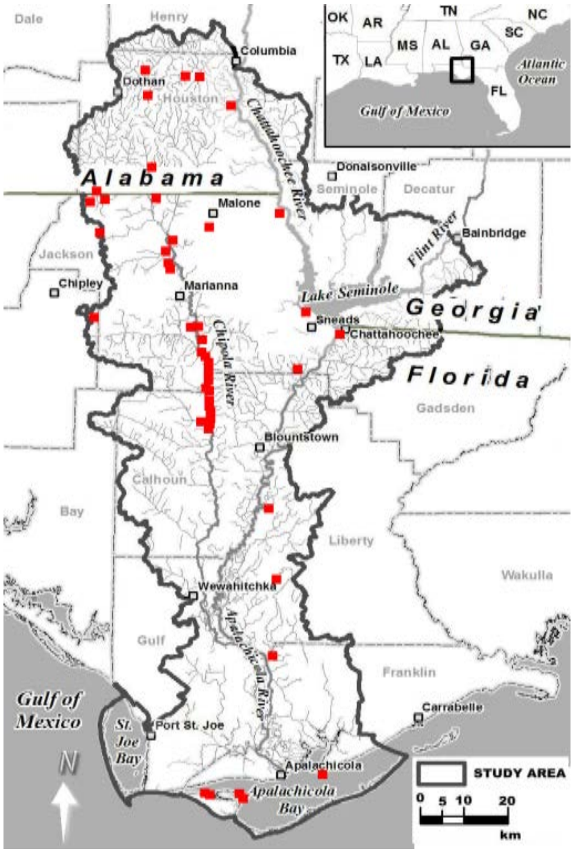


Figure 39. Distribution of Paleo-Indian sites/components (red squares) in the research region

The upper and middle Chipola, both valley area and stream bottom, have the highest known concentration of Paleo-Indian sites in the region. One explanation for this high frequency of sites is that more people visit the area to dive and hunt relics, especially around the boat landings and bridges. Additionally, perhaps the many caves along the upper and middle Chipola, including one up to 2 km long underwater in Blue Springs, were shelters during the Pleistocene when waters were far lower. When the first people arrived, the Chipola River may have been only a line of sinks/springs that held water year-round, and later became connected into a river during the Holocene. Or it was a real stream channel holding the main river, which was later diminished when stream capture upriver triggered by sea-level rise moved the river mouth and thus the whole big river eastward after the Paleo-Indian period ended. The Chipola area may have had the greatest human population density in the region during the late Pleistocene if it was the lowest portion of the developing Chattahoochee-Apalachicola system, part of a major water transportation network that reached far into the interior. Pleistocene fossils are abundant in the Chipola, suggesting that there were plenty of Ice Age megafauna to hunt, though the newest studies show that smaller animals and plants were equally important for the first people in Florida. Within the Chipola basin, diagnostic Paleo-Indian points come from fields and eroding stream banks, but mostly from the river bottom, in the upper and middle portions of the drainage system, including tributary creeks.

From Marshall Creek and Cowart's Creek, that converge just below the Alabama border to make the Chipola, downriver over a total distance of nearly 50 miles by water, Paleo-Indian sites are distributed in clusters no more than 5 or 6 miles apart. Within the upper-middle basin area of clustered sites, one 17.5-mile stretch of river in south Jackson and north Calhoun Counties contains the greatest cluster of Paleo-Indian occurrences: over 20 recorded. This is about one site per mile – not as dense as the 37 sites within 10 km (6 mi) of the Aucilla River, but professional underwater archaeology there has gone on for many years, as compared with none in the Chipola. Also notable is that many of these sites on both the Chipola and the Apalachicola rivers occur close to the mouths of tributary creeks (e.g., Dunbar 1994:309), showing the importance of transportation/information networks and nodes, as well as water sources. Below these clusters, no Paleo sites are recorded on the Chipola. This point is at about Chipola mile 47 (or 75 miles inland), the location of the "Look-and-Tremble" rapids area, which may mean some geological shift downstream from here. Either settlement decreases going downriver for cultural reasons, or, more likely, lower valley sedimentation has hidden more sites, and our ability to find them is diminished. The latter explanation is probably more accurate, since the lower Chipola slows down, backs up, and deposits more alluvium to cover ancient evidence. The lowest portion widens into Dead Lakes from natural (and once artificial) damming. Here the Chipola River is actually standing flooded forest, without any exposed banks or fields.

Recently, a few instances of Paleo-Indian finds have become known in the middle and lower Apalachicola valley (see Figure 13), and on the Apalachicola Bay shores. One collector reported a Clovis Point from Cat Point (in Eastpoint) and a Dalton point came from the surface of the Paradise Point site, 8Fr71, (too many points here!) on the bayshore of St. Vincent Island, on the west side of Apalachicola Bay (Braley 1982). This barrier island is only 4000-5000 years old, meaning that during Paleo-Indian times these places would have been on the mainland, many miles from the Gulf of Mexico shoreline during the Pleistocene. These two points were over the years generally considered chance finds, perhaps brought there by later prehistoric people. But then 20 more Paleo points from St. Vincent Island were documented during our survey (White and Kimble 2017), from three separate sites on the island. Geological investigations in Apalachicola Bay and St. Vincent Sound have shown that the mouth of the Apalachicola was farther to the west during the Pleistocene, so the hypothesis is that the original occupation of these barrier-is

Figure 40. Paleo-Indian projectile points from 8Fr362, St. Vincent 3 site, on the barrier island (see White and Kimble 2017)

island Paleo-Indian sites was on riverbanks along this old channel, that was then drowned with Holocene sea-level rise. As the barrier islands later formed by wind and currents, the slightly higher former riverbank may have constituted a substrate for their deposition.

In southeastern U.S. archaeology, Paleo-Indian has been divided into sub-periods. **Early Paleo-Indian** is used for **pre-Clovis**, with an uncertain beginning point but before 14,000 -13,500 cal. B.P. It is unclear what artifacts are diagnostic. At this time, the Pleistocene environments of Florida were far colder and dryer, resembling boreal forests of modern Canada. **Middle Paleo-Indian** means the short **Clovis horizon**, from 13,125 to 12,925 cal. B. P. (Waters and Stafford 2007), for which the diagnostics are the classic Clovis points, but which may also include unfluted Clovis, Cumberland, Suwannee, and Simpson points. These latter types are common in Florida, and their ages are uncertain (they might even be pre-Clovis). The late Pleistocene environment was unlike anywhere today, with rapid flooding, and climates more variable than at present. The only constants in the landscape, the features that structured settlement patterns, might have been chert and dependable water sources, and successful human adaptations were probably very flexible (Halligan 2013:59, 67). **Late Paleo Indian**, from about 12, 500–11,200 cal B.P. (10,500 to 9200 B.C.), is indicated by **Dalton** points and other potential diagnostic lithic tools. This was a time of rapid sea level rise during which any coastal adaptations would have needed continual reorganization. Dalton was a transitional period, leading presumably seamlessly into the Early Archaic (if successfully adapting to large-scale climate change can be considered seamless).

A great deal of work remains to sort out all the represented types of points and temporal divisions of Paleo-Indian within the Apalachicola research area. We have classified sites and points according to the standard typologies, with all their problems, so as at least to allow comparability. But the pace of work on Paleo-Indian in Florida and elsewhere almost guarantees that revisions will arise soon. Meanwhile, the site distribution in the Apalachicola Valley research region does show good confirmation to models stressing settlement where fresh water sources and lithic raw materials were abundant, and this is quite true especially for the Chipola valley. The presence of springs seems to be the best indicator of Paleo-Indian settlement, though many springs may have been drowned in the many centuries of Apalachicola delta aggradation. All these new data for the region do show that the supposed absence of settlements from the larger Apalachicola valley and the coast is in error. Earlier work on Paleo-Indian site distributions across the eastern U.S. (e.g., Anderson 1996) hypothesized that most of the Gulf and Atlantic coastal plains were unoccupied, because few finds were recorded in those areas, and the pattern was so widespread that it must have been representative of prehistoric behavior. But it is hard to think of coasts as marginal, undesirable habitats. Instead, any coastal Paleo sites are now drowned. Modern coastlines reflect past river valley adaptations, which are now far more hidden in an alluviated delta like the Apalachicola.

Beyond subsistence and settlement patterns, human social systems are much harder to infer from the archaeological record. At best, and mostly based on ethnographic analogies, we can assume Paleo-Indian groups were organized in small egalitarian bands of related people who moved around the landscape probably seasonally, in the colder Florida climate.

EARLY ARCHAIC (8000?-6000? B.C.)

As with Paleo-Indian sites, there has been less visibility in the lower Apalachicola valley and on the coast for Early Archaic. In the rest of the Apalachicola region, diagnostic Bolen/Kirk/Big Sandy points are ubiquitous and their numbers are increased with the data from this recent research. Characterization of a site from this time period so far depends solely upon the presence of these corner-notched, side-notched, often beveled projectile points. Though there is little evidence from controlled excavation, and few known intact sites, the points themselves are everywhere, as well as a few bola stones (Figures 41, 42). This ubiquity of Early Archaic points suggests that people filled out the landscape after the end of the Pleistocene, hunting deer and other modern fauna after Ice-Age large game became extinct, and also possibly increasing utilization of plants, fish, and shellfish. However, as with Paleo-Indian times, Archaic sites are often still obscured or deeply buried by subsequent geomorphological processes, or else components have been mixed into cultural deposits left by later prehistoric peoples.

Unlike with Paleo-Indian diagnostic points, which are rare in the region, every collector has Bolen Beveled points. Quite possibly there was significant population increase across the region and adaptations to more varieties of ecosystems by different human groups as the northerly glaciers melted and the climate became warmer and wetter. This project's comprehensive research (including Kreiser 2018, Tyler 2008, White and Kimble 2017) adds 59 Early Archaic sites to the already robust record on the region, all based on careful recording of finds by collectors and students. Many of these sites are underwater in the Chipola River.

Besides diagnostic points, few other artifacts unquestionably attributable to the Early Archaic are known in the region. The bola stone is an important Early Archaic artifact. It is pear-shaped, with the smaller end often having a concave surface, making it also sometimes called "dimple-stone." The first in-situ occurrence of a bola stone in datable context, with a diagnostic artifact assemblage, comes from the Page-Ladson site's Bolen-age deposits (Carter and Dunbar 2006; Dunbar 2016:179) on the Aucilla River, east of the Apalachicola. Neither the function of the bola nor the reasons for its general shape and concave end are known. It could be a net sinker or other weight or plummet, a gaming stone, a charm, or a "sling-stone" thought to have been swung around at the end of leather thongs and hurled at the legs of game to bring them down. This artifact demonstrates technological proficiency in grinding the hard rock into a smooth, rounded, standardized shape. Just a few bola stones are known from the Apalachicola-lower Chattahoochee region, all of ground quartzite. One was documented by this year's research (Figure 41) in the collection of a diver who recorded its location: the upper Chipola where a smaller tributary creek feeds in (HJ-AU Rocky Creek site, 8Ja2040). This bola is smoothly ground clear or white quartzite weathered to a tan color. Its location also produced isolated finds of Clovis and Chipola points, as well as Archaic points (Kreiser 2018:151).

Figure 41. Bola stone of ground quartzite, probably Early Archaic in age, found by a collector in the Chipola River at the HJ-AU Rocky Creek site, 8Ja2040)

Most of the data on the Early Archaic in the Apalachicola-lower Chattahoochee valley region are surface-collected points, with only a small amount of excavated evidence. Sites are distributed throughout the valley, all the way down to the barrier formations on the bay. As with Paleo-Indian sites, they are directly tied to water sources. Most Early Archaic points have come from surface contexts of heavily disturbed areas, especially plowed fields and borrow pits, where heavy equipment can dig deeper. Often, Early Archaic materials are found at the same places where Paleo-Indian points are recovered, including the underwater locales and deep terrestrial disturbance. This pattern is also seen in neighboring regions, such as on the Aucilla River and in the Tallahassee area (Halligan 2012: 29).

The greater abundance of Early Archaic sites in the lower Chattahoochee and upper to middle Chipola basins, by comparison with the rest of the region, must be due to the same kinds of sampling error that are in effect for evaluating Paleo-Indian site distribution: more exposed ground in plowed fields is available there, and more artifacts are collected from the Chipola River bottom by divers. Given the noted cautions about imperfect data, it is still clear that Early Archaic occupation was either really less concentrated into smaller areas of the region and more spread out than Paleo-Indian, or else more visible because there has been (slightly) less time for site burial by fluvial and other geomorphological processes and greater likelihood of exposure. Both hypotheses are probably correct. The transition into Early Archaic culture in the region was happening at a time of declining pine forests and increasing numbers and types of hardwoods, especially hickory, and spruce, followed by increases in beech, oak, and prairie species indicating open areas; then by around 7700 B.P. more pine and wetlands were evident, developing into modern forests in the wetter climate (Watts et al. 1992). By any measure, water sources and waterways were increasing, but still not as abundant as today. As northerly meltwaters of the Holocene moved down rivers, raising sea levels, the river channels in the region probably shifted often, leaving alluvium that covered things in their wake. Since many sites with Paleo-Indian diagnostics also have Early Archaic points, these may be places that did not change too much and remained attractive to human groups.

The riverbank below the Bristol Mound, 8Li4, (formerly Li195; see previous discussion), produced a Bolen Beveled point washing out at the water's edge from 2 to 5 m deep at a time of low water. Undoubtedly, deeply buried intact Early Archaic deposits exist throughout the region, but they are probably not easily reachable in this kind of big alluvial valley. On the Little Tennessee River, archaeologists used backhoes to get deep enough to recover undisturbed Early Archaic materials in old alluvial terraces (Chapman 1985). While Bullen (1958) and others excavated in advance of dam construction on the lower Chattahoochee and upper Apalachicola, they did it decades earlier, when techniques were slower and less refined. Therefore they could not excavate really large areas, and had less chance of finding Early Archaic diagnostics.

In the lower Apalachicola valley area, Early Archaic points have been similarly mixed in with later materials and usually lack original context. Several have been recovered from St. Vincent Island. A Bolen Beveled point from the tip of Cape San Blas peninsula (Figure 42) was recovered, documented, and donated to the St. Joseph Bay State Buffer Preserve for display by an interested visitor while we were conducting this project; its dark chert looks foreign to the region, and it is so unweathered as to suggest it just eroded out of the ever-decreasing dunes on the west side of the Cape (one of the most rapidly eroding locations along the Gulf).

Figure 42. Bolen Beveled point from Cape San Blas, from private collection (IFMT), donated to St. Joseph Bay State Buffer Preserve Center.

This is a small but real body of evidence from what are today estuarine and coastal formations but would have been still pretty far inland when Early Archaic people were living there. The river mouth would have been much farther out in the Gulf than it is today, and farther to the west. Core data show the river was surrounded by forested areas (Osterman and Twichell 2009) that probably hosted many tributary creeks and springs. Just like with Paleo-Indian settlement, Early Archaic sites were probably at these water sources on the mainland, then got both inundated by sea level rise and/or buried in alluvium with river shifts and delta advance that began in full force after about 8000 B.P. Only a very few have been recently exposed by the increasing erosional processes characteristic of our modern era. Offshore about 8 km in neighboring Apalachee Bay, 100 km to the northeast of Apalachicola Bay, underwater archaeologists have found Early Archaic cultural deposits with Bolen Beveled points along the paleochannel of the Aucilla River (Faught 2004).

MIDDLE ARCHAIC (6000?-3500? B.C.)

The Middle Archaic is also a poorly known time period. Diagnostic artifacts include Kirk Serrated, Morrow Mountain, Eva, and Sykes points and bannerstones. Private collections have helped tremendously in understanding site distributions. The combined research encompassed by this project has added 45 Middle Archaic sites to the region's record (all based on projectile point occurrences). Stretching from about 8000 to 5000 B.P. (6000 to 3000 B.C.), the Middle Archaic is sometimes thought to correspond with the Hypsithermal or Holocene Climate Optimum geological era, a time of warmer, dryer weather than at present, which might have triggered changes in human adaptations that were represented by material culture change. However, there is disagreement on the dating of Mid-Holocene climatic change and its characteristics, and also whether it was a uniform phenomenon or varied considerably in different parts of the world (e.g., Yesner 1996). It was certainly a more subtle oscillation than the warming trend after the end of the Pleistocene, and apparently not comparable to contemporary global warming (Steig 1999). In the southeastern U.S., since the earliest shell midden sites are Middle Archaic, it is assumed that warm temperatures and rising sea levels backed up rivers into estuaries that people could exploit for aquatic resources, especially shellfish.

No intact Middle Archaic sites have been subjected to controlled excavation in the research region. Though the points are relatively common in collections, the sites themselves are not very visible, probably for the same reasons that prevent discovery of undisturbed sites of earlier periods: they too are buried deeply in the alluvial delta. Those that are shallower, on less changed landscapes, were probably such attractive locations that they were reinhabited often and thus disturbed by admixture with remains left by later prehistoric peoples. Also, projectile point types diagnostic of Middle Archaic are more ambiguous and variable, and so are conservatively interpreted here, but they are the only indicators we have at present for sites of this age. The distribution of Middle Archaic sites includes hardly any on the Apalachicola, a few on the barrier islands, and a lot on the Chipola, usually near springs. Again, the obvious reasons for this distribution are the same as for sites of earlier time periods. The existence of many Middle Archaic points recently washed out of the shoreline at sites on St. Vincent Island, just like those of earlier time periods, is probably the result of delta formation over old riverbank features.

If the Middle Archaic significantly coincides with the continued warming of the Middle Holocene, when hardwood and pine forests were expanding, perhaps new resource procurement strategies called for new tools. The bannerstone is a ground-stone, symmetrical form that may be an atlatl (spear- thrower) weight. Some suggest it is also a hunter's status marker or other item with social as well as utilitarian functions. Though it is assumed that atlatls were used up through and probably beyond the time of the appearance of the bow and arrow during the Woodland period, bannerstones first appear in the Middle Archaic, possibly last through Late Archaic, then disappear (Kwas 1982). Bannerstones from the Chipola River were documented by this research (Kreiser 2018), including one of bone or antler. Bullen (1958) got a possible steatite bannerstone fragment from the Tan Vat site (8Ja20/J-18). Bannerstones from the Apalachicola-lower Chattahoochee region are generally oval or "winged" in shape, with drilled holes between about 1.5 and 2 cm in diameter, made on dark, possibly foreign stone.

LATE ARCHAIC (3500?-650? B.C.)

This time period is recognized by the appearance of new forms of chipped-stone artifacts, including distinctive chert microtools and various stemmed and notched points (see Figure 15), as well as the earliest pottery, thick, fiber-tempered, hand-built vessels. All these leave more materials for the archaeologist, though it is unclear if, how, or how much such innovations changed native life. Preceramic Late Archaic is hard to recognize by points alone, and it is unknown how many point types continued to be made later in the period after ceramics appeared. However, based on data in standard projectile point guides (Bullen 1975; Cambron and Hulse 1964) attributing various types to this time period, we have added 27 new Late Archaic sites to the region's database with the combined work (see Appendix A), based on diagnostic points alone (Kreiser 2018). In addition, the St. Vincent Island survey (White and Kimble 2017) documented large amounts of chert microtools and fiber-tempered potsherds, including new components at known sites. We also revisited the Late Archaic Duncan McMillan site, 8Ca193 (see discussion in previous section).

The Late Archaic saw great shell midden accumulation at sites in what are today estuarine and coastal environments and even on riverbanks. Contrary to earlier interpretations (e.g., Milanich 1994:86), Late Archaic sites occur not just on the coast but frequently along interior waterways throughout the entire Apalachicola region. At present, no deliberate construction of mounds or earthworks, as seen elsewhere in the South, is known for Late Archaic in the region. But, at lower valley shell middens, baked-clay objects and other artifacts show connections with the contemporaneous Poverty Point complex stretching from northeast Louisiana across the northern Gulf lowlands. The St. Vincent Island survey even documented one site (8Fr364) with a Poverty Point-type red jasper bead (Figure 43). From five sites on St. Vincent Island alone, spread along much of the north shore shell midden ridges, we have 551 fiber-tempered sherds weighing 5.28 kg (White and Kimble 2016).

Figure 43. Poverty Point-type red jasper bead from St. Vincent 5 site, 8Fr364 (from private collection, found on surface).

Many Late Archaic sites, as with those of earlier times, must be still buried or otherwise obscured by alluvial deposits heaped on as the river has moved eastward, scoured its west side, and built out its delta southward over the last five millennia. Many may also be underwater, as rising sea level has inundated low-lying coastal and estuarine areas as well as interior stream valleys. Nonetheless, more Late Archaic sites are known than those of earlier times. Orientation along waterways was no doubt both for subsistence and for the flow of people and information. Coastal and estuarine sites are shell middens, while inland sites are in sandy soils that have been exposed by borrow pits or other deep ground disturbance, including deep archaeological excavation at sites with later components. Inland sites, usually in ancient prime locations such as old meander loops, and estuarine sites, barely above the water table today, reflect fluvial history and what were attractive stream-bank settings during Late Archaic times. As sea level rose in the early Holocene, the ancient Apalachicola channel which today extends south and west under the bay, filled with deposits and provided dry, forested land to inhabit, and oysters appeared as early as 5100 B.P. (Twichell et al. 2010).

The barrier islands have Late Archaic sites with fiber-tempered pottery either washing out of the bayshore or exposed (usually by violent storms) in the deep peat layers under the dune sands. But these islands are only about 4000-5000 years old themselves, formed as sea level rose and inundated former mainland (possible riverbank), then winds and waves thrust up sands to make dry land there again. Thus it seems that as soon as there was some dry surface on which to stand, indigenous peoples were there, taking advantage of the access to bay and coastal marshes. In all, the majority of these site locations are indicators that modern climatic and physiographic conditions were not yet completely established during the Late Archaic. The lower Apalachicola is so low and wet that the more visible shell middens are the only sites found. Inland, like those of every other time period, Late Archaic sites are spread along waterways, from tiny spring-fed creeks to the big river. No Late Archaic sites are yet known from around St. Joseph Bay, possibly because their age means they are too deeply buried.

Chert microtools from good context in estuarine Late Archaic shell middens (White and Estabrook 1994) are consistent with the types established in the Poverty Point and Jaketown complexes of Louisiana and Mississippi (Ford et al. 1955; Ford and Webb 1956). These tiny tools, sometimes only 1 to 2 cm long, all have use wear, step and hinge fractures, on the edges of the tips or sides, suggesting they were used for scraping or engraving, but not drilling. They must have been hafted into handles for easy use. The steatite or soapstone bowl first appeared in the Late Archaic. Steatite is greenish- or brownish-gray, sometimes glittery, and able to be polished to a high gleam. It is so soft that it can be chipped with a fingernail, and therefore easily cut. This stone is not native to the region but had to be obtained far to the north, in the Appalachian Mountains. Steatite vessels were large open bowls, heat-resistant to allow cooking directly over a fire. As noted in the previous chapter, this project supported obtaining a good Late Archaic date of about 900 B.C. on black organic residue coating the exterior of a typical steatite vessel sherd from Thank-You-Ma'am Creek shell midden, 8Fr755. This sherd has a ticked rim and rough striations on the external surface (see Figure 24), and weighs 78 g; a similar-sized ceramic sherd would weigh about 30 g. Late Archaic steatite demonstrates long-distance economic interaction to obtain raw materials, and also represents a new technology that may pre-date pottery in the region.

Plain and simple-stamped fiber-tempered pottery is the hallmark of the later Late Archaic in the Apalachicola region. Radiocarbon dates on the actual Spanish moss fiber within the sherds show that these ceramics are as early in the region as anywhere else in the South. The pots were hand-molded, thick-walled (from < 1 cm to 2 cm thick), and flatbottomed, very different from the coiled pottery made later. I studied details of fiber-tempered ceramics from 23 sites in the Apalachicola-lower Chattahoochee region (White 2003a) to investigate whether adding sand as well as fiber to the clay prefigured the emergence of sand-tempered Woodland pottery, as had been assumed by many researchers (though contradicted by others, e.g., Saunders and Hays 2004:11-12). Nearly all of the sample of 200 sherds had some sand in the paste, and a few also had grog, along with the natural mica flecks characteristic of clays in this valley. Simple-stamping, similar to that on other fiber-tempered wares such as Wheeler in Tennessee and north Alabama, occurs on sherds from a few coastal/estuarine sites; everything else is plain-surfaced. No data suggested that the plain-surfaced or less sandy-paste sherds were stratigraphically earlier, attractive or logical as it may seem to have both increased sand and simple stamping as transitions into Early Woodland types. In fact, the simple-stamped sherds tended to be from the earlier sites, and could be from stratigraphically below plain-surfaced fiber-tempered sherds.

The Late Archaic is the earliest time period in the region for which we have some zooarchaeological and ethnobotanical data. Estuarine shell middens include remains of deer, opossum, rabbit, raccoon, rodents, alligator, various turtles, a few snakes, birds, and amphibians, and abundant fishes such as croaker, drums, bowfin, jack, various marine catfish, and mullet, as well as the ubiquitous gar fish, and a few examples of seatrout, sawfish, sunfish, crabs, and a multitude of shellfish (White 2003b). Inland, at an upper Apalachicola freshwater shell midden site, Bullen (1958:339-40) recovered, among the diverse species of mussel and snail shells, abundant deer and turtle bones and a few of beaver, lynx (bobcat), muskrat, and opossum. Plant remains, as with earlier time periods, were probably dominated by nuts and acorns, along with wild fruits, berries and other foods. Though people were beginning to domesticate local wild weedy species in the Midwest and Mid-South by the time of the Late Archaic, within the Apalachicola region and the Gulf Coastal Plain in general, only wild foods were utilized until the adoption of maize horticulture in Late Woodland times. The only domesticated species were bottle gourd (for containers) and dogs, probably both brought from the Old World by Paleo-Indians.

Reconstruction of sociopolitical systems is far more difficult for the Late Archaic than determining subsistence and settlement patterns. The lack of indications of accumulated wealth or power, absence of mound building (whatever that may signify), and absence of a lot of non-utilitarian artifacts suggest continuation of small-society egalitarian lifeways dependent upon wild local foods. In addition, the invention/adoption of pottery may have meant no more than adapting new cooking methods and artifact technologies common throughout the south, not necessarily an indicator of any craft specialization. Mounded shell middens are linear ridges of food garbage paralleling stream banks, not deliberately constructed monuments. However, a few objects of Late Archaic material culture in the Apalachicola-lower Chattahoochee region had to be obtained from afar. The dozens of steatite vessel sherds came from the mountains, perhaps 700-1000 km (500-600 miles) up the Chattahoochee. The jasper bead was clearly made in the Poverty Point region, where an enormous amount and diverse types of both local foreign stone materials characterized the lapidary industry (Ford and Webb 1956:125). These items show wide-ranging interaction networks across the South, all connected by waterways. Social ranking may indeed have been developing during the

Late Archaic, possibly connected with that long-distance exchange. Probably there was no real economic stratification, though we might imagine matrilineal clans becoming more territorially-based if people were settling into specific environments and utilizing them more thoroughly. As for culture change, there is one unmistakable effect of continually-rising sea level in the region that might be correlated with the end of the Late Archaic: coastal shell midden sites show shifts in specifically-targeted species, from oysters to marsh clams (which need more fresh water). The influx of fresher water came with the migration of the river eastward. Several Late Archaic shell middens or components of middens are inundated (White 2003b).

EARLY WOODLAND (650 B.C. – A.D. 300)

The changes in lifeways ushering in the Early Woodland brought new aspects of preserved material culture, but apparently no massive subsistence or settlement shifts, no indication yet of cultivated crops, and continued shell midden deposition in riverine, coastal, and estuarine settings. However, along with different kinds of pottery, Early Woodland in the Apalachicola valley saw the beginnings of burial mound construction and ceremonialism that suggests elaborate ritual practice. Sea-level fluctuation curves for the Gulf Coast (Balsillie and Donoghue 2004; Sankar 2015; Walker et al. 1995) indicate a drop by about 2900 B.P. (950 B.C.) that could be associated with the emergence of Early Woodland. However, the Early Woodland archaeological record in the research region does not suggest extensive change but continuity with Late Archaic adaptations, perhaps even as local ecosystems changed. Sites are often in the same places and, where preserved, faunal assemblages indicate harvesting of similar resources. New ceramic styles were important markers of some kinds of innovation, but may simply represent technological development and not major cultural shifts. Despite radical change elsewhere in the Southeast hypothesized for the transition from Archaic to Woodland, in the research region there appears to be little alteration of settlement and subsistence patterns, with continuing alignment along waterways for hunting-gathering-fishing lifeways, though greater social complexity may have been developing.

Ceramics of the Early Woodland are tempered with sand and also some grit and grog (crushed fired clay); fiber tempering disappears. The most commonly encountered sherds are plain and check-stamped (external surfaces stamped by a paddle carved in a criss-cross pattern). Clear diagnostic types are Deptford Simple-Stamped (parallel linear impressions on surface), some Fabric-Marked (woven fabric impressions), and Linear Check-Stamped (checkerboard pattern in which lines of one direction are more pronounced than those of the other). Various bowl and jar shapes include many with distinctive tetrapodal supports on the vessel base. In the latest Early Woodland, the first centuries A.D., Swift Creek Complicated-Stamped pottery first appears.

Early Woodland sites/components in the region are hard to identify if diagnostics are not present. Regular check-stamped ceramics were manufactured from this time onward, through historic Indian centuries, with little distinguishing variation by time period except (sometimes) in rim treatments and in the some-time addition of tetrapodal supports. Projectile points or other artifacts clearly associated with Early Woodland are also difficult to isolate. Even the Hernando point, one of the most diagnostic and distinctive, is seen to have lasted through Middle Woodland (Bullen 1975), and the Baker's Creek point (see Figure 33), is more associated with Middle Woodland but could have appeared earlier. Another problem with discerning Early Woodland settlement has been that coastal sites have traditionally been emphasized, with interior sites considered smaller, shorter occupations by coastal peoples making limited inland forays (e.g., Milanich 1994:114; Willey 1949:353), a model proven to be inaccurate.

An additional issue in distinguishing Early Woodland sites has been that they were obviously valued locations, and so reinhabited and covered or mixed with the debris of later prehistoric people. The proliferation of sites having mostly check-stamped and plain pottery is often attributed to Late Woodland times, with little close inspection of what other temporal clues might be present. Furthermore, Early Woodland is still old enough to be quite deeply buried by fluvial shifts. Bullen's (1958) Chattahoochee River 1 site (8Ja8 or J-5) was on the immediate riverbank, but the stratum with Early Woodland Deptford ceramics was about 1.4 m deep, some 30 cm below the Fort Walton zone, and separated from the even deeper Late Archaic component by nearly a meter of culturally sterile deposits.

In the eastern U.S., by a couple centuries B.C., a large number of conical burial mounds with grave goods having some social meaning were beginning to appear. Little is known of mound building in the Apalachicola region for Early Woodland, but the combined research within this project has expanded the knowledge of specific burial mounds having Early Woodland components. The few possibilities for Early Woodland mound construction were Chattahoochee Landing Mound 1, 8Gd4 (White 2011) and Pierce Mounds A and Singer Mound (part of Pierce complex; White 2013). These examples are enhanced with new data from this current research: Burgess Landing Mound (8Ca3) produced at least one Deptford sherd (see above discussion) and Green Point Mound (8Fr11) has proven to have far earlier materials than its companion Middle Woodland-period Porter's Bar Mound (8Fr1), as thoroughly researched by Knigge (2018). Furthermore, Jackson Midden (8Fr77) was found to have Deptford sherds (see Figure 23), suggesting at least Early Woodland habitation, if not use of the nearby Jackson Mound (8Fr15). The situations at Green Point and Pierce are similar, indicating continued utilization of the same locale for complex burial rituals from Early through Middle Woodland. Perhaps as one mound became sufficiently large, or perhaps the family of its dead themselves died out, another mound was begun nearby. Abundant check-stamped (presumably Deptford) sherds were present at Green Point, but hardly any at Porter's Bar, supporting the picture of one mound preceding the other. The Singer Mound at Pierce, with a similar abundance of check-stamped sherds, was ruled out for a Woodland association by the radiocarbon dating done during this project, and demonstrated to be Fort Walton (see discussion below).

Swift Creek Complicated-Stamped ceramics and other types whose surfaces were impressed by paddles carved with elaborate designs first appear near the end of Early Woodland in the region. They increased in importance during the Middle Woodland period, and even hung on a bit through Late Woodland. But complicated stamping occasionally on tetrapodal vessels, and with other Early Woodland types at sites having no clear Middle Woodland component indicates an earlier temporal placement. These ceramics may have marked the beginnings of the trends toward elaborate craftwork and complicated symbolic imagery that blossomed later and transitioned into Middle Woodland. Other Early Woodland artifacts known in the region include shell tools, usually made of sturdy lightning whelk. A finely made shell scoop and three pendants of interesting shapes were recovered from Green Point mound (Knigge 2018). Tiny shell beads and bone artifacts such as pins and hooks are also known (White 1994). Faunal samples from estuarine shell middens indicate subsistence upon the same species as during Late Archaic: fish and shellfish, deer and small mammals, turtles, a few birds and alligators. Inland sites in the region have few faunal remains preserved, but freshwater shell middens, where they exist, contain both river mussels and snails, as well as nuts and other typical food plants.

MIDDLE WOODLAND (A.D. 300-650)

In the eastern U.S., Middle Woodland marks the height of burial mound ceremonialism, including importing and local production of elaborate ceramics and other artifacts of exotic raw materials obtained over long-distance interaction networks to bury with the dead. The differential distribution of these valued objects signals some more complex social differentiation, though probably not economic stratification, as well as flamboyant ritual behavior and possibly increasingly complicated belief systems. Fancy material culture suggests a time of fascination with the showy and the unusual. Within the Apalachicola-lower Chattahoochee Valley region, at least 200 Middle Woodland sites are known, as well as some 40 burial mound sites, most of which were first recorded by Moore (1902, 1903, 1918), who kept returning for the beautiful pottery. The current research has not discovered any new ones but has obtained a lot more information on several mound and village sites.

The major Middle Woodland diagnostic artifacts are ceramics of both the Swift Creek and early Weeden Island (or Willey's [1949] Weeden Island I) ceramic series (see Figures 11, 14, 17, 30, 36). The latter include Weeden Island Plain, usually recognizable only by its eccentric vessel shapes often with cutout portions or latticework, often in effigy form, and also complicated rim treatments; Weeden Island Incised, with complex patterns incised into the surface and many incisions ending in large deep, round or triangular punctations; Weeden Island Punctated, with similar elements but all done in both small and those distinctive large punctations; and Weeden Island Zoned-Red, in which red paint was applied within incised zones on vessel exterior and sometimes interior surfaces. All these early Weeden Island ceramics display amazing creativity and diversity. A few vessels depict humans and animals (Figure 44), and others are complex, abstract forms. The only clearly diagnostic Middle Woodland ceramics are of these two series' types (White 2014b).

Other types first appearing during Middle Woodland are somewhat less dazzling, such Keith Incised, with criss-cross incisions, and Carrabelle Incised and Carrabelle Punctate, with a neck band of parallel diagonal incisions or punctations, respectively, as well as more generic, less standardized types such as net-marked and cordmarked. Extremely significant for archaeological interpretation is the fact that these types, which are also within the Weeden Island series as originally and confoundingly characterized by Willey, first appear in Middle Woodland but last much longer, through Late Woodland (or Willey's Weeden Island II), while the Middle Woodland diagnostics noted above disappear (except for small amounts of complicated-stamped). Thus ceramic assemblages composed of these less-spectacular types alone are not enough to distinguish specific time period, and have often been confusingly grouped into a generic "Weeden Island" period. Check-stamped pottery is a similar and even more complicated case of this confusion. As noted above, check stamping was introduced with Early Woodland and continued for over 2000 years, with most sherds not distinguishable by time period.

Figure 44. Early Weeden Island human effigy vessel from Pierce Mounds (8Fr14; no additional provenience), displayed at Florida Museum of Natural History, Gainesville, representing a woman with a topknot, folded arms, and possibly kneeling.

Chipped-stone artifacts of the Middle Woodland are often of foreign cherts imported from great distances. Diagnostic points are usually straight-based or straight-stemmed types such as the Baker's Creek (see Figure 33), though other types appear in burial caches. Various pendants and other ground-stone objects of greenstone or other rock such as quartzite, granite, or sandstone are known. Quartz crystal pendants, greenstone celts, gleaming galena (lead ore) cubes, and shiny cut-mica objects can be burial offerings. While the Bristol Mound (8Li4) had a mica piece cut in the shape of an arrowhead, interred with burials, so did the Otis Hare site, a shell-midden campground. Similarly, two quartz crystal pendants from St. Vincent Island were found at oyster shell midden sites, not mounds (White and Kimble 2017). Such exotic items were certainly more than utilitarian objects. Perhaps they were charms, marks of family/clan associations, or for some ritual use.

Smoking pipes appear as early as 500 B.C. elsewhere in the East, but they expand in numbers during the time of burial mound ritual (Blanton 2015:47). In the Apalachicola-lower Chattahoochee region, heavy, square steatite pipes are associated with Middle Woodland sites. Examples are from Jackson and Pierce Mounds on the coast (White 2013), and shell midden sites on St. Vincent Island (White and Kimble 2017). Imported metals used in Middle Woodland times may imply a fascination with light and reflection. The most common metal was copper, often seen in burial mounds as ear disks. On the east side of the Pierce complex, the Cemetery Mound, 8Fr21, produced a limestone disk with a thin copper veneer on the exterior. Pierce Mound A Burial 66 was accompanied by a copper tube, and the person in Burial 81, at the base of the mound under a deposit of oyster shell midden, had on each shoulder a silver-plated copper disc (Moore 1902:224; White 2013). Shell objects often in burial mounds include beads but also large lightning-whelk cups, presumably for drinking the sacred "black drink," yaupon holly tea.

In the Middle Woodland period the elaboration in material culture is remarkable, and greater than at any time before or after. Significantly, however, settlement patterns and subsistence systems seem not to change much, though populations may have been expanding. Camps and villages are more numerous than previously, spread along waterways. There is so far no evidence of food production, though people may have been experimenting with gardening by this time, along with continuing hunting, gathering, and fishing. The transition from Early Woodland is envisioned as an in-place intensification of socioeconomic processes that were already underway, with the addition of new ostentation that perhaps did not really change fundamental lifeways to a great extent. Middle Woodland site distribution covers most of the region, with the only obvious gaps being the lower Apalachicola alluviated areas, where sites are probably still deeply buried by natural processes. Site locations, as usual, are along waterways, from springs and tiny streams to the main river to the bayshores. Burial mounds known in the research region are all individual mounds except for two groups: Aspalaga, 8Gd1, with three mounds, and the Pierce complex, Fr14, 16, 19, 20, 21, with seven of the 13 mounds having unmistakable Middle Woodland components.

Relocating some of Moore's old mounds continues. New remote-sensing techniques such as LiDar are useful to see landscape elevations (see Figure 18, for Eleven Mile Point mound), but older techniques such as asking local people also work well. This research rediscovered an old Moore mound (Bristol Mound, 8Li4; see earlier discussion) and one Moore did not know about (Spivey mound, 8Ca114) and obtained further data on others (Porter's Bar, 8Fr1; Green Point, 8Fr11, and Richardson's Hammock, 8Gu10). Relating mounds to living areas is always a subject of archaeological debate, about whether burial mounds were isolated ceremonial centers or integrated into daily life. Those in the Apalachicola valley seem to be adjacent to habitation areas or no more than 200 m away. Other habitation areas seem unrelated to mounds, though they may contain exotic materials. Figuring prominently in this discussion is the Otis Hare site, 8Li172, the Middle through Late Woodland and early Fort Walton freshwater shell midden on the middle Apalachicola riverbank. As noted in the previous chapter, it was carefully tested, with 5-cm excavation levels to subdivide the 1.5-m thick midden stratum, and with waterscreening of soils. But the materials were unable to be thoroughly processed, and sufficient radiocarbon dates were lacking until this grant project made possible that additional work. Dates and associated ceramic frequencies through time are given in the discussion of this site (previous chapter). The earliest Middle Woodland, when the site is first occupied, some time soon after A.D. 400, is characterized by plain and Swift Creek Complicated-Stamped ceramics, shortly after which the early Weeden Island ceramics appear. Further analyses are underway, aiming at a thorough presentation of this site's transition from Early to Late Woodland times, as a probably seasonal camp, but with some ornate ritual objects.

Whatever the inspirations for Middle Woodland elaborate material culture, it suggests an enormous amount of artistic freedom and possibly celebration of idiosyncratic portrayals of familiar things or unusual compositions, all of which may be part of complex symbolism. Analyses of Middle Woodland sherds using pXRF techniques to identify trace elements in clays is still underway, but so far results indicate that even elaborate pottery was made locally. Prehistoric kin-based households probably resembled the matrilineal families and clan groups known historically and ethnographically for these indigenous peoples. Women potters may have expressed group identity in their craftwork.

At one time archaeologists thought that agricultural production would have been needed to support populations involved in major constructions such as burial mounds and manufacturing exotic artifacts, but now we realize this was not at all the case. More biotic remains, and a wider range of species, are known from Middle Woodland in the region than for earlier times. However, the data suggest similar adaptations to the same array of wild plants and animals. Detail in zooarchaeological assemblages comes from the Otis Hare site (Shockey 1991), where 33 species and 954 individual animals were identified in the small sample that was perhaps .0001 or less of the site's materials. No single species predominated, but fish and shellfish were highest in terms of usable meat masses. Interestingly, the aquatic species were far more prominent in the Middle Woodland proveniences as compared with the Late Woodland levels, in which terrestrial animals were more important. Even the reptiles were mostly aquatic, such as alligator and basking turtles. Included in this category is the Barbour's map turtle, a rare species found only in the Apalachicola basin. The fish were of diverse sizes, including small ones that were probably captured in fine mesh nets. The species include bottom-feeders, open water fish, and gar, which live in poorly oxygenated waters, all suggesting fishing in various locations from the main river to backwater streams. The coprolites from the earliest Middle Woodland levels, as previously discussed, were from dogs (Appendices C and D).

Middle Woodland in the Apalachicola region is marked by two salient characteristics: burial mounds and complex, showy material culture, with a high number of nonlocal items. Some coastal burial mounds (Pierce, Porter's Bar) incorporated shell midden (trash) materials into the graves, while other times more special soils were used. Another rather ordinary aspect of burial mounds is that the grave goods were not always elaborate, but could include everyday items such as plain pots that Moore called "inferior ware." Many burials had indications of burning, whether at the mound base or with individual graves. Deposits of calcined bones that suggested cremation elsewhere before interment are present only at Porter's Bar. Skeletons in graves can be flexed, extended, or bundled, or isolated skulls (trophy heads?), or piles of bones with no skull. The exotic grave goods demonstrate wide interaction systems. The entire Chattahoochee-Apalachicola River system is one of only two major routes through the barrier of the Appalachian mountains ultimately connecting all the way to the Gulf of Mexico (the other being the Tennessee-Ohio-Mississippi system) that would have facilitated interaction with the Hopewellian Midwest. Copper, even from the closest sources in the Appalachian mountains, had to have come from at least 300-500 km north of the region. Greenstone was available in the north Georgia mountains, as were mica and quartz crystal. Sources for galena recovered in Florida have all been identified as central and southern Missouri (Bob Austin, personal communication 2015). In exchange, a valuable local commodity may have been the leaves of yaupon holly (Ilex vomitoria), for making the “black drink.” Another was the valuable lightning whelk shell, a special commodity all over the native Eastern U.S.

The lively trade in exotics may have fostered more complex social structure. So far we have no real evidence of hierarchical leadership or stratified social organization during the Middle Woodland period in the Apalachicola-lower Chattahoochee valley region. Burials accompanied by more or fewer wealth items may indicate social ranking or other roles held by the deceased individuals. We know little of the Middle Woodland people themselves. Some skeletal studies in adjacent areas show arthritis and anemias as mostly minor problems. Cranial alteration, fronto-occipital flattening, is seen on some skulls in burial mounds. Human images give additional information (see Figure 43). Ceramic effigy vessels of men and women feature pierced earlobes, medium-width noses, robust cheeks, grimly-set mouths, and hairstyles in topknots.

LATE WOODLAND (A.D. 650-950)

Some time around A.D. 700 Middle Woodland societies began to change. Burial mound construction either slowed or halted entirely, and elaborate ceramics and exotic artifacts made of foreign materials disappeared from site assemblages. The bow and arrow made it to the deep South by about A.D. 600-700, a new technology possibly associated with greater social complexity and perhaps competition and conflict. Even more important, and possibly a key to understanding the disappearance of everything that Middle Woodland means, people were beginning to produce their own food during Late Woodland times, an activity that surely had huge consequences for society

Late Woodland ceramics are no longer very elaborate; most sites are dominated by plain and check-stamped sherds. The typical Late Woodland pot is the check-stamped globular bowl, similar to the specimen C. B. Moore retrieved from somewhere he labeled “Ocheesee” but never wrote about (see Figure 12). However, a major caution here, as noted above, is that check-stamped sherds are not enough to assign a site or component to Late Woodland or to Woodland at all, since they continued to be made during later prehistoric Fort Walton times, as well as the protohistoric period (Marrinan and White 2007). Other types that continue on from Middle Woodland as minorities are Keith Incised and Carrabelle Incised and Punctate, as noted above, with even smaller amounts of cordmarked, netmarked, and fabric-marked. These surface treatments may be simply utilitarian aspects of everyday domestic vessels, possibly to allow more surface area for heating or cooling, or a rougher surface for grasping. Occasional sherds of Swift Creek Complicated-Stamped are present in some Late Woodland assemblages.

Compared with Middle Woodland, Late Woodland flintknappers used more local stone, though quantitative data on raw materials for this time period have not been collected. Introduction of the bow and arrow may have spurred the trend toward smaller, triangular points, though spears were still used. Point types clearly associated with Late Woodland are few. Most often they are the small triangular Madison and Sand Mountain points in Alabama, or Pinellas, O’Leno points in Florida – the kinds also associated with Fort Walton. Important to note is prevalence of lithic debitage at Late Woodland sites, as would be expected at any earlier site as well. This abundance contrasts with the decided paucity of evidence for chipped-stone tool production during the succeeding Fort Walton period. Late Woodland ground-stone artifacts include the usual quartzite cobbles with use wear and grainy chunks of hematitic sandstone or red ochre that were probably used for pigments, maybe on the skin.

Late Woodland occupation, as with other time periods, is distributed along waterways, and many sites are freshwater shell middens. In the middle Apalachicola, the record at the Otis Hare site (8Li172) shell midden demonstrates the smooth transition from Middle Woodland onward, which is now well dated because of this project. Late Woodland is the first time period for which evidence of domestic structures has been recovered, and they are quite variable. On the upper Apalachicola high Torreya Bluffs, Milanich (1974) uncovered a house floor at the Sycamore site (8Gd13), a shell midden occupation with dates spanning over two centuries. The floor was an oval of dark brown, gritty, hard sand with crushed artifacts, 8.9 m north-south by 6.2 m east-west (or approximately 40 to 50 m^2), and a central hearth. He speculated that it was a bent-and-tied-sapling dwelling with bark or reed mat covering and a smoke hole, typical for a winter house in the native Southeast. Outside this house were work areas, caches of grinding stones, and evidence of food refuse and other trash. At Montgomery Fields site (9Dr10), on the Flint River about 15 miles up from the forks, Carl Miller excavated shell midden piles, 33 features that were storage, refuse, or fire pits, and 272 postmolds. He found evidence of about 8 structures, both round or oval and rectangular, 4 or 5 m along the longest dimension, suggesting possibly small huts. Two smaller round structures were possible menstrual huts, sweat lodges, or storage buildings. My research in 2017 at the Smithsonian was able to document this work from Miller's 1953 field notes.

On the coast, Late Woodland is similarly hard to recognize amid all the check-stamped and plain ceramics without dates. The three dates on the upper part of the lower midden at Paradise Point (8Fr71) on St. Vincent Island ranged between about A.D. 400-700 (averaging 500-674), covering the time leading up to a higher-than present sea-level stand (Braley 1982; Walker et al. 1995; White and Kimble 2016, 2017). The dates are on shells and so might be suspect, but have been corrected as well as possible. They are from a stratum immediately below the culturally-sterile thin bluish-gray clay layer characterized as an intertidal marsh deposit and indicating that higher sea level was from .7 to 1.37 m above that of the present. This high stand, also seen on various sea-level curves, is hypothesized to have occurred at or immediately before the transition into Late Woodland. Such an environmental change should be reflected in native cultural adaptations; higher water levels might have caused abandonment of the place or moving dwellings back from the former shoreline. Above the clay, the upper shell midden stratum is evidence that people came back when sea level dropped. How long the high stand persisted is unclear, but the curves suggest it ended at some time after A.D. 700. Some 8 km west of Paradise Point, USF's testing at the St. Vincent 5 site (8Fr364) investigated a meter-thick oyster-shell midden by 10-cm levels. The 60 cm of Late Woodland deposits were dated from cal. A.D. 640 to cal. A.D. 940, indicating deposition of about 20 cm of midden per century, probably as the buildup of seasonal or episodic occupations.

Though little is known of Late Woodland sociopolitical organization, this time period may have been setting the stage for the later emergence of agricultural, chiefly societies, with the introduction of maize horticulture/agriculture. At the Sycamore site in the middle valley, sherds with maize cob impressions were associated with a radiocarbon date as early as A.D. 900 (Milanich 1974). If maize was being cultivated there, possibly it was still a special plant substance, grown only in small amounts for ritual purposes. If late Middle Woodland societies did indeed experience cold, drought, and/or higher sea levels, a succeeding warmer period of higher water levels may correlate with the beginnings of plant cultivation, which could have looked like a path to greater food security. Agriculture takes more time than harvesting wild foods, and thus may have left less opportunity for producing all the ostentatious aspects of material culture that were present during Middle Woodland. Cultivating a little maize may have just been added to the existing plant procurement strategies at first.

Remains of just about the entire range of wild animals harvested by Native Americans have been recovered from Late Woodland sites. Identified at Otis Hare site and others are large mammals such as bear and deer; smaller ones such as beaver, opossum, squirrel, rat, rabbit, and raccoon; birds, include coot, crow, gull, duck, and turkey; abundant and diverse turtles' some alligator, snake, and frogs; and a huge array of freshwater and marine fish and shellfish. On the coast, people subsisting predominantly on aquatic species seem to have continued this general pattern from earlier time periods. At St. Vincent 5 site (White and Kimble 2017) on the island bayshore, the oyster midden showed high dependence on mullet as well as other fish, shellfish, turtle, bird, and mammal, including whale. Remains of a wide variety of wild trees, grasses, nuts and fruits, chenopods and amaranths, and other weedy plants have been identified at Late Woodland sites in the Apalachicola valley. Hickory nuts, acorns, and other nuts, as well as starchy seeds, were undoubtedly staple foods. Fruits include persimmon, plum/cherry, pawpaw, elderberry, and sparkleberry. River cane was woven or otherwise used for mats and fabrics, construction, and various other artifacts.

With the earliest food production evident at the end of Late Woodland, a huge question is why people would willingly work harder to garden or farm when they could just collect wild species with less effort. Many archaeological models try to explain the shift to agriculture, invoking climatic change, population growth, responsive genetic characteristics of the plants themselves, pre-existing sedentism, and changing social organization. Easier to address is the question of timing. The earliest dates on maize in the region are slightly after A.D. 900, from the Sycamore site, but most dates are somewhat later, hovering around 1000. Debate continues over whether agriculture emerged in times of abundant resources or times of environmental and/or social stress. The adoption of low-level food production was probably not a big shift in subsistence strategies but an integrated addition to the stable, existing hunting-fishing-gathering economies. Late Middle Woodland peoples, already so open to imported objects and ideas from far-flung places, probably welcomed interesting things like bows and arrows or maize. The idea of eating and also actually producing what was essentially a foreign, tropical crop took hold slowly, but came to consume more time, though it may not have been an immediate trigger for sedentary villages. Probably in both subsistence practices and sociopolitical organization, Late Woodland peoples beginning horticultural lifeways were reaching some intermediate state between foragers and farmers, with slightly increasing sociopolitical complexity.

FORT WALTON (A.D. 950-1500)

The variant of Mississippi-period material culture in the Apalachicola valley region, Fort Walton represents the latest prehistoric societies. This time period is represented at more and larger sites than any previous one, from small camps to large villages with flat-topped temple mounds, and site updates from this project have included data on more Fort Walton artifacts. These late prehistoric people depended upon intensive maize agriculture, but also still fished, gathered, and hunted. Their ceramics both related to those of earlier times and reflected new Mississippian styles across the South. However, Fort Walton pottery was distinctive in the persistence of tempers other than shell, which was used by most other Mississippians, and also in the development of some unusual vessel forms. A further difference from other archaeological cultures in space and time is that Fort Walton artifact assemblages have far less chipped stone. Burial practices are variable, with the dead sometimes in cemeteries and occasionally in mounds. These socially-ranked societies, characterized as chiefdoms, may not have been economically stratified.

Fort Walton pottery was still tempered with grit, grog, or sand, perhaps as a marker of regional identity. Shell-tempered sherds, typical of up to 100% of Mississippi-period ceramic assemblages elsewhere in the Southeast, constitute only 1% to 5% of early Fort Walton assemblages, and then mostly disappear later in this time period. These may represent visits by outsiders bringing pots of food. The most diagnostic Fort Walton type is Fort Walton Incised (see Figures 16, 26), with zoned incised areas and punctations, often in interlocking scroll designs. Besides bowls and jars, this type is seen in a unique vessel shape, the six-pointed open bowl, an example of which was recovered at the St. Vincent 5 site, 8Fr364 (Figure 45). The Lake Jackson type includes plain, collared jars, sometimes with handles or lugs, and parallel incisions around the neck. Cool Branch Incised looks the same except with incised arcs around the body, accompanied by a line of punctations (see Figure 31). Point Washington Incised has no punctations but only incised patterns often in scroll shapes, Rims may have ticks (tiny notches) along the lip. Rare shapes include bottles and beakers.

Figure 45. Portion of a Fort Walton Incised six-pointed open bowl from St. Vincent 5 site, 8Fr364, showing one complete rim point and incised and punctated design.

More generic ceramics include check-stamped, cobmarked, red-painted, black-painted, and engraved. Vessels can have rim effigies (adornos) of bird or other shapes. Other clay artifacts include abundant daub fragments from wattle-and-daub structures. Shell artifacts include disc, cylindrical, and tubular beads, knobbed pins, shell cups, and a great number of utilitarian objects such as scrapers, scoops, chisels, and sharply pointed awls. The Deal collection from Richardson's Hammock site (8Gu10) included a cache of bipointed whelk and conch-shell columella awls (Presto 2013). Most utilitarian shell tools are found along the shores of St. Joseph Bay, where large gastropod shells are abundant. Lithic assemblages are limited to a small amount of debitage and occasional triangular points. Possibly the use of spears lessened, and arrows were of sharpened cane or tipped with bone or other materials besides stone. Greenstone celts increase in importance, especially as burial offerings, and flat cylindrical chunkey stones are also important.

In the Apalachicola region, Fort Walton settlement patterns mostly mirror those of earlier time periods, with frequent reoccupation of earlier sites, more riverbank locations, and fewer sites on small streams. Probably this pattern relates to agricultural activities on river floodplains. Sites are linear, spread along water corridors to facilitate travel and exchange of information and goods. Unfortunately such locations mean that many are disappearing rapidly due to ramped-up erosion in recent decades. The good news is that sites become exposed and can be discovered and documented (see discussion of Mile 85 site, 8Ca282). The bad news is that main portions of most sites are long gone, leaving only back edges to investigate.

While over a third of Mississippian centers have palisades or embankments around mounds and/or domestic areas there is little evidence for such defensive or encircling architecture at any Apalachicola Fort Walton sites. A possible palisade at Waddell's Mill Pond site, 8Ja65 (Tesar and Jones 2009) is not clearly demonstrated with the data, and probably dates to the Contact Period anyway, when defense against conflict was more crucial (see discussion below for Protohistoric). The standard Mississippian wall-trench buildings are not typical in the Apalachicola region, only found at Cayson Mound (8Ca3), and no semi-subterranean structural foundations or potential earth lodges are known. At Waddell's Mill Pond, a rectangular "townhouse" was excavated (Tesar and Jones 2009:Figure 20). At at the Chattahoochee River 1 site (8Ja8 or J-5), Bullen (1958) uncovered uncovered 30 postmolds and 21 pit features, though they do not easily align into a specific pattern of a structure or structures, and at the Curlee site (8Ja7) a short trench feature and curved line of large postmolds gave possible evidence of a building 9 m in diameter (White 1982). On St. Joseph Bay, the Richardson's Hammock site (8Gu10), probably repeatedly throughout several seasons during Fort Walton times, had abundant small postmolds (6 to 20 cm diameter) and various pits but no discernible patterns.

The standard pattern of the Mississippian flat-topped pyramidal temple mound is seen at four places in the valley: Chattahoochee Landing (8Gd4) at the top of the Apalachicola, Cayson (8Ca3) and Yon (8Li2) mounds in the middle valley, and Pierce (8Fr14) at the river mouth. This project has permitted better dating at two of those sites. Mound 2, the large platform, and Mound 4, the small roadside elevation at Chattahoochee Landing, were both solidly dated to Fort Walton times (see Appendix B), and Pierce Mound F, a low sand platform, was also confirmed as a Fort Walton construction. Interestingly, Singer Mound (8Fr16), a low conical burial mound at Pierce with check-stamped and plain sherds and 19 graves, was also solidly dated to Fort Walton times, making it the first such late prehistoric conical burial mound known. No astronomical alignments have been discovered in the layout of mound centers, but it seems obvious that the Fort Walton inhabitants of the Pierce complex deliberately arranged their (platform) mounds to complete the east side of an oval configuration whose west side was made up of Early and Middle Woodland (conical burial) mounds, with Singer just outside the oval to the west. There are some cases of Middle Woodland burial mounds into which Fort Walton graves were intrusive, probably because Fort Walton people appreciated the sacredness of the resting places of their ancestors. Richardson's Hammock (8Gu10) is one example (see discussion in previous section). Others are Jackson Mound, (8Fr15) and Waddell's Mill Pond (8Ja65). Still another is Chipola Cutoff mound (8Gu5) where at least 5 of the 42 graves were associated with Fort Walton materials – but they are probably of the Contact Period (see discussion below).

Climatic conditions such as possible decrease in rainfall after A.D. 750 may have led to the expansion of maize cultivation to provide a more dependable resource during Fort Walton times. This intensification of food production could have resulted in increased sedentism, but continued collection of wild floral and faunal resources must have meant some mobility, with camps for fall/winter hunting and gathering of fruits and nuts, or travel around different shellfishing/fishing stations on the coast. Mississippian landscapes have been pictured as mosaics, with patches of agricultural fields, villages and ceremonial centers, managed forests (including controlled burning and planting of important tree crops), and larger woodland expanses used for hunting and perhaps buffer zones between competing political territories. Macrobotanical remains from Fort Walton sites include charred corncobs, as well as plant species common to disturbed, cleared areas. Zooarchaeological remains are the same deer, small mammals, fish, and other species exploited for so many centuries before. Freshwater shellfish are less emphasized at interior sites, but coastal middens show continuation of ancient subsistence practices. Coastal peoples may have traded with relatives upriver for maize, in return for shell and yaupon holly leaves. On St. Joseph Bay, the biochemistry of large whelks at Richardson's Hammock shell midden show that Fort Walton people came to harvest them year-round (Harke et al. 2015). They probably kept clouds of summer insects away with constant smoky fires, resulting in the dramatically black midden sands.

Fort Walton peoples participated in long-distance and local exchange, whether for redistribution of subsistence commodities and wealth items, for paying tribute, for political or religious gift-giving, or for establishing social positions. Riverine trade routes were probably established for many centuries. Leadership roles may have been tied to the movement or surplus storage of subsistence commodities or prestige goods. Chiefs may have had the authority to call upon the labor of everyone else. Perhaps heterarchical systems cross-cut kinship and lineage lines, whether groups of clan mothers, craftworker guilds, warrior societies, religious practitioners, or other associations that could have controlled certain social sectors or held decision-making capabilities. Whether chiefs had strong, even coercive power, or simply widely-recognized authority is not known and probably differed from region to region. Unlike in much of the Mississippian Southeast, however, Fort Walton societies seem to have been peaceful.

PROTOHISTORIC (1500-1700)

Protohistoric means the time when there are written records for some peoples and places but not all. From the time of the first Old-World invasion of the South through the Spanish Mission and Post-Mission periods, the Apalachicola Valley region must be classified as protohistoric because we know little of who was there, what they were doing, or how they disappeared. This report is not the place to relate elaborate historical reconstructions, so I just describe the archaeological record.

Early Protohistoric (1500-1650?)

Contact-Period Fort Walton is the time during which this late prehistoric adaptation changes slightly and then suddenly disappears, probably by about 1650. A very few Fort Walton sites have typical material culture with the addition of Old-World artifacts, indicating they are from post-contact times. The conquistadores, Spaniards and their other European and African associates, are not recorded as venturing into the Apalachicola valley in the sixteenth century nor in most of the seventeenth. In 1528, the Narváez expedition probably sailed their homemade boats from their outpost at St. Marks (on the coast south of Tallahassee) behind the barrier islands and out to the sea west of St. Vincent Island, passing the mouth of the Apalachicola River. The Soto expedition of 1539-40 went north to Tallahassee and beyond, and the 1559 Luna group explored north from Pensacola into central Alabama. But these and probably many other undocumented voyages by land and sea, brought foreign invaders, along with their artifacts — and germs — to the South, with devastating consequences. Besides the possibilities of actual deserters and captives among these various expeditions, as well as unrecorded European voyages for slave raids, there are other ways that Old World objects could have gotten into native hands. Trade and exchange from neighboring groups, as well as salvage of goods and even people from European shipwrecks, allowed opportunities to acquire unusual new things. But even Soto's chroniclers in 1540 noticed how many Native Americans were already dying. Introduced Old-World diseases, to which Indians had no resistance, decimated local communities.

Only a few Fort Walton sites have produced Old-World artifacts. At Corbin-Tucker cemetery (9Li142), copper discs and radiocarbon dates indicate some burials were in the late 1500s or 1600s. Thick Greenbriar site (8Ja417), a Fort Walton riverbank village, had a late stratum that produced a few glass beads and an iron spike. At Chipola Cutoff Mound (8Gu5), the Fort Walton burials intrusive into the Middle Woodland graves included glass beads and brass disks. The work of the current survey made possible the addition of another site to this small but highly significant group. The Poor Man's Creek site (8Fr1303) was already recorded, but inspection of the private collection identified very early Spanish olive jar sherds (see discussion in previous section). On the East Bay shoreline, this site could have been an out post for wreck-salvors, or a village in communication with those indigenous peoples actually contacted earlier by Narváez's men.

The effects of early contact are often debated, but there is no doubt that Fort Walton culture ceases to exist; the people either die out or merge with other survivors.

Mission Period (1650-1700?)

The Europeans came to the New World to find riches, land, and power, and also to capture and enslave indigenous people. They brought stress, conflict, and violence, and soon turned Native American groups into commercial slavers as well. Raids on formerly peaceful villages, as well as the ravages of epidemics, meant that Indian populations were severely reduced and scrambling to survive. Regrouping and combining forces meant the emergence of tribes of diverse ethnic origins. Archaeologists call these "coalescent societies," and their material cultural similarly manifests blending of generic attributes. Into this picture came more Spanish in the 1600s to set up mission settlements, convert the Indians to Christianity, and try to make them more manageable. The three westernmost missions were recorded as being established in the Apalachicola region in 1674. They did not last very long, and we are unsure by which archaeological sites they are represented. The accounts of the bishop who established them state that the Indians were Apalachicoli, who lived on the Chattahoochee River, and came to live at these new settlements near the Flint-Chattahoochee forks. He also noted how frequently Indians were dying.

The two or three sites that might represent these missions (mostly in Georgia) produced European goods and generic native ceramics, bowls and jars with incised scrolls that could fit into several ceramic types (Point Washington Incised, Lamar Incised, or Ocmulgee Fields Incised) that are widespread across the South at this time. These possible mission sites at the forks are now beneath the reservoir created by the Jim Woodruff dam, though one (San Carlos) might be in Florida and now under a state prison (8Ja60, State Hospital Farm site). Why the Spanish apparently did not venture at all into the huge, rich Apalachicola valley, or who even lived there in the 1600s, are questions so far unanswered. Amid all the raiding and upheaval through the late 1600s and early 1700s, in 1704 a force of British from Georgia and their Creek Indian allies moved southward to destroy the Spanish missions. It is unknown how this affected the Apalachicola region except that historic accounts confirm that slave raids by Indians upon settlements of other Indians continued.

Post-Mission Times (1700-1730?)

The only well documented post-mission protohistoric settlements known in the Apalachicola valley are on St. Joseph Bay. The 1718 French fort inhabited for two months still eludes identification on the ground, as detailed in Chapter 4. The Spanish Fort San José, 8Gu8, is now well documented with an abundance of artifact data (Saccente 2013, White and Saccente 2015), including new collections information recounted in this report (see Chapter 5). Occupied from 1718 through about 1723, it produced abundant Spanish material, such as colorful majolica pottery (Figure), because administrators, soldiers, sailors, tradespeople, women and children were there. In addition, there were some Native Americans, though it is unclear who they were. Some accounts note that, when the fort was abandoned, Chatot or Chacato Indians also left, to take up residence westward at Pensacola and Mobile. The native pottery is mostly of the generic styles except for some complicated-stamped wares that might fit within the series known as Lamar, about which we also know very little.

Figure 46. Majolica sherds from Fort San José, 8Gu8, in private collection.

Lamar (1700?)

Once thought of as just a different ceramic series added in Fort Walton times, Lamar pottery represents something very different, and is now dated to around A.D. 1700, most probably after Fort Walton is gone. It consists of jars with folded lips, notched below the fold or with added appliqué rim strips, and also complicated-stamped and check-stamped vessel bodies. Lamar Complicated-Stamped is the most diagnostic of these types (Figure 47), but Leon Check-Stamped (see Figure 23) and Lamar Plain are usually recognizable in rim sherds. The mission-period pottery in the Tallahassee region, where the San Luis mission was a major Spanish capital, resembles Lamar but is called Jefferson ware, and is heavily grog-tempered, unlike the mostly grit-tempered Lamar ceramics.

Radiocarbon-dating of Lamar sites has proven impossible, since the time involved is too close to the modern period for which dates are questionable because of problems with radioactive carbon in the recent atmosphere. Lamar pottery appears much farther upriver in Georgia during prehistoric times, but is clearly post-Fort Walton in the Apalachicola valley. It may be a rare, distinctive ceramic complex that reasonably does indicate actual migration, in this case, downriver into what were by that time depopulated areas. Another interesting aspect of the Lamar issue is the site distribution. Beyond the sizeable Lamar component overlying the Fort Walton village at Yon mound (8Li2) in the middle valley, most of the sites are on the bay shores, and most of those on the barrier islands (St. Vincent, St. George). This project resulted in recording one more Lamar component, at the Jackson Midden site (8Fr77; see discussion in previous chapter), near the mainland shore. The record suggests a protohistoric group or groups of so far unknown origin, with more northerly or easterly origins, apparently suddenly moving, if in small numbers, into the Apalachicola region. If they clustered on the bay shores, perhaps they were refugees fleeing the mission conflagrations and heading westward within the protected, hidden bay. Maybe someday we will know their names.

Figure 47. Lamar Complicated-Stamped and Plain (with notched, folded rims) from St. Vincent 5 site, 8Fr364.

HISTORIC PERIOD

How Lamar relates to historic Creek Indian groups is an interesting question, and this pottery is also known to have been made by historic Cherokee. However, the Creeks were the only Native Americans left in the Apalachicola valley by about 1720, and historic records are easier to find as time goes on. Locating their villages in documentary sources and archaeologically is less difficult; the distinctive Chattahoochee Brushed pottery is mostly an ethnic identifier. Creeks in northwest Florida morphed into Seminoles. The Apalachicola region was the location of the First Seminole War, with two archaeological sites playing a major role. The Flintlock Site (8Ja1763; Horrell et al. 2003), in the upper valley, may be the wreck of a boat full of Americans, soldiers and others, attacked by Indians in 1817. Fort Gadsden (Prospect Bluff), on the lower Apalachicola, was a stronghold held by Indians and escaped African slaves, blown up by Americans in 1816.

After most Indians were “removed” west of the Mississippi by the 1830s and 40s, and the remaining Seminoles fled to the south Florida Everglades, American enterprise took over the valley, with cotton shipped downriver to the town of Apalachicola. A new town, St. Joseph, existing only from 1836-1841, on St. Joseph Bay, is historically well known but archaeologically only beginning to be researched (Hunt 2014). This project identified two areas of the old town, the wharf and an urban locale, that will be part of future research. For the pre- and post-Civil War era, as well as the twentieth-century, there is a rich archaeological record that continues to be explored.

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APPENDIX A: ALL SITES INCLUDED IN PROJECT (by county; site forms submitted)

#	Name	Known components	Newly recorded*	Reference
Ca8	Ocheesee Landing	Creek, indet prehist		this report
Ca64	Larson	~~Lamar~~	MWd	
Ca65	John Boy's Landing	Paleo		Tyler 2008
Ca90	Parish Lake Rd	EArch, MArch	Paleo-Indian	this report
Ca92	Ring Jaw Island	Paleo	LArch, Wd	Tyler 2008; Kreiser 2018
Ca94	Johnny Boy Landing	Paleo, Wd	Paleo, EArch	Kreiser 2018
Ca95	Altha West	Paleo	EArch, MArch	Kreiser 2018
Ca114	Gaston Spivey Mound	MWd		this report
Ca193	Duncan McMillan	LArch	Wd	
Ca243	No Muddy Waters Here	indet prehist	EArch, LArch	Kreiser 2018
Ca282	Mile 85		indet ceramic (FW?)	this report
Ca283	HJ-AZ		MArch, LArch	Kreiser 2018
Ca284	HJ-BA		EArch	
Ca285	HJ-BB		EArch, MArch,Wd	
Ca286	HJ-BC		EArch	
Ca287	HJ-BD		Paleo, EArch, MArch	
Ca288	HJ-BE		EArch	
Ca289	HJ-BF		EArch	
Ca290	HJ-BG		EArch, MArch	
Ca291	HJ-BH		EArch	
Ca292	HJ-BI		EArch, LArch	
Ca293	HJ-BJ		LArch	
Ca294	HJ-BK		LArch	
Ca295	HJ-BL		EArch,Miss	
Ca296	HJ-BM		LArch	
Ca297	HJ-BN		EArch	
Ca298	HJ-BO		EArch, MArch, LArch, Wd	
Ca299	HJ-BP		LArch	
Ca300	HJ-BQ		Paleo?	
Ca301	HJ-BR Saw Mill		Paleo, EArch, MArch, LArch, Miss	
Ca302	HJ-BS		MArch	
Ca303	HJ-BT		LArch	
Ca304	HJ-BU		EArch, MArch	
Ca305	HJ-BV		Paleo, EArch, MArch, LArch	
Ca306	HJ-BY		EArch, MArch	
Ca307	HJ-BW		MArch	
Fr1	Porter's Bar	LArch, MWd, FW, Amer 19 cen		Knigge 2018
Fr10	Eleven Mile Pt.	MWd	EWd, FW	this report
Fr11	Green Point	EWd, MWd?		Knigge 2018
Fr14	Pierce Mounds	MWd, FW		this report
Fr16	Singer Mound	indet ceram	FW	this report
Fr71	Paradise Point	MWd, LWd	Paleo, EArch, MArch, LArch, FW, Lam	White&Kimble 2017
Fr77	Jackson Midden	MWd	EWd, FW, Lam	this report
Fr352	St. Vincent Ferry	FW	LArch? MWd? Lam	White&Kimble 2017
Fr354	St. Vincent Point	Wd, FW	Paleo, EWd	
Fr356	Big Bayou 1	indet preh		

#	Name	Known components	Newly recorded*	Reference
Fr357	Big Bayou 2	FW		
Fr360	St. Vincent 1	LArch, EWd, MWd, FW		
Fr361	St. Vincent 2	LArch, EWd, MWd? FW		
Fr362	St. Vincent 3	indet prehistoric	Paleo, Arch, EWd, MWd? LWd? FW	
Fr363	St. Vincent 4	MWd		
Fr364	St. Vincent 5	MWd	Paleo, EArch, MArch, Lam, LArch, EWd, LWd?, FW	
Fr365	St. Vincent 6	LArch, EWd, LWd, Lam/Creek	MWd? FW	
Fr366	St. Vincent 7	LWd?	MWd, FW	
Fr367	St. Vincent 8	EWd, MWd		
Fr368	St. Vincent 9	FW		
Fr369	St. Vincent 10	FW, Creek		
Fr370	St. Vincent 11	MWd	20th cen Amer	
Fr755	Thank-You-Ma'am Crk	LArch, LWd, FW		this report
Fr806	Gardner Landing	indet Wd	indet Wd	
Fr848	Harry A's Northwest	indet prehistoric	FW	
Fr915	Millender Tract	FW	FW	
Fr1265	Big Bayou South		FW	White&Kimble 2017
Fr1277	Mallard Slough		FW	
Fr1303	Poor Man's Creek	FW	Contact-period Spanish	this report
Fr1367	Little Redfish Creek		EArch, MArch? LArch, MWd, LWd? FW, hist Amer	White&Kimble 2017
Gd4	Chattahoochee Ldg	EWd, LWd? FW		this report
Gd1989	Tyler JW5		EArch	Tyler 2008
Gd1990	Tyler TM2		Paleo	
Gu3	Burgess Landing	MWd	MWd	this report
Gu8	Fort San José	hist 1st Spanish, protohistoric Native American		Saccente 2013, Saccente&White 2015; this report
Gu10	Richardson's Hammock	MWd, FW		this report; Presto 2013
Gu276	Old St. Joseph Wharf		Amer 19th cen	this report
Gu277	Old St. Joseph-Chafin		Amer 19th cen	
Gu278	Tim Nelson		indet prehistoric	
Ja66	Sims	indet prehist	Paleo	Tyler 2008
Ja75	Second Landing	indet prehist	Paleo	
Ja137	Coe's Landing	FW	Paleo	
Ja409	Sneads Port	FW, Creek	Paleo	
Ja432	Peacock Bridge South	Paleo	EArch, MArch, LArch	Kreiser 2018
Ja433	Peacock Bridge	Paleo, EArch		Tyler 2008; Kreiser 2018
Ja437	Magnolia Bridge	Paleo, EArch	MArch, LArch, Wd, Miss	Tyler 2008, Kreiser 2018, this report
Ja439	Long Branch Bend/HJ-Y	Paleo?	EArch, Wd	Kreiser 2018
Ja1502	Chipola River Peacock Bridge Shoal 1	Arch, LWd	Paleo, MArch	
Ja1505	Chipola River Spring Creek Mouth	Arch	EArch	
Ja1508	Chipola River Cypress Tree	Arch, Wd	EArch, LArch, Miss	
Ja1698	Johnson Shoals	Paleo	EArch, MArch, Wd, Miss?	

#	Name	Known components	Newly recorded*	Reference
Ja1814	FAS#4	Wd	EArch	Kreiser 2018
Ja1816	FAS#7	Wd	EArch, MArch	
Ja1818	FAS#9	Wd	MArch	
Ja1820	FAS#11	Wd	EArch, MArch	
Ja1822	FAS#13	MArch	EArch	
Ja1823	FAS#14	Wd	EArch	
Ja1826	FAS#17	LArch, Wd	EArch, MArch	
Ja2020	HJ-AE Big Shoal		Wd	
Ja2021	HJ-P Marianna-Blountstown		Paleo, EArch, MArch	
Ja2022	HJ-AA Lost Island Shoal		Paleo, EArch, MArch	
Ja2023	HJ-AB		Paleo	
Ja2024	HJ-AC		MArch	
Ja2025	HJ-AD		MArch, LArch	
Ja2026	HJ-AF Sink Creek Shoal		EArch, MArch, Wd	
Ja2027	HJ-AG		MArch	
Ja2028	HJ-AH		Wd	
Ja2029	HJ-AI		MArch	
Ja2030	HJ-AJ		MArch	
Ja2031	HJ-AK		EArch	
Ja2032	HJ-AM		Wd	
Ja2033	HJ-AL Dry Creek Shoal		Paleo, EArch, MArch, Miss	
Ja2034	HJ-AN		Paleo, MArch	
Ja2035	HJ-AO		Paleo	
Ja2036	HJ-AQ		MArch	
Ja2037	HJ-AR		MArch, Paleo	Tyler 2008; Kreiser 2018
Ja2038	HJ-AS		EArch	Kreiser 2018
Ja2039	HJ-AT		Paleo, EArch	
Ja2040	HJ-AU Rocky Creek		EArch, MArch	
Ja2041	HJ-AV		Wd	
Ja2042	HJ-AW		MArch	
Ja2043	HJ-AX		Paleo, EArch, MArch	Tyler 2008, Kreiser 2018
Ja 2044	HJ-AY		EArch	Kreiser 2018
Ja2045	HJ-B		EArch	
Ja2046	HJ-C		Paleo, EArch, LArch	
Ja2047	HJ-D		EArch	
Ja2048	HJ-E		indet prehist (drill)	
Ja2049	HJ-F		Wd?	
Ja2050	HJ-G		MArch	
Ja2051	HJ-H		MArch, Wd	
Ja2052	HJ-I		EArch, LArch	
Ja2053	HJ-J		MArch	
Ja2054	HJ-K		MArch	
Ja2055	HJ-L		EArch	
Ja2056	HJ-M		Paleo, MArch	
Ja2057	HJ-N		Paleo	
Ja2058	HJ-O		MWd	
Ja2059	HJ-Q		EArch	
Ja2060	HJ-R		Paleo, EArch, MArch, Wd	
Ja2061	HJ-S		EArch, MArch	
Ja2062	HJ-T		EArch, MArch	
Ja2063	HJ-U		Paleo	

#	Name	Known components	Newly recorded*	Reference
Ja2064	HJ-V		EArch, MArch, LArch, Wd	Kreiser 2018
Ja2065	HJ-W Small Spring Run		EArch, MArch, LArch, Wd	
Ja2066	HJ-X		EArch, MArch	
Ja2068	HJ-Z		MArch	
Ja2069	HJ-A		LArch, MArch	
Ja2071	HJBX		Paleo, EArch	
Ja2072	HJ-BZ		EArch, MArch	
Ja2073	HJ-CA		EArch, Wd	
Ja2077	Tyler CF1		Paleo	Tyler 2008
Ja2078	Tyler DB3		Paleo	
Ja2080	Tyler JW3		Paleo	Tyler 2008
Ja2081	Tyler TM1		Paleo	
Li4	Bristol Mound	MWd		this report
Li172	Otis Hare	MWd, LWd, FW		this report
Li195	Nameless Creek	EArch	hist Amer	this report

*If no known components in column 3 then site is newly recorded with this project. If no new components in column 4, then site update is just for new artifact data and/or condition of site.

Recommend vacate site numbers:

Fr76 (just void it- refers to Gu8)
Fr825 (merge with Fr364)
Fr830 (merge with Fr354)
Gu26 (merge with Gu8)
Li196 (merge with Li4)

Site numbers requested by Kreiser, by Hunt, but not used:

Ca308
Ja2067
Ja2070
Ja2079

APPENDIX B: RADIOCARBON DATES OBTAINED BY THIS PROJECT

Culture	*Site name, number*	*Provenience*	*Material dated, year dated*	*Associated materials, comments*	*Conventional radiocarbon age (yrs B.P.)*	*Calibrated date range*	*Intercept(s)*	*Lab #*
LArch?	Singer Mound (Pierce complex) 8Fr16	TUSing1 L6 -120 cm	char	1 grog-t pl; M-LWd burial mound above it; disturbed early deposits? sub-mound natural stratum?	4480±30	3345-3085 B.C. 3065-3025 B.C.	3305 B.C.- 3300 B.C. 3280 B.C. 3275 B.C. 3265 B.C. 3240 B.C. 3105 B.C	BETA 478618
LArch	Thank-you-ma'am Cr 8Fr755	surface of shell mid	burned material on steatite sherd	oyster&rangia shell mid, f-t pl & f-t s-st cer, later components	2760±30	980-830 B.C.	905 B.C.	478616
EWd	Yellow House-boat	human burial in shell midden	rib fragment	Rangia shell midden, no grave goods	1830±30	A.D. 80-320	A.D. 178*	ICA 18B/ 03100
MWd	Otis Hare 8Li172	TU1 L13,-183 to -186 cm	conifer char in dog coprolite	32% SWCrC-St, 65% pl	1370 ± 23	A.D. 620-690	A.D. 655	PRI-5859
M/LWd	Otis Hare 8Li172	TU1 L9	char 2018		1350±30	A.D. 630-720 A.D. 740-770	A.D. 675 A.D. 755	ICA 18C/ 0626
LWd/ FW	Richardson's Hammock, 8Gu10	TUE L4 (N end), near burial md; -60-80 cm	SwCrC-St, pl cer	1090±30	A.D. 860	A.D. 890-1020	A.D. 955	ICA 18C/06 25
FW	Singer Mound 8Fr16	TUSing1 L5W1/2 (base of md slope)	charcoal	2 sand&grog-t pl, oyster shell	1000±30	A.D. 983-1152	A.D.1020	BETA 478617
FW	Pierce Mound F	TU11A L3	charcoal	sand-t pl	930±30	A.D. 1025-1165	A.D. 1050 A.D. 1085 A.D. 1125 A.D. 1140 A.D. 1150	Beta 478619
FW	Chatta-hoochee Landing Mound 2, 8Gd4	backdirt, looter tunnel in mound ca. 1 m above base	deer bone	ch-st, pl cer; black mid, freshwater shell, fauna	910±30	A.D. 1030-1210	A.D. 1155	Beta 490198
FW	Pierce Mound D?/W Village	shell mid ridge, 0-10 cm depth;	char	oyster, clam shell, fauna, pl sherds	900±30	A.D. 1039-1210	A.D. 1155	BETA 478620
FW	Singer Mound 8Fr16	TUSing1 L5 E half 2017	char	pl cer, oyster shell frags	840±30	A.D. 1150-1260	A.D. 1205*	ICA 17C/ 1127
FW	Chatta-hoochee Ldg 8Gd4	Mound 4 Profile 2, dark lower layer	charl	Cotaco Creek pt, chert flakes (in fill from earlier component?)	810±30	A.D. 1160-1270	A.D. 1225*	ICA 18C/ 03101
modern	Otis Hare 8Li172	TU2 L4 2018	river cane fragments	modern rodent burrow (expected LWd)	1.244 ± .004	modern		ICA180/ 0203

APPENDIX C

POLLEN, PHYTOLITH, STARCH, AND MACROFLORAL ANALYSIS AND AMS RADIOCARBON AGE DETERMINATION OF A COPROLITE SAMPLE FROM OTIS HARE SITE (8LI172), LIBERTY COUNTY, FLORIDA

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INTRODUCTION

The Otis Hare Site (8LI172) is a riverbank freshwater shell midden campsite or small village located in Liberty County, northwest Florida. It is situated about 5 kilometers southwest of the town of Bristol, in the middle Apalachicola River valley (Nancy White, personal communication November 28, 2017). One sample of either human or canine coprolite was submitted for pollen, phytolith, starch, macrofloral, and FTIR analysis, and AMS radiocarbon age determination.

METHODS

The sample was placed in trisodium phosphate to disaggregate and wet the organic remains in preparation for extraction of pollen, starch, and phytoliths. Trisodium phosphate is used because the color of the liquid has been determined (Fry 1970; Williams-Dean 1978) to be an indicator of feces origin. After soaking, the solution turned a pale yellow color, indicating the coprolite was from a canid.

Pollen Extraction from Coprolites

After rehydration, two pieces measuring 1 ml (cc) each were separated to recover pollen, starch, and phytoliths. Each of these fragments destined for microscopic remain recovery was screened through 250-micron mesh, retaining the portion that passed through the mesh for analysis of microscopic remains, while that remaining on top of the mesh was dried and examined for macroscopic remains. In addition, all material not used for extraction of pollen, phytoliths, and starch was screened to retain the larger fraction for macrofloral analysis. Only the material destined for pollen analysis is discussed here.

After concentrating in a centrifuge tube, the pollen sample was rinsed until neutral using reverse osmosis, deionized (RODI) water. It received a 30-minute treatment in hot hydrofluoric acid to remove inorganic particles, followed by acetolysis for 10 minutes to remove extraneous organic matter. After it was rinsed to neutral with RODI water, a few drops of potassium hydroxide (KOH) were added to the sample that was then stained lightly with safranin.

A light microscope was used to count pollen at a magnification of 500x. Pollen preservation in this sample varied from good to poor. An extensive comparative reference housed at PaleoResearch Institute aided pollen identification to the family, genus, and species level, where possible.

Although “indeterminate” pollen, which includes pollen grains that are folded, mutilated, or otherwise distorted beyond recognition, are normally included in the total pollen count since they are part of the pollen record, none were observed. The microscopic charcoal frequency registers the relationship between pollen and charcoal. The total number of microscopic charcoal fragments was divided by the pollen sum, resulting in a charcoal frequency that reflects the quantity of microscopic charcoal fragments observed, normalized per 100 pollen grains.

Pollen extraction retains starch granules. Since starch analysis was requested for this sample, not only were starches recorded as part of the pollen count, an additional search for starches was conducted. Starch granules are a plant's mechanism for storing carbohydrates. Starches are found in numerous seeds, as well as in starchy roots and tubers. The primary categories of starches include the following: with or without visible hila, hilum centric or eccentric, hila patterns (dot, cracked, elongated), and shape of starch (angular, ellipse, circular, or lenticular). Some of these starch categories are typical of specific plants, while others are more common and tend to occur in many different types of plants.

Phytolith and Starch Grain Extraction from Coprolites

Extraction of phytoliths (calcium oxalate and silica) from this coprolite proceeded separately. First, the sample was placed in a beaker and saturated with a 6% solution of sodium hypochlorite (bleach) for 24 hours to remove (oxidize) some of the phytolith bearing organic matter and remove organic matter. This relatively short exposure to bleach will not harm silica or calcium oxalate phytoliths. The sample was rinsed in RODI water using a centrifuge at least five times, then was acetylated for 30 minutes to remove extraneous organic matter. The sample was rinsed with RODI water to neutral, then received a final alcohol rinse and was transferred to a storage vial. A subsample was mounted in optical immersion oil for counting with a light microscope at a magnification of 400x. The phytolith diagram was produced using Tilia, a computer program developed by Dr. Eric Grimm of the Illinois State Museum.

Macrofloral

The coprolitic material that remained on the 250-micron mesh sieve was allowed to dry and formed the macrofloral sample. The dried sample was weighed, then passed through a series of graduated screens (US Standard Sieves with 4-mm, 2-mm, 1-mm, 0.5-mm, and 0.25- mm openings) to separate charcoal debris and to initially sort the remains. Contents of each screen then were examined. Charcoal pieces larger than 0.25 mm in diameter were separated from the rest of the light fraction, and the total charcoal was weighed. Charcoal pieces in a representative sample were broken to expose fresh cross, radial, and tangential sections, then examined under a binocular microscope at a magnification of 70x and under a Nikon Optiphot 66 microscope at magnifications of 320–800x. Weights of each charcoal type within the representative sample were recorded. Material that remained in the 4-mm, 2-mm, 1-mm, 0.5- mm, and 0.25-mm sieves was scanned under a binocular stereo microscope at a magnification of 10x, with some identifications requiring magnifications of up to 70x. Material that passed through the 0.25-mm screen was not examined. The heavy fraction was scanned at a magnification of 2x for the presence of botanic remains. The term "seed" is used to represent seeds, achenes, caryopses, and other disseminules. Remains from the light and heavy fractions were recorded as charred and/or uncharred, whole and/or fragments. Macrofloral remains, including charcoal, were identified using manuals (Carlquist 2001; Hoadley 1990; Martin and Barkley 1961; Musil 1963; Schopmeyer 1974; Schweingruber et al. 2011, 2013) and by comparison with modern and archaeological references. Clean laboratory conditions were used during flotation and identification to avoid contamination of charcoal and botanic remains to be submitted for radiocarbon dating. All instruments were washed between various project samples, and the sample was protected from contact with modern charcoal.

AMS Radiocarbon Dating-Charcoal

Conifer charcoal recovered from the coprolite was weighed prior to pre-treatment. Any remainder of the charred sample is curated permanently at PaleoResearch Institute. The subsample was vacuum freeze-dried, freezing out all moisture at -107 EC and < 10 millitorr. Then the sample was treated with cold pH 2 hydrochloric acid (HCl), followed by cold 6N HCl. The sample then was heated to approximately 110 EC while in 6N HCl. This step, which removes iron compounds and calcium carbonates that hamper humate compound removal, was repeated until the supernatant was clear. Next, the sample was subjected to 0.05% and 0.1% potassium hydroxide (KOH) to remove humates using both cold solutions and solutions that were heated. Once again, the sample was rinsed to neutral and re-acidified with pH 2 HCl between each KOH step. This step was repeated until the supernatant was clear, signaling removal of all humates, then was rinsed to neutral. After humate removal, the sample was made slightly acidic with pH2 HCl. Each sample was freeze-dried, then combined in a quartz tube with a specific ratio of cupric oxide (CuO) and elemental silver (Ag) in quantities based on the mass of carbon in the sample. The tubes were hydrogen flame-sealed under vacuum.

Standards and laboratory background wood samples were treated to the same acid and base processing as wood and charcoal samples of unknown age. A radiocarbon "dead" wood blank from the Gray Fossil site in Washington County, Tennessee, dated to the Hemphillian stage of the late Miocene, 4.5-7 MYA (currently beyond the detection capabilities of AMS) was used to calibrate the laboratory correction factor. In addition, standards of known age, such as the Third International Radiocarbon Inter-comparison (TIRI) Sample "B" (Belfast Pine) with a consensus age of 4503 ± 6, and TIRI Sample "J" (Bulston Crannog wood) with a consensus age of 1605 ± 8 (Gulliksen and Scott 1995) are used to help establish the laboratory correction factor. After the requisite pre-treatment, a quantity similar to submitted samples of each wood standard was sealed in a quartz tube. Once all the wood standards, blanks, and submitted samples of unknown age were prepared and sealed in their individual quartz tubes, they were combusted at 820 EC, soaked for an extended period of time at that temperature, and allowed to cool slowly, enabling the chemical reaction that extracts carbon dioxide (CO2) gas.

Following this last step, the sample of unknown age, the wood standards, and the laboratory backgrounds were sent to The Center for Applied Isotope Studies in Athens, Georgia, where the CO2 gas was processed into graphite. The graphitized samples were placed in the target and run through the accelerator, generating numbers that are subsequently converted into radiocarbon dates. Data presented in the Discussion section are displayed as conventional radiocarbon ages and calibrated ages using IntCal13 curves on OxCal version 4.3.2 (Bronk Ramsey and Lee 2013; Bronk Ramsey 2009; Reimer et al. 2013). This probability-based method for determining conventional ages provides a calibrated date reflecting the probability of its occurrence within a given distribution (signaled by the amplitude [height] of the curve). This method is different from the intercept-based method of individual point estimates that provides no information concerning probabilities. As a result, the probability-based method offers more stability to the calibrated values than those derived from intercept-based methods, which are subject to adjustments in the calibration curve (Telford et al. 2004).

FTIR (Fourier Transform Infared Spectroscopy)

A mixture of chloroform and methanol (CHM) was used as the solvent to remove lipids and other organic substances from the coprolite. The coprolite fragment was placed in a glass container with CHM solvent, covered, and allowed to sit for several hours, after which the solvent was poured into a small aluminum evaporation dish, where the CHM was allowed to evaporate leaving organic residues behind. To evaporate the entire quantity of CHM, the aluminum dishes are filled repeatedly until all the solution has been evaporated. The aluminum dishes were tilted during evaporation to separate the lighter fraction (lighter molecular weight compounds) from the heavier fraction (heavier molecular weight compounds), leaving the residue of absorbed chemicals in the aluminum dish after the solvent has evaporated. Then the aluminum dish containing the residue was placed residue side down on the FTIR ATR diamond crystal, and the spectra were collected. Lighter and heavier fractions are designated upper (lighter fraction) and lower (heavier fraction), respectively, in the subsequent analysis.

FTIR is performed using a Bruker Alpha optical bench FTIR with an ATR (attenuated total reflection) accessory and a diamond crystal. The aluminum dish containing the sample residue was placed residue side down approximately on the diamond crystal in the path of a specially encoded infrared beam that passes through the crystal, producing a signal called an "interferogram". The interferogram contains information about the frequencies of infrared light that are absorbed and the strength of the absorptions, reflecting the sample's chemical make-up. A computer reads the interferogram, uses Fourier transformation to decode the intensity information for each frequency (wave numbers), then presents the data as a spectrum. Lighter and heavier fractions are designated upper (lighter fraction) and lower (heavier fraction), respectively, in the subsequent analysis.

RADIOCARBON REVIEW

Radiocarbon dates from non-annuals, such as trees and shrubs, reflect the age of that portion of the tree/shrub when it stopped exchanging carbon with the atmosphere, not necessarily the date the tree/shrub died or was burned. Trees and shrubs grow each year by adding new layers or rings of cells to the cambium. During photosynthesis, new cells take in atmospheric carbon dioxide, which includes carbon-14 (14C) or radiocarbon. The radiocarbon absorbed is consistent with atmospheric 14C levels during that growth season. Metabolic processes stop for the inner sapwood once it is converted into heartwood. At this point, no new carbon atoms are acquired, and the radiocarbon that is present starts to decay. Studies show there is little to no movement of carbon-bearing material between rings (Berger 1970, 1972 in Taylor and Bar-Yosef 2014:67). As a result, wood from different parts of the tree yields different radiocarbon dates (Puseman 2007). The outer rings exhibit an age close to the cutting or death date of the tree, while the inner rings reflect an early stage of tree growth. Because the younger, outer rings burn to ash first, usually it is the older, inner rings that are remaining in a charcoal assemblage (Puseman et al. 2009; Taylor 1987).

Radiocarbon age calibrations are based on comparisons between measured 14C and calendar dates determined by dendrochronology and other techniques. The relationship between measured 14C ages and calendar dates is not a straight line, but instead includes fluctuations. A "squiggly" line from the upper left toward the lower right portion of the calibration figure depicts these fluctuations, which have their basis in variability in the ratio of 14C present in the atmosphere through time, among other things. The elongated bell-shaped curve at the left margin of the calibration window depicts the two-sigma probability range (± values) around a central point (radiocarbon date in RCYBP) (Taylor and Bar-Yosef 2014:156-157). The solid black peaks at the bottom of the graph represent the intersection of the bell-shaped curve and the "squiggly" line of the calibration curve. Their amplitude and area of coverage indicate the probability that the radiocarbon date falls within any given year range. Brackets along the bottom edge of these peaks indicate the one-sigma and two-sigma ranges. These probabilities also are presented at the right side of the figure. The probability does not provide a value judgment or measure of the appropriateness for any point on the calibration curve. In contrast an intercept date represents the central point between the two extremes of the calibrated age range. This intercept point or mathematical central point may fall in a zero probability portion of the calibration curve. Additional information from samples' proveniences and their contexts relative to architectural features, such as collapsed walls or capped features, facilitates evaluation and interpretation of which calibrated date range portions most accurately represent occupation or the activity of interest.

We report only the corrected radiocarbon age, which has been calculated using the IRMS δ13C value measured for the sample. In the past "measured radiocarbon age" was reported, reflecting a deficiency in technology that no longer exists. Now it is an intermediate number used in the radiocarbon laboratory. In the past all dates were assumed to be on charcoal with an average δ13C of -25. Now that it is possible to measure the 13C/12C ratio, otherwise known as the δ13C value, during the process of AMS dating, as it has been for the past few decades, this measured value may be adjusted to reflect the δ13C of the item dated. Most AMS laboratories adjust the dates and report only this corrected radiocarbon age.

DISCUSSION

The Otis Hare Site (8LI172) is a riverbank freshwater shell midden campsite or small village, roughly 100 meters long, in the middle of the Apalachicola River valley in Liberty County, Florida. The site was occupied from Middle Woodland through late Prehistoric periods, with likely habitation occurring seasonally or periodically between AD 400 and 1000. Local vegetation consists of Quercus virginiana (live oak), Carya spp. (hickory), and Magnolia spp. (magnolia). Nearby uplands support various pines (Pinus), including P. palustris (longleaf pine), P. elliottii (slash pine), P. taeda (loblolly pine). The soil at the site also contained freshwater bivalves and gastropods.

Sample 270-26 represents a coprolite of either human or canine origin, containing fish head bones. The sample was collected from Test Unit 1, Level 13, between 183 and 186 centimeters below the surface (Table 1). The test unit includes the deepest cultural deposits in the greasy black midden soils. The coprolite was submitted for pollen, phytolith, macrofloral, starch and FTIR analysis, as well as AMS radiocarbon age determination. Ceramics associated with the coprolite indicate Middle Woodland period (AD 300–500) occupation.

Pollen analysis yielded only two pollen grains (Pinus and Persicaria, representing pine and knotweed) (Table 2). Persicaria commonly grows in moist or wet sediments. It is likely the knotweed pollen was introduced with drinking water. No starches were observed while scanning this sample.

The phytolith record was dominated by bulliform and elongate smooth phytoliths (Figure 1), representing grasses. Small quantities of rondel and trapeziform phytoliths represent Festucoid or cool season grasses. Elongate spiny forms are similar to smooth elongate forms in that they are common in grasses. Trichomes or plant hairs are typical of both grasses and sedges. Dicots are represented by angular and parallelepipid forms. Spherasters and sponge spicules derive from the water that this canid drank. Many of the phytoliths exhibited signs of dissolution, which is typical of phytoliths in wet, alkaline environments.

The macrofloral record for Sample 270-26 yielded several conifer charcoal fragments (0.0011 g) too small (~0.25 mm) for further identification (Tables 3 and 4), probably reflecting pines from the uplands burned in wild fires. Ashes and small charcoal particles likely were washed into the Apalachicola River. Tiny conifer charcoal fragments likely entered the digestive tract of the animal as a result of drinking water from the river. Conifer charcoal fragments were submitted for AMS radiocarbon age determination providing a date of 1370 ± 23 RCYBP (PRI-5859) and a two-sigma calibrated age range of 1330–1260 CAL yr. BP or AD 620–690 (Table 5, Figures 2 and 3), reflecting a natural fire event that occurred during the initial portion of the Late Woodland period. Therefore, this coprolite is associated with deposition/occupation that followed this event.

FTIR analysis yielded peaks suggesting the presence of proteins and carbohydrates (Table 6). No credible peaks appear to reflect fats, lipids, or esters. The high amplitude peak at 1023 wave numbers (cm-1) probably represents pectin and less probably starch. Pectin is a common compound in plant cell walls and might be present as a result of consumption of charcoal present in the drinking water. Recovery of a few peaks representing proteins suggests the canid that produced this coprolite ate lean meat.

SUMMARY AND CONCLUSIONS

Pollen, phytolith, macrofloral, radiocarbon, and FTIR analysis were conducted on a canine coprolite (Sample 270-26) recovered from the Otis Hare Site (8LI172), Liberty County, Florida. These analyses provided data indicating this canid drank water that introduced microscopic charcoal recovered in the pollen and macrofloral records. Recovery of only two pollen, one pine and one knotweed, suggests this coprolite might have been deposited in the winter when pollen in the water supply was very limited. Recovery of grass short cells, elongates, and bulliforms suggests either that this canid ate some grass, as they are known to do when their stomachs need settling, or that these phytoliths were part of the water supply. The latter is suggested from recovery of both spherasters and sponge spicules. No starches were recovered in either the pollen or phytolith samples. The FTIR signature suggests eating lean meat.

Several tiny conifer charcoal fragments collected from Coprolite Sample 270-26 were too small for further identification. A date of 1370 ± 23 RCYBP (PRI-5859) obtained on these charcoal fragments indicates a local wild fire burned in this area between AD 620 and 690 (1300-1260 BO). Cultural deposits associated with this coprolite likely were younger than the wild fire event.

TABLE 1. PROVENIENCE DATA FOR SAMPLES FROM OTIS HARE SITE (8LI172), LIBERTY COUNTY, FLORIDA

Sample No.	PRI No. (AMS)	Unit	Level	Depth (cmbs)	Provenience/ Description	Analysis
270-26	5859	TU 1	13	183–196	Coprolite associated with Middle Woodland ceramics	Pollen Phytolith Starch Macrofloral AMS 14C Date FTIR

FTIR = Fourier Transform Infrared Spectroscopy

TABLE 2. POLLEN RESULTS FROM OTIS HARE SITE (8Li172), LIBERTY COUNTY, FLORIDA

Scientific Name	Common Name	Number of Pollen
Pinus	Pine	1
Persicaria	Knotweed	1
Total Pollen		2
Non-pollen:		
Sponge spicule		2
Microscopic charcoal		1481
Tracers		41

TABLE 3. MACROFLORAL REMAINS FROM OTIS HARE SITE (8LI172), LIBERTY COUNTY, FLORIDA

Sample No.	Identification	Part	Charred		Uncharred		Weights/ Comments
			W	F	W	F	
270-26	Water-screened Sample Weight						0.926 g
	CHARCOAL/WOOD:						
	Total charcoal > 0.25 mm						0.0011 g
	Conifer - small	Charcoal		X			0.0011 g
	NON-FLORAL REMAINS:						
	Rock Sand					X X	Few Few

W = Whole F = Fragment X = Presence noted in sample
g = grams mm = millimeters

TABLE 4. INDEX OF MACROFLORAL REMAINS RECOVERED FROM OTIS HARE SITE (8LI172)

Scientific Name	Common Name
CHARCOAL/WOOD:	
Conifer	Cone-bearing, gymnospermous trees and shrubs, mostly evergreens, including the pine, spruce, fir, juniper, cedar, yew, hemlock, redwood, and

TABLE 5. RADIOCARBON RESULTS FOR A SAMPLE FROM OTIS HARE SITE (8LI172)

PRI AMS No. & Sample No.	Sample Identification	AMS 14C Date*	1-sigma Calibrated Date (68.2%)	2-sigma Calibrated Date (95.4%)	δ13C (o/00)
PRI-5859 270-26	Conifer charcoal	1370 ± 23 RCYBP	1310–1280 CAL yr. BP	1330–1260 CAL yr. BP	-26.6
			AD 640–670	AD 620–690	

*Reported in radiocarbon years at 1 standard deviation measurement precision (68.2%), corrected for δ13C

TABLE 6. FTIR PEAK SUMMARY FOR SAMPLES FROM SITE 8LI172, LIBERTY COUNTY, FLORIDA

Peak Range	Represents	Coprolite Sample 270-26
Proteins:		
1700-1350	Protein	1636/27, 1541/49, 1417/15/14
	Proteins: Amino Acids:	
1560, 1415	Glutamate CO2- asymmetric stretching	1417/15/14
1640-1610, 1550-1485	Lysine (amino acid) NH3+ bending	1636/27
1602, 1450, 760, 700	Phenylalanine Benzene ring vibrations	1451/49
1600, 1450	Tyrosine Benzene ring vibrations	1451/49
1450	Valine CH3 Asymmetric bending	1451/49
Carbohydrates (General)		
874	Polysaccharides	878/74/73
	Carbohydrates: Monosaccharides	
915, 840	α–D–glucose	912
915, 900	β–D–glucose	912
	Carbohydrates: Polysaccharides	
1156, 1040, 892, 879	Arabinogalactan (Type II)	878/74/73
872	Arabinogalactan (Type II) + Glucomannan (9:1, w/w), Glucomannan, Galactoglucomannan	878/74/73
3452/3444 2933 2891 1660/59 1626 1558	Chitin (O–H Stretching) Chitin (COCH3 Stretching) Chitin (C–H Stretching) Chitin (C–O Stretching) Chitin (C=H Stretching of N-acetyl group) Chitin (N–H Bending of N-acetyl group)	1636/27
1149, 1064, 1034, 960, 934	Galactoglucomannan	961
1680–1600, 1260, 1152, 1144, 1104vs, 1100, 1047, 1022, 1017, 972, 955/53, 891, 857, 835/34	Pectin	1636/27 1023
1155, 1110, 1082, 1026vs, 931, 850	Starch	1023
1153, 1118, 1041, 945	Xyloglucan	947

FCR = Fire-cracked Rock
vs = Very Strong band
s = Strong band – If the vs or s is next to a number it applies to that number. If it is left of two numbers it applies to both. If it is next to a compound it applies only to that compound at that specific wave number.

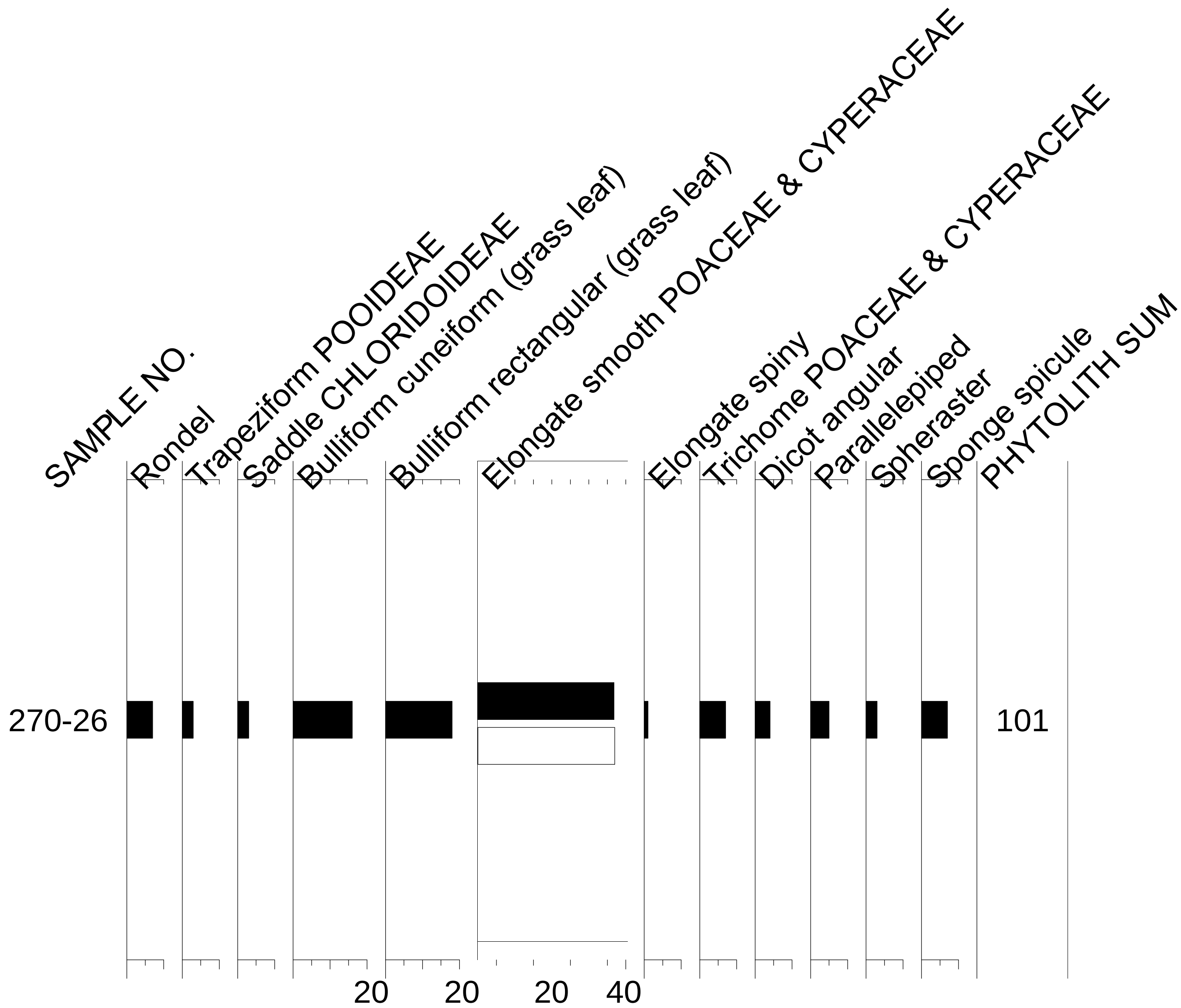
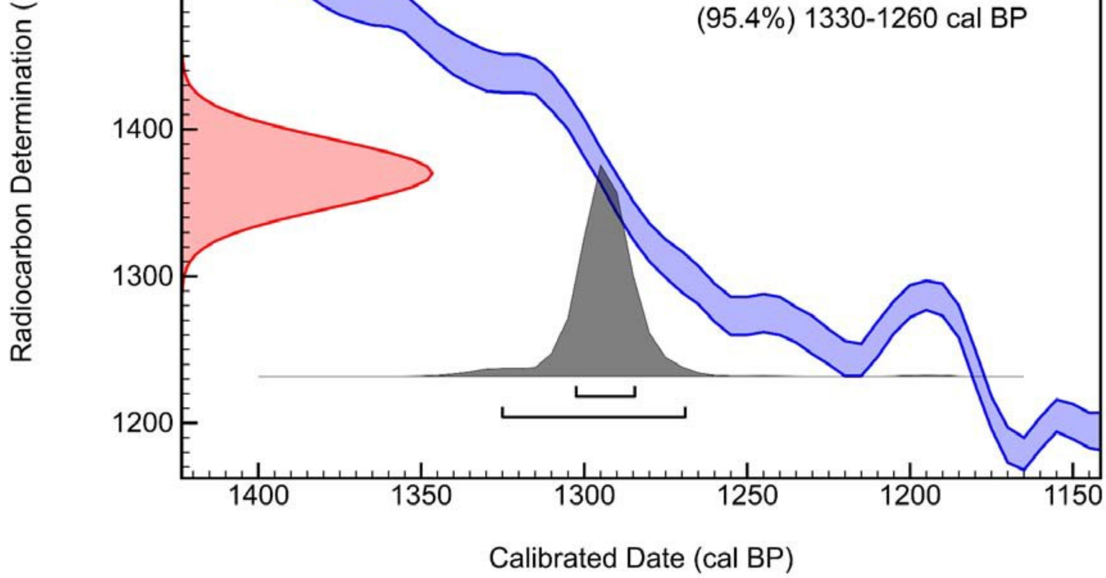
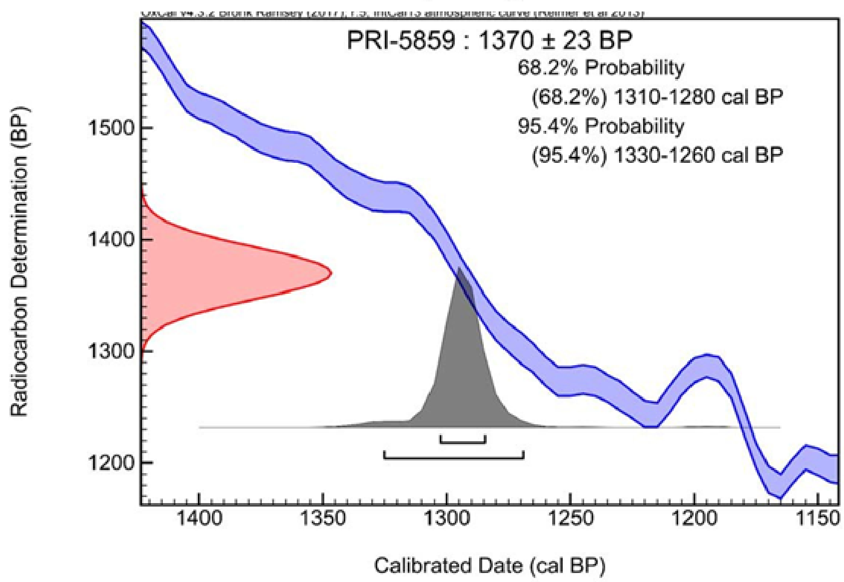


FIGURE 1. PHYTOLITH DIAGRAM FOR SITE 8LI72, LIBERTY COUNTY, FLORIDA.





Intercept Statement. For radiocarbon calibration, PRI uses OxCal4.3.2 (Bronk Ramsey 2009; Bronk Ramsey and Lee 2013), which is a probability-based method for converting ages in radiocarbon years (RCYBP) into calibrated dates (CAL yr BP). This method is preferred over the intercept-based alternative because instead of providing individual point estimates, it reflects the probability of the date's occurrence within a given range (reflected by the amplitude [height] of the curve). As a result, the probability-based method produces more stable calibrated values than do intercept-based methods (Telford 2004). Ongoing refinements and adjustments to the calibration curve have a greater apparent effect on individual points than on ranges.

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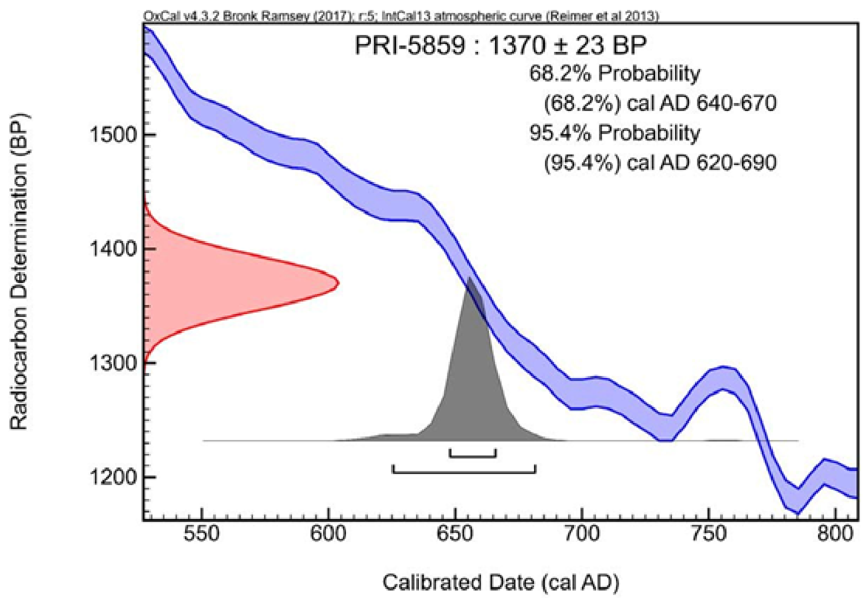
FIGURE 3. PRI-5859 (270-26) CALIBRATION AD.

Laboratory Number (Sample Number): PRI-5859 (270-26)
Sample Identification: Conifer charcoal
Conventional AMS ^{14}C Date: 1370 ± 23 RCYBP
1-sigma Calibrated Age Range (68.2%): AD 640–670
2-sigma Calibrated Age Range (95.4%): AD 620–690
$\delta^{13}C$ ($^{o}/_{oo}$): -26.



Intercept Statement. For radiocarbon calibration, PRI uses OxCal4.3.2 (Bronk Ramsey 2009; Bronk Ramsey and Lee 2013), which is a probability-based method for converting ages in radiocarbon years (RCYBP) into calibrated dates (CAL yr BP). This method is preferred over the intercept-based alternative because instead of providing individual point estimates, it reflects the probability of the date's occurrence within a given range (reflected by the amplitude [height] of the curve). As a result, the probability-based method produces more stable calibrated values than do intercept-based methods (Telford 2004). Ongoing refinements and adjustments to the calibration curve have a greater apparent effect on individual points than on ranges.

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APPENDIX D

DNA OF THREE COPROLITE SAMPLES FROM OTIS HARE SITE, 8LI172

Shapiro Lab Report, by Heather Milne, for Nancy White - 07/20/18
Beth Shapiro, Professor, Ecology and Evolutionary Biology, Director of Evolutionary Genomics
UCSC Genomics Institute, University of California Santa Cruz

Dry Lab Methods

To process both the shotgun and the capture data, we used SeqPrep2 to remove adapter sequences from the ends of each sequenced fragment, and merged paired end reads. This program was also used to remove all reads shorter than 30bp, because the shortest reads cannot be mapped to a reference genome with high confidence. In addition, we removed low complexity reads using the DUST algorithm with PRINSEQ-lite (Schmieder and Edwards, 2011; https://www.ncbi.nlm.nih.gov/pubmed/21278185). After these filtering steps, we mapped the remaining reads to the dog (Canis lupus) nuclear genome (https://www.ncbi.nlm.nih.gov/genome/?term=canis+familiaris) and human nuclear genome hg38 using BWA (Li and Durbin, 2009; https://www.ncbi.nlm.nih.gov/pubmed/19451168). Duplicate reads were removed using Samtools v1.19 (Li H, 2009; http://samtools.sourceforge.net/). To assess the authenticity of the DNA, we assessed each of the reads that mapped to the reference nuclear genome for the characteristic patterns of ancient DNA damage (elevated rates of cytosine deamination at the ends of each read) using mapDamage2 (Jonsson et al., 2013; https://www.ncbi.nlm.nih.gov/pubmed/23613487). We independently mapped the filtered reads to the mitochondrial genomes of wolf (Canis lupus, NCBI ID# NC008092.1), domestic dog (Canis lupus familiaris, GenBank ID# U96639.2), and human (Homo sapiens, NCBI ID# NC012920), using MIA (Green et al, 2008; https://www.ncbi.nlm.nih.gov/pubmed/18692465), an assembler designed for use with degraded DNA. We also used BLASTn (Camacho et al, 2009; https://www.ncbi.nlm.nih.gov/pubmed/20003500?dopt=Citation) to compare all of the filtered reads to the NCBI nucleotide database. The results were summarized using MEGAN6 (Huson et al, 2016; http://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1004957), a program designed to analyze BLAST hits for metagenomic analysis.

Results

Capture Data

Capture (also referred to as enrichment) is an approach that uses a diverse, specifically-designed array of RNA baits to “capture” complementary DNA. This technique is performed on already-completed sequencing libraries. For this approach with the three coprolite samples, we used a set of custom baits ordered from MyBaits, designed to capture fragments of mitochondrial DNA of 73 species of mammalian megafauna. The goal was to capture and amplify fragments from the mitochondria of the target organism (dog), and exclude DNA from bacteria, plants, humans, and other potential contaminant DNA.

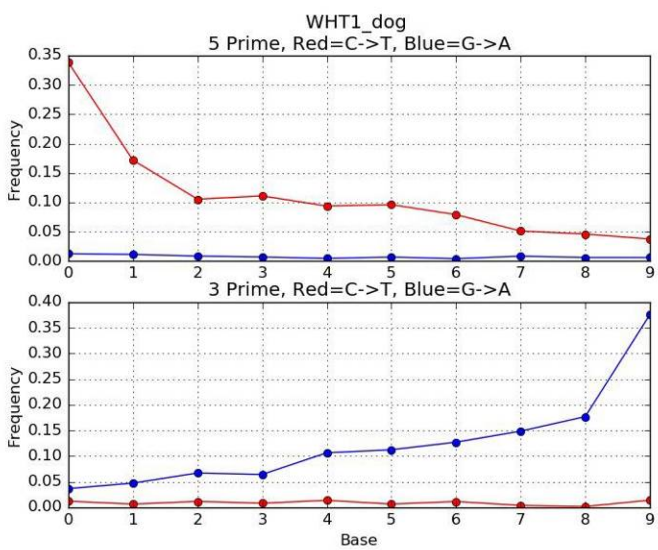
The capture data were analyzed by the pipeline described above. However, the results indicated that the capture was not successful. We can see this clearly, across all three samples, by three methods: 1) We saw close to the same number of reads mapping to the nuclear genome in the captured libraries as in the shotgun libraries. 2) We did not see an increase in the number of mitochondrial reads mapping to the dog mitogenome. 3) Blast results still indicated a very high (94%+) proportion of bacterial reads in the captured library.

If successful, this approach could have potentially allowed us to confirm the presence of dog DNA in the sample. However, with our current results, we cannot draw any conclusions from the absence of dog mitochondrial DNA or the absence of human mitochondrial DNA.

Sample # 8Lil72-90-233 (library IDs WHT1A and WHT1C)

From the shotgun data, we saw 2168 reads mapping to the dog nuclear genome, of a total of 2,607,068 QC-passed reads (0.081% of reads). In comparison, we had 0.0003% of reads mapping to the human nuclear genome. Four reads mapped to both the gray wolf and domestic dog mitochondrial genomes (0.01X coverage), and no reads mapped to the human mitochondrial genome. To provide evidence that this finding is authentic, we analyzed the deamination profile of the reads that mapped to the dog genome (image below). The presence of C -> T transitions at the ends of the fragments indicates that the reads mapping to the dog genome are highly degraded, which is a well-documented signature of ancient DNA molecules. This is also supported by the average size of mapped reads of 51 bp. We also ran BLASTn on the reads that mapped to the dog genome and analyzed the findings using MEGAN6. Of the 163 BLAST hits that matched at the species level, 129 matched to Canis lupus (78.3%).

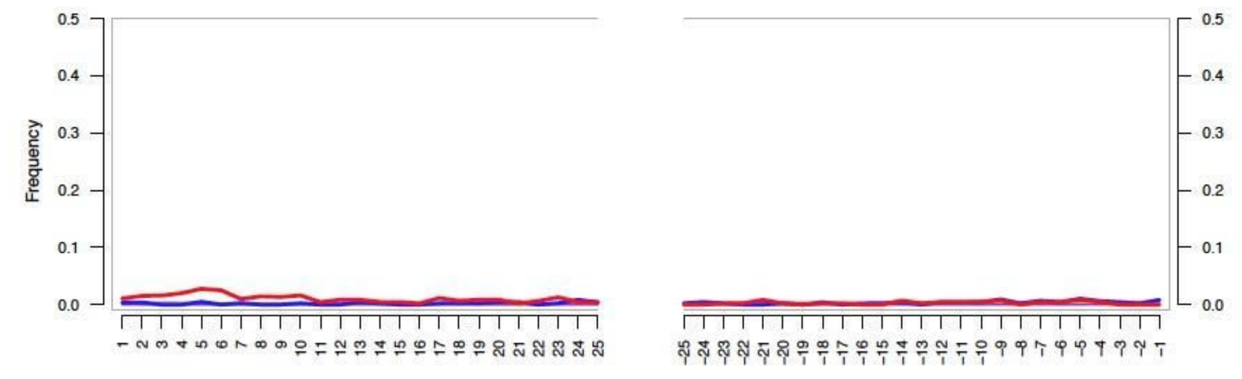
Though the sample was highly degraded, the data suggest that there is authentic ancient dog DNA in the coprolite. However, in order to pursue further questions such as whether the dog is wild or domestic, what the coprolite indicates about the diet of the animal, or the sex of the animal, we would need to produce more extractions and libraries, and conduct more enrichment and sequencing of the libraries.



Sample # 8Lil72-203.18 (library IDs WHT2A and WHT2C)

For nuclear mapping of the shotgun data, 2034 reads mapping to the human nuclear genome (0.052%), of a total of 2,325,562 usable reads, compared to only 71 reads for dog (0.003%). No reads mapped to the mitochondrial genomes of human nor dog.

In order to support the evidence of human DNA, we analyzed the deamination profile of the mapped reads. Unfortunately, the profile showed no C -> T transitions at the ends of the fragments. This lack of deamination, along with the average mapped fragment size of 120 bp, suggests that the reads mapping to the human genome are not of ancient origin.



To see if we could learn about other possible origins of the coprolite sample, we ran BLASTn on the quality-controlled reads, but the vast majority of reads had no hits, and those that did match a database entry were primarily to bacteria (94.5% and 95.5% for each replicate). Because of the highly degraded nature of the sample, and the contamination with modern human DNA, we cannot confirm the origin of the sample with the current data.

Sample # 8Li172-90-270 (library IDs WHT3A and WHT3C)

With 866675 usable reads from the shotgun data, we saw a mix of low-level mapping to the human nuclear genome (145 reads, 0.011% mapping) and dog nuclear genome (130 reads, 0.014% mapping), and no reads mapping to either mitochondrial genome. The capture data showed similar results, with 793 and 145 reads mapping to the human nuclear genome for each of 2 replicates (0.04% and 0.01% mapping, respectively), and 155 and 143 reads mapping to the dog nuclear genome for each of 2 replicates (0.01% and 0.02% mapping, respectively).

Because the number of reads mapping to each genome was so small, we could not successfully create a deamination profile of the mapped reads (any potential signal is obscured by noise).

Finally, we used BLASTn to see what other organisms might be identifiable in the libraries. The overwhelming majority of identifiable reads in the library were bacteria and archaea (a total of 98.59% and 96.44%). Because of the highly degraded nature of the sample, we do not have enough data to make any conclusions about this sample.