Prehistoric shell artifacts from the Apalachicola River Valley area, Northwest Florida

Eric C. Eyles
University of South Florida

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Prehistoric Shell Artifacts from the Apalachicola River Valley Area, Northwest Florida

by

Eric Eyles

A thesis submitted in partial fulfillment of the requirement of the degree of Master of Arts
Department of Anthropology
College of Arts and Sciences
University of South Florida

Major Professor: Nancy Marie White, Ph.D. Brent R. Weisman, Ph.D. Trevor Purcell, Ph.D.

Date of Approval: November 3, 2004

Keywords: Shell artifacts, Prehistoric archaeology, Cultural Resources, Northwest Florida, Apalachicola River Valley

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Dedication

Three things stand out in my life above all others as pinnacles of pride and accomplishment: completing this thesis comes in a distant third. First and foremost rates my marriage. Without my wife, Cary Hopkins Eyles, I would never have taken on graduate school in the first place, and I would no doubt be wandering aimlessly through life. Her love, encouragement, and calls back to reality have grounded my experiences within a sane and joyful dance, and she fills my days with shining laughter.

I would also like to dedicate this work to both my sister-in-law, Meli Mossey, and her husband Mike Mossey. Without their help and support, my second-best accomplishment could not have taken place: my removal, service, and re-installation of the engine from my Volkswagen. They two are always there for me, and I could ask for no better friends.

No dedication would ring true without speaking of my parents, Andrea and Walter Eyles. It was their guidance and direction that ultimately made all of this possible--from giving me eyes to see the beauty of my wife, to the confidence to work on my car, to the Scotch-Irish stubbornness to see a thesis to its end. Thanks Mom and Dad.
Acknowledgments

No thesis is the product of one person. Rather, a whole host of people come together to guide, influence, and encourage the student. To all my family and friends, I say thank-you. To Dr. White, my mentor, I cannot imagine having gotten through this with anyone else. Thank-you Dr. Purcell and Dr. Weisman for making me stretch just a little bit more. Thank-you to Jennifer and Mark Foley--I know I would have starved to death if you hadn't fed me--both with food and spiritual support. Thanks to my brother, Matt Eyles, for being such a rock. Thanks to my sisters, Jennifer Dietz and Heather Perrin--you have always been there for me. To all the Foleys, Trasks, Hopkins, Enrights, and Eyles, the aunts, uncles, cousins, nieces, nephews, and to all those who have gone before me--I feel the deepest gratitude.

To Nelson Rodriguez, my best friend; Rae Harper, April Buffington, Robert Whalen, Cory McNeil Bennett, Karen Mayo, Jon and Cea Catuccio, you are my friends, and have seen me through this. I would also like to say a special thanks to the following for keeping me from losing my mind: The Dave Matthews Band, They Might Be Giants, Donna the Buffalo, Peter Murphy, and Tampa's own WMNF 88.5.
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Prehistoric Shell Artifacts from the
Apalachicola River Valley Area, Northwest Florida

Eric Eyles

ABSTRACT

With this thesis, I aim to fill a gap in our knowledge of shell artifacts from the northwest part of the state of Florida. It represents a first look at the range of shell artifacts in the collections of the University of South Florida (USF) obtained during the ongoing program of archaeological investigations in the Apalachicola Valley and surrounding region. There are 46 sites in the study area that have been identified as yielding shell artifacts, of which samples from 27 sites are curated in the USF Archaeology Laboratory. The proposed typology is based on an analysis of over 2300 specimens collected from archaeological sites in northwest Florida, including the Gulf Coast, barrier islands, St. Joseph Bay, and the Apalachicola River drainage.

Shell artifacts represent one informative set of strategies that pre- and proto-historic Native Americans used to make a living. Despite this recognition, shell artifacts from northwest Florida have thus far received very little attention when compared with collections from south Florida. The paucity of available chert or other stone raw materials probably helped encourage south Florida peoples to utilize
marine shell resources more extensively (White, Fitts, Rodriguez, and Smith 2002:16). The USF Apalachicola collection clearly demonstrates that marine shell played an important role in the lives of prehistoric native peoples from the north Gulf Coast as well. Twenty-two artifact types, including adzes, hammers, and dishes have been identified at 46 sites extending as far as 70 river miles inland.

It is hoped that the research here presented will provide an opportunity to expand our knowledge of how past peoples lived in their everyday settings and help anthropologists categorize material culture in a more organized fashion. The provisional typology of shell tools is intended as a foundation for future work in the Apalachicola River area and in neighboring regions.
Chapter One

Introduction

For more than 20 years, the University of South Florida’s Department of Anthropology has conducted archaeological research in northwest Florida (Figures 1, 2 and 3) under the direction of Nancy White, concentrating on the Apalachicola River drainage. A considerable volume of shell artifacts and ecofacts has accumulated. However, while other archaeological data have been studied, ranging from potsherds to fish vertebrae, the hundreds of pieces of shell have received very little attention.

We know from various studies of shell artifacts relating to other areas of Florida that much can be learned about the everyday life and activities of prehistoric peoples (Beriault 1986; Hudson 1976, 1979; Larson 1980; Marquardt 1992, 1999; Milanich 1979; Wheeler 2001). Certainly, shell does not appear to have been used as extensively in the northwest region of Florida as in the southern areas. The prehistoric Native Americans living in the Apalachicola River drainage may well have preferred chert to the softer marine shell when they could obtain it. And yet, we have clear and unmistakable
Figure 1. State of Florida with Research Area Identified.
Figure 2. Apalachicola River Delta Area with Sites Producing Shell Artifacts Identified.
Figure 3. Apalachicola River Area with Shell Artifact Sites Included in the USF Apalachicola Collection Identified.
evidence for the presence--indeed, in some cases the abundance--of marine shell being fashioned into artifacts.

There are 46 sites in the Apalachicola River basin and adjacent St. Joseph Bay area (Figures 1 and 2, Table 1) that have been identified as yielding shell tools (Barton 1992; Belovich, Brose, Weisman and White 1982; Benchley and Bense 2001; Brose and White 1999; Bullen 1949; Florida Division of Historic Resources 2003; Henefield 1987; Henefield and White 1986; Hutchinson, Simpson, White, and McDaniel 1991; Keel, Johnson and Nelson 1994; Mayo 2003; Miller and Stapor 1981; Moore 1902; Parker 1994; Percy 1976; Tesar, Harp, Ogles, Warzeski, and Horton 1996; White 1987, 1992, 1994a, 1994b, 1996, 1994, 1999, 2001, 2003a, 2003b; White and Estabrook; White, Fitts, Rodriguez, and Smith 2002; Willey 1949). Thus far all shell artifacts have been identified as being made of marine shell. The Department of Anthropology, at its USF Tampa campus laboratory, curates shell artifacts from 27 of these sites (identified on Table 1 with asterisk, Figure 3), predominantly from the lower valley. The sites range in age from 4000 years B.P. to 300 years B.P., classified on the basis of current ceramic seriation.
Table 1. Summary of Archaeological Sites Producing Shell Artifacts in the Apalachicola River Valley.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Site Name</th>
<th>Cultural Component(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calhoun County</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8CA142</td>
<td>*Corbin Tucker Weeden Island/ Ft. Walton</td>
<td></td>
</tr>
<tr>
<td>Franklin County</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8FR1</td>
<td>*Porter's Bar</td>
<td>Deptford, Swift Creek, Weeden Island, Ft. Walton</td>
</tr>
<tr>
<td>8FR8</td>
<td>Brickyard Creek</td>
<td>Swift Creek, Early Weeden Island</td>
</tr>
<tr>
<td>8FR11</td>
<td>Green Point</td>
<td>Swift Creek, Early Weeden Island</td>
</tr>
<tr>
<td>8FR12</td>
<td>*Huckleberry Landing</td>
<td>Swift Creek</td>
</tr>
<tr>
<td>8FR14</td>
<td>*Pierce Mounds</td>
<td>Swift Creek</td>
</tr>
<tr>
<td>8FR24</td>
<td>*St. George West</td>
<td>Fort Walton</td>
</tr>
<tr>
<td>8FR27</td>
<td>New Pass, St. George Island</td>
<td>Fort Walton</td>
</tr>
<tr>
<td>8FR54</td>
<td>St. Vincent Point</td>
<td>Early Weeden Island</td>
</tr>
<tr>
<td>8FR360</td>
<td>Saint Vincent 1</td>
<td>Deptford, Swift Creek-Early Weeden Island, Fort Walton</td>
</tr>
<tr>
<td>8FR366</td>
<td>St. Vincent 7</td>
<td>Swift Creek, Early Weeden Island</td>
</tr>
<tr>
<td>8FR744</td>
<td>*Van Horn Creek Shell Mound</td>
<td>Late Archaic, Fort Walton</td>
</tr>
<tr>
<td>8FR745</td>
<td>*Hendrix 2</td>
<td>Indeterminate Prehistoric</td>
</tr>
<tr>
<td>8FR754</td>
<td>*Sam's Cutoff</td>
<td>Late Archaic</td>
</tr>
<tr>
<td>8FR755</td>
<td>*Thank-You - Ma'am Creek Shell Mound</td>
<td>Fort Walton</td>
</tr>
<tr>
<td>8FR825</td>
<td>St. Vincent Island West Side</td>
<td>Early Archaic, Deptford, Swift Creek, Early Weeden Island, Fort Walton</td>
</tr>
<tr>
<td>8FR864</td>
<td>*Sand Beach Hammock</td>
<td>Late Archaic</td>
</tr>
<tr>
<td>8FR888</td>
<td>*Cape St. George East</td>
<td>Weeden Island/ Ft. Walton</td>
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<td>Gadsden County</td>
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<tr>
<td>8GD1</td>
<td>Aspalaga Landing Mounds</td>
<td>Swift Creek, Early Weeden Island</td>
</tr>
<tr>
<td>Gulf County</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8GU1</td>
<td>Mound Near Indian Pass</td>
<td>Weeden Island II</td>
</tr>
<tr>
<td>8GU2</td>
<td>*Gotier Hammock</td>
<td>Weeden Island</td>
</tr>
<tr>
<td>8GU5</td>
<td>Chipola Cutoff</td>
<td>Swift Creek, Early Weeden Island, Fort Walton, Proto-historic</td>
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(Table 1 continued)

<table>
<thead>
<tr>
<th>8GU10</th>
<th>*Richardson's Hammock</th>
<th>Weeden Island/ Ft. Walton</th>
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<tr>
<td>8GU11</td>
<td>*Black's Island</td>
<td>Weeden Island/ Ft. Walton</td>
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<tr>
<td>8Gu17</td>
<td>*Indian Pass</td>
<td>Indeterminate Prehistoric</td>
</tr>
<tr>
<td>8GU20</td>
<td>*Conch Island</td>
<td>Swift Creek</td>
</tr>
<tr>
<td>8GU55</td>
<td>*Yellow Houseboat</td>
<td>Deptford, Swift Creek, Fort Walton</td>
</tr>
<tr>
<td>8GU56</td>
<td>*Depot Creek Shell Mound</td>
<td>Archaic, Deptford, Early Swift Creek</td>
</tr>
<tr>
<td>8GU60</td>
<td>*Clark Creek Shell Mound</td>
<td>Late Archaic, Deptford, Swift Creek</td>
</tr>
<tr>
<td>8Gu81</td>
<td>Eagle Harbor Site</td>
<td>Swift Creek, Early Weeden Island, Fort Walton</td>
</tr>
<tr>
<td>8Gu85</td>
<td>Old Cedar Site</td>
<td>Weeden Island</td>
</tr>
<tr>
<td>8GU114</td>
<td>*Lighthouse Bayou site</td>
<td>Ft. Walton, Lamar/ Early Historic</td>
</tr>
<tr>
<td>8GU126</td>
<td>*Baby Oak site</td>
<td>Indeterminate Prehistoric</td>
</tr>
<tr>
<td>8GU129</td>
<td>*Door Moss site</td>
<td>Indeterminate Prehistoric</td>
</tr>
<tr>
<td>8GU130</td>
<td>*Lost Crew</td>
<td>Indeterminate Prehistoric</td>
</tr>
<tr>
<td>8GU131</td>
<td>*Treasure Shores Road Turpentine Site</td>
<td>Indeterminate Prehistoric</td>
</tr>
<tr>
<td>8GU132</td>
<td>*Yellow Flower</td>
<td>Indeterminate Prehistoric</td>
</tr>
<tr>
<td>8GU</td>
<td>*Live Oak site</td>
<td>Indeterminate Prehistoric</td>
</tr>
<tr>
<td>8GU149</td>
<td></td>
<td>Indeterminate Prehistoric</td>
</tr>
</tbody>
</table>

**Jackson County**

| 8JA1 | Sampson's Landing | Swift Creek, Early Weeden Island |
| 8JA7 | Curlee | Late Weeden Island, Ft. Walton, Lamar |
| 8JA56 | Rock Shelter | Archaic |
| 8JA104 | Scholz Steam Plant Site | Swift Creek, Early Weeden Island, Late Weeden Island |

**Liberty County**

| 8Li3 | Mound Below Bristol 8Li3 | Swift Creek |
| 8Li4 | Bristol Mound 8Li4 | Swift Creek, Early Weeden Island |
| 8Li5 | Rock Bluff Landing | Swift Creek, Early Weeden Island |
| 8Li172 | *Otis Hare site | Swift Creek, Early Weeden Island, Late Weeden Island, Fort Walton |

**Alabama**

**Houston County**

| 1Ho309 | Oakley Site |

**Henry County**

| 1He94-1 | Mobley Site |

**Georgia**

**Early County**

| 9Er93-1 | King Spring Site |

* Shell artifacts from these sites included in this study

** Please note that Live Oak Homestead site is labeled as 8GuX, as an official site number had not been assigned at the time of this printing
The collection under discussion comprises 2335 pieces of shell. My study involved examination of each of these artifacts.

In an effort to preserve the highest standards of research, at least one view of each shell artifact was digitally photographed. Unlike traditional photography, special attention must be paid when printing digital photographs. The quality of resolution is directly related to the quality of the printing equipment used. Where it was judged advantageous, more than one profile of the item was recorded, including close-up images of interesting features. Thus, 2926 individual digital photographs were taken of 2335 shell artifacts for this research.

Sites that are listed in the Florida Master Site File (Florida Division of Historic Resources 2003) in Tallahassee and in the USF Apalachicola Valley database as containing shell artifacts do not seem to be distributed randomly across the area of study (Figures 2 and 3). As might be expected, sites with shell artifacts occur with more frequency closer to sources of the large marine shells, either the Gulf of Mexico or St. Joseph Bay. The sites at the southern extremes of the Apalachicola River also contain a higher volume of shell artifacts. The use of shell by prehistoric people in northwest Florida to make tools extends from at least as far back as the Late Archaic Period (3000-4000 years before present), as represented by Sam's Cutoff site.
8Fr754 at river mile 7 (Henefield and White 1986; White and Estabrook 1994; White 2003b:27), until the seventeenth century, seen at Lighthouse Bayou site, 8Gu114 (White, Fitts, Rodriguez, and Smith 2002), situated on the southwestern shore of St. Joseph Bay.

This study is primarily focused on examining artifacts to be termed *utilitarian*. Decorative items such as beads, ceremonial items such as gorgets, or indeterminate pieces and debitage from tool manufacture will not receive as much attention, without de-emphasizing the importance of these artifact types.

Thus far little attention has been paid to utilitarian shell technological tools from northwest Florida. While shell ceremonial artifacts have already received attention by archaeologists, utilitarian shell tools have been understudied throughout the southeastern Gulf Coast of the United States (Brown 2003; Brown and Fuller 1992; Neuman 1984; White 1985; White, Fitts, Rodriguez, and Smith 2002:16). Marine shell, whether as beads, carved gorgets, or large engraved gastropod cups, has been found as far away as Spiro in Oklahoma, Monks Mound in Illinois, and Hopewell Mounds in Ohio (Larson 1980:74). However, in contexts so distant from the source of shell raw materials, shell artifacts are exotic and presumably associated with elite status. Studying utilitarian shell tools goes beyond merely filling in a small piece of the mosaic of prehistoric
indigenous lifeways. Tools form a unique and dynamic feature of a culture, representing the very means by which individuals translate their ideas into everyday material reality.

At the very outset, I recognize that shell tools are not glamorous or necessarily aesthetically pleasing (White, Fitts, Rodriguez, and Smith 2002:17). The sites where utilitarian shell tools occur with the highest densities are places where marine gastropods (conchs and whelks) were most bountiful. Simply put, utilitarian shell tools are most often made of common materials. As distance from the sources of marine shell increase, shell becomes increasingly used for decorative and/or clearly status items. And while some marine shells do occur in contexts much farther north, the shells I discuss are nothing if not work-a-day items. They do not provide many (if any) hints of long-distance trade networks (other than along the river proper); I assume they are not elite.

Archaeology is, as a discipline, not exclusively interested in studying elite individuals. Rather, both academics and field archaeologists--especially those working in Cultural Resource Management find it critical to look more and more to the records of common peoples' lifeways, since funding for nearly all archaeological research comes directly or indirectly from average citizens through taxes. Beyond this mercenary reality, the common people have
always provided the bulk of the energy, resources, and the means to conserve and/or to change culture. Non-elites are the main producers in any cultural group, forming the backbone of all societies. Therefore, if we wish to come to a fuller understanding of culture we must carefully study the common people (McGuire 1992:83-84).

We can best demonstrate the value of our research by fostering connections and shared experiences--bringing out facets of the past that would be more familiar to the public. For example a basic claw hammer may be more relevant and directly familiar to a much wider group of people than is a jeweled tiara.

Furthermore, the study of tools gives us a unique avenue from which to explore the very cognitive mindscapes of past peoples:

"Now, tools and signs are not merely collateral categories of human culture. They are not independent entities. They presuppose one another. "Clearly, the production and use of a tool, being a cultural entity, cannot be pre-wired as an instinct or individually developed in a simple learning process. The ways of producing and using a tool can only be transmitted culturally, that is by means of signs. On the other hand, there would be no reason to create signs if not in order to communicate the culturally defined meaning of tools and operations" (Karpatschof 1999:162).

Karpatschof further suggests (1999:162-163) that learning in general, cognitive development, and language acquisition all happen most efficiently when tools are employed. Specific tools become
referenced with specific action sequences, and help to form thought habits (Ristau 1998:131).

Because tools are both cultural augmentations to peoples' ability to modify their environments and symbols, the examination of tools of any kind, shape, size, and function will prove fruitful. We can perhaps even get closer to gaining an emic perspective of these past peoples.

Now that a host of prehistoric shell tools are known for sites in northwest Florida's Apalachicola River area, a typology needs be created to manage the data and to begin to understand what the tools might mean. Therefore, I propose in this thesis to develop a descriptive analysis and classification system of the shell artifact assemblages to aid further research and recognition of this widely used resource. A typology can itself be regarded as a tool made for a purpose (Adams and Adams 1991:8). As James Ford wrote, "This tool is designed for the for the reconstruction of culture history in time and space. This is the beginning and not the end. . ." (1954:52).
Chapter Two

Geographic and Environmental Setting

The USF Archaeological program in the Apalachicola River Valley area has been investigating hundreds of sites for more than two decades. Chapters II and III summarize that endeavor as well as the geographic, environmental and native cultural background of the region to place the shell artifacts in their geographic and cultural contexts.

The Apalachicola River flows south for 107 river miles from the confluence of the Flint and Chattahoochee Rivers at the Jim Woodruff Lock and Dam to the Gulf of Mexico. The river drains about 2,600-square miles (Figures 2 and 3) and its shallow estuary covers about 208 square miles (White 1994a). The drainage area includes parts of six counties: Jackson, Gadsden, Calhoun, Liberty, Gulf, and Franklin (Figure 4). The total area of these counties covers 3,969 square miles, with an estimated 1993 population of 126,992 people. Current population densities vary considerably from county to county, with a high of 83 persons per square mile in Gadsden County, less than an hour west of Tallahassee, to a low of 7 persons per square mile in Liberty County (U.S Census Bureau 2000).
The Apalachicola River only falls 40 ft in elevation as it flows south through the Gulf Coast Lowlands. Tidal influences do not extend beyond 25 miles upstream from the river's mouth. The discharge of the Apalachicola River is the largest in Florida, accounting for 35 percent of freshwater flow on the western coast of Florida (Livingston 1992).

The study area is made up of the Apalachicola River Valley proper, numerous tributary streams and streamlets, St. Joseph Bay, and the barrier islands that have formed at the mouth of Apalachicola Bay. I have included the St. Joseph Bay region even though it is not technically within the drainage limits of the Apalachicola Valley today.
(White, Fitts, Rodriguez, and Smith 2002:1). However, it is located in the lower delta area and was probably once connected to the main river, plus it is a major source of large gastropod shell for prehistoric tools. At this time, only a few shell tools are recorded from sites along the lower Chattahoochee River (White 1994a:6).

The river itself has been steadily migrating from west to east over time. The predominant feature in the lower valley remains a system of archaic sand dunes and swales (White, Fitts, Rodriguez, and Smith 2002:3). The St. Joseph Peninsula provides a well sheltered, shallow bay. No fresh water flows into this bay today (Benchley and Bense 2001:3; White, Fitts, Rodriguez, and Smith 2002:2-3), thus providing a marine environment with a saline concentration comparable to or greater than that of the Gulf of Mexico (Davis 1997:166-167).

The importance of the physiographic system of dunes, swales, and hammocks cannot be understated. The crests of dry, elevated live-oak hammocks stretch across the landscape, providing more comfortable and dry living spaces, while also sheltering a host of plants and animals used by the early indigenous populations. The swales would catch rainwater runoff, and could--depending on the season--play a part in navigation to and from larger streams and creeks, along with providing access to fresh water (White, Fitts,
Rodriguez, and Smith 2002:21-22). The dune and swale system of the lower delta would have been mature, or maturing at the onset of the Holocene (12,000 years B.P.), and was certainly well established by the time of the Early Woodland (3,200 years B.P.; Scott 1992:46-48).

The environmental conditions are significant. The forest and aquatic environments provided a stable and predictable set of resources, such as fresh water, edible and medicinal plants, terrestrial animals, as well as gill and shellfish, including sources of shells for artifact manufacture.

As the Apalachicola River winds from north to south, it picks up large quantities of sand and silt, which are deposited along the Gulf Coast at the base of the river delta. Wave and wind action upon the Gulf shore builds up sand to form the system of barrier islands, which includes St. Vincent Island (Miller and Stapor 1981), St. George Island (Mayo 2003), Dog Island (White, Grammar, and Mayo 1995), as well as the St. Joseph Peninsula (White and Fitts 2001; White et al 2002). The presence of these islands creates rich and relatively protected bays full of shellfish and gillfish, turtles and sea mammals such as dolphins, as well as a host of plants from marshy seagrasses to kelps. These animals and plants would not only have been resources in their own rights, but would have attracted birds and terrestrial animals that
prehistoric aboriginal people could have taken advantage of, hunting, trapping, and netting the choicest foods. The barrier islands also gave native people a base from which to collect Gulf shell. In addition, the extremely salty conditions in St. Joseph Bay provided another source of shell even more accessible from the mainland.

The unique conditions provided by St. Joseph Bay in turn provide unusual prehistoric sites, in that high concentrations of large gastropods form the basis of entire midden structures (White, Fitts, Rodriguez, and Smith 2002:18, 33). Conch Island, 8Gu20, is in fact the crest of a large shell midden that rises above the surface of bay waters (White, Fitts, Rodriguez, and Smith 2002:33). Black's Island (8Gu11) rests on a foundation of black, concreted shell midden (Mayo 2003:8) made in part of lightning whelk and horse conch shells. The structure of Richardson's Hammock (8Gu10) is composed mostly of lightning whelk (White and Fitts 2001:1; White, Fitts, Rodriguez, and Smith 2002:1, 4-5). Likewise, the individual shell piles characterizing Lighthouse Bayou site (8Gu114; White, Fitts, Rodriguez, and Smith 2002:23) are deposits of lightning whelk and horse conch (White 2002:16). In sharp contrast, an inland shell midden rising out of the swamp like Depot Creek (8Gu56) is made of thousands upon thousands of freshwater clamshells, (White 1992:119; White 1994a:10).
The St. Joseph peninsula is a fairly narrow 15-mile long strip of land (Benchley and Bense 2001:3), at some points along the southern extremity less than a mile wide. This no doubt explains why so many rich sites occur along this narrow spit, which allowed for access to both the Gulf waters and the shallow protected Bay (White, Fitts, Rodriguez, and Smith 2002:3).

Like the historic populations until modern times, prehistoric people would have relied heavily on the river and its tributary systems for their livelihoods. In the thick warm temperate forests, no other options besides water networks existed for quick and easy travel over distance--that is, until the railroads and highways were built.

St. Joseph Bay provides for unique marine conditions, along with the freshwater environment of the river system proper, the estuarine waters, the shallows around the barrier islands, and the salty water of the Gulf of Mexico.

The hurricane season runs from approximately August through November, the same for most of the Gulf of Mexico and the Caribbean. The occurrence of large tropical storms no doubt affected prehistoric peoples. While dangerous and potentially destructive, the hurricanes play a vital role in the ecosystems with which they come into contact. The storm surge and heavy wave action would deposit shellfish onto
shore of barrier islands, perhaps providing an additional, easy access to food and fresh shell.

*Shell Artifact Raw Materials*

The unique environmental conditions of the Apalachicola River area result in an abundance of large gastropods in some areas, and other shellfish widely available for food and the raw materials needed for tool manufacture. Interestingly, the same salty waters that large gastropods favor also seem to promote robust populations of *Cliona* sponges, boring organisms that attack and consume the shells of gastropods. Many shells within the USF Apalachicola collection used by prehistoric people bear the scarring and pocking from the *Cliona* (Walker 2003). Even though the perforations do weaken the shell, it appears from many specimens that this does not disqualify the shell for use as tools. However, it suggests that the indigenous people gathered organisms that had already died. Therefore, at least in some cases, prehistoric Native Americans from this region would gather shell specifically as raw material for artifact manufacture, and not merely as a happy by-product of food acquisition.

St. Joseph Bay, the other bays in this valley system, and the Gulf of Mexico (reachable across the various barrier islands) present a
host of shellfish--especially the larger gastropods from which tools were most frequently made. Table 2 presents a list of shellfish species present at sites from the USF Apalachicola Collection, with both their scientific and common names. I will proceed using the convention of referring to shellfish species by their common names.

Although bivalves were certainly collected, in some cases in very high volume, few show evidence of being made into tools. Unlike the south Florida examples of quahog clamshells being used as anvils

Table 2. Shellfish Species Represented in the USF Apalachicola Collection.

<table>
<thead>
<tr>
<th>Scientific name</th>
<th>Common name</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Busycon sinistrum</em> (or <em>contrarium</em>)</td>
<td>lightning or left-handed whelk</td>
</tr>
<tr>
<td><em>Plueroploca gigantea</em></td>
<td>horse conch</td>
</tr>
<tr>
<td><em>Busycon carica</em></td>
<td>knobbed whelk</td>
</tr>
<tr>
<td><em>Melongena corona</em></td>
<td>crown conch</td>
</tr>
<tr>
<td><em>Crassotsrea virginica</em></td>
<td>oyster</td>
</tr>
<tr>
<td><em>Macrocallista nimbosa</em></td>
<td>sunray Venus clam</td>
</tr>
<tr>
<td><em>Mercenaria campechiensis</em></td>
<td>quahog or Venus clam</td>
</tr>
<tr>
<td><em>Rangia cuneata</em> and <em>Polymesoda</em></td>
<td>marsh clam</td>
</tr>
<tr>
<td><em>Fasciolaria</em></td>
<td>tulip</td>
</tr>
<tr>
<td><em>Argopecten irradians concentricus</em></td>
<td>southern bay scallop</td>
</tr>
</tbody>
</table>

(Luer 1986b:139; Marquardt 1992:211), and as adzes (Marquardt 1992:211), the USF Apalachicola collection shows no specimens thus used. Even so, a small number of quahog clams, sunray venus clams, and scallops, as well large amounts of oysters and marsh clams were collected and eaten at bayshore sites (White 1985, 1986, 1994a,
1994b, 1996, 1999, 2001, 2002, 2003a, 2003b; White and Trauner 1987; White and Estabrook 1994). A small number of bivalve shells in the USF Apalachicola collection show marked evidence of being perforated, others appear to have been intentionally cut, and there is some evidence of quahog clam shells being chipped along their edges. This damage may have been the result of extracting the organism for food or of post-depositional processes. The oysters, scallops, and sunray venus shells have all been classified as ecofacts. While the occasional piece of quahog shell may have been fashioned into some kind of artifact, none of the other species show definitive signs of being used as tools.

By far the most abundant shells being used as artifacts, however, are those from large gastropods from the bay and the Gulf. Even though the horse conch, the knobbed whelk, and the crown conch are all represented in the collection, they appear to be mostly ecofacts. Only 1 knobbed whelk tool specimen has been identified, collected from the Lighthouse Bayou site; only 2 crown conch hammers have been recognized. While Brian Parker argues for the inclusion of crown conch shell hammers from the Thank-You Ma'am Creek Site (8Fr744; Parker 1994:141-145), many of the specimens strike me as being too small and the shell too thin for them to have been tools. However, it may that they were used for a very particular
type of work, and it may also be possible that these small hammers were toys of some kind. Eighty-six horse conch artifacts--a mere 4% of the total specimens I examined--have been identified; all save one have provenances in Gulf County. The remaining artifacts, the overwhelmingly largest portion, appear to be made from the left-handed or lightning whelk. In the literature, the lightning whelk has also been called *perversum* and *contrarium*. The organism properly known as *perversum*, or *Busycon perversum* pulleyi, is a holotype of the lightning whelk (looking like but not genetically identical), and occurs from Breton Sound, Louisiana, to Texas and the north Mexican coast (Larson 1980:75). According to the work of Solomon Hollister and others (1958:84-87; Abbott and Morris 1995:222-223; Emerson and Morris 1976:144), the label *Busycon contrarium* refers to the fossil form of the organism, and *Busycon sinistrum* to the modern living animal. The host of differing scientific names applied to this organism through time is why I have opted to use the common name and hopefully avoid confusion.

Numerous explanations for this preference of the single species lightning whelk for artifact use certainly present themselves. The lightning whelk may have been more abundant in the nearby waters. In modern times, St. Joseph Bay is known for its scallop and oyster beds. If oyster populations were robust in prehistory, lightning whelks
would have been attracted to the area, as oysters are a preferred prey (Larson 1980:68). Lightning whelks, in turn, may have been the preferred food of prehistoric aboriginal people (there's no accounting for taste), or the shell itself may have been considered the best for fashioning into tools. Certainly, the lightning whelk shell is more robust than that of the crown conch or the knobbed whelk, but the horse conch shell in many cases appears at least as thick and likely to withstand kinetic stresses (Larson 1980:74-75).
Chapter Three

Prehistoric Cultural Background

In order to place the shell artifacts in temporal and cultural context, this chapter presents a brief overview of the cultural history of the Apalachicola Valley region. Divisions of time into discreet stages or phases do not reflect an objective reality of the past. Rather, these divisions are subjective but necessary to organize and study the data.

Paleo-Indian Period

The earliest people in northwest Florida left a material culture we label Paleo-Indian. Work on the Aucilla river, to the east of the Apalachicola, confirms human occupation as early as 12,000 years ago (Faught, Dunbar, and Webb 1992:11-12). Paleo-Indian stone tools in the Apalachicola River valley tend to cluster along the Chipola River (White 1994a:6; White and Trauner 1987), the largest tributary of the Apalachicola River.

Since few sites have been discovered and excavated by professional archaeologists, the data we have about this time period are incomplete (White 1994a:6; White, Fitts, Rodriguez, and Smith
Small bands of people most likely maintained a nomadic hunter-gatherer lifestyle, following seasonally motivated patterns of plant fruition and of animal migration (Claasen 1985:133-135; White 1994a:7). The most common marker for this time period is the large lanceolate projectile point made from chert (Bense 1994:41-42; Milanich 1994:43).

The climate during the Paleo-Indian period, during the end of the Pleistocene, would have certainly been cooler and drier. Shorelines would have existed much farther out into the present-day Gulf of Mexico (Donoghue 1993). Many sites from this period may therefore have been inundated as the glacial sheets melted, and sea levels rose. Needless to say, it is assumed that people living in Florida at the time would not have restricted their hunting-gathering activities to large animals or small plants; it is likely that aquatic environments were tapped. Shellfish are fairly easy to gather, and provide an excellent, ready source of protein. White and Trauner (White and Trauner 1987) note that no Paleo-Indian materials have been found in the main Valley of the Apalachicola River. However, Clovis and other Paleo points have been recovered along and in the Chipola River, the major tributary to the west, where the main river probably once ran during the Pleistocene. Even though we would expect indigenous people from the paleo-Indian period to have used wood, bone, and shell, little other
than stone preserves over such a long time in normal southeastern U.S. climatic conditions, so we have no shell from the paleo-Indian period in our Apalachicola collection.

_Archaic Period_

The Archaic began about 9,000-10,000 years ago at the end of the Pleistocene. For this period, a more varied archaeological record exists. Environmental conditions during this time period, the onset of the Holocene, began to change toward those of today. Adaptive strategies would also have had to change, as the Pleistocene mega-fauna (i.e. mammoth, mastodon, giant sloth, and American bison) died out and climatic conditions moderated (Milanich 1994:63). Consequently, we infer that a strictly nomadic lifeway was rejected in favor of settlement at larger, seasonal base camps that would be returned to again and again through generations of small kin groups (White 1986). Diagnostic artifacts are various forms of notched and stemmed points (White 1994a:7).

During the Archaic, there is the first evidence for artifacts made from shell, as well as bone. The first appearance of ceramics in northwest Florida occurs during the Late Archaic, as early as 2000 BCE. People made robust vessels that have the epiphyte, Spanish
moss (*Tillandsia usneoides*), used as a temper in the clay paste (White 1994a:8; White 2003b; White and Estabrook 1994).

As the forests matured and resources likely became more stable and predictable, an upsurge in sedentary subsistence strategies took place. This is most evident in the practice of interring human remains, and the expansion and specialization of tool kits.

Rising sea levels from melting glacial ice expanded estuaries, making available more aquatic resources, including-- and especially-- shellfish. Thus it is no surprise that the Late Archaic is the earliest time period to which shell tool specimens may be attributed (Henefield 1987; White 2003b:30; White and Estabrook 1994). A single lightning whelk columella hammer (Figure 5) was recovered from level 3 of a formal test unit excavated at Sam's Cutoff site (8Fr754), a site occupied only during the Late Archaic.

*Woodland Period*

This time period is defined mostly on the basis of ceramics in the Eastern U.S., with sand-tempered wares replacing the fiber-tempered pottery (Milanich 1994:105-106; White 2003a:78).

The earliest archaeological culture within the Woodland Period to be identified in the region of northwest Florida has been termed the
Figure 5. Shell Hammer from Sam's Cutoff (8Fr754), shown in left and right views.
Deptford ceramics tend be made from pastes that have been tempered with sand, or less frequently with grit or grog. Deptford pottery was stamped in linear or checked patterns while the clay was still wet (Benchley and Bense 2001:15; Willey 1949:354). It is suggested for the Early Woodland, about 1000 BCE-200 CE, that increasingly predictable resources and more intense sedentism promoted the development of greater social complexity. A manifestation of this emergent complexity is the appearance of burial mounds on the landscape of the southeastern United States—although no mounds dating to the Early Woodland have yet been recorded in the Apalachicola River drainage (White 1994a:8). Instead, there are large middens or mounds composed primarily of clamshells, oyster shells, aquatic and terrestrial animal bones, as well as stone tools, chert flakes, and Deptford pottery (White 1994a:8). Slightly later during Early Woodland times, Swift-Creek pottery appears. It has distinctive complicated-stamped patterns. Shell tools also appear in the Deptford/ Swift-Creek sites, mostly in the shell midden sites closer to the Gulf of Mexico.

By the Middle Woodland, the people(s) of northwest Florida had begun to construct burial mounds, too. It is at this time that the distinctive Weeden Island pottery appears in the record, with complex incised and/or punctated designs, accompanying the Swift-Creek
ceramics. Swift-Creek/ early Weeden Island sites, both burial mounds and domestic sites of all sizes, are likely to have more exotic artifacts, including shell tools and ornaments. Shell is at this time a valuable ritual item in the eastern U.S. Florida Gulf coast shell is exchanged widely and ends up, for example, in Ohio Hopewell Middle Woodland high status burials (Larson 1980:74). Middle Woodland populations were still hunting, gathering and fishing, though also beginning to start the cultivation of plants in some areas of the southeast.

The introduction of maize agriculture was a slow process, with very little to indicate its presence in northwest Florida until the Late Woodland period (CE 600-1000; Milanich 1994:108, 1974). Perhaps the reliance on aquatic resources tended to retard the perceived advantages of agriculture closer to the coast. Late Woodland material culture is characterized by late Weeden Island pottery, especially check-stamped and plain pottery, and the absence of mounds. For reasons that are not entirely clear, fewer Late Woodland sites have been located in the lower Apalachicola delta than in the northern portion of the river system (White 1986). Since we have few diagnostics in the ceramic assemblage, it can prove difficult to assign Late Woodland affiliation to a site. However, shell artifacts are present at many late Weeden Island sites.
**Mississippian Period**

It is during the Mississippian period that more intensive maize agriculture became prominent, and cultivation also included squash, beans, and local plant varieties. While no doubt hunting, trapping, fishing, and collecting wild plants continued to play vital roles for the people throughout the Southeast, major culture change was taking place beginning around 800-1000 CE.

Evidence for the advent of chiefdoms as a political organization can be seen in the temple mounds and surrounding complexes of plazas and villages. The local manifestation of the Mississippian adaptation is the Fort Walton culture. Many Fort Walton villages and several temple mound centers are situated in the Apalachicola River valley and its associated delta system (White 1994a:9). While inland riverine sites have abundant evidence of maize agriculture (White 1982, 2000)--the hallmark of Mississippian development--most Fort Walton sites in the lower valley and delta region show a continued reliance upon aquatic resources instead (White 1986). Fort Walton sites on the coast and estuaries are typically large shell middens, mostly made from clam or oyster shell. On the salty shores of St. Joseph Bay are Richardson's Hammock (8Gu10) and Lighthouse Bayou site (8Gu114), Fort Walton middens of large gastropods such as the
lightning whelk, and horse conch (White and Fitts 2001:7; White, Fitts, Rodriguez, and Smith 2002:1; White 2003:4-5, 23-25; Willey 1949:452-455). Although inland Fort Walton sites have some shell artifacts, these are few and more often of a ritual nature. But sites on the coast and lower valley have many more utilitarian artifacts of shell, as can be expected.

Lamar/ Protohistoric Period

The arrival of European explorers to the Americas in the early 1500's coincided with the decline and dissolution of the Fort Walton culture (White 1994a:9-10). As Spanish and other European explorers made their way from the newly established ports in the Caribbean and onto the mainland, they disrupted the extant social systems and contributed to the evacuation and near extinction in the peninsula of all native peoples. The rapid spread of European diseases, the aggressive, militaristic and often violent mindset of the conquistadores, and the wholesale disruption of vital social networks all contributed to the depopulation of Florida. The earliest Old World invaders did not get as far as the Apalachicola Valley, but depopulation occurred there anyway from the effects of conquest. Some of the few natives left were missionized in the seventeenth century in the Upper 32
Valley. We have no historic records for indigenous peoples living in the lower valley and estuarine areas (White 1994a:9-10), though they certainly were present and using shell tools. The few survivors were removed to live as slaves in Cuba, with some lucky few fleeing to the west (White et al 2002). The diagnostic archaeological markers for this time period are Lamar ceramics, stamped in large checks and complicated patterns, added to or replacing the Fort Walton ceramic assemblage.

When the remaining local people disappeared due to the effects of colonization, Creek Indians from Georgia and Alabama moved into northwest Florida and later became known as the Seminoles (Hudson 1976:464). The movement of Lower Creek peoples into the Florida peninsula and their subsequent cultural evolution into a separate loose federation of tribes known as the Seminoles was embedded in a complex series of migrations and political maneuvers over the course of more than one hundred years, on both sides of the Atlantic Ocean. The Spanish, the French, the English, the United States, and other Native American groups--even including Upper Creeks--brought their disparate and conflicting interests to bear over time (Covington 1993). The Seminole migrations came in three phases, from the early to mid eighteenth century, from the mid eighteenth century until approximately the U.S. War of 1812, and from the War of 1812 into
the early 1820's (Covington 1993:3). Initially, Seminoles originating in the Apalachicola Valley established themselves as independent from the Creek Confederacy, inhabiting towns across the peninsula and even into Georgia. By the early nineteenth century, the U.S. government applied pressure on the emerging Seminole population for various reasons, in the end attempting to remove them forcibly in the early nineteenth century. Many Seminoles were captured or surrendered and were sent to Indian Territory, while some few were driven to south Florida during the intermittent campaigns waged by the U.S. federal troops, known as the Seminole Wars (Hudson 1976:464-469). While they may have still been using shell for artifacts, we have less knowledge of these tools beyond ethnographic descriptions of mostly ritual items, including shell cups used for Black Drink (Hudson 1976:226, 1976).

In the modern era, the fortunes of northwest Florida have undergone significant fluctuations. Most notably, the port of Apalachicola changed from being the second largest cotton port in the United States before the Civil War, to existing in relative obscurity afterward. The fortunes of Apalachicola, and the region, had been intimately tied to the successful use of the Apalachicola River, and
steamboat travel was still important until the early twentieth century. However, as travel overland became more important, this region went into economic decline (Willoughby 1993:116-120).
Chapter Four

Shell Tool Categories, Distributions, and Previous Studies

The most common shells from which tools were manufactured in the USF Apalachicola collection are the lightning whelk and horse conch. Several easy to identify physical characteristics allow for classification. Figure 6 shows an unmodified lightning whelk shell, with its features listed. These features characterize all the gastropod shell species included in the northwest Florida collection. The lightning whelk aperture is to the left of the columella, large spines develop at the shoulder of the shell, the spire tends to be fairly low pitched, and the body whorl displays growth cycles as ridges running on the long axis of the shell. The horse conch tends to have a channel that runs along the columella itself, the whorl is smooth, the spire is highly pronounced, and the aperture is to the right of the columella (Abbott 1954:236; Hollister 1958:85; Figure 7). The more complete the shell remains, the easier it is to determine the species. The lightning whelk is heavily over-represented in the USF collection (accounting for 96% of the artifacts), and therefore is considered the most likely classification when shell pieces are too small to attribute to species (White, Fitts, Rodriguez, and Smith 2002:18-19, 35).
Figure 6. Generic lightning whelk shell redrawn from Luer 1986a with features labeled.
Figure 7. Examples of large gastropod shells from the Apalachicola River Delta area. The shell on the left is a lightning whelk; the shell on the right is a horse conch.
Though there are freshwater shell middens in the interior riverine habitats of the Apalachicola Valley, most shell midden sites are on the coast or in the estuaries of the lower delta. In plotting the prehistoric sites on a map of the region, it becomes immediately obvious that a high concentration of sites where gastropod and bivalve shell organisms were exploited for food occurs along the southern coast of the river delta (Figure 2). Most of the sites that have produced shell tools are these coastal and estuarine shell middens.

At the same time, the navigability of the river allowed materials from coastal areas to be moved northward. The relative abundance of stone outcroppings upriver providing chert suitable for tool manufacture made transportation of shells and shell tools less necessary for utilitarian reasons than in other regions (White, Fitts, Rodriguez, and Smith 2002:34), although little chert suitable for tool making is found in the southern extent of the Apalachicola River area (Benchley and Bense 2001:4). In some instances, such as the large shell cup from the Corbin Tucker site (Figure 8), a Fort Walton cemetery on a creek upstream at river mile 55 (White 1994a:163), the conclusion seems obvious that the artifact occurs so far north of the Gulf because of its ceremonial context. However, the vast majority of shell artifacts appear to have performed utilitarian functions, even
Figure 8. Lightning whelk shell cup from the Corbin Tucker site (8Ca142), shown with exterior and interior views with soil matrix in place.
when they occur inland. This evidence does not rule out the possibility that shell hammers, adzes, cutting tools, or other tool types could have been reserved for performing ritual or symbolic actions; however, there is little evidence to suggest this scenario, either--with the exception of shell cups.

Typically, the shell cup would be used to hold the famous Black Drink of the Southeastern cultures, a tea made from yaupon holly, *Ilex vomitoria* (Hudson 1976, 1979; Merrill 1979; Milanich 1979). We assume prehistoric use was the same as that described in historic records. As far back as ethnohistoric records go, we find testimonials and depictions of large marine gastropods being used primarily as ceremonial drinking cups (Milanich 1979:83). It seems logical that this practice extended into prehistory as most archaeologists assume, at least as far back as the Middle Woodland, since we have many such shell cups in the archaeological record (as noted, including the one large shell cup in the USF Apalachicola collection). Historically the Black Drink was used as both a social beverage and a purifying emetic; the brew was often ritually consumed in preparation for the holding of ball games (Merrill 1979:49). These games were often played between neighboring villages, strengthening social ties and no doubt engaging in long-standing rivalries. We know lightning whelk cups are found all over the Southeastern U.S.--many may have been
of Gulf shell collected from the Apalachicola region (Claasen and Sigmann 1993:344).

Other ritual items, such as decorative shell gorgets and carved shell objects have not been recovered by USF researchers. However, we know of at least one fine example from the region, the Williams Island shell gorget from Jackson County, currently housed at the Florida Museum of Natural History (Wheeler 2001; Figure 9). Even shell beads, at the very least social in nature, are underrepresented in Apalachicola Valley collections. The acidic conditions of the soils--even in the middens where the calcium carbonate of the shells would sweeten the soil matrix--and the small size of the beads may contribute to this paucity. However, as materials studied from prehistoric contexts indicate, the potential for manufacturing other artifacts, such as hammers, cutting tools, and/ or scrapers is clear.

The earliest archaeological publications dealing with northwest Florida discuss shell artifacts. For example, C.B. Moore (1921:15-18) provides clear and detailed figures of different lightning whelk hammers, (Figures 10 and 11) along with an interview with a local man, who indicated some of the uses to which the smaller hammers were likely to be put. Specifically, those hammers that are depicted in Figure 11 show that gastropods could be secured to a green stake by passing the wood through a hole in the top or apex of the shell, and
Figure 9. Carved Shell Gorget from Jackson County, adapted Wheeler 2001.
Figure 10. Example of Two Shell Hammers redrawn from Moore 1921.
Figure 11. Example of Two Hafted Shell Hammers redrawn from Moore 1921.
then bending the stake back onto itself. Additional holes could be placed, allowing for leather thongs to be passed through to help strengthen the attachment. Once secured in this fashion, small gastropod shells could then be used to perforate other shells, such that the primary gut attachment would be severed causing the animal to slide out the shell aperture (While shell artifact B is referred to as a hammer in Moore's text, it could also be classified as a cutting tool; Carr 1986; Waselkov 1987:103). An example of this type of hafted hammer from the USF Apalachicola collection is depicted in Figure 12.

Florida archaeologists have documented shell artifacts regularly, describing beads, drinking cups, hammers, gouges, picks, pendants, plummets, and columellae (Bullen 1949:6, 1950:23-26, 39, 41; 1966:861; Griffin 1949:22, 124-129; Goggin and Sommer 1949:54-55; Voegelin 1972:50-53). Even with numerous descriptions of shell implements, details and data about shell artifacts (especially utilitarian tools) from Florida in general, and from northwest Florida specifically remained thin. But in south Florida, John Beriault (1986) had compiled the first extensive examination of shell artifacts. Later, William H. Marquardt and Karen Walker built upon Beriault's work, producing what is currently the most detailed work on shell tools (Marquardt 1992; Walker 2000). In his study of Charlotte Harbor archaeology, Marquardt dedicates an entire chapter to the examination
Figure 12. Shell Hammer similar to the one depicted in Moore 1921, from Thank-you Ma'am Creek Site (8Fr755-4).
and analysis of prehistoric shell artifacts—including the placement of artifacts into types, with descriptions. It is to this work that the present study is most heavily indebted as a model classification system.

Numerous striking differences exist between the shell artifacts discussed by Marquardt and those from the Apalachicola River area. Some factors, such as environmental conditions, available species, and availability of stone raw materials no doubt played significant roles in both the similarities and in the differences between the various tool kits. As noted earlier, stone suitable for tool manufacture and use was not in short supply in northwest Florida, whereas its rarity in the Calusa region would have encouraged prehistoric people there to make more extensive use of their shell resources. Table 3 presents both shell artifact types found in Marquardt's study (1992) and those identified within the USF Apalachecola collection. There are, therefore, numerous categories of shell artifacts from south Florida that have no analogs in northwest Florida. We do not see adzes or anvils manufactured from clam shells (Luer 1986b:139); nor do we have evidence for anvils made from larger gastropods (Marquardt 1992:211). In only one case each (thus far) does the Apalachicola material include a shell blank (Luer 1986a, Marquardt 1992:193), a
Table 3. Comparison of Artifact Types Listed in Marquardt and the USF Apalachicola Collection.

<table>
<thead>
<tr>
<th>Shell Artifact Types Listed in Marquardt</th>
<th>Shell Artifact Types defined in the USF Apalachicola Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Hafted Gastropod Tool Blank</td>
<td>Tool Blank</td>
</tr>
<tr>
<td>2 Gastropod Cutting-edged Tool A</td>
<td>Cutting Tool</td>
</tr>
<tr>
<td>3 Gastropod Cutting-edged Tool B</td>
<td></td>
</tr>
<tr>
<td>4 Gastropod Cutting-edged Tool C</td>
<td></td>
</tr>
<tr>
<td>5 Gastropod Cutting-edged Tool D</td>
<td></td>
</tr>
<tr>
<td>6 Gastropod Cutting-edged Tool E</td>
<td></td>
</tr>
<tr>
<td>7 Gastropod Cutting-edged Tool H</td>
<td></td>
</tr>
<tr>
<td>8 Gastropod Cutting-edged Tool I</td>
<td></td>
</tr>
<tr>
<td>9 Gastropod Cutting-edged Tool J</td>
<td></td>
</tr>
<tr>
<td>10 Gastropod Cutting-edged Tool, unhafted</td>
<td></td>
</tr>
<tr>
<td>11 Cutting-edged Tools, Indeterminate</td>
<td></td>
</tr>
<tr>
<td>12 Gastropod Hammer A</td>
<td>Hammer</td>
</tr>
<tr>
<td>13 Gastropod Hammer B</td>
<td></td>
</tr>
<tr>
<td>14 Gastropod Hammer C</td>
<td></td>
</tr>
<tr>
<td>15 Gastropod Hammer D</td>
<td></td>
</tr>
<tr>
<td>16 Gastropod Hammer E</td>
<td></td>
</tr>
<tr>
<td>17 Gastropod Hammer F</td>
<td></td>
</tr>
<tr>
<td>18 Gastropod Hammer G</td>
<td></td>
</tr>
<tr>
<td>19 Gastropod Hammer, unhafted</td>
<td></td>
</tr>
<tr>
<td>20 Hammer, Indeterminate</td>
<td></td>
</tr>
<tr>
<td>21 Gastropod Pounder</td>
<td></td>
</tr>
<tr>
<td>22 Gastropod Hammer/ Pounder</td>
<td></td>
</tr>
<tr>
<td>23 Gastropod Grinder/ Pulverizer</td>
<td>Grinder/ Pulverizer</td>
</tr>
<tr>
<td>24 Notched Gastropod Shell Handle</td>
<td>Shell Handle</td>
</tr>
<tr>
<td>25 Columella Cutting-edged Tool</td>
<td></td>
</tr>
<tr>
<td>26 Columella Perforator</td>
<td>Bi-pointed Columella</td>
</tr>
<tr>
<td>27 Columella Hammer</td>
<td>Columella Tool</td>
</tr>
<tr>
<td>28 Columella Sinker</td>
<td></td>
</tr>
<tr>
<td>29 Columella Plane</td>
<td>Plane</td>
</tr>
<tr>
<td>30 Shouldered Gastropod Adze</td>
<td>Adze</td>
</tr>
<tr>
<td>31 Shouldered Gastropod Adze Blank</td>
<td></td>
</tr>
<tr>
<td>32 Gastropod Adze/ Celt</td>
<td></td>
</tr>
<tr>
<td>33 Gastropod Adze/ Celt Blank</td>
<td></td>
</tr>
<tr>
<td>34 Bivalve Adze/ Celt</td>
<td></td>
</tr>
<tr>
<td>35 Notched Bivalve Shell</td>
<td></td>
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<tr>
<td>36 Anvil</td>
<td></td>
</tr>
<tr>
<td>37 Chopper</td>
<td></td>
</tr>
<tr>
<td>38 Anvil/ Chopper</td>
<td></td>
</tr>
<tr>
<td>39 Bivalve Knife/ Scraper</td>
<td></td>
</tr>
<tr>
<td>40 Perforated Gastropod</td>
<td></td>
</tr>
</tbody>
</table>
Table 3 continued

<table>
<thead>
<tr>
<th>Shell Artifact Types Listed in Marquardt 1992</th>
<th>Shell Artifact Types in the USF Apalachicola Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>41 Perforated Bivalve</td>
<td>Perforated Shell</td>
</tr>
<tr>
<td>42 Notched/ Waisted Shell</td>
<td></td>
</tr>
<tr>
<td>43 Net Mesh Gauge</td>
<td></td>
</tr>
<tr>
<td>44 Spindle Whorl</td>
<td></td>
</tr>
<tr>
<td>45 Gorget</td>
<td></td>
</tr>
<tr>
<td>46 Shell Beads</td>
<td>Shell Beads</td>
</tr>
<tr>
<td>47 Dipper/ Vessel</td>
<td></td>
</tr>
<tr>
<td>48 Cup</td>
<td>Cup/ Dipping Vessel</td>
</tr>
<tr>
<td>49 Saucer</td>
<td>Dish</td>
</tr>
<tr>
<td>50 Spoon/ Scoop</td>
<td>Scoop/ Spoon</td>
</tr>
<tr>
<td>51 Worked Columella</td>
<td></td>
</tr>
<tr>
<td>52 Debitage</td>
<td>Debitage</td>
</tr>
<tr>
<td></td>
<td>Scraper/ Spatula</td>
</tr>
<tr>
<td></td>
<td>Awl</td>
</tr>
<tr>
<td></td>
<td>Indeterminate Tool</td>
</tr>
<tr>
<td></td>
<td>Probable Tool</td>
</tr>
<tr>
<td></td>
<td>Spire-Apex</td>
</tr>
<tr>
<td></td>
<td>Worked Shell</td>
</tr>
<tr>
<td></td>
<td>Fragment</td>
</tr>
</tbody>
</table>

gastropod grinder (Marquardt 1992:203), and what is likely a plane (Marquardt 1992:207).

While Marquardt identifies fifty-two artifact types and their sub-types, it became immediately apparent during my research that the delineation of principal artifact categories such as "hammer" or "cutting-edge tool" into sub-types based on the evidence for different hafting techniques (Lee 1989) or of specific use would prove too subtle for meaningful application to the USF Apalachicola collection. Therefore, both hafted and non-hafted varieties of shell tools are included, along with their descriptions and representative figures.
Analysis will proceed seeking to "divide or take apart... data into as small units as...[one] either chooses or as is possible for purposes of examination and comparison" (Ford 1961:113). The goal is to aid classification and laboratory sorting. Now is therefore judged too early, and our knowledge still too incomplete, to benefit from such a refined analysis.

Yet, I feel better informed for having reviewed the literature on typology creation in archaeology and on shell tools in south Florida. Even if, occasionally, certain artifacts that clearly exist elsewhere could not readily be identified in the USF Apalachicola collection, the study of the extant literature served to expand the awareness of artifact types that may potentially exist.

It was this realization that encouraged the expansion of the review beyond the narrow confines of archaeological literature. Because I recognized a varied artifact assemblage, I thought it pertinent to examine how archaeological remains become classified as tools. Answering this question was critical before laboratory work could commence, as it would help to develop a sorting system under which individual items would either qualify as "Artifact" (tools), or "Ecofact" (food remains). Surprisingly, materials relating to a theoretical understanding of the concept of tools proved elusive. In the end, the most fruitful branch of study was that relating to cultural
ethology. Cultural ethology is the study of animal behavior involving the use and sometimes the fashioning of tools by animals (Ristau 1998).

"Tools are artifacts produced by human beings to facilitate a certain operation within a specific goal-directed action that is a constituent of human activity. Thus, the tool is characterized by a certain functional value. The tool is thereby a culture-specific operational mediator. The tool is a piece of hardware that is not a part of the inborn morphology of the individual; its production and use are, furthermore, not defined by a piece of software that is pre-wired or simply programmed through an individual learning process" (Karpatschof 1999:162).

Beyond initial expectations, it was this portion of the study that yielded the most solid argument for the value of analyzing shell artifacts. There is a pronounced link between cognition, language, and learning to use tools (Karpatschof 1999:162-163). Thus, an investigation of this kind becomes much more than an interesting philatelic exercise. To be sure, the conclusions about how these specific tools and other artifacts could have influenced the development of thought habits and the potential signatures on language remain to be realized. After all, this thesis is but the first step in using the data of the USF Apalachicola collection.
Tools are one artifact category out of many. They shape our mental pictures of the world--they are a very powerful cultural lens, defining what is possible and what is not possible more so than other kinds of artifacts. Tools become how people interact with their natural environment.

These thoughts took center stage during the initial examination of the shell artifact collection from Apalachicola. It is very interesting to see how our own concepts of what tools are--what can be included and what cannot be included--are social categories shaped by our modern culture. The junkiest, rudest, least-lovable chunk of shell may be able to tell us far more about what we actually want to know--the daily lived experiences of past people--than the most beautifully carved ritual object.

My starting point for generating this shell tool typology was in answering a simple question: what purpose do I want this typology to fulfill? A typology should have a practical purpose above all else (Adams and Adams 1991:157-159). In my case, the primary practical purpose is descriptive. No comprehensive data on shell tools from the USF Apalachicola collection have been published to date. I hope that
making such data public will encourage and enhance future research and that archaeologists will be able to use and further refine this typology.

The first step in researching the collection of shell artifacts at USF was to develop a working definition of what qualified as a tool. A multi-disciplinary literature review was performed, seeking out the most helpful definitions of tools in anthropology, including archaeology, primatology, and as far afield as the aforementioned cultural ethology.

Due to the very interesting suggestion that tools are both cultural augmentations to peoples' ability to modify their environments and symbols, the examination of tools of any kind, shape, and or size will prove fruitful (Cushing 1892; Karpatschof 1999). We can take one step closer to defining general trends in the cognitive mindscapes of the past peoples--especially because we have little idea about symbols in prehistory. While the specific thought habits of the prehistoric people who made the artifacts under discussion may not be known at this time, perhaps some first glimpses may be caught.

For the purposes of this research I define shell artifacts as being recognized on the basis of two simple criteria: (1) the shell exhibits deliberate shaping, such as cutting, perforation, or beveling, and/ or
(2) the shell shows evidence of being utilized, such as smoothing from friction, or chipping and spalling from hammering.

Numerous shells exhibited shaping, both deliberate and non-intentional, that is not viewed as the hallmark of tool forms. For example, holes knocked into large gastropod shells just below the shoulder area were considered the results of animal extraction, and not tool manufacture. Square breaks in shell could be the result of simply being stepped on, of bag-wear, or even of being "bounced around the 4-wheeler as we drove along the beach" (White, Fitts, Rodriguez, and Smith 2002:17). Additionally, care was taken to differentiate between use-wear and wear due to exposure on the ground surface. A comparative collection of non-artifact shells (see Figure 7) was used as a point of reference to help to control improperly classifying shells altered by normal site formation processes as being subjected to human modification.

I selected 2649 pieces of shell for investigation at the start of the study based on their identification as artifacts within existing USF archaeological site reports. Of these, 2335 shell artifacts were identified, with the remaining 314 reclassified as ecofacts. A number of these 2335 shells turned out not be tools in their own right, but were instead the by-products of tool manufacture (debitage). Many of the shells gathered on the surface of sites showed signs of Cliona
sponge scarring. The cliona is a boring organism that attacks shells of
dead sea organisms, leaving tiny holes. It has been determined
however, that these holes do not appear to render the shell useless.
Scarred shells have sometimes been made into artifacts, although
such shells may not have been preferred. Perhaps when people were
farther from the coast where shell was less plentiful, damaged shell
was more likely to have been used.

The next operation I performed was to establish a classification
system, building on previous work done at USF (White 2002) and
following Marquardt's classification (1992) system as closely as
possible. Bearing in mind that a type is made up of a combination of
attributes, and therefore has both measurable elements and mental
dimensions (Adams and Adams 1991:30), I was careful to cultivate a
broad set of ideas regarding potential tools, formed through studying
prior publications (Beriault 1986; Brose and White 1999; Bullen 1950,
1966; Goggin 1954; Griffin 1949; Marquardt 1992; Moore 1902,
1921). In certain cases, I have proposed new classifications, with the
goal of refraining from the use of terms that may have modern
analogues that are too specific. For example, where Marquardt opted
to use the term "saucer" (Marquardt 1992:216) to label a class of shell
objects, this thesis proposes the more generic label "dish" in an
attempt to avoid implying specific function. The similarity of the shape
of specimens is the most important attribute in considering whether or not to group specific individuals in one class or another (Read 1982:73). Where a tool does not fit into any existing classification system, it remains important to try to classify the tool in terms of its morphological characteristics and not its presumed functional attributes. Suggestions are made as to how it is imagined that certain items may have been used, but using prejudicial names was avoided as much as possible.

The extant literature dealing specifically with shell tools and the shell tool industry of prehistoric Florida was reviewed, including those by Beriault (1986), Goggin (1954), Griffin (1949), Luer (1986a, 1986b), Marquardt (1992, 1999), C.B. Moore (Moore 1902, 1921), and Walker (2000), to develop a more informed concept for how to approach the large USF Apalachicola collection. A list was compiled of all prehistoric sites that have produced possible shell artifacts in the research area, comprised of the Apalachicola River, Apalachicola Bay, St. Joseph Bay, St. Joseph Peninsula, St. Vincent Island, Dog Island, and St. George Island.

From the full list of shell artifact sites, I then identified those in the USF Apalachicola collection to determine how many specimens I could have available for study. Once this was done, laboratory records were studied from surveys and investigations, including the more
detailed artifact catalogue sheets. In this process, the broadest of standards for inclusion of artifacts in the initial study were maintained. In other words, all shell items originally classified as "artifacts" were pulled out of the collection boxes and bags for inspection. A review of the previous research conducted at USF demonstrated that researchers have maintained a consistent and highly accurate record of classifying specimens as tools. The most common error was one of omission, rather than of inclusion—and even this was admittedly rare.

After becoming familiar with the artifact collection and using it to set up provisional types, I had produced a list of 27 prehistoric sites for further investigation. From these 27 sites, I created a list of artifacts for study. Once the list of artifacts was created, the process of digitally photographing the specimens began. Shells from sites containing the fewest artifacts were photographed first.

During the initial photography phase I noted a small number of cases demonstrating that bag-wear, as evidenced by fresh breaks and notations in the USF archaeological materials catalogue, could cause breaks giving the appearance of human intent. Thus sometimes ecofact shells could end up looking very much like artifacts (Figures 13 and 14). These cases highlight the fact that the very qualities making shell attractive for tool manufacture also potentially cause ecofacts to resemble tools after subjection to normal site-formation processes.
Figure 13. Lightning whelk ecofact from Richardson's Hammock (8Gu10) showing effects of bag-wear. View A shown intact shell; view B shows tip of siphonal canal removed.
Figure 14. Sun-ray venus clam ecofact from Richardson's Hammock (8Gu10) showing effects of bag-wear. The sun-ray venus shell is shown top as collected (whole), and bottom displaying the shell with a piece broken off through bag-wear.
The fact that shell will normally break along straight fracture lines would be very appealing to manufacturers. These attractive shell qualities were demonstrated first hand in 2001 during the USF field school in northwest Florida. While visiting the Little St. George Island preserve, I picked up a modern, medium-sized lightning whelk shell for a simple experiment. I was determined to try to remove the columella and create, if possible, both a shell cup and a columella tool. The fresh shell proved highly resilient. In trying to shape the sample, I had very little success. As a last resort, I used a modern claw hammer to reduce the shell. We noted that even when the head of the hammer penetrated through the shell, little collateral damage occurred. It proved exceedingly difficult to remove the columella, which I finally achieved by breaking it into small pieces. In the end, I succeeded only in fashioning a crude but serviceable shell drinking cup.

Recognizing that tools, which, for lack of a better term, are thought of as "expedient" may also exist in the artifact collection, I made particular efforts to identify shell with any qualities that might indicate use-wear, such as pieces with beveled or worn edges. Specimens with this kind of potential use-wear do not conform readily to established types. Often, these tools were quite small, sometimes under 5 centimeters. However, even today, small plastic hand
scrapers that bear a resemblance to prehistoric shell can be purchased through many retail outlets (Figure 15). The modern scrapers are used to scoop out food from pans or dishes.

The digital format was used to document the shell tools due to its ease, the ability to correct orientation of pictures and to adjust image scales for comparison, its low cost, and the benefits of not having to choose the most photogenic specimens to record. Given access to high quality printing equipment, digital photographs can be reproduced to a quality that approaches traditional print film. The economic benefits, however, stand out as quite profound. For this project, as one example, we could assume that each roll of 24 frames of print film would cost approximately $10 to purchase and subsequently develop. The USF Apalachicola data include approximately 2600 photographs—which were kept: truly a large figure. The merits of using digital photography are clear when compared to a modest cost projection of traditional print film. For example, if we assume that 100 rolls of film would have been needed, and given the above approximate cost per roll for purchase and processing, then this project would have cost at least $1,000.00. The $1,000 figure alone represents the price of a good digital camera. Furthermore, any number of additional photographs were inspected
Figure 15. 2 Modern plastic "Pan" scraper-spatulas. Scraper A was acquired at a local flea market, Hillsborough County, Florida. Scraper B was purchased at retail outlet in northeast Tampa, Florida.
and found lacking--due to poor focus, bad lighting, or incorrect framing--and they could be erased and retaken with no cost other than time.

The ability to take photographs of all shell in the USF Apalachicola collection in a digital format enabled me to examine and re-examine the specimens a half-dozen times, to review categorizations, and to compare specimens with an ease that promoted a gestalt data matrix out of which novel specimens with characteristics deviating from the norm were recognized (Wertheimer 1967:2; Adams and Adams 1991:42-43, 54-56).

Beyond the monetary benefits--which are not small--or perhaps because them, digital photography provides the advantage of not needing to choose which items to photograph. As many shells as were in the collection could be photographed without regard to how representative or how esthetically pleasing the specimens were. The fact that these data are in digital format will also facilitate ease of study over time and space, as anyone around the world can request and receive the complete photographic catalogue of shells from the sites without any appreciable cost. As the technology develops and undergoes refinement over time, the quality of images stored and reprinted will only increase.
Once the photographs were taken, they were loaded onto the lab computer and labeled by their USF catalogue numbers. In cases where more than one artifact shared the same catalogue number and provenience, a secondary number was assigned. For example: 8Gu114-01-1-1, where "8Gu114" is the site number, "01" is the year of collection, and "1" is the catalogue number, the additional "1" represents the particular artifact from a provenience, which included multiple specimens. When more than one photograph was taken of an artifact--which was nearly always to obtain more than one view--an additional letter was assigned: 8Gu114-01-1-1a, 8Gu114-01-1-1b. Handwritten records were also kept to ensure all digital photographs were properly labeled.

A backup copy of the photographs was burned onto 3 compact discs. Next, all photographs were inspected for clarity, and retaken if necessary. Minor flaws, such as hot spots on the image due to lighting (the most common problem) and the orientation of the image were then corrected for in Photoimpact software.

*Raw Materials and Research Biases*

Today, gathering shells of dead shellfish organisms is easy only on Cape St. George, where waves and wind presumably deposit them.
Few large shells are seen on the rest of St. George Island or the other barrier islands.

The most commonly identified tools in the USF Apalachicola collection are tools made in whole or in part from the dense columellae of gastropods. While there are four different gastropods from which tools in the collection have been manufactured, one species appears to have been preferred. Of the horse conch, the crown conch, the knobbed whelk, and the lightning whelk, the USF Apalachicola collection contains more lightning whelk tools (96%). Both the crown conch and the knobbed whelk are less robust than their cousins, and do not achieve quite as large a size. Why the lightning whelk was preferred remains open to conjecture. The horse conch is just as robust as the lightning whelk. Perhaps the species was more abundant, or the meat of the animal was preferred. It also seems possible that the left-handed spiral characteristic of the lightning whelk could have played a role in this selection process (Milanich 1979:86). Ethnographic accounts detail ceremonial significance to left-handedness. It is difficult to determine whether or not other factors played roles in selecting which species of shellfish were collected at archaeological sites. Ethnographic accounts from other shellfishing cultures have tended downplay the collection of shellfish. For example, along the Northwest coast (and many other places) of the
United States, collection of oysters and clams was engendered as women's work (Moss 1993:632). The fact that "optimal times for gathering shellfish during the lowest tides on the days around new and full moons" (Moss 1993:634) may have served as a basis and a reinforcement to the association of shellfishing and women, relying on the connection between lunar and women's menstrual cycles. I do not mean to state that shellfishing for all or any of the prehistoric peoples of northwest Florida was considered women's work. After all, considerable variation can be seen even within the thin ethnographic accounts of shellfisher cultures relating to when, where, and who collected and ate shellfish (Claasen 1986:23, 27, 30; Glasgow and Wilcoxon 1988:42, 47). Furthermore, among the studies I examined all the shellfish under discussion were bivalve species, and even more important, shell tools are mentioned only in passing, if at all (Claasen 1986:22, 26; Moss 1993:634,637; Glasgow and Wilcoxon 1988:41; Waselkov 1987:103).

One factor that could have played a role in limiting tool recognition in this study is the imagination of the researcher. The ability to divine the use to which a particular shell could be put, and thereby place into the shell tool category and not the ecofact category can become an overwhelming Pandora's box. From one moment to the next, all the shells in the collection look like tools, and then none
of them look like tools. Weighing the merits of including or excluding particular specimens makes me realize that simply because I can envision a use does not mean the item was so used. Conversely, simply because I cannot imagine a use doesn't mean the shell is not a tool. Perhaps Timothy Taylor says it best:

"Philosophers of science recognize the "interpretive dilemma" at all attempts at archaeological explanation: in order to interpret something, I must have decided that there is something to interpret. Inevitably, by focusing on that something, I will have already formed some idea of what it is" (Taylor 2002:37).

Tools made out of columellae, which in the broadest sense include hammers, cutting-edged tools, bi-pointed columellae, shell handles, and columellae tools, are the most common in the USF Apalachicola collection, accounting for 17% of all identified tools. Certainly, the columellae of conch and whelk shells are the strongest parts of the shells, are easy to fashion into points, are easy to grasp, and may therefore have been over selected for tool manufacture. In addition, it is a reality that a worked columella seems obviously to be a tool, and would therefore attract attention and be collected in the field.

Of the hammers and cutting-edged tools, many do not exhibit perforations or holes that would be required to attach a handle or haft. Certainly, examples do stand out that exhibit the classic perforations as described by Goggin (1954), most especially by Marquardt (1992),
C.B. Moore (1921), and Willey (1949). It is not clear, though, if this seeming paucity of hafted tools is due to collection bias or if it accurately reflects the archaeological record. Non-hafted tools would have been smaller and easier to carry than tools with handles; perhaps a more mobile population would have preferred this convenience. It is also possible that tool makers and users simply waited to fashion handles until they got to the work site.

The USF Apalachicola collection contains few examples of artifacts outside the utilitarian. Items such as shell beads should be considered tools, but they belong to a different class of tool—social as opposed to utilitarian.

Shell bowls and "scoops/ spoons" have proven harder to identify with confidence. These items have been mostly made from shell body-whorls. As such, they are far less distinctive, and require less effort to produce. In fact, it is not unreasonable to conjecture that normal site formation processes could "create" some of these artifacts, by someone simply stepping on an intact gastropod and thereby fracturing off a section of body whorl. Further examination and analysis remains to be conducted.

The Apalachicola collection also contains a number of small shell tools. Square and rectangular pieces with apparently beveled edges may have been used as scrapers or spatulas, net mesh gauges, or
even game pieces. Slivers of body-whorls, some less than five centimeters long, appear to have use-wear; maybe they were used as awls (Wheeler and McGee 1994:361-636) or engravers. Examples of the smaller tools are rarer, perhaps due mainly to the difficulties associated with making positive identification in the field. Separating these items from the large number of other shell fragments is where a rigorous gestalt analysis proves most valuable (Wertheimer 1967:2; Adams and Adams 1991:42-43, 54-56).

One important fact produces a measure of research bias: the two sites which have the highest concentration of shell tools are the two large gastropod middens, Richardson's Hammock site (8Gu10), and Lighthouse Bayou site (8Gu114; White and Fitts 2001:1). Combined, these two sites account for 2,297 of the 2,343 tools--98% of the samples. Lighthouse Bayou site alone accounts for 1,497, or 63% of the total. Both sites are situated on St. Joseph Bay. The physical location is such that access to both the Gulf of Mexico and the waters of the bay, full of these large gastropods, would have been very convenient. The sites themselves are close enough to be identified by looking across the waters of St. Joseph Bay with the naked eye from one to the other. Having such an abundance of shell resources results in the high volume of shell artifacts from these locations. In addition, all of the artifacts from these two sites seem to
be expedient tools (White, Fitts, Rodriguez, and Smith 2002:22, 30), not the ceremonial items that we might expect the people to have made for exchange, taking advantage of their access to this important resource.

_Economics of Shellfishing_

The ethnographic information regarding cultures that rely upon shellfishing and their economic system remains thin (Hudson 1976:5-9, 76-77, 310; Waselkov 1987:96). In fact, George Waselkov clearly states that, "no recorded modern society has relied primarily on molluscan resources for subsistence (1987:109). Shellfish have been undervalued or even ignored in many studies (Claasen 1991:276-277; Moss 1993:631-632). Much of the existing research refers to groups living on the western coast of the U.S., for example the Chumash (Glasgow and Wilcoxon:1988) and the Tlingit (Moss 1993), the Yuki, and the Yurok (Waselkov 1987:96). A significant bias in the valuation and the reporting of shellfishing activities may be grounded in the engendering of the work of gathering shellfish itself (Claasen 1991:276-277; Waselkov 1987:97, 99). "As in most areas of the world, shellfishing is considered to be primarily women's work" (Moss 1993:632). As women's work, shellfishing may have not been deemed
important enough for informants to speak of; it may have been
discounted by ethnographers; and/or male informants may have been
ignorant of the work (Moss 1993:639). Furthermore, shellfish as a
food source could have suffered low ranking compared to other food
sources by members of a group (Claasen 1991:278; Glasgow and
Wilcoxon 1988:47; Waselkov 1987:146). With particular reference to
my thesis, I must note that even among those studies that have good
information of shellfishing, it is in reference to bivalves--oysters and
clams (Claasen 1986, 1991; Glasgow and Wilcoxon 1988; Hudson

The gathering of shellfish, whether conch, whelk, oyster, or clam
is reportedly easy, although still requiring effort (Glasgow and
Wilcoxon 1988:42). Once a host of factors have been accounted for
(including availability, tides, seasonality, and toxic algae blooms;
Claasen 1991:277; Moss 1993:634, 639) and the location of the
shellfish has been determined, one has but to reach down and pick the
animal up (Waselkov 1987:96), or perhaps dig around slightly.

Ease of gathering has no doubt contributed to the reported
stigma of shellfish as food, as well as to engendering it. Procuring
shellfish may have been relegated to women, children, and/or the
elderly of a group because it was seen as safe and still productive.
Among the Tlingit, shellfish was also associated with poverty (Moss
1993:641). Even if gathering shellfish might have been restricted to certain segments within a population, this may not mean other members would have avoided eating the shellfish (Glasgow and Wilcoxon 1988:47). After all, shellfish could have provided significant dietary protein and nutrients (Claasen 1991:279-283; Glasgow and Wilcoxon 1988:39). In some cases, shellfish beds could have been owned or controlled by kin groups (Moss 1993:635), suggesting value and control of resources.

No doubt, the social milieu surrounding shellfish gathering and consuming is complex. Gender and class both seem to play significant roles in who collects and eats shellfish. It is not clear what treatment the shell itself as a resource would have received. It is likely that corporate or kin control of the shellfish would have included not only the food but also the shell—although I can easily imagine a shift in the gendering of the resource at the intersection of food and tool. In a similar way, many modern U.S. households have a habit of ascribing food preparation a feminine gender, unless it happens outside over and open flame where it is decidedly male. A corporate-kin group could therefore have had control of a food resource and of raw materials for artifact manufacture. It is at least possible that the group collecting the shellfish would also have processed the animals and have been involved in fashioning shell artifacts, or using them in
other ceremonial contexts (Claasen 1991:294-296). Interestingly, women may have been responsible not only for food gathering, but also of tool making, and even control of symbols and ceremonial materials.

Proceeding to utilize ethnographic analogy must be done with caution. There may or may not be definite similarities between how Native American groups viewed and used shellfish. The studies on the Tlingit (Moss 1993) and the Chumash (Glasgow and Wilcoxon 1988), as well as the examination of large riverine shell middens (Claasen 1986; Waselkov 1987) are not only separated in time and space from the prehistoric aboriginal people of the Apalachicola River valley, but are also separated by utility. The large clam and oyster middens were created after acquiring a food resource, and are clearly made of food waste; while the large gastropod middens show unmistakable evidence of shell artifacts—a whole different class of materials.

*Establishing Types*

With these and other considerations in mind, a system of 22 categories for the shell in the USF Apalachicola collection is proposed in this thesis. The categories were conceptualized after reviewing the previous work conducted on this topic and examining every single
artifact in our Apalachicola collection. I approached the development of types following the example of Hodson (1982:23) where he defines "...a type as a class of items and...we chose to regard such a class informally as a cluster of units related to each other by their similarity and separated from units in other clusters by their dissimilarity..." In other words, the individuals within each class look more like each other and less like members of other classes. Individual specimens were placed in a particular class based on evidence of modification or deliberate shaping in preparation for use (tool manufacture) and evidence of use-wear (use of the tool), such as smoothing, chipping, and/or spalling.

Certain categories, such as "Hammer" and "Cutting Tool" have not been broken down into subtypes. It is not clear, upon inspection, if or how refined subtypes might take shape from the USF Apalachicola collection. The USF Apalachicola specimens do not seem to conform enough to Dr. Marquardt's system of fine distinctions, based on the work of Beriault, Goggin, and C. B. Moore. The result of such fine distinctions is a system of 52 shell artifact types in *Culture and Environment in the Land of the Calusa*, chapter 5. Table 3 displays the 52 south Florida shell artifact type categories juxtaposed with the initial 22 artifact category types from northwest Florida. However, within certain tool types such as hammers and cutting-edge tools, a
fairly large variation in size is noted. It is therefore at least conceivable that tool subtypes may be able to be established based on specific tool function. Large hammers may have been used very differently and for very different work when compared to small hammers, as exemplified by the functional differences between a modern sledgehammer and a modern tack hammer. Both are hammers, but with very different applications. However, to divine subtypes with certainty based on size, a series of experiments would have to be conducted, which is beyond the scope of this thesis.

Where possible, the Apalachicola shell tool types were matched up with their correlates from Marquardt's typologies. However, 8 types from the USF Apalachicola collection were not similar enough to have such equivalents. The goal of the typology is, first, to make standard laboratory classification possible. After classification, new hypotheses may be developed and experiments conducted to further our understanding of human behavior.
Chapter Six

Laboratory Research

All of the shells included in this study can be seen as items in themselves, but also as points on a continuum. Like stone tools, shell tools are made through a process of reduction (Masson 1988; Luer 1986a). Use of the artifact continues to reduce and reshape it over time, and may help transform the artifact from type to type. Items that began their use-lives as shell cups could be transformed over time into smaller tools, such as dishes, scoops, or scrapers; cutting tools could become hammers and perhaps eventually bi-pointed columellae. Drawing from the tradition of lithic analysis, it is appropriate to consider shell artifacts from the "perspective that the manufacture of any artifact represents a process of mitigation between functional, technological, and stylistic considerations (Masson 1988; Tomka and Prewitt 1993:50). Placing shell artifacts into specific categories can therefore present a challenging exercise, as the lines that separate one artifact type from another may be very blurry and indistinct (Hester 1993). Simply determining whether a particular shell was an artifact or an ecofact has proven habitually difficult at best (White and Fitts 2001:9-10; White, Fitts, Rodriguez, and Smith 2002:16-17; Waselkov 16987: 103, 148).
Once all of the shell in USF Apalachicola collection had been examined and photographed, the process of first establishing types and then placing each specimen into its type was carried out by inspecting the photos on the computer screen in thumbnail format. This process was chosen to facilitate comparing artifacts from many different sites without risking mixing proveniences, since most specimens were not labeled. The artifacts were classified starting with the broadest of categories, becoming progressively more refined.

A simple categorization tree was put into effect as a sorting rubric (Figure 16). There are three main classes of artifacts: (1) columellae, (2) body whorl fragments, and (3) whole shell. The columella is the central column of the gastropod from which the body whorl spirals out. Any shell with the outer whorl and the columella is considered a whole shell; those with no columella are considered whorl. The handful of bivalve shells in the collection generally falls within the whole shell category. Where marine shell, bivalve or gastropod, occurs upriver, it is more likely to be an artifact by default, since it had to be brought over longer distances for a purpose and usually occurs as a single specimen. The presence of such shell would not be explainable as mere food garbage. Even in instances where little or no modification is evidenced, distance from marine shell sources is more than ample reason for particular scrutiny.
SHELL

GASTROPODS

ECOFACTS
BAG-WEAR
ARTIFACTS
WHOLE SHELL
  hammer
  cutting tool
  tool blank
  probable tool
  indeterminate tool
  worked shell
WHORL FRAGMENTS
  cup
  dish
  scoop/ spoon
  grinder
  scraper/ spatula
  adze
  awl
  bead
  perforated shell
  debitage
  probable tool
  indeterminate tool
  worked shell
  fragment
COLUMELLAE
  hammer
  cutting tool
  columella tool
  bipointed columella
  plane
  probable tool
  indeterminate tool
  debitage
  worked shell
  fragment

BIVALVES

ECOFACTS
BAG-WEAR
ARTIFACTS
  scoop/ spoon
  spatula/ scraper
  perforated shell
  worked shell

Figure 16. Categorization tree used for the USF Apalachicola Collection.
Beyond simple classification, there was a problem with understanding pitting on the tools. After exhausting a number of hypotheses to explain the pitting on some shells, and especially on shell that had all the signatures of being tools, I still had doubts about them. I contacted William H. Marquardt and Zooarchaeologist Karen J. Walker (both of the Florida Museum of Natural History; Marquardt 2003; Walker 2003), who had observed our St. Joseph Bay sites in the field and examined many of our shell artifacts and ecofacts. Upon examining the digital photograph of an adze crafted from the outer body whorl of a lightning whelk shell that exhibits cliona-sponge pitting, it was Dr. Walker who observed that the cuts to make the tool pass through some of the pits (Figure 17, shell B; Walker 2003). This indicates that the shell was collected in a condition in which the cliona damage had already occurred, meaning that the organism was long dead, and then the tool was fashioned (see Appendix B for transcript of this email communication).

Apalachicola Shell Tool Types

Following is a detailed description and discussion of the twenty-two categories of shell artifacts (and a few ecofacts) that constitute
Figure 17. Shell Adzes: Lightning whelk shell adze A from Lighthouse Bayou site (8Gu114) shown left in convex view, and right in concave view. Lightning whelk shell adze B from Clark Creek Shell Mound (8Gu60) shown left in convex view, and right in concave view. Lightning whelk shell adze C from Lighthouse Bayou site (8Gu114) shown left in convex view, and right in concave view.
Table 4. Tool Categories, with Maximum, Minimum, Average and Modal Lengths, in centimeters.

<table>
<thead>
<tr>
<th>Tool Classification</th>
<th>Total Individuals</th>
<th>Max Length (cm)</th>
<th>Min Length (cm)</th>
<th>Ave. Length (cm)</th>
<th>Modal Length (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hammer</td>
<td>137</td>
<td>27</td>
<td>3</td>
<td>13.6</td>
<td>13</td>
</tr>
<tr>
<td>Cutting Tool</td>
<td>23</td>
<td>24</td>
<td>6.5</td>
<td>14.5</td>
<td>13</td>
</tr>
<tr>
<td>Grinder</td>
<td>1</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Tool Blank</td>
<td>1</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Shell Handle</td>
<td>4</td>
<td>24</td>
<td>11</td>
<td>16.9</td>
<td>N/A</td>
</tr>
<tr>
<td>Bi-pointed Columella Tool</td>
<td>133</td>
<td>20</td>
<td>2</td>
<td>6.3</td>
<td>5</td>
</tr>
<tr>
<td>Columella Tool</td>
<td>95</td>
<td>19.5</td>
<td>0.5</td>
<td>7.2</td>
<td>7</td>
</tr>
<tr>
<td>Adze</td>
<td>6</td>
<td>11</td>
<td>5</td>
<td>8.1</td>
<td>N/A</td>
</tr>
<tr>
<td>Cup/ Dipper Vessel</td>
<td>2</td>
<td>23</td>
<td>8</td>
<td>15.5</td>
<td>N/A</td>
</tr>
<tr>
<td>Dish</td>
<td>39</td>
<td>22</td>
<td>3.5</td>
<td>10.9</td>
<td>9.5</td>
</tr>
<tr>
<td>Scoop/ Spoon</td>
<td>80</td>
<td>27</td>
<td>4.5</td>
<td>14.6</td>
<td>15</td>
</tr>
<tr>
<td>Scraper/ Spatula</td>
<td>12</td>
<td>12</td>
<td>4.5</td>
<td>8.8</td>
<td>12</td>
</tr>
<tr>
<td>Awl</td>
<td>9</td>
<td>6</td>
<td>3</td>
<td>4.7</td>
<td>6</td>
</tr>
<tr>
<td>Plane</td>
<td>1</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Bead</td>
<td>4</td>
<td>1.5</td>
<td>1</td>
<td>1.1</td>
<td>1</td>
</tr>
<tr>
<td>Perforated Shell</td>
<td>16</td>
<td>8</td>
<td>2.5</td>
<td>4.1</td>
<td>4</td>
</tr>
<tr>
<td>Probable Tool</td>
<td>12</td>
<td>12</td>
<td>3</td>
<td>5.7</td>
<td>4</td>
</tr>
<tr>
<td>Indeterminate Tool</td>
<td>267</td>
<td>26</td>
<td>1.5</td>
<td>8.2</td>
<td>6</td>
</tr>
<tr>
<td>Worked Shell</td>
<td>74</td>
<td>32</td>
<td>2.5</td>
<td>14.3</td>
<td>20</td>
</tr>
<tr>
<td>Debitage</td>
<td>661</td>
<td>17.5</td>
<td>1</td>
<td>5.5</td>
<td>5</td>
</tr>
<tr>
<td>Apex</td>
<td>19</td>
<td>11</td>
<td>1.5</td>
<td>5.1</td>
<td>5.5</td>
</tr>
<tr>
<td>Fragment</td>
<td>748</td>
<td>18</td>
<td>0.5</td>
<td>4.2</td>
<td>2</td>
</tr>
<tr>
<td>Total Specimens</td>
<td>2335</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
the research of this thesis. Table 4 provides metric data for each category.

The types of "bi-pointed columellae" and "columellae tool" were among the clearest types within the Apalachicola collection and accommodate a host of specimens (229) that showed unmistakable evidence of use and modification. It is assumed that the process of removing a columella completely from the whole shell requires too much energy to occur simply by accident. Many specimens display chipping or spalling at one end, the result of percussion. The bi-pointed columellae remain sharp to the touch, even centuries after deposition.

Marquardt proposed that an artifact similar in appearance to a "Busycon hammer with the anterior [basal] end of the shell . . .left intact" (Marquardt 1992:203-204) may have been used as a handle for other tools. As demonstrated in Figure 18, a similar type of shell artifact does in fact occur in northwest Florida.

Having mentioned the easiest types to see, I must note the most difficult. The "Probable" category became a catchall for items that displayed characteristics simply too suspicious to reject the specimen as "tool" but that do not fit into any established category either. The "Debitage" category exists as separate from "Fragments" because it is
Figure 18. Lightning whelk shell Handle A from Clark Creek Shell Mound (8Gu60, surface) shown in left and right views. Lightning whelk shell Handle B from Lighthouse Bayou site (8Gu114) shown in left and right views. Lightning whelk shell Handle from Lighthouse Bayou site (8Gu114) shown in left and right views. Lightning whelk shell handle from Lighthouse Bayou site (8Gu114) shown in left and right views.
composed mostly of the tips of siphonal canals and small pieces of
columellae. The siphonal canal tips would have been removed as a
necessary step in reducing a raw gastropod shell into either a cutting
tool or a hammer. The small pieces of columellae appear to have been
fractured off existing tools through use, rather than existing as tools in
their own right.

The "Indeterminate" category represents shell specimens that
could either be seen as artifact or as ecofacts. These specimens
usually possess more than one tool characteristic, but lack that
definitive aspect, such as use wear, which gives necessary confidence
to categorize it accurately.

The "Worked Shell" category is made up of items that are most
likely ecofacts, but show suspicious signs of activity beyond food
acquisition. Basically, too much shell damage occurs for mere animal
extraction.

Fragments, therefore, denote the bits of shell that do not
obviously present themselves as related to tool manufacture or use,
though they may very well be. In each case, not enough material was
available to determine whether pieces broke off due to site formation
processes or were the result of human agency. No use-wear is
aparent on samples as well.
Specifics

(1) Hammer. Hammers come in many variations, but all have in common the presence of a blunted basal end of a columella. They may or may not have been hafted for use. The blunting, spalling, and chipping are assumed to be the result of pounding actions.

The gastropod hammer occurs in some form in approximately one-third of the sites I studied (Table 5, Figure 19).

Table 5. Gastropod Hammer tools from the USF Apalachicola Collection.

<table>
<thead>
<tr>
<th>Site Name and Number</th>
<th>Associated culture</th>
<th>Average Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Fr1 Porter's Bar</td>
<td>Deptford, Swift Creek, Weeden Island, Fort Walton</td>
<td>7.5 cm</td>
</tr>
<tr>
<td>8Fr24 St. George West</td>
<td>Fort Walton</td>
<td>12.5 cm</td>
</tr>
<tr>
<td>8Fr744 Van Horn Creek Shell Mound</td>
<td>Late Archaic, Deptford, Fort Walton</td>
<td>9.8 cm</td>
</tr>
<tr>
<td>8Fr754 Sam's Cutoff</td>
<td>Late Archaic</td>
<td>10 cm</td>
</tr>
<tr>
<td>8Fr755 Thank-You-Ma'am Creek</td>
<td>Late Archaic, Deptford, Fort Walton</td>
<td>15.8 cm</td>
</tr>
<tr>
<td>8Gu10 Richardson's Hammock</td>
<td>Deptford, Swift Creek, Early Weeden Island, Fort Walton</td>
<td>13.9 cm</td>
</tr>
<tr>
<td>8Gu56 Depot Creek Shell Mound</td>
<td>Deptford, Swift Creek</td>
<td>6.8 cm</td>
</tr>
<tr>
<td>8Gu60 Clark Creek Shell Mound</td>
<td>Late Archaic, Deptford, Swift Creek</td>
<td>5.5 cm</td>
</tr>
<tr>
<td>8Gu114 Lighthouse Bayou site</td>
<td>Fort Walton, Lamar/ Early Historic Indian</td>
<td>13.6 cm</td>
</tr>
<tr>
<td>8Gux Live Oak</td>
<td>Indeterminate Prehistoric</td>
<td>14 cm</td>
</tr>
</tbody>
</table>
This is a striking number, given that many of the sites received only walking survey. Of 27 sites that are represented in the USF Apalachicola collection, 10 have hammer artifacts. Thirteen hammer specimens were selected to represent the widest range of characteristics, from raw materials, to size and form. They are presented in eight figures that follow.

Figure 20 depicts two hammers crafted from the shell of horse conchs. This species is identifiable by the parallel diagonal ridges on the columella visible in Figure 20 A, upper and lower left. As can be seen, hammer A still retains a fraction of its body whorl, and the basal
Figure 20. Horse conch shell Hammer A from Lighthouse Bayou site (8Gu114) shown in left and right views; horse conch shell Hammer B from Lighthouse Bayou site (8Gu114) shown in left and right views with one close-up of proposed hafting hole.
end is significantly blunted. The basal end of the columella and the tip of the siphonal canal have both been removed. To the right, another horse conch hammer, B, has had a far larger portion of the body whorl removed, and a hole has been punched into the apex. The hole may have been used as the attachment location for a wooden haft or handle.

Figure 21 depicts a single lightning whelk hammer, which shows very little modification for use. As can be seen in the close-up, the basal end shows spalling and chipping that would be associated with its use as a hammer.

The hole in the body whorl just below the shoulder may not have been for hafting, since the hole does not pass close enough to the central columella to withstand the stresses from pounding. Also, the hole itself is very irregular in shape.

Figure 22 depicts one lightning whelk hammer that displays visible spalling at the basal end of the columella. While it is possible that this tool and others like it were attached to handles, it appears more like a hand-held tool.

Figure 23 displays two lightning whelk shell hammers of a less typical shape. Both exhibit the expected reduction of the columellae to a condition better suited for use. A large piece has been removed
Figure 21. Lightning whelk shell Hammer from Lighthouse Bayou site (8Gu114) shown top whorl-side up, bottom aperture-side up, and close-up of end with use-wear.
Figure 22. Lightning whelk shell hammer from Van Horn Creek (8Fr744) shown in left and right views.
Figure 23. Lightning whelk shell hammer A from Richardson's Hammock (8Gu10) shown top left and bottom left in left and right aspects. Lightning whelk shell hammer B from Richardson's Hammock (8Gu10) shown top and bottom right, in left and right views with one close-up of end with use-wear.
along the columella of Shell B, the result of spalling that began at the tip. Both shells bear a striking resemblance to a type of shell hammer (Figure 24) described by Luer (1986:113). He describes this tool type as an intermediary stage of a cutting tool being reshaped into a hammer. Of note is the lack of hafting holes in any of the specimens of this type from the USF Apalachicola collection, but clearly drawn in Luer--again leading me to believe these hammers were hand-held, not hafted. The remaining portion of whorl could have been used as a handle.

Figures 25 and 26 display five of the smaller hammers that are columellae without additional shell. All show signs of wear and blunting at the basal ends with no top, apex, or shoulder material.

Figure 27 depicts a final example of a lightning whelk shell hammer, selected because this specimen shows notching on the lip to accommodate a handle-haft.

(2) Cutting-edge Tool. Cutting tools, like hammers, vary in form and size. They may include the body whorl of the gastropod, or be only made of columellae. The distinctive feature is an angular cut at the basal end of the columella, which provides a cutting edge for the tool. The distribution of these tools is shown in Table 6 and in Figure 28. Seven cutting-edged tools were chosen for display in order to represent the widest range of this type as seen in the USF Apalachicola
Figure 24.  Shell Hammer in the Process of Reduction, redrawn from Luer 1986a.
Figure 25. Lightning whelk shell Hammer A from Lighthouse Bayou site (8Gu114), shown top and bottom left, in left and right views, with 1 close-up of end with use-wear. Lightning whelk shell Hammer B also from Lighthouse Bayou site (8Gu114) shown top and bottom right, left and right views.
Figure 26. Lightning whelk shell hammer A from Lighthouse Bayou site (8Gu114) shown in left and right views. Lightning whelk shell hammers B and C from Lighthouse Bayou site (8Gu114) shown in left and right views, and each with close-up of end with use-wear.
Figure 27. Lightning whelk shell hammer from Cape St. George West site (8Fr24) surface, shown in left and right views.
Table 6. Gastropod Cutting Tools in the USF Apalachicola Collection.

<table>
<thead>
<tr>
<th>Site Name and Number</th>
<th>Cultural Component(s)</th>
<th>Average Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Fr755 Thank You Ma'am Creek Shell Midden</td>
<td>Late Archaic, Deptford, Fort Walton</td>
<td>7.8 cm</td>
</tr>
<tr>
<td>8Gu2 Gotier Hammock</td>
<td>Weeden Island</td>
<td>25 cm</td>
</tr>
<tr>
<td>8Gu10 Richardson's Hammock</td>
<td>Weeden Island, Fort Walton</td>
<td>15.3 cm</td>
</tr>
<tr>
<td>8Gu56 Depot Creek Shell Mound</td>
<td>Deptford, Swift-Creek</td>
<td>10.5 cm</td>
</tr>
<tr>
<td>8Gu114 Lighthouse Bayou site</td>
<td>Fort Walton, Lamar/ Early Historic Indian</td>
<td>14.4 cm</td>
</tr>
</tbody>
</table>

Cutting tools were most likely part of a larger wood-working complex that may also include adzes and planes. Cutting tools from sites included in the USF Apalachicola collection.

Figure 28. Distribution of Sites Producing Gastropod Cutting Tools.
curiously do not exhibit definitive evidence for having been fastened to handles, and many are really quite small.

Figure 29 depicts two horse conch cutting tools, with tool B approximately half as long as tool A. The larger tool A has had more body whorl material removed, but retains its central apex, where tool B displays just the opposite. The close-up of each basal columella end demonstrates the steep angle achieved through reductive manufacturing techniques, resulting in the cutting edge. In Figure 30, two different cutting-edged tools are also depicted. The smaller tool A is little more than the columella of a horse conch, whereas the lightning whelk cutting tool B still retains portions of its body whorl, shoulder, and apex.

Figure 31 shows a fairly large horse conch cutting tool. The distinctive feature is the obvious pitting along the columella. As discussed, the pitting does not mean that the shell would have been rejected as raw material for tool manufacture. Figure 32 displays two smaller cutting tools, derived from lightning whelk shells. In both instances, very little other than the columellae remain, with apparent angular cutting edges achieved through the reductive process.
Figure 29. Horse conch cutting-edge tool A from Lighthouse Bayou site (8Gu114) shown in left and right views with close-up of cutting edge. Horse conch cutting-edge tool B from Lighthouse Bayou site (8Gu114) also shown in left and right views with 1 close-up of cutting edge.
Figure 30. Horse conch shell cutting-edge tool A from Richardson's Hammock (8Gu10) TUA shown in left and right views with close-up of cutting edge. Lightning whelk cutting-edge tool B from Richardson's Hammock (8Gu10) 2, also shown in left and right views with close-up of cutting edge.
Figure 31. Horse conch cutting-edge tool from Gotier Hammock, surface, shown in left and right views.
Figure 32. Lightning whelk cutting-edge tool A from Thank-You Ma'am Creek site (8Fr755) shown in left and right views with 1 close-up of cutting edge. Lightning whelk cutting-edge tool B from Depot Creek (8Gu56) shown in left and right views.
(3) **Grinder/ Pulverizer.** The grinder, as described by Marquardt (1992:203), is a large gastropod with the entire spire and apex of the shell removed down to its shoulder, and then worn smooth (Figure 33).

Thus far, only one gastropod shell grinder has been identified in the USF Apalachicola collection, from the Weeden Island/ Fort Walton component of Black's Island (8Gu11). It is 14 centimeters long on its longest axis.

The major difference between a grinder and hammer or cutting-edged tools is obvious in Figure 33, as the top end of the columella has been worn down and rounded and the siphonal canal has suffered no chipping or spalling resulting from percussive action. That is because the columella and basal end of the shell functions as a handle, and the top is the grinding edge.

(4) **Tool blank.** According to Luer (1986:92) the tool blank represents an early stage in the reduction process in tool manufacture, and is similar to a "primary flake" from lithic technological analysis. Our collection only has one example, shown in Figure 34 with a measurement of 24 centimeters; it appears to conform perfectly to Luer's description. A nearly unmodified gastropod has an oval hole pierced into the apex as diagrammed in Figure 35, between $80^\circ$ and
Figure 33. Lightning whelk shell grinder from Black’s Island (8Gu11) shown top in concave and bottom in convex views.
Figure 34. Lightning whelk shell Tool Blank from Richardson's Hammock (8Gu10) shown left, right, and top views.
Figure 35. Lightning whelk Tool Blank redrawn from Luer 1986a. 120° on a line drawn from the natural end of the suture and the spire/ apex.
The present study's only gastropod shell tool blank was collected from the Fort Walton component of Richardson's Hammock (8Gu10; White and Fitts 2001).

In Figure 34, it can be seen that the basal end of the columella remains, as well as the basal portion of the siphonal canal. If this specimen had been fashioned into a completed tool, these parts of the shell would have been removed. The very top of the apex has been sheared or broken off, most likely to remove the animal from the shell by severing its primary gut attachment (Carr 1986; Waselkov 1987: 103). A single oval hole has been punched just above the shoulder, in the same location as discussed in Luer (1986a). This hole would have been used to affix a handle to the shell.

(5) Shell handle. This tool, as proposed by Marquardt (1992:203-204), is a portion of gastropod made mainly of apex and columella, and is suggested to be used as a handle to haft other tools. Two sites have produced shell handles (Figure 36): a mixed context of Late Archaic, Deptford, and Swift Creek components at Clark Creek Shell Mound (White 1992:139-140; White 1994a:112; White 2003a:73), and a Lamar/ Early Historic Indian component of Lighthouse Bayou site (White, Fitts, Rodriguez, and Smith 2002:31-33). The gastropod handle from Clark Creek Shell Mound measures 19
centimeters; those from Lighthouse Bayou site range in size from 11-24 centimeters, with an average of 16.2 centimeters.

Figure 36. Distribution of Sites Producing Gastropod Shell Handles.

Figure 18 displays 4 proposed lightning whelk shell handles. In each case, very little modification, if any, has occurred at the basal end of the columellae, and yet significant modification has occurred to the rest of the shell. Nearly all of the body whorls have been broken or cut off, and in two of the cases, handles B and C, the entire top portions including shoulders, spires, and apices have been removed. Enough whorl material remains to create a lip that appears to be notched to accept the desired tool.
(6) Bi-pointed columellae. In this tool type, both ends of columellae have been reduced in such a way that they come to fairly sharp points. Use has not been determined but could easily be for poking or boring holes in soft materials. Some suggested functions include those of fishing gorges, punches, awls, and a type of needle. A fishing gorge is an object, pointed at both ends, which is tied to a line around the middle. A fish would take the gorge in its mouth and start to swallow it length-wise. A fisher jerks on the line, causing the gorge to change its orientation from parallel to the throat to lodging perpendicularly, snaring the fish. Examples of this tool in the USF Apalachicola collection are listed in Table 7.

Table 7. Distribution of Bipointed Columellae Shell Tools.

<table>
<thead>
<tr>
<th>Site Name and Number</th>
<th>Cultural Component(s)</th>
<th>Average Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Ca142 Corbin Tucker</td>
<td>Fort Walton</td>
<td>7 cm</td>
</tr>
<tr>
<td>8Fr1 Porter's Bar</td>
<td>Deptford, Swift Creek, Early Weeden Island, Fort Walton</td>
<td>8 cm</td>
</tr>
<tr>
<td>8Fr744 Van Horn Creek Mound</td>
<td>Deptford, Fort Walton</td>
<td>13 cm</td>
</tr>
<tr>
<td>8Fr754 Sam's Cutoff</td>
<td>Late Archaic</td>
<td>4 cm</td>
</tr>
<tr>
<td>8Fr888 Cape St. George East</td>
<td>Weeden Island, Fort Walton</td>
<td>9.5 cm</td>
</tr>
<tr>
<td>8Gu10 Richardson's Hammock</td>
<td>Deptford, Swift Creek, Early Weeden Island, Fort Walton</td>
<td>4.8 cm</td>
</tr>
<tr>
<td>8Gu11 Black's Island</td>
<td>Weeden Island, Fort Walton</td>
<td>7.1 cm</td>
</tr>
<tr>
<td>8Gu114 Lighthouse Bayou site</td>
<td>Fort Walton, Lamar/ Early Historic Indian</td>
<td>7.4 cm</td>
</tr>
<tr>
<td>8Gu130 Lost Crew Site</td>
<td>Indeterminate Prehistoric</td>
<td>6 cm</td>
</tr>
</tbody>
</table>
Figure 37. Distribution of Sites Producing Bipointed Columella Tools.

Distribution of this tool type is shown above in Figure 37; in Figures 38 and 39 fifteen bi-pointed columellae are shown. It is assumed intentional human agency played a large role in reducing gastropod shells to this form, since the amount of material removed from the raw gastropod shells seems to preclude simple accident, and obviously the points are deliberately sharpened.

(7) Columella tool. As with bipointed columellae, it is assumed that completely separating the columella from the parent shell requires enough energy that it rarely occurs by accident. Columella tools can
Figure 38. Lightning whelk bipointed columella tool A from Lost Crew site (8Gu130) shown in left and right views. Lightning whelk bipointed tools B and C from Black’s Island (8Gu11) each shown in 1 view. Lightning whelk bipointed tools, D, E, F, and G from Richardson’s Hammock (8Gu10), each shown in 1 view. Horse conch bipointed columella tool H from Lighthouse Bayou site (8Gu114) shown in left and right views. Lightning whelk bipointed columella tool I from Lighthouse Bayou site (8Gu114) shown in left and right views.
Figure 39. Lightning whelk bipointed columella tool A from the Corbin Tucker site (8Ca142) shown in left and right views. Lightning whelk bipointed tool B from Cape St. George East (8Fr888) shown in left and right views. Lightning whelk bipointed tool C from Sam's Cutoff (8Fr754) shown in 1 view. Lightning whelk bipointed tool D from Porter's Bar (8Fr1) shown in 1 view. Lightning whelk bipointed tool E from Van Horn Creek Shell Mound (8Fr744) shown in left and right views.
have the look of hammers, but lack enough specific features for confident categorization. Many have a distinctive point at one end. Columellae tools are no doubt closely related to the more complete artifacts, which are easier to classify. Distribution is shown on Table 8.

Table 8. Distribution of Columella Tools.

<table>
<thead>
<tr>
<th>Site Name and Number</th>
<th>Cultural Component(s)</th>
<th>Average Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Fr1 Porter's Bar</td>
<td>Deptford, Swift Creek, Weeden Island, Fort Walton</td>
<td>9.5 cm</td>
</tr>
<tr>
<td>8Fr24 St. George West</td>
<td>Fort Walton</td>
<td>7.5 cm</td>
</tr>
<tr>
<td>8Fr744 Van Horn Creek Shell Mound</td>
<td>Archaic</td>
<td>9.5 cm</td>
</tr>
<tr>
<td>8Fr864 Sand Beach Hammock</td>
<td>Late Archaic patented town</td>
<td>16.5 cm</td>
</tr>
<tr>
<td>8Gu2 Gotier Hammock</td>
<td>Indeterminate Prehistoric</td>
<td>7.5 cm</td>
</tr>
<tr>
<td>8Gu10 Richardson's Hammock</td>
<td>Deptford, Swift Creek, Early Weeden Island, Fort Walton</td>
<td>4.6 cm</td>
</tr>
<tr>
<td>8Gu11 Black's Island</td>
<td>Weeden Island, Fort Walton</td>
<td>6.2 cm</td>
</tr>
<tr>
<td>8Gu56 Depot Creek Shell Mound</td>
<td>Deptford, Swift-Creek</td>
<td>3.75 cm</td>
</tr>
<tr>
<td>8Gu60 Clark Creek Shell Mound</td>
<td>Deptford, Swift-Creek</td>
<td>11.8 cm</td>
</tr>
<tr>
<td>8Gu114 Lighthouse Bayou site</td>
<td>Fort Walton, Lamar/ Early Historic Indian</td>
<td>8.7 cm</td>
</tr>
<tr>
<td>8Gu126 Baby Oak Site</td>
<td>Indeterminate Prehistoric</td>
<td>11.5 cm</td>
</tr>
<tr>
<td>8GuX Live Oak</td>
<td>Indeterminate Prehistoric</td>
<td>7 cm</td>
</tr>
<tr>
<td>8Li172 Otis Hare site</td>
<td>Swift Creek, Early Weeden Island</td>
<td>11.8 cm</td>
</tr>
</tbody>
</table>
Columellae tools may be remnants of cutting-edged tools or hammers, or may have been made as pointing, punching tools in their own right. Their distribution is displayed in Figure 40. Eleven columella tools are shown in Figures 41 and 42. These particular columella tools were also selected from Richardson's Hammock (8Gu10), each shown in left and right views to demonstrate the range of artifacts that can be assigned to this category. Little remains of shoulders, body whorls, spires, or shell apices. It is apparent in all cases that to achieve this level of reduction, a reasonably high level of effort and energy must have been expended.

Figure 40. Distribution of Sites Producing Columella Tools.
Figure 41. Lightning whelk columella tools A and B from Clark Creek Shell Mound (8Gu60) each shown in left and right views. Lightning whelk columella tool C from Richardson's Hammock (8Gu10) shown in left and right views.
Figure 42. Lightning whelk columella tool A, from Otis Hare site (8Li172) shown in left and right views. Lightning whelk columella tools B and C from Cape St. George West site (8Fr24) each shown in left and right views. Lightning whelk columella tool D from Baby Oak site (8Gu126) shown in left and right views with 1 close-up of end with use-wear.
(8) Adze. Comprised of fragments of gastropod body whorls, adzes tend to be roughly trapezoidal in shape, and display an obvious beveled edge. Table 9 shows Adze distribution within this data set.

Table 9. Distribution of Adze Shell Tools.

<table>
<thead>
<tr>
<th>Site Name and Number</th>
<th>Cultural Component(s)</th>
<th>Average Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Gu10 Richardson's Hammock</td>
<td>Fort Walton</td>
<td>10 cm</td>
</tr>
<tr>
<td>8Gu56 Depot Creek Shell Mound</td>
<td>Deptford, Swift-Creek</td>
<td>12 cm</td>
</tr>
<tr>
<td>8Gu60 Clark Creek Shell Mound</td>
<td>Deptford, Swift-Creek</td>
<td>10 cm</td>
</tr>
<tr>
<td>8Gu114 Lighthouse Bayou site</td>
<td>Fort Walton, Lamar</td>
<td>9 cm</td>
</tr>
</tbody>
</table>

Six adze tools are displayed in Figures 17, 43, and 44. As in previous artifact types, a broad selection was chosen to demonstrate the range of size and shape. These tools, like cups, dishes, scoops, and scrapers discussed later, are made from the body whorls of gastropod shells. All adzes shown have a steeply angled beveled working edge along the long side of the trapezoid (arrows on Figure 44). The narrow side of the trapezoid is the edge that would be attached to a handle, pointed out by arrows in Figure 43. In Figure 17, adze B shows damage from the cliona sponge. This specimen displays a cut used to craft the tool passing through a number of pre-
Figure 43. Lightning whelk shell adze from Depot Creek Shell Mound (8Gu56), shown top left in concave view, top right in convex view, and bottom in close-up of beveled working edge.
Figure 44. Lightning whelk shell adze A from Richardson's Hammock (8Gu10) shown top left in edge-on view, top right convex view, and middle left as close-up of beveled working edge. Lightning whelk adze B from Richardson's Hammock (8Gu10) shown bottom left in concave view and bottom right in convex view.
existing pits, indicating that the shell was gathered after the scarring had taken place. The presence of adzes indicates that a relatively specialized type of woodworking was taking place, in that the adze is a more precise and refined tool than a simple gastropod cutting tool. Distribution of adze tools is given in Figure 45, above.

(9) *Cup or dipping vessel.* In this artifact the entire columella has been removed from the gastropod, leaving the body whorl, apex, outer lip, and most of the siphonal canal intact. This provides a container of fair volume to hold liquids. Currently, the USF Apalachicola collection includes shell cups from two sites (Figure 46):
Corbin Tucker (8Ca142), a Fort Walton cemetery, and the Deptford component of Depot Creek (8Gu56; White 1994a). They measure 23 centimeters and 7.5 centimeters long, respectively.

Figures 8 and 47 show lightning whelk shell cups. The very large cup shown in Figure 8 was collected from the Corbin-Tucker site (8Ca142), far inland on a meander in the river, in a context that suggests it was a status object. It was excavated from a cemetery that had other high-status grave goods such as greenstone celts, copper discs, and Fort Walton pottery. The cup is made from one of
Figure 47. Lightning whelk Shell cup from Depot Creek Shell Mound (8Gu56) shown top in concave view and bottom in convex views.
the largest examples of lightning whelk in the collection. The inside of the shell still holds a large volume of the original soil matrix, awaiting processing. The shell cup shown in Figure 47 is a much smaller specimen from the Depot Creek Shell Mound (8Gu56; White 1994a), and serves once again to demonstrate the size range within artifact types. The essential features are the same, each cup possessing an intact, high-walled interior space that would serve to hold liquids or solids, as well as retaining some portion of the lower siphonal canal, perhaps to service as a handle to the vessel.

Shell cups are closely associated with consumption of yaupon tea or the Black Drink. Thus, one would expect this artifact to be found more regularly inland than other, more expedient tools. After all, the utilitarian tools could be crafted from chert sources, but large drinking cups could not. Certainly, consumption of the Black Drink was not restricted entirely to high ceremonial contexts, but it was always an integral part of the native social fabric of the southeast. Using shell cups may have been the "right way" to consume Black Drink. In a modern analog, the hot beverage from Argentina, Yerba Mate, a tea made from Ilex paraguarensis, which is related to Ilex vomitoria (Hu 1979:32; Hudson 1976:226), is properly consumed from a wooden cup through a filtering straw.
(10) *Dish.* Exclusively made of a body-whorl fragment, the dish will have a fairly pronounced concave aspect, although less so than a cup, which may have served to hold either solids or liquids. Dish distribution is shown on Table 10 and Figure 48.

**Table 10. Distribution of Shell Dishes.**

<table>
<thead>
<tr>
<th>Site Name and Number</th>
<th>Cultural Component(s)</th>
<th>Average Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Gu10 Richardson's Hammock</td>
<td>Deptford, Swift Creek, Early Weeden Island, Fort Walton</td>
<td>8.6 cm</td>
</tr>
<tr>
<td>8Gu20 Conch Island</td>
<td>Indeterminate Prehistoric</td>
<td>7.5 cm</td>
</tr>
<tr>
<td>8Gu114 Lighthouse Bayou site</td>
<td>Fort Walton, Lamar/ Early Historic Indian</td>
<td>11.4 cm</td>
</tr>
</tbody>
</table>

![Figure 48. Distribution of SitesProducing Shell Dishes.](image)
The Dish artifact type is shown in Figures 49 and 50, with five individual examples. The two sides of each artifact are displayed. It is easy to see how a dish may be related to a cup in the same way that hammers and columellae tools may be related to cutting tools. The significant remaining portion of the body whorl is not as high-walled as in the cup, so the interior is flatter and possibly more suitable to hold solid material.

(11) Scoop/ spoon. Scoop/ spoon artifacts appear more commonly in the USF Apalachicola collection (Table 11). They are perhaps related to the cup or dipping vessel in the same way that

Table 11. Distribution of Shell Scoop/ Spoons.

<table>
<thead>
<tr>
<th>Site Name and Number</th>
<th>Cultural Component(s)</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Fr12 Huckleberry Landing</td>
<td>Swift Creek</td>
<td>15 cm</td>
</tr>
<tr>
<td>8Fr744 Van Horn Creek Shell Mound</td>
<td>Late Archaic, Deptford, Fort Walton</td>
<td>24 cm</td>
</tr>
<tr>
<td>8Fr755 Thank You Ma'am Creek Shell Midden</td>
<td>Late Archaic, Deptford</td>
<td>22 cm</td>
</tr>
<tr>
<td>8Gu10 Richardson's Hammock</td>
<td>Deptford, Swift Creek, Early Weeden Island, Fort Walton</td>
<td>11-27 cm, 18.2 cm ave.</td>
</tr>
<tr>
<td>8Gu11 Black's Island</td>
<td>Deptford, Early Weeden Island, Fort Walton</td>
<td>9-20 cm, 14.1 cm ave.</td>
</tr>
<tr>
<td>8Gu17 Indian Pass</td>
<td>Indeterminate Prehistoric</td>
<td>12 cm</td>
</tr>
<tr>
<td>8Gu20 Conch Island</td>
<td>Indeterminate Prehistoric</td>
<td>15-16 cm, 15.5 cm ave.</td>
</tr>
<tr>
<td>8Gu56 Depot Creek Shell Mound</td>
<td>Deptford, Swift-Creek</td>
<td>8-8.5 cm, 8.3 cm ave.</td>
</tr>
<tr>
<td>8Gu60 Clark Creek Shell Mound</td>
<td>Deptford, Swift-Creek</td>
<td>9-24 cm, 16.8 cm ave.</td>
</tr>
<tr>
<td>8Gu114 Lighthouse Bayou site</td>
<td>Fort Walton, Lamar/ Early Historic Indian</td>
<td>4.5-22 cm, 13.2 cm ave.</td>
</tr>
</tbody>
</table>
Figure 49. Lightning whelk shell Dish A from Richardson's Hammock (8Gu10) shown top left in convex view and bottom left in concave view. Lightning whelk shell Dish B from Lighthouse Bayou site (8Gu114) shown top middle in convex view and bottom middle in convex view. Lightning whelk shell Dish C from Lighthouse Bayou site (8Gu114) shown top right in convex view and bottom right in concave view.
Figure 50. Lightning whelk shell dish A, from Conch Island (8Gu20) is shown top left in convex view and bottom left in concave view. Lightning whelk shell dish B from Richardson's Hammock (8Gu10) is shown top right in concave view and bottom right in convex view.
hammers may be related to cutting tools, the scoop or spoon is usually far smaller than a cup or dish and may include columellae and whorl fragments. The distinguishing characteristics separating the scoop and the dish artifact types are less clear than in the other cases discussed thus far. Distribution of this artifact type is shown in Figure 51. The seven examples in Figures 52, 53, and 54 show the range of materials and character included in this tool category. In one case, a scoop is made from a quahog clamshell, shown in Figure 54 A. The scoop potentially holds less material than a dish or a cup, and therefore may have been used more for moving and processing smaller amounts of material rather than for holding or serving. The majority of these tools (but not all) displays a type of possible handle feature, as the remnant of the siphonal canals.

Figure 51. Distribution of Sites Producing Shell Scoop/Spoons.
Figure 52. Lightning whelk shell scoops A and B from Black’s Island (8Gu11) are top left and middle concave views, bottom left and middle convex views. Lightning whelk shell scoop C from Clark Creek Shell Mound (8Gu60) shown top left in concave view and bottom left in convex view.
Figure 53. Lightning whelk shell scoop from Huckleberry Landing (8Fr12) shown left in concave view and right in convex view.
Figure 54. Quahog shell scoop A from Depot Creek Shell Mound (8Gu56) is shown top left in concave view and bottom left in convex view. Lightning whelk shell scoop B from Depot Creek Shell Mound (8Gu60) is shown top middle in convex view and bottom middle in concave view. Lightning whelk shell scoop C from Indian Pass (8Gu17) is shown top right in convex view and bottom right in concave view.
(12) **Scraper/ Spatula.** Varies in size and shape. Typically of whorl fragments, these pieces display beveling on one or more edges, which I hypothesize results from a scraping action. They are flatter or shallower than scoops. Their distribution is shown on Table 12 and in Figure 57.

Table 12. Distribution of Shell Spatulas.

<table>
<thead>
<tr>
<th>Site Name and Number</th>
<th>Cultural Component(s)</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Fr14 Pierce Mounds</td>
<td>Swift Creek</td>
<td>8 cm</td>
</tr>
<tr>
<td>8Gu10 Richardson's Hammock</td>
<td>Deptford, Swift Creek, Weeden Island, Fort Walton</td>
<td>4-12 cm, 8.3 cm ave.</td>
</tr>
<tr>
<td>8Gu11 Black's Island</td>
<td>Weeden Island, Fort Walton</td>
<td>4.5-12 cm, 8.3 cm ave.</td>
</tr>
<tr>
<td>8Gu20 Conch Island</td>
<td>Indeterminate Prehistoric</td>
<td>10-12 cm, 11 cm ave.</td>
</tr>
<tr>
<td>8Gu56 Depot Creek Shell Mound</td>
<td>Deptford, Swift-Creek</td>
<td>8.5 cm</td>
</tr>
<tr>
<td>8Gu60 Clark Creek Shell Mound</td>
<td>Late Archaic, Deptford, Swift-Creek</td>
<td>9 cm</td>
</tr>
<tr>
<td>8Gu114 Lighthouse Bayou site</td>
<td>Fort Walton</td>
<td>12 cm</td>
</tr>
<tr>
<td>8Gu132 Yellow Flower</td>
<td>Indeterminate Prehistoric</td>
<td>5 cm</td>
</tr>
<tr>
<td>8Li172 Otis Hare site</td>
<td>Swift Creek, Early Weeden Island</td>
<td>6 cm</td>
</tr>
</tbody>
</table>

Figures 55 and 56 show shell scrapers-spatulas. Six scrapers are displayed, for range of size and shape. The scrapers are made from body whorl fragments, show signs of significant wear, and even beveling along one or more edges, suggestive of a regular scraping action. Figure 15 shows two modern plastic "pan" scrapers or spatulas for comparison, obtained at a local flea market and at a local kitchen goods outlet.
Figure 55. Lightning whelk shell scraper A, from Otis Hare site (8Li172) is shown top left in concave view and top right in convex view. Lightning whelk shell scraper B from Pierce Mounds (8Fr14) is middle left in concave view and middle right in convex view. Lightning whelk shell scraper C from Depot Creek Shell Mound (8Gu56) is shown bottom left in concave view and bottom right in convex view.
Figure 56. Lightning whelk shell scraper A from Conch Island (8Gu20) is top left, shown first in concave and then in convex views. Lightning whelk shell scraper B from Clark Creek Shell Mound (8Gu60) is top right, shown first in concave and then in convex views. Lightning whelk shell scraper C from Richardson's Hammock (8Gu10) is bottom left, shown first in concave and then in convex views.
(13) Awl. These tools are small fragments of whorl, almost slivers, which appear to show an unusual amount of rounding or use-wear. In this case, I am using a functional name to label this tool type, although these small tools could also be thought of as gravers or small chisels. They are distinguished from bipointed and pointed columellae, which may have had the same kinds of functions, but these awls are made of the solid whorl rather than columellae. Lighthouse Bayou site (White, Fitts, Rodriguez, and Smith 2002) stands out as the only site in this study from which shell awls have been recovered. They range in size from 3 to 6 centimeters long, averaging 4.7 centimeters long, with 6 centimeters long the most
commonly occurring maximum length. They have been recovered from Fort Walton and Lamar/Early Historic Indian components.

Figure 58 depicts five shell awls. In each case, a significant amount of smoothing has occurred, seeming to indicate heavy amounts of friction as from continual rubbing.

(14) Plane. We have only one candidate in this category, which is made from a piece of columella and measures 8 centimeters long. Figure 59 depicts this small shell tool, with a pronounced flattened edge, as of the blade of a plane. At this time, the only shell plane has been identified from the Lamar/Early Historic Indian component of Lighthouse Bayou site.

(15) Bead. Four small beads and one freshwater pearl are contained in the collection, shown in Figure 60. The pearl (1 centimeter) is included, although it may not have been intended for decorative use. It was recovered from a mixed Late Archaic-Deptford component of Van Horn Creek Shell Mound. In fact, it may have been simply collected as a novelty by someone, or even deposited accidentally in the shell midden. The disk-shaped beads, however, were deliberately made. So far, shell beads have only been identified from three sites in the USF Apalachicola Collection (Figure 61). A one-
Figure 58. Lightning whelk awl A from Lighthouse Bayou site (8Gu114). Lightning whelk awl's B and C from Lighthouse Bayou site (8Gu114). Lightning whelk awl D from Lighthouse Bayou site (8Gu114). Lightning whelk awl E from Lighthouse Bayou site (8Gu114). Lightning whelk awl F from Lighthouse Bayou site (8Gu114).
Figure 59. Shell Plane from Lighthouse Bayou site (8Gu114) is shown top edge-side up, bottom edge-side down.
Figure 60. Fresh water pearl A is from Van Horn Creek Shell Mound (8Fr744). Shell bead B is also from Van Horn Creek Shell Mound (8Fr744). Shell bead C from Clark Creek Shell Mound (8Gu60). Shell Bead D is also from Clark Creek Shell Mound (8Gu60). Shell Bead E is from Porter's Bar (8Fr1).
centimeter diameter bead was collected from a mixed Late Archaic-Deptford component of Van Horn Creek Shell Mound (White 1992:129; White 1994a:67-68). Two beads slightly larger than 1 centimeter in diameter were collected from levels containing Late Archaic, Deptford and Swift-Creek components, at Clark Creek Shell mound, and a rough 3-centimeter diameter bead was recovered from Porter's Bar--which cannot be attributed to a single component, but may belong to Deptford, Swift Creek, Weeden Island or Fort Walton periods; White 1996:40). The beads are flat, small disks, unlike the large and small tubular shell beads reported from Richardson's Hammock, which may have been part of a necklace, depicted in Figure 62. Additionally, tubular shell beads and pins have are known from the Curlee site, a
Figure 62. Cylindrical shell beads in private collection, said to be from Richardson's Hammock (8Gu10) Burial Mound, and likely attributable to Swift-Creek/Early Weeden Island or possibly Fort Walton cultural components. The string is modern.
Late Weeden Island-Ft. Walton village site in the northern river valley (Figure 63).

(16) Perforated Shell. While numerous bivalve shells display perforations that do not appear to be the results of random accident or site-formation processes, this type is defined as being shells with holes drilled or punched in them suggesting they were used by people. It is possible that perforated shells were found as they were, but it is also conceivable that they were made to suit by human hands. Figure 64 and Table 13 show their distribution; Figures 65, 66, and 67 depict examples of perforated shells. These shells may have been decorative, like beads, they may have been bead blanks, or they may have been used as net weights (Hudson 1976:282; Vojnovski 1998:259) or sinkers for fishing lines. Most of the perforated shells were crafted from bivalve shell. Figure 65 shows an example of a large piece of gastropod shell, which has a small hole drilled into it. This artifact may represent a stage in manufacturing beads--drill a hole in a large piece of shell, and then cut the bead out. The remaining perforated shells show irregularly shaped holes. Figure 65 shows two examples in which the collateral damage on the outside of the shell--the extra flaking--makes it apparent that the holes were punched from the inside out. Figure 66 shows an additional eleven
Figure 63. Shell pins, 1 cylindrical bead, and 2 tubular beads, apparently with Fort Walton burials at Curlee site (8Ja7) currently held in a private collection.
perforated shells exhibiting the same kind of punching. Because the
damage is consistent, it seems unlikely to have been accidental.

Table 13. Distribution of Perforated Shell.

<table>
<thead>
<tr>
<th>Site Name and Number</th>
<th>Cultural Component(s)</th>
<th>Average Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Fr744 Van Horn Creek Shell Mound</td>
<td>Late Archaic, Deptford</td>
<td>5 cm</td>
</tr>
<tr>
<td>8Gu11 Black's Island</td>
<td>Weeden Island, Fort Walton</td>
<td>8 cm</td>
</tr>
<tr>
<td>8Gu56 Depot Creek Shell Mound</td>
<td>Deptford, Swift Creek</td>
<td>3.8 cm</td>
</tr>
<tr>
<td>8Gu60 Clark Creek Shell Mound</td>
<td>Deptford, Swift Creek</td>
<td>3 cm</td>
</tr>
</tbody>
</table>

Figure 64. Distribution of Sites Producing Perforated Shell
Figure 65. Perforated lightning whelk shell from Black's Island (8Gu11) is shown top in convex view and bottom in concave view.
Figure 66. Perforated marsh clam shells A and B from Van Horn Creek Shell Mound (8Fr744) are shown left in convex view and right in concave view.
Figure 67. Perforated marsh clamshells A through K are all from Depot Creek Shell Mound (8Gu56), and are all shown in convex view.
Probable Tool. These are pieces of shell that range in size and shape, and that are unmistakably processed, but for which we currently have no use analogue. The probable tools may have been purely expedient, for small, one-time jobs, or they may even have been toys. Artifacts labeled as Probable Shell Tools have only been identified for the Fort Walton, Lamar, and Early Historic Indian components of Lighthouse Bayou site (8Gu114; White, Fitts, Rodriguez, and Smith 2002), a mixed Fort Walton, Swift Creek, Early Weeden island components of Richardson's Hammock, and the Swift-Creek/ Early Weeden Island component of Otis Hare site. They range from 3 centimeters to 12 centimeters long, averaging 5.7 centimeters, and have 4 centimeters long as the mode. The best explanation for the fact that Probable Tools have been identified from this site alone is that its unique proximity to the Gulf of Mexico and St. Joseph Bay led to activities that were simply different from those at other locations.

The Probable Tool category is by far the most difficult category under discussion. Each of the Figures displays one object for which no category determination is clear. If they are not toys, or practice pieces, then these tools may either be in the beginning stages of manufacture--on their ways to becoming tools--or at the end of their tool-use cycle. Or, they may have been made for reasons we just cannot imagine. Enough evidence exists, in all cases, to define each of
these specimens as tools with confidence. Yet, they do not readily conform to existing categories, and share little in common with one another.

Figure 68 displays 3 different quahog shells, each of which shows signs of intentional modification. The straight angles of cuts or breaks in each shell have been made across the grain. Shell A shows moderate chipping along one edge, apparent in both views. Shells B and C also show signs of use-wear, smoothing along an edge. These quahog shells are most problematic due to their species. The vast majority of tools has been fashioned from the shells of large gastropods. In addition, northwest Florida's other shell midden sites are mostly made of freshwater clam and oyster, with no evidence of harvesting quahogs for food--unlike in South Florida. This is true even at the sites around salty St. Joseph Bay. Today, quahog shells are easy to pick up only on the Gulf side of Cape St. George.

Figure 69 is of a whorl fragment, roughly trapezoidal in shape like an adze, but totally lacking the steep beveling along any edge. The material does appear to have been cut, as the edges are clean and straight. The specimen in Figure 69 is also fairly small, at around 4 centimeters maximum length.
Figure 68. Probable quahog shell tools A, B, and C from Richardson's Hammock (8Gu10). Shell A is shown top left in convex view and bottom left in convex view; shell B is shown top middle in convex view and bottom middle in concave view; shell C is shown top right in convex view and bottom right concave view.
Figure 69. Probable lightning whelk shell tool from Lighthouse Bayou site (8Gu114) is shown top in concave view and bottom in convex view.
Figure 70 presents one of the more curious specimens, in a small piece of shell from the whorl of a gastropod. It was placed in the probable tool category instead of the perforated shell category because the modification appears more obviously intentional and functional than the shells in Figures 64 through 66. Clearly, one surface shows cracking along the long axis, whereas the other side has cracks along the short axis. There are two rounded holes, perhaps drilled, approximately 2 centimeters apart from each other, creating an asymmetrical appearance. If this is a bead preform, or pendant fragment, it is unlike the other examples from the USF Apalachicola collection.

Another slightly irregular shell square, shown in Figure 71, has what might be a degree of beveling. The small size of the beveled edge, at under 5 centimeters, raises the question (like in other cases) of whether this could in fact, be a spatula or scraper.

Figure 72 shows a highly unusually shaped piece of gastropod shell. Some scarring of the shell is apparent in the left view. As can be clearly seen in the interior or right view, the small rounded edge has a marked bevel or wear, perhaps from scraping while the larger portion was held in the hand. However, this artifact does not look like any of the identified spatulas or scrapers. It may be just one more example of the diversity of shape for another artifact category, perhaps it is a
Figure 70. Probable lightning whelk shell tool from Lighthouse Bayou site (8Gu114) is shown top in convex view and bottom in concave view.
Figure 71. Probable lightning whelk shell tool from Lighthouse Bayou site (8Gu114) is shown top in concave view, middle in convex view, and bottom as close-up with an arrow pointing out a possible beveled edge.
Figure 72. Probable lightning whelk shell tool from Lighthouse Bayou site (8Gu114) is shown on left in convex view and on right in concave view. The arrow points to possible beveled edge.
specialized tool, or just an expedient tool for scraping or scooping up something quickly. Figure 73 shows a squarish piece of gastropod shell. The close-up indicates a small protruding edge, which appears to have a moderate bevel. Again, the irregular shape poses problems for confident categorization, but it may be a small scraper. Figure 74 also shows an irregularly shaped smooth piece of shell, the most important characteristic being its heavy wear. The edges in particular are rounded and smooth. Due to its small size, barely over 5 centimeters at its longest, and its irregular shape, categorization remains elusive. It could be, as some suggest, a net-mesh gauge (Marquardt 1992:212; White 2003a); although, it could be a very small scraper or spatula. The last Probable tool under discussion is the biconical-shaped piece of shell from Otis Hare site, depicted in Figure 75. The degree of smoothing and apparent wear is very pronounced, and the particular shape is unique from all other shells in the collection at this time. This probable tool could have been used as an awl or graver, but, again, definitive evidence of specific use waits for more than gross visual analysis.
Figure 73. Probable lightning whelk shell tool from Lighthouse Bayou site (8Gu114) is shown top in concave view, middle in convex view, and bottom as close-up of a possible beveled edge. The arrow points to a possible working edge.
Figure 74. Probable lightning whelk shell tool from Lighthouse Bayou site (8Gu114) is shown left in convex view and right in concave view.
Figure 75. Probable lightning whelk bi-conical shell tool from Otis Hare site (8Li172).
(18) Indeterminate. This represents a broad category of shell fragments for which one could argue convincingly for or against inclusion into various tool categories. Distribution of Indeterminate tools is shown on Table 14 and Figure 76. They usually possess more than one tool-like characteristic, but lack a specific definitive feature,

Table 14. Distribution of Indeterminate Shell Tools.

<table>
<thead>
<tr>
<th>Site Name and Number</th>
<th>Cultural Component(s)</th>
<th>Average Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Fr1 Porter's Bar</td>
<td>Deptford, Swift Creek, Weeden Island, Fort Walton</td>
<td>4.2 cm</td>
</tr>
<tr>
<td>8Fr24 Cape St. George West site</td>
<td>Fort Walton</td>
<td>20.5 cm</td>
</tr>
<tr>
<td>8Fr754 Sam's Cutoff</td>
<td>Archaic</td>
<td>3 cm</td>
</tr>
<tr>
<td>8Fr755 Thank You Ma'am Creek Shell Midden</td>
<td>Late Archaic, Deptford, Fort Walton</td>
<td>9.8 cm</td>
</tr>
<tr>
<td>8GU 2 Gotier Hammock</td>
<td>Indeterminate Prehistoric</td>
<td>8.5 cm</td>
</tr>
<tr>
<td>8Gu10 Richardson's Hammock</td>
<td>Deptford, Swift Creek, Weeden Island, Fort Walton</td>
<td>7.2 cm</td>
</tr>
<tr>
<td>8Gu11 Black's Island</td>
<td>Deptford, Weeden Island, Fort Walton</td>
<td>8 cm</td>
</tr>
<tr>
<td>8Gu17 Indian Pass</td>
<td>Indeterminate Prehistoric</td>
<td>5.25 cm</td>
</tr>
<tr>
<td>8Gu56 Depot Creek Shell Mound</td>
<td>Deptford, Swift Creek</td>
<td>8 cm</td>
</tr>
<tr>
<td>8Gu60 Clark Creek Shell Mound</td>
<td>Late Archaic, Deptford, Swift Creek</td>
<td>6.1 cm</td>
</tr>
<tr>
<td>8Gu114 Lighthouse Bayou site</td>
<td>Fort Walton, Lamar/ Early Historic Indian</td>
<td>8.7 cm</td>
</tr>
<tr>
<td>8Gu130 Lost Crew Site</td>
<td>Indeterminate Prehistoric</td>
<td>16 cm</td>
</tr>
</tbody>
</table>
such as use-wear, that would provide a compelling basis for classification. Indeterminate shell tool 8Gu114-01-105 (Figure 77) might very well be a scraper. It appears to be a piece of body-whorl from a gastropod, most likely a whelk. It shows some signs of wear, and is smooth to the touch. Figure 78 depicts a piece of shell with a shape unique in this collection of over 2300 individuals. It is a knob from the shoulder of a whelk shell. I have no confident suggestion as to function, but the shape suggests that it would be useful for poking or grinding, with the wider end held in the hand. One of the smallest
Figure 77. Indeterminate lightning whelk shell tool from Lighthouse Bayou (8Gu114) is shown left in concave view and on right in convex view.
Figure 78. Indeterminate lightning whelk tool from Lighthouse Bayou site (8Gu114) is shown in left in concave view and right in convex view.
items displayed from the USF Apalachicola collection is shown in Figure 79. This piece of shell appears to be only a fragment of knob from a whelk shell. It is highly worn or smoothed, but is also very tiny at less than 3 centimeters in length. Perhaps this is a small incising tool for pottery.

Figure 80 displays a larger piece of whorl material, broken from a whelk shell. The specimen is nearly flat, with little wear along its edges. This may be a shallow dish, an unused scoop, or simply a shell fragment.

(19) Worked shell. This category, like the Indeterminate category, holds a broad rang of shell and shell pieces. Specimens in this category demonstrate a wide range of suspicious characteristics, but nothing definitive. Worked Shells show signs of heavy modification, but typically lack obvious use-wear. These facts make it questionable whether shells that fit this category could or should be placed in any other tool type. Distribution is shown on Table 15 and Figure 81; examples of the Worked Shell type are displayed in Figures 82, 83 and 84; . As can bee seen, they differ both from those in the Indeterminate type and from simple ecofacts in that they have been reduced beyond the level one would expect to be required for mere
Figure 79. Indeterminate lightning whelk tool from Lighthouse Bayou site (8Gu114) is shown top in concave view and bottom in convex view.
Figure 80. Indeterminate lightning whelk tool from Lighthouse Bayou site (8Gu114) on left concave view, on right convex view.
Table 15. Distribution of Worked Shell.

<table>
<thead>
<tr>
<th>Site Name and Number</th>
<th>Cultural Component(s)</th>
<th>Average Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Fr745 Hendrix II</td>
<td>Late Archaic</td>
<td>15.5 cm</td>
</tr>
<tr>
<td>8Fr755 Thank You Ma'am Creek Shell Midden</td>
<td>Indeterminate Prehistoric</td>
<td>24 cm</td>
</tr>
<tr>
<td>8Gu2 Gotier Hammock</td>
<td>Indeterminate Prehistoric</td>
<td>7 cm</td>
</tr>
<tr>
<td>8Gu10 Richardson's Hammock</td>
<td>Fort Walton</td>
<td>16.4 cm</td>
</tr>
<tr>
<td>8Gu11 Black's Island</td>
<td>Weeden Island, Fort Walton</td>
<td>9 cm</td>
</tr>
<tr>
<td>8Gu114 Lighthouse Bayou site</td>
<td>Fort Walton, Lamar/Early Historic Indian</td>
<td>13.3 cm</td>
</tr>
<tr>
<td>8Gu132 Yellow Flower</td>
<td>Indeterminate Prehistoric</td>
<td>6 cm</td>
</tr>
</tbody>
</table>

Figure 81. Distribution of Sites Producing Worked Shell.
Figure 82. Worked lightning whelk shell from Thank-You Ma'am Creek site (8Fr755) is shown on left whorl-side up, and on right aperture-side up.
Figure 83. Worked lightning whelk shell A from Thank-You Ma'am Creek site (8Fr755) is shown left whorl-side up, middle aperture-side up. Worked lightning whelk shell B from Black's Island (8Gu11).
Figure 84. Worked lightning whelk shell A from Thank-You Ma’am Creek site (8Fr755) is shown on left aperture-side up, on right whorl-side up, on bottom close-up of the damage to basal end of columella. Worked lightning whelk shell B from Black's Island (8Gu11) shown on right aperture-side up, on left whorl-side up. Worked lightning whelk shell C from Black's Island (8Gu11) is shown on left aperture-side up, on right whorl-side up.
food processing, and yet they show no signs of wear, like chipping or spalling. Shell A in Figure 83 is not considered a hammer because the central columella is totally missing.

(20) Debitage. Mostly the very tips of siphonal canals, and some columellae that appear to have been broken from tools. Debitage distribution is shown on Table 16 and on Figure 85. The siphonal tips would be removed from the shell as part of the process in gastropod tool manufacture, beyond the stage of tool blank. The tips are removed to make gastropod hammers and cutting tools.

Figure 85. Distribution of Sites Producing Shell Debitage.
Figure 86 shows the removal of a columella tip or siphonal canal from a gastropod, redrawn from Luer (1986:108). The occurrence of the tips of siphonal canals in the archaeological record may indicate a high likelihood of tool manufacture. Shell debitage, shown in Figure 87, is analogous to chert debitage in this way. However, it is also likely that many tips were broken off accidentally. After all, the tip of the siphonal canal is one of the weakest parts of the shell--which is why tool makers would have gotten rid of them in the first place.

(21) Spire-Apex. The very top of a gastropod is displayed in Figure 88. Spire-apices A and C are from lightning whelk shells; spire-apex B is from a horse conch. It is not clear at this time whether this type is itself a tool, or is merely the debitage of a specific reduction process.

Nonetheless, these pieces stand out in that the amount of effort required to remove them so completely from the rest of the shell precludes mere accident or normal site-formation processes. Spire-apex distribution is shown on Table 17 and in Figure 89.

(22) Fragments. Includes all the bits and pieces of shell that show no specific evidence of use beyond food acquisition, but at the same time are not large enough to be completely ruled out as having been part of the process of tool manufacture. It is possible that in
Figure 86. Shell showing removal of columella tip or siphonal canal. Redrawn from Luer 1986a.
Figure 87. Examples of shell debitage from Richardson’s Hammock (8Gu10).
Table 16. Distribution of Shell Debitage.

<table>
<thead>
<tr>
<th>Site Name and Number</th>
<th>Cultural Component(s)</th>
<th>Average Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Ca142 Corbin Tucker</td>
<td>Fort Walton</td>
<td>4 cm</td>
</tr>
<tr>
<td>8Fr1 Porter's Bar</td>
<td>Deptford, Swift Creek, Weeden Island, Fort Walton</td>
<td>2.3 cm</td>
</tr>
<tr>
<td>8Fr14 Pierce Mounds</td>
<td>Swift Creek</td>
<td>10 cm</td>
</tr>
<tr>
<td>8Fr24 Cape St. George West site</td>
<td></td>
<td>10 cm</td>
</tr>
<tr>
<td>8Fr744 Van Horn Creek Shell Mound</td>
<td>Late Archaic, Deptford, Fort Walton</td>
<td>6.2 cm</td>
</tr>
<tr>
<td>8Fr754 Sam's Cutoff</td>
<td>Archaic</td>
<td>4.1 cm</td>
</tr>
<tr>
<td>8Gu10 Richardson's Hammock</td>
<td>Deptford, Swift Creek, Weeden Island, Fort Walton</td>
<td>5.4 cm</td>
</tr>
<tr>
<td>8Gu11 Black's Island</td>
<td>Deptford, Weeden Island, Fort Walton</td>
<td>4.8 cm</td>
</tr>
<tr>
<td>8Gu17 Indian Pass</td>
<td>Indeterminate Prehistoric</td>
<td>6 cm</td>
</tr>
<tr>
<td>8Gu55 Yellow Houseboat</td>
<td>Swift Creek, Early Weeden Island, Fort Walton</td>
<td>4.5 cm</td>
</tr>
<tr>
<td>8Gu56 Depot Creek Shell Mound</td>
<td>Deptford, Swift Creek</td>
<td>8.3 cm</td>
</tr>
<tr>
<td>8Gu60 Clark Creek Shell Mound</td>
<td>Deptford, Swift Creek</td>
<td>8.8 cm</td>
</tr>
<tr>
<td>8Gu114 Lighthouse Bayou site</td>
<td>Fort Walton, Lamar/ Early Historic Indian</td>
<td>5.6 cm</td>
</tr>
<tr>
<td>8Gu131 Treasure Shores Road Turpentine Site</td>
<td>Indeterminate Prehistoric</td>
<td>7.8 cm</td>
</tr>
<tr>
<td>8Gu149</td>
<td>Indeterminate Prehistoric</td>
<td>3.5 cm</td>
</tr>
</tbody>
</table>
Figure 88. Lightning whelk apex A from Clark Creek Shell Mound (8Gu60) is shown top left exterior view, top right interior view. Horse conch Apex B from Lighthouse Bayou site (8Gu114) is shown middle left exterior view, middle right interior view. Lightning whelk Apex C, from Lighthouse Bayou site (8Gu114) is shown bottom left exterior view, bottom right interior view.
hitting the conch or whelk shell to remove the animal, fragments were scattered about and were ignored. They may also have resulted from normal site-formation processes--like being stepped on.

Table 17. Distribution of Gastropod Apices.

<table>
<thead>
<tr>
<th>Site Name and Number</th>
<th>Cultural Component(s)</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Gu10 Richardson's Hammock</td>
<td>Fort Walton</td>
<td>5-11 cm, 5.8 cm ave.</td>
</tr>
<tr>
<td>8Gu60 Clark Creek Shell Mound</td>
<td>Deptford, Swift-Creek</td>
<td>10 cm</td>
</tr>
<tr>
<td>8Gu114 Lighthouse Bayou site</td>
<td>Fort Walton, Lamar/ Early Historic</td>
<td>1.5-10 cm, 5 cm ave.</td>
</tr>
</tbody>
</table>

Figure 89. Distribution of Sites Producing Gastropod Spire/ Apices.
Fragment distribution is expectedly widespread throughout the sites under discussion, shown on Table 18 and Figure 90. Figures 91 and 92 illustrate the category of Fragments. Eleven examples serve to demonstrate the random nature of the breaks, such that they were not intentionally designed to create tools.

Figure 90. Distribution of Sites Producing Shell Fragments.
Table 18. Distribution of Shell Fragments.

<table>
<thead>
<tr>
<th>Site Name and Number</th>
<th>Cultural Component(s)</th>
<th>Average Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Ca142 Corbin Tucker</td>
<td>Fort Walton</td>
<td>4.6 cm</td>
</tr>
<tr>
<td>8Fr1 Porter's Bar</td>
<td>Deptford, Swift Creek, Weeden Island, Fort Walton</td>
<td>4 cm</td>
</tr>
<tr>
<td>8Fr14 Pierce Mounds</td>
<td>Swift Creek</td>
<td>4.5 cm</td>
</tr>
<tr>
<td>8Fr744 Van Horn Creek Shell Mound</td>
<td>Late Archaic, Deptford, Fort Walton</td>
<td>8.2 cm</td>
</tr>
<tr>
<td>8Fr755 Thank You Ma'am Creek</td>
<td>Late Archaic, Deptford, Fort Walton</td>
<td>6.3 cm</td>
</tr>
<tr>
<td>8Gu10 Richardson's Hammock</td>
<td>Deptford, Swift Creek, Weeden Island, Fort Walton</td>
<td>3.4 cm</td>
</tr>
<tr>
<td>8Gu11 Black's Island</td>
<td>Weeden Island, Fort Walton</td>
<td>3.7 cm</td>
</tr>
<tr>
<td>8Gu20 Conch Island</td>
<td>Indeterminate Prehistoric</td>
<td>5 cm</td>
</tr>
<tr>
<td>8Gu56 Depot Creek Shell Mound</td>
<td>Deptford, Swift Creek</td>
<td>5.8 cm</td>
</tr>
<tr>
<td>8Gu60 Clark Creek Shell Mound</td>
<td>Late Archaic, Deptford, Swift Creek</td>
<td>5.8 cm</td>
</tr>
<tr>
<td>8Gu114 Lighthouse Bayou site</td>
<td>Fort Walton, Lamar/ Early Historic</td>
<td>4.9 cm</td>
</tr>
<tr>
<td>8Gu131 Treasure Shores Road Turpentine Site</td>
<td>Indeterminate Prehistoric</td>
<td>4-8 cm, 6 cm ave.</td>
</tr>
<tr>
<td>8Li172 Otis Hare site</td>
<td>Swift Creek, Early Weeden Island</td>
<td>6-6.5 cm, 6.3 cm ave.</td>
</tr>
</tbody>
</table>
Figure 91. 8 lightning whelk shell fragments from Richardson's Hammock (8Gu10).
Figure 92. 3 lightning whelk shell fragments from Clark Creek Shell Mound (8Gu60).
Ecofacts, like fragments, are not artifacts, but are included in discussion and are shown for research purposes. The essential difference is that fragments are pieces, whereas ecofacts are nearly whole shell. Figure 93 shows a single oyster shell fragment from the Lamar/ Early Historic Indian component of Lighthouse Bayou site (8Gu114). Three shells in Figure 94 serve to demonstrate the kinds of damage done to shell to remove the animal for food, rather than to create holes in the shell to accept a handle. Those from Richardson's Hammock are attributed to a Fort Walton component; the ecofact from Lighthouse Bayou site is also attributed to a Fort Walton component. Both shell midden sites are essentially made up of such specimens by the hundreds (White et al, 2002).

Six oyster shells in Figure 95 show no signs of perforations as in the possible pendants previously discussed. These shells were collected from an oyster midden, Cape St. George West site (8Fr24), from the surface, and are once again from a Fort Walton component (White 1996:41). As noted earlier, Figures 13 and 14 are both ecofact remains that have suffered bag-wear that mimics intentional reduction. This is evident from the fresh appearance of the breaks, and the fact that the shells as listed in the USF materials catalogue in the singular.
Figure 93. Oyster ecofact from Lighthouse Bayou site (8Gu114) shown on left in convex view and on right in concave view.
Figure 94. Horse conch ecofact A from Richardson's Hammock (8Gu10) is shown top left whorl-side up, and on right aperture-side up. Lightning whelk ecofact B from Richardson's Hammock (8Gu10) is shown middle left whorl-side up, and middle right aperture-side up. Lightning whelk ecofact C from Lighthouse Bayou site (8Gu114) is shown bottom left aperture-side up, and bottom right whorl-side up.
Figure 95. Oyster ecofacts A through F are from Cape St. George West site (8Fr24).
Figure 13 was collected from Richardson's Hammock, in a mixed context of Swift Creek, Early Weeden Island, and Fort Walton components. It shows a similar type of damage to a lightning whelk shell tool, but the small piece from the siphonal tip has broken off in storage, only looking suspiciously like normal debitage. In order for the removal of siphonal debitage to produce functional results, it needs to be cut or broken off high enough up on the canal to leave a robust edge (Luer 1986:108).

Finally, Figure 14 shows 2 sunray venus clamshells, one of which exhibits bag-wear that might be misconstrued as an intentional notch. They were both collected from a mixed Weeden Island, Fort Walton component of Richardson's Hammock.
Chapter Seven

Summary and Conclusion


Who? The prehistoric indigenous peoples of the Apalachicola River area covered in my thesis all seem to have used shell as a raw material for tools. Shell was available and presumably easy to gather. If the people were already eating the conchs and whelks, and some clams, it makes a certain amount of sense that they would have tried to do something with the shell.

That the Native Americans in prehistory persisted in using the shell medium over time is a testament to the fact, in plain English, that it was a good idea. The skills to shape gastropod and bivalve shells into utilitarian tools would have been passed down from generation to generation. It is also likely that this good idea was rediscovered time and again. In fact, at sites across the area of interest, examples of utilitarian shell tools can be attributed to a time-span that reaches from the Late Archaic through at least the Lamar period, now dated to the seventeenth century, and probably well into history--between five and six thousand years.
What? The indigenous peoples of northwest Florida produced a varied utilitarian shell tool assemblage during five to six millennia. Twenty-two types of shell tool as defined here comprise the USF Apalachicola collection. The presence of these types demonstrates a complex adaptation to the marine, estuarine, and riverine environments of the Apalachicola River area. The collection and use of shellfish for food and technology shows sophisticated indigenous knowledge or indigenous science in practice throughout prehistory on par with other hunting, fishing, and gathering skills (Hudson 1976:272-273; 281).

The large gastropod-eaters from northwest Florida had to know when and where to get their preferred lightning whelks. They had to know how to collect them, how to remove the animal from the shell, and how to prepare them. They would have been able to recognize raw shell that would best serve their purposes for making tools--and would have known how to make do with damaged shell when they had to.

Specific kinds of tools, such as planes, adzes, and cutting tools demonstrate a woodworking complex. Scrapers might be associated with food processing or leather-working. Awls could have been used to perforate leather or cloth, or perhaps to incise decorations into
pottery prior to firing. Hammers were no doubt used for many tasks, from breaking into shells to pounding posts into the ground.

When and Where? Conclusions regarding patterns of shell tool use over time and space must be tentative. Of the fifty-one sites identified at the outset as producing utilitarian shell tools, twenty-seven are represented in the USF Apalachicola collection. The collection contains shell tool specimens from the shores of the Gulf of Mexico as far north as Otis Hare site, at approximately river mile seventy. Of the twenty-seven sites, only ten were formally excavated. Two sites, Richardson's Hammock and Lighthouse Bayou site, are heavily over-represented. They also represent two of the three sites located on the shore of St. Joseph Bay, which is rich in large gastropods, formally excavated by USF (the third being Black's Island, which is completely surrounded by the bay). Even so, I have discussed the evidence for the presence of utilitarian shell tools from the barrier islands at the mouth of the Apalachicola to sites well inland.

My data suggest that most of the tool types discussed were used throughout prehistory. It is not possible to draw conclusions about the prevalence of such artifacts as grinders, planes, and tool blanks, as the USF Apalachicola collection currently has only one specimen of each. I found it tempting to draw conclusions about the fact that shell adzes have only been found in Deptford, Swift Creek, Fort Walton and
Lamar contexts, and that cups have thus far only been discovered from Deptford and Fort Walton contexts. However, there are simply too few specimens of these types of shell tools for me to do so with confidence. I may reasonably hypothesize that more archaeological work done in the Apalachicola River area will demonstrate that nearly all shell tools have enjoyed a long and robust use-history.

The limitations of this study have already been alluded to, in that a majority of the shell tools in the USF Apalachicola Collection were collected from Lighthouse Bayou site and Richardson's Hammock. It could be said that at this time that we know an awful lot about an awful little. However, this specialized database will serve as the foundation for future inductively developed hypotheses, which then may be tested at other sites.

A great number of questions might be answered through experimental archaeological methods. Fresh shell from the Apalachicola River area could be acquired, and then worked into familiar shapes. We could then use the new tools in ways we believe the archaeological tools were used, and compare the use-wear.

I would also suggest that attempts to develop an ethnological approach could be made. No doubt, ethnographies already exist that study cultural groups making extensive use of shell resources, like those of Madonna L. Moss (1993) and Michael A. Glasgow and Larry R.
Wilcoxon (1988). By comparing these ethnographies to the material culture from the Apalachicola River Area, new insights, new questions, and perhaps some answers may be arrived at.

No doubt, other limitations can be pointed out--after all, this thesis is but a first step in a long process of enhancing our understanding of the prehistoric Native Americans of northwest Florida, of the Southeastern U.S., and of human beings in general. With the newly available data, the world may not yet be our oyster, but perhaps it can be our lightning whelk.
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Appendix One

*Correspondences Regarding Cliona Sponges*

*02:11 PM 10/30/2003*

Dear Dr. Marquardt:

My name is Eric Eyles. I am a student of Dr. Nancy White's down here at USF. I am working on my thesis right now, which is on shell artifacts and tools from the Apalachicola River drainage in northwest Florida. I am indebted to your work on the Calusa region and your wonderfully detailed descriptions, drawings, and photographs.

I was wondering if you have come across hammers, cutting edged tools, adzes, and cups and, that show signs of scarring from the boring sponge, cliona.

I keep coming across shell that otherwise looks like a hammer or some other tool, and yet is pitted. I did not see any depictions in your work of cliona-pitted shell being used for tools.

I was hoping to get your input, if you could spare a few moments.

Thank you in advance for your help

sincerely,

Eric Eyles

I posed your question to Dr. Karen Walker, who has thought more about this than I have, and asked her if Cliona were more likely to infest sessile shells or dead ones than active or live animals.
She answers:

"Cliona spp. bores into both the shells of live molluscs and dead ones. But yes, probably dead shells are more likely to be bored. As for sessile guys, it varies. Live quahogs are probably rarely bored because they are usually down in the sand. But live oysters often host the sponges. If you found a Busycon or Mercenaria or Melongena shell tool with little sponge holes, the distribution of the holes would determine whether or not the tool spent time underwater. Are there holes on the modified/working surfaces? Are there holes on the inside of the shell?"

Another possibility is that tools could have been discarded near the shore line, and then were covered slowly by rising sea level, at which point the sponges moved in. Even if sea level subsequently regressed, the holes from the sponges would remain in your artifacts, which you subsequently dig up on dry land.

Your question is an interesting one. I hope this gives you a direction in which to proceed.

WM

At 10:57 AM 10/31/2003 -0800

Dear Dr. Walker:

Thank you and Dr. Marquardt so much for your quick response. It helps a bunch. Some of the things i am looking at are like the attached 3 stills of what i believe to be a shell adze or celt. There is not much in the way of pitting, but it is enough to make
me wonder. The provenience is from Clark Creek 8Gu60, from the surface. The interesting thing here is that Clark Creek is pretty far upriver, and therefore presumably not near enough to the Gulf Coast or the shores of St. Joseph Bay to be greatly influenced by sea-level change. So, i am assuming that the pitting had to happen at some other location. However, what that means, i don't know (yet).

I've got a few others kicking about, both larger and smaller. I don't want to take up too much of your time--you've already helped me out so much! Thanks again, and have a wonderful weekend.

Hi Eric,
I would guess, based on the photo b, that the holes (which do look like Cliona sp. borings, although I can't be certain) were made before the tool was. The holes along the top margin appear to be open, as if the shaping of the tool intersected the holes. ? Living lightning whelks, especially old robust ones, can be impacted with some sponge activity (usually not a lot, though... not like oysters). Do you think the whelk came from St. Joseph Bay? It is certainly a high-salinity bay. All 3 of the Gulf Cliona species require high salinity waters. What is the blue-green looking stain around the periphery of the shell object? Is that real?
Karen

At 11:14 AM 11/6/2003 -0800
Dear Dr. Walker:
Thank you so much for pointing the holes along the edge out to me. That is too cool! I believe the coloration, the staining was due to post-depositional weathering. This piece was found on the surface. I think that the lighter area was directly exposed, with the greenish stain perhaps the result of being just below the forest carpet. I will have to see if the exact conditions under which it was found and collected are referenced in the field notes.

If you will pardon my excitement, I have to say that this is the coolest. From what I have seen everywhere else that I've looked, from C.B. Moore, to Willey, to Dr. Marquardt's work, it would appear that this area might be unique in using shell that has this pitting. I don't know yet what that means, but it is very intriguing. I will ask Dr. White what the specific salinity of St. Joe's Bay is, to see whether the cliona can occur there or not. Of course, there are plenty of related sites along the barrier islands, and

But, we are getting pitted shells from places like Lighthouse Bayou site, 8Gu114--which is close to the Gulf waters, yes, but is right on the Bay. Here is an oyster shell from Lighthouse Bayou site, and a gastropod--another B. sinistrum. Thanks again! I am indebted to you more than i can say!

sincerely,

Eric Eyles
Eric,
That makes sense about the stain.
Too much *Cliona* activity can weaken shell structure; so bored shell would not have been the ideal choice for tools. Maybe they were choosing shells with bore holes for making tools because all available shells had some degree of bore holes. I wonder what a modern population of St. J's whelks looks like (in terms of whether or not they all have some holes)? In a high-salinity bay, almost entirely enclosed with little freshwater input (i.e., St. J's), one might expect a very healthy, abundant boring sponge population. If you think about it (look at a map and compare it with others in FL), St. J's Bay is not your average estuary. Although each estuary around the state is different from the next, I think that St. J's Bay is especially different in its configuration, which results in a pretty high-salinity context. Maybe it is not even technically an estuary, perhaps "marine bay" is more accurate.

In the Charlotte Harbor/Pine Island Sound region, the configuration is very different, and there are 3 big rivers dumping into the system, so Cliona activity is not so abundant in Pine Island Sound, which is where most of our big whelks come from. Thus our tools from Pineland and other sites in the area rarely exhibit bore holes. The answer that you seek is in the nature of the estuary itself - the hydrological/ecological context. Don't let anyone tell you that Florida's coastal areas/estuaries are all alike. Archaeologists often make this mistake when thinking about paleoenvironmental contexts and change. They expect results from one coastal area to be the same as those from another area. Each individual coastal/estuarine area must be examined first in order to understand archaeological deposits from each of those areas.
I visited the Lighthouse Bayou site. It has an interesting location. I'll bet that through the centuries, the land that today serves to close the St. J's Bay off from the Gulf has been periodically breached and inlets existed from time to time. Maybe Joe Donoghue would have an idea about that possibility. At any rate, inlet or no, St. Joe's is a high salinity environment and perhaps has been for most of the Holocene. There's just not enough fresh water coming in there.

Your second photo shows what might be a knobbed whelk, rather than a lightning whelk. The opening is on the right, is it not? Lightning whelks always open on the left.

Do you know about a second species of oyster called the crested oyster? *Ostrea equestris*. It is a great salinity indicator, if used in concert with the common oyster.

Gotta go to an appointment.

Karen