EFFECTIVE SEASONS AND MOBILITY PRACTICES IN THE LOWER SUWANNEE REGION, FLORIDA: A ZOOARCHAEOLOGICAL STUDY

By

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EFFECTIVE SEASONS AND MOBILITY PRACTICES IN THE LOWER SUWANNEE REGION, FLORIDA: A ZOOARCHAEOLOGICAL STUDY

By

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This dissertation is designed to critically evaluate the concept of seasons as utilized in zooarchaeological studies of coastal settlements. The project aims to show that "seasons," as a matter of perception, emerge from interplay between natural processes and human practices. Because processes and practices vary geographically and historically, effective seasons are contingent on local circumstances and histories. This dissertation presents methods for utilizing data on present-day fish populations in the Lower Suwannee area of the Florida Gulf Coast to model locally relevant seasons and apply them to interpretations of coastal settlement over much of the last 4,500 years.

Fish data collected between 1996 and 2012 by Florida Fish and Wildlife Conservation Commission are used to establish indicator groups of local conditions. Zooarchaeological assemblages are interpreted via taxa abundances, allometric estimates, and diversity values. These methods are used to re-interpret settlement and mobility patterns among pre-Columbian groups in the lower Suwannee region of Florida.

The research provides the first fine-screened zooarchaeological analyses for the lower Suwannee region. One key result suggests mobile and sedentary practices co-

existed among coastal occupants. Through time, people have been sedentary within the region as a whole, but moved between locations based on cultural and environmental factors. Interpretations are enriched through assessments of multiple co-eval sites over single contexts.

Between 2630 and 2290 BC inland locations were occupied. Resources were collected from open waters throughout the year and transported whole to residential sites. Densely occupied sites are not identified between 260 BC and AD 220, which could result from submergence due to rising sea levels or from light occupations during this time. Intense land modifications began by AD 430. Fish distributions suggest selective procurement near sites occupied throughout the year. Sites used ca. AD 610 suggest warm-weather mobility around larger camps and ritual centers. After AD 750, various coastal strategies were employed.

Effective seasons provide a localized framework to evaluate zooarchaeological assemblages. Indicator groups are used to examine practices reflective of local circumstances. Analyses reveal that groups through time employed various mobility and settlement strategies to maintain coastal existences.

CHAPTER 1
INTRODUCTION

Pre-Columbian coastal foragers structured their lives around subtle changes in when and where fish and shellfish were available. People moved within waterways, estuaries, and littoral habitats with knowledge of the dynamic world around them. Much of that knowledge likely was related to how animals moved relative to subtle changes in rainfall, tides, temperature, and length of day. Many of these insights are lost when we use conventional seasons as a guide for behaviors of non-western groups.

This research promotes a critical fine-tuning of seasonality as the concept is applied to coastal fishing groups. Seasonality often is used to infer the nature of settlement and mobility strategies. However, these patterns cannot be assessed at the site level. Instead, sedentism and mobility must be analyzed at a region-wide level, incorporating multiple co-eval sites.

Additionally, we must question the use of conventional seasons. Conventional seasons are rigid categories based on astronomical patterns (e.g., solstices and equinoxes). These broad-scale seasons do not reflect local variations in seasonal expressions. Seasons, however, are dynamic phenomena that variously influence the movement of people, water, and fish, among other variables. Researchers note that sedentism and mobility are both relative terms (Kelly 1992; Bar-Yosef 1998), and yet seasonality, a concept commonly used to examine these ideas, is not granted a similar degree of relativity.

In this dissertation, I replace conventional seasons with effective seasons that are defined in terms of locally relevant factors – such as fish migration patterns, cycles in rainfall, and annual temperature fluctuations. Effective seasons allow for consideration of the influences of local conditions on archaeological faunal assemblages. The results of this research provide insight into spatial and temporal patterning of practices in the lower Suwannee region of Florida.

This research was undertaken as a part of the Laboratory of Southeastern Archaeology's Lower Suwannee Archaeological Survey (LSA-LSAS). The overall aims of the LSAS include documenting the pre-Columbian archaeological record, salvaging threatened archaeological sites, and exploring human-environmental interactions through time in the lower Suwannee region of the Big Bend, a largely undeveloped stretch of Florida's northeast coast (Sassaman et al. 2011).

The lower Suwannee region has been occupied by humans for more than 4,500 years (Sassaman et al. 2011). The present study incorporates analyses of vertebrate and invertebrate materials collected from eight sites in the lower Suwannee region, with radiocarbon assays spanning from 2630 cal. B.C. to cal. A.D. 980 (Appendix A). The zooarchaeological data herein present the first fine-screened zooarchaeological analyses for this region. These data provide a composite data set to document variations in faunal utilization through time and space within the lower Suwannee region, interpret paleoenvironmental conditions, and test hypotheses concerning seasonal resource procurement.

The earliest deposits (2630 to 2290 BC) suggest that Bird Island and Ehrbar acted as main base camps. The sites are roughly equidistant north and south from mouth of the Suwannee River, but the shoreline was located several kilometers west of its present-day location when these sites were occupied (McFadden 2015). Multi-seasonal or year-round occupations are indicated at both of these inshore sites. Fish remains are predominantly marine species, which suggests fish transportation from open Gulf waters to the west.

The early component of Cat Island slightly predates Ehrbar and Bird Island. Cat Island deposits indicate exploitation of lower-salinity locations near the river mouth. Seasonal inferences are inconclusive based on the sample, and occupations here are sparser than either Bird Island or Ehrbar. Whole skeletons are not represented at Cat Island and different types of artifacts are identified. These dissimilarities suggest significant variations in practices between these locations.

Less dense deposits are identified between 260 BC and AD 220. Bird Island deposits suggest the site was more heavily occupied than the sites at Deer and Little Bradford Islands, although samples are admittedly small in size. The prevalent fish species suggest warm-weather procurement from shallow seagrass areas. Furthermore, few large settlements have been identified in the region during this time, suggesting that such sites are submerged present-day (e.g., Faught 2004) or did not exist in the region.

Deposits after AD 430 indicate the onset of intense land modifications. Fish distributions at Shell Mound suggest selective procurement in proximity of the site, which was occupied throughout the year. Large fishes were targeted over small fishes. Spatial variation of fishes and artifacts suggest distinct activity areas within the site. The site may have been located at the high tide line on the western edge.

After ca. A.D. 610, sites with less dense occupations are identified. Cat Island and McClamory Key contain evidence of warm-weather procurement. These sites may have acted as warm-weather foraging sites for activities at the Shell Mound Interior.

Following the abandonment of large sites, such as Shell Mound and Garden Patch, after ca. A.D. 770, people relocated to sites such as Richards Island and Bird Island. Differences in occupations are evident – Bird Island is west of Garden Patch, and multi-seasonal fishing occurred. Richards Island is located south of Shell Mound in protected, intertidal waters. Warm-weather fish collection is interpreted.

In Chapter 2, I discuss the theoretical underpinnings that influenced this research. Many archaeological studies utilize conventional seasonal categories. Seasons, however, are variously represented in different times and locations, and should be evaluated with regard to local conditions.

Furthermore, conventional methods commonly adhere to a behavioral ecology underpinning. These optimization frameworks do not consider non-environmental factors affecting resource procurement. Therefore, practice theory (e.g., Giddens 1984; Sewell 1992) is used to frame coastal mobility and settlement practices in this region of the Gulf coast.

In essence, practices (e.g., fishing, fish/shellfish processing, consumption, and deposition) are engaged by agents, and these practices enforce and manipulate social structures (e.g., Giddens 1984; Sewell 1992). Environmental variables influence practices, but practices also influence which environmental variables are significant to human practices. Seasons are a culture-specific schema that influence what practices may be enacted (e.g. Harris 1998). As such, it is important to define effective seasons that are relevant for each context in order to understand broad mobility and economic strategies.

In Chapter 3, I provide a culture history and an ecological background of the region. I discuss patterning in practices through time with regard to broad climatic fluctuations. Site locations along the Gulf coast reflect human and non-human influences, but coastal orientation has been important to residents through time. Marine fish taxa and oysters are common in all deposits, despite age or proximity to shoreline.

The lower Suwannee region is part of the larger Big Bend region, characterized by low wave energy and dense seagrass beds. The shoreline is wreathed with tidal marshes and creeks that empty directly into the Gulf. It is a rich and diverse region with more than 200 species of fishes. Biologists observe that changes in the environment only roughly adhere to the lunar calendar (e.g., Tuckey and Dehaven 2006). Instead, predictable environmental cycles in the area denote effective seasons of warm/dry, warm/rainy, cool/dry, and cool/rainy periods (e.g., Tien-Shui and Matheson 2007; Wolfe 1990c).

Local people who engage in coastal fishing practices (e.g., Florida Sportsman 2011; see also Garcia-Quijano 2007) pay attention not only to broad solar revolutions and lunar phases, but also to small-scale fluctuations that co-vary with astronomical seasons, such as barometric pressure, wind, and tide. People also observe fish behavior – such as when sea trout gather at the creek mouths, or when mullet move offshore, or when catfish spawn. In this we see that environmental fluctuations and fish behaviors denote seasons.

Although cultural perceptions of past groups are irretrievable, local ecological and fisheries data provide a means of characterizing relevant environmental fluctuations for coastal fishing groups. Local data differs from large-scale data in that it considers environmental parameters specific to the region in question. For instance, juvenile sea catfish are most prevalent in low-salinity areas within the Mississippi Sound, but are more common in offshore habitats in areas of Texas and Florida (SMS 2011). Local data is necessary to identify fish characteristics within the research area.

Local data, rather than generalizations from distant geographic areas, allow for more in-depth interpretations about the temporality of past people's practices because it considers where and when fishes are found within the specific region, which affects when and how people procure those fishes. In lieu of fitting past peoples' actions into the rigid conventional seasonal framework, I use ecological models of locally relevant, or effective, seasonal delineations (e.g., Tien-Shui and Matheson 2007; Wolfe 1990c) that I characterize with present-day fish behaviors.

In Chapter 4, I describe the present-day data used to characterize effective seasons and habitats and introduce the concept of ecological indicator groups. Indicator groups are a broadly applicable method of examining zooarchaeological data (Kenward and Hall 1997; Reitz et al. 2012: 64; 81). Many fish follow regular annual cycles, wherein they spend certain parts of their lives in certain environments. For example, the Smithsonian Marine Station (2011) documents that large striped mullet (*Mugil cephalus*) gather in large schools at river and creek mouths in "fall" months. They migrate to spawn in deep, off-shore waters during "winter" months. The larvae fish migrate inshore to the shallow estuaries and intertidal zones (SMS 2011). Using only biological literature and an optimizing behavioral ecology approach, researchers may assume that the presence of adult mullet in an archaeological assemblage reflects proximity to a river mouth and/or collection during the "fall" because this is when the mullet are large, highly abundant, and localized.

However, these high abundances of mullet at specific times and places depicts a general mobility trend. Present-day local data reveals that mullet can be collected from all areas of the estuary during all times of year. Similar observations among other fish species have led some southeastern zooarchaeologists to dismiss the value of using overall fish assemblages for seasonality assessments (e.g., Reitz et al. 2012:80).

I suggest that by using local data, indicator groups may provide a means of revitalizing fish-based seasonality assessments. To that end, nearly 17 years of local fish data from the lower Suwannee region are analyzed. These present-day data sets, collected by Florida Fish and Wildlife Conservation Commission (FWC n.d.a), are used in conjunction with local ecological data to model effective seasons, establish indicator groups, and provide a baseline for archaeological comparisons.

The lower Suwannee region is a temporally and spatially heterogeneous zone which people manipulated through various fishing practices. In addition to the effective seasons documented in ecological literature, more general seasons are derived based on fish distributions observed in the FWC data. Distributions based on temperature indicate warm (> 22 °C), and cool (< 22 °C) temperature influences. Local geography, such as proximity to the shoreline and freshwater, is also considered.

These effective seasons and geographic areas are characterized in terms of fish abundances, diversity, and sizes. ANOVA are used to assess the values of specific fishes as indicators. Spot fish are the most abundant during cool temperatures. Jack are common in estuaries during specific times of years. Pigfish are most common in open waters. Other fish associations are described in Chapter 4.

In Chapter 5, I discuss zooarchaeological materials and methods employed in analyses of fauna from the lower Suwannee region. Faunal remains, 1 mm and larger, are examined from 57 samples from eight sites. Site contexts, excavation results, and artifact distributions are described for each sample. Archaeological samples include general strata and feature contexts, and are of varying sizes. Several strata were sub-sampled, and the differences between sub-samples are assessed with Chi-Square tests. Traditional zooarchaeological quantifications are used in these faunal analyses, including minimum number of individuals (MNI), diversity, and allometry.

In Chapter 6, I present archaeological results in terms of MNI. Contexts are organized by temporal association. Vertebrate and invertebrate results are included from fine-screened stratigraphic and feature contexts. Vertebrate remains are regarded from ¼-in and larger general level contexts. The most common species and any unusual species, as well as diversity and allometric estimates for select taxa, are documented.

In Chapter 7, I depict the seasonal and habitat associations of each archaeological context from a practice perspective. Temporal and spatial differences are observed among fish and other artifact assemblages. Early sites contain nearly whole fish skeletal representations that were collected year-round from distant habitats. Later, large sites indicate an emphasis on select large fishes that could be locally procured. Smaller foraging sites, utilized during warm weather, are found around large site centers.

Tiny fishes, such as anchovies and clupeids, which are highly abundant in present-day samples, are largely absent in all archaeological contexts. However, juvenile pinfish and killifish are commonly identified archaeologically. Therefore, procurement technologies were available to collect small fishes, but certain species were differentially disposed or not collected.

Chapter 8 provides a summary of the archaeological findings and evaluation of the methodologies employed. This study provides the first fine-screened zooarchaeological analyses for the lower Suwannee region. Instead of conventional temperate categories, effective seasonal categories are used to assess procurement practices because they account for local conditions. Through analyses of indicator groups from multiple archaeological sites in the region, fishing-related seasonal mobility patterns are identified in the region.

Indicator groups, size measurements, and diversity values all contribute to seasonal interpretations. Sampling strategies also affect interpretations. Fine-screen sampling reveals which sites relied more heavily on smaller fish, while inclusion of 1/4-inch materials from general level contexts reveals the sometimes-overlooked significance of larger fishes at sites. Sub-sampling strata vertically and horizontally revealed variations in fish distributions within strata, indicating the importance of multiple samples and the issues of generalizing a sample to represent an entire stratum.

Practice-based approaches are useful for moving beyond behavioral ecological frameworks and emphasizing social considerations of resource procurement. Future directions for this project include establishing additional local proxies and recognizing and quantifying extreme or unusual seasonal/environmental events to move beyond ‘annual round’ analyses. Other issues, implications, and future directions for this research are discussed.

CHAPTER 2
SEASONALITY THEORY AND METHOD

In this chapter, I describe conventional approaches to archaeological seasonality studies, including premises, methods, and applications. I critically examine the broad-scale application of conventional seasons with regard to resource procurement and mobility practices. I introduce the concept of effective seasons to provide an alternative to conventional seasonality approaches. Effective seasons work from the idea that seasons are perceptions that arise from the mutual influences of human practices and environmental processes. This approach considers how the resources used by past occupants of a region can be used to assess local seasonal patterns and provides a means to better interpret the practices of past peoples.

Time is used to regulate human practices and organize experiences. As a structuring device, it is pervasive in all aspects of life -- from the mundane to the ritual (Lucas 2005; Munn 1992). However, the significance of time was overlooked by early anthropologists, who instead applied their own perspectives of time on the cultural groups they studied (Fabian 1983). Perspectives of time used by early anthropologists were rooted in concepts of evolution and progress, so that non-Western cultural groups were treated as timeless windows to the past, rather than groups who created their own viable cultural perspectives and practices within their specific circumstances and histories. This "denial of coevalness" or allochronism, generally resulted in a dehumanization of anthropological subjects (Fabian 1983:33).

Conventional Seasonality Studies

In archaeological studies, allochronism is most easily identified in studies of seasonal mobility. Seasons refer to “regular, recurring, intra-annual fluctuations” (Huss-

Ashmore 1988:1) that affect resource distribution on the landscape. Seasons are part of predictable cycles that humans incorporate into their practices, which affect patterns of resource procurement and mobility.

Winter (January to March), spring (April to June), summer (July to September), and fall (October to December) are the conventional seasons typically used in archaeological seasonality studies in the southeastern United States. These seasons were delineated in temperate Europe and are associated with agricultural traditions dating back to 950 B.C. (Dutka 1988:54-56). They are based on solar and lunar cycles and do not consider local variations that influence seasonal expressions.

Seasonality studies commonly are conceptualized from a cultural ecology framework (Steward 1972). From this view, cultures are viewed primarily as adaptations to environmental fluctuations. Steward suggested that adaptations increase in complexity along levels of sociocultural integration. This perspective gave rise to evolutionary theoretical orientations such as behavioral ecology and optimal foraging theory (e.g., Bird and O'Connell 2006; Winterhalder 1986).

These models work from the premise of optimization. Humans are presumed to procure resources based on caloric value and ease of procurement (Winterhalder 1986). Resource procurement practices are structured around the goal of evolutionary fitness – survival via reproduction (Bird and O'Connell 2006). This concern is seen as the predominant factor that influences the frequency and scale of human movement in the environment. Additionally, human movement commonly is interpreted with regards to an annual round. The annual round is an 'averaged expression' which plots patterns of resource procurement and human movement on a generalized yearly cycle (Cross 1988:56).

In other words, behavioral ecologists assume that past peoples operated on the idea of the most energy for the least effort. People moved across the landscape in predictable patterns for the best resources to support human population survival and growth. Under this school of thought, personal or cultural preferences are not considered to be significant factors. This evolutionary approach has since been critiqued (e.g., Gremillion 2002; Holt 1996; Moss 2012). The core idea of an interplay between human and environmental variables (rightly) maintains (e.g., Cannon 2002; Huss-Ashmore 1988; Marquardt and Walker 2013; Reitz et al. 2012), but the evolutionary premise continues to underlie many seasonality studies..

Early culture historians explained an evolutionary trajectory of cultural groups from highly mobile, egalitarian bands to sedentary, complex chiefdoms. Hunter-gatherers were small, foraging groups who lived by the whim of the environment. Sedentary lifestyles were viewed as testaments of social complexity – groups who harnessed the environment via technological advances to better their societies. Sedentism is associated with abundant resources, commonly associated with agricultural practices. Hunter-gatherers, who did not practice intensive agriculture, represented early lifestyles that had not advanced to more complex technologies and economic practices.

Dissatisfied with these evolutionary approaches, archaeological and ethnohistorical studies soon came forth that revealed the inappropriateness of progressive categories and dichotomizing concepts (Kelly 1992:47). Early groups were recognized that were more sedentary and diversely networked than later populations (e.g., Thomas and Sanger 2010). Sedentary coastal fishing groups were identified that did not rely on agriculture (e.g., Arnold 1992; Marquardt 1992; Moseley 1975). Cultural groups crossed the line back and forth between sedentary and mobile lifestyles without the expected changes in social structure (e.g., Eder 1984; Walter et al. 2006).

Such studies highlighted the ambiguity of sedentism and mobility and their ineffectiveness as markers of progress (Kelly 1992; Rocek and Bar-Yosef 1998; Rosenberg 1998). As a result, sedentism became regarded as a relative measure best defined based on past mobility practices and through comparisons (Kelly 1992). Now archaeologists recognize that mobility is a multi-dimensional concept, variably expressed among cultural groups, and not an opposing concept to sedentism. Cultural groups, regardless of economic and subsistence systems, practice differing scales of mobility. No group is completely sedentary, and sedentary groups have mobile aspects (Bar-Yosef and Rocek 1998; Kelly 1992).

Behavioral Ecology and Economic Strategies

However, many seasonality studies continue to rely on unexamined premises of behavioral ecology. Resource procurement practices often are associated with economic strategies. Binford (1980) laid out the foundational procurement strategies from which many researchers work today. Foraging and collecting represent different extremes of resource procurement (Binford 1980:12). These definitions reflect adaptations to human and non-human factors. They do not reflect progressive practices towards complexity (Binford 2001). Binford (2001:29) observed that hunter-gatherer strategies fluctuate variably. Groups are neither normative nor static.

On one end of the spectrum, foraging practices include ‘mapping on’ to the environment (Binford 1980:13), through strategies such as high mobility and low logistical planning. Groups who primarily forage do not store food and resources, but gather them on a daily basis. Mobility is often viewed as a response to resource availability.

One the other side, collecting practices include ‘logistic organization’ (Binford 1980:13), through strategies such as low mobility and intense logistical planning. Groups who primarily collect are distinguished archaeologically by the presence of food storage systems. They are considered more sedentary than foragers. Collecting practices may include special task groups and tools for resource procurement. Procurement trips generally take group members farther away than do foraging practices, but collectors move base camps less frequently.

Archaeologically, site features, such as size and density of deposits, are used to assess whether a group practiced foraging or collecting practices. Both residential base camps and locations are associated with foraging and collecting practices. The base camp is defined as the focus of subsistence activities where processing, manufacturing, and maintenance activities occur (Binford 1980:4-10).

The location is an area where resources are collected or extracted. Resources are collected at temporary locations and brought back to base camps. The tools and artifacts used at a location are more likely to be procured locally and may be more expedient than artifacts recovered at residential base camps. Locations are much less intensely occupied and exhibit much fainter archaeological signatures than residential base camps (Binford 1980:4-10).

Both types of procurement practices are associated with the same kinds of archaeological sites. Because foragers move more frequently, Binford (1980:13) suggests that foragers can be identified by more numerous residential base camps than are associated with collecting groups. Collectors, who move less frequently, may make use of more storage features at base camp sites than do foraging groups.

Because these strategies are not mutually independent, a group may make use of numerous foraging- or collecting-based strategies. Through analyses of seasonality and economic strategies, past groups are characterized by when, where, and how sites were occupied. Rather than depicting optimizing behaviors, archaeological sites and materials may be understood as representing the dynamic interplay of human and non-human factors that affected practices and worldly understandings. Degrees of foraging and collecting represent the strategies that were enacted by people within specific circumstances in time-space.

Methods of Seasonal Analysis

One of the first and most common methods of seasonal analysis includes identifying the presence or absence of seasonally sensitive species (Monks 1981). The presence of a seasonally sensitive species is used to infer that humans used a site during a given season (e.g., certain fauna are present in cold times, other fauna during warm times). However, in the coastal southeast US, some researchers deem presence/absence of a species an inadequate measure of seasonality because the seasonal signals of many fishes in the region are not exceptionally strong (Reitz et al. 2012:64). Cold weather signatures are difficult to discern because many fish migrate offshore to deeper waters. Therefore, there are few fish indicators used by southeastern zooarchaeologists to assess cool weather occupations. Additionally, the absence of a species does not necessarily indicate the absence of a seasonal signature – factors such as preference and technology also affect what species are collected (Quitmyer 2013:50).

Other methods of seasonality assessments have since been developed. These methods are divided into morphological, structural, geochemical, and demographic categories (Quitmyer 2013:350). Prominent zooarchaeological research in the Southeastern U.S. (e.g., Colaninno 2012; Marelli and Arnold 2006; Quitmyer 2013; Reitz et al. 2012) demonstrates how these methods are employed and used to interpret past peoples.

Morphological analyses consider change in shell structure to assess seasonal signatures (Quitmyer 2013:52). However, shell structures may reflect more than seasonal fluctuations. Therefore, longitudinal studies are necessary to interpret structural features. For example, Marelli and Arnold (2006) observed genetic changes in scallop populations along the Gulf coast over 1,500 years. They noted that when population pressures become severe, morphological changes may be more easily identified.

Structural analyses consider how internal growth structures of bone or shell respond to seasonal fluctuations. Schlerochronology, a type of structural analysis, is used to correlate shell growth with environmental fluctuations. The growth lines of some shellfish, such as hard clams, precipitate in response to environmental fluctuations, such as temperature (Quitmyer 2013:352). Through a visual analyses of growth lines, one can determine the general season of death of an organism (e.g., Quitmyer and Jones 2012). However, this method can be applied only to specific types of remains.

Oyster shells are one of the most abundant constituents in shell middens in the southeast, but oyster shell growth lines do not correspond with regular fluctuations in temperature. Therefore, oyster shells cannot be subjected to sclerochronological measures. Structural analyses can be applied only when significant quantities of appropriate bivalves are recovered from a site, but hard clam shells generally are not abundant materials recovered from middens in the lower Suwannee region.

Geochemical analyses rely on examination of the ratio of stable isotopes within bone or shell. Like structural growth lines, isotopic ratios change in response to external conditions. For example, oxygen has two stable isotopes that are used to assess past evironments and climates, ^{16}O and ^{18}O. Elements contain measurable ratios of these isotopes, which reflect water temperature. Samples that have higher $\delta^{18}O$ values indicate growth in lower water temperatures (UGA n.d.). Therefore, assessments of the oxygen isotopes of the most recent growth of archaeological bone or shell provides ratios that can be used to determine relative water temperature at time of death (Quitmyer 2013:352).

Colaninno (2012) analyzed $\delta^{18}O$ values from present-day fish otoliths to compare against archaeological otoliths of hardhead catfish and Atlantic croaker from St. Catherines Island. She analyzed 24 present-day otoliths of known context and 42 archaeological otoliths from four proximate Late Archaic shell rings. From her isotopic analyses, Colaninno (2012) finds evidence of all four seasons between the four sites, but more data is necessary to understand the patterns of use between sites.

Additionally, only sufficiently large otoliths can be sampled, limiting the scope of analysis.

Demographic analyses consider how sizes of fish or shellfish cohorts reflect seasonal fluctuations (Quitmyer 2013:52). Because some fishes utilize different areas of the estuary at different times of their lives, general sizes of fishes can be used to assess season and location of collection. Other species, such as impressed odostome, live for only one year and grow at a predictable rate; therefore, sizes of these gastropods can be used to identify season of collection (e.g., Russo 1991a). Cannarozzi observed although odostome populations increase in size throughout the year, the absolute size values vary geographically (Cannarozzi 2012:185). She stresses the importance of a locally procured proxy data set.

Effective Seasonality Studies

While sedentism and mobility were acknowledged to be relative measures (Kelly 1992; Bar-Yosef and Rocek 1998), seasonality has not been accepted into this fold. However, it is important to consider how seasonal categories affect what research questions are being asked and how methods are applied to those questions. This consideration affects the results and anthropological interpretations.

The uncritical application of conventional time categories is an example of allochronism and presents an issue for anyone concerned with how time (e.g., seasonality) influenced past practices and structures. In this section, I discuss seasons as perceptions that result from the interactions between human practices and environmental processes. When viewed in this regard, effective seasons can be defined to reflect local conditions, which can be used to re-examine mobility and subsistence practices. However, I am not suggesting that archaeologists will identify the actual ‘folk’ seasonal perceptions on which past groups oriented.

Cross (1988) observes that seasonality studies predominantly emphasize methodological over contextual or theoretical concerns. Annual rounds emphasize average conditions, such as annual temperature or amount of rainfall, but they do not focus on extreme conditions. Both factors, however, significantly affect cultural practices.

Cross (1988) suggests moving beyond the concept of annual rounds. He notes that archaeological contexts often represent hundreds of years of activities – “successes, failures, and everything in between” (Cross 1988:55). Seasons are dynamic categories with predictable and unpredictable variations. Therefore, he recommends documenting a range of strategies that people used to cope with events, rather than delineating a fixed list of predictable events and responses.

While I promote the use of effective seasons over conventional seasons, effective categories still fall within Cross’s (1988) critique. Like conventional seasons, effective seasons rely on averaged conditions. However, by regarding seasons as contingent on location and historical circumstance, effective seasons reflect more local conditions than astronomical conditionals. By using effective seasons, it may be possible to identify extreme conditions, as Cross (1988:56) suggests.

In this way, effective seasons one day may provide a means of moving beyond an annual round. Additionally, they offer more insight on social structures, practices, and agents’ perceptions within the region (e.g., Thompson 1967). Finally, effective seasons are not limited to four strictly-bound seasonal categories – effective seasons can be delineated as available seasonal indicators are identified.

Effective seasons incorporate numerous local factors that may have affected practices in the past. Patterns in tides, winds, barometric pressure, and plant/animal growth have all been documented as major seasonal indicators among different groups (e.g., Eder 1984; Evans-Pritchard 1939; Harris 1998; Mauss 1979; Ono 2010; Smith 1987). While these finer-scale factors are not independent from broad-scale seasonal cycles, they provide more detailed nuances into human practices.

In the Dampierland Peninsula of northern Australia, for example, the Bardi observe fluctuations in numerous environmental factors to influence their practices across the landscape (Smith 1987). The Bardi identify six seasons, determined by the direction of the wind and rain, the maturation of fruit, and the presence and size of certain animals. Theses seasonal indicators influence mobility and procurement practices. The onset and durations of these seasons vary from year-to-year, so that seasons are not static categories.

Similarly, Harris (1998) argued that the Paruaros of the Amazon floodplain create relevant seasons. Seasons are broadly divided into rainy and dry seasons, the durations and onset of which vary from year to year. Seasons are directly related to spatial boundaries because the river floods the forest. Due to the extreme seasonal variations, land and water cannot be separated or fixed in space. During dry seasons, the Paruaros can traverse the forest by foot and collect terrestrial resources. During rainy seasons, the Paruaros can only traverse the forest by watercraft and collect riverine resources. Rainy season is associated with lack of activities and depression, as individuals largely remain indoors above flood waters. These seasonal divisions affect levels of social interaction. Dry season is eagerly anticipated for new beginnings, new growth, and freedom to travel outdoors (Harris 1998).

These studies demonstrate that conventional temperate seasons are not always the best analytical categories. Additionally, conventional seasons may be difficult to characterize in different geographic locations. For example, Tuckey and Dehaven (2006) collapse winter and spring into a single analytical category when discussing present-day seasonal and habitat distributions of fishes in the lower Suwannee region of Florida, presumably because the two analytical categories do not exhibit significant differences (see also Tien-Shui and Matheson 2007).

Practice-based Approaches

Past cultural groups can be appreciated for the diversity of practices that people engaged based on their understanding of the world. To that end, I apply apractice-based perspective to archaeological assemblages from sites in the lower Suwannee region of Florida. Material remains reflect the practices of skilled agents who used schemas that outlined appropriate mobility patterns and resource procurement techniques – which may not have always emphasized optimization. Each site was associated with specific practices and meanings, while contributing to the overall structure of a coastal fishing culture in the region.

Structuration is a type of practice theory that examines the relations between social structures, practices, and agents (e.g., Giddens 1984; Sewell 1992). Agents, both human and nonhuman, perform actions that create and maintain the flow of social life. These actions result in material residues. Social structures are malleable frameworks of society that empower and constrain social action (and vice versa). The agents who live within these structures have the ability, through their practices, to enforce or change structures. The relationship between social structure and agency is a mutually influencing duality rooted in practice. Through practices, social structure and agency are strengthened and changed (Sewell 1992).

Atalay and Hastorf (2011) analyzed the relationship between food-related practices and seasons. They examined plant, animal, other artifacts, and site architectural remains to trace procurement, processing, and eating habits. They identified a range of wild plants and domestic animals that influenced the seasonal and social life of residents at Catalhoyuk. The seasonal availability of resources are listed, along with taphonomic markings to the remains and any other materials found in association. From these data, Atalay and Hastorf paint a detailed narrative of food-related practices.

Mlekuz (2010) regarded gardening practices of the Balkans Neolithic (ca. 7000 BC) as a way that people actively participated in annual growth cycles, rather being passive observers. Gardens were durable centers of activity that structured human actions and linked humans with plants, animals, and ancestors. By the transportation of nonlocal materials to garden sites, people created and maintained history.

I consider these examples with regard to archaeological sites in the lower Suwannee region. Archaeological sites are regarded as loci of structure from which practices and routines may be inferred. Examples of practices include procurement, transportation, processing, cooking, consumption, and deposition of materials. These practices are interpreted from the middens that characterize each site. Middens contain materials such as faunal remains, shell hammers, ceramic sherds, and lithic debitage.

The contents of these deposits were informed by relevant schema –such as regular environment fluctuations and socially acceptable collection, processing, and consumption practices. The faunal and artifactual patterning between sites reflect not only the practices associated with each site, but the larger social structures that influenced and were influenced by human actions.

Although lower Suwannee occupants primarily are coastal fishers through time, fishing-related activities can take on very different meanings among different groups of people through time. For example, a broad range of fish elements is represented at the earliest occupied sites (see chapter 6), which suggests that the entire fish skeleton was deposited in base camp middens. This pattern contrasts later occupations, where fewer or more fragmented remains represent each fish taxon. Although both assemblages indicate marine-focused resource procurement, the practices and meanings associated with fishes vary among groups (e.g., Ropke 2009:2494).

Summary

In this chapter, I critically examined common foundations, methods, and goals of seasonality studies. Seasons are predictable, recurring patterning of environmental conditions that affect resource availability, and thus, human mobility. The four conventional seasons are categorized by the regular cycles of eclipses and solstices. Despite local variations in seasonal expressions, conventional seasons are used to assess archaeological materials from broad geographic ranges. Often seasons are considered static categories, although seasons are better understood as geographically and historically contingent perceptions that result from human and environmental interactions.

I incorporate a practice-theory approach to emphasize the influences of human as agents over the optimization focus of behavioral ecology. I suggest a more dynamic seasonality study is possible through the use of effective seasons. Effective seasons provide a means of examining resource procurement with regard to local conditions. By understanding predictable environmental patterns specific to a region, a researcher can delineate effective seasons and possibly identify unusual or extreme conditions that affected resource procurement practices in the past.

To that end, the next chapter includes discussions of ecological contexts and culture histories along the Florida Gulf coast. I describe the local ecology, effective seasons, and prominent fauna in the region. Then I discuss how different groups have occupied this region through time, noting differences settlement patterns, mobility practices, and resource procurement strategies.

CHAPTER 3
CULTURAL AND ENVIRONMENTAL BACKGROUNDS

In this chapter, I provide a background of environmental processes relevant to the Big Bend region.   Effective seasons and habitats are identified from ecological literature based on factors such as water temperature, rainfall, local habitat, faunal abundances, and faunal sizes. Characteristics of significant species are documented. I provide a culture history narrative of coastal groups who have occupied this area and surrounding regions in the southeastern United States.

Local Ecology

The lower Suwannee region is located within the Big Bend region of northwest Florida. Even today, the Big Bend region remains one of the least polluted coastal areas in the United States. The Big Bend region extends south from St. Marks to the Anclote River (Figure 3-1). This mixed siliciclastic-carbonate coastline is characterized by a shallow coastal shelf, a drowned karst geology, and low wind- and wave-energies, the Big Bend region contains the second-largest seagrass ecosystem in Florida after the Florida Bay. The area of seagrass beds in the Big Bend region is nearly five times that of the combined seagrass beds of Tampa Bay, Sarasota Bay, and Charlotte Harbor (Carlson et al. 2010:3; Carlson and Madley 2006:99; Dawes et al. 2004:6-13; Mattson 1999:259-260; Mattson et al. 2006:171-173).

The presence of these seagrass beds is important because seagrasses provide features such as resource production, habitat and structure, sediment filtration, oxygen production, nutrient regeneration, and dampening of waves along the coast (Dawes et al. 2004:5; EPA 2006:2-4; Wolfe et al. 1990:192-193). Seagrass beds increase surface area as much as 15-20 times relative to unvegetated areas, which provides resources and habitats for a diversity of species. The seagrass beds of the Big Bend region are "more productive on a per-unit basis than either tropical coral reef systems or the upwelling regions of Peru" (Wolfe et al. 1990:192).

Additionally, the Big Bend region generally lacks barrier islands and reefs, such as those identified in the Georgia Bight. Most estuaries are influenced by tides and protected from the ocean by barrier islands or reefs. The absence of barrier islands and the density of sea grasses distinguish the Big Bend region. However, these areas contain transitional zones from terrestrial to aquatic habitats and from fresh to marine waters. These intersecting zones result in numerous, dynamic habitats. Fresh and marine waters do not mix easily, resulting in stratified water layers, where the lighter freshwater lies over the denser saltwater. The degree of stratification affects habitat, water circulation, and chemical profiles of the water (EPA 2006:2-2).

The waters in the lower Suwannee region specifically are relatively shallow, with average depths of 2.2 meters below mean sea level. The tides are semidiurnal and have a tidal range of 0.7 meters (Tuckey and Dehaven 2006:103). Average monthly water temperatures between 1996 and 2012 (FWC n.d.a) range between 15°C and 30°C with significant annual temperature fluctuations.

The main influx of freshwater from the Suwannee River contributes to the diversity of species that occupy these areas. Salinity levels are lowest at the mouth of the Suwannee River, and increase (up to 35 psu) away from the river mouth. The freshwater mixes with estuarine waters as it flows south along the Gulf Stream current (Bledsoe and Phlips 2000). The areas south of the river mouth are associated with less edge habitat and more freshwater marshes (Raabe et al. 2007:59).

Salinity levels in the Big Bend region do not fluctuate in a regular, annual cycle. Instead they are “extremely variable” (Wolfe 1990c:58). The mixing of freshwater runoff with marine waters generally result in lower salinities at river mouths and during rainy seasons, with higher salinity levels occurring away from the river mouth and during times of low freshwater discharge.

The dominant landscape features in the lower Suwannee region are seagrass meadows, intertidal marshes, and oyster bars. Because of the lack of barrier islands, rivers, creeks, and marshes drain directly into the Gulf. However, the lower Suwannee region is partially bounded by oyster reefs and sand deposits (Raabe et al. 2007:3). These deposits are temporary, however, as they largely respond to environmental fluctuations. Seagrasses generally are able to thrive because of the low sediment load and clear groundwater from the Florida Aquifer. (Dawes et al. 2004: 12-40; Katz and Raabe 2005:6-8; Mattson 1999:260; Mattson et al. 2006:171-173; Wolfe 1990b:2).

The influx of freshwater and the low-energy coastal processes in the Big Bend estuaries result in salinity levels lower than marine waters (32+ practical salinity units (psu)), dense vegetation, and diverse, abundant faunal species. Oyster beds accumulate in intertidal and subtidal areas, and provide additional habitats for other species. Warm-temperate, subtropical, and tropical species are identified and overlap in the seagrass meadows and oyster bed communities of the Big Bend region. The Big Bend region marks the northernmost distributions of tropical seagrasses and mangroves. The town of Cedar Key presently is identified as the northernmost extension of mangroves on the Florida west coast (Carlson and Madley 2006:99; Dawes et al. 2004:6-13; Mattson 1999:259-260; Mattson et al. 2006:171-173). These areas and associated faunal groups are not static or easily categorized, even under stable environmental conditions (Dawes et al. 2004: 12-40; Mattson et al. 2006:171-173; Wolfe et al. 1990:168-169).

Of significant concern, however, is the loss of seagrasses observed in aerial photographs of the Big Bend region between 1984 and 2006 (Carlson et al. 2010). River runoff, which contributes to low seagrass coverage near river mouths (Dawes et al. 2004:13), cannot explain the widespread loss of seagrasses in the region during this time. Carlson and colleagues (2010:18) suggest that decline in seagrasses in the Suwannee region is attributed to lowered salinity levels and higher turbidity, color, and phytoplankton biomass caused by storms associated with the El Niño events of 1997 and 1998, as well as the notably strong hurricane season of 2004 and 2005.

However, the timing of these storm events is significant. Seagrass losses were not as severe in Tampa Bay or Charlotte Harbor over the same time period. Carlson and Madley (2006:101) suggest that because the Suwannee River receives most of its rainfall during cool weather, compared to warm weather for the two locations to the south, the increased rainfall from the El Niño and hurricane events extended the duration of high river discharge for the Suwannee River, contributing to the loss of seagrasses (Carlson et al. 2010:21-22).

Effective Seasons in the Big Bend region

Some biologists in the Big Bend region eschew conventional seasons, and instead draw upon regular environmental fluctuations in temperature and rainfall to derive effective seasons relevant to the region (e.g., Tien-Shu and Matheson 2007; Wolfe 1990c). The Big Bend region is generally is divided into patterns of two wet and two dry seasons. Correlations between these seasons and fish distributions are documented (e.g., Tien-Shui and Matheson 2007).

The period between April and May is characterized by warm weather and little rain (Wolfe 1990a:Figure 15). The warm and rainy season, between June and September (+/- six weeks), is associated with convective storms. The storms are frequent, but often of short duration (1-2 hours) – longer periods of summer rain are generally associated with tropical storm systems. Seagrass biomass is at its peak during this season. High summer temperatures are lowered by sea breezes and afternoon thunderstorms (Carlson and Madley 2006:101; Carlson et al. 2010:5; Wolfe 1990a:27-34). Typically the majority of intense hurricanes occur at the tail end of this season, primarily between August and October (Curtis 2008).

Between October and January a portion of the Bermuda high-pressure cell separates over the Gulf of Mexico, resulting in anticyclonic, low-level winds from a westerly direction. The combination of convective forces and coastal mechanisms result in erratic patterns. Temperatures are cooler, and generally less rainfall occurs during this time. During this ‘season of frontal passages’, winds primarily arise from northwesterly, rather than southwesterly directions. These circulatory patterns are influenced by cold continental air masses. Wind directions shift based on thunderstorm formations and cold fronts in clockwise patterns before returning to generally southerly winds (Wolfe 1990a:32-34).

The cool rainy season occurs generally between February and March (+/- six weeks) and is associated with frontal storm systems. During this season, the Suwannee River receives most of its rainfall. The storms typically last longer than summer convective events, but they occur less frequently. Cold fronts are ameliorated by the Gulf waters, and the fronts are often separated by a few days of warmer weather. Seagrass cover declines during this time due to cold fronts and low tides from lunar forces (Carlson and Madley 2006:110; Carlson et al. 2010:22; Wolfe 1990a:27-34).

Faunal Species of the Big Bend region

The distribution of fauna in the Big Bend region correlates with effective seasons (e.g., Tien-Shui and Matheson 2007). Biological profiles of archaeologically significant species are discussed here and revisited in later chapters.

Fishes. Sea catfish (Family: Ariidae) are common inhabitants of estuaries that prefer warmer temperatures in the southeastern United States (Figure 3-2). Two species of sea catfish are found on the Gulf coast – Hardhead catfish (*Ariopsis felis*) and Gafftopsail catfishes (*Bagre marinus*). Sea catfishes are bottom-feeding, schooling fishes that are found predominantly on muddy/sandy bottoms. Young of the year catfish measure up to 133 mm total length (TL), while adult sea catfish reach maturity by 250 mm (Fishbase 2014; SMS 2011). Sea catfish sizes tend to be smaller within estuaries during warm weather because sea catfishes spawn during these times. Adult sea catfishes have been observed keeping juvenile offspring in their mouths to protect them (Muncy and Wingo 1983; SMS 2011).

Little is known about needlefishes (Order: Beloniformes) (Figure 3-2). They are commonly found in seagrass meadows, but they can tolerate both fresh and brackish waters. Average needlefishes sizes range between 380 and 680 mm TL (i.e., *Strongylura* sp.). Needlefishes typically are not the most numerically dominant fish where they occur (SMS 2011).

Toadfishes (*Opsanus* sp.) are found among seagrass meadows and shallow coastal areas (Figure 3-2). They grow up to 300 mm TL. Along the Gulf coast, they spawn in February and March (Fishbase 2014). Toadfish are hardy fishes that can survive in waters with low levels of dissolved oxygen (FLMNH n.d.).

Killifishes (*Fundulus* sp.) are small schooling fishes that prefer grassy areas with low currents and nearby freshwater influxes (Figure 3-2). They can grow up to 180 mm TL. Killifish generally spawn between March and September. Although generally drab colors, breeding male killifish exhibit vibrant blue, red, and orange colorations. Eggs are laid on nearshore vegetation during spring high tides and left exposed to air. When the next spring high tide occurs (about 12 days), the eggs are inundated and hatch (USGS 2015).

Jack (*Caranx* sp.) are schooling fish that spawn offshore in deeper waters, generally between March and September (Figure 3-3). Juveniles are common in muddy/sandy bottoms and seagrass meadows in estuaries (FLMNH n.d.). FWC (n.d.b) reports that most mature jack (greater than 600 mm (FLMNH n.d.)) are found off the continental shelf, outside of estuarine waters (Fishbase 2014).

Numerous species of jack are common sports fish today (Florida Sportsman 2011). These fish are popular because they put up a good fight once they are hooked. The fights are described as unimpressive for a bystander, but few fishes of comparable size put up as dogged a fight as the Crevalle jack (Florida Sportsman 2011).

Sheepshead (*Archosargus probatocephalus*) is an abundant species found in estuarine areas (Figrue 3-3). They move to deeper waters to spawn during cool weather. Adult sheepshead can measure up to 910 mm TL. Although found throughout the estuary, juvenile pinfish are common in seagrasses, and adult sheepshead are most common in areas with hard substrates, such as oyster reefs and piers (SMS 2011).

Pinfish (*Lagodon rhomboides*) are schooling fish that spawn primarily during cooler weather (Darcy 1985) (Figure 3-3). Clark (1974) reports that pinfish are most commonly found in areas with minimal current and abundant vegetation. Hansen (1970) observed that mature pinfish are larger than 132 mm TL, but they can reach sizes up to 400 mm TL (Fishbase 2014).

Silver perch (*Bairdiella chrysoura*) are schooling fish that prefer sandy/muddy bottoms (Fishbase 2014) (Figure 3-3). Silver perch spawn during warmer months within estuaries (Grammer et al. 2009) and/or tidal creeks (FWC n.d.b; NERRS n.d.). Mature silver perch generally measure at least 95 mm standard length (SL) (Grammer et al. 2009), but they can reach up to 300 mm TL (Fishbase 2014).

Spot (*Leiostomus xanthurus*) are schooling fishes that prefer sandy/muddy bottoms, although they are found in vegetated areas as well (Figure 3-4). Spot tend to enter estuaries upon reaching between 10 and 24 mm SL (SMS 2011) and often remain in the estuary year-round (Fishbase 2014). Adult spot generally reach about 250 mm TL (Fishbase 2014).

Red drum *(Sciaenops ocellatus*) commonly are found in estuarine regions, but adults also migrate to offshore waters (Figure 3-4). Along the Gulf coast, red drum spawn between September and October. Juvenile red drum are commonly found in seagrass areas, while adult red drum are common in seagrass meadows, sandy/muddy bottoms, and oyster bars. Red drums are most common along the edges of habitats

(SMS 2011). Red drum reach maturity between 550 and 830 mm TL, but they can reach sizes up to 1,550 mm TL (Fishbase 2014).

At least three species of mullet (Family: Mugilidae) are found in the Gulf of Mexico, of which striped mullet (*Mugil cephalus)* is the largest and most common (SMS 2011) (Figure 3-4). Mullet can be found in fresh and brackish waters, in sandy/muddy bottoms and seagrass meadows (FLMNH n.d.). Juvenile mullet prefer intertidal areas where temperature and salinity fluctuate. Older mullet prefer deeper, more stable waters (SMS 2011). Each species spawns during different times of the year (SMS 2011). Striped mullet reach maturity around 350 mm TL and can grow up to 1,000 mm TL (Fishbase 2014). Archaeologically, mullet are typically identified to genus but not species (Reitz et al. 2012).

Burrfishes (Family: Diodontidae) are covered with bony spines (Figure 3-4). They can intake water to inflate their body sizes against predators (Fishbase 2014; SMS 2011). Additionally, some species of burrfishes are known to secrete toxins (Abbott et al. 2003; Malpezzi et al. 1997) Burrfishes are common in seagrass meadows within estuaries and commonly reach up to 400 mm TL (Fishbase 2014; SMS 2011).

Turtles. In addition to fishes, several types of turtle are common in the lower Suwannee region. Pond turtles (Emydidae) are the most common turtle family identified, but snapping turtles (Chelydridae), mud/musk turtles (Kinosternidae), and sea turtles (Cheloniidae) also are present. The pond turtle family consists of numerous species. The majority of these turtles are freshwater species, such as cooters (*Pseudemys* sp.). Pond turtles are commonly seen basking on logs and swimming. Cooters are one of the largest pond turtles, found predominantly around slow-moving bodies of waters. The diamondback terrapin (*Malaclemy terrapin*) are smaller and prefers brackish waters (Franklin n.d.).

Snapping turtles (*Chelydra serpentina*) are large turtles that can be found in both freshwater and brackish areas. They often bury themselves in mud (Franklin n.d.). Mud/musk turtles are small turtles that can be found in slow-moving freshwater and brackish areas. Sea turtles are large, aquatic turtles with limbs modified for swimming. These turtles rarely come ashore except to lay eggs (Franklin n.d.)

Large Invertebrate. Abundances of large invertebrate remains (typically identified in ¼-in mesh) are used to infer likely food resources and procurement environments. Abundances of incidental invertebrates (i.e., small invertebrate remains typically identified in 2 mm or smaller mesh and not considered food remains) are assessed to interpret environmental conditions and processing practices.

Eastern oyster (*Crassostrea virginica*) is one of the most common large bivalves found in the lower Suwannee region. The shells are one of the main constituents of shell rings along the coast in this region. Oysters grow in clumps or reefs both inter- and sub-tidally in areas with good fresh/brackish water mixing. They spawn during high temperatures and salinity levels (Russo 1991a). Oysters are filter-feeders, and as such, increase water quality and provide habitats for numerous fishes, gastropods, bivalves, and other fauna (Bergquist et al. 2006; SMS 2011).

Scallops (*Argopecten* sp.), marsh clams (*Polymesoda caroliniensis*), and crown conchs (*Melongena corona)* are also commonly encountered large invertebrate remains in archaeological deposits. Scallops are common in seagrass areas when temperatures are above 21 °C and salinity levels are between 24 and 30 psu. Scallops live between

12 and 18 months (SMS 2011), increasing in size gradually through that time. Therefore, scallops have the potential to be used as seasonal indicators.

Marsh clams are common in intertidal areas (Wakida-Kusunoki and MacKenzie 2004), but they can also be found upstream of tidal influences (William et al. 2014:405). Marsh clams prefer shallow waters with muddy/sandy bottoms (William et al. 2014:405). Marsh clam occur where salinity levels are below 20 psu, but they are most abundant where salinities are around 5 psu (Montagna et al. 2008).

Crown conchs prefer low-energy seagrass areas and oyster reefs. Woodbury (1986) observed that crown conchs are larger in oyster reefs than in seagrass areas. Other researchers (e.g., Hathaway and Woodburn 1961; Tiffany 1974) have suggested that crown conchs can be used as evidence of estuaries with poor health, especially if other species, such as oysters or clams, are scarce. However, these studies have not been substantiated (SMS 2011).

Lightning whelks (*Busycon contrarium*), like crown conchs, are found in seagrasses and oyster beds in the lower Suwannee region. Lightning whelks are larger and less common than crown conches. While crown conchs and most other large gastropods on the Gulf coast spiral open to the right, lightning whelks are distinguished by their counter-clockwise spiral to the left (SMS 2011).

Incidental Invertebrates. Impressed odostomes are small ectoparasitic snails that live for approximately one year and prey primarily on eastern oysters. Russo (1991a) suggests that the modal sizes of odostomes in an archaeological assemblages can be used to infer the time of year during which eastern oysters were collected because odostomes increase gradually in size throughout the year. The odostome cohort grows at similar rates, so that the most common sizes of an assemblage may reflect the time of collection.

Periwinkle (*Littorina* sp.) is a small littoral species found among seagrass areas in the lower Suwannee region (SMS 2011). Little is known about their ecological tolerances. Periwinkle has been considered as both a non-food incidental and a targeted taxon in different contexts. The presence of periwinkle remains in archaeological deposits is suggestive of targeted collection of seagrass or the deposition of archaeological materials near seagrass areas.

Truncatella (*Truncatella* sp.) are found commonly at high-tide lines (Hubricht 1985). Truncatella live buried under moist leaf litter at the interface of land and sea (Petuch and Myers 2014). Little else is known about their ecological tolerances. The presence of truncatella shells in archaeological deposits suggests that either materials were deposited near high-tide lines or that leaf litter was collected from the shore.

Grass ceriths (*Bittolum varium*) commonly are found in seagrass habitats and among oyster beds during warm months where salinity levels are above 10 psu. Grass ceriths have been observed in lesser numbers buried in bottom sediments in response to cooler weather (SMS 2011; Wells 1961). Grass ceriths have relatively short lives (average < 1.5 years) and grow at predictable rates. Like impressed odostomes, growth intervals among grass ceriths may be useful proxies for seasonality of resource procurement (SMS 2011).

Barnacles (Balanidae) are small incidental invertebrates and are not commonly considered a food source. They adhere to oyster shells and other solid substrates (SMS 2011). There is little information presently available about barnacle environmental preferences. The presence of barnacle remains in archaeological deposits is suggestive of the collection of oysters with barnacles attached to their shells, or of the proximity of the deposits to brackish water sources, such that barnacles could have adhered to shells post-depositionally.

Numerous other invertebrate species are identified in the lower Suwannee region, including both marine and terrestrial species. Marine species include taxa from the families cerithiopses (Cerithiopsidae), ceriths (Cerithiidae), and dovesnails (Columbellidae), among others. Many of these species are found in intertidal seagrass shallow areas. Terrestrial species primarily include taxa from the order Polygyroidea. Ratios of incidental marine and terrestrial snails may be useful proxies for interpreting procurement and depositional practices with regard to distance from the shoreline.

Cultural Histories

Analyses of archaeological materials from coastal sites are used to infer shifting patterns in environment, site locations, mobility, resource procurement strategies, and other practices. Although I use broad categories (i.e., Archaic and Woodland) to organize the discussion in this chapter, I emphasize a centuries-level focus to highlight variation at a human-relevant scale throughout the rest of the dissertation.

Regional sea level generally has increased since the Pleistocene to present-day levels. At a human-relevant scale, fluctuations through time have resulted in small-scale transgressions and regressions of sea level that significantly would have affected populations who lived on the coast (Faught 2004; McFadden 2015). McFadden (2015) observes that the local representation of paleoenvironmental shifts are variably expressed between regions. Therefore, locally relevant datasets are necessary for environmental reconstructions and assessments. To that end, archaeological data sets have been analyzed to examine human responses to both broad- and small-scale climatic shifts along the Gulf coast (e.g., Marquardt and Walker 2013; McFadden 2015; Pluckhahn et al. 2015; Sassaman and Wallis 2015).

Late Archaic Period (3000 to 1200 cal. B.C.)

From a broad-scale perspective, populations of the southeastern U.S. between ca. 3000 and 1200 cal. B.C. are characterized by the introduction of pottery and by large exchange networks that connected smaller sites to central hubs such as Poverty Point in the Mississippi valley. These social networks are indicated by the presence of diverse artifacts from far-distant locations (Anderson and Mainfort 2002:1-6; Kidder 2010:24). Large shell midden sites were constructed along the coasts (Anderson and Mainfort 2002:1-6; Saunders and Russo 2011; Steponaitis 1986:372), which researchers have variously interpreted as ritual, non-residential, and/or residential sites (e.g., Marquardt 2010; Saunders and Russo 2011; Russo 1991b; Thomas 2008).

Florida Gulf Coast. Along the Florida Gulf coast, however, large coastal Late Archaic sites are uncommon (Russo 2010:163). Russo attributes this primarily to the loss of sites from destruction and/or submergence due to the shallow continental shelf and rise in sea level (see also Faught 2004). Meig's Pasture, in the western part of the panhandle, is one of the few Late Archaic coastal shell ring sites identified, with a radiocarbon date of 4100-3000 B.P. (Russo 2010:164). Numerous artifact scatters and hamlets are suggestive of foraging practices that centered around Meig's Pasture. Many sites in the region were abandoned between ca. 3000 to 2500 B.P., which Kidder (2010:24) attributes to significant climatic fluctuations.

No large Archaic shell rings are documented in the lower Suwannee region. However, cemeteries have been identified at Bird Island and several other sites in the region, such as Cat Island, McClamory Key, and Atsena Otie. The Bird Island cemetery includes one of the largest soapstone caches in Florida. More than 18 different types of soapstone are identified from different provenances in the southeastern U.S., such as Spartanburg, South Carolina (McFadden 2015:75-76; Roberson 2015). The varied provenances link the occupants of Bird Island to broad trade networks extending beyond Florida (McFadden et al. 2015).

The next large, Late Archaic shell ring site is found south of Tampa Bay (Russo and Quitmyer 2008:242-243). Uncorrected radiocarbon assays place occupation of the Palmer Site - Hill Cottage between 2150 and 1400 cal. B.C. The U-shaped midden is more than 150 meters long and contains an abundance of scallops, oysters, and other marine invertebrates. With evidence of year-round occupations, other site architecture includes interments, post molds for structures, hearths, and a mix of decorated and non-decorated artifacts. Similar to Meig's Pasture, the site is surrounded by smaller foraging sites.

In southwest Florida, Horr's Island contains a large –U-shaped ring of comparable size to the Palmer Site (Russo 1991b; Russo and Quitmyer 2008). Surrounding the site are three large shell/sand mounds. Uncorrected radiocarbon assays indicate occupation between 3000 and 2400 B.C. Year-round occupations are inferred from analyses of shellfish and fish remains, as well as the richness of species identified at the site. Additionally, the site contains evidence of numerous structures and hearths, as well as a diverse shell-tool assemblage.

Georgia Bight. Large shell ring sites are more numerous on the Atlantic coast, which may reflect differences in the slope of the continental shelf between the Gulf and

Atlantic coasts. The shelf is shallower along the Gulf coast, which would have allowed sites to be occupied further offshore during times of lower sea level, compared to the Atlantic coast. Gulf coast sites would have been inundated by rising sea levels, while the Atlantic coast sites would still be evident present-day.

From three islands in the Georgia Bight, materials from five shell rings are analyzed – St. Catherines Ring and McQueen Ring on St. Catherines Island, Ring III on Sapelo Island, ande Cannon's Point and West Ring on St. Simons Island. Radiocarbon assays from these sites range from 2760 to 1740 cal. B.C. The shell rings are all circular patterns of mounded shell around a shell-free center. Materials from these sites indicate limited mobility (e.g., procurement from local habitats) and year-round exploitation of resources (Colaninno 2012:13, 38-42).

Summary. Large Archaic sites in the southeastern United States indicate an emphasis on marine taxa and year-round or multi-seasonal occupations (e.g., Colaninno 2012; Russo 1991b; Russo and Quitmyer 2008). In general, however, large Late Archaic shell ring sites are uncommon features on the west coast of Florida, whether due to their absence, destruction, or submergence (Kidder 2010; Russo 2010). Numerous smaller sites have been identified along the Gulf coast, including sites with cemeteries and artifact assemblages indicative of widespread mobility or trade (Sassaman and Wallis 2015). Although nearly all of these sites were abandoned by 1500 B.C., many of them were later reoccupied (e.g., McFadden et al. 2015; Russo 2010; Sassaman et al. 2015a; Sassaman and Wallis 2015).

Woodland Period (1200 cal. B.C. to cal. A.D. 1000)

From a broad perspective, populations between ca. 1200 and 200 cal. B.C. are distinguished from earlier occupations by the decline of large-scale social networks.

After 200 cal. B.C., sites are found in more inland locations than on the coast (Sassaman and Wallis 2015), and people are described as moving about in smaller groups and smaller ranges across the landscape (Kidder 2010:24). These groups are further distinguished from earlier populations by increased pottery use and the relative absence of non-local materials at sites. Elaborate burial sites connected the otherwise disparate groups (Anderson and Mainfort 2002:1-6; Steponaitis 1986:379).

Cooling sea surface temperatures are documented between 100 B.C. and A.D. 1 from records in the Sargasso Sea, Florida Straits, west Africa, and the Chesapeake region (see Walker 2013:38). Archaeological sites in coastal regions of the southeastern U.S. during this time are neither broadly distributed nor deeply stratified, which may reflect inundation of sites by rising sea levels (Sassaman and Wallis 2015; Stephenson et al. 2002). Some researchers suggest that coastal groups chose to move inland, to sites such as Kolomoki in south Georgia, rather than remain near the coast during unfavorable conditions (Milanich 1994; Sassaman and Wallis 2015). For groups that chose to remain near the coasts, they likely migrated inland during cool weather (Byrd 1997; Milanich 1994).

Rapidly warming sea surface temperatures are documented between ca. A.D. 1 and A.D. 150 from the Sargasso Sea, Florida Straits, west Africa, and Chesapeake regions (see Walker 2013:38). The warming trend continued at a more gradual pace until ca. A.D. 550. These warm conditions are associated with the latter half of the Roman Warm Period (Walker 2013:38). Recent isotopic research in southwest Florida documents drier warm conditions and colder cool conditions relative to present-day climate during this time (Wang 2011:53). Additionally, sites along both the Atlantic and

Gulf coasts are associated with higher-than-present-day sea levels and increased storm frequencies (Walker 2013:39), but no evidence has been found within the lower Suwannee region (McFadden 2015:109-110; Wright et al. 2005).

Circa A.D. 100, village communities grew in size and spatial extent within the Gulf coastal plain. Largely occupied between A.D. 100 and 500, these sites are marked by elevated, arcuate, circular, or horseshoe-shaped deposits of earth and/or shell surrounding plaza areas (Wallis et al. 2015). Many larger sites are located several kilometers inland from the present-day coast. The biographies of these sites, as indicated through assessments of Accelerator Mass Spectrometry (AMS) assays, indicate complex histories of construction, occupation, and abandonment (Wallis et al. 2015). McFadden (2015) suggests that the intense occupations of these sites may have been based primarily on environmental factors. In many of these location, people would have been protected from high-energy, open-marine habitats, while being located in proximity to resources associated with these habitats.

Around A.D. 536, a significant cooling event is documented throughout many regions of the northern hemisphere (Arjava 2005; Gunn 2000). Likely associated with volcanic activity, the event is characterized by cooler temperatures and a persistent fog. Reduced sunlight for ca. 18 months and diminished tree growth are documented in Europe and Asia during this time (Arjava 2005).

Sea surface temperature records from the Sargasso Sea, Florida Straits, Puerto Rico, west Africa, and Chesapeake regions suggest a punctuated pattern of cooling and warming between the A.D. 536 event and ca. A.D. 900, including a warming event between roughly A.D. 700 and 800 in southwest Florida (Walker 2013:41-42; Wang

2011:54-55). This paleoclimatic period is known as the Vandal Minimum (see Walker 2013:39-40).

The Vandal Minimum was followed by the Medieval Warm Period, where sea surface temperature records from the Sargasso Sea, Chesapeake Bay, Florida Straits, and west Africa document relatively warmer conditions than experienced during Vandal Minimum. However, the Medieval Warm Period is also marked by short-term episodes of warming and cooling through A.D. 1200. In areas of the southwest Florida, assessments of sediment cores suggest rising sea levels ca. A.D 850 (Lowery 2002; Walker 2013:41-42).

During this time, complex site construction continued in the southeastern United States (Anderson and Mainfort 2002:1-5). These sites typically are found in more coastal locales than earlier sites (Byrd 1997:51; Pluckhahn et al. 2015; Sassaman and Wallis 2015). McFadden (2015) suggests site occupations indicate the prioritization of social over environmental factors alone. Several Gulf coast sites during this time are located in proximity to older sites, rather than based on any regular environmental pattern.

Florida Gulf Coast. Along the Gulf coast, several large site complexes have been identified, each associated with complex occupation histories. The Garden Patch and Crystal River site complexes each contain numerous mounds, a plaza, and smaller middens. Crystal River slightly predates Garden Patch, but both sites follow similar use patterns.

Analyses of materials indicate episodes of planned construction, abandonment, and relocation of various parts of the sites. The sites were initially occupied during times of lower sea level, indicating that both sites were inland and protected from open waters. Intense site constructions roughly occurred from cal. A.D. 220 until cal. A.D. 600. The main areas of both sites were abandoned sometime after A.D. 730. More seaward occupations are identified following abandonment of the complexes (at Bird Island and Roberts Island, respectively) (Pluckhahn et al. 2010:165-175; 2015; Singleton 2015; Wallis et al. 2015:508-515).

Bird Island and Roberts Island occupations differ significantly from one another, however. Bird Island does not contain large mounds. Roberts Island consists of at least three flat-topped mounds and an expansive shell midden with several mounded areas (Pluckhahn et al. 2015; Sampson 2015).

Other types of large sites are identified in these areas as well. The Shell Mound site consists of a large, arcuate shell ring. Located on the mainland south of the Suwannee River, a light occupation occurred ca. A.D. 200 to 300. Intense ring construction and occupations on the ring itself occurred from ca. A.D. 400 to 550, while the interior of the ring continued to be occupied until ca. A.D. 760 (Sassaman et al. 2015a). Associated with Shell Mound, the Palmetto Mound is located due west and contains human interments and an array of locally procured materials (Sassaman et al. 2015a; Sassaman and Wallis 2015).

Artifact distributions across Shell Mound vary, with the most intense occupation identified on the northern part of the ring. Oyster shell characteristics on the ring suggest purposeful cultivation (Sassaman et al. 2015a:92). Excavations on the interior slope of the north side of the ring revealed living surfaces and numerous features. Faunal materials from a large feature in this area identified high quantities of mullet, water birds, and deer that have not been identified in other areas of Shell Ring, much less the wider Suwannee region. Several stratified pit features, which potentially include layers of different fauna, have also been identified. So far each test unit at Shell Mound has revealed different stratigraphy and faunal distributions, indicating various practices associated with the site (Sassaman et al. 2015a:94-99; Sassaman, pers. comm.).

South of Old Tampa Bay, several sites are identified, such as Yat Kitischee (Vojnovski 1995), Palmer Site – Shell Ridge (Russo and Quitmyer 2008), and Weedon Island (O'Donnell 2015). Less detail is known about specific site occupations, compared to the sites in the Big Bend region. These sites are interpreted as village sites, i.e., 'permanent' (Russo and Quitmyer 2008:244), but zooarchaeological signatures vary.

Invertebrate remains increase in abundance from the earliest deposits at Yat Kitischee until around A.D. 500, after which they decrease. Vertebrate distributions are relatively consistent through time, and seasonality assessments proved inconclusive. Seasonal assessments from the Palmer Site – Shell Ridge midden (ca. A.D. 200 to contact), on the other hand, suggests multi-seasonal occupations and focus on bivalve collection. The Weedon Island assemblages (cal. A.D. 895 and 1265) are dominated by gastropods (O'Donnell 2015). No seasonal interpretation are conjectured, but resource exploitation models indicate that local habitats were targeted for collection, while the open Gulf habitat was avoided.

In southwest Florida, early site signatures at the Pineland site complex include numerous middens located parallel to the shoreline, corresponding with sea level transgressions and regressions. Seasonality assessments document shifting occupation patterns (deFrance and Walker 2013; Quitmyer 2013; Walker 1992). After cal. A.D. 800, however, intense site construction occurred in the region, resulting in large shell and sand mounds, water courts, and man-made canals – at Pineland as well as other sites in the region, including Mound Key (Thompson and Worth 2011:70-71).

Georgia Bight. Byrd (1997) observes a change in coastal subsistence practices ca A.D. 400 in the southeastern U.S., which he attributes to increasing populations. He observes that some sites in the Georgia Bight, such as Catfish Creek and King's Bay (e.g., Reitz and Quitmyer 1988) are characterized by larger fishes coupled with the absence of small fishes, compared to co-eval sites in the Florida panhandle. Byrd suggests these data reflect changing fishing practices and technologies and diversification of resources which encouraged increased sedentism and territoriality on the Atlantic coast (1997:53).

Summary. Sites are characterized by light occupations of inland areas along brackish waterways ca. A.D. 100. These areas would have been protected from flooding and storm events along the coast. Later, rapid construction and intense occupations of both coastal and inland sites occurred prior to A.D. 600 (Pluckhahn et al. 2015; Sassaman et al. 2015a; Wallis et al. 2015). Large mounds, such as mortuary features, were constructed in each location, as well as residential areas. The sites are presumed to have been occupied year-round based on faunal analyses, site architecture, and settlement patterns.

After the cooling event of ca. A.D. 536 (Walker 2013), inland areas were abandoned and/or occupied less intensely in favor of more coastal locations, which suggests more favorable coastal conditions at this time (McFadden 2015; Pluckhahn et al. 2015; Sassaman and Wallis 2015; Wallis et al. 2015). The abandonment of several of these sites after A.D. 750 (Crystal River, Garden Patch, and Shell Mound) (e.g., Pluckhahn et al. 2015; Sassaman et al. 2015; Sassaman and Wallis 2015) appears to coincide with the brief warming period ca. A.D. 700 to 800 (Walker 2013:40). Although occupations are still identified in the Big Bend region (e.g., Bird Island), they are not as intense as occupations in southwest Florida after this time (Marquardt and Walker 2013; Thompson and Worth 2011).

Summary

Local environmental data indicates that the Big Bend region is a highly-productive, low-wave-energy area. Predictable seasons of cool, warm, rainy, and dry weather correspond with rich, diverse arrays of fish populations in the region. These variables affected cultural fishing practices and lifestyles through time.

Analyses of archaeological deposits along Florida and Georgia coasts demonstrate that coastal occupants through time have been largely marine-oriented, even when sites were not located on the coast. Evidence of year-round or multi-seasonal occupations are observed in the majority of sites through time (e.g., Colaninno 2012; Russo and Quitmyer 2008; Quitmyer 2013).

Large shell rings, characteristic of early occupations along southeastern coasts, are largely absent in the lower Suwannee region. However, materials from lower Suwannee sites indicate intense occupations and connections to broad trade networks. During later occupations, bouts of intense site construction, occupation, and site abandonment occur throughout the region – earlier along the northwest coast than the southwest Gulf coast. These dynamic patterns of site use indicate the myriad of social and environmental influences affecting each occupation.

In the next chapter, I identify indicator groups by which to interpret seasonal practices in the lower Suwannee region. I discuss fish distributions in more detail with regard to season and habitat using a wealth of present-day data.

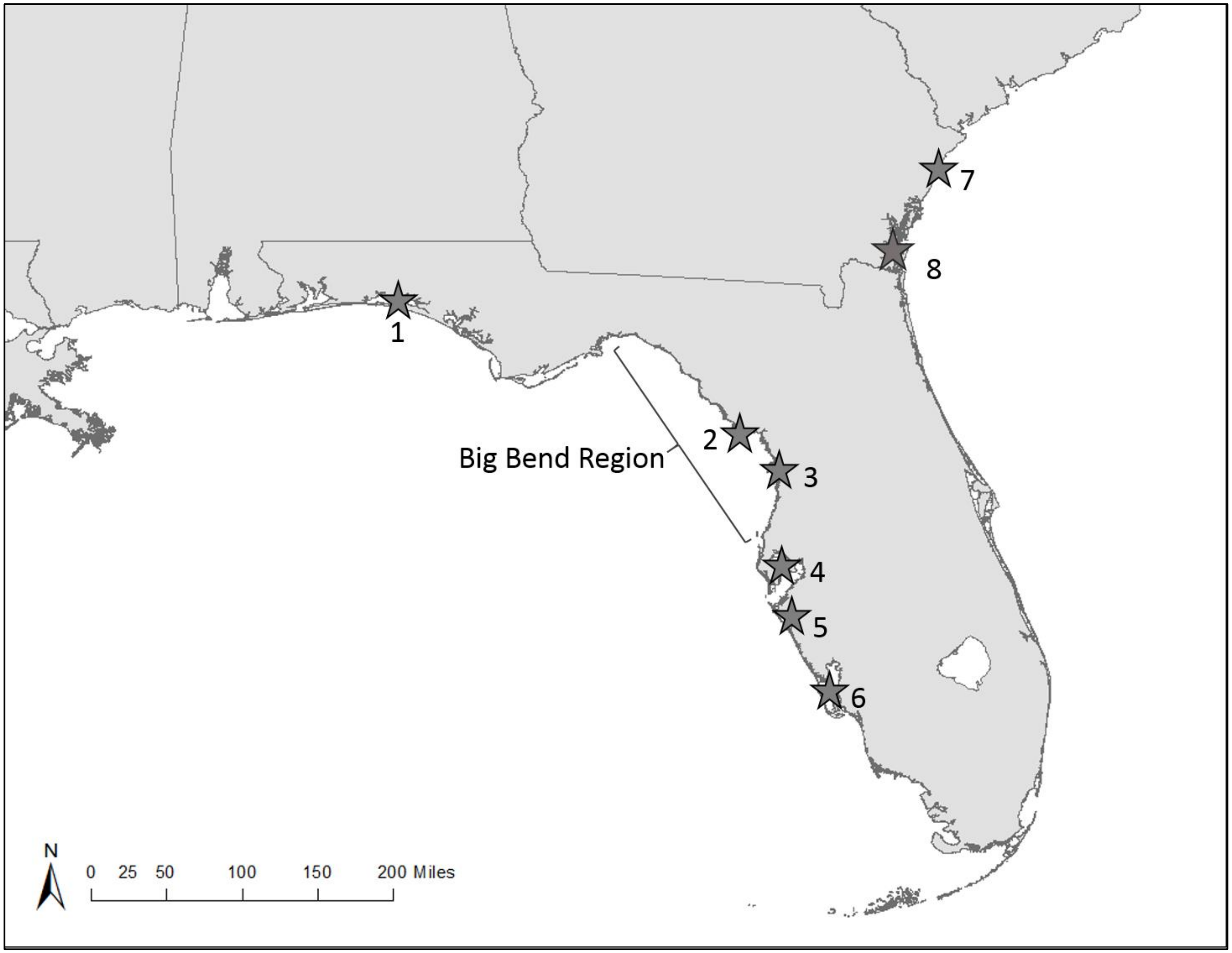

Figure 3-1. Locations of sites mentioned in text (1 = Meig's Pasture, 2 = Lower Suwannee Region, 3 = Crystal River, 4 = Tampa Bay, 5 = Palmer Hill site, 6 = Pineland site complex, 7 = St. Catherines Island, 8 = King's Bay).

Figure 3-2. Images of common fishes in the lower Suwannee region. A) Hardhead catfish (*Ariopsis felis*). B) Gulf toadfish (*Opsanus beta*). C) Gulf killifish (*Fundulus grandis*). D) Redfin needlefish (*Strongylura notata*). Reprinted with permission from Fishbase, http://www.fishbase.org (October 2015).

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Figure 3-3. Images of common fishes in the lower Suwannee region. A) Crevalle jack (*Caranx hippos*). B) Sheepshead (*Archosargus probatocephalus*). C) Pinfish (*Lagodon rhomboides*). D) Silver perch (*Bairdiella chrysoura*). Reprinted with permission from Fishbase, http://www.fishbase.org (October 2015).

Figure 3-4. Images of common fishes in the lower Suwannee region. A) Spot (*Leiostomus xanthurus).* B) Red drum (*Sciaenops ocellatus*). C) Striped mullet (*Mugil cephalus*). D) Striped burrfish (*Chilomycterus schoepfii*). Reprinted with permission from Fishbase, http://www.fishbase.org (October 2015).

CHAPTER 4
PRESENT-DAY FISHERIES DATA

In this chapter, I describe present-day fish data collected in the lower Suwannee region. Fish frequencies, fish sizes, and assemblage diversity values are included in analyses. These data are used to test whether fish-based indicator groups can be used in the lower Suwannee region to infer seasons and habitats of procurement.

Description of Data

Present-day fish data were collected by the Florida Fish and Wildlife Conservation Commission (FWC n.d.a) between 1996 and 2012 in the lower Suwannee region. These data were collected via stratified random sampling, with an average of six trips occurring each month, each consisting of eight sampling locations. Fishes were collected with 21-m seines (3.1 mm mesh) or 183-m haul-and-purse seines (37.5mm stretch mesh, 18.8mm bar mesh). Both methods are mass capture techniques used in order to collect all sizes and varieties of fishes in the area. All fish were identified to taxon by program biologists. Counts, sizes, sexes, and other data were recorded for each taxon. Ambient environmental conditions were recorded for each sampling location.

The FWC (n.d.a) data are used to characterize meaningful seasonal and habitat patterns (Table 4-1) based on fish availability in the lower Suwannee region, and document how fishes move with regard to these conditions. These inferred patterns are used to test hypotheses about seasonal procurement and habitat use among archaeological samples. This is an improvement over the traditional spring/summer/winter/fall characterizations because it reflects local dynamics. The environmental conditions of the area determines the seasons. The geographic categories represented herein also reflect seasonality in that some fishes use specific areas of the estuary during different parts of their life cycle. Additionally, fish assemblages can be used to infer which habitats are used during specific seasons.

While the lower Suwannee region has not escaped modern development and alterations, the effects are relatively minimal compared to other areas of Florida. The Big Bend region is colloquially known as the 'Nature Coast.' Hypothetically, the Nature Coast provides an adequate representation of 'natural' fish dynamics – that is, less influenced by present-day industrial and commercial practices, such as those found in more highly developed areas like Tampa Bay.

However, FWC data (n.d.a) are used with the understanding that fish dynamics, climate, resource procurement strategies, and other conditions have fluctuated through time (e.g., Carlson et al. 2010). These data are used as a comprehensive view of annual species distributions and as an environmental baseline by which to compare archaeological data. Archaeological assemblages that vary significantly from present-day FWC data may reflect changes in human practices, preferences, or environmental conditions over time. Assemblages that contain more similar distributions to present-day FWC data may reflect similar procurement methods and environmental conditions to present-day assemblages.

FWC (n.d.a) has identified more than 200 species of marine vertebrates in the lower Suwannee region at present. The overwhelming majority of fishes collected by FWC include anchovies (Engraulidae) and other very small fishes (e.g., blennies (Blennidae), gobies (Gobiidae), herrings/shads (Clupeidae), mojarras (Gerreidae)) whose tiny remains are rarely encountered even in the 1-mm fraction of Suwannee archaeological samples. The archaeological recovery techniques are sufficient to collect these fish remains if they are present. The sheer number of these fishes today obscures the contributions of other, more archaeologically relevant taxa.

For that reason, I emphasize taxa that are more common in the archaeological record (Table 4-2). Fish families and orders that are not identified archaeologically are grouped into an "Other fishes" category. Herrings/shads and mojarras are occasionally found among archaeological samples, but they are not identified in significant quantities anywhere near proportionate to their abundances in FWC (n.d.a) samples. These fishes, too, therefore, are grouped with "Other fishes." During nearly any time of the year, the archaeologically relevant taxa only represent roughly half of the available fishes in the lower Suwannee region. Among archaeologically relevant taxa, spot, pinfish, and silver perch are ubiquitous in the region today. These species comprise at least half of the overall FWC assemblages when smaller fishes are removed from consideration.

Spot, however, is not nearly as common archaeologically as it is today in the lower Suwannee region. The archaeological lack of both spot and small fishes reflects environmental fluctuations and/or human practices. Spot and small fishes such as threadfin herring (*Opisthonema oglinum*) are common in archaeological deposits in areas of southwest Florida (e.g., deFrance and Walker 2013; Russo 1991b).

It is possible that the predominance of spot in present-day samples (e.g., Tien-Shui and Matheson 2007), a species which prefers muddy/sandy bottoms (SMS 2011), is related to the loss of seagrasses observed in the Big Bend region since 1984 (Carlson et al. 2010:21-22). The lack of small fishes in the archaeological record suggests taphonomic influences and/or that past occupants of the lower Suwannee region were selective with procurement or disposal techniques.

Assessing Effective Seasons

Several seasonal and habitat categories are identified (Table 4-1). These categories are not static. The onset of seasons are observed to fluctuate over several weeks from year to year (Wolfe 1990a:27-34) and coastal dynamics make it difficult to delineate strict habitat boundaries (e.g., Raabe et al. 2007). However, for consistency, seasons are divided based on temperature and months (Tables 4-3 and 4-4), and habitats are divided by salinity and shoreline proximity (Figure 4-1; Table 4-5). These categories are discussed in terms of archaeologically relevant taxa (Table 4-2). The abundances and size of associated taxa comprise indicator groups per category (Table 4-3 to 4-8).

Analysis of Variance (ANOVA, $\boldsymbol{\alpha}$ =0.5) are used to assesses fish data with regard to effective seasons and habitats using variance around a mean. ANOVA tests whether variation between two samples is significant with regard to a null hypothesis (H0). In this case, the null hypothesis states that variation between two samples is within normal variation – i.e., the samples both could have been collected from similar contexts. ANOVA tests are used to either accept or reject the null hypothesis (Drennan 2009:168-173; Kahn Academy 2010a; SJSU n.d.).

Variations within groups and between groups are used to identify an F-ratio. Based on the designated p-value and the degrees of freedom associated with overall groups, a critical F-value is identified. If the sample F-ratio is higher than the critical F-value, the null hypothesis can be rejected, which indicates significant variation between samples (Drennan 2009:168-173; Kahn Academy 2010a; SJSU n.d.).

ANOVA is used for both the raw counts of fish species and for the sizes of fishes per seasonal or spatial category. FWC (n.d.a) data are organized by collection trip which allows for analysis of average number or size of a species collected per trip (Tables C-1 to C-34). Results indicate that many local fishes are useful indicators for a specific set of conditions (Table 4-3). Abundances of taxa are summarized by season and habitat (Tables 4-3 to 4-5). Averages and standard deviation of fish lengths are summarized by season (Tables 4-7 and 4-8).

Cool Versus Warm Weather Associations

Average air temperatures range between 15 and 30 °C annually in the lower Suwannee region (FWC n.d.a) (Figure 4-2). Natural breaks in (archaeologically relevant) fish abundances reveal two different distributions based on temperature – distributions during cooler weather, defined as lower than 22 °C, and during warmer weather, defined as higher than 22 °C (Figure 4-3). Warmer temperatures roughly correspond with April to mid-October, the warm seasons, while cooler temperatures roughly correspond with mid-October to March, the cool seasons (Figure 4-1).

Regardless of conditions, spot, pinfish, and silver perch exhibit the highest frequencies over all, however, prevalence of specific species demonstrate correlations with temperature (Tables 4-3; Figure 4-4). Spot are the most frequently collected fish during cool weather (Table 4-3). Spot are caught during cool weather 77 percent of the time.

Other species of fish that are commonly identified during cool weather are mullet, killifish, and rays/skates. However, these fishes are only caught during cool conditions 45 percent of the time. Sea trout and sea catfishes are some of the most common fishes collected during warm weather (Table 4-3). These fishes are caught during warm weather 92 percent of the time.

Warm/Dry Season

Pigfish, mullet, rays/skates, and sea trout are some of the most common fishes collected during the warm/dry season (roughly April and May) (Table 4-4). However, these species are caught during cool weather only 18 percent of the time. The least numbers of fishes are collected during this time of the year.

Warm/Rainy Season

The highest numbers of fishes are caught during the warm/rainy season (roughly June through September). Sea trout and sea catfish are some of the most common fishes collected during this time (Table 4-4). Sea catfish are caught during warm/rainy conditions 68 percent of the time. Rays/skates, toadfish, and pigfish are more likely to be caught during this time of the year, while spot are less prevalent during this time of (Tables 4-3 and 4-4).

Cool/Dry Season

Mullet, killifish, and ray are some of the more common fishes collected during the cool/dry seasons (roughly October through January) (Tables 4-3 and 4-4). However, these fishes are caught together during cool/dry conditions only 31 percent. Red drum and burrfishes are more common during this season than others (Tables 4-3 and 4-4), but they still are caught during this time only 47 percent of the time. Sea trout, needlefish, and pigfish are less commonly encountered during this season.

Cool/Rainy Season

Spot is by far the most common fish caught during the cool/rainy season (roughly February and March; see also Tien-Shui and Matheson 2007), contributing 51 percent of cool/rainy assemblages (Tables 4-3 and 4-4). Mullet is also commonly collected during this time (Table 4-4). Like the warm/dry season, however, fish in general are less commonly in the region at this time.

Habitat Associations

In general, salinity is less useful than temperature as an indicator of fish distributions in the lower Suwannee region (Wolf 1990c:58). Salinity levels range from oligohaline (0 psu) to marine (32+ psu). Oligohaline areas (0-5 psu) exhibit more variation in fish distributions (FWC n.d.a) than is evident between other brackish areas, such as between mesohaline (5-18 psu) and polyhaline (18-32 psu) areas (EPA 2006:14-2; Greenwood 2007). Oligohaline areas are predominantly located near the mouth of the Suwannee river, which Raabe and colleagues (2007:Figure 24) roughly denote as the delta marsh region.

Raabe and Bialkowska-Jelinska (2007) observe that warm-water temperature anomalies have been observed in tidal creeks between Shired Island and Cedar Key. These plume features tentatively are associated with Florida aquifer seeps. Anomalies are more common and/or associated with higher discharge south of the Suwannee River (Raabe and Bialkowska-Jelinska 2007:Figure 2).

Therefore, I categorize collection sites into delta marsh, intertidal (north and south), and Suwannee Sound regions. Delta marsh areas are denoted by 0-5 psu. Intertidal areas include regions that are periodically exposed to open air or submerged through tidal action. In this case, intertidal is arbitrarily defined as within 0.1 miles of the shoreline, including brackish tidal creeks. This area includes intertidal fluctuations and encompasses more protected estuarine areas. Suwannee Sound is largely subtidal, arbitrarily defined as greater than 0.1 miles from the shoreline, and encompasses open, unprotected areas (Table 4-1; Figure 4-1). The Sound would not have been directly located next to any archaeological site and likely would have required extra effort to reach, compared to intertidal and marsh areas.

Intertidal areas by far contain the most dense seagrass beds and the most fishes. The northern intertidal area is characterized by tidal creeks with more winding morphology, versus the straighter creeks and anomalous warm-water plumes identified south of the river. Many more fish are identified south of the river than north, which may additionally reflect river discharge forces.

While fishes utilize different areas of the estuary at different points in their life cycles and during different seasons, I do not further subdivide into combined season and habitat categories. The combined categories are too specific to be of use for this study. Therefore, I keep seasons and habitats separate. The emphasis of this research is seasonal mobility, therefore I focus on fish sizes based on effective seasons. Future research, however, could be directed to examine size differences per habitat.

Delta Marsh

Spot, mullet, and killifish are some of the more common fishes collected in the delta marsh (Figure 4-1, Tables 4-3 and 4-5). The likelihood of collecting spot, mullet, and killifish together in these areas, however, is only 17 percent. Although less abundant than the other fishes, red drum are associated with marsh habitats (Table 4-3). Silver perch is collected least frequently in these areas. Sea catfish, pigfish, burrfish, sharks/rays are rarely encountered in these areas (Table 4-5).

Intertidal Areas

Nearly 77 percent of silver perch collected by FWC (n.d.a) are from intertidal environments, 87 percent of which are from the southern intertidal areas. Mullet, sharks/rays, killifish, and sea catfishes also are commonly collected in intertidal environments (Tables 4-3 and 4-5, Figure 4-1). The likelihood of collecting these species together in intertidal environments is 77 percent (Table 4-5). Crevalle jack are most commonly encountered in intertidal areas (Table 4-3). The likelihood of collecting a jack in an intertidal area is 86 percent, of 78 percent of the time from southern intertidal areas (Table 4-5).

Suwannee Sound

Pigfish, sea trout, and sea catfishes are commonly collected in the Suwannee Sound (Tables 4-3 and 4-5; Figure 4-1). However, these fishes are caught in these areas together only 45 percent of the time. Toadfish, porgies burrfishes, and boxfishes are more commonly encountered in the Suwannee Sound than other areas (Table 4-5). These fishes are caught together in this habitat 81 percent of the time. Killifish are rarely encountered in these areas.

Fish Length Data

Analysis of Variance among fish size data indicates significant seasonal variations (Table C-29 to C-34). Based on FWC size data, sea catfish sizes smaller than 136 mm are 93 percent likely to represent warm-weather collection (Table 4-7 and C-31; Figure 4-5). Smaller sea catfish sizes are suggestive of juvenile-fish collection during spawning seasons (SMS 2011). Sea catfish sizes are not useful for determining cool-weather collection because comparatively few sea catfish are collected during these times.

Jack can be found from juvenile sizes up to 690 mm, but average jack sizes are 195 mm in the Lower Suwannee region (Table 4-7 and C-31; Figure 4-6). Nearly 95 percent of jack are collected in warm weather in this region (Table 4-7).

Pinfish larger than 95 mm are 82 percent likely to represent warm-weather collection (Table 4-7 and C-32; Figure 4-7). Pinfish spawn during cool weather (SMS 2011), but pinfish sizes smaller than 55 mm (Table 4-7) are only 57 percent likely to indicate cool weather collection.

Silver perch sizes smaller than 96 mm are 88 percent likely to represent warm-weather collection (Table 4-7 and C-33; Figure 4-8). Larger silver perch are not good indicators of cool-weather collection. Spot sizes smaller than 60 mm are 85 percent likely to represent cool-weather collection. Sizes larger than 60 mm are 87 percent likely to represent warm-weather collection (Table 4-7 and C-34; Figure 4-9).

Mullet sizes smaller than 112 mm are 69 percent likely to represent warm-weather collection (Table 4-7 and C-35; Figure 4-10). Mullet larger than 259 mm are only 53 percent likely to indicate cool weather. However mullet collected during cool weather tend to be more widely distributed in size (Table 4-7 and 4-8). This suggests that collection during cool versus warm weather may be distinguished for contexts that contain a wider size range of mullet compared to other contexts.

With fluctuating environmental conditions through time, it is likely that fish sizes varied in the past. However, the general patterns are still useful. Relatively small sea catfish, small silver perch, large spot, and large pinfish are indicative of collection during warm weather. Jack, too, are indicative of warm weather collection. Small spot are indicative of collection during cool weather. Wide size ranges of mullet may help identify assemblages collected during cooler weather (Figure 4-11).

Diversity and Equitability

Diversity estimates provide a means of comparing the range of taxa represented in a sample. The following formula (from Reitz and Wing 2008) is used to calculate diversity:

$$H' = -\Sigma [(pi) (\ln (pi))],$$

where H' is the diversity value. Pi is calculated by dividing the MNI of each taxon by the total MNI of the sample. The diversity value is the absolute value of the sum of pi multiplied by the natural log of pi. Diversity values range between 0 and 5, where the higher the value, the higher the diversity of the sample.

Diversity and equitability values vary between temperature categories (Table 4-9). Cooler weather is associated with lower diversity and equitability values. Warm weather is associated with higher diversity and equitability values. These trends are consistent between habitats within the region and on a year-by-year basis. Warm/rainy typically has the highest values, while cool/rainy typically has the lowest values. However, these patterns do not apply to daily collection samples, which demonstrate extreme variability. These trends are applied to archaeological assemblages with the assumption that an assemblage accumulated over several months, years, or decades. Therefore, diversity is calculated for stratum contexts, which assume longer-term use, but not to feature samples, which may reflect shorter-term use.

Diversity values in the lower Suwannee region, emphasizing archaeologically relevant taxa in FWC (n.d.a) samples, range between 1.3 and 2.5 (Table 4-9). Diversity values among present-day samples do not provide values approaching 5, the maximum possible diversity value. Therefore, diversity values lower than 1.3 or higher than 2.5 (granted adequate sample sizes) among archaeological samples may be indicative of highly selective, non-random resource procurement, while values between 1.3 and 2.5 may reflect less-selective mass-capture techniques at various times of the year (Figure 4-12).

Equitability measures how evenly a taxon is used with regard to other taxa in a sample. The following formula (from Reitz and Wing 2008) is used to calculate equitability:

$$V' = H' / \ln (S),$$

where V' is the equitability estimate. H' is the diversity value, and S represents the number of taxa from which MNI was determined. Equitability is the diversity value divided by the natural log of S. Equitability values range between 0 and 1, where the higher the value, the more equally present each taxon in a sample (e.g., indiscriminant mass capture). An equitability value closer to 0 indicates an intense focus on one or few taxa.

Generally, equitability trends are similar to diversity trends. Warm/rainy conditions have the highest equitability values, and cool/rainy conditions have the lowest values (Table 4-9; Figure 4-11). Dry conditions, whether warm or cool, have similar equitability values.

Indicator Groups

Reitz and colleagues (2012) discuss the concept of indicator packages for zooarchaeological studies. An indicator group is a group of taxa that have similar environmental requirements and can be used as evidence of certain environmental conditions (such as seasons) (Kenward and Hall 1997:665; Reitz et al. 2012) and human practices. Presence/absence data for species are combined with frequencies and size classes. Indicator groups contribute a higher level of detail for environmental associations than presence/absence data alone. When used in conjunction with the FWC (n.d.a) data, they provide a powerful tool for assessing seasonality in archaeological contexts.

Indicator packages are collections of quantified data that are used as evidence of specific environmental conditions or human activities (Kenward and Hall 1997; Reitz et al. 2012:52). These data can include any combination of taxa that are related by a common set of traits. The FWC data provide an avenue to identify indicator taxa within the lower Suwannee region.

Unfortunately, weak seasonal signals affect identification of indicator groups (e.g., Reitz et al. 2012) even with the quality of FWC (n.d.a) data. Cool weather signatures are rarely identified. Sometimes numerous conditions are associated with a single taxon. For example, fishes are most abundant in intertidal environments between June and January, but many of the same species occur year-round (Tables 4-4 and 4-5). A few potential indicator groups are identified nonetheless from the FWC data (Table 4-6).

Indicator Groups for Effective Seasons.

Spot is, by far, the most common archaeologically relevant fish collected in the lower Suwannee region between 1996 and 2012 (Table 4-3 to 4-5; see Tien-Shui and Matheson 2007). They are 77 percent likely to represent cool-weather collection (Table 4-3) and most common during cool/rainy weather in intertidal environments (Table 4-6). Furthermore, spot smaller than 60 mm SL are most likely to represent collection during cool weather (Table 4-7).

Contexts with the widest size ranges of mullet may represent cool weather collection (Table 4-8). Furthermore, low diversity values (< 2.15) are indicative of cool-weather collection. Values approaching 1.3 may represent cool/rainy conditions. Values lower than 1.3 are suggestive of highly selective procurement practices (Table 4-9).

Crevalle jack are 95 percent likely to be caught during warm weather (Table 4-3). Sea trout and sea catfishes together are 92 percent likely to represent warm-weather collection and 68 percent likely to represent collection during the warm/rainy season (Tables 4-3, 4-4, and 4-6). Additionally, pinfish larger than 95 mm SL, silver perch larger than 96 mm SL, spot larger than 60 mm SL, and sea catfishes smaller than 136 mm SL likely represent warm weather collection (Tables 4-7).

Finally, higher diversity values (> 2.15) are indicative of warm-weather collection. Values approaching 2.5 may represent warm/rainy conditions. Values higher than 2.5 are suggestive of highly selective resource procurement practices (Table 4-9).

Indicator Groups for Habitats.

Most fishes in the lower Suwannee region are associated with intertidal habitats (Table 4-6). Assemblages containing toadfishes, burrfishes, porgies, and boxfishes are 81 percent likely to represent collection from Suwannee Sound areas (Table 4-5), but only pigfish is statistically more prevalent in the Sound (Table 4-6). Killifish and red drum are indicative of the Delta Marsh habitat (Table 4-6).

Summary

In this chapter, I characterized effective seasons and habitats using fish data collected by the Florida Fish and Wildlife Conservation Commission. These characterizations serve as a baseline for interpreting archaeological samples. Assemblages that fit into expectations based on FWC data may suggest minimal human preference influencing procurement, mass capture techniques sufficient to catch these types and sizes of fishes, consistent seasonal use over time, and/or similar environmental conditions over time. Samples that fit within expected values indicate that no intense fish selection occurred and that environmental conditions were not drastically different than present-day conditions.

Assemblages that do not fit into expectations may reflect environmental fluctuations, multi-seasonal occupations, varied procurement strategies associated with different samples, and/or targeting of specific taxa. Samples that do not fall within expected values indicate human preference or environmental conditions that resulted in non-random fish collection. Interpretation of these factors are regarded on a case-by-case basis, and in comparison with other sites.

For example, an increase in one type of fish among co-eval sites of similar habitats may suggest environmental effects. On the other hand, an increase in one type of fish at one site among co-eval sites of similar habitats may indicate human preference or targeting, especially when compared to occupations from different times. Multi-seasonal occupations may be reflected in a diversity of fishes indicative of both cool and warm weather, especially when compared to co-eval sites. Procurement strategies may be reflected in the types (e.g., bottom-dwelling fish, fishes associated with seagrasses or oyster beds, schooling versus non-schooling fishes) and/or sizes (presence or absence of very small fishes to indicate size of net mesh) of fishes.

Whether or not an indicator group is adequately represented in an archaeological assemblage depends on a degree of researcher subjectivity. In this case, a taxa preferably should be one of the most common fishes in an assemblage, versus represented by one or few individuals, to be used as evidence of a seasonal inference.

In the next chapter, I introduce the zooarchaeological sites and assemblages that will be tested with the indicator groups. I also describe the zooarchaeological methods employed in analysis.

Table 4-1. Effective seasons and habitats discussed in text.

Effective Category	Characteristics
Seasons	
Warm conditions	Water temperatures > 22 C
Cool conditions	Water temperatures < 22 C
Warm/Dry	April and May
Warm/Rainy	June through September
Cool/Dry	October through January
Cool/Rainy	February and March
Habitats	
Delta Marsh	< 5 psu
Intertidal	Within 0.1 miles of the shoreline. Includes the most dense seagrass beds and tidal creeks. Divided into North and South sections.
Suwannee Sound	> 0.1 miles of the shoreline.

Table 4-2. Present-day fishes identified in the lower Suwannee region (1996-2012, data courtesy of FWC).

Archaeologically Relevant Taxa		Other Fishes[1]	
Taxon	Common Name	Taxon	Common Name
Acipenser sp.	Sturgeon	*Amia calva*	Bowfin
Archosargus probatocephalus	Sheepshead	Anguilliformes	Eels
Ariidae	Sea catfishes	Atherniformes	Silversides
Bairdiella chrysoura	Silver perch	Aulopiformes	Lizardfishes
Beloniformes	Needlefishes	Blenniidae	Blennies
Calamus sp.	Grass porgies	Blennioidei	Other blennies
Carangidae	Jacks	Centrarchidae	Other sunfishes
Caranx hippos	Crevalle jack	Clupeidae	Herrings/shads
Centropristis striata	Black sea bass	Cypriniformes	Minnows
Centropromus sp.	Snook	Cyprinodontidae	Pupfishes
Chondrichthyes	Sharks/rays	Cyprinodontiformes	Other killifishes
Cynoscion sp.	Sea trout	Echeneidae	Remora
Diodontidae	Burrfishes	Engraulidae	Anchovies
Elops saurus	Ladyfish	Ephippidae	Spadefishes
Euselachii	Sharks	Gadiformes	Cods
Fundulidae	Killifish	Gerreidae	Mojarra
Ictaluridae	Freshwater catfish	Gobiidae	Gobies
Lagodon rhomboides	Pinfish	Gobiesocidae	Clingfishes
Leiostomus xanthurus	Spot	Haemulidae	Grunts
Lepisosteus sp.	Gar	Labridae	Wrasses
Lepomis sp.	Sunfishes	Lophiformes	Anglerfishes
Lutjanidae	Snappers	Megalopidae	Tarpons
Mugilidae	Mullet	Pleuronectiformes	Flatfishes
Mugil cephalus	Striped mullet	*Pomatomus saltatrix*	Bluefishes
Opsanus sp.	Toadfish	Scombridae	Tuna/mackerel
Orthopristis chrysoptera	Pigfish	Serranidae	Sea basses
Ostraacidae	Boxfishes	Stromateidae	Butterfishes
Paralichthys sp.	Flounders	Syngathidae	Pipefishes
Pogonias cromis	Black drum	Tetraodontiformes	Pufferfishes
Rajiformes	Rays/skates	Uranoscopidae	Stargazers
Sciaenidae	Other drum		
Sciaenops ocellatus	Red drum		
Sparidae	Other porgies		

[1]Other fishes include fish taxa not identified in archaeological samples and species that are highly abundant in present-day samples but not identified in significant quantities in archaeological samples.

Table 4-3. Fish distribution by temperature in the lower Suwannee region (1996-2012, data courtesy of FWC).

Taxon	Common Name	Cool (<22C)		Warm (>22C)		Grand Total	
		N	%	N	%	N	%
Chondrichthyes	Cartilaginous fishes	210	.03	1493	.13	1703	.10
Euselachii	Sharks	19	-	370	.03	389	.02
Rajiformes	Rays/skates	9586	1.56	20347	1.73	29933	1.67
Actinopterygii	Other fishes	203258	33.16	739108	62.74	942356	52.62
Lepisosteus sp.	Gar	97	.02	478	.04	575	.03
Elops saurus	Ladyfish	1547	.25	4012	.34	5559	.31
Acipenser sp.	Sturgeon	19	-	12	-	31	-
Ictaluridae	Freshwater catfishes	635	.10	1069	.09	1704	.10
Ariidae	Sea catfishes	2549	.42	23675	2.01	26224	1.46
Opsanus sp.	Toadfishes	91	.01	429	.04	520	.03
Beloniformes	Needlefishes	736	.12	2983	.25	3719	.21
Fundulidae	Killifishes	10366	1.69	17009	1.44	27375	1.53
Centropomus sp.	Snooks	8	-	51	-	59	-
Centropristis sp.	Sea basses	390	.06	1320	.11	1710	.10
Lepomis sp.	Sunfishes	390	.06	1027	.09	1417	.08
Carangidae	Jacks	476	.08	11344	.96	11820	.66
Caranx hippos	Crevalle jack	27	-	908	.08	935	.05
Lutjanidae	Snappers	292	.05	975	.08	1267	.07
Orthopristis chrysoptera	Pigfish	4256	.69	23920	2.03	28176	1.57
Sparidae	Porgies	137	.02	1262	.11	1399	.08
Archosargus probatocephalus	Sheepshead	858	.14	1555	.13	2413	.13
Calamus sp.	Porgies	43	.01	236	.02	279	.02
Lagodon rhomboides	Pinfish	73212	11.95	109063	9.26	182275	10.18
Sciaenidae	Drums/croakers	2364	.39	17230	1.46	19594	1.09
Bairdiella chrysoura	Silver perch	38872	6.34	68534	5.82	107406	6.00
Cynoscion sp.	Sea trout	2116	.35	26987	2.29	29103	1.62

Table 4-3. Continued

Taxon	Common Name	Cool (<22C)		Warm (>22C)		Grand Total	
		N	%	N	%	N	%
Leiostomus xanthurus	Spot	222763	36.35	68390	5.80	291153	16.26
Pogonias cromis	Black drum	669	.11	2472	.21	3141	.18
Sciaenops ocellatus	Red drum	4005	.65	4494	.38	8499	.47
Mugilidae	Mullet	3931	.64	4091	.35	8022	.45
Mugil cephalus	Striped mullet	26215	4.28	18733	1.59	44948	2.51
Paralichthys sp.	Flounders	1532	.25	2928	.25	4460	.25
Diodontidae	Burrfishes	817	.13	1184	.10	2001	.11
Ostraciidae	Boxfishes	395	.06	457	.04	852	.05
Grand Total		612871	100.00	1178146	100.00	1791017	100.00

Table 4-4. Fish distribution per effective seasons (1996-2012, data courtesy of FWC).

Taxon	Common Name	Apr/May (Wm/Dry)		Jun-Sept (Wm/Rain)		Oct-Jan (Cool/Dry)		Feb/Mar (Cool/Rain)		Overall	
		N	%	N	%	N	%	N	%	N	%
Euselachii	Shark/ray	479	0.25	831	0.11	333	0.06	60	0.02	1703	0.10
Carcharhiniform	Shark	42	0.02	253	0.03	91	0.02	3	0.00	389	0.02
Rajiformes	Ray/skate	5990	3.18	10900	1.38	7549	1.43	5497	1.93	29936	1.67
Actinopterygii	Other fish	81106	43.01	517448	65.47	289548	54.84	54320	19.10	942422	52.61
Lepisosteus sp.	Gar	80	0.04	330	0.04	133	0.03	32	0.01	575	0.03
Acipenser sp.	Sturgeon	9	0.00	4	0.00	11	0.00	7	0.00	31	0.00
Elops saurus	Ladyfish	782	0.41	2131	0.27	2437	0.46	209	0.07	5559	0.31
Ictaluridae	Freshwater catfish	168	0.09	912	0.12	380	0.07	244	0.09	1704	0.10
Ariidae	Sea catfish	1730	0.92	17220	2.18	6386	1.21	888	0.31	26224	1.46
Opsanus sp.	Toadfish	56	0.03	342	0.04	96	0.02	30	0.01	524	0.03
Beloniformes	Needlefish	588	0.31	2182	0.28	759	0.14	190	0.07	3719	0.21
Fundulidae	Killifish	1420	0.75	13458	1.70	9495	1.80	3002	1.06	27375	1.53
Centropomus sp.	Snook	9	0.00	33	0.00	17	0.00	0	0.00	59	0.00
Centropristis striata	Sea bass	211	0.11	887	0.11	543	0.10	69	0.02	1710	0.10
Lepomis sp.	Sunfish	184	0.10	764	0.10	348	0.07	121	0.04	1417	0.08
Carangidae	Jacks	107	0.06	9431	1.19	2231	0.42	51	0.02	11820	0.66
Caranx hippos	Crevalle jack	73	0.04	433	0.05	422	0.08	7	0.00	935	0.05
Lutjanidae	Snappers	26	0.01	564	0.07	659	0.12	18	0.01	1267	0.07
Orthopristis chrysoptera	Pigfish	8366	4.44	13402	1.70	5819	1.10	589	0.21	28176	1.57
Sparidae	Porgies	152	0.08	986	0.12	243	0.05	18	0.01	1399	0.08
Archosargus probato.	Sheepshead	371	0.20	955	0.12	796	0.15	291	0.10	2413	0.13
Calamus sp.	Porgies	13	0.01	177	0.02	86	0.02	3	0.00	279	0.02
Lagodon rhomboides	Pinfish	29503	15.65	66961	8.47	48434	9.17	37459	13.17	182357	10.18
Sciaenidae	Drum	1946	1.03	13189	1.67	4001	0.76	458	0.16	19594	1.09

Table 4-4. Continued											
Taxon	Common Name	Apr/May (Wm/Dry)		Jun-Sept (Wm/Rain)		Oct-Jan (Cool/Dry)		Feb/Mar (Cool/Rain)		Overall	
		N	%	N	%	N	%	N	%	N	%
Bairdiella chrysoura	Silver perch	12583	6.67	42175	5.34	35852	6.79	16796	5.91	107406	6.00
Cynoscion sp.	Sea trout	4689	2.49	20231	2.56	3570	0.68	614	0.22	29104	1.62
Leiostomus xanthurus	Spot	28658	15.20	35227	4.46	83528	15.82	143899	50.60	291312	16.26
Pogonias cromis	Black drum	358	0.19	1719	0.22	885	0.17	179	0.06	3141	0.18
Sciaenops ocellatus	Red drum	993	0.53	2207	0.28	4040	0.77	1260	0.44	8500	0.47
Mugilidae	Mullet	751	0.40	2511	0.32	3281	0.62	1479	0.52	8022	0.45
Mugil cephalus	Striped mullet	5755	3.05	10029	1.27	13924	2.64	15252	5.36	44960	2.51
Paralichthys sp.	Flounder	1032	0.55	1602	0.20	960	0.18	866	0.30	4460	0.25
Diodontidae	Burrfish	224	0.12	637	0.08	847	0.16	297	0.10	2005	0.11
Ostraciidae	Boxfish	119	0.06	260	0.03	301	0.06	183	0.06	863	0.05
Grand Total		188573	100.00	790391	100.00	528005	100.00	284391	100.00	1791360	100.00

Table 4-5. Fish distribution by habitat in the lower Suwannee region (1996-2012, data courtesy of FWC).

		Delta Marsh		North Intertidal		South Intertidal		Suwannee Sound		Total	
Taxon	Common Name	n	%	n	%	n	%	n	%	n	%
Euselachii	Sharks/rays	-	-	75	.03	1511	.15	117	.04	1703	.10
Carcharhiniformes	Sharks	3	-	21	.01	331	.03	34	.01	389	.02
Rajiformes	Rays/skates	701	.28	2343	1.03	23106	2.34	3786	1.16	29936	1.67
Actinopterygii	Other fishes	141537	56.97	144400	63.47	470885	47.63	185600	56.79	942422	52.61
Lepisosteus sp.	Gar	172	.07	38	.02	332	.03	33	.01	575	.03
Elops saurus	Ladyfish	174	.07	891	.39	4334	.44	160	.05	5559	.31
Acipenser sp.	Sturgeon	27	.01	-	-	2	-	2	-	31	-
Ictaluridae	Freshwater catfish	1690	.68	1	-	13	-	-	-	1704	.10
Ariidae	Sea catfish	450	.18	677	.30	16004	1.62	9093	2.78	26224	1.46
Opsanus sp.	Toadfish	26	.01	7	-	132	.01	359	.11	524	.03
Beloniformes	Needlefishes	227	.09	608	.27	2554	.26	330	.10	3719	.21
Fundulidae	Killifishes	5887	2.37	1763	.77	16244	1.64	3481	1.07	27375	1.53
Centropomus sp.	Snook	-	-	-	-	58	.01	1	-	59	-
Centropristis sp.	Sea bass	1	-	-	-	42	-	1667	.51	1710	.10
Lepomis sp.	Sunfishes	1409	.57	-	-	7	-	1	-	1417	.08
Carangidae	Jacks	803	.32	1244	.55	6087	.62	3686	1.13	11820	.66
Caranx hippos	Crevalle jack	114	.05	177	.08	623	.06	21	.01	935	.05
Lutjanidae	Snappers	338	.14	104	.05	439	.04	386	.12	1267	.07
Orthopristis chrysoptera	Pigfish	65	.03	179	.08	9417	.95	18515	5.66	28176	1.57
Sparidae	Porgies	1	-	-	-	207	.02	1191	.36	1399	.08
Archosargus probatorcephalus	Sheepshead	294	.12	674	.30	1401	.14	44	.01	2413	.13
Calamus sp.	Porgies	-	-	-	-	8	-	271	.08	279	.02
Lagodon rhomboides	Pinfish	23070	9.29	13813	6.07	116576	11.79	28898	8.84	182357	10.18
Sciaenidae	Drums/croakers	1071	.43	1861	.82	8703	.88	7959	2.44	19594	1.09
Bairdiella	Silver perch	4925	1.98	10135	4.45	72501	7.33	19845	6.07	107406	6.00

Table 4-5. Continued

Taxon	Common Name	Delta Marsh n	Delta Marsh %	North Intertidal n	North Intertidal %	South Intertidal n	South Intertidal %	Suwannee Sound n	Suwannee Sound %	Total n	Total %
Cynoscion sp.	Sea trout	3630	1.46	2911	1.28	12199	1.23	10364	3.17	29104	1.62
Leiostomus xanthurus	Spot	51844	20.87	35614	15.65	177759	17.98	26095	7.98	291312	16.26
Pogonias cromis	Black drum	109	.04	366	.16	2449	.25	217	.07	3141	.18
Sciaenops ocellatus	Red drum	2154	.87	1544	.68	4588	.46	214	.07	8500	.47
Mugilidae	Mullet	361	.15	1655	.73	5947	.60	59	.02	8022	.45
Mugil cephalus	Striped mullet	7055	2.84	6053	2.66	30856	3.12	996	.30	44960	2.51
Paralichthys sp.	Flounder	297	.12	341	.15	2748	.28	1074	.33	4460	.25
Diodontidae	Burrfishes	14	.01	22	.01	464	.05	1505	.46	2005	.11
Ostraciidae	Boxfishes	3	-	-	-	28	-	832	.25	863	.05
Grand Total		248452	100.00	227517	100.00	988555	100.00	326836	100.00	1791360	100.00

Table 4-6. Indicators for season and habitat.

Taxonomic name	Common name	Season	Habitat
Rajiidae	Rays/skates	Warm/Rainy and Cool/Dry	Intertidal and Sound
Ariidae	Sea catfish	Warm/Rainy	Intertidal and Sound
Opsanus sp.	Toadfish	Warm/Rainy	-
Beloniidae	Needlefish	-	Intertidal
Fundulidae	Killifish	Warm/Rainy and Cool/Dry	Intertidal and Marsh
Caranx hippos	Crevalle jack	-	Intertidal
Orthopristis chrysoptera	Pigfish	Warm/Rainy	Sound
Lagodon rhomboides	Pinfish	-	Intertidal
Bairdiella chrysoura	Silver perch	Warm/Rainy	Intertidal and Sound
Cynoscion sp.	Sea trout	Warm/Rainy	Intertidal
Leiostomus xanthurus	Spot	Cool/Rainy	Intertidal
Sciaenops ocellatus	Red drum	Cool/Dry	Intertidal and Marsh
Mugil cephalus	Striped mullet	Cool/Dry	-
Diodontidae	Burrfish	Warm/Rainy and Cool/Dry	-

Table 4-7. Fish length data for select taxa from the lower Suwannee region based on temperature (1996-2012, data courtesy of FWC).

Taxon	Common Name	Effective Season	Number	Average	Std. Dev.
Ariidae	Sea catfish	Cool	1488	225.29	+/- 89.76
Ariidae	Sea catfish	Warm	11931	166.24	+/- 81.72
Caranx sp.	Jack	Cool	49	210.22	+/- 185.74
Caranx sp.	Jack	Warm	845	193.41	+/- 99.94
Lagodon rhomboides	Pinfish	Cool	18371	59.41	+/- 34.70
Lagodon rhomboides	Pinfish	Warm	32864	86.52	+/- 31.51
Bairdiella chrysoura	Silver perch	Cool	6106	121.66	+/- 26.09
Bairdiella chrysoura	Silver perch	Warm	16312	95.71	+/- 45.11
Leiostomus xanthurus	Spot	Cool	71217	32.02	+/- 28.26
Leiostomus xanthurus	Spot	Warm	59673	101.78	+/- 41.86
Mugil sp.	Mullet	Cool	17149	158.61	+/- 100.50
Mugil sp.	Mullet	Warm	16372	187.61	+/- 75.20

Table 4-8. Fish length data for select taxa from the lower Suwannee region based on seasons (1996-2012, data courtesy of FWC).

Taxon	Common Name	Effective Season	Number	Average	Std. Dev.
Ariidae	Sea catfish	Cool/Dry	3423	163.28	+/- 83.94
Ariidae	Sea catfish	Cool/Rainy	549	258.88	+/- 69.59
Ariidae	Sea catfish	Warm/Dry	1563	245.26	+/- 54.72
Ariidae	Sea catfish	Warm/Rainy	7884	156.55	+/- 79.76
Caranx sp.	Jack	Cool/Dry	358	149.54	+/- 38.99
Caranx sp.	Jack	Cool/Rainy	8	513.13	+/- 236.96
Caranx sp.	Jack	Warm/Dry	73	410.93	+/- 107.63
Caranx sp.	Jack	Warm/Rainy	455	189.21	+/- 86.04
Lagodon rhomboides	Pinfish	Cool/Dry	12972	82.25	+/- 32.24
Lagodon rhomboides	Pinfish	Cool/Rainy	9153	50.73	+/- 33.65
Lagodon rhomboides	Pinfish	Warm/Dry	9475	67.44	+/- 35.4
Lagodon rhomboides	Pinfish	Warm/Rainy	19655	89.80	+/- 29.43
Bairdiella chrysoura	Silver perch	Cool/Dry	5395	118.27	+/- 26.34
Bairdiella chrysoura	Silver perch	Cool/Rainy	2631	127.29	+/- 21.19
Bairdiella chrysoura	Silver perch	Warm/Dry	4200	101.7	+/- 49.49
Bairdiella chrysoura	Silver perch	Warm/Rainy	10192	88.69	+/- 44.57
Leiostomus xanthurus	Spot	Cool/Dry	27808	56.96	+/- 53.88
Leiostomus xanthurus	Spot	Cool/Rainy	45861	29.33	+/- 23.11
Leiostomus xanthurus	Spot	Warm/Dry	25815	68.55	+/- 35.90
Leiostomus xanthurus	Spot	Warm/Rainy	31513	116.08	+/- 35.05
Mugil sp.	Mullet	Cool/Dry	11622	170.88	+/- 90.08
Mugil sp.	Mullet	Cool/Rainy	8106	149.11	+/- 106.92
Mugil sp.	Mullet	Warm/Dry	5079	190.61	+/- 75.92
Mugil sp.	Mullet	Warm/Rainy	8726	186.74	+/- 74.90

Table 4-9. Diversity and equitability values of archeologically relevant present-day fish assemblages (1996-2012, data courtesy of FWC).

Season	Total Individuals	Total Taxa	Diversity	Equitability
All Data	848938	33	2.15	.62
Overall Warm Weather	439038	33	2.44	.70
Warm/Dry	107467	33	2.15	.61
Warm/Rainy	272943	33	2.48	.71
Overall Cool Weather	409623	33	1.59	.55
Cool/Dry	238457	33	2.11	.61
Cool/Rainy	230071	32	1.32	.38

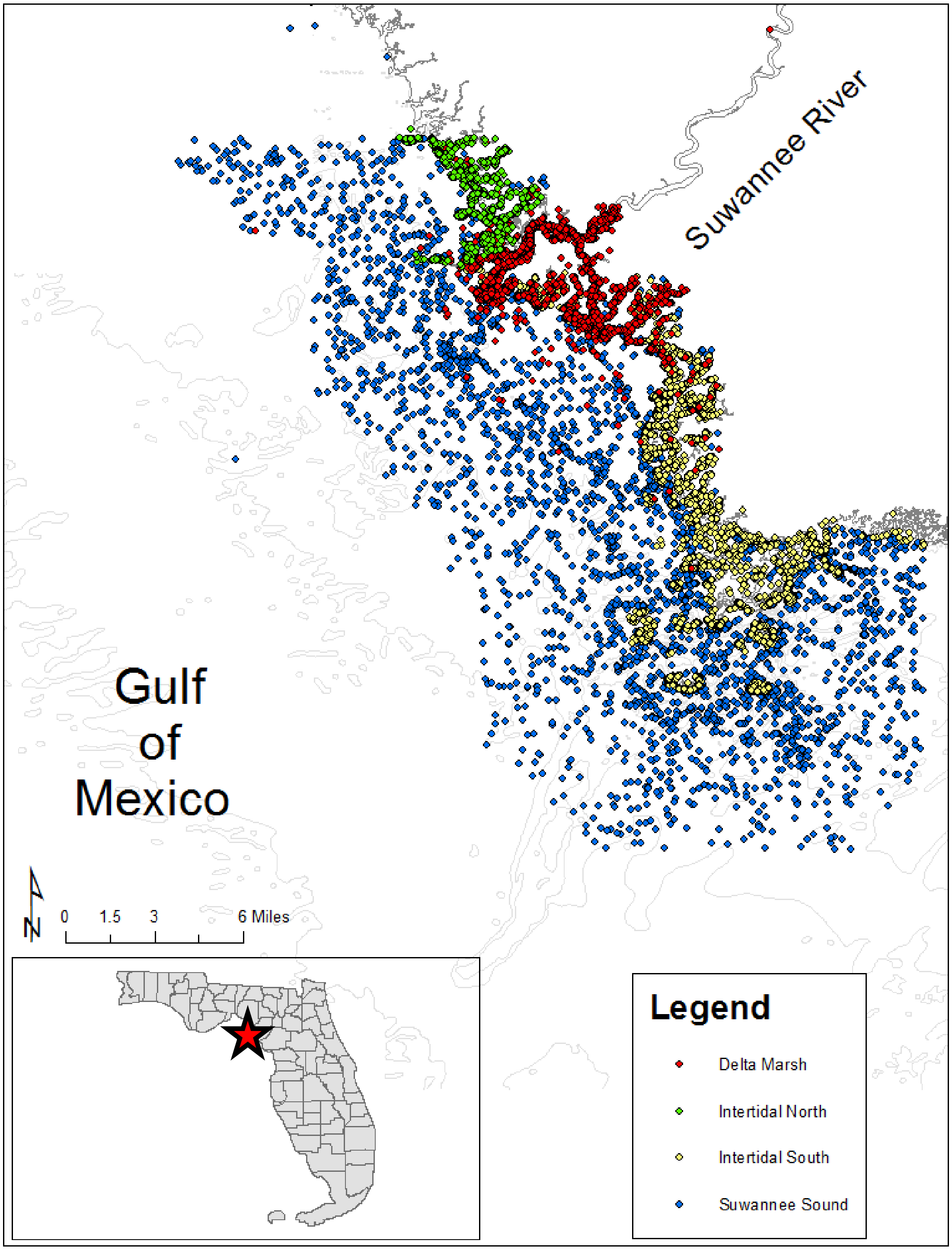


Figure 4-1. Location of FWC collection sites, divided into delta marsh (< 5 psu), intertidal north and south (within 0.1 miles of the coastline), and Suwannee Sound (greater than 0.1 miles from the coastline) environments (1996-2012, data courtesy of FWC).

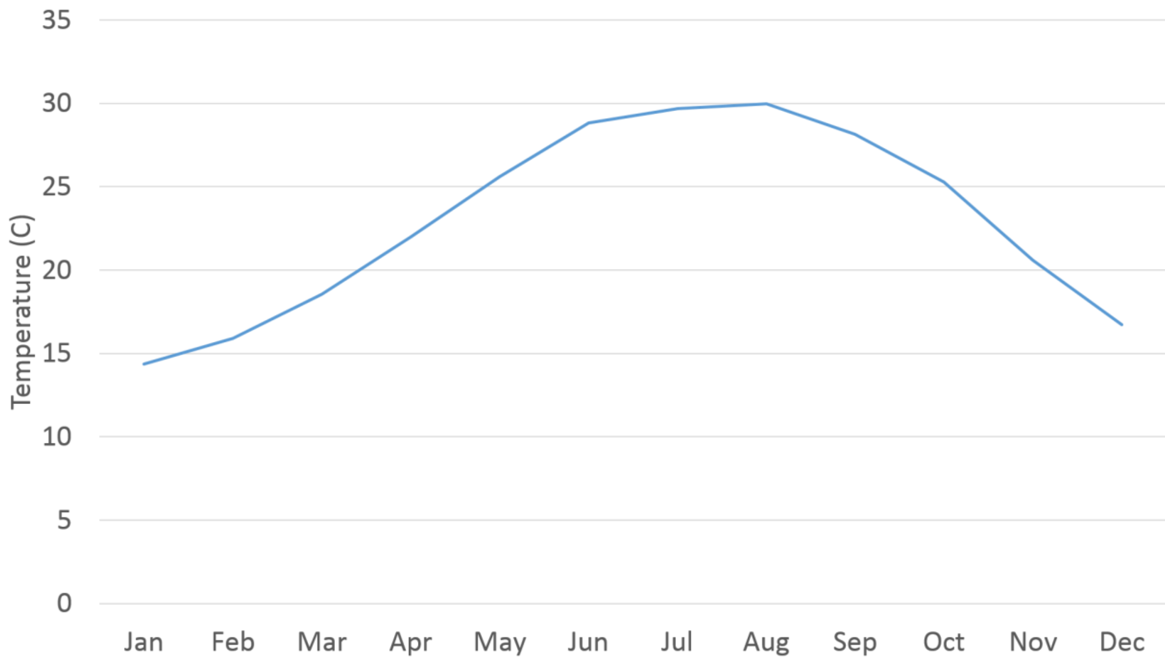


Figure 4-2. Average annual air temperature fluctuations in the lower Suwannee region (1996-2012).

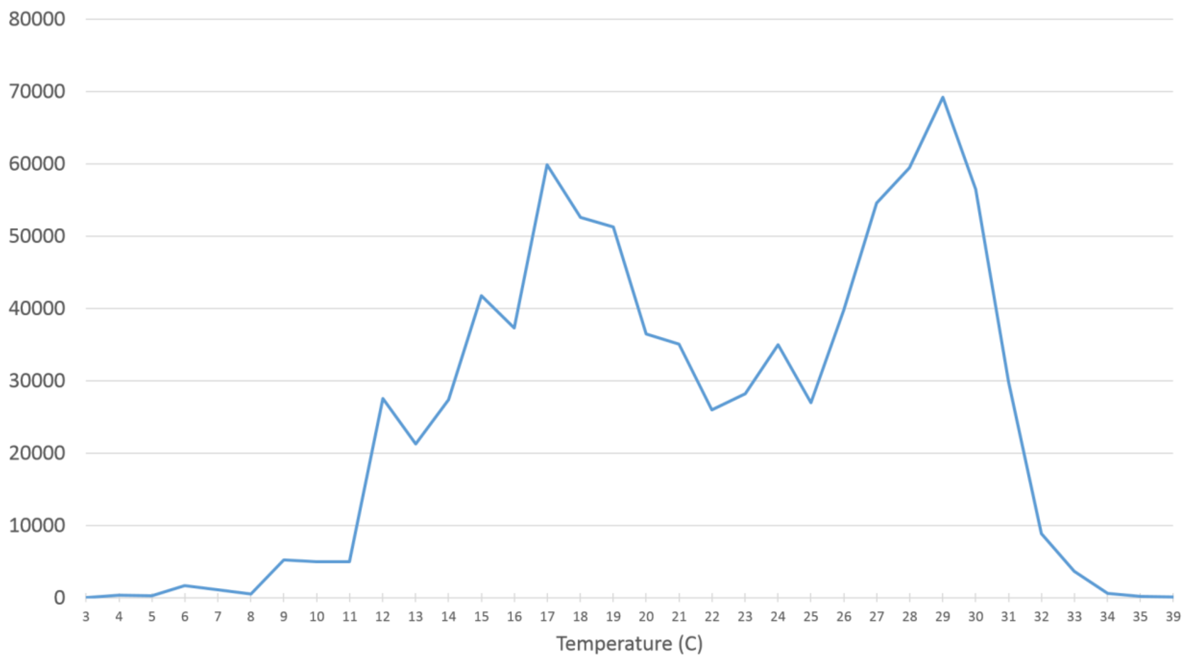
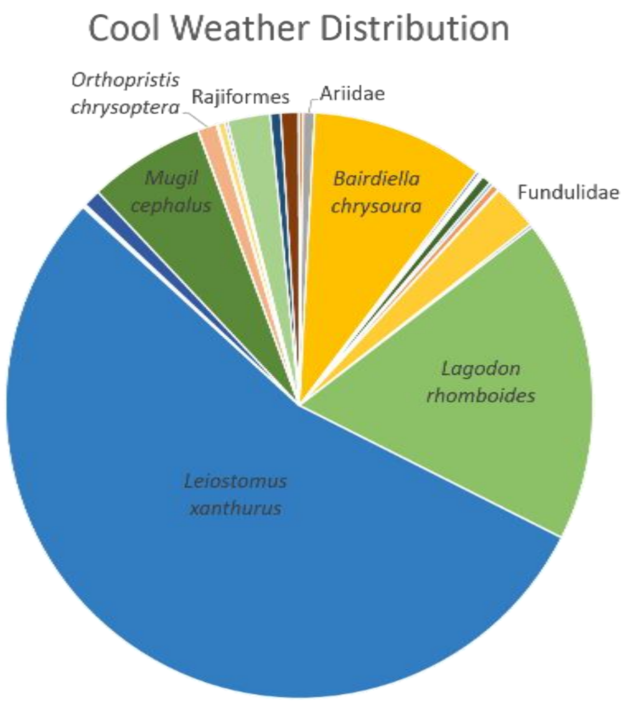
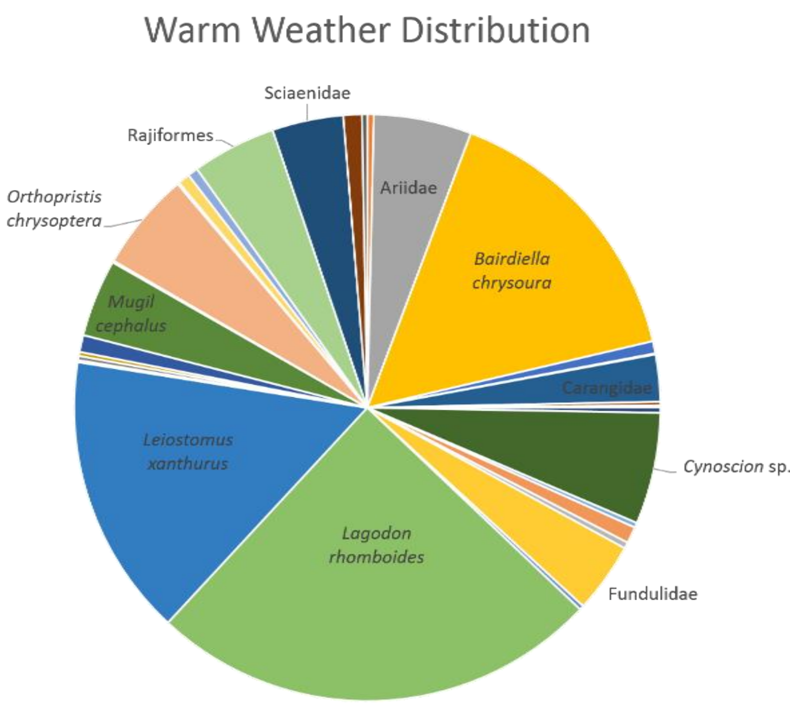


Figure 4-3. Numbers of archaeologically relevant fishes collected with regard to water temperature in the lower Suwannee region of Florida (1996-2012, data courtesy of FWC).



A



B

Figure 4-4. Distribution of archaeologically relevant fish taxa during A) cool and B) warm temperatures in the lower Suwannee region of Florida (1996-2012, data courtesy of FWC).

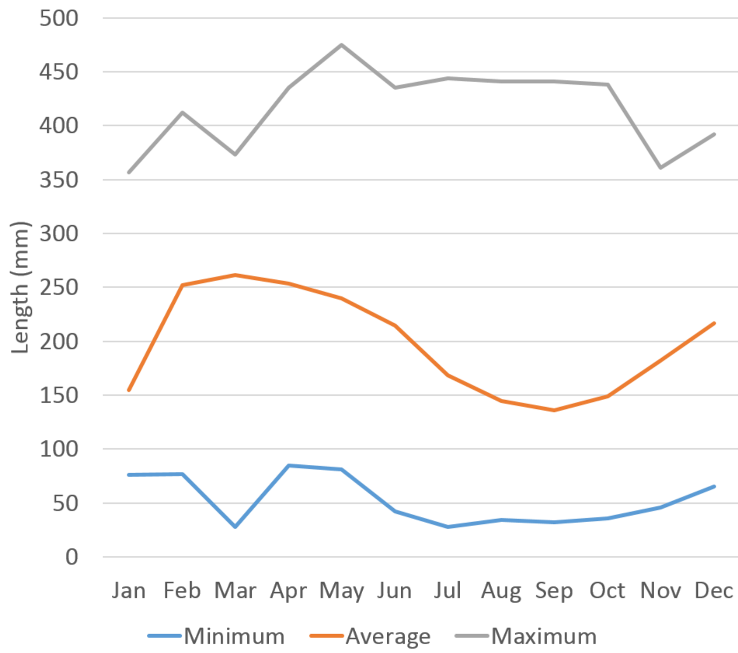


Figure 4-5. Sea catfish lengths (mm) per month between 1996 and 2012, data courtesy of Florida Fish and Wildlife Conservation Commission.

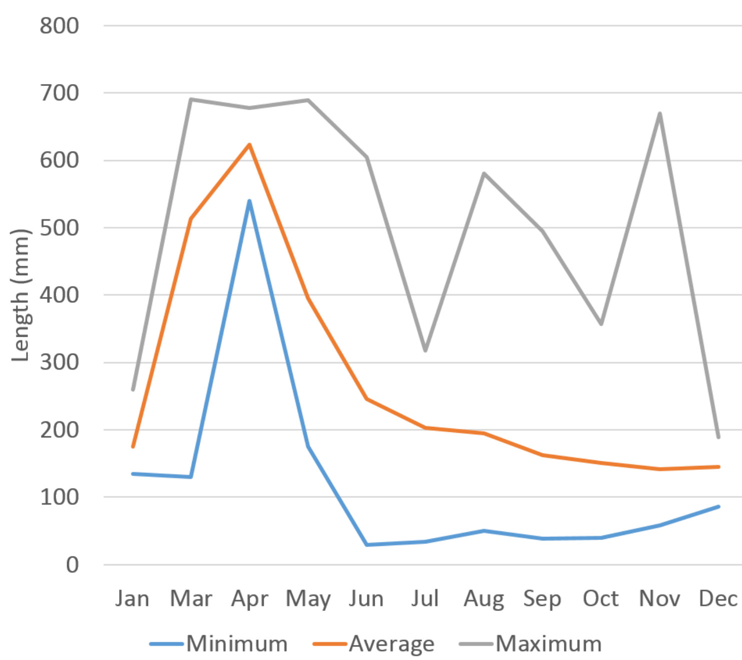


Figure 4-6. Jack lengths (mm) per month between 1996 and 2012, data courtesy of Florida Fish and Wildlife Conservation Commission.

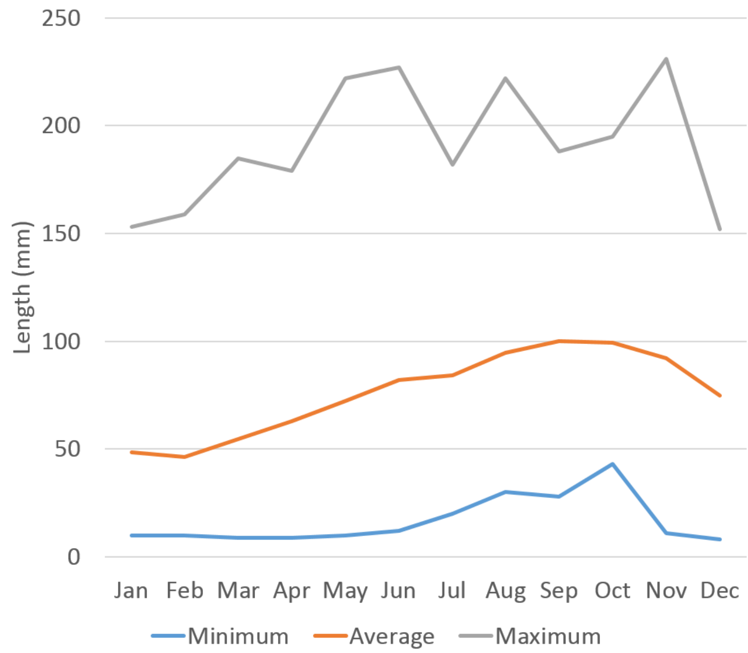


Figure 4-7. Pinfish lengths (mm) per month between 1996 and 2012, data courtesy of Florida Fish and Wildlife Conservation Commission.

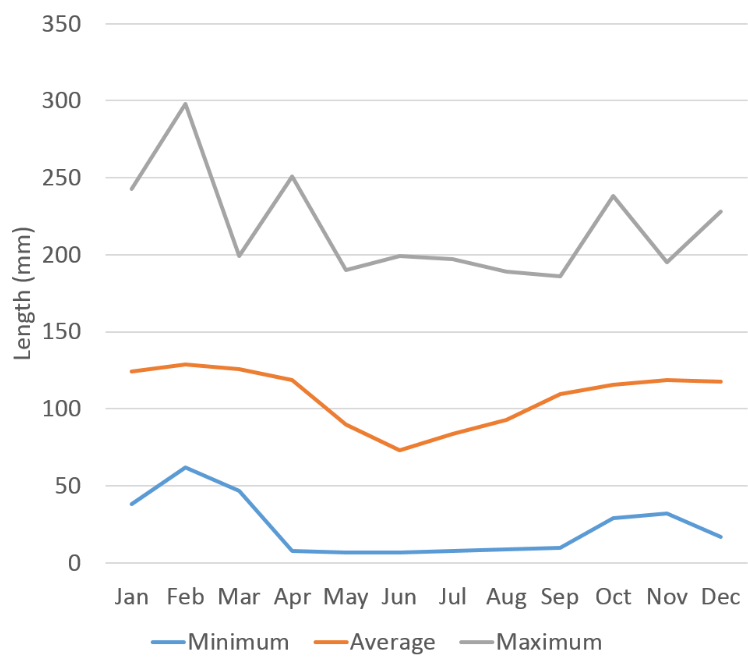


Figure 4-8. Silver perch lengths (mm) per month between 1996 and 2012, data courtesy of Florida Fish and Wildlife Conservation Commission.

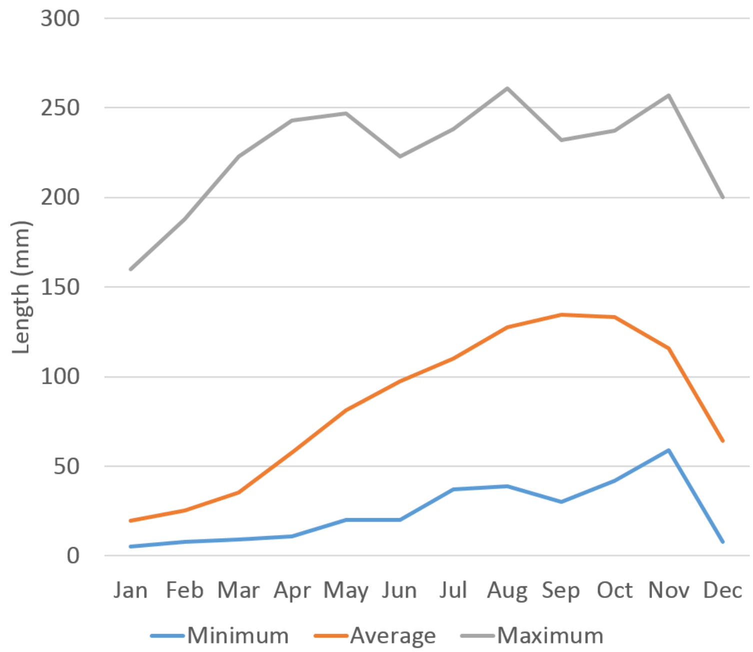


Figure 4-9. Spot lengths (mm) per month between 1996 and 2012, data courtesy of Florida Fish and Wildlife Conservation Commission.

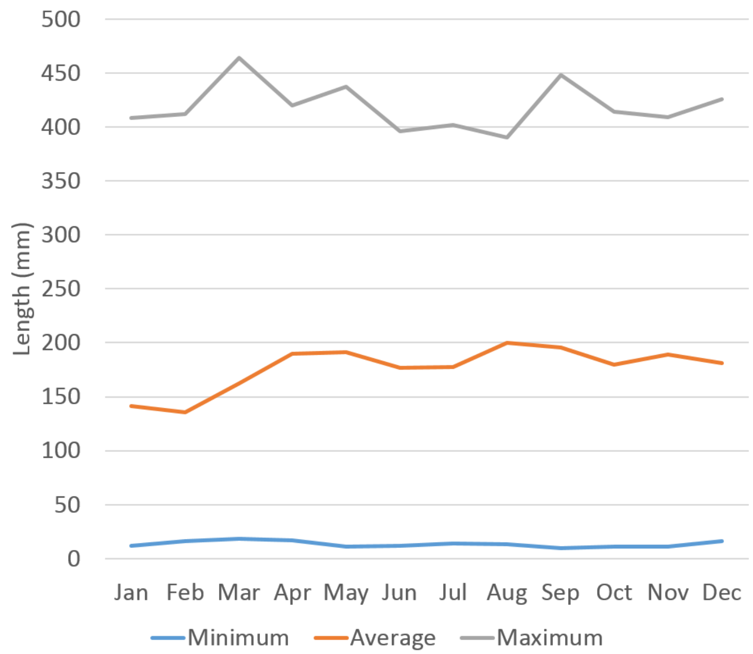
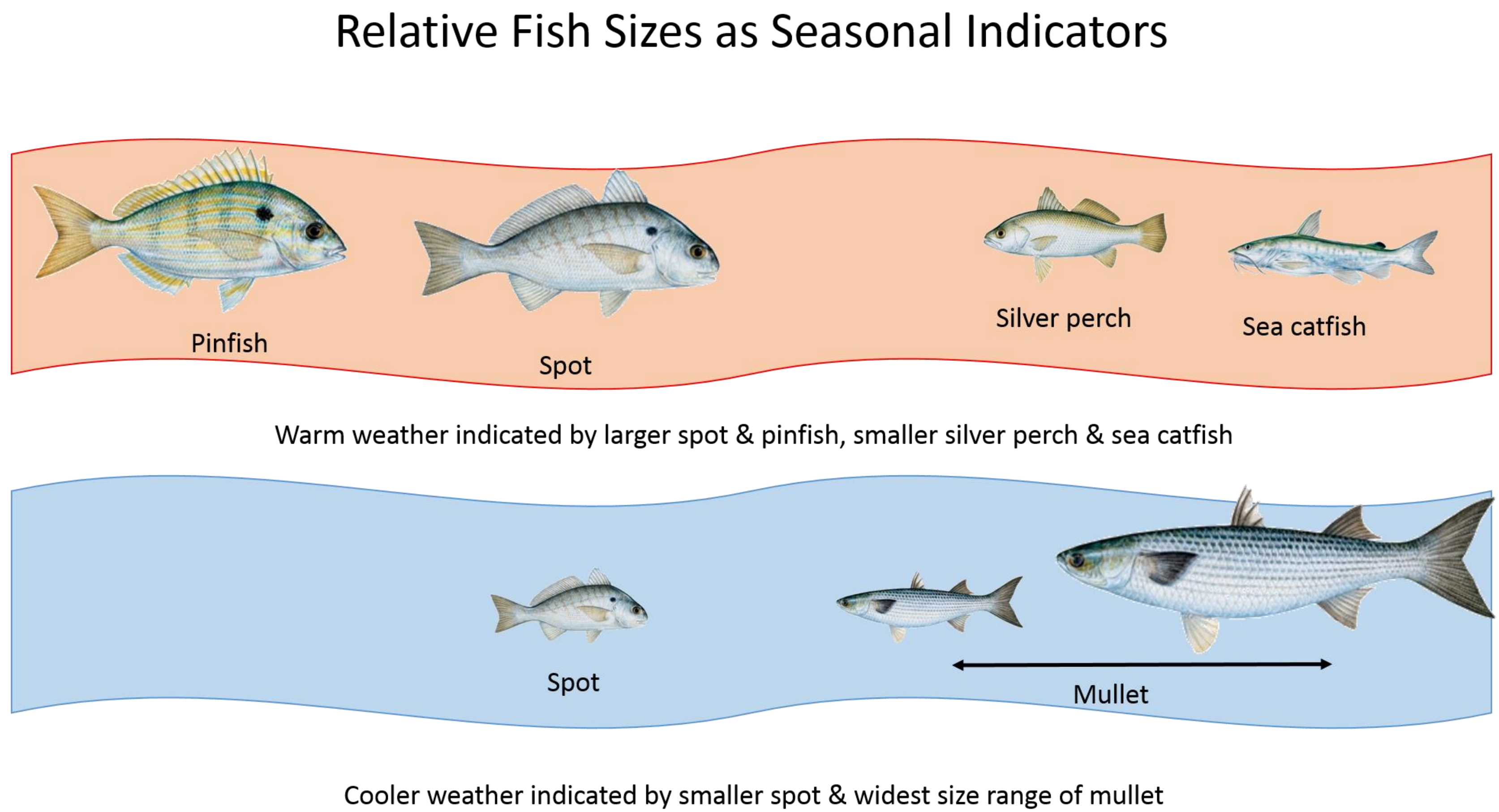


Figure 4-10. Mullet lengths (mm) per month between 1996 and 2012, data courtesy of Florida Fish and Wildlife Conservation Commission.



Figue 4-11. Schematic depicting seasonal trends in fish sizes based on FWC (n.d.) data.

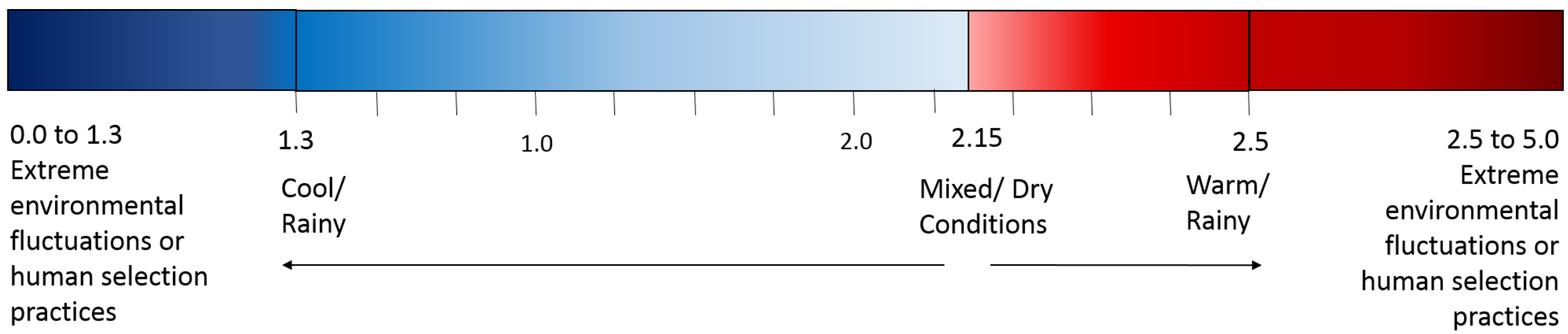


Figure 4-12. Schematic of present-day diversity values with regard to effective seasons based on FWC (n.d.) data.

CHAPTER 5
ZOOARCHAEOLOGICAL MATERIALS AND METHODS

Archaeological Contexts

In this chapter, I discuss the archaeological samples and associated methods of analysis. Forty-five flotation samples from eight sites (Figure 5-1) are included in faunal analyses. Thirteen general level samples from two sites also are included to increase coverage, account for larger faunal remains, and complement results from flotation samples (Table 5-1). Flotation samples range in size from 3.5 to 36 liters in volume.

Flotation samples were collected from unit profiles and marked on profile drawings unless noted otherwise. Column samples typically were collected post-excavation from a 50-x-50-cm area in the unit profile to ensure that samples were collected from a single stratum. In the cases of thick strata, samples were subdivided by depth to examine potential temporal changes within a single stratum. In other cases, bulk samples were collected from opposite unit profiles (2 m apart) to examine spatial variations in faunal distribution. Other bulk samples, such as feature fill, were also collected and analyzed.

Eight sites are included in analyses for the lower Suwannee region (Figure 5-1). Due to sample availability, contexts with AMS assays between 2630 cal. B.C. and cal. A.D. 980 are represented (Appendix A). From north to south, sites include: Bird Island (8DI52), Cat Island (8DI29), Little Bradford Island (8DI32), Deer Island (8LV75), Shell Mound (8LV42), Richards Island (8LV137), McClamory Key (8LV288), and Ehrbar (8LV282).

Bird Island (8DI52)

Bird Island is located at the northern end of the lower Suwannee region study area (Figure 5-1). The site is on a small island, located on a relic paleodune in the shallow Horseshoe Cove area. The area has been significantly altered by human and non-human influences, such as storms, erosion, and dredging (McFadden 2015; McFadden and Palmiotto 2012).

Circa 2480 to 2290 cal. B.C., Bird Island was still part of the mainland, located near an extension of the present-day Lolly Creek and surrounded on the south and east by salt marshes. The creek allowed access through the marsh to collect fishes from more open marine environments, which were located several kilometers to the west. By ca. 360 to 170 cal. B.C., Bird Island was located on the tip of a peninsula still connected to the mainland, but by cal. A.D. 200, Bird Island had been separated from the mainland (McFadden 2015:126-130).

Intact midden deposits date back from 2480 cal. B.C. to cal. A.D. 980 (Appendix A). The added elevation from these archaeological deposits may help explain why these islands still exist today (McFadden and Palmiotto 2012). Although no architectural evidence has been observed during Bird Island excavations, the artifact assemblages and pit features suggest domestic occupations at the site (McFadden 2015:101).

Human burials, likely associated with occupations between cal. 2630 and 2290 cal. B.C., have been identified on the island. Materials at the site, including a diverse array of non-local soapstone, suggest that Bird Island was a periphery trading post associated with the Elliot's Point and Poverty Point cultures (McFadden 2015:100;

McFadden et al. 2015). At least 18 different types of soapstone from a wide geographic range are identified at Bird Island (McFadden 2015; McFadden et al. 2015).

Initial site survey of Bird Island included shovel test pits in a transect across the highest elevation on the south side of island. These tests revealed intact midden deposits more than a meter thick at the highest elevation. The midden thinned out as elevation decreased, and evidence of redeposition was identified in several areas on the surface area. Initially, two test units were excavated in 2011. Test Unit (TU) 1 was placed at the highest elevation. Intact midden deposits provided evidence of more than 3,000 years of occupation. TU 2 was excavated on the southwest side of the island. No intact midden deposits were observed (McFadden and Palmiotto 2012).

TU 3 was a 1-x-2-m unit excavated in March 2013. The unit was located caddy corner to TU 1. Column samples were collected from a 50-x-50-cm area in the east profile of TU 3 after excavations were complete and profiles drawn. The feature bulk samples were collected during excavation when the features were encountered. Radiocarbon assays from the adjacent TU 1 are used to characterize TU 3 strata (McFadden and Palmiotto 2012; McFadden et al. 2015).

Thirteen flotation samples are analyzed from Bird Island (Table 5-1). These samples account for five stratigraphic units and two features from TU 3 (Figure 5-2). These samples provide a diachronic perspective of site use, as well as samples for comparison with other co-eval samples in the study region.

Stratum II consists of dense eastern oyster shells (*Crassostrea virginica*) and other archaeological materials in a dark grayish brown sand (10YR4/2). Pottery was not abundant, but limestone-tempered plain sherds, sand-tempered check-stamp sherds,and some Weeden Island incised sherds were observed (Appendix B; McFadden and Palmiotto 2012). Additionally, lithic biface fragments and chunks of burned limestone were also identified. Two bulk samples were collected. An AMS assay from TU 1 provides an age estimate of cal. A.D. 810-980 (Appendix A)..

Stratum III is distinguished from Stratum II by increased frequencies in oyster shells and occasional gastropod shells. Additionally, less pottery and other artifacts were recovered during general level excavations (Appendix B). Three bulk samples were collected. An AMS assay from TU 1 provides an age estimate of 360-170 cal. B.C. (Appendix A).

Stratum IV is a thin lens of very dark gray fine sand (10YR3/2). Few material remains are identified. This lens is interpreted as a culturally sterile, storm-surge level based on frequencies of sponge spicules identified in the sediment samples (McFadden 2015:101).

Directly beneath, Stratum V consists of a very dark grayish fine sand (10YR3/1) with dense oyster shells and increased numbers of gastropods. Little pottery was observed in this stratum, but a modified bone pin from a deer metapodial and increased quantities of lithic materials were found. Burned limestone was also observed in this stratum (Appendix B). Two bulk samples were collected. An AMS assay from TU 1 provides an age estimate of 2480-2290 cal. B.C. (Appendix A).

Finally, Stratum VI consists of dark grayish brown sands (10YR4/2) with little archaeological materials, except for what appears to be intrusive pits from higher levels (McFadden and Palmiotto 2012:Table 1-1). Feature 2 appears to be an intrusive pit originating in Stratum III, but containing similar materials to Stratum V. Feature 3 appears to be an intrusive pit originating in Stratum V, which contains a cache of large lightning whelk (*Busycon contrarium*) and small crown conch (*Melongena corona*) shells (see McFadden 2015:Figure 3-5). Three bulk samples were collected in the field. The pit was sectioned into southeast and southwest sections. The lightning whelk shells were bagged and cleaned separately, and the contents of the shells provided a third sample for comparison (McFadden et al. 2015).

Additionally, three samples of ¼-in general-level vertebrate materials are analyzed. These samples were recovered arbitrary levels, but they were selected because they largely were contained within single strata. Levels A is a 20-cm level associated with Stratum II. Level E is a 10-cm level associated with Stratum III. Level J is a 10-cm level associated with Stratum V. While Level A, the surface level, is prone to mixing from later activities at the site (McFadden and Palmiotto 2012), Level B was ineffective for analysis because it encompassed areas of both Strata II and III.

Cat Island (8DI29)

Cat Island is a small tidal marsh island located a few kilometers north of the mouth of the river (Figure 5-1). It is highly impacted by shoreline erosion, dredging, and other influences (Sassaman et al. 2011:57). Archaeological deposits indicate both Late Archaic and Woodland occupations at the site, with radiocarbon assays ranging from 2630 cal. B.C. to cal. A.D. 610 (Appendix A). Human remains associated with Late Archaic materials have been identified at the site.

Eight flotation samples are analyzed from Cat Island (Table 5-1). These samples account for four stratigraphic layers between the two test units (Figures 5-3 and 5-4). Test Unit 1 and TU 2 were 1-x-2-m units situated on the southwest side of the island and excavated in May 2009. Test Unit 1 was situated perpendicular to an eroding midden escarpment. Bulk samples were collected from the north profile of TU 1 in 50-x-50-x-10-cm sections (Figure 5-3), of which five liters were saved for flotation samples and the rest water-screened through 1/8-in hardware cloth. The water-screened materials are not included in these analyses.

Three bulk samples from TU 1 Stratum V are analyzed. Stratum V is characterized by a very dark brown fine sandy loam (10YR2/2) and dense oyster and marsh clam (*Polymesoda caroliniensis*) shell deposits (Sassaman et al. 2011: Table 3-1). Weeden Island and limestone-tempered pottery sherds were observed in the stratum (Appendix B). An AMS assay from Stratum V provides an age estimate of cal. A.D. 610-680 (Appendix A; Sassaman et al. 2011:62-66).

TU 2 was situated about 16 m southeast of TU 1 in an open area located six meters inland from the escarpment. Bulk samples were collected from the east profile of TU 2 in 50-x-50-x-10-cm sections (Figure 5-4) in the same manner as TU 1. One sample was analyzed each from Stratum IV and V, and three samples were analyzed from Stratum VI.

Stratum IV is characterized by very dark gray fine sandy loam (10YR4/1) and moderate oyster shells. It is described as a buried A horizon. Stratum V is characterized by dark grayish brown sand (10YR4/2) and sparse-to-moderate shell deposits. Stratum VI is characterized by black loamy sand (10YR2/1) and abundant oyster shells (Sassaman et al. 2011: Table 3-3). An AMS assay from Stratum VI provides an age estimate of 2830-2820 and 2630-2470 cal. B.C. (Appendix A; Sassaman et al. 2011:66-70).

Little Bradford Island (8DI32)

Little Bradford is a small island at the mouth of the Suwannee river (Figure 5-1). Largely impacted by boat wakes and other influences today, the island is highly eroded, as evinced by the meter-high escarpment of exposed archaeological deposits (Sassaman et al. 2011:85). Archaeological materials are associated with a radiocarbon assay of cal. A.D. 20 to 220 (Appendix A; Sassaman et al. 2011:95), and undated human remains have been identified at the site (Sassaman and Wallis 2015).

One flotation sample is analyzed from Little Bradford Island (Table 5-1). The sample is from TU 2 and represents one stratigraphic layer (Stratum IV) (Figure 5-5). The sample was collected from a 50-x-50-x-10-cm section of the west profile, of which five liters were saved for flotation and the rest water-screened through 1/8-in hardware cloth. The water-screened materials are not included in these analyses.

TU 2 was situated on top of the escarpment, parallel to the shoreline (Sassaman et al. 2011). It was excavated in May 2010. However, TU 2 reached the water table before excavations could expose the base of Stratum IV. Stratum IV is characterized by dark grey sands (10YR3/1). It contains sandy concretions, limestone-tempered plain sherds (Appendix B), oysters, and marsh clams (though reduced in quantities compared to higher strata) (Sassaman et al. 2011: Table 4-3).

Deer Island (8LV75)

Deer Island is located south of the Suwannee River (Figure 5-1). It is part of a remnant parabolic dune, and has been exposed to erosion and other human and non-human influences (Mones et al. 2012:4). Four separate sites are identified on the island. The analyzed sample in this study is from the shell ring on Deer Island, which is the oldest shell ring in the study area. A radiocarbon assay suggests human occupations between 180 cal. B.C. and cal. A.D. 20 (Appendix A).

One flotation sample is analyzed from Deer Island (Table 5-1). The sample was collected from TU 2 and represents one stratigraphic layer (Stratum II) (Figure 5-6). TU 2 was a 1-x-1-m unit situated adjacent to the interior on the north edge of an arcuate shell ridge. It was excavated in October 2010 (Mones et al. 2012:30). Stratum II is characterized by very dark grayish brown sand (10YR3/2) and moderately dense oyster shell deposits. Deptford-period pottery sherds (Appendix B) and relatively high quantities of crown conch were observed in the field.

Shell Mound (8LV42)

Shell Mound is located several kilometers south of Deer Island (Figure 5-1). The site consists of an arcuate deposit of shells that lies on the southwest end of a large remnant paleodune. With heights up to seven meters above mean sea level, it is the only shell ring in this region that is accessible on the mainland. Despite being impacted by shell mining activities in the early 1900s, Shell Mound site is still largely intact (Sassaman et al. 2013).

The shells contributing to the ring are predominantly eastern oyster shells. Shell is largely absent from the interior of the ring, which is an approximately 60-x-70-meter circular area. The site interior opens to the southeast of the ring onto a small sand-and-shell mound with heights up to two meters above mean sea level (however, after recent coring of the mound, Sassaman believes this may be a push-pile (Sassaman, pers. comm. 2015). Another small sand-and-shell mound is also located a few hundred meters northeast of Shell Mound (Sassaman et al. 2013:1-5).

In planar view, Shell Mound appears to consist of several summits across the top of the mound, which Sassaman et al. (2013:7) consider suggestive of distinct components with specific stratigraphic profiles (i.e., the mound consists of numerous deposition episodes, including a remnant dune arm, so that no single stratigraphic profile from the site is representative of all Shell Mound deposits) (Sassasman et al. 2015a). At the time of this writing, the Laboratory of Southeastern Archaeology has conducted excavations on the northern, southern, and western areas of the ring, as well as the interior (Sassaman et al. 2013; 2015a). Radiocarbon assays from these excavations suggest that early occupations of the area occurred around 2470 to 2300 cal. B.C., but these deposits are not the basis of the ring. The area at the edge of a relict dune was occupied around A.D. 200 and 300. The shell ring was constructed over these deposits and occupied between cal. A.D. 450-650, while the interior was occupied up to cal. A.D. 650-750 (Sassaman et al. 2013:8, 2015:99; Sassaman and Wallis 2015).

Fifteen flotation samples are analyzed from the south, west, and interior of Shell Mound (Figure 5-7; Table 5-1). These samples are used to explore spatial variation within the site. Additionally, ten samples are analyzed from general-level contexts.

South Side Excavations. Six samples are analyzed from units on the south side of the ring (TU 1 and 2) (Figures 5-7, 5-8, 5-9). These units were excavated in May 2012 (Sassaman et al. 2013). The samples represent four stratigraphic layers and one stratigraphic layer/feature (Table 5-1). The units were adjacent, allowing for a longer view of the profile along the slope. TU 1 was located at the bottom of the slope and provided a view of the base of the shell deposits.

During excavations, the mound strata were observed to contain predominantly oyster shells, organic soils, and marine fish fauna. Limestone- and sand-tempered ceramic sherds, as well as crown conch hammers are also identified (Appendix B). From TU 1, Strata V (upper and lower sections) and VIA are analyzed (Figure 5-8). Stratum V is a thick stratum, around 75 cm deep, consisting of bedded oyster shell with relatively less soil matrix compared to surrounding strata (Sassaman et al. 2013:Table 2-1). Two bulk samples were taken to examine differences in the upper and lower halves of the stratum, which are differentiated based on variations in soil color and deposit structure. The stratum itself was not subdivided, however, because these variations are not consistent throughout the profile and instead are used to characterize the stratum. An AMS assay from Stratum V provides an age estimate of cal. A.D. 430-600 (Appendix A; Sassaman et al. 2013:21).

Stratum VIA is about 25 cm deep, consisting of a very dark gray fine sand (10YR3/1) and dense oyster shell (Sassaman et al. 2013: Table 2-1). It is interpreted as a shell-filled pit stratum/feature that intruded into earlier deposits. An AMS assay from Stratum VIA provides an age estimate of cal. A.D. 600-660 (Appendix A), suggesting that Stratum VIA deposits are more recent than Stratum V deposits (Sassaman et al. 2013:21).

From TU 2, Strata II, III, and IV are analyzed (Figure 5-9; Table 5-1). Stratum II consists of bedded oyster shell with relatively less soil matrix compared to surrounding strata. Stratum III contains bedded oyster shell in dark brown fine sand (10YR4/2). Stratum IV is similar to Stratum II, with bedded oysters shells and little-to-no soil matrix (Sassaman et al. 2013: Table 2-3). AMS assays provide overlapping age estimates of cal. A.D. 540-640 from Stratum II and cal. A.D. 570-650 from Stratum III (Appendix A; Sassaman et al. 2013:25).

The assays from TU 2 Strata II and III are similar to the assay obtained from the shell-filled pit (Stratum VIA) and a bit later than the assay from Stratum V in TU 1. This suggests that TU 1 and 2 comprise an intact stratigraphic profile and that the shell deposits were accumulated relatively quickly, over approximately 200 years (Sassaman et al. 2013:25).

Six general-level samples are included from TU 1 and TU 2. From TU 1, materials are analyzed from three levels. Level B is a 20-cm level associated with Stratum V-Upper. Levels E and F are both 20-cm levels associated with Stratum V-Lower. From TU 2, materials are analyzed from three levels. Level B is a 20-cm level associated with Stratum II. Level D is a 20-cm level associated with Stratum III. Level F is a 20-cm level associated with Stratum IV.

West Side Excavations. Test Unit 6 was a 1-x-2-m unit located near the boat launch and parking areas (Figure 4-7). Six samples are analyzed from TU 6 (Table 5-1), which was excavated in June 2013. These samples represent two stratigraphic layers and two features (Figure 5-10).

Stratum III consists of very dark grey medium sand (7.5YR3/7) with crushed shell fragments. Stratum V consists of yellow fine sand (10YR7/6) with degraded shell inclusions. Feature 3 and 7 appear to be intrusive pits originating in Stratum III and extending below the base of the shell midden (Sassaman et al. 2015a:20).

Interior Excavations. Three samples are analyzed from interior units of Shell Mound (TU 3-5) (Figure 4-7; Table 5-1). TU 3 was excavated in May 2012 (Sassaman et al. 2013). TU 4 and TU 5 were excavated in June 2013. All three samples were collected from Stratum II (Figure 5-11). Stratum II consists of very dark brown fine sand (10YR2/2). Sparse shell is observed, but the stratum contains a higher density of ceramic and lithic artifacts than the strata of the mounded areas (Appendix B).

Limestone-tempered ceramic sherds are the most common artifact. Concretions of shell and sand in the unit are suggestive of thermal activity, such as a hearth. No similar types of evidence are observed on west or south sides of the mound itself (Appendix B). An AMS assay from Stratum II provides an age estimate of cal. A.D. 650-760 (Appendix A). This suggests that the interior of the ring was occupied towards the later end of the time range associated with the shell deposits (Sassaman et al. 2013:32-34, 2015a; Sassaman and Wallis 2015).

In addition to the flotation samples, four samples are analyzed from general-level contexts of the ring interior. From TU 3, Levels C (a 10-cm level associated with Stratum II) and E (a 10-cm level associated with Stratum III) are analyzed. From TU 5, Levels D (a 10-cm level associated with Stratum II) and E (a 10-cm level associated with Stratum III) are analyzed.

McClamory Key (8LV288)

McClamory Key is a small island about one kilometer south of Shell Mound (Figure 5-1). It is highly eroded from human and non-human influences. An AMS assay collected from a shovel test pit (STP) in the midden on the west side of the island provides an age estimate of cal. A.D. 650 to 710 (Appendix A; Sassaman et al. 2015b). Artifacts associated with the 12th and 13th centuries have been recovered from middens on the east side of the island. A burial site is eroding out of the south side of the island.

Artifacts recovered along the beach proximate to the remains suggest a Late Archaic age of the burial deposits (Sassaman et al. 2015b).

Two flotation samples are analyzed from the west midden on McClamory Key (Table 5-1). These samples were collected from STP 1 and TU 2 and represent one stratigraphic layer (Figure 5-12). STP 1 was a 50-x-50-cm square test pit excavated in August 2012. A small bulk sample (~3.7 L) was collected in a gallon-size bag from the profile of the most shell-dense stratum.

TU 2 was a 1-x-2-m unit excavated in March 2013, close to STP 1. A flotation sample was collected from the unit profile of Stratum I (Figure 5-12). Stratum I consists of very dark grey find sand (10YR3/1) with dense oyster shell and crown conch shells (Sassaman et al. 2015b:48). Sand-tempered plain, punctated, and incised ceramic sherds are the most common artifacts recovered from this context (Appendix B). Modified shells, including hammers, cutting edge tools, and a bead blank, also are identified (Sassaman et al. 2015b:49).

Richards Island (8LV137)

Richards Island is a small island located about two kilometers south of Shell Mound (Figure 5-1). The island contains numerous arcuate or S-shaped shell deposits (Sassaman et al. 2011:113). The island is relatively remote, bordered by shallow creeks, oyster shoals, mud flats, and seagrasses.

Two flotation samples are analyzed from Richards Island (Table 5-1). These samples were collected from TU 2 and represent one stratigraphic layer and an associated feature (Figure 5-13). TU 2, a 1-x-2-m unit, was excavated in March 2014 from the interior of an arcuate ring on the northwest side of the island. TU 2 was situated in the northwest section of the interior plaza, at the foot of the mounded shell

(Mones, personal communication). An AMS assay provides an age estimate of cal. A.D. 775 to 970 (Appendix A).

Stratum IV is characterized by very dark gray loamy sand (10YR3/1) and moderately dense shell (including oyster, clam (*Mercenaria* sp.), and gastropod shells). Sand-tempered plain ceramic sherds are the most common artifact identified in this context (Appendix A). Feature 1 appears to originate in Stratum IV and has the same soil characteristics.

Ehbar Site (8LV282)

The Ehrbar site is located in a residential area of Cedar Key (Figure 5-1). Cedar Key is located on Way Key, and the area has been significantly altered in recent history by development. Surveys conducted in the late 1980s revealed numerous archaeological sites, including middens, platform mounds, burial mounds, and other deposits, which ranged in time from the Early to Late Woodland periods. The specific area of Ehrbar – near the southeast edge of designated 8LV282 – however, was not explored, likely because of the absence of large mounds (McFadden and Palmiotto 2013:4-9).

Three flotation samples are analyzed from the Ehrbar site (Table 5-1). These samples were collected from TU 1 and represent one stratigraphic (Figure 5-14). . TU 1, a 1-x-2-m unit, was excavated in March 2012 on the residential property of Elizabeth Ehbar. The unit was located west of the carport and revealed intact, undisturbed strata. An AMS assay provides an age estimate of 2560-2350 cal. B.C. (Appendix A).

Stratum II consists of black organic sands (10YR2/1) and dense deposits of oyster and scallop (*Argopecten* sp.) shells. Patches of concreted shell and soil were encountered across the units, suggestive of burning or hearths, such as were observed in areas of Bird Island and Shell Mound (McFadden and Palmiotto 2013).

Zooarchaeological Methods

Sites are organized for discussion based on radiocarbon assays (Appendix A). The chronological ordering allows the analysis to be structured with a centuries-level focus, permitting a more human-scale investigation of seasonal and mobility practices. Charcoal materials identified primarily in flotation samples from column samples, delineated by strata.

All flotation samples were transported to the Laboratory of Southeastern Archaeology. Sample volumes were measured before the samples were processed. Samples were processed with a Dausman flotation machine to separate the soil from faunal and other archaeological remains. The heavy fractions were dried and then screened with nested 1, 2, and 4 mm hardware clothes. Both the invertebrate and vertebrate remains from flotation samples were identified to the lowest possible taxonomic level. All faunal materials greater than 1 mm in size were analyzed. Remains 2 mm and larger were fully sorted and identified, while remains 1-2 mm in size were sorted solely for diagnostic elements. Faunal elements from flotation samples were identified using the Environmental Archaeology comparative collections at the Florida Museum of Natural History (FLMNH).

In addition to flotation samples, general-level samples are included in analyses. Vertebrate faunal remains were recovered during field operations via ¼-in hardware cloth. I discuss faunal materials from the general level matrix of select areas in order to increase coverage and account for larger faunal remains that might be underrepresented in smaller flotation samples level. Vertebrate remains are identified from the general-level samples largely using the comparative specimens at the Laboratory of Southeastern Archaeology and the zooarchaeology laboratory in the Department of Anthropology at the University of Florida.

The number of identified specimen (NISP), minimum number of individuals (MNI), and bone weight per taxon are recorded for each context per traditional reporting techniques to allow for comparison with other sites. The data are incorporated into presence/absence and demographic methods to address effective seasons. Abundances of fishes, fish length data, and impressed odostome lengths are used.

MNI was determined based on element size, side, matching, and stratigraphic location. Results are discussed using MNI to be comparable with present-day data, avoid taphonomic and preservation biases inherent in NISP, and to circumvent biases based on variations in species' bone/shell densities (Grayson 1984:29-34; Klein and Cruz-Uribe 1984:24-10). While NISP is additive, allowing for easier grouping of analytical units, result are easily under- or overemphasized based on the number of bones in different taxa skeletons, fragmentation, and other taphonomic effects. MNI alleviates issues with NISP, however, it is prone to calculation error and comparability between samples is questionable because there is no standard method to establish MNI. MNI is not additive, therefore it is tedious to establish analytical groups after samples have been analyzed (Grayson 1984:29-34; Klein and Cruz-Uribe 1984:24-10).

Several researchers have suggested a combined use of MNI and NISP to interpret data (Grayson 1984:29-34; Klein and Cruz-Uribe 1984:24-10). I primarily discuss fauna in terms of MNI, referencing NISP where appropriate. Comparability of

MNI is not an issue in this case because flotation samples were identified by a single analyst.

However, the NISP and weight categories should not be taken at face value. During analyses of materials, unidentifiable vertebrate material and unidentifiable fish materials were lumped together into a single analytical category. Several of these samples were revisited (noted in Appendix E) to resort the unidentifiable vertebrate materials. While no new fish species or MN were identified during reanalysis, the raw counts and weights inaccurately represent the unidentifiable taxa categories. The same issue exists for unidentifiable invertebrate materials. A reanalysis of one Shell Mound sample revealed no new gastropods or MNI, but numerous small oysters, barnacles, and slippersnails were identified. These additions did not change either relative invertebrate proportions or interpretations, but the reader should be aware of the discrepancy in these categories.

Chi-Square Tests

Because they consist of count data, differences between sub-samples are analyzed using Chi-Square tests (G-tests, $p<0.05$) (Beals et al. 1999; Khan Academy 2010a). Chi-Square tests are used to determine whether observed frequencies of data vary significantly from expected frequencies. The following formula is used:

$$\chi^2 = \Sigma \, [\, (o-e)^2 \, / \, e \,],$$

where χ^2 is the Chi-Square test statistic, *o* is the observed frequency, and *e* is the expected frequency (Beals et al. 1999; Khan Academy 2010b). In this case, the combined contexts are used to assess how well sub-samples represent each stratum.

Diversity and Equitability

Diversity and equitability estimates are calculated using cartilaginous and bony fish remains from strata flotation samples for several reasons. First, these remains are used to examine values between sites in the region without the bias of oyster shells and incidental invertebrate taxa. This distinction allows for focus on other taxa that were likely purposefully used without being overwhelmed by the sheer number of oyster and/or incidental invertebrate materials. Secondly, these values are comparable to present-day FWC (n.d.a) samples, which consist of fish and shark remains.

Higher archaeological diversity values (between 2.5 and 5) may be indicative of more intense and/or warm weather occupations. Lower diversity values (between 0 and 1.3) may be indicative of cool weather occupations. Values between 1.3 and 2.5 may be indicative of multi-seasonal occupations. In this context, diversity does not represent only economic resource use, but also may provide support for seasonal interpretations (Table 4-9)

Equitability values should follow the same trend as diversity values. Values approaching .40 may suggest cool/rainy conditions (Table 4-9). Values approaching 0.70 may suggest warm/rainy conditions. Values between these ranges should not be used to support seasonal inferences.

Allometry and Size Analyses

Allometry is a means of correlating the total size of an animal to its specific elements via regression plots (Reitz and Wing 2008). For example, the vertebra of a fish grows at a rate that is in relative proportion with the rate that the entire fish grows. Therefore, sizes of fish vertebrae may be used to predict the overall length of the fish (e.g., Quitmyer 2013). Allometric equations are compiled to predict the standard lengths of fishes commonly encountered in archaeological samples. Standard length refers to the length of the fish from tip of the head to tip of the last vertebra (but does not include fins).

Taxa included in allometric assessments are sea catfishes (Ariidae), jack (Carangidae), pinfish (*Lagodon rhomboides,* family: Sparidae), silver perch (*Bairdiella chrysoura*, family: Sciaenidae), spot (*Leiostomus xanthurus,* family: Sciaenidae), and mullet (*Mugil* sp., family: Mugilidae). Allometric estimates are based on diagnostic vertebra, atlas, and/or otolith maximum-width measurements (maximum centrum width of atli and vertebrae, maximum width of otoliths) using available FLMNH zooarchaeological comparative specimens (Table 5-2).

The following equation is used to determine predicted standard length (SL) (from Reitz and Wing 2008):

$$Y = aX + b, \text{ or}$$

$$Y = 10 \wedge [\; (\text{Log } (X) * \; \text{Slope} \;) + \text{Y-intercept} \;],$$

where Y is the standard length, X is the width of the measured element, a is the slope, and b is the Y-intercept. Y-intercept and slope were calculated by measuring element widths of comparative specimens with known length. Regression analyses were computed in Microsoft Excel. The predicted standard lengths of archaeological specimens are compared with FLMNH data and examined between archaeological samples to support inferences about resource procurement, seasonality, and other environmental factors.

For instance, variations in pinfish, silver perch, spot, and sea catfish sizes can be used to identify cooler- or warmer-weather occupation of sites (Quitmyer 2013; SMS 2011). Relative size differences in jack may be used to infer open water versus intertidal fishing techniques, while variation in sizes of sea catfishes may be indicative of selective capture of adult or juvenile fishes or of indiscriminant capture (SMS 2011). Size variations in these species are useful for seasonality assessments because these species spawn and migrate in response to annual environmental fluctuations.

Additionally, impressed odostome lengths are measured between assemblages (Russo 1991a). Although a local curve is not available, I analyze measurements via ANOVA to test for significant size differences between samples. Specific seasons cannot be attributed to samples or time periods, however, significant variations in sizes may indicate differences in collecting environments, which could be reconsidered one day, given a local baseline for assessments (e.g., Cannarozzi 2012).

Artifact Distributions

Other artifacts analyzed from general-level contexts are included in analyses (Appendix B; Figures 5-15 to 5-19). These materials were analyzed by researchers at the Laboratory of Southeastern Archaeology and consist of lithic, ceramic, and shell tool artifacts. Artifact frequencies and distributions vary between sites in the lower Suwannee region. Patterns between faunal and artifact assemblages may be used to infer site activities, resource collection patterns, and other practices (e.g., Atalay and Hastorf 2006; Mlekuz 2010).

Recent studies explored artifact distributions from several contexts in the lower Suwannee region (ca. AD 400 to 1000). Sassaman and colleagues (2015a) observed differences in faunal and artifact distributions in different areas of the Shell Mound site. Palmiotto discussed artifact distributions at sites between cal. A.D. 430 and 980 within the region (Palmiotto 2014). Differences in faunal and artifact distributions indicate a diversity of practices and meanings.

For example, the south side of Shell Mound contains high numbers of shell tools. The west side of Shell Mound contains higher quantities of lithic materials, but relatively few shell tools. I associate shell tools with shellfish processing because they appear to be more common at shell-dense sites than other sites in the region. This indicates shellfish processing on the south side of Shell Mound, while different activities, which included the use of lithic materials, occurred on the west side of the site (Palmiotto 2014) (Appendix B; Figure 5-17). In the next chapter, differences in fish assemblages are documented to further distinguish these areas.

Table 5-1. Summary of archaeological samples included in analyses.

Site #	Site Name	TU	Provenience	Vol (l)	Sample Type	Cultural Association	AMS assay (2 σ)
8DI52	Bird Island	3	Str IIA	13	Stratum	AD 610-980	cal. AD 810-980
8DI52	Bird Island	3	Str IIB	15	Stratum	AD 610-980	-
8DI52	Bird Island	3	Str IIIA	15	Stratum	260 BC-AD 220	260-170 cal BC
8DI52	Bird Island	3	Str IIIB	15	Stratum	260 BC-AD 220	-
8DI52	Bird Island	3	Str IIIC	17	Stratum	260 BC-AD 220	-
8DI52	Bird Island	3	Str IVA	15	Stratum	-	-
8DI52	Bird Island	3	Str VA	15	Stratum	2630-2290 BC	2480-2290 cal BC
8DI52	Bird Island	3	Str VB	15	Stratum	2630-2290 BC	-
8DI52	Bird Island	3	Str VI	15	Stratum	-	-
8DI52	Bird Island	3	Fea-02 South	7	Feature	260 BC-AD 220	-
8DI52	Bird Island	3	Fea-03 Whelk fill	3	Feature	2630-2290 BC	-
8DI52	Bird Island	3	Fea-03 SE	6	Feature	2630-2290 BC	-
8DI52	Bird Island	3	Fea-03 SW	7	Feature	2630-2290 BC	-
8DI52	Bird Island	3	Level A	-	General level	AD 610-980	-
8DI52	Bird Island	3	Level E	-	General level	260 BC-AD 220	-
8DI52	Bird Island	3	Level J	-	General level	2630-2290 BC	-
8DI29	Cat Island	1	Str VA	5	Stratum	AD 610-980	cal AD 610-680
8DI29	Cat Island	1	Str VB	5	Stratum	AD 610-980	-
8DI29	Cat Island	1	Str VC	5	Stratum	AD 610-980	-
8DI29	Cat Island	2	Str IVB	5	Stratum	2630-2290 BC	-
8DI29	Cat Island	2	Str V	4.5	Stratum	2630-2290 BC	2630-2470 cal BC
8DI29	Cat Island	2	Str VIA	5	Stratum	2630-2290 BC	-

Table 5-1. Continued

Site #	Site Name	TU	Provenience	Vol (l)	Sample Type	Cultural Association	AMS assay (2 σ)
8DI29	Cat Island	2	Str VIB	5	Stratum	2630-2290 BC	-
8DI29	Cat Island	2	Str VIC	5	Stratum	2630-2290 BC	-
8DI32	Little Bradford	2	Str IVA	5	Stratum	260 BC-AD 220	cal AD 20-220
8LV75	Deer Island	2	Str II	3.75	Stratum	260 BC-AD 220	180 cal BC - cal AD 20
8LV42	Shell Mound	1	Str V-Lower	14	Stratum	AD 430-660	cal AD 430-600
8LV42	Shell Mound	1	Str V-Upper	14	Stratum	AD 430-660	cal AD 430-600
8LV42	Shell Mound	1	Str VIA	5	Feature	AD 430-660	cal AD 600-660
8LV42	Shell Mound	1	Level B	-	General level	AD 430-660	-
8LV42	Shell Mound	1	Level F	-	General level	AD 430-660	-
8LV42	Shell Mound	2	Str II	12.5	Stratum	AD 430-660	cal AD 540-640
8LV42	Shell Mound	2	Str III	13	Stratum	AD 430-660	cal AD 570-650
8LV42	Shell Mound	2	Str IV	-	Stratum	AD 430-660	-
8LV42	Shell Mound	2	Level B	-	General level	AD 430-660	-
8LV42	Shell Mound	2	Level D	-	General level	AD 430-660	-
8LV42	Shell Mound	2	Level F	-	General level	AD 430-660	-
8LV42	Shell Mound	3	Str II	3.5	Stratum	AD 610-980	cal AD 650-690
8LV42	Shell Mound	3	Level C	-	General level	AD 610-980	-
8LV42	Shell Mound	3	Level E	-	General level	AD 610-980	-
8LV42	Shell Mound	4	Str II	4.5	Stratum	AD 610-980	-
8LV42	Shell Mound	5	Str II	6	Stratum	AD 610-980	-
8LV42	Shell Mound	5	Level D	-	General level	AD 610-980	-
8LV42	Shell Mound	5	Level E	-	General level	AD 610-980	-

Table 5-1. Continued

Site #	Site Name	TU	Provenience	Vol (l)	Sample Type	Cultural Association	AMS assay (2 σ)
8LV42	Shell Mound	6	Str III E 1/2	9	Stratum	AD 430-660	-
8LV42	Shell Mound	6	Str III W 1/2	6.5	Stratum	AD 430-660	-
8LV42	Shell Mound	6	Str V	8	Stratum	AD 430-660	-
8LV42	Shell Mound	6	Fea-03	12.5	Feature	AD 430-660	-
8LV42	Shell Mound	6	Fea-07	20	Feature	AD 430-660	-
8LV42	Shell Mound	6	Fea-07 E 1/2	16	Feature	AD 430-660	-
8LV288	McClamory	-	STP 1	4	Stratum	AD 610-980	cal AD 650-710, 750-770
8LV288	McClamory	2	Str I	10	Stratum	AD 610-980	-
8LV137	Richards Island	2	Str IV	<10	Stratum	AD 610-980	cal AD 775-970
8LV137	Richards Island	2	Fea 01	<10	Feature	AD 610-980	cal AD 775-970
8LV282	Ehrbar	1	Str IIB	26.5	Stratum	2630-2290 BC	-
8LV282	Ehrbar	1	Str IIC	26	Stratum	2630-2290 BC	-
8LV282	Ehrbar	1	Str IID	36	Stratum	2630-2290 BC	2560-2350 cal BC

Table 5-2. Allometric constants for select taxa based on FLMNH data.

Taxon	Common name	Element	N	Slope	Y-intercept	R^2
Ariidae	Sea catfish	Otolith	23	1.06	1.32	.94
Ariidae	Sea catfish	Vertebra	23	.73	1.87	.90
Carangidae	Jack	Atlas	26	.89	1.81	.97
Carangidae	Jack	Vertebra	22	.89	1.71	.99
Sciaenidae	Drums/croakers	Atlas	67	.94	1.74	.96
Sciaenidae	Drums/croakers	Otolith	55	.83	1.53	.77
Sparidae	Porgies	Atlas	32	.72	1.88	.75
Mugilidae	Mullet	Atlas	22	.66	1.96	.90
Mugilidae	Mullet	Vertebra	27	.79	1.83	.97

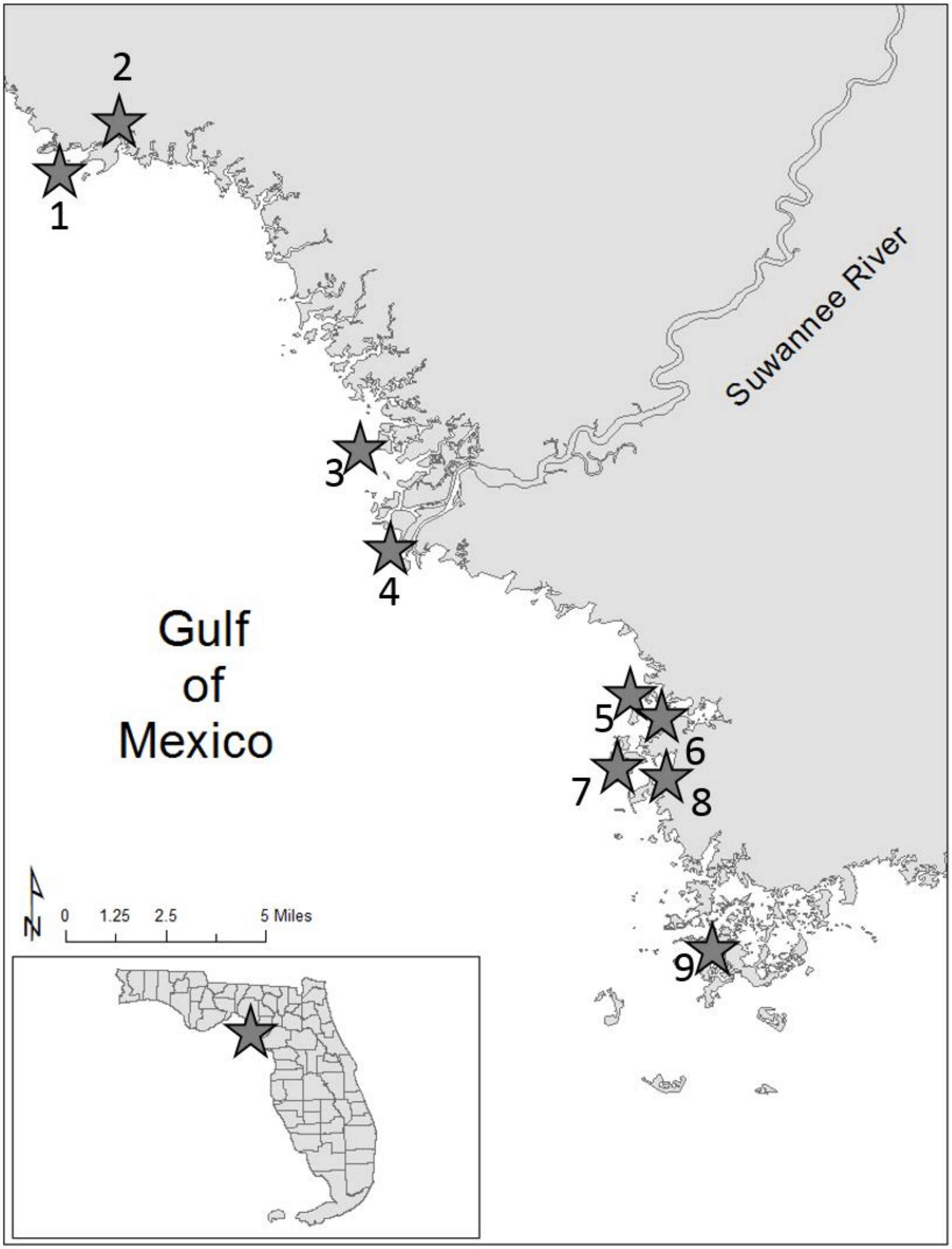


Figure 5-1. Locations of lower Suwannee sites discussed in text (1 = Bird Island, 2 = Garden Patch, 3 = Cat Island, 4 = Little Bradford Island, 5 = Deer Island, 6 = Shell Mound, 7 = McClamory Key, 8 = Richards Island, 9 = Ehrbar).

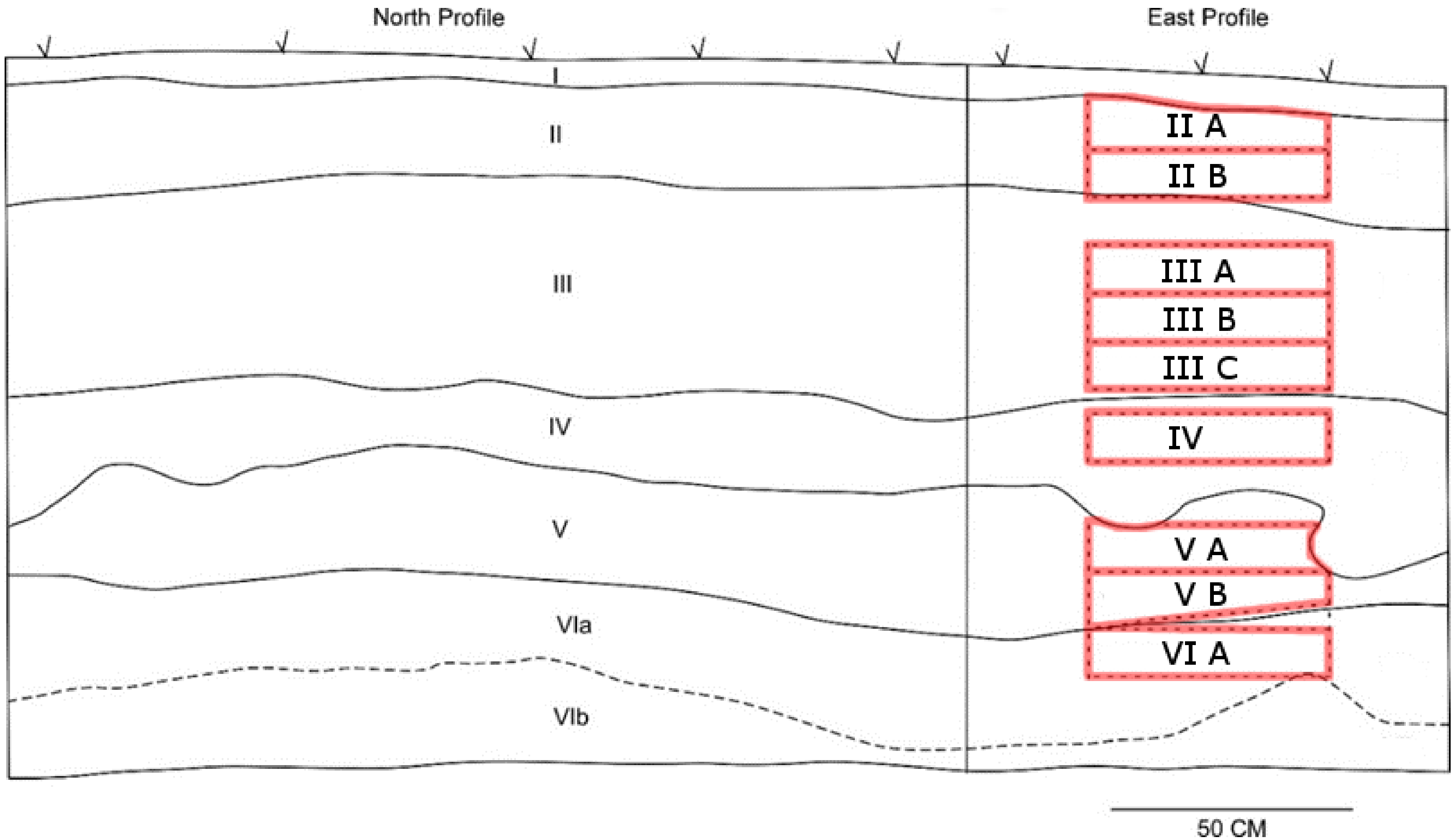


Figure 5-2. North and east stratigraphic profiles of Bird Island (8DI52) TU 3 (McFadden et al. 2015:Figure 1-4). Flotation sample locations marked in red.

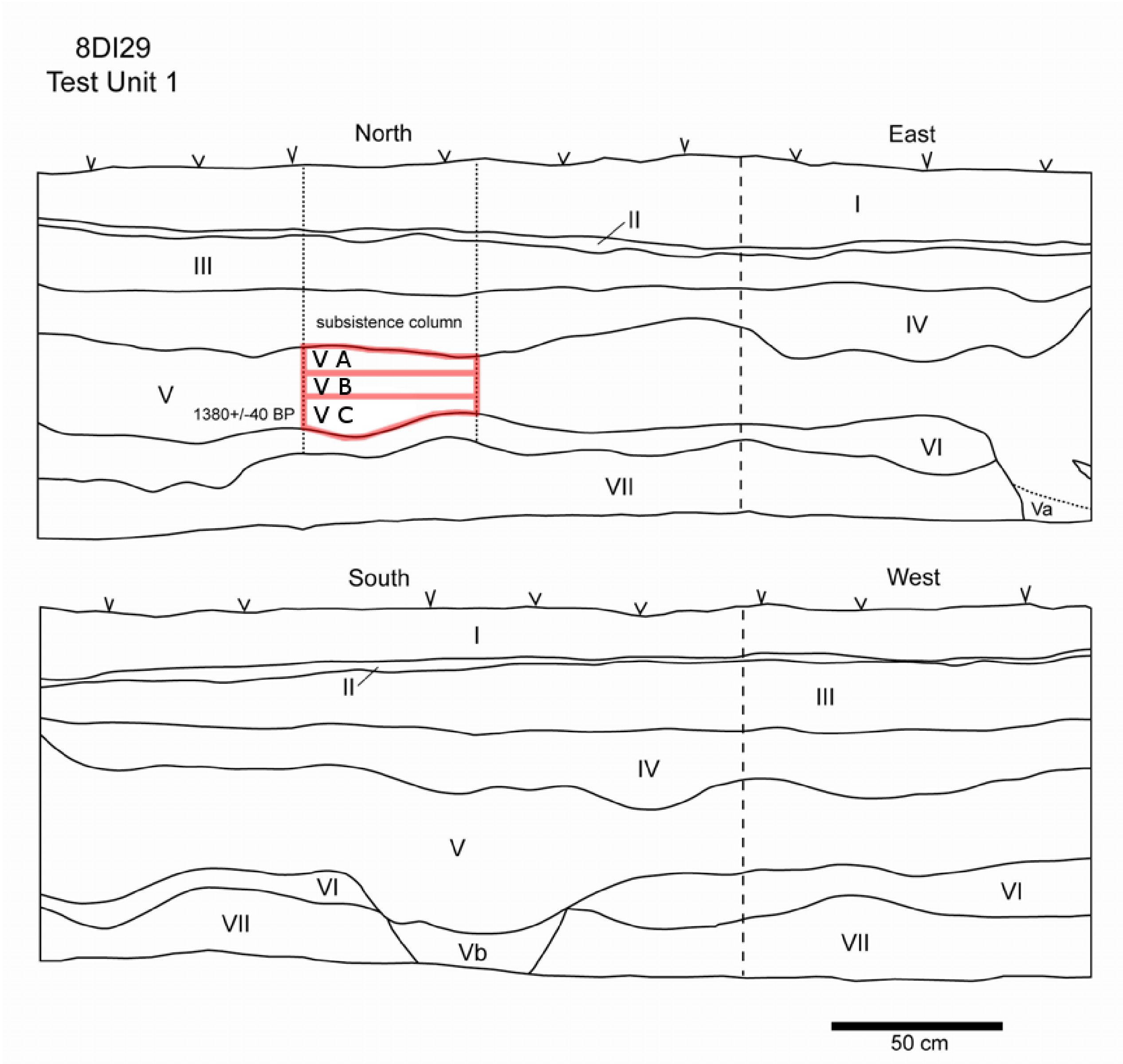


Figure 5-3. Stratigraphic profiles of Cat Island (8DI29) TU 1 (Sassaman et al. 2011:Figure 3-7). Approximate flotation sample locations marked in red.

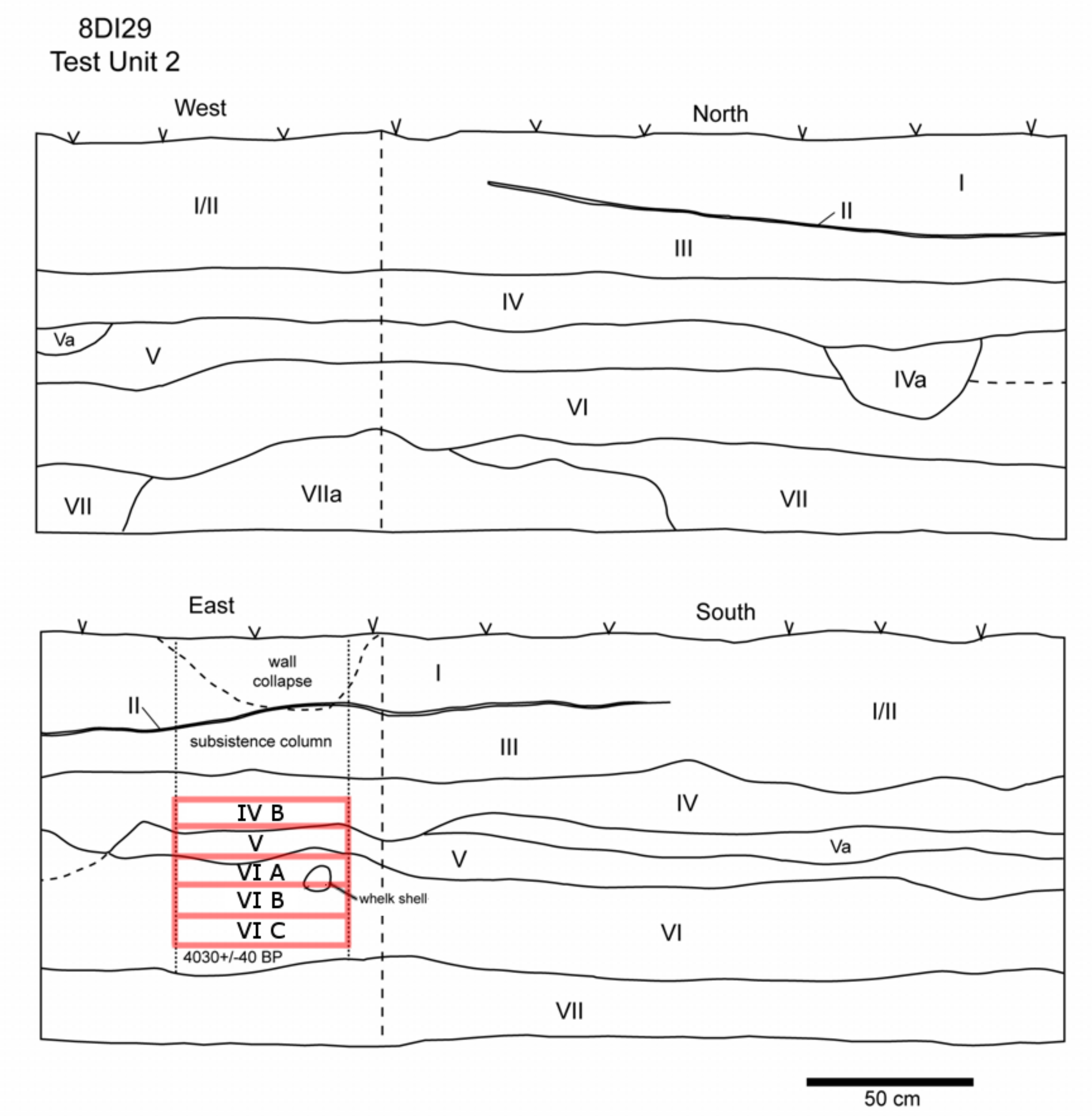


Figure 5-4. Stratigraphic profiles of Cat Island (8DI29) TU 2 (Sassaman et al. 2011:Figure 3-9). Approximate flotation sample locations in red.

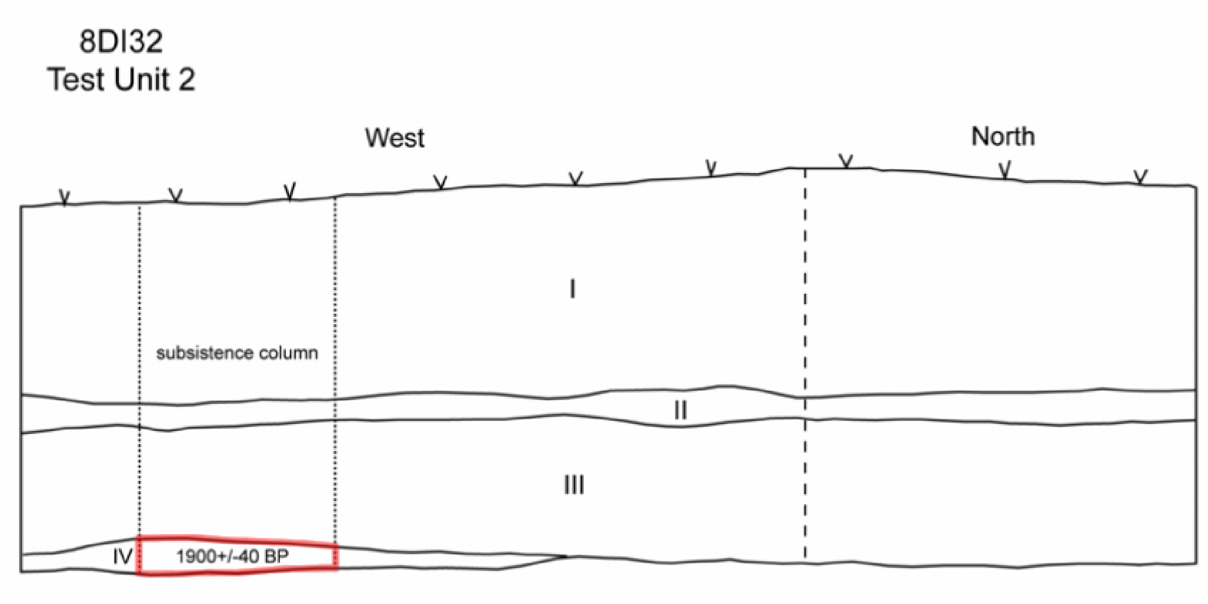


Figure 5-5. Stratigraphic profile of Little Bradford (8DI32) TU 2 (Sassaman et al. 2011:Figure 4-9). Flotation sample location outlined in red.

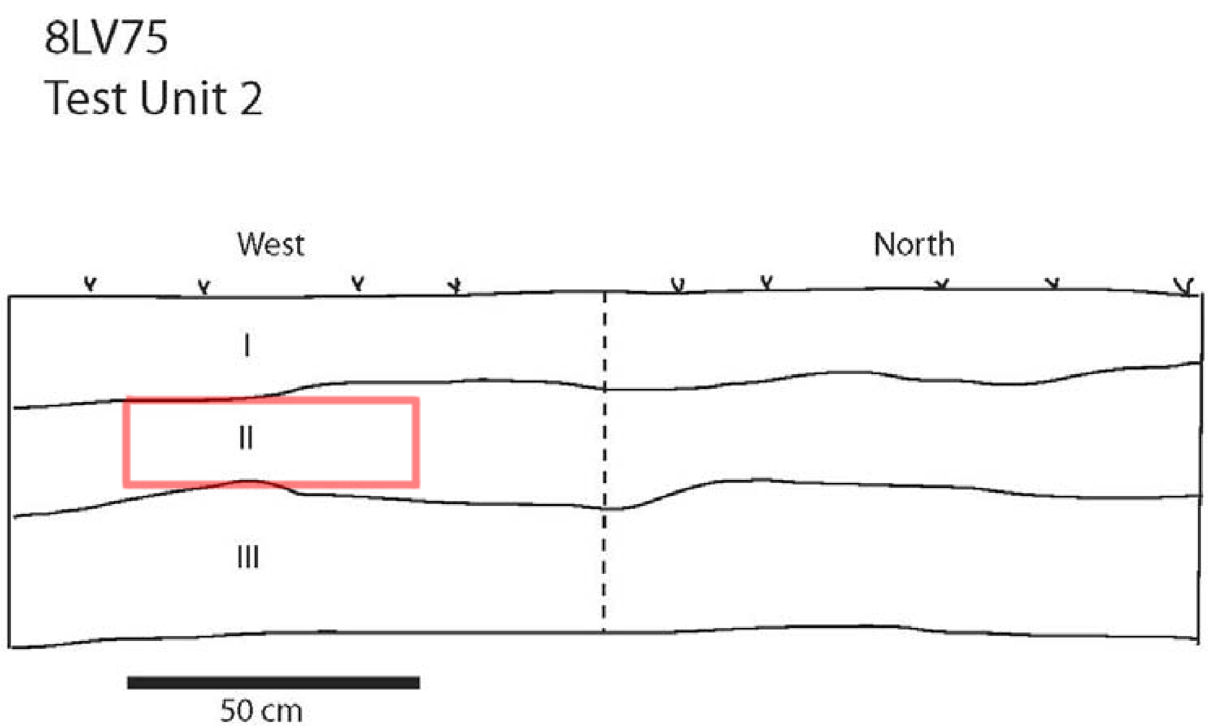


Figure 5-6. Stratigraphic profile of Deer Island (8LV75) TU 2 (Mones et al. 2012:Figure 3-8). Flotation sample location approximated in red.

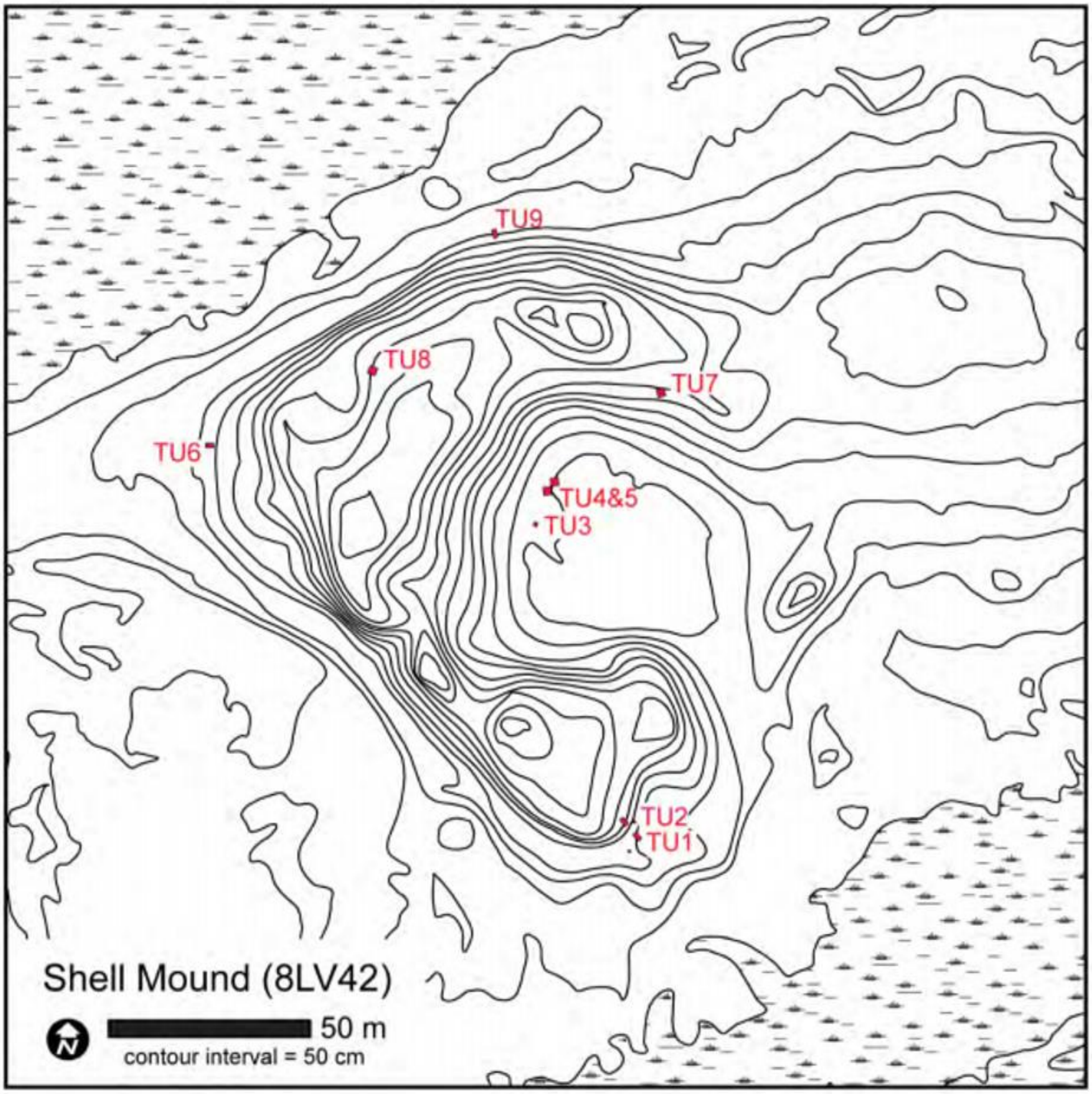


Figure 5-7. Plan view of Shell Mound site (8LV42) with Test Unit locations marked in red (Sassaman et al. 2015a:Figure 2-1).

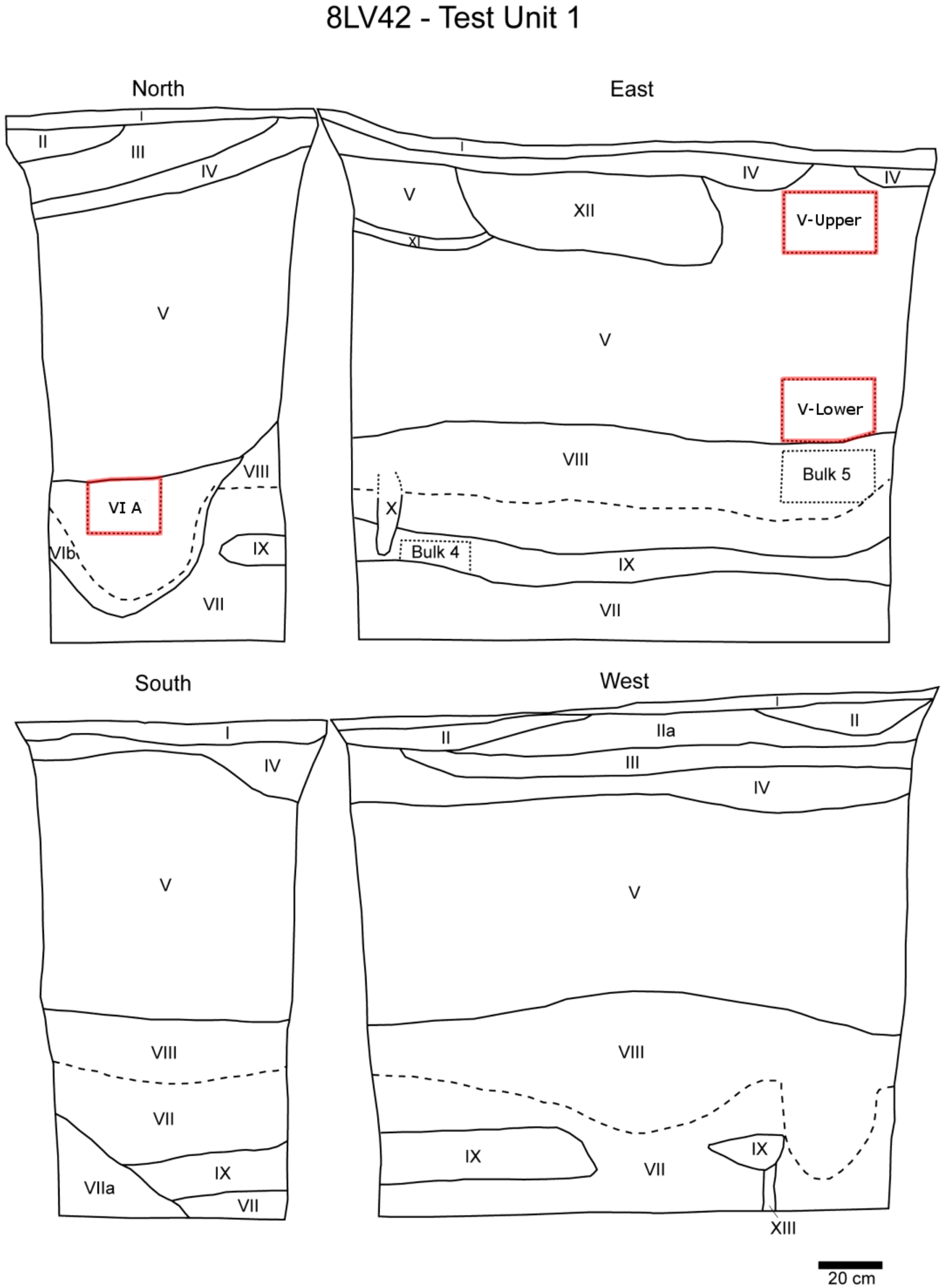


Figure 5-8. Stratigraphic profiles of Shell Mound (8LV42) TU 1 (Sassaman et al. 2013:Figure 2-8). Analyzed flotation sample locations marked in red.

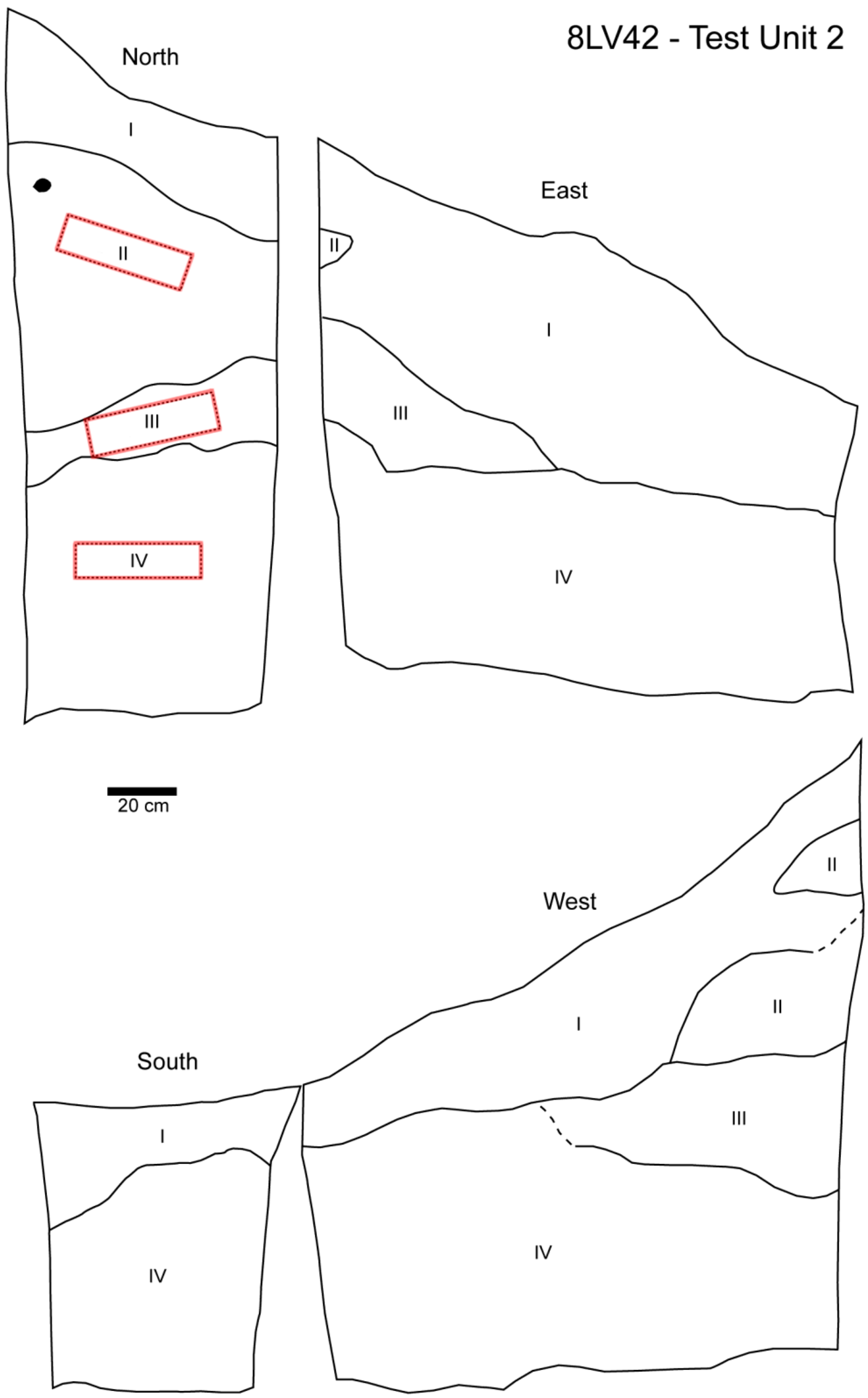


Figure 5-9. Stratigraphic profiles of Shell Mound (8LV42) TU 2 (Sassaman et al. 2013:Figure 3-13). Flotation sample locations marked in red.

8LV42 - Test Unit 6

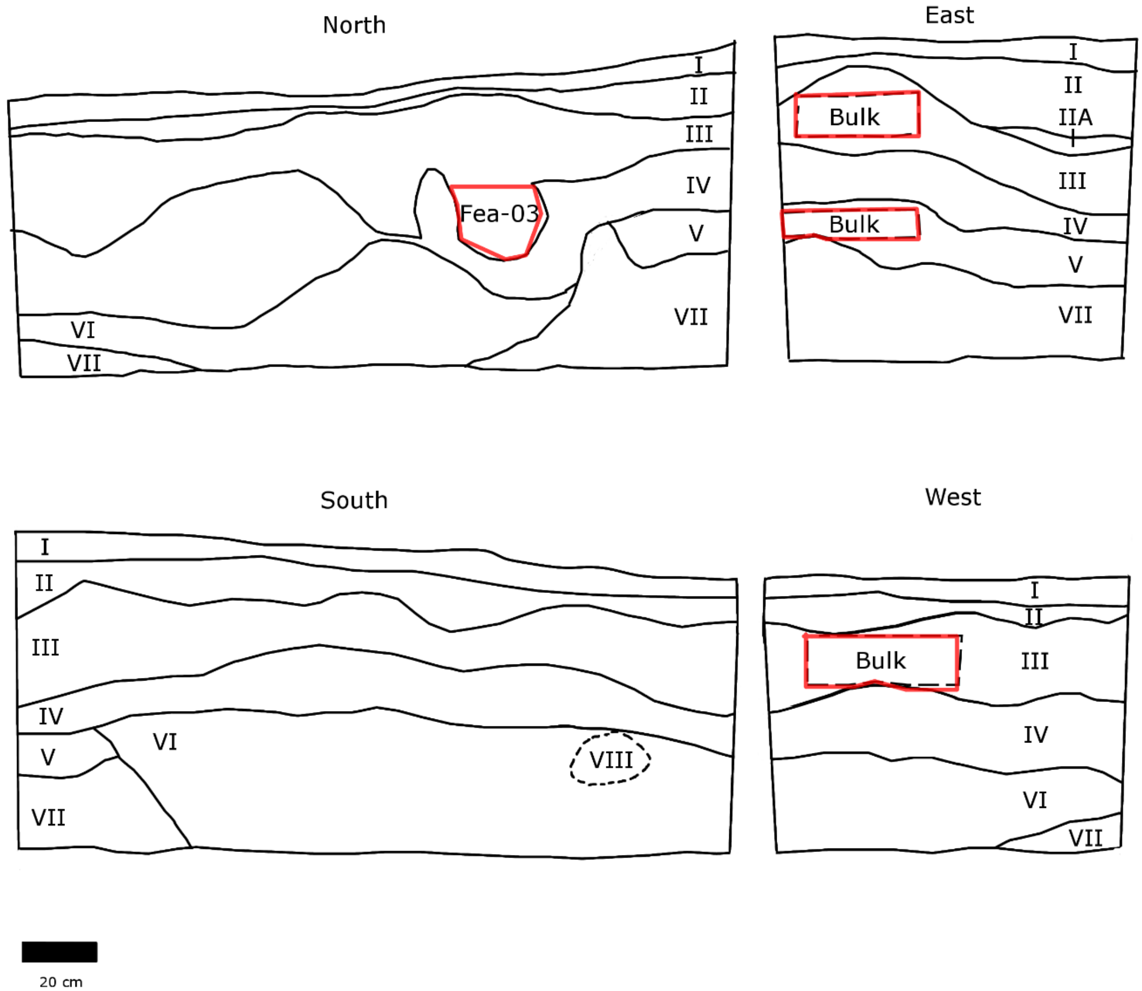


Figure 5-10. Stratigraphic profile of Shell Mound (8LV42) TU 6. Flotation sample locations marked in red.

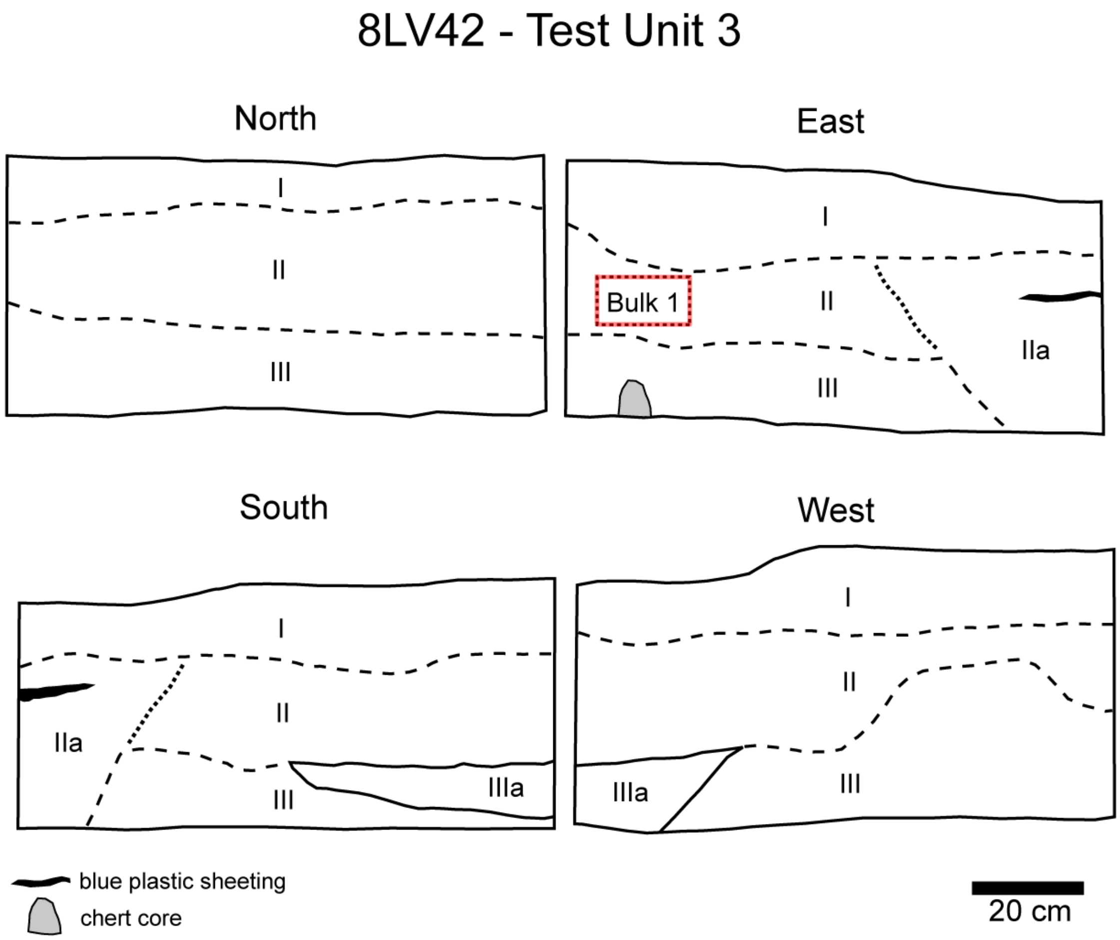


Figure 5-11. Stratigraphic profiles of Shell Mound (8LV42) TU 3 (Sassaman et al. 2013:Figure 3-17). Flotation sample location marked in red.

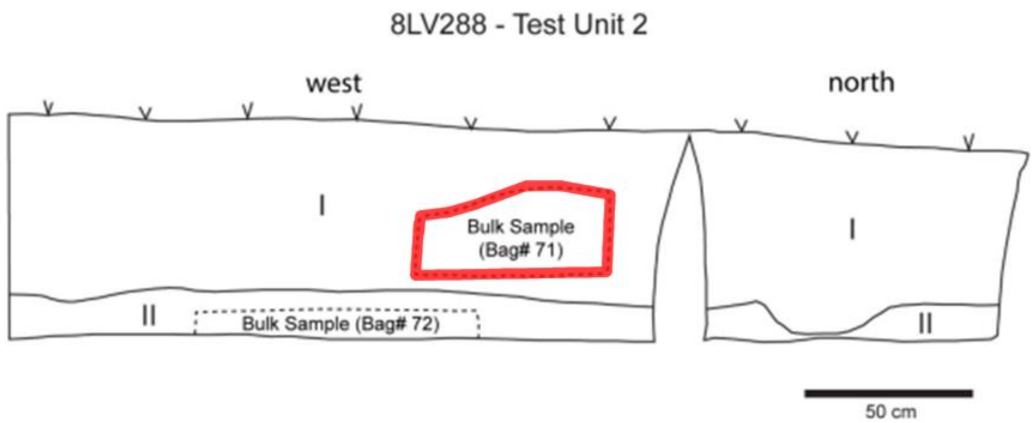


Figure 5-12. Stratigraphic profile of McClamory Key (8LV288) TU 2. Analyzed flotation sample location marked in red.

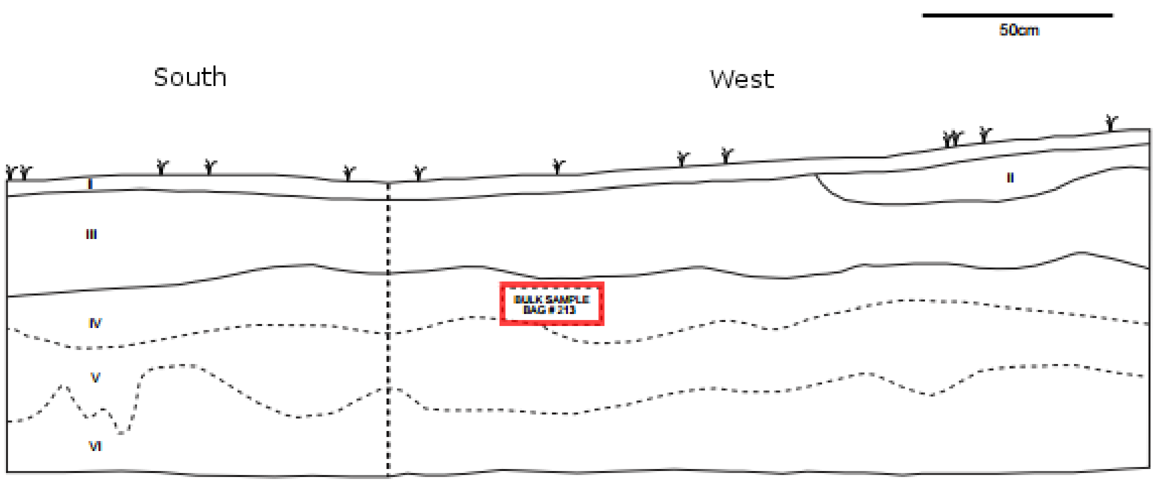


Figure 5-13. Stratigraphic profile of Richards Island (8LV137) TU 2 (Mones, pers. comm.). Analyzed flotation sample location outlined in red.

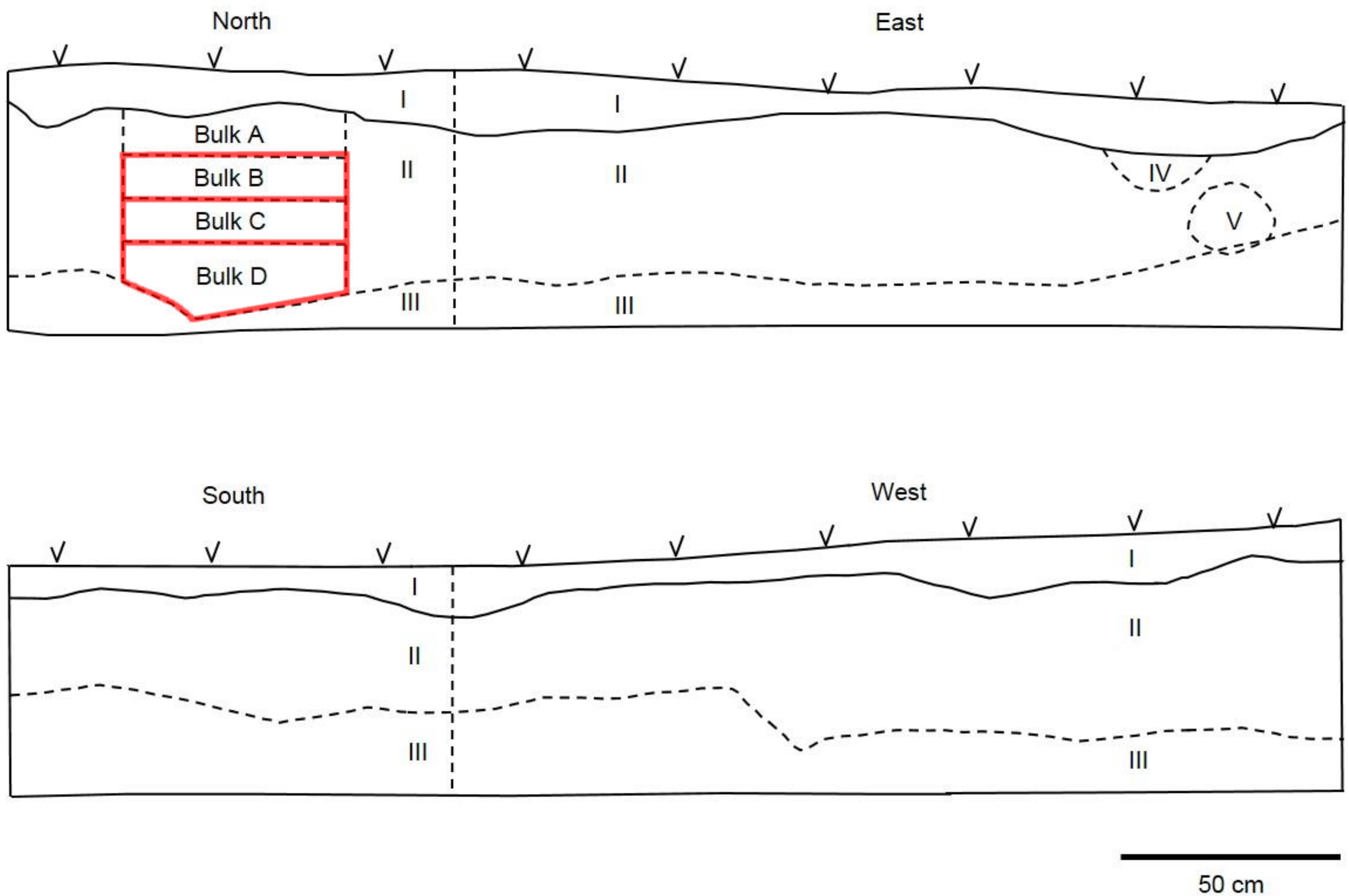
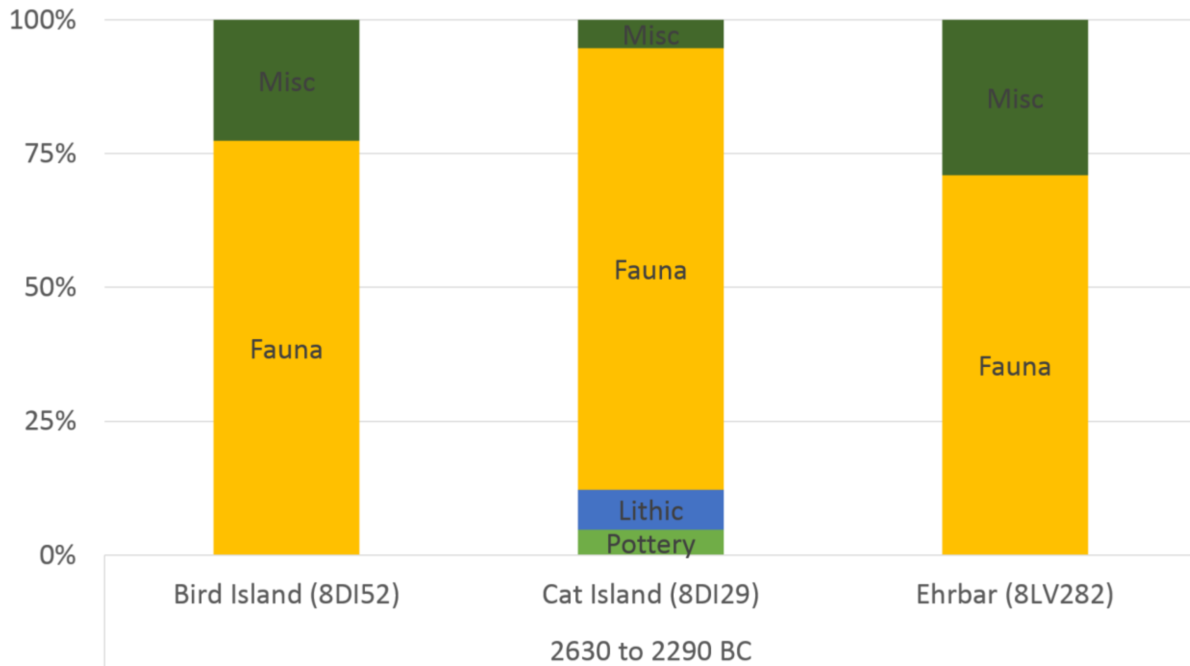
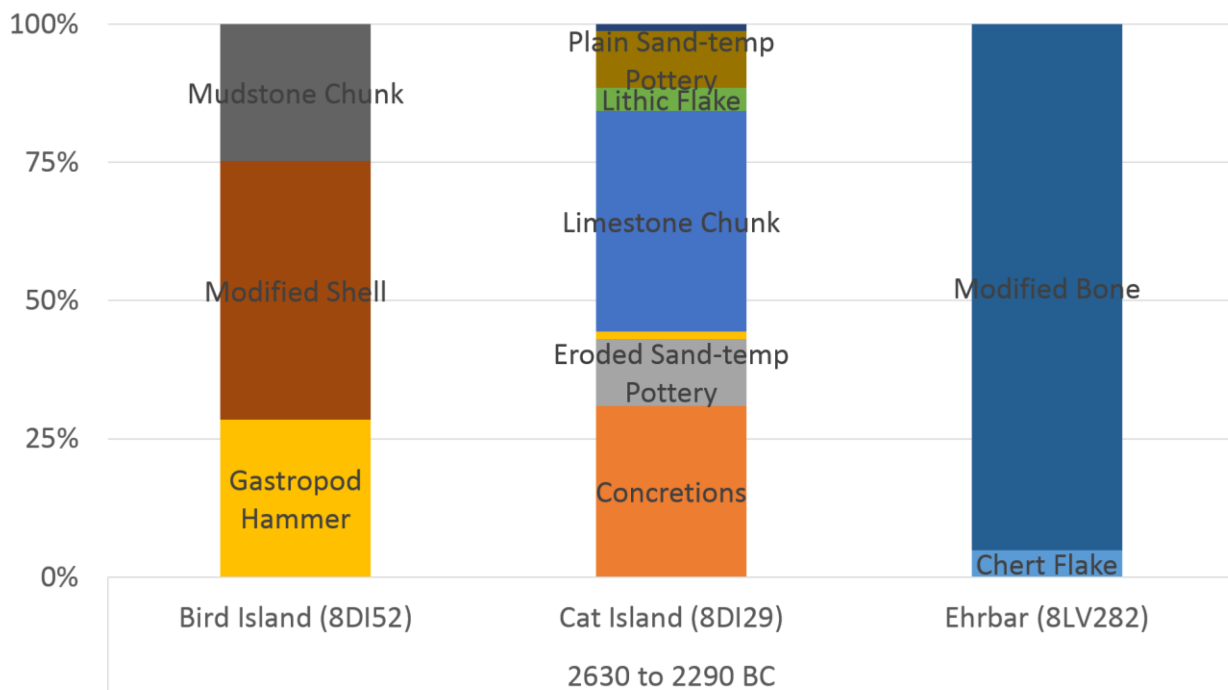


Figure 5-14. Stratigraphic profiles of Ehrbar (8LV282) TU 1 (McFadden and Palmiotto 2013:Figure 2-6). Analyzed flotation sample locations outlined in red.

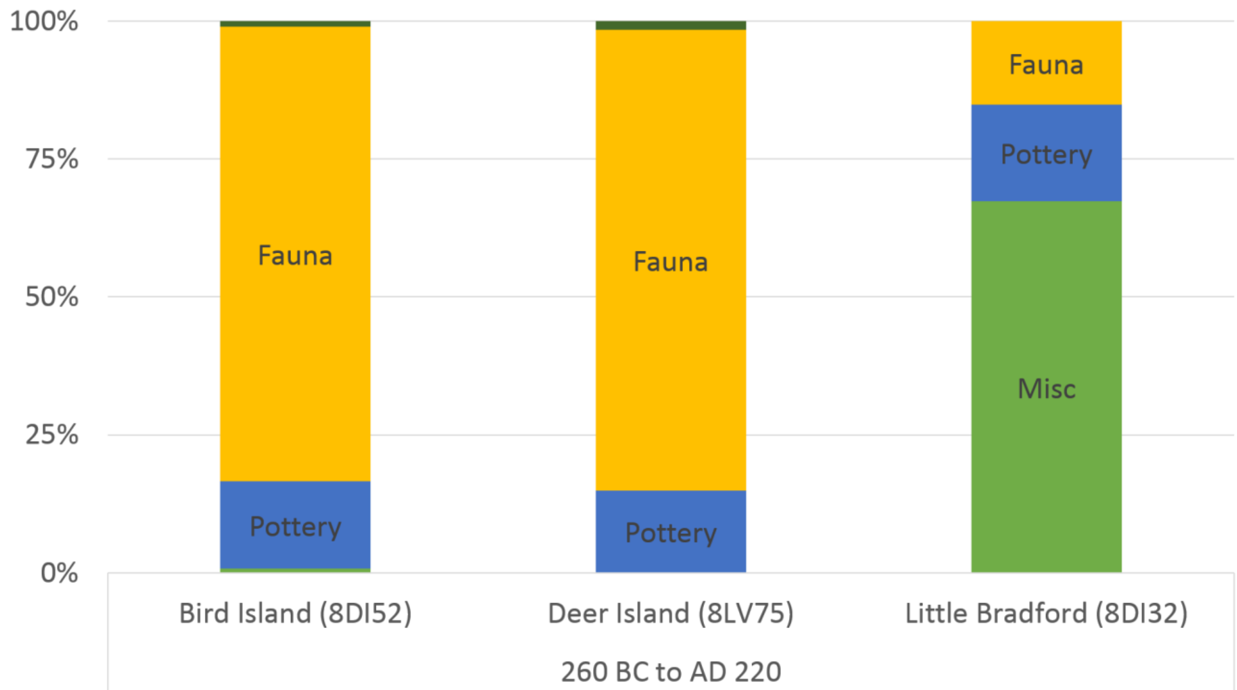


A

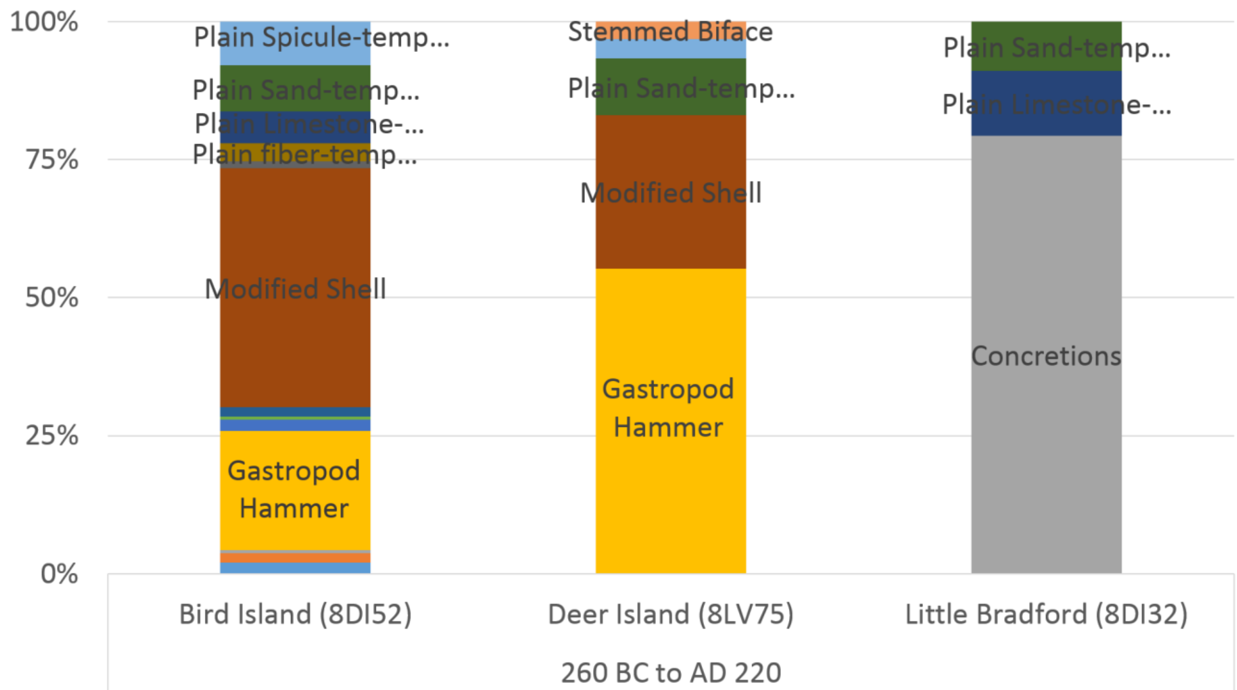


B

Figure 5-15. Artifact frequencies from sites (2630 to 2290 cal BC). A) General class. B) Artifact type.

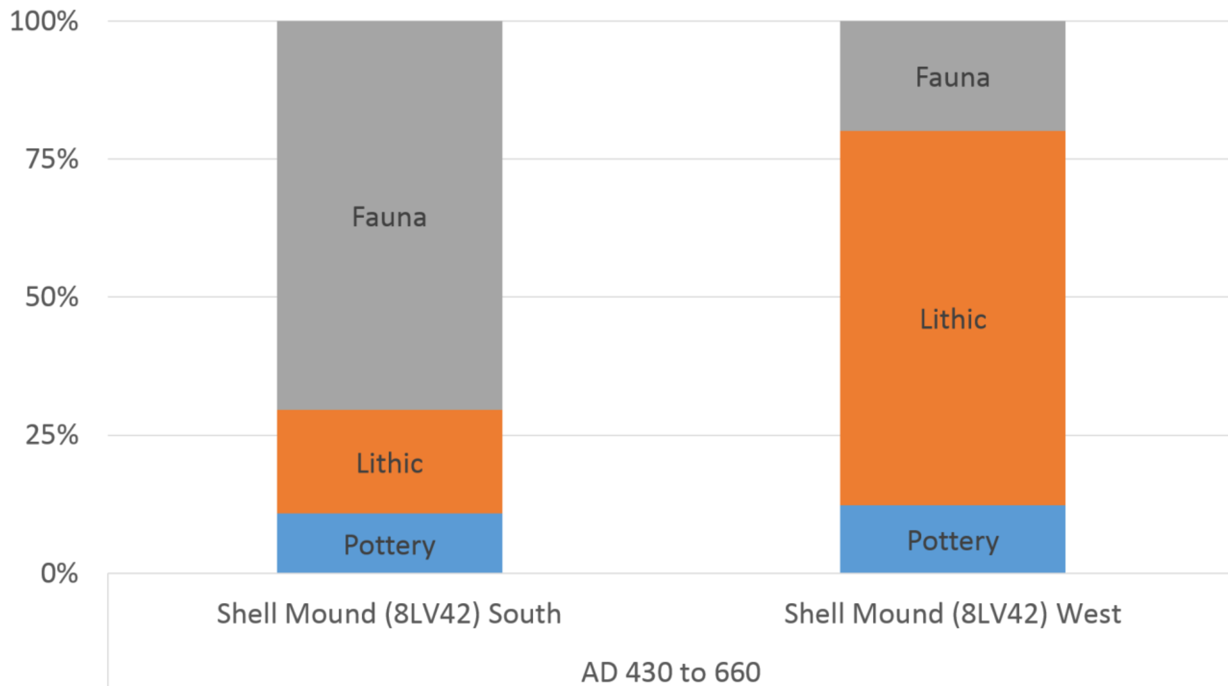


A

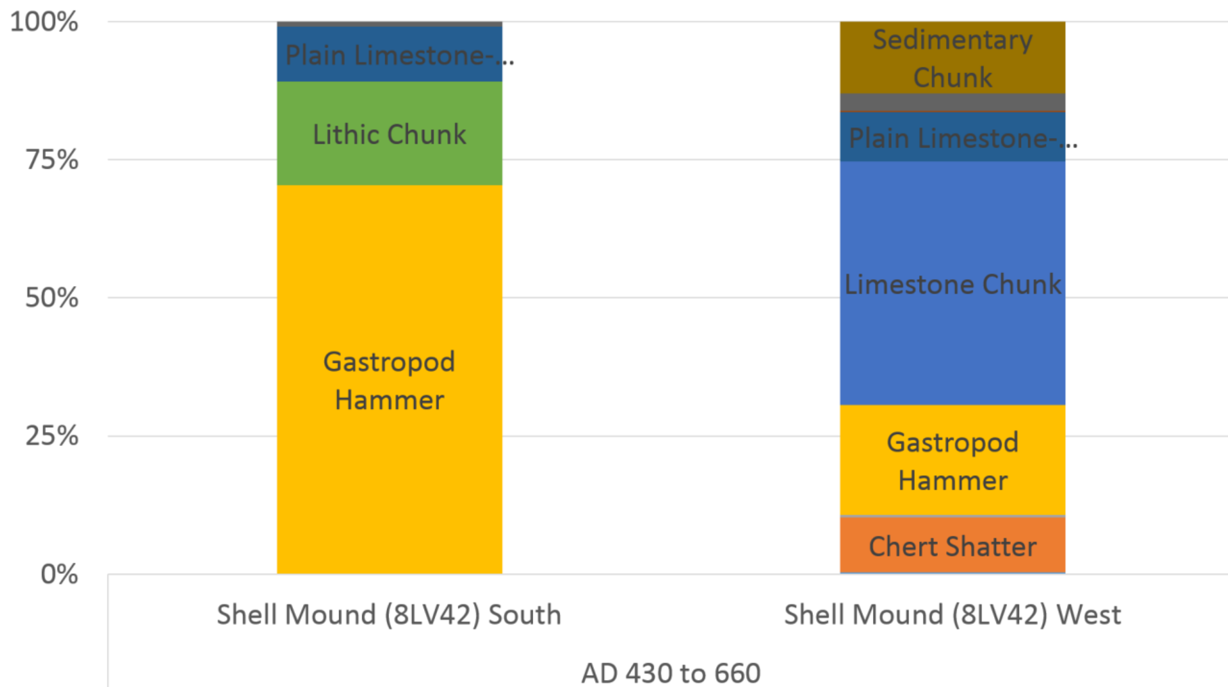


B

Figure 5-16. Artifact frequencies from sites (260 BC to AD 220). A) General class. B) Artifact type.

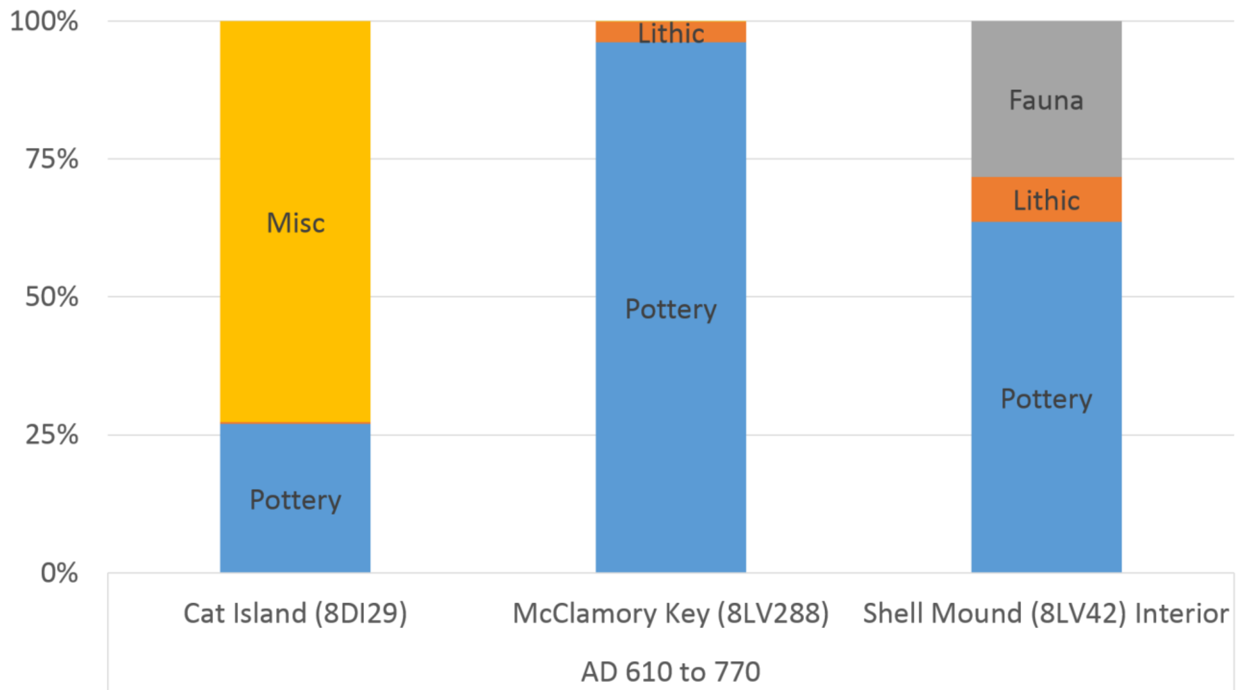


A

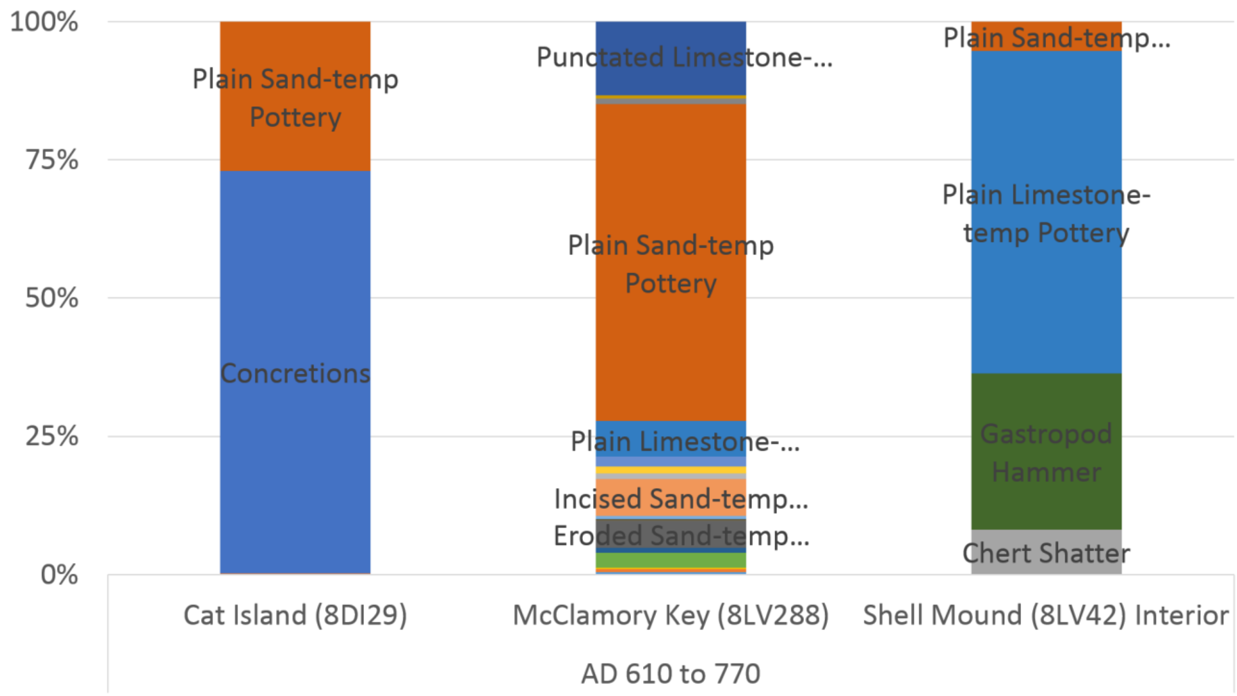


B

Figure 5-17. Artifact frequencies from sites (cal AD 430 to 660). A) General class. B) Artifact type.

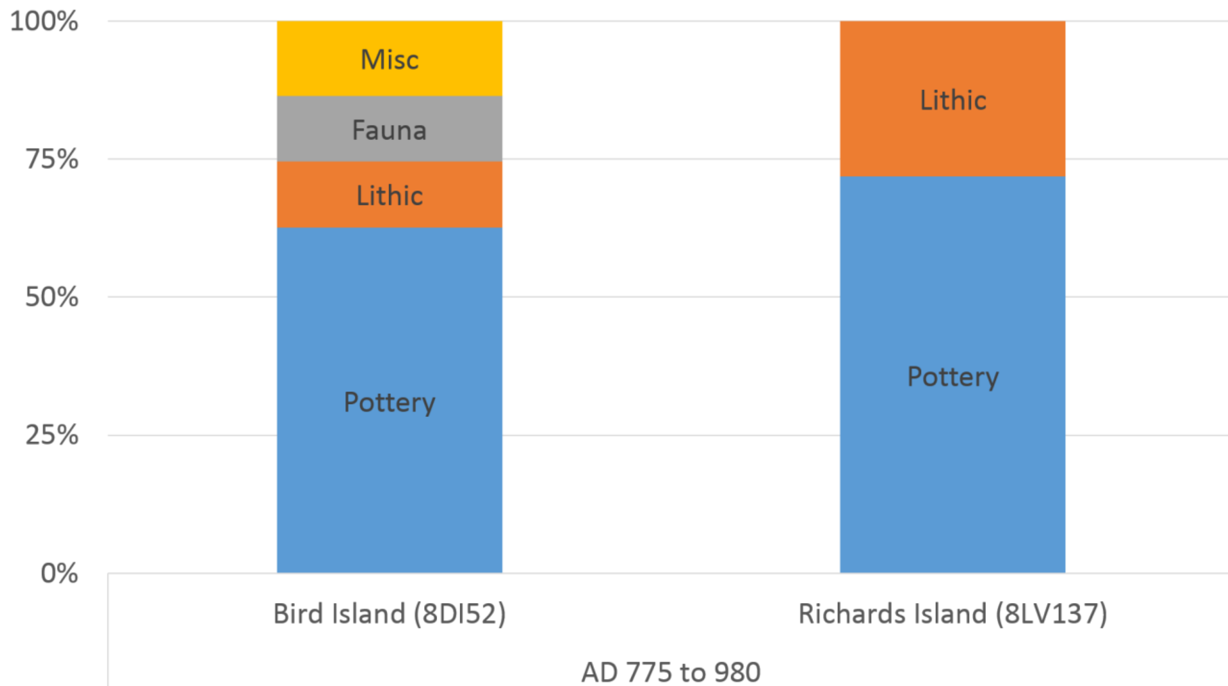


A

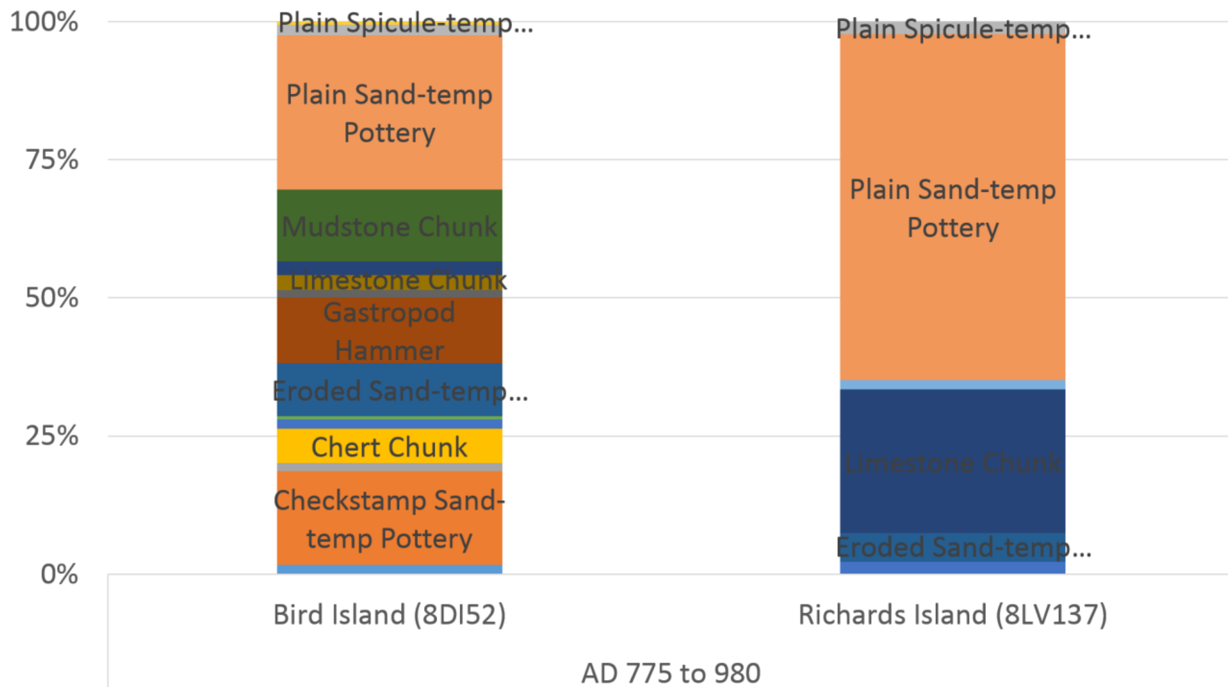


B

Figure 5-18. Artifact frequencies from sites (cal AD 610 to 770). A) General class. B) Artifact type.



A



B

Figure 5-19. Artifact frequencies from sites (cal AD 775 to 980). A) General class. B) Artifact type.

CHAPTER 6
ZOOARCHAEOLOGICAL RESULTS

The results of the faunal analyses herein are discussed in terms of MNI. Results are divided into vertebrate and invertebrate remains, and organized by radiocarbon assays. Fishes are the most common vertebrate class identified, followed by reptiles (Table 6-1). While eastern oyster is the most common large invertebrate material identified, incidental invertebrate remains (e.g., barnacle, periwinkles, and other marine gastropods) overwhelm oyster contributions in several samples.

Table 6-2 presents a summary of taxa and MNI contributions by time period. Chi-Square tests are calculated for subdivided strata and distinct spatial areas within sites to determine similarity between samples (Table C-35). Appendix D provides a summary of the number of taxa, total MNI, diversity, and equitability for each sample context. Appendix E includes a spatially organized species lists for each flotation sample analyzed. Appendix F provides species lists from general-level contexts.

Vertebrate Analyses

Fish are the dominant vertebrate remains among all samples. They are used most frequently between 2630 and 2290 cal. B.C., and gradually decline in frequency through time. Shark remains are most common between cal. A.D. 430 and 660. Reptiles, mammals and birds are comparatively prevalent in samples between 260 cal. B.C. and cal. A.D. 220, as well as samples between cal. A.D. 610 and 980 (Table 6-1).

MNI is adjusted for combined archaeological samples based on element, size, pairing, and/or stratigraphic location per analytical unit. Diversity and equitability are calculated using shark/ray and fish MNI from flotation samples. Results are presented in Table 6-3. Allometric estimates are listed in Tables 6-4 to 6-9.

Vertebrate Assemblages Between 2630 and 2290 cal. B.C.

Pinfish is the most common fish identified during this time period, followed by killifish, needlefish, burrfish, and toadfish. At Ehrbar and Bird Island, numerous fish skeletal elements are identified per taxon, representing nearly whole fish skeletons in the midden. This pattern is not observed at Cat Island. In addition, minority fractions of deer (*Odocoileus virginianus*), possum (*Didelphis virginiana*), sea turtle, alligator (*Alligator mississippiensis*), snapper (Lutjanidae), and red-breasted merganser (*Mergus serrator*) are identified at these sites (Tables E-7, E-8, E-11 to E-13; E-17 to E-21, E-43 to E-45, F-3).

Assemblages during this time contain an average of 19 taxa and 67 MNI (Table 6-2). The lowest average diversity values are observed during this time (Table 6-3). Distributions are similar between sub-samples at each site, except at Ehrbar (X2=65.89, df=44, p=.02) and within Bird Island Feature 03 (X2=23.22, df=15, p=.08; Table C-35). The smallest sea catfish (Table 6-4) and spot (Table 6-8) are observed during this period.

Vertebrate Assemblages Between 260 cal. B.C. and cal. A.D. 220

The most common taxon identified during this time period is killifish, followed by toadfish, sea catfish, pinfish, and silver perch. In addition, minority fractions of white-tailed deer, migratory duck (Anatidae), snook (*Centropomus undecimalis*), and diamondback terrapin are identified. Most of these taxa are identified at Bird Island. No taxon is represented by more than a single individual at Deer or Little Bradford Islands (Tables E-3 to E-5, E-22, E-23, F-2).

Assemblages during this time contain an average of 17 taxa and 24 MNI (Table 6-2). Variation between sub-samples is minimal (Table C-35). The largest pinfish (Table 6-6) and smallest silver perch (Table 6-7) are observed during this period.

Vertebrate Assemblages Between cal. A.D. 430 and 610

The ring portion of Shell Mound in general lacks small fish. Overall, pinfish and sea catfish, followed by jack, killifish, mullet, and sheepshead are some of the most common fishes on the shell ring. Minority fractions of possum, raccoon (*Procyon lotor*), turtles, sturgeon (*Acipenser* sp.), and goliath grouper (*Epinephelus itajara*) are identified (Tables E-24 to E-35; F-4 to F-9).

Assemblages during this time contain an average of 14 taxa and 22 MNI (Table 6-2). The highest average diversity value is associated with this time period (Table 6-3). Faunal distributions are not significantly different between the south and west sides of the ring (Table C-35). The highest quantities of jack (Table 6-5), the largest spot (Table 6-8), and the widest size range of mullet (Table 6-9) are observed during this time.

Vertebrate Assemblages Between cal. A.D. 610 and 770

Sea catfish, killifish, and jack are some of the most common taxa observed during this time period. Vertebrate assemblages, however, are relatively sparse between the Shell Mound Interior, Cat Island, and McClamory Key, compared to other contexts. A couple of sharks are identified by large teeth elements from the interior of Shell Mound. These are the only sharks identified to species among all analyzed samples. Additionally, minority fractions of deer, rabbit (*Sylvilagus* sp.), alligator, and turtles are identified (Tables E-14 to E-16, E-36 to E-40). An average of 11 taxa and 14 MNI are observed during this time period (Table 6-2). Distributions are similar between sub-samples (Table C-35).

Vertebrate Assemblages Between cal. A.D. 775 and 980

Killifish, pinfish, sea catfish, and burrfish are some of the most common fishes identified during this time period. Minority fractions of sea turtle and diamondback terrapin are identified between Bird and Richards Islands (Tables E-1, E-2, E-41, E-42, F-1). An average of 19 taxa and 29 MNI are observed during this time period (Table 6-2). Differences are minimal between sub-samples (Table C-35).

Invertebrate Analyses

Overall, invertebrates are observed most frequently between cal. A.D. 430 and 660. High quantities of barnacles and other arthropods are associated with shell-dense deposits between 2630-2290 cal. B.C. and cal. A.D. 430-660 (Table 6-1). Average impressed odostome measurement results are presented in Table 6-10.

Significant variation is observed among all invertebrate samples except Bird Island Feature 03 (pre-2290 B.C.) and Cat Island (after A.D. 610) (Table C-35). In several cases, invertebrate remains are more abundant in the lower half of subdivided strata than the upper portions. This pattern is observed at Bird Island after A.D. 775 (Tables E-1 and E-2) and before 2290 B.C. (Tables E-7 and E-8) and at Shell Mound South (Tables E-24 and E-25)), Because this pattern is consistent among large, shell-dense strata, it may reflect settling of invertebrate remains.

Invertebrate Assemblages Between 2630 and 2290 cal. B.C.

Eastern oyster, periwinkles, and scallops are the most common taxa identified during this time period. A large cluster of lightning whelk are identified in the pit feature at Bird Island. Periwinkles are most prevalent at Bird Island, where they outnumber oysters. Scallops are most common at Ehrbar, where they are found in similar proportions as oysters. The Cat Island assemblage is comparatively sparse (Tables E-

7, E-8, E-10 to E-13, E-19 to E-21, E-43 to E-45). An average of 18 taxa and 435 MNI are observed during this time period (Table 6-2).

Invertebrate Assemblages Between 260 cal. B.C. and cal. A.D. 220

Eastern oyster is the most common taxon identified during this time period. Marsh clam is most prevalent at Little Bradford Island. High quantities of terrestrial snails, impressed odostomes, dovesnails, barnacles, and truncatella also are observed between Bird, Little Bradford, and Deer Island (Tables E-3 to E-5, E-22, E-23). An average of 22 taxa and 548 MNI are observed (Table 6-2).

Invertebrate Assemblages Between cal. A.D. 400 and 610

Eastern oyster is the most common taxon identified on the Shell Mound ring. High quantities of incidental species, including barnacles, slippersnails, and impressed odostome are observed on the south side of Shell Mound, but fewer such species are identified on the west side (Table E-24 and E-35). An average of 24 taxa and 1,016 MNI are observed per sample during this time period (Table 6-2).

Invertebrate Assemblages Between cal. A.D. 610 and 770

Eastern oyster is the most common taxon identified during this time period. Marsh clams are found in similar proportions to oysters at Cat Island. Invertebrate remains are sparse between Cat Island, McClamory Key, and the interior of Shell Mound, compared to other contexts (Tables E-14 to E-16, E-36 to E-40). An average of eight taxa and 99 MNI are observed per sample (Table 6-2).

Invertebrate Assemblages Between cal. A.D. 775 and 980

Eastern oyster is the most common taxon identified. High quantities of incidental taxa, such as barnacles and odostomes also are observed at Bird and Richards Islands

(Table E-1, E-2, E-41, E-42). An average of 16 taxa and 302 MNI are observed per sample (Table 6-2).

Summary

Pinfish, killifish, toadfish, and needlefish are prevalent vertebrate species between 2630 and 2290 cal. B.C. Vertebrate MNI estimates at Bird Island and Ehrbar average over 100 individuals per sample, though much fewer individuals are identified at Cat Island. Additionally, whole fish skeletal representations are observed at Bird Island and Ehrbar (Tables E-7, E-8, E-11 to E-13; E-17 to E-21, E-43 to E-45, F-3).

Invertebrate assemblages are sparse at Cat Island. Eastern oyster and scallops are identified in similar quantities at Ehrbar. Periwinkles outnumber eastern oysters at Bird Island. Numerous crown conch are also identified (Tables E-7, E-8, E-11 to E-13; E-17 to E-21, E-43 to E-45). The widest range of impressed odostome sizes are observed at Bird Island (Table 6-10).

Killifish is the most common species identified between 260 cal. B.C. and cal. A.D. 220. Bird Island contains a larger and more diverse assemblage than either Deer or Little Bradford Islands. Relative to other time periods, however, fish deposits are sparse. The Little Bradford invertebrate assemblage is distinguished from Bird and Deer Islands by high quantities of marsh clams (Tables E-3 to E-5, E-22, E-23, F-2).

Pinfish, sea catfish, jack, and mullet are prevalent species between cal. A.D. 430 and 660. Small fishes are relatively absent on the ring portions of Shell Mound. Invertebrate MNI estimates are several times higher on the south side versus the west side of Shell Mound. High quantities of barnacles, slippersnails, and other incidental taxa distinguish these areas (Tables E-24 to E-35; F4 to F-9).

Sea catfish, killifish, and jack are prevalent species after cal. A.D. 610. The interior of Shell Mound contains few remains, but large shark teeth and large jack are identified. Invertebrate assemblages are relative sparse (Tables E-1, E-2, E-14 to E-16, E-36 to E-42, F-1).

In the next chapter, I synthesize these data to interpret the seasonal and habitat signatures of sites. I consider environmental and social factors influencing deposits across space and time.

Table 6-1. MNI contributions of faunal classes per time period from flotation and general level samples.

	2630-2290 cal BC		260 cal BC – cal AD 220		cal AD 430-660		cal AD 610-770		Cal AD 775-980		Total	
Faunal Class	MNI	%	MNI	%	MNI	%	MNI	%	MNI	%	MNI	%
Bivalvia	2543	44.94	1971	72.01	3457	27.37	569	71.30	791	65.26	9331	40.50
Gastropoda	2060	36.40	694	25.36	4837	38.29	209	26.19	345	28.47	8145	35.35
Arthropod	1056	18.66	72	2.63	4338	34.34	20	2.51	76	6.24	5562	24.14
Grand Total	5659	100.00	2737	100.00	12632	100.00	798	100.00	1212	100.00	23038	100.00
Mammalia	12	1.39	6	4.17	12	2.91	7	4.70	5	2.54	42	2.35
Aves	6	.69	4	2.78	9	2.18	2	1.34	5	2.54	26	1.45
Reptilia	30	3.47	14	9.72	26	6.30	24	16.11	11	5.58	105	5.86
Amphibia	1	.12	2	1.39	1	.24	1	.67	1	.51	6	.34
Chondrichthyes	16	1.85	5	3.47	16	3.87	11	7.38	5	2.54	53	2.96
Actinopterygii	800	92.49	113	78.47	349	84.50	104	69.80	170	86.29	1559	87.05
Grand Total	865	100.00	144	100.00	413	100.00	147	100.00	197	100.00	1791	100.00

Table 6-2. Average number of taxa and MNI per contexts.[1]

Conxtext	Ave. Soil Volume	Ave. Vert Taxa	Ave. Vert MNI	Ave. Invert Taxa	Ave. Invert MNI
2630-2290 cal BC	13.68	18.5	67.1	18.2	435.0
Cat Island	4.90	12.8	15.4	11.8	109.8
Ehrbar	29.50	25.3	148.7	33.3	1226.7
Bird Island	9.20	20.0	69.8	15.4	285.2
260 BC-AD 220	8.14	17.2	24.4	22.4	548.2
Bird Island	15.67	23.7	35.7	25.0	749.3
Deer Island	3.75	8.0	8.0	16.0	123.0
Little Bradford	5.00	7.0	7.0	21.0	370.0
AD 430-660	9.54	14.3	21.7	24.3	1016.2
Shell Mound South	13.38	13.7	21.2	23.8	1418.2
Shell Mound West	7.83	14.8	22.2	24.7	614.2
AD 610-770	5.56	11.1	13.1	8.0	99.4
Shell Mound Interior	4.67	6.3	6.7	8.3	54.3
Cat Island	5.00	13.3	16.7	5.3	57.0
McClamory Key	7.00	15.0	17.5	11.5	230.5
AD 775-980	11.33	18.5	28.8	15.8	302.3
Bird Island	14.00	24.0	41.0	20.5	513.5
Richards Island	10.00	13.0	16.5	11.0	91.0

Table 6-3. Summary of diversity and equitability values for combined archaeological contexts, using fish and shark MNI (from flotation samples).

Provenience	Number of taxa[1]	MNI[1]	Diversity	Equitability
2630-2290 BC			2.33	.74
Cat Island TU 2	23	47	2.79	.89
Ehrbar TU 1 Str II	24	399	1.98	.62
Bird Island TU 3 Str V	24	219	2.22	.70
260 BC-AD 220			2.40	.76
Bird Island TU 3 Str III	23	58	2.40	.76
AD 430-660			2.59	.84
Shell Mound South	20	73	2.44	.81
Shell Mound West	23	44	2.74	.87
AD 610-770			2.49	.95
Shell Mound Interior	10	15	2.21	.96
Cat Island TU 1	18	30	2.75	.95
McClamory Key	14	19	2.51	.95
AD 775-980			2.39	.88
Bird Island TU 3 Str II	23	58	2.73	.87
Richards Island TU 2 Str IV	10	12	2.05	.89

[1]Total number of taxa and MNI derived from shark/ray and fish.

Table 6-4. Average predicted standard lengths (mm) of sea catfishes from various archaeological contexts in the lower Suwannee region.

Context	Count	Mean	Minimum	Maximum
2630-2290 BC	43	211.75	40.89	383.89
Cat Island TU 2 Str VI	14	237.80	201.66	383.89
Ehrbar TU 1 Str II	12	158.81	40.89	323.23
Bird Island TU 3 Str V	13	213.06	116.10	265.05
Bird Island TU 3 Fea 03	4	239.32	211.59	261.57
260 BC-AD 220	10	240.33	36.36	362.77
Bird Island TU 3 Str III	8	134.66	36.36	275.39
Bird Island TU 3 Level E	1	-	362.77	362.77
Little Bradford TU 2 Str IV	1	-	223.56	223.56
AD 430-660	40	251.75	47.75	470.02
Shell Mound TU 1 Str V	8	82.63	47.75	258.06
Shell Mound TU 1 Level F	1	-	271.96	271.96
Shell Mound TU 2 Level B	10	333.78	249.78	470.02
Shell Mound TU 2 Level D	6	292.65	257..73	332.22
Shell Mound TU 2 Level F	3	273.29	259.83	295.00
Shell Mound TU 6 Str III	8	223.90	82.71	312.18
Shell Mound TU 6 Fea 07	4	284.07	256.05	302.31
AD 610-770	8	270.44	188.80	329.66
Shell Mound TU 5 Level D	3	303.66	267.82	329.66
Shell Mound TU 5 Level E	1	-	278.47	278.47
Cat Island TU 1 Str V	4	229.18	188.80	263.08
AD 775-980	58	215.68	47.75	388.13
Bird Island TU 3 Str II	9	187.33	47.75	275.39
Bird Island TU 3 Level A	38	268.66	173.03	388.43
Richards Island TU 2 Str IV	2	177.78	165.42	190.13
Richards Island TU 2 Fea 01	9	228.96	153.43	299.33

Table 6-5. Average predicted standard lengths (mm) of jack from various archaeological contexts in the lower Suwannee region.

Context	Count	Mean	Minimum	Maximum
2630-2290 BC	1	-	311.65	311.65
Cat Island TU 2 Str VI	1	-	311.65	311.65
260 BC-AD 220	3	335.03	225.80	547.27
Bird Island TU 3 Str III	1	-	225.80	225.80
Bird Island TU 3 Level E	2	444.26	341.24	547.27
AD 430-660	121	320.79	156.24	635.27
Shell Mound TU 1 Str V	7	270.43	156.24	461.17
Shell Mound TU 1 Level F	12	346.10	246.86	493.84
Shell Mound TU 2 Str II	6	285.20	237.86	339.09
Shell Mound TU 2 Level B	78	329.19	196.05	635.27
Shell Mound TU 2 Level D	9	352.77	265.46	401.25
Shell Mound TU 2 Level F	8	436.07	289.30	599.32
Shell Mound TU 6 Str III	1	-	225.80	225.80
AD 610-770	4	327.96	218.61	580.57
Shell Mound TU 3 Level C	3	437.31	263.98	580.57
Shell Mound TU 5 Level D	1	-	218.61	218.61

Table 6-6. Average predicted standard lengths (mm) of pinfish from various archaeological contexts in the lower Suwannee region.

Context	Count	Mean	Minimum	Maximum
2630-2290 BC	253	76.12	1.07	188.66
Cat Island TU 2 Str IV	2	92.53	91.77	93.29
Cat Island TU 2 Str VI	4	94.48	77.53	112.82
Ehrbar TU 1 Str II	156	90.64	8.90	188.66
Bird Island TU 3 Str V	62	45.57	1.07	134.62
Bird Island TU 3 Fea 03	29	57.39	2.08	121.17
260 BC-AD 220	3	78.04	39.59	102.26
Bird Island TU 3 Str III	3	78.04	39.59	102.26
AD 430-660	38	65.852	14.63	125.72
Shell Mound TU 1 Str V	6	55.56	24.07	79.16
Shell Mound TU 1 Str VI	3	14.63	14.63	14.63
Shell Mound TU 2 Str III	1	-	92.28	92.28
Shell Mound TU 6 Str III	10	74.75	24.07	125.72
Shell Mound TU 6 Fea 07	18	92.04	28.25	125.72
AD 610-770	2	7.05	3.79	10.31
Cat Island TU 1 Str V	2	7.05	3.79	10.31
AD 775-980	12	57.91	2.53	167.40
Bird Island TU 3 Str II	8	29.53	2.53	81.85
Richards Island TU 2 Str IV	2	15.57	133.74	167.40
Richards Island TU 2 Fea 01	2	128.64	127.07	130.20

Table 6-7. Average predicted standard lengths (mm) of silver perch from various archaeological contexts in the lower Suwannee region.

Context	Count	Mean	Minimum	Maximum
2630-2290 BC	147	108.19	45.01	179.00
Cat Island TU 2 Str V	1	-	114.09	114.09
Cat Island TU 2 Str VI	3	121.64	88.11	143.83
Ehbar TU 1 Str II	114	106.70	47.65	179.00
Bird Island TU 3 Str V	15	92.91	45.01	131.49
Bird Island TU 3 Fea 03	14	105.62	86.40	129.75
260 BC-AD 220	2	71.78	69.39	74.16
Bird Island TU 3 Str III	2	71.78	69.39	74.16
AD 430-660	2	145.20	144.37	146.02
Shell Mound TU 6 Str III	1	-	144.37	144.37
Shell Mound TU 6 Fea 07	1	-	146.02	146.02
AD 610-770	2	188.45	74.16	162.74
McClamory Key STP 1	2	188.45	74.16	162.74
AD 775-980	9	86.26	66.98	119.10
Bird Island TU 3 Str II	8	89.92	66.98	119.10
Richards Island TU 2 Fea 01	1	-	82.59	82.59

Table 6-8. Average predicted standard lengths (mm) of spot from various archaeological contexts in the lower Suwannee region.

Context	Count	Mean	Minimum	Maximum
2630-2290 BC	27	54.13	3.31	122.31
Cat Island TU 2 Str VI	1	-	76.71	76.71
Ehrbar TU 1 Str II	21	57.27	3.31	122.31
Bird Island TU 3 Str V	5	28.40	6.36	55.52
AD 430-660	9	80.69	37.02	153.65
Shell Mound TU 6 Str III	5	74.36	39.70	106.05
Shell Mound TU 6 Fea 07	4	87.02	37.02	153.65
AD 610-770	1	-	108.24	108.24
Cat Island TU 1 Str V	1	-	108.24	108.24

Table 6-9. Average predicted standard lengths (mm) of mullet from various archaeological contexts in the lower Suwannee region.

Context	Count	Mean	Minimum	Maximum
2630-2290 BC	29	298.03	204.77	344.22
Cat Island TU 2 Str VI	1	-	290.85	290.85
Ehrbar TU 1 Str II	26	287.94	204.77	344.22
Bird Island TU 3 Level J	2	315.31	309.74	320.87
260 BC-AD 220	2	296.24	253.17	339.30
Bird Island TU 3 Level E	2	296.24	253.17	339.30
AD 430-660	156	288.42	204.77	443.46
Shell Mound TU 1 Str V	4	225.16	211.57	251.65
Shell Mound TU 1 Str VI	5	286.64	279.05	296.69
Shell Mound TU 1 Level F	10	283.44	237.07	365.10
Shell Mound TU 2 Str II	4	337.11	271.25	397.20
Shell Mound TU 2 Level B	77	288.65	213.17	409.98
Shell Mound TU 2 Level D	12	295.97	224.62	353.31
Shell Mound TU 2 Level F	29	305.84	204.77	443.46
Shell Mound TU 6 Fea 07	15	284.56	238.62	357.13
AD 610-770	12	276.08	194.26	371.99
Shell Mound TU 3 Str II	1	-	194.26	194.26
Shell Mound TU 3 Level C	3	327.72	304.32	371.99
Shell Mound TU 3 Level E	3	265.31	249.36	293.41
Shell Mound TU 5 Level D	4	267.94	246.69	311.54
Shell Mound TU 5 Level E	1	-	325.15	325.15
AD 775-980	6	255.85	153.14	348.27
Bird Island TU 3 Str II	2	170.01	153.14	186.89
Richards Island TU 2 Str IV	2	284.21	277.94	290.48
Richards Island TU 2 Fea 01	2	313.66	279.05	348.27

Table 6-10. Impressed odostome length measurements (mm) from archaeological contexts.

Context	N	Mean	Min	Max
2630-2290 BC				
Cat Island TU 2 Str VI	33	3.25	1.74	5.16
Bird Island TU 3 Str V	78	4.21	1.62	6.27
Bird Island TU 3 Fea 03	41	3.55	2.29	5.56
Ehrbar TU 1 Str II	117	3.53	1.72	5.3
260 BC-AD 220				
Bird Island TU 3 Str III	23	3.71	2.07	5.35
Deer Island TU 2 Str II	45	3.32	1.76	4.87
Little Bradford Island TU 2 Str IV	13	3.86	2.07	5.06
AD 430-660				
Shell Mound TU 1 Str V Upper	339	3.47	1.93	5.77
Shell Mound TU 1 Str V Lower	378	3.54	1.9	6.17
Shell Mound TU 1 Str VI	68	3.25	1.83	5.55
Shell Mound TU 2 Str II	111	3.44	1.89	5.52
Shell Mound TU 2 Str IV	106	3.31	1.66	5.25
Shell Mound TU 6 Str III E1/2	94	3.02	1.9	4.38
Shell Mound TU 6 Str III W1/2	48	3.5	1.83	4.53
Shell Mound TU 6 Fea 07	324	3.26	1.72	6.39
AD 610-770				
Shell Mound TU 5 Str II	5	2.69	2.19	3.25
AD 775-980				
Bird Island TU 3 Str II	29	3.85	2.17	5.58
Richards Island TU 2 Fea 01	31	3.75	1.93	5.02

CHAPTER 7
INTERPRETATION AND DISCUSSION

Seasons are dynamic perspectives that arise from human and environmental interactions (e.g., Harris 1998). Although the perspectives of past coastal occupants are irretrievable, locally defined seasons provide an alternative to broad astronomical categories. These effective seasons are characterized by local fish abundances, size patterning, and diversity values. Coastal occupants through time were skilled agents who understood and interacted with dynamic environments to sustain coastal lifeways. Considering locally relevant seasons and the fish-based indicator groups used to characterize these seasons, this chapter is used to demonstrate an alternative approach to archaeological mobility and fishing interpretations.

Table 7-1 presents a summary of season and habitat interpretations for each archaeological sample. The majority of sites exhibit predominantly warm-weather signals. Several sites also contain evidence of cool-weather associations, including Bird Island contexts through time; Shell Mound West; and the Ehrbar site.

General Observations

Over time, changes in fish and artifact distributions reflect a continued coastal orientation with variations in associated practices and social structures. No pattern of increasing fishing intensity is observed through time in the lower Suwannee region. During none of these time periods can people easily be categorized as either foragers or collectors. There is no evidence of foraging sites that increase in distance from base camps, nor evidence of numerous, sequential base camps. No materials in this analyses indicate intense logistic planning or storage practices.

Abundances of several fish species suggest targeted collection, however, no fishing implements have been identified and many of these species could have been collected with tidal traps, nets, or other mass-capture methods. Reitz and colleagues (2012:79-80) observed that occupants of the Georgia Bight were not easily categorized by economic strategies because the Bight is a highly productive area with seasonally and spatially uneven resources. This same assessment can be applied to occupants of the lower Suwannee region.

Overall archaeological fish distributions in the lower Suwannee region differ significantly from expected present-day distributions. For example, pre-2290 cal. B.C. and post cal. A.D. 430 samples contain the most faunal-dense samples, indicating more intense procurement practices in the earliest and latest samples than is associated with intermediary samples. Variations in distributions suggest 1) significant environmental fluctuations over time and/or 2) effects of human-factors on assemblage distributions (e.g., resource targeting, procurement strategies). Because of the relatively undisturbed conditions of the lower Suwannee region and the consistent presence of the same species through time, I opt to think such variations are more likely the result of human practices than extreme environmental fluctuations.

While some fishes, such as pinfish, killifish, silver perch, sheepshead, and mullet, are ubiquitous among all samples, the distribution of other fishes, such as jack, spot, burrfish, toadfish, and needlefish vary significantly between sites. These distributions suggest that 1) these fish were prominent in proximity to the sites where they are most commonly found and/or 2) fishes were specifically collected or transported to these areas for specific purposes.

The types of fishes and represented elements vary between early and late contexts, indicating differences in procurement locations, disposal practices, and/or environmental conditions, rather than increasing ‘complexity’ in the region. Storage pits at several sites, such as the cache at Bird Island Feature 03, indicate possible long-term occupations, while the variation in pit contents at other sites, such as the features on the west side of Shell Mound, indicate a multitude of activities.

The sites in the region indicate high levels of mobility. However, low levels of planning likely were engaged based on the lack of specialized fishing implements. Modified gastropod and other shell tools are most common at shell-dense sites (Figures 5-15 to 5-17; Appendix B), suggesting that these tools are associated with shellfish processing. In all, the abundances of fishes in the lower Suwannee region did not necessitate frequent movement between base camps. Occupants were able to utilize foraging-like practices for fish collection, but possible storage pits and hearths at several sites suggest some long-term occupations.

Based on expected fish distributions and diversity values (from present-day random collections), people procured fishes and shellfishes based on social factors and environmental conditions rather than environmental influences alone. Social factors can range anywhere from taste/preference to the status associated with catching a fish, based on factors such as the capture effort (e.g., jack and shark are known as fighting fish), size (e.g., goliath grouper and sharks), appearance (e.g., killifish are brightly colored during certain times of the year), availability (e.g., uncommon tropical or freshwater fishes), or other special values (e.g., toxicity associated with some pufferfishes).

Higher-than-expected diversity values, suggestive of significant human selection practices or environmental fluctuations, are identified at Bird Island after A.D. 810, Shell Mound West, and both contexts of Cat Island (Table 6-2). Seasonal assessments are indeterminate (Table 7-1) for the non-cultural Bird Island stratum, Little Bradford Island, and Deer Island. This may reflect small sample sizes of the latter two contexts and the non-cultural nature of the Bird Island stratum. Alternatively, fish resources might not have been targeted or they were transported off-site from Deer and Little Bradford Islands.

Evidence of intense inland mobility is not evident in any faunal materials. Mammals and freshwater fishes are not prevalent in any sample. Cool-weather signatures are associated with several assemblages, but these signatures are never in isolation of warm-weather signatures nor are cool-weather indicators especially strong. One possible interpretation is that people practiced higher levels of mobility inland to other sites when the cool weather became unfavorable for coastal occupation.

Very small fishes, such as anchovies, herrings/shads, and mojarras are not well represented in archaeological deposits. However, the presence of small killifishes and juvenile fishes such as pinfish and sea catfish suggest appropriate technologies were available for small-fish captures. Thus, these distributions suggests that taxa targeting, taphonomic influences, and/or differential processing and disposal practices.

Differences between sub-samples demonstrate the fallacy of characterizing an entire stratum by the contents of one sample (see Ehrbar and Bird Island Feature 03; Table C-35). General samples demonstrate the significance of larger fish that is not revealed through the analysis of bulk samples alone (see Shell Mound and Bird Island; Appendix F).

Sites as Loci of Practices

If archaeological sites are viewed as loci of social structure, coastal midden sites in the lower Suwannee region provide a way of inferring practices and routines through the materials recovered from these deposits. The contents of these deposits reflect local schema – such as environment fluctuations, preferred procurement locations, preferred resources, and culturally appropriate methods of collection, processing, and disposal (see chapter 2). Faunal and artifact distributions between sites reflect variations in local practices and larger social structures.

Seasonal Signatures Between 2630 and 2290 cal. B.C.

Cat Island is associated with warm-weather fish procurement, including during the rainy season. The types of fishes indicate local procurement from intertidal and marsh areas. Ehrbar and Bird Island are associated with both cool- and warm-weather fish procurement. Fishes were collected from numerous habitats in the region (Table 7-1). Significant variations in odostome lengths suggests differences in procurement practices between Ehrbar and Bird Island (Table C-36).

Bird Island Feature 03 has a strong warm-weather signal (Table 7-1). Additionally, the sub-samples are dissimilar (Table C-35). This suggests that fish and shellfish were purposefully collected during a brief period of time and arranged particularly in the pit.

Narrative Interpretation. Within the broader southeast, this time period is associated with extensive exchange networks and large coastal shell rings that were were capable of supporting year-round or multi-seasonal occupations (e.g., Anderson and Mainfort 2002; Russo and Quitmyer 2008; Steponaitis 1986). Although shell rings are uncommon on the Florida gulf coast (Russo 2010), evidence of distant trade is observed in the lower Suwannee region (Roberson 2015).

Despite the lack of large shell rings, both Bird Island and Ehrbar demonstrate purposeful multi-seasonal occupations in the lower Suwannee region. Both sites are roughly equidistant from the mouth of the Suwannee River (Figure 5-1) and are interpreted as base camps, occupied year-round/multi-seasonally (Table 7-1). The assemblages from these sites are dense and contain predominantly marine species, despite their distance from the coast at this time. Some of the most abundant species at both sites are found in the Suwannee Sound, present-day (Figure 7-1). Given the distance of these sites from the coast during this time period, this indicates that people bypassed local environments and traveled several kilometers west, likely via watercraft, to collect whole fishes and transport them to Bird Island and Ehrbar for processing.

Oysters are the most common large invertebrate shell, but they were not the only important shellfish. Scallops were utilized nearly equally at the Ehrbar site. Materials at Bird Island were either deposited intertidally on seagrasses full of periwinkles, else the periwinkles were targeted for collection over oysters. One pit feature identified at Bird Island contains a cache of lightning whelk shells surrounded by numerous small crown conch and pinfish – all marine species. These materials were purposefully collected over a short range of time and carefully arranged in the feature.

No equally large co-eval sites have been identified near the mouth of the Suwannee River to date. This absence may reflect 1) the need for further archaeological survey, 2) the loss of such sites due to taphonomic factors, and/or 3) the aversion of residents to this area. Cat Island is a lightly occupied site near the mouth of the river. Like Bird Island, Cat Island contains human interments (Sassaman et al. 2011), indicating the significance of this site. However, whole fish skeletal elements are not present, and numerous oligohaline species are identified. The oligohaline species indicate a difference in planning and an absence of coastal mobility for fish procurement at Cat Island.

Artifacts are generally sparse in these contexts, but distributions vary between these sites. The most modified bone and shell fragments are identified at Bird Island (Appendix B; Figure 5-15). Additionally, Bird Island contains a cemetery and one of the largest caches of soapstone on the Gulf coast (McFadden et al. 2015; Roberson 2015). The soapstone represents a wide geographic range, thus linking Bird Island to broader trade networks in the southeastern United States (Roberson 2015).

The majority of lithic remains (chunks and flakes) are identified at Cat Island. (Appendix B; Figure 5-15). Combined with the faunal assemblage, this suggests that Cat Island was associated with different or specialized practices and/or it was used by different people than occupied Bird Island and Ehrbar. The difference in faunal and artifactual materials suggest various meanings associated with each site and the practices that were enacted there. High quantities of sand concretions (Figure 5-15) at Cat Island likely reflect taphonomic influences, as this pattern is observed in the later occupations of the site and at Little Bradford Island, which is also located within the river delta (Figure 5-16 and 5-17).

The habitats associated with the fishes represented at Bird Island and Ehrbar, as well as the variations in materials between sites, suggests that occupants during this time period were not generalists. The habitats were not directly adjacent to the sites. Instead, specific taxa and locations were targeted, and effort was expended to reach these areas. Although there is no evidence of watercraft in the lower Suwannee region, technologies would have been available to construct and maintain watercraft (see Wheeler et al. 2003) for travel and transportation.

Seasonal Signatures Between cal. 260 cal. B.C. and cal. A.D. 220

Bird Island is associated with predominantly warm-weather fish procurement. Fish assemblages suggest procurement during the rainy season from numerous habitats, notably intertidal areas. The stratum directly below these deposits lacks strong seasonal and habitat associations (Table 7-1), which corresponds with the non-cultural nature of the stratum (McFadden 2015:101). Assemblages from both Little Bradford and Deer Island largely are inconclusive with regard to season and habitats of resource procurement (Table 7-1).

Bird Island Feature 02 has a similar signature to the pre-2290 cal. B.C. stratum (i.e., multi-seasonal and multi-habitat), despite its origination after 260 cal. B.C. I am inclined to accept Feature 02 indicators for pre-2290 cal. B.C. because the materials, which intrude into earlier deposits, appear similar in quality and type. The pit may have been refilled largely with the same materials excavated from it.

Narrative Interpretation. In the broader southeast, this time period is associated with small groups of people located inland and generally sparse coastal occupations (e.g., Kidder 2010; Sassaman and Wallis 2015). The lack of coastal sites may reflect inundation of sites by rising sea levels or general disfavor of coastal regions by people due to unfavorable conditions, such as increased storm frequency, at that time (e.g., Sassaman and Wallis 2015; Walker 2013). Instead, many sites may have been situated to provide access to coastal resources while also affording protection from high-energy, open-coastal habitats (McFadden 2015).

Lower Suwannee sites generally fit into these broader observations. Bird Island contain less dense fish deposits than the earlier occupation. However, the stratum is still relatively dense and thick, compared to Deer and Little Bradford, suggesting possible residential site use of Bird Island. The majority of fishes from these deposits could have been collected easily from seagrass beds in shallow, low-current areas (Table 7-1), presumably the same type of conditions associated with Bird Island during this time (McFadden 2015). If Bird Island resembled a peninsula during this time (McFadden 2015), then three sides of the site would have provided intertidal habitats conducive for the fish and shellfish identified in the stratum.

Numerous truncatella shells indicate the proximity to or collection of leaf litter from high tide areas (Hubricht 1985). Few materials in the fish assemblage suggests off-site procurement. The pit feature at Bird Island intrudes into earlier deposits. The pit includes taxa from the Suwannee Sound. These quantities of these taxa are similar to the earlier Bird Island occupation, indicating the pit likely was refilled with the earlier materials.

The assemblages from Deer Island and Little Bradford Island are both sparse. Likely these sites were not residential sites. However, located near the river mouth, both sites are now highly eroded. Human interments at Little Bradford Island and the arcuate shell deposits at Deer Island indicate the significance of both sites (Mones et al. 2012; Sassaman et al. 2011; Sassaman and Wallis 2015). Gastropod hammers and other modified shell tools, likely indicative of shellfish processing, are found in similar proportions between Bird Island and Deer Island, while Little Bradford contains little else but concretions (Appendix B; Figure 5-16).

Like many other areas of the east Gulf coast, overall site signatures in the lower Suwannee region are light between 260 cal. B.C. and cal. A.D. 220. Some indicators suggest warm-weather occupations, but other indicators are indeterminate (Table 7-1). Identified materials indicate that fishes could easily be procured in proximity to the sites, but little else is interpreted about cultural practices during this time.

Seasonal Signatures Between cal. A.D. 430 and 660

On both the west and south sides of Shell mound, assemblages indicate cool- and warm-weather fish procurement. However, compared to other contexts, relatively few small fish are identified given the density of midden deposits. Local intertidal and marsh areas were utilized by occupants (Tables 6-2 and 7-1, Appendix D).

Although Shell Mound was constructed relatively quickly (Sassaman et al. 2013:8), distinct episodes of ring construction are observed within strata, based on differences in shellfish density between TU 2 Strata II through IV (Appendix D, Tables E-27 to E-29). Additionally, Shell Mound has wide intra-site spatial variability (Table C-35). Variations in odostome length between the west and south side suggest differences in procurement practices (Table C-40, C-42).

Narrative Interpretation. Within the broader southeast, this time period is associated with population growth and increased shell and/or earthen constructions on the landscape, including the Florida gulf coast (Wallis et al. 2015). Environmental conditions were more favorable to coastal occupations than earlier occupations. The construction of many large site complexes, including Shell Mound, began prior to the A.D. 536 event (e.g., Pluckhahn et al. 2010; Sassaman et al. 2015a; Wallis et al. 2015), but continued construction and use of the site indicate that the effects of the event did not dissuade people from coastal occupations and practices.

Given the cooler temperatures and other environmental conditions associated with the A.D. 536 event, one would expect differences in the expression of seasons or distributions of fish over this time. However, any potential effects that the A.D. 536 event had on the lower Suwannee region are not obvious based on faunal materials. Although spot, a cool-weather indicator, are identified at Shell Mound, large warm-weather fish, such as jack, appear to have been targeted for human use at the site throughout its construction and use. How or if the A.D. 536 event affected environmental processes and human practices warrants future research.

Variation is assemblages from different areas of Shell Mound fit in with Sassaman and colleagues' (2013; 2015a) assessment of the site as an important center or ritual area. Different activities occurred on the south and west sides of the shell ring (and the north side, but this is not yet quantified (see Sassaman et al. 2015a)). Large jack and numerous mullet were disposed on the south side (Table 7-1; Figure 7-2). Crown conch hammers are more common in this area (Figure 5-16; Appendix B). Fish and shellfish likely were procured from intertidal habitats, especially during warm weather (Table 7-1). The high quantities of gastropod hammers may indicate shellfish processing on the south side of Shell Mound.

On the west side of the site, fewer large fish are identified (Table 7-1; Figure 7-2). More lithic materials (debitage and chunks) are identified here than in other areas of Shell Mound (Appendix B). High quantities of truncatella shells may indicate the proximity of the high tide line (Hubricht 1985), or the collection of leaf litter from the tide line. When combined with the observed prevalence of sheepshead, which are common in areas with hard substrates (SMS 2011), these data indicate that the west side of Shell Mound may have been located at the shoreline when the site was in use.

Additionally, the ring was built in several episodes. Disparities in overall quantities of shellfish (Appendix E-24 to E-36) document bouts of ring construction. Shellfish likely were collected from various areas and brought to the ring with little processing before deposition, based on taxa representation in each stratum and odostome lengths (Table C-40, C-40, Appendix D). Finally, the two pit features on the west side of the ring differ in quantities of fish and shellfish remains (Tables C-35).

The variation suggests distinct purposes and environmental conditions associated with each pit. People targeted specific fish, such as large jack, which are known today for being difficult fighters to hook on a line (Florida Sport Fishing n.d.), and mullet, which congregate in large schools (SMS 2011). These different fishes suggest that multiple methods of fish procurement may have been employed.

Seasonal Signatures Between cal. A.D. 610 and 770

Cat Island is associated with predominantly warm-weather fish procurement. The predominance of sea catfish and red drum suggest that fishes were collected from nearby intertidal and marsh areas. Assemblages at McClamory Key are indicative of fishing during warm/rainy conditions from local intertidal habitats (Table 7-1).

The interior of Shell Mound contains few faunal remains. However, killifish, large jack, and shark elements are identified (Figure 7-2). These data suggest occupation during multiple seasons (Table 7-1). Additionally, the interior contains the only shark teeth large enough to identify to species level.

Narrative Interpretation. Large site complexes were still in use at this time along the Gulf coast (e.g., Pluckhahn et al. 2010; Sassaman and Wallis 2015; Wallis et al. 2015). In the lower Suwannee region, the Shell Mound site was also still actively used by people. The interior of Shell Mound contains copious quantities of plain limestone-tempered pottery fragments and large, unmodified shark teeth.

Both the large jack and sharks identified at Shell Mound are likely the result of targeted exploitation. Both fish are known among fishermen today as strong, dogged fighting fishes (Florida Sportsman 2011). The large shark teeth found within the interior versus the smaller, less identifiable shark and ray elements on the ring demonstrate that species were purposefully used and disposed in different areas of the site. The large fishes and the abundance of ceramic sherds in the interior suggests numerous specialized collection, processing, and/or storage/transportation practices occurred. These activities may have occurred throughout the year, but seasonal signatures are not strong.

The capture of large sharks is not explained by the artifact collection. Sharks are most common in the intertidal areas south of the river present-day (Table 4-5). No hooks or other fishing implements, which might explain the capture of large jack and sharks, have been identified from sites in this analysis. However, this does not preclude the possibility of non-portable features or technologies that could not be inferred from midden deposits.

Comparatively small assemblages of fishes are identified from the Cat Island and McClamory Key. These sites are identified as smaller procurement or otherwise specialized camps that were related to activities at Shell Mound. The fishes that are identified at Cat Island and McClamory suggest warm-fish collection. However, the small amount of fish remains combined with quantities of ceramic materials may indicate that remains were transported away from these sites, likely to Shell Mound.

Cat Island contains mostly plain sand-tempered pottery sherds, while McClamory Key has a high diversity of pottery types. Alternatively, the artifact assemblages at these sites may indicate the significance of the sites for non-fishing practices. The sites likely hosted different activities, based on disparities in pottery assemblages. However, the lack of fish, combined with the quantities of ceramic remains, suggest these sites were warm-weather fishing camps that were situated with regard to the larger Shell Mound site. Supporting this link, both Cat Island and McClamory Key fell into disuse around the same time as the interior of Shell Mound (and the Garden Patch site complex, north of the river (Wallis et al. 2015)).

Seasonal Signatures Between cal. A.D. 775 and 980.

Richards Island and Bird Island are indicative of fish procurement during warm/rainy conditions (Table 7-1). Richards Island represents an inland location, while Bird Island was a bonafide island, separated from the mainland. Nearby intertidal habitats likely were targeted at Richards Island, while numerous habitats were utilized by Bird Island occupants (Table 7-1).

Narrative Interpretation. After Shell Mound, Garden Patch, and other large site complexes along the Gulf coast were abandoned, a shift in occupations is observed (Pluckhahn et al. 2015; Sassaman and Wallis 2015). Later residents did not occupy these existing sites. Instead, people occupied different areas. However, a common pattern is not evident among these later occupations. Both Bird Island and Roberts Mound represent seaward relocations, but Roberts Island continues a trend of large-scale shell and earthen constructions, while Bird Island does not contain any mounds (Pluckhahn et al. 2010; Sassaman and Wallis 2015).

In the lower Suwannee, both Richards Island and Bird Island represent later occupations. While Bird Island represents a more seaward location than the formerly occupied Garden Patch complex, Richards Island is located more inland than Shell Mound. Although Bird Island does not contain large shell or earthen works, Richards Island contains numerous arcuate shell deposits (Sassaman et al. 2011). Links between Garden Patch and Shell Mound are unexplored at present, but Bird and Richards Islands represent occupations of different peoples and/or different activities. A tenuous connection exists between Richards Island and Bird Island based on the similarly high diversity of pottery types between these sites (Figure 5-19).

Although Richards Island is southeast of Shell Mound, it is not connected to the mainland. Fish likely were procured during warm water from the intertidal areas around the island. Combined with the high pottery diversity, the numerous shell ring deposits across the island suggest possible use as a main base camp or ritual site.

By the time it was re-occupied, Bird Island had separated from the mainland and was located at the end of a paleodune in Horseshoe Cove (McFadden 2015). Fish assemblages suggest procurement from both low-current intertidal areas and from the Suwannee Sound (Table 7-1). Both types of habitats would have been in relatively close proximity to the island. Numerous truncatella shells suggests deposition near high tide or collection of leaf litter (Hubricht 1985). Although no features are identified from this occupation, the high diversity of ceramic sherds suggests that Bird Island may have acted as a main base camp.

Diachronic Changes at Bird Island

The strata of Bird Island provide the longest record of occupation among any single site in this analysis. Fishing practices varied through time at Bird Island. During the earliest occupations, the site, which was located on the mainland, is associated with multi-seasonal and multi-habitat procurement practices. Marine fishes are prevalent despite distance from the coast (Table 7-1). Nearly whole fish skeletons are represented at this time. Many of the cranial elements and vertebral elements per taxon are represented by numerous fragments in the earliest deposits, versus the more limited cranial and post-cranial representations evident in later Bird Island samples.

During later occupations, sea level rise resulted in the separation of Bird Island from the mainland. After this point, the site is associated with predominantly warm-weather fish procurement from local habitats. Seasons of oyster collection varied between later occupations (Table 7-1). Fish such as burrfish persist through time at the site (while less prominent at other sites in this analysis), suggesting that conditions near Bird Island were favorable to burrfish populations. Otherwise, differences in other fish species and element representations indicate marked differences in procurement and/or deposition practices over time at the site.

Assessments of Methods

Seasonal site use and fishing practices are inferred from a practice-orientated, multi-proxy approach. Indicator groups are a useful measure to assess seasons and habitats associated with human practices at a site. In addition to simple distributions of fishes within specific environmental parameters, measures such as fish size/allometry and impressed odostome lengths enhance characterizations of seasons and habitats.

Additionally, unusual species reveal details of extreme procurement conditions or human preferences.

Diversity values of assemblages are useful to support interpretations drawn from more specific analyses of fish type or size. However, adequately large sample sizes must be observed (e.g., more than 25 vertebrate taxa) that represent longer stretches of time than, for example, a feature that may represent a single short-term event. Diversity values also can be used to distinguish intense resource selection or extreme environmental fluctuations compared to a present-day baseline. Equitability values, despite their correlation with diversity values, provided a weaker assessment of conditions and practices.

The inclusion of both faunal remains and other artifact classes provides a means of exploring human practices beyond a behavioral ecology approach. Additionally, neither a single proxy nor a single site or sample is an adequate way to determine the season of site occupation or resource procurement. Multiple proxies provide a more robust interpretation of cultural practices because people may have been engaged in numerous activities at a site. Multiple co-eval sites and samples provide a frame of reference for interpretation because a combination of sites provides a broader picture of cultural practices and environmental conditions, versus inferences drawn from a single site in isolation.

To determine the significance of observed variation within a site, between sites, or through time, assessments such as Chi-Square tests are useful. Chi-Square tests reveal that different practices or activities can be observed in the space of a few centimeters, such as is seen among invertebrate assemblages at Shell Mound (Table

C-35). In lieu of a local odostome baseline, Chi-Square tests can be used to assess differences in odostome samples, even if these differences cannot be attributed to seasons.

Numerous sampling techniques at a site can be used to examine differences in resource patterns. Stronger inferences are made about a site when multiple samples are analyzed and when samples include both fine-screened and larger materials. For example, large general level samples are well suited to identifying the importance of larger fauna, such as the shark and jack at Shell Mound (Appendix F) that may be underrepresented in small column samples that emphasize smaller fishes, such as pinfish and killifish (Appendix E).

However, there are still many uncertainties inherent in this research. This dissertation does not provide absolute information about environmental conditions or climate change through time. The inferences drawn from the data are relative inferences based on comparison of co-eval sites against a present-day framework. Details of how habitats or fish populations changed as a result of environmental processes or human actions are not considered here. The effects of large-scale climatic events, such as the A.D. 536 event, on environments and human practices in the lower Suwannee region were not observed in this study.

For species that comprise indicator groups, it is inadvisable to use the presence of one or few individuals as an indicator of a condition. Ideally, numerous indicators are present and/or an indicator is one of the most common and abundant species identified from a sample. Furthermore, an understanding of local site conditions, broader environmental processes, and climatic fluctuations is necessary to put assemblages into broader contexts. Local indicator groups must be established for each region to account for particular conditions.

Finally, early stages of this dissertation included assessments of $\delta^{18}O$ values from present-day oyster shell and water samples to determine whether $\delta^{18}O$ values from oyster shells could be used to identify habitat of collection. Andrus and Thompson (2012) used absolute $\delta^{18}O$ values from oyster shells to differentiate between habitats in the Georgia Bight. While the general oscillation of $\delta^{18}O$ oyster shell values reflect seasonal temperature variation, the absolute values could be used to distinguish salinity gradients. Different areas of the estuary can be characterized by salinity gradients, and therefore, habitats of oyster collection could be differentiated in archaeological samples based on absolute $\delta^{18}O$ values from oyster shells (Andrus and Thompson 2012).

To assess whether this method could be applied to the lower Suwannee region, two present-day oysters were sampled from the lower Suwannee (Appendix G) and water temperature and salinity levels were measured on a monthly basis for a year. The sinusoidal oscillations from $\delta^{18}O$ values of oyster shells demonstrated correlation with seasonal fluctuations in water temperature (Tables G-1 and G-2). However, because there is no seasonal pattern of salinity values in the lower Suwannee region (Wolfe 1990c), Andrus and Thompson’s (2012) approach could not be applied.

Future Research

This research provides a new perspective for seasonality and mobility studies. These methods can be applied and expanded upon in coastal, riverine, lacustrine, and other areas, if present-day local biological data is available to use as a baseline. This approach can be used to explore how variations in local seasons affected resource procurement, mobility, and other practices through time, and explore how this affected interactions between people who may have been operating under diverse and different environmental indicators.

In this dissertation, I observed that at times, people practiced high levels of mobility while remaining within the region. Additional analyses may help identify more relevant effective seasons, indicator groups, mobility patterns, practices, and faunal species targeted at each site. In the lower Suwannee region specifically, an increased number of sites for comparison would provide a broader view of local practices.

Indicator groups may be derived that reflect longer-scale changes in a region. If oscillations can be observed in present-day data to reflect long-term patterning in fishes based on events that have supra-annual cycles (e.g., El Niño, or possible longer, generational-scale cycles), this can be used to refine assessments of seasonality, climate change, and human responses to unexpected conditions. These types of indicator groups work toward Cross's (1988) suggestion of looking beyond annual rounds to explore strategies of coping with dynamic conditions.

Various contexts are available to increase sample diversity, including more recent excavations from Shell Mound (see Sassaman et al. 2015a:94-99), other sites that have yet to be analyzed (e.g., Butler Island, Raleigh Island, Seahorse Key, etc.), and sites that have yet to be archaeologically tested. Few sites north of the Suwannee River were available for this research, so no assessment of possible differences between north and south intertidal areas was possible (Raabe and Bialkowska-Jelinska 2007).

Additionally, this type of research would benefit from additional faunal proxies. Studies of scallop, grass cerith, and impressed odostome annual length variation (i.e., Cannarozzi 2012) within effective seasonal categories would be useful to identify more specific details of species' demography in the region as well as the seasons that people were collecting each species. Analyses of plant remains, too, would provide a more robust interpretation of mobility and subsistence economy. More intense analyses of other material remains could help elucidate site activities. For example, Wylde (2013:35) analyzed vessel size and forms of Belle Glade pottery at a site in southwest Florida to infer the use of nested pots based on gradations of rim diameter in the assemblages, which he related to vessel transportation.

Finally, a myriad of other research is ongoing in the lower Suwannee region. Results of this dissertation dovetail with these studies, including Mahar's ethnoarchaeological fishing technology experiments (2015), Jenkin's research on oyster aquaculture (Sassaman et al. 2015a), and McFadden's (2015) sea level and landscape research. The combination of these studies highlight the significance of the region to peoples from 4,500 years ago to present-day and the diversity of practices that have occurred through time.

Summary

Overall, regardless of time period, large base camps and ritual sites (i.e., Bird Island, Ehrbar, and Shell Mound) provide evidence of year-round/multi-seasonal occupations. Many of these sites were also located in protected intertidal areas (i.e., Ehrbar, Shell Mound, and Richards Island). Most sites in this study were used or occupied during warm weather, and no site has evidence of singularly cool-weather occupations.

At no point in time do occupants of the lower Suwannee region appear to be generalists, collecting resources at random. The lower Suwannee region is a productive area, with different distributions of fish species in different habitats. Specific locations and fish species were targeted by different peoples. Fishing techniques and technologies and artifact assemblages were shaped based on human preferences and environmental processes.

The earliest populations (2630 to 2290 cal. B.C.) traveled several kilometers out to the Suwannee Sound, likely via canoe or other watercraft. Fishes were collected from marine habitats and transported whole to year-round base camps. The sparse samples dating between 260 cal. B.C. and cal. A.D. 220 indicate warm-weather fishing practices from nearby intertidal areas.

After cal. A.D. 430, intense construction began at Shell Mound. Numerous episodes of ring building are evident by the strata, which indicate shellfish collection from a variety of locations. After cal. A.D. 610, small, warm-weather foraging camps are identified around Shell Mound. Mobility practices emphasized the collection of specific fishes (e.g., jack and shark) from local habitats during warm weather. However, fish procurement likely was not the only driver of movement within the region. In particular, the diversity of pottery types and other artifacts at sites with otherwise light faunal deposits suggest site use beyond resource procurement. By A.D. 750, Shell Mound and the smaller sites fell into disuse. Disparate locations (seaward versus landward) and fishing patterns distinguish sites occupied after cal. A.D. 775.

In the next chapter, I provide concluding thoughts on the seasonal indicators used to infer past practices. I provide a summary of the dissertation, including the archaeological results and assessment of the methods used.

Table 7-1. Summary of seasonal interpretations per indicator.

Context	Top 3 fish	Indicator Group	Diversity	Fish Allometry	Boonea height[1]	Habitats
2630-2290 cal. B.C.						
Cat Island TU 2 Str IV	Pinfish, shark/rays, gar	Warm	Warm/Rainy	Warm	-	Delta/Intertidal
Cat Island TU 2 Str V	Sheepshead, sea catfish, pinfish	Warm	Warm/Rainy	-	-	Intertidal
Cat Island TU 2 Str VI	Pinfish, sea catfish, sheepshead	Warm	Warm/Rainy	Warm	Warm	Intertidal
Ehrbar	Pinfish, silver perch, killifish	Multiple	Cool	Warm	Warm	Multiple
Bird Island TU 3 Str V	Pinfish, killifish, needlefish	Warm	Warm	Multiple	Multiple	Multiple
Bird Island TU 3 Fea 03	Pinfish, killifish, porgy	Warm	-	-	Warm	Multiple
Bird Island TU 3 Str VI	Killifish, pinfish, toadfish	Warm/Rainy	Warm	-	-	Multiple
260 cal. B.C. – cal. A.D. 220						
Bird Island TU 3 Fea 02	Pinfish, silver perch, toadfish	Warm/Rainy	-	Cool	-	Multiple
Bird Island TU 3 Str III	Killifish, toadfish, pinfish	Warm/Rainy	Warm	Warm	Multiple	Multiple
Bird Island TU 3 Str IV	Killifish, pinfish, silver perch	Multiple	Multiple	-	-	Delta/Intertidal
Deer Island TU 2 Str II	-	-	-	-	Warm	-

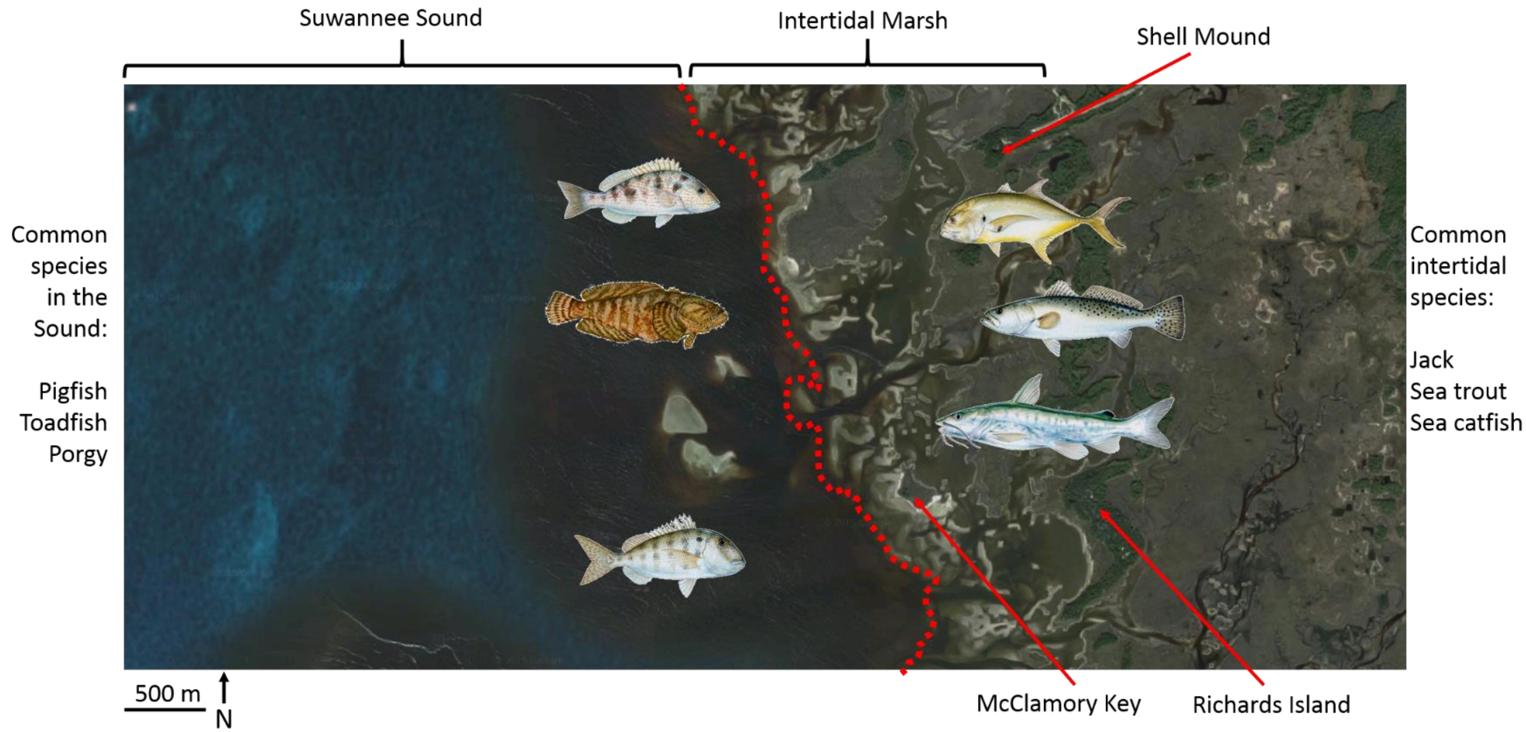
Table 7-1. Continued						
Context	Top 3 fish	Indicator Group	Diversity	Fish Allometry	Boonea height[1]	Habitats
Little Bradford TU 2 Str IV	-	-	-	-	Warm	-
Cal. A.D. 430-660						
Shell Mound TU 1 Str V	Sea catfish, pinfish, jack	Warm	Warm	Multiple	Warm	Delta/Intertidal
Shell Mound TU 1 Str VI	Pinfish, killifish	-	-	-	Warm	Delta/Intertidal
Shell Mound TU 2 Str II	Jack, mullet	Multiple	Warm	Cool	Warm	-
Shell Mound TU 2 Str III	Killifish, mullet, jack	Cool/Dry	Warm	Cool	-	Delta/Intertidal
Shell Mound TU 2 Str IV	-		Warm	-	Warm	-
Shell Mound TU 6 Str III	Pinfish, spot, sea catfish	Multiple	Warm/Rainy	Multiple	Warm	Delta/Intertidal
Shell Mound TU 6 Str V	-	-	Warm/Rainy	-	Warm	-
Shell Mound TU 6 Fea 03	-	-	-	-	-	-
Shell Mound TU 6 Fea 07	Pinfish, spot, mullet	Cool	-	Warm	Warm	Delta/Intertidal
Cal. A.D. 610- 770						
Cat Island TU 1 Str V	Sea catfish, red drum	Multiple	Warm/Rainy	Warm	-	Delta/Intertidal
McClamory TU 2 Str I	Pinfish, sea catfish, silver perch	Warm/Rainy	Warm	Warm	-	Intertidal
Shell Mound Interior	Killifish, jack, shark	Multiple	-	-	Warm	Delta/Intertidal

Table 7-1. Continued.

Context	Top 3 fish	Indicator Group	Diversity	Fish Allometry	Boonea height[1]	Habitats
Cal. A.D. 775 - 980						
Richards Island TU 2 Str IV	Pinfish, sea trout	Warm/Rainy	-	-	Warm	Intertidal
Richards Island TU 2 Fea 01	Sheepshead, sea catfish, pinfish	Warm	-	Warm	Warm	Intertidal
Bird Island TU 3 Str II	Killifish, sea catfish, toadfish	Warm/Rainy	Warm/Rainy	Warm	Cool	Multiple

[1]Seasons for impressed odostome height derived from Russo (1991a)

Figure 7-1. Schematic depicting prevalent fish habitats in the lower Suwannee region.

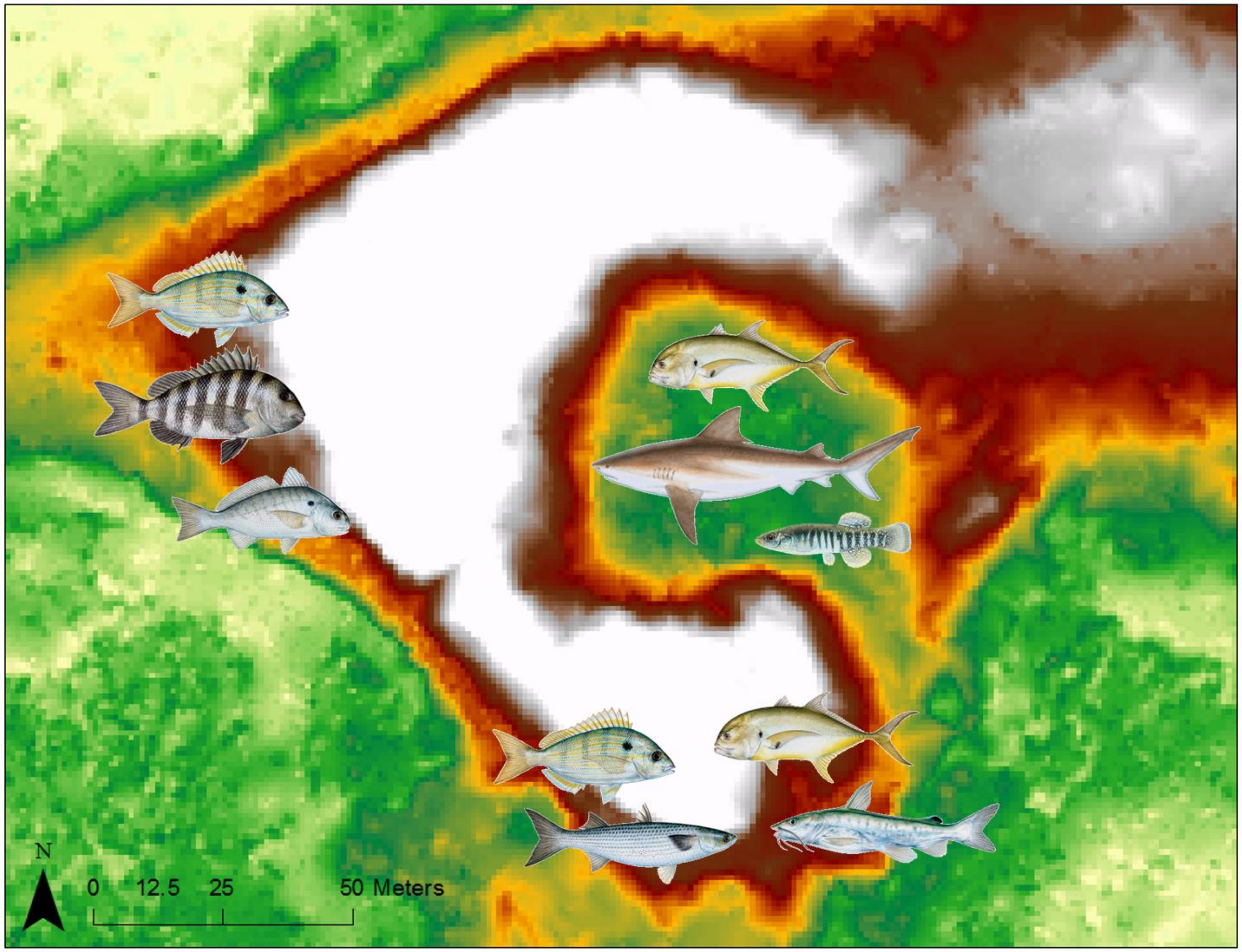


Reprinted with permission from Google Maps, http://maps.google.com (October 2015). Fish illustrations from Florida Sports Fishing (n.d.) and Calvert Marine Museum (n.d.).

Figure 7-2. Schematic depicting fish distributions across Shell Mound.

Common fishes on the west side:

Pinfish
Sheepshead
Spot



Common fishes on the interior:

Jack
Sharks
Killifish

Common fishes on the south side:

Pinfish
Jack
Mullet
Sea catfish

Fish imagery from Florida Sports Fishing (n.d.) and Fishes of Texas (n.d.).

CHAPTER 8
CONCLUSION

This research provides an alternative approach to seasonal mobility and fishing interpretations among pre-Columbian coastal groups. Coastal groups through time were skilled agents who interacted with the world around them to procure resources. With this in mind, seasons are viewed as fluid, dynamic perspectives that result from human/environmental interactions (e.g., Harris 1998). Effective seasons are characterized by local patterns in fish size and distribution, rather than using astronomical conditions characterized by broad trends among fishes. Effective seasons demonstrate a means of examining practices based on local spatial and temporal parameters.

Local fish data, courtesy of FWC (n.d.a.) provides an appropriate database from which to delineate effective seasons. Groups of fishes are used to identify Indicator groups for particular ranges of temperature, salinity, and/or geographic location – i.e., effective seasons and habitats. Indicator groups provide the baseline to interpret archaeological data (e.g., Kenward and Hall 1997; Reitz et al. 2012).

Vertebrate and invertebrate assemblages from eight sites in the lower Suwannee region are included in this analysis. Occupations span from 2630 cal. B.C. to cal. A.D. 980. Results indicate that marine fish use is fairly consistent through time, but different fishing techniques were employed at different sites and distinct practices were associated with specific places. People were not generalists, collecting fishes at random. Neither can the people associated with any site or time period easily be defined as either foragers or collectors. The high productivity of the lower Suwannee estuary coupled with uneven distribution of specific species provided a region that allowed for year-round sedentary occupations as a whole, while people moved constantly within the estuary.

Groups who occupied Bird Island and Ehrbar, between 2630 and 2290 cal. B.C., likely used the sites multi-seasonally/year-round. Residents traveled several kilometers into the Gulf for fishes and other resources. Whole fishes were transported to these sites for processing (whether for consumption or trade), based on the whole fish skeletal representations at these sites. Shell tools are one of the most common artifacts at these sites and are associated here with shellfish processing.

Cat Island, near the river mouth, does not contain similar faunal remains or artifacts to either Bird Island or Ehrbar. The Cat Island faunal assemblage suggests localized procurement practices, different processing practices (whole skeletons not represented), and, in combination with the lithic materials, suggests that significantly dissimilar or specialized practices by the same group of people and/or a different group may have occupied this site compared to Bird Island and Ehrbar.

Occupations between 260 cal. B.C. and cal. A.D. 220 have lighter faunal residues than earlier sites. Warm-weather seasonal signatures are most dominant, and fishes could be easily procured in proximity of the sites. The period between cal. A.D. 430 and 660 is marked by intense construction of the Shell Mound site. Materials were gathered from a range of locations to build the ring. Spatial variation indicates different activity areas across the site.

The south side of the ring is associated with warm-weather fish procurement, and shellfish processing. Large jack are a common species in this area, and shell tools are prevalent. The west side of the ring likely was located at the high tide line. Lithic materials are more common than shell tools on the west side.

The period between cal. A.D. 610 and 980 is marked by shifts in occupations. The interior of Shell Mound contains a sparse faunal assemblage, but large shark and jack remains are found, as well as high quantities of plain limestone-tempered pottery fragments. Faunal assemblages also are sparse at sites such as Cat Island and McClamory Key, but there is evidence of warm-weather fish procurement. Fishes may have been collected from these sites and brought to Shell Mound. Large pottery assemblages are identified from both of these smaller sites (plain sherds at Cat Island and a diversity of types at McClamory Key), which may reflect a means of fish transportation.

After cal. A.D. 750, Shell Mound, Cat Island, and McClamory Key largely fall out of use, as does the large Garden Patch site complex to the north. Sites such as Richards and Bird Islands are occupied after this time. These sites are located in different habitats and have different seasonal signatures. Bird Island is located more seaward and has evidence of multi-seasonal occupations and a wide range of fish procurement habitats. .Richards Island is located in a more protected intertidal area and has evidence of warm-weather resource procurement from local habitats.

These inferences about seasonal site use and other practices are inferred from a practice-orientated, multi-proxy approach using present-day local data as a baseline. Both faunal remains and other artifact classes are included in analyses. These methods provide a means of exploring seasonality and mobility beyond a behavioral ecology approach. Indicator groups, including fish distributions, allometric values, and impressed odostome lengths, provide robust interpretations. Diversity values support interpretations and can be used to identify intense resource selection or extreme environmental fluctuations.

This seasonality research suggests that a single proxy is not enough to determine season of site occupation or resource procurement. A single site or sample is not enough to determine mobility patterns or characterize a site or stratum. Chi-Square tests of sub-samples within strata reveal that significant variation can be observed in the space of a few centimeters.

Additionally, general level samples are well suited to identifying important large fauna that can be underrepresented in column samples that emphasize small fishes. Combinations of artifacts and faunal assemblages provide insight into the various practices that occurred at a site. Distributions of shell tools, lithics, and pottery sherds, largely collected from general level sampls, can be correlated with different types of fauna to delineate distinct activity areas and practices.

Future avenues to expand this research include analyses of more contexts within the region. Additionally, this type of research would benefit from refinement of effective seasons, additional faunal proxies, and analyses of plants, vessel forms, and tool types. Seasonality is not simply about what people eat or where people move, but also the activities associated with economic strategies.

The present study demonstrates a more human-focused approach to zooarchaeology, seasonality, and mobility studies. Effective seasons and practice theory are promoted over conventional seasons and behavioral ecological frameworks. Methods that include multiple sites, multiple seasonality proxies and multiple artifact classes provide a more robust interpretation than reliance on any single element. Framed within a consideration of past archaeological and environmental contexts and present-day conditions, this study demonstrates the diversity of seasonal and mobility practices in the lower Suwannee region through time.

APPENDIX A
RADIOCARBON ASSAYS FROM THE LOWER SUWANNEE REGION

Table A-1. Radiocarbon assays from the lower Suwannee region.

Provenience	Material	Beta Lab #	Measured 14C age BP	13/12C ratio	Conventional 14C age BP	2-sigman cal AD/BC	2-sigma cal BP	Reference
Bird Island TU 1 Str VB	Charcoal	301596	3930 +/- 40	-26.3	3910 +/- 40	BC 2480 – 2290	4430-4240	McFadden and Palmiotto 2012
Bird Island TU 1 Str IIIB	Charcoal	301595	2170+/- 30	-24.5	2180 +/- 30	BC 360 – 170	2310-2120	McFadden and Palmiotto 2012
Bird Island TU 1 Str IIB	Charcoal	301594	1150 +/- 30	-25.7	1140 +/- 30	AD 810 - 980	1140-970	McFadden and Palmiotto 2012
Cat Island TU 1 Str VB	Charcoal	270205	1400 +/- 40	-26.3	1380 +/- 40	AD 610 – 680	1340-1270	Sassaman et al. 2011
Cat Island TU 2 Str VIC	Charcoal	270206	4040 +/- 40	-25.4	4030 +/- 40	2830 – 2820 BC; 2630 – 2470 BC	4780-4770; 4580-4420	Sassaman et al. 2011
Little Bradford Island TU 2 Str IV	Charcoal	279609	1920 +/- 40	-26.2	1900 +/- 40	AD 20 - 220	1930-1730	Sassaman et al. 2011
Deer Island TU 2 Str II	Charcoal	289504	2040 +/- 40	-23.9	2060 +/- 40	BC 180 – AD 20	2130-1930	Mones et al. 2012
Shell Mound TU 3 Str II	Charcoal	321186	1350 +/- 30	-35.5	1340 +/- 30	AD 650 – 690; AD 750 – 760	1300-1260; 1200-1190	Sassaman et al . 2013
Shell Mound TU 2 Str II	Charcoal	321184	1510+/- 30	-26.6	1480 +/- 30	AD 540 – 640	1410-1310	Sassaman et al . 2013
Shell Mound TU 2 Str III	Charcoal	321185	1450 +/- 30	-25.7	1440 +/- 30	AD 570 – 650	1380-1300	Sassaman et al . 2013
Shell Mound TU 1 Str V	Charcoal	321182	1540 +/- 30	-25.8	1530 +/- 30	AD 430 - 600	1520-1350	Sassaman et al . 2013
Shell Mound TU 1 Str VIA	Charcoal	321183	1440 +/- 30	-24.6	1420 +/- 30	AD 600 - 660	1360-1290	Sassaman et al . 2013
McClamory Key STP 1	Charcoal	329225	1330 +/- 30	-24.9	1330 +/- 30	AD 650 – 710, AD 750 - 770	1300-1240, 1200-1180	Sassaman, pers. comm.

Table A-1. Continued

Provenience	Material	Beta Lab #	Measured 14C age BP	13/12C ratio	Conventional 14C age BP	2-sigman cal AD/BC	2-sigma cal BP	Reference
Richards Island TU 2 Str IV	Charcoal	381200	1170 +/- 30	-25.4	1160 +/- 30	AD 775 - 970	1174-1080	Sassaman, pers. comm.
Ehrbar TU 1 Str IID	Charcoal	329223	3940 +/- 30	-24.9	3940 +/- 30	2560-2350 cal BC	4510-4300	McFadden and Palmiotto 2013

APPENDIX B
GENERAL ARTIFACT DISTRIBUTION

Table B-1. General artifact distributions from sites in the lower Suwannee region.

Site	TU	Level	Depth (cm)	Artifact class	Artifact description	Count	Wt (g)
Bird Island (8DI52)	1	B	10	Lithic	Limestone Chunk	1	12.8
Bird Island (8DI52)	1	B	10	Misc	Concretions	-	2.9
Bird Island (8DI52)	1	B	10	Misc	Mudstone Chunk	2	56.5
Bird Island (8DI52)	1	B	10	Pottery	Residual sherds	-	6.2
Bird Island (8DI52)	1	B	10	Pottery	Checkstamp Sand-temp Pottery	1	2.8
Bird Island (8DI52)	1	B	10	Pottery	Eroded Sand-temp Pottery	6	25.1
Bird Island (8DI52)	1	B	10	Pottery	Incised/Punctated Sand-temp Pottery	1	13.8
Bird Island (8DI52)	1	B	10	Pottery	Plain Sand-temp Pottery	5	42.5
Bird Island (8DI52)	1	C	10	Fauna	Gastropod Hammer	1	60.1
Bird Island (8DI52)	1	C	10	Lithic	Chert Chunk	2	31.5
Bird Island (8DI52)	1	C	10	Misc	Mudstone Chunk	-	9.5
Bird Island (8DI52)	1	C	10	Pottery	Residual sherds	10	7.9
Bird Island (8DI52)	1	C	10	Pottery	Checkstamp Sand-temp Pottery	2	8.2
Bird Island (8DI52)	1	C	10	Pottery	Eroded Sand-temp Pottery	3	14.1
Bird Island (8DI52)	1	C	10	Pottery	Incised Sand-temp Pottery	1	6.7
Bird Island (8DI52)	1	C	10	Pottery	Plain Sand-temp Pottery	3	13.7
Bird Island (8DI52)	1	C	10	Pottery	Plain Sand-temp Pottery	1	11
Bird Island (8DI52)	1	D	10	Lithic	Chert Flake	1	5.3
Bird Island (8DI52)	1	D	10	Lithic	Lithic Flake	1	1.9
Bird Island (8DI52)	1	D	10	Pottery	Plain Limestone-temp Pottery	1	17.9
Bird Island (8DI52)	1	D	10	Pottery	Residual sherds	1	0.7
Bird Island (8DI52)	1	D	10	Pottery	Stamp Sand-temp Pottery	2	15
Bird Island (8DI52)	1	E	10	Fauna	Gastropod Hammer	2	67.3
Bird Island (8DI52)	1	E	10	Fauna	Modified Bone	1	5.1
Bird Island (8DI52)	1	E	10	Misc	Concretions	-	1.7
Bird Island (8DI52)	1	E	10	Misc	Mudstone Chunk	-	3.6
Bird Island (8DI52)	1	E	10	Pottery	Residual sherds	1	1.4
Bird Island (8DI52)	1	E	10	Pottery	Plain Sand-temp Pottery	1	3.4
Bird Island (8DI52)	1	E	10	Pottery	Plain Spicule-temp Pottery	2	24.7

Table B-1. Continued

Site	TU	Level	Depth (cm)	Artifact class	Artifact description	Count	Wt (g)
Bird Island (8DI52)	1	F	10	Fauna	Modified Shell	2	135.1
Bird Island (8DI52)	1	F	10	Pottery	Plain fiber-temp Pottery	1	10.3
Bird Island (8DI52)	1	F	10	Pottery	Residual sherds	4	1.4
Bird Island (8DI52)	1	F	10	Pottery	Checkstamp Sand-temp Pottery	1	6.4
Bird Island (8DI52)	1	F	10	Pottery	Linear Checkstamp Sand-temp Pottery	1	6.3
Bird Island (8DI52)	1	F	10	Pottery	Plain Sand-temp Pottery	3	22.8
Bird Island (8DI52)	1	I	10	Fauna	Modified Shell	1	368.7
Bird Island (8DI52)	1	I	10	Fauna	Gastropod Hammer	2	170.3
Bird Island (8DI52)	1	I	10	Lithic	Chert Flake	1	0.1
Bird Island (8DI52)	1	J	10	Fauna	Gastropod Hammer	1	53.4
Bird Island (8DI52)	1	J	10	Lithic	Chert Flake	1	0.6
Bird Island (8DI52)	1	J	10	Misc	Mudstone Chunk	-	195.5
Bird Island (8DI52)	3	B	10	Lithic	Chert Flake	3	8.3
Bird Island (8DI52)	3	B	10	Lithic	Burned Limestone Chunk	3	8.4
Bird Island (8DI52)	3	B	10	Pottery	Residual sherds	-	15.9
Bird Island (8DI52)	3	B	10	Pottery	Checkstamp Sand-temp Pottery	4	75
Bird Island (8DI52)	3	B	10	Pottery	Eroded Sand-temp Pottery	4	9.9
Bird Island (8DI52)	3	B	10	Pottery	Plain Sand-temp Pottery	7	52.8
Bird Island (8DI52)	3	B	10	Pottery	Plain Sand-temp Pottery	1	21.4
Bird Island (8DI52)	3	B	10	Pottery	Punctated Sand-temp Pottery	1	2.9
Bird Island (8DI52)	3	B	10	Pottery	Checkstamp Spicule-temp Pottery	1	7.9
Bird Island (8DI52)	3	B	10	Pottery	Plain Spicule-temp Pottery	2	9.9
Bird Island (8DI52)	3	B	10	Pottery	Uid Stamped-temp Pottery	3	12.7
Cat Island (8DI29)	1	G	10	Lithic	Chert Flake	2	0.1
Cat Island (8DI29)	1	G	10	Misc	Concretions	-	26.6
Cat Island (8DI29)	1	G	10	Pottery	Residual sherds	-	8.4
Cat Island (8DI29)	1	G	10	Pottery	Plain Sand-temp Pottery	1	9.9
Cat Island (8DI29)	2	E	10	Historic	Historic	-	2.9
Cat Island (8DI29)	2	E	10	Pottery	Residual sherds	5	5.8

Table B-1. Continued

Site	TU	Level	Depth (cm)	Artifact class	Artifact description	Count	Wt (g)
Cat Island (8DI29)	2	F	10	Historic	Historic	-	3.2
Cat Island (8DI29)	2	F	10	Lithic	Chert Flake	1	0.1
Cat Island (8DI29)	2	F	10	Pottery	Eroded Sand-temp Pottery	4	29.3
Cat Island (8DI29)	2	G	10	Historic	Historic	-	2.8
Cat Island (8DI29)	2	G	10	Pottery	Residual sherds	1	1.2
Cat Island (8DI29)	2	G	10	Pottery	Plain Spicule-temp Pottery	1	3
Cat Island (8DI29)	2	H	10	Lithic	Limestone Chunk	1	97.3
Cat Island (8DI29)	2	H	10	Lithic	Lithic Flake	2	1.4
Cat Island (8DI29)	2	H	10	Misc	Concretions	-	27.9
Cat Island (8DI29)	2	H	10	Pottery	Residual sherds	2	3.1
Cat Island (8DI29)	2	H	10	Pottery	Plain Sand-temp Pottery	5	25.2
Cat Island (8DI29)	2	I	10	Fauna	Gastropod Hammer	1	3.3
Cat Island (8DI29)	2	I	10	Lithic	Lithic Flake	1	8.8
Cat Island (8DI29)	2	I	10	Misc	Concretions	-	47.6
Deer Island (8LV75)	2	C	10	Fauna	Modified Shell	1	37.3
Deer Island (8LV75)	2	C	10	Fauna	Gastropod Hammer	2	74.2
Deer Island (8LV75)	2	C	10	Pottery	Residual sherds	3	1
Deer Island (8LV75)	2	C	10	Pottery	Plain Sand-temp Pottery	1	13.7
Deer Island (8LV75)	2	C	10	Pottery	Plain Spicule-temp Pottery	1	4.8
Deer Island (8LV75)	2	C	10	Pottery	Plain Uid-temp Pottery	4	13.8
Deer Island (8LV75)	2	D	10	Lithic	Stemmed Biface	1	4.2
Deer Island (8LV75)	2	D	10	Pottery	Uid-temp Pottery	1	5.7
Ehrbar (8LV282)	1	B	10	Fauna	Modified Bone	2	6.7
Ehrbar (8LV282)	1	B	10	Historic	Historic	-	0.5
Ehrbar (8LV282)	1	B	10	Historic	Historic	1	25.2
Ehrbar (8LV282)	1	B	10	Historic	Historic	-	20.4
Ehrbar (8LV282)	1	B	10	Historic	Historic	-	1.3
Ehrbar (8LV282)	1	B	10	Lithic	Chert Flake	1	0.4
Ehrbar (8LV282)	1	C	10	Historic	Historic	-	0.5

Table B-1. Continued

Site	TU	Level	Depth (cm)	Artifact class	Artifact description	Count	Wt (g)
Ehrbar (8LV282)	1	D	10	Fauna	Modified Bone	1	1.2
Ehrbar (8LV282)	1	D	10	Historic	Historic	-	4.4
Little Bradford (8DI32)	2	E	10	Misc	Concretions	-	138
Little Bradford (8DI32)	2	E	10	Pottery	Plain Limestone-temp Pottery	1	20.4
Little Bradford (8DI32)	2	E	10	Pottery	Plain Sand-temp Pottery	2	15.5
McClamory Key (8LV288)	2	B	10	Lithic	Limestone Chunk	1	15
McClamory Key (8LV288)	2	B	10	Lithic	Limestone Chunk	6	9.9
McClamory Key (8LV288)	2	B	10	Pottery	Residual sherds	-	88.4
McClamory Key (8LV288)	2	B	10	Pottery	Checkstamp Sand-temp Pottery	2	9.5
McClamory Key (8LV288)	2	B	10	Pottery	Eroded Sand-temp Pottery	20	51.4
McClamory Key (8LV288)	2	B	10	Pottery	Plain Sand-temp Pottery	30	169.4
McClamory Key (8LV288)	2	B	10	Pottery	Plain Sand-temp Pottery	3	10.5
McClamory Key (8LV288)	2	B	10	Pottery	Punctate Sand-temp Pottery	17	103.1
McClamory Key (8LV288)	2	B	10	Pottery	Punctate Sand-temp Pottery	1	7.4
McClamory Key (8LV288)	2	B	10	Pottery	Dentate Sand-temp Pottery	3	56.9
McClamory Key (8LV288)	2	B	10	Pottery	Plain Spicule-temp Pottery	1	19.1
McClamory Key (8LV288)	2	C	10	Lithic	Chert Flake	9	9.5
McClamory Key (8LV288)	2	C	10	Lithic	Chert Utilized Flake	1	4.9
McClamory Key (8LV288)	2	C	10	Lithic	Lithic Chunk	1	15.8
McClamory Key (8LV288)	2	C	10	Pottery	Residual sherds	-	124.8
McClamory Key (8LV288)	2	C	10	Pottery	Eroded Sand-temp Pottery	11	37
McClamory Key (8LV288)	2	C	10	Pottery	Incised Sand-temp Pottery	4	23.6
McClamory Key (8LV288)	2	C	10	Pottery	Incised Sand-temp Pottery	2	19.3
McClamory Key (8LV288)	2	C	10	Pottery	Plain Sand-temp Pottery	73	445.7
McClamory Key (8LV288)	2	C	10	Pottery	Plain Sand-temp Pottery	7	89
McClamory Key (8LV288)	2	C	10	Pottery	Punctated Sand-temp Pottery	26	115.8
McClamory Key (8LV288)	2	C	10	Pottery	Punctated Sand-temp Pottery	2	11.3
McClamory Key (8LV288)	2	D	10	Lithic	Chert Flake	3	1.5
McClamory Key (8LV288)	2	D	10	Lithic	Lithic Chunk	2	21.5

Table B-1. Continued

Site	TU	Level	Depth (cm)	Artifact class	Artifact description	Count	Wt (g)
McClamory Key (8LV288)	2	D	10	Misc	Fired Clay	6	1.8
McClamory Key (8LV288)	2	D	10	Pottery	Eroded fiber-temp Pottery	1	16.7
McClamory Key (8LV288)	2	D	10	Pottery	Plain Limestone-temp Pottery	14	65.7
McClamory Key (8LV288)	2	D	10	Pottery	Plain Limestone-temp Pottery	4	28.5
McClamory Key (8LV288)	2	D	10	Pottery	Punctated Limestone-temp Pottery	1	2.3
McClamory Key (8LV288)	2	D	10	Pottery	Residual sherds	-	75.7
McClamory Key (8LV288)	2	D	10	Pottery	Eroded Sand-temp Pottery	2	5.4
McClamory Key (8LV288)	2	D	10	Pottery	Incised Sand-temp Pottery	1	1.9
McClamory Key (8LV288)	2	D	10	Pottery	Incised Sand-temp Pottery	7	87.4
McClamory Key (8LV288)	2	D	10	Pottery	Incised/Punctated Sand-temp Pottery	2	20.2
McClamory Key (8LV288)	2	D	10	Pottery	Plain Sand-temp Pottery	79	400.8
McClamory Key (8LV288)	2	D	10	Pottery	Plain Sand-temp Pottery	6	30.5
McClamory Key (8LV288)	2	D	10	Pottery	Punctated Sand-temp Pottery	2	5.6
McClamory Key (8LV288)	2	D	10	Pottery	Punctated Sand-temp Pottery	4	23.8
McClamory Key (8LV288)	2	D	10	Pottery	Punctated Sand-temp Pottery	1	5.1
McClamory Key (8LV288)	2	D	10	Pottery	Eroded Spicule-temp Pottery	2	2.5
McClamory Key (8LV288)	2	E	10	Pottery	Eroded limestone-temp Pottery	1	1.5
McClamory Key (8LV288)	2	E	10	Pottery	Incised Limestone-temp Pottery	1	12.5
McClamory Key (8LV288)	2	E	10	Pottery	Plain Limestone-temp Pottery	9	38.4
McClamory Key (8LV288)	2	E	10	Pottery	Punctated Limestone-temp Pottery	1	8.1
McClamory Key (8LV288)	2	E	10	Pottery	Residual sherds	-	31.3
McClamory Key (8LV288)	2	E	10	Pottery	Eroded Sand-temp Pottery	4	8
McClamory Key (8LV288)	2	E	10	Pottery	Incised Sand-temp Pottery	2	6.6
McClamory Key (8LV288)	2	E	10	Pottery	Plain Sand-temp Pottery	7	25
McClamory Key (8LV288)	2	E	10	Pottery	Punctated Sand-temp Pottery	2	4.4
McClamory Key (8LV288)	2	E	10	Pottery	Plain Spicule-temp Pottery	1	3.3
McClamory Key (8LV288)	2	F	10	Lithic	Chert Flake	1	0.1
McClamory Key (8LV288)	2	F	10	Lithic	Lithic Flake	1	0.1
McClamory Key (8LV288)	2	F	10	Pottery	Residual sherds	-	1.7

Table B-1. Continued

Site	TU	Level	Depth (cm)	Artifact class	Artifact description	Count	Wt (g)
McClamory Key (8LV288)	2	F	10	Pottery	Plain Sand-temp Pottery	4	13.2
McClamory Key (8LV288)	2	F	10	Pottery	Eroded Uid-temp Pottery	1	1.8
Richards Island (8LV137)	2	E	10	Lithic	Chert Flake	5	6
Richards Island (8LV137)	2	E	10	Lithic	Limestone Chunk	3	68.3
Richards Island (8LV137)	2	E	10	Pottery	Plain Limestone-temp Pottery	1	4.5
Richards Island (8LV137)	2	E	10	Pottery	Residual sherds	-	20.3
Richards Island (8LV137)	2	E	10	Pottery	Eroded Sand-temp Pottery	2	13.7
Richards Island (8LV137)	2	E	10	Pottery	Plain Sand-temp Pottery	22	165
Richards Island (8LV137)	2	E	10	Pottery	Plain Spicule-temp Pottery	5	6
Shell Mound (8LV42) Interior	3	C	10	Fauna	Gastropod Hammer	2	82.3
Shell Mound (8LV42) Interior	3	C	10	Lithic	Chert Flake	1	0.4
Shell Mound (8LV42) Interior	3	C	10	Lithic	Chert Shatter	2	23.2
Shell Mound (8LV42) Interior	3	C	10	Pottery	Plain Limestone-temp Pottery	26	129.2
Shell Mound (8LV42) Interior	3	C	10	Pottery	Plain Limestone-temp Pottery	3	40.8
Shell Mound (8LV42) Interior	3	C	10	Pottery	Residual sherds	-	4.8
Shell Mound (8LV42) Interior	3	C	10	Pottery	Residual sherds	-	1.7
Shell Mound (8LV42) Interior	3	C	10	Pottery	Plain Sand-temp Pottery	4	13.8
Shell Mound (8LV42) Interior	3	C	10	Pottery	Plain Sand-temp Pottery	1	1.7
Shell Mound (8LV42) South	1	D	20	Fauna	Gastropod Hammer	5	180.7
Shell Mound (8LV42) South	1	D	20	Pottery	Plain Limestone-temp Pottery	9	60.2
Shell Mound (8LV42) South	1	D	20	Pottery	Residual sherds	-	7
Shell Mound (8LV42) South	1	D	20	Pottery	Plain Sand-temp Pottery	3	4.6
Shell Mound (8LV42) South	1	E	20	Fauna	Gastropod Hammer	8	413.3
Shell Mound (8LV42) South	1	E	20	Lithic	Lithic Chunk	2	161.6
Shell Mound (8LV42) South	1	E	20	Pottery	Plain Limestone-temp Pottery	1	13.1
Shell Mound (8LV42) South	1	E	20	Pottery	Plain Limestone-temp Pottery	6	31.5
Shell Mound (8LV42) South	1	E	20	Pottery	Residual sherds	-	9.6
Shell Mound (8LV42) South	2	C	20	Fauna	Gastropod Hammer	4	197.2
Shell Mound (8LV42) South	2	C	20	Lithic	Lithic Chunk	1	49.1

Table B-1. Continued

Site	TU	Level	Depth (cm)	Artifact class	Artifact description	Count	Wt (g)
Shell Mound (8LV42) South	2	C	20	Pottery	Plain Limestone-temp Pottery	1	6.4
Shell Mound (8LV42) South	2	C	20	Pottery	Residual sherds	-	4.1
Shell Mound (8LV42) South	2	C	20	Pottery	Plain Sand-temp Pottery	1	5.6
Shell Mound (8LV42) West	6	B	10	Fauna	Gastropod Hammer	1	51.1
Shell Mound (8LV42) West	6	B	10	Lithic	Chert Shatter	2	3.9
Shell Mound (8LV42) West	6	B	10	Pottery	Plain Limestone-temp Pottery	10	36.1
Shell Mound (8LV42) West	6	B	10	Pottery	Residual sherds	-	6.6
Shell Mound (8LV42) West	6	B	10	Pottery	Residual sherds	-	2.2
Shell Mound (8LV42) West	6	B	10	Pottery	Plain Sand-temp Pottery	4	22.7
Shell Mound (8LV42) West	6	C	10	Fauna	Gastropod Hammer	4	113.9
Shell Mound (8LV42) West	6	C	10	Lithic	Chert Shatter	1	65.9
Shell Mound (8LV42) West	6	C	10	Lithic	Limestone Chunk	8	365.4
Shell Mound (8LV42) West	6	C	10	Lithic	Sedimentary Chunk	1	107.6
Shell Mound (8LV42) West	6	C	10	Pottery	Plain Limestone-temp Pottery	10	37.8
Shell Mound (8LV42) West	6	C	10	Pottery	Residual sherds	-	1
Shell Mound (8LV42) West	6	C	10	Pottery	Residual sherds	-	0.7
Shell Mound (8LV42) West	6	C	10	Pottery	Plain Painted Sand-temp Pottery	1	2.1
Shell Mound (8LV42) West	6	C	10	Pottery	Plain Sand-temp Pottery	1	3.8
Shell Mound (8LV42) West	6	E	10	Lithic	Chert Flake	1	2.6
Shell Mound (8LV42) West	6	E	10	Lithic	Chert Shatter	1	12.6
Shell Mound (8LV42) West	6	E	10	Lithic	Chert Utilized Flake	1	4.1

APPENDIX C
STATISTICAL SUMMARY TABLES

Table C-1. ANOVA of rays/skates distribution during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	4803.40	1601.13	14.28	2.61	-
Within Seasons	6001	6.73E+05	112.15			
Total	6004	6.78E+05				

Table C-2. ANOVA of sea catfish distribution during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	1.70E+04	5690.34	5.36	2.61	-
Within Seasons	2695	2.86E+06	1062.47			
Total	2698	2.88E+06				

Table C-3. ANOVA of toadfish distribution during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	28.10	9.36	4.28	2.63	-
Within Seasons	325	711.34	2.19			
Total	328	739.42				

Table C-4. ANOVA of needlefish distribution during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	14.23	4.74	.34	2.61	.80
Within Seasons	1583	2.23E+04	14.08			
Total	1586	2.23E+04				

Table C-5. ANOVA of killifish distribution during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	4.98E+04	16614.75	7.73	2.61	-
Within Seasons	2703	581E+06	2149.63			
Total	2706	5.86E+06				

Table C-6. ANOVA of Crevalle jack distribution during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	236.72	78.91	1.59	2.63	.19
Within Seasons	289	1.43E+04	49.55			
Total	292	1.46E+04				

Table C-7. ANOVA of pigfish distribution during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	3.82E+04	12728.86	7.00	2.61	-
Within Seasons	2016	3.67E+06	1818.84			
Total	2019	3.70E+06				

Table C-8. ANOVA of pinfish distribution during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	3.26E+04	10853.41	2.03	2.61	.11
Within Seasons	7008	3.75E+07	5345.50			
Total	7011	2.75E+07				

Table C-9. ANOVA of silver perch distribution during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	6.32E+05	2.11E+05	7.91	2.61	-
Within Seasons	3027	8.07E+07	26661.38			
Total	3030	8.13E+07				

Table C-10. ANOVA of sea trout distribution during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	2.49E+04	8293.87	9.56	2.61	-
Within Seasons	4226	3.67E+06	867.65			
Total	4229	3.69E+06				

Table C-11. ANOVA of spot distribution during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	4.24E+06	1.41E+06	36.16	2.61	-
Within Seasons	6352	2.48E+08	3.90E+04			
Total	6355	2.52E+08				

Table C-12. ANOVA of red drum distribution during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	450	150	4.11	2.61	.01
Within Seasons	2409	88016	36.54			
Total	2412	88466				

Table C-13. ANOVA of striped mullet distribution during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	3.85E+04	1.28E+04	3.25	2.61	.02
Within Seasons	3705	1.47E+07	3943.62			
Total	3708	1.47E+07				

Table C-14. ANOVA of burrifsh distribution during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	141.72	47.24	4.02	2.61	.01
Within Seasons	982	1.16E+04	11.76			
Total	985	1.17E+04				

Table C-15. ANOVA of rays/skates distribution between effective habitats (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	1.01E+04	3368.45	30.27	2.61	-
Within Seasons	6001	6.68E+05	111.27			
Total	6004	6.78E+05				

Table C-16. ANOVA of sea catfish distribution between effective habitats (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	2.74E+04	9148.69	8.64	2.61	-
Within Seasons	2695	2.85E+06	1058.62			
Total	2698	2.88E+06				

Table C-17. ANOVA of toadfish distribution between effective habitats (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	17.10	5.70	2.57	2.63	.05
Within Seasons	325	722.32	2.22			
Total	328	739.42				

Table C-18. ANOVA of needlefish distribution between effective habitats (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	142.85	47.62	3.40	2.61	0.02
Within Seasons	1583	2.22E+04	14.00			
Total	1586	2.23E+04				

Table C-19. ANOVA of killifish distribution between effective habitats (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	8.89E+04	2.96E+04	13.87	2.61	-
Within Seasons	2703	5.77E+06	2135.19			
Total	2706	5.86E+06				

Table C-20. ANOVA of Crevalle jack distribution between effective habitats (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	1599.61	533.20	11.89	2.64	-
Within Seasons	289	1.30E+04	44.83			
Total	292	1.46E+04				

Table C-21. ANOVA of pigfish distribution between effective habitats (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	2.97E+04	9889.57	5.42	2.61	-
Within Seasons	2016	3.68E+06	1823.07			
Total	2019	3.70E+06				

Table C-22. ANOVA of pinfish distribution between effective habitats (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	3.53E+05	1.18E+05	22.18	2.61	-
Within Seasons	7008	3.71E+07	5299.83			
Total	7011	3.75E+07				

Table C-23. ANOVA of silver perch distribution between effective habitats (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	3.95E+05	1.32E+05	4.92	2.61	-
Within Seasons	3027	8.09E+07	2.67E+04			
Total	3030	8.13E+07				

Table C-24. ANOVA of sea trout distribution between effective habitats (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	4.17E+04	1.39E+04	16.11	2.61	-
Within Seasons	4226	3.65E+06	863.67			
Total	4229	3.69E+06				

Table C-25. ANOVA of spot distribution between effective habitats (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	3.10E+05	1.03E+05	2.60	2.61	.05
Within Seasons	6352	2.52E+08	3.97E+04			
Total	6355	2.52E+08				

Table C-26. ANOVA of red drum distribution between effective habitats (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	753.64	251.21	6.90	2.61	-
Within Seasons	2409	8.77E+04	36.41			
Total	2412	8.85E+04				

Table C-27. ANOVA of striped mullet distribution between effective habitats (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	1.72E+04	5730.85	1.45	2.61	.23
Within Seasons	3705	1.46E+07	3949.36			
Total	3708	1.46E+07				

Table C-28. ANOVA of burrfish distribution between effective habitats (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	33.32	11.11	.94	2.61	.42
Within Seasons	982	1.17E+04	11.87			
Total	985	1.17E+04				

Table C-29. ANOVA of sea catfish lengths during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(.05)	P-value
Between Seasons	3	1.47E+07	4.89E+06	803.77	2.61	-
Within Seasons	13415	8.16E+07	6081.99			
Total	13418	9.63E+07				

Table C-30. ANOVA of Crevalle jack lengths during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(.05)	P-value
Between Seasons	3	4.97E+06	1.66E+06	287.24	2.61	-
Within Seasons	890	5.13E+06	5765.23			
Total	893	1.01E+07				

Table C-31. ANOVA of pinfish lengths during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	1.08E+07	3.59E+06	3485.42	2.61	-
Within Seasons	51253	5.27E+07	1028.95			
Total	51256	6.35E+07				

Table C-32. ANOVA of silver perch lengths during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(.05)	P-value
Between Seasons	3	4.90E+06	1.63E+06	1033.65	2.61	-
Within Seasons	22414	3.55E+07	1581.62			
Total	22417	4.04E+07				

Table C-33. ANOVA of spot lengths during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(0.05)	P-value
Between Seasons	3	1.43E+08	4.75E+07	35117.16	2.60	-
Within Seasons	130997	1.77E+08	1352.69			
Total	131000	3.20E+08				

Table C-34. ANOVA of mullet lengths during effective seasons (data courtesy of FWC).

Source	df	SS	MS	F	F(.05)	P-value
Between Seasons	3	7.90E+06	2.63E+06	333.06	2.61	-
Within Seasons	33542	2.65E+08	7908.03			
Total	33545	2.73E+08				

Table C-35. Chi-Square results.

Context	Temporal Assoc.	X2 Stat	Df	X2 (0.05)	P-Value
Vertebrate Assemblages					
Bird Island Str II	AD 650-980	8.95	21	32.67	0.99
Bird Island Str III	260 BC-AD 220	29.09	44	60.48	0.96
Bird Island Str V	2630-2290 BC	24.64	22	33.92	0.31
Bird Island Fea 03	2630-2290 BC	23.22	15	25.00	0.08
Cat Island TU 1	AD 430-680	27.54	34	48.60	0.78
Cat Island TU 2	2630-2290 BC	21.98	36	51.00	0.97
Cat Island TU 2 Str VI	2630-2290 BC	16.17	34	48.60	1.00
Shell Mound South/West	AD 430-680	29.01	23	35.17	0.18
Shell Mound South	AD 430-680	78.29	72	92.81	0.29
Shell Mound TU 1 Str V	AD 430-680	19.57	16	26.30	0.24
Shell Mound TU 6 Str III	AD 430-680	19.05	20	31.41	0.52
Shell Mound TU 6 Fea 07	AD 430-680	14.30	21	32.67	0.86
Ehrbar	2630-2290 BC	65.89	44	60.48	0.02
Invertebrate Assemblages					
Bird Island Str II	AD 650-980	41.26	25	37.65	0.02
Bird Island Str III	260 BC-AD 220	160.77	62	81.38	0.00
Bird Island Str V	2630-2290 BC	128.48	20	31.41	0.00
Bird Island Fea 03	2630-2290 BC	26.57	17	27.59	0.06
Cat Island TU 1	AD 430-680	17.07	16	26.30	0.38
Cat Island TU 2	2630-2290 BC	122.85	80	101.88	0.00
Cat Island TU 2 Str VI	2630-2290 BC	63.55	40	55.76	0.01
Shell Mound South/West	AD 430-680	976.20	39	54.57	0.00
Shell Mound South	AD 430-680	1734.26	144	173.00	0.00
Shell Mound TU 1 Str V	AD 430-680	292.65	30	43.77	0.00
Shell Mound TU 6 Str III	AD 430-680	50.50	25	37.65	0.00
Shell Mound TU 6 Fea 07	AD 430-680	208.81	37	52.19	0.00
Ehrbar	2630-2290 BC	380.76	76	97.35	0.00

Table C-36. ANOVA of impressed odostome lengths between Bird Island and Ehrbar, 2630 to 2290 cal. B.C.

Source	df	SS	MS	F	F(0.05)	P-value
Between Sites	1	21.99	21.99	25.33	3.89	0.00
Within Sites	193	167.54	0.87			
Total	194	189.53				

Table C-37. ANOVA of impressed odostome lengths between Bird, Deer, and Little Bradford Islands, 260 cal. B.C. to A.D. 220.

Source	df	SS	MS	F	F(0.05)	P-value
Between Sites	2	4.11	2.05	2.72	3.11	0.07
Within Sites	78	58.90	0.76			
Total	80	63.01				

Table C-38. ANOVA of impressed odostome lengths between Shell Mound TU 1 Str V Upper and Lower, cal. A.D. 430 to 660.

Source	df	SS	MS	F	F(0.05)	P-value
Between Sites	1	0.73	0.73	0.95	3.85	0.33
Within Sites	715	544.50	0.76			
Total	716	545.23				

Table C-39. ANOVA of impressed odostome lengths between Shell Mound TU 2 Str II and Str IV, cal. A.D. 430 to 660. A.D. 220.

Source	df	SS	MS	F	F(0.05)	P-value
Between Sites	1	1.00	1.00	1.23	3.89	0.27
Within Sites	215	176.15	0.82			
Total	216	177.16				

Table C-40. ANOVA of impressed odostome lengths between Shell Mound TU 6 Str III East and West, cal. A.D. 430 to 660.

Source	df	SS	MS	F	F(0.05)	P-value
Between Sites	1	7.42	7.42	19.86	3.91	0.00
Within Sites	140	52.28	0.37			
Total	141	59.70				

Table C-41. ANOVA of impressed odostome lengths between Shell Mound TU 6 Feature 07 East and West, cal. A.D. 430 to 660.

Source	df	SS	MS	F	F(0.05)	P-value
Between Sites	1	0.75	0.75	1.15	3.87	0.29
Within Sites	322	210.33	0.65			
Total	323	211.07				

Table C-42. ANOVA of impressed odostome lengths between Shell Mound South and West, cal. A.D. 430 to 660.

Source	df	SS	MS	F	F(0.05)	P-value
Between Sites	1	10.83	10.83	14.82	3.85	0.00
Within Sites	1074	784.78	0.73			
Total	1075	795.61				

APPENDIX D
SUMMARY OF ANALYSES FROM FLOTATION SAMPLES

Provenience	Total Taxa	Total MNI	Tot. Vert. Taxa	Tot. Vert. MNI	Tot. Taxa Div/Eq[1]	Tot. MNI Div/Eq[1]	Div	Equit
Bird Island TU 3 Str IIA	42	426	23	41	19	37	2.64	.90
Bird Island TU 3 Str IIB	47	683	25	41	20	35	2.81	.94
Bird Island TU 3 Str IIIA	44	748	21	30	14	23	2.34	.89
Bird Island TU 3 Str IIIB	49	704	22	41	17	36	2.18	.77
Bird Island TU 3 Str IIIC	53	903	28	36	22	30	2.95	.95
Bird Island TU 3 Str IVA	17	35	13	20	10	17	2.10	.91
Bird Island TU 3 Str VA	35	406	27	164	21	158	2.21	.73
Bird Island TU 3 Str VB	49	711	24	77	19	72	2.30	.78
Bird Island TU 3 Str VIA	24	180	15	23	12	20	2.28	.92
Bird Island TU 3 Fea-02	35	210	25	90	19	84	2.29	.78
Bird Island TU 3 Fea-03 Gastropod	28	132	14	28	12	26	1.95	.79
Bird Island TU 3 Fea-03 SE	30	236	18	43	14	39	2.22	.84
Bird Island TU 3 Fea-03 SW	35	290	17	37	14	34	2.12	.80
Cat Island TU 1 Str VA	19	96	12	14	10	11	2.27	.99
Cat Island TU 1 Str VB	16	72	13	17	12	16	2.40	.96
Cat Island TU 1 Str VC	21	53	15	19	12	16	2.34	.94
Cat Island TU 2 Str IVB	8	28	3	4	3	4	1.03	.94
Cat Island TU 2 Str V	19	61	14	17	10	13	2.20	.96
Cat Island TU 2 Str VIA	27	129	17	20	14	17	2.56	.97
Cat Island TU 2 Str VIB	35	196	16	21	14	19	2.51	.95
Cat Island TU 2 Str VIC	34	212	14	15	12	13	2.46	.99
Little Bradford TU 2 Str IVA	24	131	8	8	7	7	1.95	1.00
Deer Island TU 2 Str II	28	377	7	7	5	5	1.61	1.00
Shell Mound South TU 1 Str V Upper	46	1934	14	16	13	15	2.52	.98
Shell Mound South TU 1 Str V Lower	45	2520	16	51	14	49	1.93	.73
Shell Mound South TU 1 Str VIA	30	361	13	17	11	15	2.25	.94
Shell Mound South TU 2 Str II	40	1560	14	14	11	11	2.40	1.00
Shell Mound South TU 2 Str III	26	785	12	15	10	13	2.20	.96
Shell Mound South TU 2 Str IV	38	1476	13	14	8	8	2.08	1.00
Shell Mound West TU 6 Str III East	49	592	25	39	20	34	2.68	.79
Shell Mound West TU 6 Str III West	37	333	14	19	12	17	2.31	.93

Appendix D. Continued

Provenience	Total Taxa	Total MNI	Tot. Vert. Taxa	Tot. Vert. MNI	Tot. Taxa Div/Eq. [1]	Tot. MNI Div/Eq. [1]	Div	Equit
Shell Mound West TU 6 Str V	12	67	7	7	6	6	1.79	1.00
Shell Mound West TU 6 Fea-03	24	137	4	4	2	2	.69	1.00
Shell Mound West TU 6 Fea-07 East	51	1006	18	27	16	25	2.64	.95
Shell Mound West TU 6 Fea-07 West	64	1683	21	37	19	35	2.54	.86
Shell Mound Interior TU 3 Str II	10	16	8	8	5	5	1.61	1.00
Shell Mound Interior TU 4 Str II	10	40	2	2	2	2	.69	1.00
Shell Mound Interior TU 5 Str II	24	127	9	10	7	8	1.91	.98
McClamory Key TU 2 Str I	23	134	12	14	10	12	2.25	.98
McClamory Key STP 1 Str I	30	362	18	21	13	16	2.43	.95
Richards Island TU 2 Str IV	20	50	12	14	10	12	2.05	.89
Richards Island TU 2 Fea-01	28	165	14	19	13	18	2.48	.97
Ehrbar TU 1 Str IIB	60	1643	24	133	18	127	2.11	.73
Ehrbar TU 1 Str IIC	59	1093	25	162	20	157	2.07	.69
Ehrbar TU 1 Str IID	57	1390	27	151	21	145	2.00	.65

[1]Total taxa and MNI used in diversity and equitability values derived from shark/ray and fish.

APPENDIX E
SPECIES LISTS FROM FLOTATION CONTEXTS

Table E-1. Faunal remains from Bird Island (8DI52) TU 3 Str IIA, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	1553.1	39.06
Crassostrea virginica	Eastern oyster	973	88.05	282	73.25	2382.1	59.91
cf. *Anomalocardium auberiana*	Pointed venus	2	.18	1	.26	-	-
Total Bivalvia		975	88.23	283	73.51	2382.1	59.91
Gastropoda A	UID marine gastropods	7	.63	7	1.82	-	-
Gastropoda B	UID Gastropods	8	.72	1	.26	4.9	.12
Littorina sp.	Periwinkle	7	.63	7	1.82	1.7	.04
cf. *Truncatella* sp.	Truncatella	10	.90	10	2.60	-	-
Neverita duplicata	Sharkseye	1	.09	1	.26	3.2	.08
Cerithiopsidae	Marine snails	3	.27	3	.78	-	-
Urosalpinx sp.	Oyster drills	1	.09	1	.26	.1	-
Melongena corona	Crown conch	15	1.36	15	3.90	22.6	.57
Astyris lunata	Lunar dovesnail	1	.09	1	.26	-	-
cf. *Columbella rusticoides*	Rusty dovesnail	1	.09	1	.26	-	-
cf. *Costoanachis* sp.	Dovesnail	13	1.18	13	3.38	.5	.01
Boonea impressa	Impressed odostome	20	1.81	20	5.19	-	-
cf. Hydrobiidae	Mud snails	1	.09	1	.26	-	-
Euglandina rosea	Rosy wolfsnail	1	.09	1	.26	7.5	.19
Gastrocopta pellucida	Slim snaggletooth	2	.18	2	.52	-	-
Polygyroidea	Land snails	13	1.18	13	3.38	.1	-
Total Gastropodoa		104	9.42	97	25.21	40.6	1.01
Balanidae	Barnacles	26	2.35	5	1.30	.6	.02
Total Arthropoda		26	2.35	5	1.30	.6	.02
Total Invertebrata		1105	100.00	385	100.00	3976.4	100.00
Vertebrata	UID Vertebrates	-	-	-	-	11.2	11.72
Rodentia	Rodents	12	.39	1	2.44	.1	.10
Total Mammalia		12	.39	1	2.44	.1	.10
Serpentes	Snakes	19	.61	1	2.44	.2	.21
Testudines	Turtles	77	2.48	-	-	7.8	8.16
Cheloniidae	Sea turtle	3	.10	1	2.44	1.4	1.46
Total Reptilia		99	3.19	2	2.44	9.4	9.83
Amphibia	Amphibian	1	.03	1	2.44	-	-
Total Amphibia		1	.03	1	2.44	-	-
Chondrichthyes	Sharks/rays	26	.84	-	-	.3	.31

Table E-1. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Euselachii	Sharks	1	.03	1	2.44	-	-
Total Chondrichthyes		27	.87	1	2.44	.3	.31
Actinopterygii	UID Fishes	2732	87.82	-	-	62.2	65.06
Lepisosteus sp.	Gar	53	1.70	1	2.44	1.8	1.88
Elops saurus	Ladyfish	1	.03	1	2.44	-	-
Clupeidae	Herring/shad	5	.16	1	2.44	-	-
Ariopsis felis	Hardhead catfish	32	1.03	4	9.76	2.8	2.93
Bagre marinus	Gafftopsail catfish	1	.03	1	2.44	.1	.10
Opsanus sp.	Toadfish	37	1.19	4	9.76	2.6	2.72
Fundulus sp.	Killifish	64	2.06	8	19.51	.3	.31
Caranx cryos	Bluerunner	2	.06	1	2.44	.1	.10
Calamus artifrons	Grass porgy	6	.19	2	4.88	.7	.73
Lagodon rhomboides	Pinfish	12	.39	4	9.76	.1	.10
Bairdiella chrysoura	Silver perch	5	.16	1	2.44	.1	.10
Cynoscion sp.	Sea trout	3	.10	2	4.88	.8	.84
Pogonias cromis	Black drum	1	.03	1	2.44	.5	.52
Sciaenops ocellatus	Red drum	1	.03	1	2.44	.3	.31
Mugil sp.	Mullet	5	.16	1	2.44	.1	.10
Paralichthys sp.	Flounders	1	.03	1	2.44	-	-
Diodontidae	Burrfishes	4	.13	1	2.44	1.9	1.99
Ostraciidae	Boxfishes	7	.23	1	2.44	.2	.21
Total Actinopterygii		2972	95.53	36	87.83	74.6	78.00
Total Vertebrata		3111	100.00	41	100.00	95.6	100.00
Grand Total		4216		426		4072	

Table E-2. Faunal remains from Bird Island (8DI52) TU 3 Str IIB, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	2192.3	35.05
Mytilidae	Mussels	9	.65	1	.16	.2	-
Crassostrea virginica	Eastern oyster	1126	81.65	475	73.98	4006.5	64.06
cf. *Anomalocardium auberiana*	Pointed venus	3	.22	1	.16	-	-
Total Bivalvia		1138	82.43	477	74.29	4006.7	64.06
Gastropoda	UID marine gastropod	10	.73	10	1.56	-	-
Cerithium sp.	Cerith	3	.22	3	.47	.2	-
Modulus modulus	Buttonsnail	2	.15	2	.31	-	-
Littorina sp.	Periwinkle	6	.44	6	.93	3.7	.06
cf. *Truncatella* sp.	Truncatella	13	.94	13	2.02	.1	-
Cerithiopsidae	Marine snails	1	.07	1	.16	-	-
Melongena corona	Crown conch	7	.51	5	.78	47.7	.76
Nassarius vibex	Bruised nassa	3	.22	3	.47	.2	-
Astyris lunata	Lunar dovesnail	1	.07	1	.16	-	-
cf. *Costoanachis* sp.	Dovesnail	28	2.03	28	4.36	.7	.01
Prunum apicinum	Common Atlantic Marginella	1	.07	1	.16	-	-
Boonea impressa	Impressed odostome	45	3.26	45	7.01	.1	-
cf. *Cerithidea* sp.	Horn snail	1	.07	1	.16	-	-
Assimineidae	Marine snails	2	.15	2	.31	-	-
Melampus sp.	Melampus	1	.07	1	.16	-	-
Polygyroidea	Land snails	13	.94	13	2.02	.3	-
Haplotrema concava	Lancetooth	11	.80	11	1.71	-	-
Polygyra cereolus	Southern flatcoil	3	.22	3	.47	.1	-
Total Gastropoda		151	10.96	149	23.22	53.1	
Balanidae	Barnacles	90	6.53	16	2.49	1.9	.03
Total Arthropoda		90	6.53	16	2.49	1.9	.03
Total Invertebrata		1379	100.00	642	100.00	6254.0	100.00
Vertebrata	UID Vertebrates	-	-	-	-	65.2	66.91
Rodentia	Rodents	18	1.74	1	2.44	.3	.31
Total Mammalia		18	1.74	1	2.44	.3	.31
Aves	Birds	19	1.84	2	4.88	.9	.92
Total Aves		19	1.84	2	4.88	.9	.92
Serpentes	Snakes	10	.97	1	2.44	.2	.21
Sirenidae	Sirens	1	.10	1	2.44	-	-

Table E-2. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Testudines	Turtles	94	9.08	-	-	3.8	3.91
Emydidae	Pond turtles	14	1.35	-	-	4.3	4.42
Malaclemmys terrapin	Diamondback terrapin	2	.19	1	2.44	.9	.92
Total Reptilia		121	11.69	3	7.32	9.2	9.46
Chondrichthyes	Sharks/rays	21	2.03	-	-	.3	.31
Euselachii	Sharks	2	.19	1	2.44	-	-
Total Chondrichthyes		23	2.22	1	2.44	.3	.31
Actinopterygii[1]	UID Fishes	661	63.86	-	-	12.7	13.05
Lepisosteus sp.	Gar	43	4.15	1	2.44	1.5	1.54
Elops saurus	Ladyfish	2	.19	1	2.44	-	-
Clupeidae	Herring/shad	1	.10	1	2.44	-	-
Ariopsis felis	Hardhead catfish	50	4.83	3	7.32	3.0	3.08
Opsanus sp.	Toadfish	28	2.71	3	7.32	.9	.92
Belonidae	Needlefishes	2	.19	1	2.44	-	-
Fundulus sp.	Killifish	26	2.51	5	12.17	.1	.10
Orthopristis chrysoptera	Pigfish	2	.19	1	2.44	-	-
Archosargus probatocephalus	Sheepshead	4	.39	1	2.44	1.4	1.44
Calamus artifrons	Grass porgy	6	.58	2	4.88	.6	.62
Lagodon rhomboides	Pinfish	9	.87	4	9.75	.1	.10
Bairdiella chrysoura	Silver perch	7	.68	3	7.32	.1	.10
Cynoscion sp.	Sea trout	1	.10	1	2.44	-	-
Leiostomus xanthurus	Spot	1	.10	1	2.44	.1	.10
Pogonias cromis	Black drum	2	.19	1	2.44	.3	.31
Mugil sp.	Mullet	2	.19	1	2.44	.1	.10
Paralichthys sp.	Flounders	2	.19	2	4.88	.2	.21
Diodontidae	Burrfishes	3	.29	1	2.44	.4	.41
Ostraciidae	Boxfishes	2	.19	1	2.44	-	-
Total Actinopterygii		854	82.50	34	82.96	21.4	22.08
Total Vertebrata		1035	100.00	41	100.00	97.3	100.00
Grand Total		2414		683		6351.3	

[1]UID Actinopterygii resorted

Table E-3. Faunal remains from Bird Island (8DI52) TU 3 Str IIIA, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	1225.1	20.33
Mytilidae	Mussels	1	.06	1	.14	-	-
Crassostrea virginica	Eastern oyster	1381	89.39	596	83.01	4730.8	78.49
cf. *Anomalocardium auberiana*	Pointed venus	2	.13	1	.14	-	-
Total Bivalvia		1384	89.58	598	83.29	4730.8	78.49
Cerithium muscarum	Flyspeck cerith	2	.13	2	.28	.1	-
Modulus modulus	Buttonsnail	1	.06	1	.14	-	-
Littorina sp.	Periwinkle	2	.13	2	.28	.5	.01
cf. *Truncatella* sp.	Truncatella	15	.97	15	2.09	.1	-
Cerithiopsidae	Marine snails	1	.06	1	.14	-	-
Urosalpinx sp.	Oyster drills	4	.26	4	.56	.5	.01
Melongena corona	Crown conch	2	.13	2	.28	67.0	1.11
Nassarius vibex	Bruised nassa	1	.06	1	.14	-	-
cf. *Costoanachis* sp.	Dovesnail	13	.84	13	1.81	.4	.01
Bittolum varium	Grass cerith	9	.58	9	1.25	-	-
Boonea impressa	Impressed odostome	34	2.20	34	4.74	.1	-
Melampus sp.	Melampus	2	.13	2	.28	.1	-
Euglandina rosea	Rosy wolfsnail	6	.39	4	.56	1.2	.02
Oligogyra orbiculata	Globular drop	1	.06	1	.14	-	-
Polygyroidea	Land snails	11	.71	8	1.11	.1	-
cf. *Haplotrema concava*	Land snails	4	.26	4	.56	-	-
Hawaii miniscula	Minute gem	5	.32	5	.70	-	-
Polygyra cereolus	Southern flatcoil	3	.19	3	.42	-	-
Triodopsis hopetonensis	Magnolia threetooth	1	.06	1	.14	-	-
Total Gastropoda		117	7.54	112	15.62	70.1	1.16
Balanidae	Barnacles	44	2.85	8	1.11	1.1	.02
Total Arthropoda		44	2.85	8	1.11	1.1	.02
Total Invertebrata		1545	100.00	718	100.00	6027.1	100.00
Vertebrata	UID Vertebrates	-	-	-	-	4.7	11.52
Mammalia	Mammals	1	.06	-	-	.1	.25
Rodentia	Rodents	71	4.61	1	3.33	1.5	3.68
Total Mammalia		72	4.67	1	3.33	1.6	3.93
Anatidae	Migratory ducks	1	.06	1	3.33	2.0	4.90
Total Aves		1	.06	1	3.33	2.0	4.90

Table E-3. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Serpentes	Snakes	20	1.30	1	3.33	.4	.98
Sirenidae	Sirens	1	.06	1	3.33	-	-
Testudines	Turtles	28	1.82	1	3.33	2.1	5.15
Malaclemmys terrapin	Diamondback terrapin	2	.13	1	3.33	.7	1.72
Total Reptilia		51	3.31	4	13.32	3.2	7.85
Anura sp.	Frogs/toads	1	.06	1	3.33	-	-
Total Amphibia		1	.06	1	3.33	-	-
Chondrichthyes	Sharks/rays	12	.78	1	3.33	.1	.25
Total Condrichthyes		12	.78	1	3.33	.1	.25
Actinopterygii	UID Fishes	1303	84.67	-	-	26.0	63.73
Lepisosteus sp.	Gar	14	.91	1	3.33	.4	.98
Ariidae	Sea catfishes	3	.19	-	-	.2	.49
Ariopsis felis	Hardhead catfish	3	.19	1	3.33	.4	.98
Opsanus sp.	Toadfish	9	.58	2	6.67	.7	1.72
Fundulus sp.	Killifish	51	3.31	7	23.33	.3	.74
Centropristis striata	Black sea bass	1	.06	1	3.33	.1	.25
Lepomis macrochirus	Bluegill	2	.13	1	3.33	-	-
Caranx sp.	Jack	2	.13	1	3.33	.3	.74
Archosargus probatocephalus	Sheepshead	1	.06	1	3.33	.5	1.23
Lagodon rhomboides	Pinfish	8	.52	3	10.00	.1	.25
Bairdiella chrysoura	Silver perch	1	.06	1	3.33	-	-
Cynoscion sp.	Sea trout	1	.06	1	3.33	-	
Mugil sp.	Mullet	1	.06	1	3.33	.1	.25
Diodontidae	Burrfishes	2	.13	1	3.33	.1	.25
Total Actinopterygii		1402	91.06	22	73.3	29.2	71.61
Total Vertebrata		1539	100.00	30	100.00	40.8	100.00
Grand Total		3084		748		6067.9	

Table E-4. Faunal remains from Bird Island (8DI52) TU 3 Str IIIB, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	1441.2	22.65
Crassostrea virginica	Eastern oyster	973	86.18	529	79.79	4872.3	76.56
cf. *Polymesoda caroliniana*	Marsh clam	1	.09	1	.15	-	-
Anomalocardia auberiana	Pointed venus	2	.18	2	.30	-	-
Total Bivalvia		976	86.45	532	80.24	4872.3	76.56
Gastropoda	UID marine gastropod	12	1.06	12	1.81	-	-
Cerithium muscarum	Flyspeck cerith	2	.18	2	.30	.1	-
Modulus modulus	Buttonsnail	1	.09	1	.15	-	-
Truncatella sp.	Truncatella	8	.71	8	1.21	.1	-
Neverita duplicata	Sharkseye	1	.09	1	.15	3.6	.06
Cerithiopsidae	Marine snails	8	.71	8	1.21	-	-
Urosalpinx sp.	Oyster drills	2	.18	2	.30	.1	-
cf. *Busycon contrarium*	Lightning whelk	2	.18	1	.15	7.8	.12
Melongena corona	Crown conch	3	.27	3	.45	34.7	.55
Nassarius vibex	Bruised nassa	3	.27	3	.45	.2	-
Fasciolaria lilium	Banded tulip	1	.09	1	.15	.4	.01
Astyris lunata	Lunar dovesnail	2	.18	2	.30	-	-
cf. *Costoanachis* sp.	Dovesnail	16	1.42	16	2.41	.4	.01
Bittolum varium	Grass cerith	6	.53	6	.90	-	-
Boonea impressa	Impressed odostome	16	1.42	16	2.41	-	-
cf. Hydrobiidae	Mud snails	1	.09	1	.15	-	-
Euglandina rosea	Rosy wolfsnail	2	.18	2	.30	2.4	.04
Gastrocopta pellucida	Slim snaggletooth	1	.09	1	.15	-	-
Oligogyra orbiculata	Globular drop	1	.09	1	.15	-	-
Polygyroidea	Land snails	6	.53	6	.90	.1	-
Haplotrema concava	Lancetooth	16	1.42	16	2.41	-	-
Hawaii miniscula	Minute gem	10	.89	10	1.51	-	-
Polygyra cereolus	Southern flatcoil	7	.62	7	1.06	.1	-
Total Gastropoda		127	11.29	126	18.98	50.0	.79
Balanidae	Barnacles	26	2.30	5	.75	.7	.01
Total Arthropoda		26	2.30	5	.75	.7	.01
Total Invertebrata		1129	100.00	663	100.00	6364.2	100.00
Vertebrata	UID Vertebrates	-	-	-	-	2.0	7.41
Odocoileus virginianus	White-tailed deer	1	.07	1	2.44	.6	2.22

Table E-4. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Rodentia	Rodents	17	1.15	1	2.44	.2	.74
Total Mammalia		18	1.22	2	4.88	.8	2.96
Serpentes	Snakes	30	2.03	1	2.44	.3	1.11
Sirenidae	Sirens	4	.27	1	2.44	.1	.37
Testudines	Turtles	6	.41	1	2.44	.4	1.48
Total Reptilia		40	2.71	3	7.32	.8	2.96
Chondrichthyes	Sharks/rays	10	.68	1	2.44	.1	.37
Total Chondrichthyes		10	.68	1	2.44	.1	.37
Actinopterygii	UID Fishes	1287	86.90	-	-	20.8	77.04
Lepisosteus sp.	Gar	13	.88	1	2.44	.2	.74
Elops saurus	Ladyfish	1	.07	1	2.44	-	-
cf. *Brevoortia smithi*	Yellowfin menhaden	1	.07	1	2.44	-	-
Ariopsis felis	Hardhead catfish	10	.68	3	7.32	.4	1.48
Opsanus sp.	Toadfish	4	.27	1	2.44	.1	.37
Belonidae	Needlefishes	2	.14	2	4.88	-	-
Fundulus sp.	Killifish	70	4.73	16	39.02	.2	.74
Centropristis striata	Black sea bass	2	.14	2	4.88	-	-
Caranx sp.	Jack	3	.20	1	2.44	-	-
Orthopristis chrysoptera	Pigfish	1	.07	1	2.44	-	-
Archosargus probatocephalus	Sheepshead	2	.14	1	2.44	1.0	3.70
Lagodon rhomboides	Pinfish	5	.34	1	2.44	-	-
Bairdiella chrysoura	Silver perch	2	.14	1	2.44	-	-
Paralichthys sp.	Flounders	2	.14	1	2.44	.3	1.11
Diodontidae	Burrfishes	5	.34	1	2.44	.3	1.11
Ostraciidae	Boxfishes	3	.20	1	2.44	-	-
Total Actinopterygii		1413	95.45	35	85.38	23.3	86.29
Total Vertebrata		1481	100.00	41	100.00	27	100.00
Grand Total		2610		704		6391.2	

Table E-5. Faunal remains from Bird Island (8DI52) TU 3 Str IIIC, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	1183.3	17.36
Bivalvia	Small bivalves	2	.11	1	.12	-	-
Crassostrea virginica	Eastern oyster	1398	77.58	632	72.90	5623.0	82.47
Ostrea equestris	Crested oyster	1	.06	1	.12	-	-
Total Bivalvia		1401	77.75	634	73.14	5623.0	82.47
Gastropoda	UID marine gastropod	24	1.33	24	2.77	-	-
Littorina sp.	Periwinkle	1	.06	1	.12	.8	.01
cf. *Truncatella* sp.	Truncatella	27	1.50	27	3.11	.1	-
Crepidula sp.	Slippersnail	1	.06	1	.12	-	-
Cerithiopsidae	Marine snails	2	.11	2	.23	-	-
Urosalpinx sp.	Oyster drills	1	.06	1	.12	-	-
Melongena corona	Crown conch	2	.11	2	.23	4.5	.07
Nassarius vibex	Bruised nassa	1	.06	1	.12	-	-
Astyris lunata	Lunar dovesnail	5	.28	5	.58	-	-
cf. *Costoanachis* sp.	Dovesnail	9	.50	9	1.04	.2	-
Oliva sp.	Olive snail	1	.06	1	.12	-	-
Bittolum varium	Grass cerith	13	.72	13	1.50	-	-
Boonea impressa	Impressed odostome	14	.78	14	1.61	-	-
cf. *Cerithidea* sp.	Horn snail	1	.06	1	.12	-	-
Euglandina rosea	Rosy wolfsnail	1	.06	1	.12	.2	-
Gastrocopta pellucida	Slim snaggletooth	4	.22	4	.46	-	-
Oligogyra orbiculata	Globular drop	1	.06	1	.12	-	-
cf. *Haplotrema concava*	Lancetooth	18	1.00	18	2.08	-	-
cf. *Hawaii miniscula*	Minute gem	11	.61	11	1.27	-	-
cf. *Zontoides arboreus*	Quick gloss	15	.83	15	1.73	.1	-
Polygyroidea	Land snails	47	2.61	47	5.42	.9	.01
Total Gastropoda		199	11.08	199	22.99	6.8	.09
Balanidae	Barnacles	202	11.21	34	3.92	5.0	.07
Total Arthropoda		2025	11.21	34	3.92	5.0	.07
Total Invertebrata		1802	100.00	867	100.00	6818.1	100.00
Vertebrata	UID Vertebrates	-	-	-	-	17.2	52.76
Sigmodon hispidus	Hispid cotton rat	10	2.21	1	2.78	.1	.31
Total Mammalia		10	2.21	1	2.78	.1	.31
Aves	Birds	3	.66	1	2.78	.1	.31

Table E-5. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Total Aves		3	.66	1	2.78	.1	.31
Serpentes	Snakes	15	3.32	1	2.78	-	-
Anolis sp.	Anolis lizards	2	.44	1	2.78	-	-
Testudines	Turtles	25	5.53	-	-	.8	2.45
Cheloniidae	Sea turtle	14	3.10	1	2.78	7.7	23.62
Total Reptilia		56	12.39	3	8.34	8.5	26.07
Amphibia	Amphibian	1	.22	1	2.78	-	-
Total Amphibia		1	.22	1	2.78	-	-
Chondrichthyes	Sharks/rays	1	.22	-	-	-	-
Rajiformes	Rays/skates	1	.22	1	2.78	-	-
Total Chondrichthyes		2	.44	1	2.78	-	-
Actinopterygii[1]	UID Fishes	286	63.27	-	-	3.5	10.74
Lepisosteus sp.	Gar	3	.66	1	2.78	.1	.31
Elops saurus	Ladyfish	3	.66	1	2.78	.1	.31
Clupeidae	Herring/shad	6	1.33	1	2.78	-	-
Ariidae	Sea catfishes	2	.44	-	-	.1	.31
Ariopsis felis	Hardhead catfish	1	.22	1	2.78	-	-
Bagre marinus	Gafftopsail catfish	5	1.11	1	2.78	.6	1.84
Opsanus sp.	Toadfish	10	2.21	2	5.56	.2	.61
Belonidae	Needlefishes	1	.22	1	2.78	-	-
Fundulus sp.	Killifish	25	5.53	5	13.89	.1	.31
cf. *Centropristis striata*	Black sea bass	2	.44	1	2.78	-	-
Lepomis gulas	Warmouth	1	.22	1	2.78	-	-
Caranx sp.	Jack	4	.88	1	2.78	1.4	4.29
Orthopristis chrysoptera	Pigfish	2	.44	1	2.78	-	-
Archosargus probatocephalus	Sheepshead	2	.44	1	2.78	.4	1.23
Calamus artifrons	Grass porgy	1	.22	1	2.78	.1	.31
Lagodon rhomboides	Pinfish	7	1.55	2	5.56	.1	.31
Bairdiella chrysoura	Silver perch	2	.44	2	5.56	-	-
cf. *Sciaenops ocellatus*	Red drum	1	.22	1	2.78	-	-
Mugil sp.	Mullet	4	.88	2	5.56	-	-
Paralichthys sp.	Flounders	6	1.33	1	2.78	-	-
Diodontidae	Burrfishes	3	.66	1	2.78	-	-
Ostraciidae	Boxfishes	3	.66	1	2.78	-	-

Table E-5. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Total Actinopterygii		380	84.03	29	80.61	6.7	20.57
Total Vertebrata		452	100.00	36	100.00	32.6	100.00
Grand Total		2254		903		6850.7	

[1]UID Actinopterygii resorted.

Table E-6. Faunal remains from Bird Island (8DI52) TU 3 Str IVA, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	38.9	16.01
Crassostrea virginica	Eastern oyster	126	96.92	12	80.00	203.9	83.94
Total Bivalvia		126	96.92	12	80.00	203.9	83.94
Boonea impressa	Impressed odostome	1	.77	1	6.67	-	-
Gastrocopta pellucida	Slim snaggletooth	1	.77	1	6.67	-	-
Total Gastropoda		2	1.54	2	13.34	-	-
Balanidae	Barnacles	2	1.54	1	6.67	.1	.04
Total Arthropoda		2	1.54	1	6.67	.1	.04
Total Invertebrata		130	100.00	15	100.00	242.9	100.00
Vertebrata	UID Vertebrates	-	-	-	-	1.7	4.42
Rodentia	Rodents	4	.16	1	5.00	.1	.26
Total Mammalia		4	.16	1	5.00	.1	.26
Aves	Birds	5	.20	1	5.00	.1	.26
Total Aves		5	.20	1	5.00	.1	.26
Serpentes	Snakes	9	.35	1	5.00	.1	.26
Total Reptilia		9	.35	1	5.00	.1	.26
Chondrichthyes	Sharks/rays	4	.16	-	-	-	-
Euselachii	Sharks	8	.31	1	5.00	.1	.26
Rajiformes	Rays/skates	1	.04	1	5.00	-	-
Total Chondrichthyes		13	.51	2	10.00	.1	.26
Actinopterygii	UID Fishes	2457	96.54	-	-	33.0	85.71
Lepisosteus sp.	Gar	9	.35	1	5.00	.2	.52
Ariopsis felis	Hardhead catfish	3	.12	1	5.00	.6	1.56
Fundulus sp.	Killifish	25	.98	4	20.00	-	-
cf. *Caranx cryos*	Blue runner	1	.04	1	5.00	.2	.52
Archosargus probatocephalus	Sheepshead	5	.20	1	5.00	1.8	4.68
Lagodon rhomboides	Pinfish	9	.35	4	20.00	.1	.26
Bairdiella chrysoura	Silver perch	2	.08	2	10.00	-	-
Mugil sp.	Mullet	3	.12	1	5.00	.5	1.30
Total Actinopterygii		2514	98.78	15	85.00	36.4	94.55
Total Vertebrata		2545	100.00	20	100.00	38.5	100.00
Grand Total		2675		35		281.4	

Table E-7. Faunal remains from Bird Island (8DI52) TU 3 Str VA, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	708.8	28.50
Crassostrea virginica	Eastern oyster	394	69.86	116	47.93	1307.6	52.57
Ostrea equestris	Crested oyster	2	.35	1	.41	1.1	.04
Total Bivalvia		396	70.21	117	48.34	1308.7	52.61
Littorina sp.	Periwinkle	86	15.25	73	30.17	14.5	.58
Neverita duplicata	Sharkseye	5	.89	5	2.07	18.6	.75
Melongena corona	Crown conch	49	8.69	36	14.88	436.1	17.53
Boonea impressa	Impressed odostome	5	.89	5	2.07	-	-
Polygyroidea	Land snails	2	.35	2	.83	-	-
Total Gastropoda		147	26.07	121	50.02	469.2	18.86
Balanidae	Barnacles	21	3.72	4	1.65	.5	.02
Total Arthropoda		21	3.72	4	1.65	.5	.02
Total Invertebrata		564	100.00	242	100.00	2487.2	100.00
Vertebrata	UID Vertebrates	-	-	-	-	5.2	2.25
Rodentia	Rodents	15	.13	1	.61	.1	.04
Total Mammalia		15	.13	1	.61	.1	.04
Aves	Birds	8	.07	-	-	.9	.39
Mergus serrator	Red-breasted merganser	2	.02	1	.61	.6	.26
Total Aves		10	.09	1	.61	1.5	.65
Serpentes	Snakes	8	.07	1	.61	.5	.22
Anolis sp.	Anolis lizards	1	.01	1	.61	-	-
Testudines	Turtles	76	.67	1	.61	26.1	11.31
Total Reptilia		85	.75	3	1.83	26.6	11.53
Amphibia	Amphibian	1	.01	1	.61	-	-
Total Amphibia		1	.01	1	.61	-	-
Chondrichthyes	Sharks/rays	14	.12	-	-	.2	.09
Euselachii	Sharks	7	.06	1	.61	-	-
Rajiformes	Rays/skates	2	.02	1	.61	.1	.04
Total Chondrichthyes		23	.20	2	1.22	.3	.13
Actinopterygii	UID Fishes	10301	90.45	-	-	163.9	71.01
Lepisosteus sp.	Gar	24	.21	1	.61	.9	.39
Clupeidae	Herring/shad	7	.06	1	.61	-	-
Ariopsis felis	Hardhead catfish	69	.61	6	3.66	6.7	2.90
Opsanus sp.	Toadfish	379	3.33	27	16.46	15.2	6.59

Table E-7. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Belonidae	Needlefishes	14	.12	13	7.93	-	-
Fundulus sp.	Killifish	271	2.38	15	9.15	1.5	.65
Centropristis striata	Black sea bass	1	.01	1	.61	-	-
Lepomis macrochirus	Bluegill	2	.02	2	1.22	-	-
Caranx hippos	Crevalle jack	1	.01	1	.61	-	-
Orthopristis chrysoptera	Pigfish	7	.06	6	3.66	.1	.04
Archosargus probatocephalus	Sheepshead	7	.06	3	1.83	2.1	.91
Calamus artifrons	Grass porgy	30	.26	8	4.88	1.9	.82
Lagodon rhomboides	Pinfish	91	.80	55	33.54	.3	.13
Sciaenidae	Drums/croakers	4	.04	-	-	.2	.09
Bairdiella chrysoura	Silver perch	13	.11	9	5.49	.2	.09
Cynoscion sp.	Sea trout	5	.04	3	1.83	1.4	.61
Leiostomus xanthurus	Spot	4	.04	2	1.22	.1	.04
Mugil sp.	Mullet	3	.03	1	.61	-	-
Chilomycterus schoepfii	Striped burrfish	10	.09	1	.61	2.4	1.04
Ostraciidae	Boxfishes	11	.10	1	.61	.2	.09
Total Actinopterygii		11254	98.83	156	95.14	197.1	85.40
Total Vertebrata		11388	100.00	164	100.00	230.8	100.00
Grand Total		11952		406		2718	

Table E-8. Faunal remains from Bird Island (8DI52) TU 3 Str VB, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	1084.3	24.86
Mytilidae	Mussels	4	.25	2	.32	.1	-
Crassostrea virginica	Eastern oyster	718	44.29	177	27.92	2696.0	61.81
Ostrea equestris	Crested oyster	1	.06	1	.16	.2	-
Total Bivalvia		723	44.60	180	28.4	2696.3	61.81
Dinocardium robustum	Atlantic giant cockle	1	.06	1	.16	1.0	.02
Gastropoda	UID marine gastropod	1	.06	1	.16	-	-
Cerithium muscarum	Flyspeck cerith	3	.18	3	.47	-	-
Modulus modulus	Buttonsnail	5	.31	5	.79	.1	-
Littorina sp.	Periwinkle	542	33.44	263	41.48	199.0	4.56
Crepidula sp.	Slippersnail	5	.31	5	.79	-	-
Cerithiopsidae	Marine snails	4	.25	4	.63	-	-
cf. *Seila adamsi*	Minature cerith	8	.49	8	1.26	.1	-
cf. *Triphora* sp.	Triphora snail	4	.25	4	.63	-	-
Melongena corona	Crown conch	38	2.34	17	2.68	373.2	8.56
Fasciolaria sp.	Tulips	1	.06	1	.16	3.2	.07
Bittolum varium	Grass cerith	1	.06	1	.16	-	-
Boonea impressa	Impressed odostome	94	5.80	94	14.83	.5	.01
cf. *Cerithidea* sp.	Horn snail	1	.06	1	.16	-	-
Gastrocopta contracta	Bottleneck snaggletooth	1	.06	1	.16	-	-
Gastrocopta pellucida	Slim snaggletooth	3	.19	3	.47	-	-
Oligogyra orbiculata	Globular drop	4	.25	4	.63	.1	-
Polygyroidea	Land snails	2	.12	2	.32	-	-
Haplotrema concava	Lancetooth	4	.25	4	.63	-	-
Hawaii miniscula	Minute gem	3	.19	3	.47	-	-
Total Gastropoda		725	44.73	425	67.04	577.1	13.22
Balanidae	Barnacles	173	10.67	29	4.57	3.8	.09
Total Invertebrata		1621	100.00	634	100.00	4361.6	100.00
Vertebrata	UID Vertebrates	-	-	-	-	23.4	42.78
Mammalia	Mammalia	1	.50	1	1.30	.8	1.46
Rodentia	Rodents	5	.10	1	1.30	-	-
Total Mammalia		6	.60	2	2.60	.8	1.46
Serpentes	Snakes	4	.40	1	1.30	-	-
Anolis sp.	Anolis lizards	2	.20	1	1.30	-	-

Table E-8. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Testudines	Turtles	52	5.24	-	-	8.7	15.90
Malaclemmys terrapin	Diamondback terrapin	1	.10	1	1.30	.3	.55
Total Reptilia		59	5.94	3	3.90	9.0	16.45
Chondrichthyes	Sharks/rays	10	1.01	-	-	.1	.18
Rajiformes	Rays/skates	1	.10	1	1.30	.3	.55
Total Chondrichthyes		11	1.11	1	1.30	.4	.73
Actinopterygii[1]	UID Fishes	537	54.08	-	-	10.4	19.01
Lepisosteus sp.	Gar	15	1.51	1	1.30	.7	1.28
Clupeidae	Herring/shad	3	0.30	1	1.30	-	-
Ariopsis felis	Hardhead catfish	6	.60	1	1.30	.2	.37
Opsanus sp.	Toadfish	95	9.57	8	10.39	2.2	4.02
Belonidae	Needlefishes	6	.60	2	2.60	-	-
Fundulus sp.	Killifish	153	15.41	10	12.99	.5	.91
cf. *Lutjanus synagris*	Lane snapper	2	.20	1	1.30	-	-
Lutjanus griseus	Mangrove snapper	1	.10	1	1.30	-	-
Orthopristis chrysoptera	Pigfish	5	.50	3	3.90	.2	.37
Calamus artifrons	Grass porgy	2	.20	1	1.30	.1	.18
Lagodon rhomboides	Pinfish	47	4.73	24	31.17	.3	.55
Bairdiella chrysoura	Silver perch	9	.91	5	6.49	.1	.18
Cynoscion sp.	Sea trout	12	1.21	4	5.19	2.6	4.75
Leiostomus xanthurus	Spot	5	.50	5	6.49	-	-
Sciaenops ocellatus	Red drum	3	.30	1	1.30	.1	.18
Mugil sp.	Mullet	1	.10	1	1.30	-	-
Diodontidae	Burrfishes	14	1.41	1	1.30	3.7	6.76
Ostraciidae	Boxfishes	1	.10	1	1.30	-	-
Total Actinopterygii		917	92.33	71	92.22	21.1	38.56
Total Vertebrata		993	100.00	77	100.00	54.7	100.00
Grand Total		2614		711		4416.3	

[1]UID Actinopterygii resorted.

Table E-9. Faunal remains from Bird Island (8DI52) TU 3 Str VI, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	136.4	19.56
Crassostrea virginica	Eastern oyster	117	40.07	36	22.93	495.0	71.00
Polymesoda caroliniana	Marsh clam	1	.34	1	.64	4.3	.62
Total Bivalvia		118	40.41	37	23.57	499.3	71.62
Littorina sp.	Periwinkle	106	36.30	88	56.05	28.8	4.13
Crepidula sp.	Slippersnail	1	.34	1	.64	-	-
Melongena corona	Crown conch	13	4.45	6	3.82	31.4	4.50
Boonea impressa	Impressed odostome	15	5.14	15	9.55	-	-
Polygyroidea	Land snails	3	1.03	3	1.91	.4	.06
Haplotrema concava	Lancetooth	1	.34	1	.64	-	-
Total Gastropoda		139	47.6	114	72.61	60.6	8.69
Balanidae	Barnacles	35	11.99	6	3.82	.9	.13
Total Arthropoda		35	11.99	6	3.82	.9	.13
Total Invertebrata		292	100.00	157	100.00	697.2	100.00
Vertebrata	UID Vertebrates	-	-	-	-	1.3	10.48
Didelphis virginanus	Opossum	1	.11	1	4.35	.6	4.84
Total Mammalia		1	.11	1	4.35	.6	4.84
Serpentes	Snakes	1	.11	1	4.35	-	-
Testudines	Turtles	20	2.19	1	4.35	.7	5.65
Total Reptilia		21	2.30	2	8.70	.7	5.65
Chondrichthyes	Sharks/rays	9	.98	1	4.35	.1	.81
Total Chondrichthyes		9	.98	1	4.35	.1	.81
Actinopterygii	UID Fishes	834	91.15	-	-	8.4	67.74
Opsanus sp.	Toadfish	6	.66	3	13.04	.3	2.42
Belonidae	Needlefishes	1	.11	1	4.35	-	-
Fundulus sp.	Killifish	19	2.08	4	17.39	-	-
cf. *Lepomis gulosus*	Warmouth	1	.11	1	4.35	-	-
cf. *Orthopristis chrysoptera*	Pigfish	1	.11	1	4.35	-	-
Lagodon rhomboides	Pinfish	8	.87	4	17.39	-	-
Sciaenidae	Drums/croakers	3	.33	1	4.35	.2	1.61
Cynoscion sp.	Sea trout	2	.22	1	4.35	.5	4.03
Mugil sp.	Mullet	2	.22	1	4.35	.1	.81
Diodontidae	Burrfishes	5	.55	1	4.35	.2	1.61
Ostraciidae	Boxfishes	2	.22	1	4.35	-	-

Table E-9. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Total Actinopterygii		884	96.63	19	82.62	9.7	78.22
Total Vertebrata		915	100.00	23	100.00	12.4	100.00
Grand Total		1207		180		709.6	

Table E-10. Faunal remains from Bird Island (DI52) TU 3 Fea-02, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	510.0	37.02
Crassostrea virginica	Eastern oyster	256	61.54	36	30.25	718.1	52.12
Dinocardium robustum	Atlantic giant cockle	2	.48	1	.84	1.0	.07
Total Bivalvia		258	62.02	37	31.09	719.1	52.19
Modulus modulus	Buttonsnail	2	.48	2	1.68	-	-
Littorina sp.	Periwinkle	32	7.69	31	26.05	11.3	.83
Neverita duplicata	Sharkseye	1	.24	1	.84	7.2	.52
Busycotypus spiratus	Pear whelk	1	.24	1	.84	2.3	.17
Melongena corona	Crown conch	35	8.41	30	25.21	125.3	9.09
Nassarius vibex	Bruised nassa	1	.24	1	.84	.1	.01
Boonea impressa	Impressed odostome	2	.48	2	1.68	-	-
Total Gastropoda		74	17.78	68	57.14	146.2	10.62
Balanidae	Barnacles	84	20.19	14	11.76	2.4	.17
Total Arthropoda		84	2019	14	11.76	2.4	.17
Total Invertebrata		416	100.00	119	100.00	1377.7	100.00
Carnivora	Carnivore	2	.04	1	1.11	0.1	.10
Rodentia	Rodents	3	.05	1	1.11	-	-
Total Mammalia		5	.09	2	2.22	.1	.10
Aves	Birds	2	.04	1	1.11	.4	.39
Total Aves		2	.04	1	1.11	.4	.39
Serpentes	Snakes	8	.14	1	1.11	.1	.10
Testudines	Turtles	55	.97	-	-	5.0	4.82
Emydidae	Pond turtles	1	.02	1	1.11	.2	.19
Kinosternidae	Mud/musk turtles	2	.04	1	1.11	.3	.29
Total Reptilia		66	1.17	3	3.33	5.6	5.40
Chondrichthyes	Sharks/rays	2	.04	-	-	.1	.10
Dasyatis sp.	Whiptail stingray	24	.42	1	1.11	.2	.19
Total Chondrichthyes		26	.46	1	1.11	.3	.29
Actinopterygii	UID Fishes	5246	92.19	-	-	82.1	79.09
Lepisosteus sp.	Gar	21	.37	1	1.11	.6	.58
Clupeidae	Herring/shad	14	.25	2	2.22	-	-
Ariopsis felis	Hardhead catfish	28	.49	4	4.44	3.9	3.75
Opsanus sp.	Toadfish	65	1.15	6	6.67	4.8	4.62
Belonidae	Needlefishes	4	.08	2	2.22	-	-

Table E-10. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Fundulus sp.	Killifish	98	1.72	6	6.67	.4	.39
cf. *Lepomis gulosus*	Warmouth	5	.09	3	3.33	-	-
Caranx sp.	Jack	2	.04	1	1.11	.2	.19
Orthopristis chrysoptera	Pigfish	2	.04	2	2.22	-	-
Calamus artifrons	Grass porgy	6	.11	3	3.33	.4	.39
Lagodon rhomboides	Pinfish	57	1.00	31	34.44	.3	.29
Bairdiella chrysoura	Silver perch	17	.30	12	13.33	.3	.29
Cynoscion sp.	Sea trout	5	.09	1	1.11	.4	.39
Leiostomus xanthurus	Spot	3	.06	3	3.33	-	-
Sciaenops ocellatus	Red drum	9	.16	2	2.22	4	3.85
Mugil sp.	Mullet	4	.07	2	2.22	-	-
Paralichthys sp.	Flounders	4	.08	1	1.11	-	-
Ostraciidae	Boxfishes	1	.02	1	1.11	-	-
Total Actinopterygii		5591	98.31	83	92.19	93.8	93.83
Total Vertebrata		5690	100.00	90	100.00	103.8	100.00
Grand Total		6106		209		1481.5	

Table E-11. Faunal remains from Bird Island (8DI52) TU 3 Fea-03 Gastropod fill, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	164.5	7.46
Crassostrea virginica	Eastern oyster	21	11.17	6	5.77	14.7	.67
Total Bivalvia		21	11.14	6	5.77	14.7	.67
Modulus modulus	Buttonsnail	1	.53	1	.96	-	-
Littorina sp.	Periwinkle	4	2.13	2	1.92	.2	.01
Crepidula sp.	Slippersnail	2	1.06	2	1.92	.2	.01
cf. *Seila adamsi*	Minature cerith	3	1.60	3	2.88	-	-
Busycon contrarium	Lightning whelk	15	7.98	15	14.42	2022.2	91.66
Melongena corona	Crown conch	7	3.72	4	3.85	3.3	.15
Boonea impressa	Impressed odostome	26	13.83	26	25.00	-	-
Polygyroidea	Land snails	4	2.13	4	3.85	-	-
Glyphyalinia umbilicata	Texas glyph	1	.53	1	.96	-	-
Haplotrema concava	Lancetooth	13	6.91	13	12.50	-	-
Lobosculum pustula	Grooved liptooth	10	5.32	10	9.62	-	-
Triodopsis hopetonensis	Magnolia threetooth	4	2.13	4	3.85	-	-
Total Gastropoda		90	47.87	85	8173	2025.9	91.83
Balanidae	Barnacles	77	40.96	13	12.50	1.0	.05
Total Arthropoda		77	40.96	13	12.50	1.0	.05*T*
Total Invertebrata		188	100.00	104	100.00	2206.1	100.00
Vertebrata	UID Vertebrates	-	-	-	-	.8	5.03
Rodentia	Rodents	7	.43	1	3.57	-	-
Total Mammalia		7	.43	1	3.57	-	-
Serpentes	Snakes	2	.12	1	3.57	-	-
Total Reptilia		2	.12	1	3.57	-	-
Euselachii	Sharks	4	.24	1	3.57	-	-
Rajiformes	Rays/skates	4	.24	1	3.57	-	-
Total Chondrichthyes		8	.48	2	7.14	-	-
Actinopterygii	UID Fishes	1508	92.23	-	-	14.2	89.31
Lepisosteus sp.	Gar	1	.06	1	3.57	-	-
Clupeidae	Herring/shad	2	.12	1	3.57	-	-
Ariopsis felis	Hardhead catfish	1	.06	1	3.57	.4	2.52
Opsanus sp.	Toadfish	14	.86	1	3.57	.2	1.26
Belonidae	Needlefishes	4	.24	2	7.14	-	-
Fundulus sp.	Killifish	49	3.00	2	7.14	.2	1.26

Table E-11. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Orthopristis chrysoptera	Pigfish	2	.12	1	3.57	-	-
Lagodon rhomboides	Pinfish	32	1.96	12	42.86	.1	0.63
Bairdiella chrysoura	Silver perch	4	.24	2	7.14	-	-
Ostraciidae	Boxfishes	1	.06	1	3.57	-	-
Total Actinopterygii		1618	98.95	24	85.7	15.1	94.98
Total Vertebrata		1635	100.00	28	100.00	15.9	100.00
Grand Total		1823		132		2222.0	

Table E-12. Faunal remains from Bird Island (8DI52) TU 3 Fea-03 SE portion, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	835.9	37.73
Mytilidae	Mussels	1	.21	1	.52	-	-
Crassostrea virginica	Eastern oyster	291	61.52	77	39.90	1199.3	54.14
Total Bivalvia		292	61.73	78	40.42	1199.3	54.14
Modulus modulus	Buttonsnail	2	.42	2	1.04	.2	.01
Littorina sp.	Periwinkle	51	10.78	35	18.13	19.3	.87
Cerithiopsidae	Marine snails	2	.42	2	1.04	-	-
Melongena corona	Crown conch	56	11.84	31	16.06	159.9	7.22
Astyris lunata	Lunar dovesnail	1	.21	1	.52	-	-
Boonea impressa	Impressed odostome	30	6.34	30	15.54	-	-
Gastrocopta contracta	Bottleneck snaggletooth	1	.21	1	.52	-	-
Hawaii miniscula	Minute gem	6	1.27	6	3.11	-	-
Helicodiscus parallelus	Compound coil	2	.42	2	1.04	-	-
Total Gastropoda		151	31.91	110	57.00	179.4	8.1
Balanidae	Barnacles	30	6.34	5	2.59	.6	.03
Total Arthropoda		30	6.34	5	2.59	.6	.03
Total Invertebrata		473	100.00	193	100.00	2215.2	100.00
Vertebrata	UID Vertebrates	-	-	-	-	3.1	10.87
Sigmodon hispidus	Hispid cotton rat	5	.28	1	2.33	.1	.35
Total Mammalia		5	.28	1	2.33	.1	.35
Aves	Birds	1	.06	1	2.33	.1	.35
Total Aves		1	.06	1	2.33	.1	.35
Serpentes	Snakes	5	.28	1	2.33	.2	.70
Testudines	Turtles	3	.17	1	2.33	.2	.70
Total Reptilia		8	.45	2	4.66	.4	1.40
Chondrichthyes	Sharks/rays	9	.50	1	2.33	.2	.70
Total Chondrichthyes		9	.50	1	2.33	.2	.70
Actinopterygii	UID Fishes	1654	92.61	-	-	21.7	76.11
Lepisosteus sp.	Gar	1	.06	1	2.33	-	-
Clupeidae	Herring/shad	1	.06	1	2.33	-	-
Ariopsis felis	Hardhead catfish	11	.62	2	4.65	.2	.74
Opsanus sp.	Toadfish	23	1.29	4	9.30	.7	2.46
Belonidae	Needlefishes	1	.06	1	2.33	-	-
Fundulus sp.	Killifish	32	1.79	7	16.28	.1	.35

Table E-12. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Archosargus probatocephalus	Sheepshead	1	.06	1	2.33	.1	.35
Calamus artifrons	Grass porgy	2	.11	1	2.33	-	-
Lagodon rhomboides	Pinfish	24	1.34	11	25.58	.3	1.05
Bairdiella chrysoura	Silver perch	9	.50	5	11.63	.1	.35
Mugil sp.	Mullet	2	.11	2	4.65	.1	.35
Chilomycterus schoepfii	Striped burrfish	1	.06	1	2.33	1.3	4.56
Ostraciidae	Boxfishes	1	.06	1	2.33	-	-
Total Actinopterygii		1763	98.73	38	88.4	24.6	86.32
Total Vertebrata		1786	100.00	43	100.00	28.51	100.00
Grand Total		2259		236		2243.71	

Table E-13. Faunal remains from Bird Island (8DI52) TU 3 Fea-03 SW portion, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	594.7	20.51
Argopecten sp.	Scallops	1	.12	1	.40	2.6	.09
Crassostrea virginica	Eastern oyster	619	73.17	109	43.08	1741.1	60.06
Total Bivalvia		617	73.29	110	43.48	1743.7	60.15
Gastropoda	UID Gastropod	3	.35	1	.40	5.2	.18
Modulus modulus	Buttonsnail	3	.35	3	1.19	.4	.01
Littorina sp.	Periwinkle	34	4.02	22	8.70	17.4	.60
Crepidula sp.	Slippersnail	1	.12	1	.40	-	-
Cerithiopsidae	Marine snails	1	.12	1	.40	-	-
cf. *Seila adamsi*	Minature cerith	1	.12	1	.40	-	-
Triphoridae	Triphorid	1	.12	1	.40	-	-
Melongena corona	Crown conch	121	14.30	69	27.27	536.9	18.52
Nassarius vibex	Bruised nassa	1	.12	1	.40	-	-
Marginella sp.	Marginella	1	.12	1	.40	-	-
Boonea impressa	Impressed odostome	31	3.66	31	12.25	.1	-
Polygyroidea	Land snails	5	.59	5	1.98	-	-
Haplotrema concava	Lancetooth	2	.24	2	.79	-	-
Total Gastropoda		205	24.23	139	54.98	560.0	19.31
Balanidae	Barnacles	21	2.48	4	1.58	.6	.02
Total Arthropoda		21	2.48	4	1.58	.6	.02
Total Invertebrata		846	100.00	253	100.00	2899	100.00
Vertebrata	UID Vertebrates	-	-	-	-	.9	2.89
Sigmodon hispidus	Hispid cotton rat	4	.18	1	2.70	.1	.32
Total Mammalia		4	.18	1	2.70	.1	.32
Serpentes	Snakes	4	.18	1	2.70	-	-
Testudines	Turtles	2	.09	1	2.70	.1	.32
Total Reptilia		6	.27	2	5.40	.1	.32
Actinopterygii	UID Fishes	2135	93.93	-	-	26.1	83.92
Lepisosteus sp.	Gar	8	.35	1	2.70	.1	.32
Elops saurus	Ladyfish	1	.04	1	2.70	-	-
Clupeidae	Herring/shad	1	.04	1	2.70	-	-
Ariidae	Sea catfishes	2	.09	-	-	-	-
Bagre marinus	Gafftopsail catfish	3	.13	1	2.70	.2	.64
Opsanus sp.	Toadfish	33	1.45	2	5.41	1.6	5.14

Table E-13. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Fundulus sp.	Killifish	19	.84	2	2.70	-	-
Orthopristis chrysoptera	Pigfish	1	.04	1	2.70	-	-
Archosargus probatocephalus	Sheepshead	1	.04	1	2.70	.3	.96
Calamus sp.	Porgy	7	.31	3	8.11	.7	2.25
Lagodon rhomboides	Pinfish	26	1.14	14	37.84	.2	.64
Bairdiella chrysoura	Silver perch	15	.66	3	8.11	.3	.96
Cynoscion sp.	Sea trout	2	.09	2	5.41	.5	1.61
Mugil sp.	Mullet	3	.13	1	2.70	-	-
Ostraciidae	Boxfishes	6	.26	1	2.70	-	-
Total Actinopterygii		2263	99.54	34	89.18	30	96.44
Total Vertebrata		2273	100.00	37	100.00	31.1	100.00
Grand Total		3119		290		2930.1	

Table E-14. Faunal remains from Cat Island (8DI29) TU 1 Str VA, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	275.3	26.64
Crassostrea virginica	Eastern oyster	151	31.52	36	43.90	395.3	38.24
Polymesoda caroliniana	Marsh clam	321	67.01	39	47.56	362.4	35.06
Total Bivalvia		472	98.53	75	91.46	757.7	73.3
Crepidula sp.	Slippersnail	1	.21	1	1.22	-	-
Busycon contrarium	Lightning whelk	1	.21	1	1.22	.6	.06
Boonea impressa	Impressed odostome	3	.63	3	3.66	-	-
Gastrocopta pellucida	Slim snaggletooth	1	.21	1	1.22	-	-
Polygyroidea	Land snails	1	.21	1	1.22	-	-
Total Gastropoda		7	1.47	7	8.54	.6	.06
Total Invertebrata		479	100.00	82	100.00	1033.6	100.00
Vertebrata	UID Vertebrates	-	-	-	-	1.6	3.96
Alligator mississippiensis	Alligator	1	.11	1	7.14	1.1	2.79
Testudines	Turtles	17	1.90	2	14.29	5.1	12.96
Total Reptilia		18	2.01	3	21.43	6.2	15.75
Chondrichthyes	Sharks/rays	5	.56	1	7.14	-	-
Total Chondrichthyes		5	.56	1	7.14	-	-
Actinopterygii	UID Fishes	823	92.06	-	-	28.9	73.42
Lepisosteus sp.	Gar	32	3.58	1	7.14	.8	2.03
Ariidae	Sea catfishes	2	.22	1	7.14	-	-
Ariopsis felis	Hardhead catfish	6	.67	2	14.29	.4	1.02
Fundulus sp.	Killifish	1	.11	1	7.14	-	-
cf. *Lepomis* sp.	Warmouth	1	.11	1	7.14	-	-
Archosargus probatocephalus	Sheepshead	1	.11	1	7.14	.4	1.02
Lagodon rhomboides	Pinfish	3	.33	1	7.14	.1	.25
Pogonias cromis	Black drum	1	.11	1	7.14	.5	1.27
Sciaenops ocellatus	Red drum	1	.11	1	7.14	.5	1.27
Total Actinopterygii		871	97.41	10	71.41	31.6	80.28
Total Vertebrata		894	100.00	14	100.00	39.6	100.00
Grand Total		1373		96		1072.96	

Table E-15. Faunal remains from Cat Island (8DI29) TU 1 Str VB, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	211.34	27.61
Crassostrea virginica	Eastern oyster	73	25.44	21	38.18	233.9	30.56
Polymesoda caroliniana	Marsh clam	213	74.22	33	60.00	308.9	40.36
Total Bivalvia		286	99.66	54	98.18	542.8	71.92
Melongena corona	Crown conch	1	.35	1	1.82	11.3	1.48
Total Gastropoda		1	.35	1	1.82	11.3	1.48
Total Invertebrata		287	100.00	55	100.00	765.44	100.00
Testudines	Turtles	27	2.41	1	5.88	3.7	9.37
Total Reptilia		27	2.41	1	5.88	3.7	9.37
Chondrichthyes	Sharks/rays	2	.18	1	5.88	-	-
Total Chondrichthyes		2	.18	1	5.88	-	-
Actinopterygii	UID Fishes	1039	92.69	-	-	32.5	82.28
Lepisosteus sp.	Gar	16	1.43	1	5.88	.1	.25
Ariidae	Sea catfishes	10	.89	1	5.88	.3	.76
Caranx sp.	Jack	1	.09	1	5.88	-	-
Archosargus probatocephalus	Sheepshead	5	.45	1	5.88	1.1	2.78
Lagodon rhomboides	Pinfish	5	.45	2	11.76	.1	.25
Bairdiella chrysoura	Silver perch	1	.09	1	5.88	-	-
Leiostomus xanthurus	Spot	1	.09	1	5.88	-	-
Micropogonias undulatus	Atlantic croaker	2	.18	2	11.76	-	-
Pogonias cromis	Black drum	1	.09	1	5.88	.2	.51
Sciaenops ocellatus	Red drum	4	.36	3	17.65	.9	2.28
Mugil sp.	Mullet	7	.62	1	5.88	.6	1.52
Total Actinopterygii		1092	97.43	15	88.21	35.8	90.63
Total Vertebrata		1121	100.00	17	100.00	39.5	100.00
Grand Total		1408		72		804.94	

Table E-16. Faunal remains from Cat Island (8DI29) TU 1 Str VC, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	84.3	19.13
Crassostrea virginica	Eastern oyster	81	45.51	17	50.00	246.9	56.02
Polymesoda caroliniana	Marsh clam	87	48.88	12	35.29	103.6	23.51
Total Bivalvia		168	94.39	29	85.29	350.5	79.53
Gastropoda	UID Gastropod	3	1.69	-	-	1.6	.36
Busycon contrarium	Lightning whelk	1	.56	1	2.94	.6	.14
Melongena corona	Crown conch	1	.56	1	2.94	3.6	.82
Boonea impressa	Impressed odostome	2	1.12	2	5.88	-	-
Total Gastropoda		7	3.93	4	11.76	5.8	1.32
Balanidae	Barnacles	3	1.69	1	2.94	.1	.02
Total Arthropoda		3	1.69	1	2.94	.1	.02
Total Invertebrata		178	100.00	34	100.00	440.7	100.00
Vertebrata	UID Vertebrates	-	-	-	-	1.4	3.73
Aves	Birds	1	.10	1	5.26	-	-
Total Aves		1	.10	1	5.26	-	-
Serpentes	Snakes	1	.10	1	5.26	-	-
Testudines	Turtles	17	1.71	1	5.26	2.8	7.47
Total Reptilia		18	1.81	2	10.52	2.8	7.47
Chondrichthyes	Sharks/rays	5	.50	-	-	-	-
Euselachii	Sharks	2	.20	1	5.26	-	-
Rajiformes	Rays/skates	4	.40	-	-	-	-
Dasyatis sp.	Rays	1	.10	1	5.26	-	-
Total Chondrichthyes		12	1.2	2	10.52	-	-
Actinopterygii	UID Fishes	910	91.64	-	-	30.8	82.13
Lepisosteus sp.	Gar	28	2.82	1	5.26	.1	.27
Elops saurus	Ladyfish	1	.10	1	5.26	-	-
Ariopsis felis	Hardhead catfish	6	.60	4	21.05	.8	2.13
Caranx sp.	Jack	2	.20	1	5.26	.2	.53
Orthopristis chrysoptera	Pigfish	1	.10	1	5.26	-	-
Archosargus probatocephalus	Sheepshead	3	.30	1	5.26	1.2	3.20
Lagodon rhomboides	Pinfish	3	.30	1	5.26	-	-
Bairdiella chrysoura	Silver perch	2	.20	1	5.26	-	-
Cynoscion sp.	Sea trout	1	.10	1	5.26	.2	.53
Mugil sp.	Mullet	5	.50	2	10.53	-	-

Table E-16. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Total Actinopterygii		962	96.86	14	73.66	333	88.79
Total Vertebrata		993	100.00	19	100.00	37.5	100.00
Grand Total		1171		53		478.2	

Table E-17. Faunal remains from Cat Island (8DI29) TU 2 Str IVB, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	81.9	21.35
Crassostrea virginica	Eastern oyster	42	91.30	20	83.33	298.3	77.74
cf. *Polymesoda caroliniana*	Marsh clam	1	2.17	1	4.17	.5	.13
Total Bivalvia		43	93.47	21	87.50	298.8	77.87
cf. *Melongena corona*	Crown conch	1	2.17	1	4.17	3.0	.78
Polygyra cereolus	Southern flatcoil	1	2.17	1	4.17	-	-
Total Gastropoda		2	4.34	2	8.34	3.0	.78
Balanidae	Barnacles	1	2.17	1	4.17	-	-
Total Arthoproda		1	2.17	1	4.17	-	-
Total Invertebrata		46	100.00	24	100.00	383.7	100.00
Chondrichthyes	Sharks/rays	1	.18	1	25.00	-	-
Total Chondrichthyes		1	.18	1	25.00	-	-
Actinopterygii	UID Fishes	553	97.36	-	-	16.5	99.40
Lepisosteus sp.	Gar	12	2.11	1	25.00	.1	.6
Lagodon rhomboides	Pinfish	2	.35	2	50.00	-	-
Total Actinopterygii		567	98.82	3	75.00	16.6	99.46
Total Vertebrata		568	100.00	4	100.00	17	100.00
Grand Total		614		28		400.0	

Table E-18. Faunal remains from Cat Island (8DI29) TU 2 Str V, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	132.1	20.21
Crassostrea virginica	Eastern oyster	171	93.96	38	86.36	505.4	77.34
Polymesoda caroliniana	Marsh clam	8	4.40	3	6.82	8.4	1.28
Total Bivalvia		179	98.36	41	93.18	513.8	78.62
Crepidula sp.	Slippersnail	1	.55	1	2.27	-	-
Melongenidae	Whelks/conches	1	.55	1	2.27	7.6	1.16
Boonea impressa	Impressed odostome	1	.55	1	2.27	-	-
Total Gastropoda		3	1.65	3	6.81	7.6	1.16
Total Invertebrata		182	100.00	44	100.00	653.5	100.00
Vertebrata	UID Vertebrates	-	-	-	-	3.4	5.09
Rodentia	Rodents	2	.11	-	-	-	-
Oryzomys palustris	Marsh rice rat	1	.05	1	5.88	-	-
Total Mammalia		3	.16	1	5.88	-	-
Serpentes	Snakes	2	.11	1	5.88	.1	.12
Testudines	Turtles	22	1.17	-	-	2.6	3.89
Emydidae	Pond turtles	3	.16	1	5.88	3.8	5.78
Kinosternidae	Mud/musk turtles	3	.16	1	5.88	.9	1.41
Total Reptilia		30	1.60	3	17.64	7.4	11.20
Chondrichthyes	Sharks/rays	12	.64	-	-	.47	.71
Rajiformes	Rays/skates	1	.05	1	5.88	.1	.14
Total Chondrichthyes		13	.69	1	5.88	.48	.85
Actinopterygii	UID Fishes	1785	94.55	-	-	44.9	68.16
Lepisosteus sp.	Gar	21	1.12	1	5.88	1.2	1.8
Ariopsis felis	Hardhead catfish	10	.53	2	11.76	2.4	3.57
Archosargus probatocephalus	Sheepshead	15	.79	3	17.65	5.5	8.35
cf. *Calamus* sp.	Porgy	2	.11	1	5.88	.1	.15
Lagodon rhomboides	Pinfish	3	.16	2	11.76	.1	.11
Bairdiella chrysoura	Silver perch	3	.16	1	5.88	.2	.24
Leiostomus xanthurus	Spot	1	.05	1	5.88	-	-
Sciaenops ocellatus	Red drum	2	.11	1	5.88	.3	.47
Total Actinopterygii		1842	97.58	12	70.57	54.7	82.85
Total Vertebrata		1888	100.00	17	100.00	65.9	100.00
Grand Total		2070		61		719.4	

Table E-19. Faunal remains from Cat Island (8DI29) TU 2 Str VIA, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	117.3	10.20
Crassostrea virginica	Eastern oyster	251	79.43	69	63.30	1006.3	87.47
Polymesoda caroliniana	Marsh clam	22	6.96	3	2.75	26.5	2.30
Total Bivalvia		273	86.39	72	66.05	1032.8	89.77
Gastropoda	UID marine gastropod	1	.32	1	.92	-	-
Crepidula sp.	Slippersnail	2	.63	2	1.83	-	-
Boonea impressa	Impressed odostome	21	6.65	21	19.27	-	-
Oligogyra orbiculata	Globular drop	2	.63	2	1.83	-	-
Polygyra cereolus	Southern flatcoil	2	.63	2	1.83	.1	.01
cf. *Haplotrema concava*	Lancetooth	4	1.27	4	3.67	-	-
Hawaii miniscula	Minute gem	3	.95	3	2.75	-	-
Total Gastropoda		35	11.08	35	32.1	.1	.01
Balanidae	Barnacles	8	2.53	2	1.83	.3	.03
Total Arthropoda		8	2.53	2	1.83	.3	.03
Total Invertebrata		316	100.00	109	100.00	1151	100.00
Rodentia	Rodents	1	.04	1	5.00	-	-
Total Mammalia		1	.04	1	5.00	-	-
Serpentes	Snakes	3	.11	1	5.00	.1	.10
Testudines	Turtles	12	.45	1	5.00	3.6	3.74
Total Reptilia		15	.56	2	10.00	3.7	3.84
Chondrichthyes	Sharks/rays	2	.07	-	-	.1	.10
Rajidae	Rays	5	.19	1	5.00	-	-
Total Chondrichthyes		7	.26	1	5.00	.1	.10
Actinopterygii	UID Fishes	2591	97.08	-	-	76.5	79.44
Lepisosteus sp.	Gar	15	.56	1	5.00	-	-
Ariidae	Sea catfishes	5	.19	1	5.00	-	-
Bagre marinus	Gafftopsail catfish	3	.11	1	5.00	1.4	1.45
Opsanus sp.	Toadfish	1	.04	1	5.00	-	-
Fundulus sp.	Killifish	3	.11	1	5.00	-	-
Centropristis striata	Black sea bass	1	.04	1	5.00	.1	.10
Caranx sp.	Jack	1	.04	1	5.00	4.2	4.36
Archosargus probatocephalus	Sheepshead	13	.49	2	10.00	9.6	9.97
Lagodon rhomboides	Pinfish	5	.19	3	15.00	-	-
Cynoscion sp.	Sea trout	1	.04	1	5.00	.5	.52

Table E-19. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Leiostomus xanthurus	Spot	1	.04	1	5.00	-	-
Sciaenops ocellatus	Red drum	2	.07	1	5.00	-	-
Mugil sp.	Mullet	4	.15	1	5.00	.2	.21
Total Actinopterygii		2646	99.15	16	80	92.5	96.05
Total Vertebrata		2669	100.00	20	100.00	96.3	100.00
Grand Total		2985		129		1247.8	

Table E-20. Faunal remains from Cat Island (8DI29) TU 2 Str VIB, 1 mm and larger

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	282.6	20.48
Mytilidae	Mussels	1	.29	1	.57	.1	.01
Crassostrea virginica	Eastern oyster	247	70.57	87	49.71	1079	78.18
Ostrea equestris	Crested oyster	4	1.14	3	1.71	1.4	.10
Parastarte triquetra	Brown gem clam	1	.29	1	.57	-	-
Polymesoda caroliniana	Marsh clam	5	1.43	2	1.14	12.1	.88
Total Bivalvia		258	73.72	94	53.7	1092.6	79.17
Gastropoda	UID small marine gastropod	3	.86	3	1.71	-	-
Crepidula sp.	Slippersnails	4	1.14	4	2.29	-	-
cf. *Bittiolum varium*	Grass cerith	1	.29	1	.57	-	-
Triphoridae	Triphorid	1	.29	1	.57	-	-
Melongena corona	Crown conch	1	.29	1	.57	4.3	.31
cf. *Costoanachis* sp.	Dovesnail	1	.29	1	.57	-	-
Boonea impressa	Impressed odostome	41	11.71	41	23.43	.1	.01
cf. Hydrobiidae	Marine snails	1	.29	1	.57	-	-
cf. *Odostomia* sp.	Ovoid odostome	2	.57	2	1.14	-	-
Melampus sp.	Melampus	1	.29	1	.57	-	-
Polygyroidea	Land snails	1	.29	1	0.57	-	-
Haplotrema concava	Lancetooth	3	.86	3	1.71	-	-
Hawaii miniscula	Minute gem	18	5.14	18	10.29	-	-
Total Gastropoda		78	22.31	78	44.56	4.4	.32
Balanidae	Barnacles	14	4.00	3	1.71	.5	.04
Total Arthropoda		14	4.00	3	1.71	.5	.04
Total Invertebrata		350	100.00	175	100.00	1380	100.00
Serpentes	Snakes	1	.03	1	4.76	-	-
Testudines	Turtles	6	.15	1	4.76	3	3.46
Total Reptilia		7	.18	2	9.52	3	3.45
Euselachii	Sharks	3	.08	1	4.76	-	-
Rajiformes	Rays/skates	5	.13	1	4.76	.2	.23
Total Chondrichthyes		8	.21	2	9.52	.2	.23
Actinopterygii	UID Fishes	3869	98.57	-	-	75.9	87.54
Lepisosteus sp.	Gar	12	.31	1	4.76	.9	1.04
Ariopsis felis	Hardhead catfish	7	.18	2	9.52	1.9	2.19
Fundulus sp.	Killifish	2	.05	1	4.76	-	-

Table E-20. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
cf. *Lepomis* sp.	Warmouth	1	.03	1	4.76	-	-
cf. *Caranx* sp.	Jack	1	.03	1	4.76	.3	.35
Archosargus probatocephalus	Sheepshead	7	.18	2	9.52	4.4	5.07
Lagodon rhomboides	Pinfish	4	.10	4	19.05	-	-
Bairdiella chrysoura	Silver perch	2	.05	1	4.76	-	-
cf. *Sciaenops ocellatus*	Red drum	1	.03	1	4.76	-	-
Leiostomus xanthurus	Spot	1	.03	1	4.76	-	-
Mugil sp.	Mullet	1	.03	1	4.76	-	-
Ostraciidae	Boxfishes	2	.05	1	4.76	.1	.12
Total Actinopterygii		3910	99.64	17	80.93	83.5	96.31
Total Vertebrata		3925	100.00	21	100.00	86.7	100.00
Grand Total		4275		196		1466.8	

Table E-21. Faunal remains from Cat Island (8DI29) TU 2 Str VIC, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	354.7	23.43
Mytilidae	Mussels	7	1.82	3	1.52	.1	.01
Crassostrea virginica	Eastern oyster	206	53.51	73	37.06	1127.5	74.48
Ostrea equestris	Crested oyster	1	.26	1	.51	.2	.01
Polymesoda caroliniana	Marsh clam	7	1.82	2	1.02	18.3	1.21
Total Bivalvia		221	57.41	79	40.11	1146.1	75.71
Crepidula sp.	Slippersnails	4	1.04	4	2.03	.2	.01
Cerithiopsidae	Marine snails	1	.26	1	.51	-	-
Seila adamsi	Seila snail	1	.26	1	.51	-	-
Triphoridae	Triphorid	1	.26	1	.51	-	-
Melongenidae	Whelks/conchs	1	.26	1	.51	3.7	.24
Melongena corona	Crown conch	3	.78	2	1.02	6.1	.40
cf. Hydrobiidae	Marine snails	1	.26	1	.51	-	-
Boonea impressa	Impressed odostome	39	10.13	39	19.80	.1	.01
cf. *Odostomia* sp.	Ovoid odostome	6	1.56	6	3.05	-	-
cf. *Melampus* sp.	Melampus	1	.26	1	.51	-	-
cf. *Oligogyra orbiculata*	Globular drop	1	.26	1	.51	.1	.01
Gastrocopta pellucida	Slim snaggletooth	3	.78	3	1.52	-	-
Polygyroidea	Land snails	7	1.82	7	3.55	.2	.01
Haplotrema concava	Land snails	3	.78	3	1.52	-	-
Hawaii miniscula	Minute gem	38	9.87	38	19.29	.1	.01
Total Gastropoda		110	28.58	109	55.35	10.5	.69
Balanidae	Barnacles	54	14.03	9	4.57	2.6	.17
Total Gastropoda		54	14.03	9	4.57	2.6	.17
Total Invertebrata		385	100.00	197	100.00	1514	100.00
Vertebrata	UID Vertebrates	-	-	-	-	.5	.63
Serpentes	Snakes	2	.08	1	6.67	.1	.13
Testudines	Turtles	2	.08	1	6.67	1.1	1.39
Total Reptilia		4	.16	2	13.34	1.2	1.52
Chondrichthyes	Sharks/rays	2	.08	1	6.67	-	-
Total Chondricthyes		2	.08	1	6.67	-	-
Actinopterygii	UID Fishes	2565	97.60	-	-	62.6	78.84
Lepisosteus sp.	Gar	9	.34	1	6.67	.1	.13
Ariopsis felis	Hardhead catfish	5	.19	1	6.67	.6	.76

Table E-21. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Fundulus sp.	Killifish	1	.04	1	6.67	-	-
cf. *Lepomis* sp.	Warmouth	1	.04	1	6.67	-	-
Archosargus probatocephalus	Sheepshead	21	.80	2	13.33	13.9	17.51
Lagodon rhomboides	Pinfish	1	.04	1	6.67	-	-
Bairdiella chrysoura	Silver perch	2	.08	1	6.67	-	-
Cynoscion sp.	Sea trout	1	.04	1	6.67	.2	.25
Sciaenops ocellatus	Red drum	1	.04	1	6.67	.1	.13
Mugil sp.	Mullet	4	.15	1	6.67	.1	.13
Ostraciidae	Boxfishes	11	.42	1	6.67	.1	.13
Total Actinopterygii		2622	99.78	12	80.03	77.7	97.88
Total Vertebrata		2628	100.00	15	100.00	79.4	100.00
Grand Total		3013		212		1593.3	

Table E-22. Faunal remains from Little Bradford Island (8DI32) TU 2 Str IVA, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	496.2	33.41
Mytilidae	Mussels	3	.69	1	.81	-	-
Crassostrea virginica	Eastern oyster	131	30.18	32	26.02	531.4	35.78
Ostrea equestris	Crested oyster	1	.23	1	.81	-	-
Polymesoda caroliniana	Marsh clam	184	42.40	34	27.64	455.7	30.68
Total Bivalvia		319	73.5	68	55.28	987.1	66.46
Crepidula sp.	Slippersnail	1	.23	1	.81	-	-
cf. *Bittiolum varium*	Grass cerith	2	.46	2	1.63	-	-
cf. *Astyris lunata*	Lunar dovesnail	1	.23	1	.81	-	-
cf. Hydrobiidae	Marine snails	1	.23	1	.81	-	-
cf. *Cerithidea* sp.	Horn snail	3	.69	3	2.44	-	-
Boonea impressa	Impressed odostome	18	4.15	18	14.63	-	-
cf. *Odostomia* sp.	Ovoid odostome	1	.23	1	.81	-	-
cf. *Melampus* sp.	Melampus	1	.23	1	.81	-	-
Polygyroidea	Land snails	7	1.61	7	5.69	-	-
cf. *Haplotrema concava*	Lancetooth	3	.69	3	2.44	-	-
cf. *Hawaii miniscula*	Minute gem	4	.92	4	3.25	-	-
Total Gastropoda		42	9.67	42	34.13	-	-
Balanidae	Barnacles	73	16.82	13	10.57	1.9	.13
Total Arthropoda		73	16.82	13	10.57	1.9	.13
Total Invertebrata		434	100.00	123	100.00	1485.2	100.00
Testudines	Turtles	1	.06	1	12.50	.8	1.87
Total Reptilia		1	.06	1	12.50	.8	1.87
Chondrichthyes	Sharks/rays	11	.65	-	-	.2	.47
Rajiformes	Rays/skates	6	.36	1	12.50	-	-
Total Chondrichthyes		17	1.01	1	12.50	.2	.47
Actinopterygii	UID Fishes	1634	96.86	-	-	37.8	88.32
Lepisosteus sp.	Gar	18	1.07	1	12.50	.4	.93
Bagre marinus	Gafftopsail catfish	9	.53	1	12.50	1.4	3.27
Fundulus sp.	Killifish	1	.06	1	12.50	-	-
Archosargus probatocephalus	Sheepshead	4	.24	1	12.50	1.9	4.44
Cynoscion sp.	Sea trout	1	.06	1	12.50	.3	.70
Mugil sp.	Mullet	2	.12	1	12.50	-	-
Total Actinopterygii		1669	98.94	6	75	41.8	97.66

Table E-22. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Total Vertebrata		1687	100.00	8	100.00	42.8	100.00
Grand Total		2121		131		1528.0	

Table E-23. Faunal remains from Deer Island (8LV75) TU 2 Str II, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	649.8	32.35
Mytilidae	Mussels	1	.13	1	.27	.1	-
Crassostrea virginica	Eastern oyster	455	59.95	138	37.30	1274.1	63.43
Total Bivalvia		456	60.08	139	37.57	1274.2	63.43
Gastropoda	UID gastropod	6	.79	1	.27	4.2	.21
Gastropoda	UID small marine gastropod	10	1.32	10	2.70	-	-
Truncatella sp.	Truncatella	4	.53	4	1.08	-	-
Crepidula sp.	Slippersnail	23	3.03	23	6.22	.4	.02
Neverita duplicata	Sharkseye	4	.53	2	.54	15.6	.78
Cerithiopsidae	Marine snails	3	.40	3	.81	-	-
Seila adamsi	Seila snail	2	.26	2	.54	-	-
Triphoridae	Triphorid	1	.13	1	.27	-	-
Melongena corona	Crown conch	14	1.84	7	1.89	60.7	3.02
cf. Hydrobiidae	Marine snails	1	.13	1	.27	-	-
Columbellidae	Dovesnail	5	.66	5	1.35	-	-
Parvanachis ostreicola	Oyster dovesnail	1	.13	1	.27	-	-
Boonea impressa	Impressed odostome	86	11.33	86	23.24	.4	.02
Gastrocopta contracta	Bottleneck snaggletooth	4	.53	4	1.08	-	-
Oligogyra orbiculata	Globular drop	2	.26	2	.54	.2	.01
Polygyroidea	Land snails	34	4.48	28	7.57	2.3	.11
Haplotrema concava	Lancetooth	35	4.61	26	7.03	-	-
Hawaii miniscula	Minute gem	16	2.11	16	4.32	-	-
Total Gastropoda		251	33.07	222	59.99	83.8	417
Balanidae	Barnacles	52	6.85	9	2.43	.8	.04
Total Arthropoda		52	6.85	9	2.43	.8	.04
Total Invertebrata		759	100.00	370	100.00	2008.6	100.00
Rodentia	Rodents	7	.55	1	14.29	.1	1.04
Total Mammalia		7	.55	1	14.29	.1	1.04
Anolis sp.	Anolis lizards	2	.16	1	14.29	-	-
Total Reptilia		2	.16	1	14.29	-	-
Actinopterygii	UID Fishes	1261	98.82	-	-	9.4	97.92
Lepisosteus sp.	Gar	1	.08	1	14.29	-	-
Ariidae	Sea catfishes	1	.08	1	14.29	-	-
Fundulus sp.	Killifish	2	.16	1	14.29	-	-

Table E-23. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Bairdiella chrysoura	Silver perch	1	.08	1	14.29	.1	1.04
Ostraciidae	Boxfishes	1	.08	1	14.29	-	-
Total Actinopterygii		1267	99.3	5	71.45	9.5	98.96
Total Vertebrata		1276	100.00	7	100.00	9.6	100.00
Grand Total		2035		377		2018.2	

Table E-24. Faunal remains from Shell Mound (8LV42) TU 1 Str V - Upper, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata[1]	Invertebrates	-	-	-	-	557.4	8.16
Mytilidae	Mussels	46	.51	4	.18	1.8	.03
Argopecten sp.	Scallop	3	.03	3	.14	11.1	.16
Crassostrea virginica	Eastern oyster	2276	30.93	557	25.31	5906.6	86.44
Ostrea equestris	Crested oyster	42	.47	22	1.00	20.7	30
Dinocardium robustum	Giant Atlantic cockle	3	.03	1	.05	5.6	.08
Parastarte triquetra	Brown gem clam	1	.01	1	.05	-	-
Total Bivalvia		2871	31.99	588	26.72	6503.2	95.17
Gastropoda	UID marine gastropod	4	.04	4	.18	-	-
Gastropoda	UID gastropods	8	.09	1	.05	11.8	.17
cf. *Cerithium* sp.	Cerith	1	.01	1	.05	-	-
Crepidula sp.	Slippersnails	284	3.16	284	12.9	4.7	.07
Vermetidae	Worm snails	1	.02	1	.05	-	-
Cerithiopsidae	Marine snails	38	.42	38	1.73	.1	-
cf. *Seila adamsi*	Minature cerith	1	.01	1	.05	-	-
Triphoridae	Triphorid	19	.21	19	86	-	-
Urosalpinx perrugata	Gulf oyster drill	1	.01	1	.05	.3	-
Busycon contrarium	Lightning whelk	4	.04	1	.05	10.3	.15
Melongena corona	Crown conch	8	.09	5	.23	158.6	2.32
Nassarius vibex	Bruised nassa	1	.01	1	.05	-	-
Fasciolaris sp.	Tulip	6	.07	5	.23	27.1	.40
Astyris lunata	Lunar dovesnail	19	.21	19	.86	-	-
cf. *Costoanachis* sp.	Dovesnail	2	.02	2	.09	-	-
Parvanachis ostreicola	Oyster dovesnail	2	.02	2	.09	-	-
Prunum apicinum	Common Atlantic Marginella	1	.01	1	.05	-	-
Bittolum varium	Grass cerith	8	.09	8	.36	-	-
Boonea impressa	Impressed odostome	353	3.93	353	16.04	1.4	.02
cf. *Cerithidea* sp.	Horn snail	1	.01	1	.05	-	-
Gastrocopta pellucida	Slim snaggletooth	3	.03	3	.14	-	-
Polygyroidea	Land snails	17	.19	17	.77	.1	-
cf. *Haplotrema concava*	Land snails	4	.04	4	.18	-	-
Hawaii miniscula	Minute gem	15	.17	15	.68	-	-
Total Gatropoda		801	8.92	787	35.76	214.4	3.14
Balanidae	Barnacles	5287	58.90	823	37.39	114.2	1.67

Table E-24. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Decapoda	Crabs	17	.19	3	.14	1.2	.02
Total Arthropoda		5304	59.09	826	3753	115.4	1.69
Total Invertebrata		8976	100.00	2201	100.00	6833.0	100.00
Vertebrata	UID Vertebrates	-	-	-	-	5.7	23.36
Rodentia	Rodents	3	.30	1	6.25	-	-
Total Mammalia		3	.30	1	6.25	-	-
Chondrichthyes	Sharks/rays	4	.40	1	6.25	-	-
Total Chondrichthyes		4	.40	1	6.25	-	-
Actinopterygii[1]	UID Fishes	811	94.96	-	-	13.0	53.28
Elops saurus	Ladyfish	2	.20	1	6.25	-	-
Clupeidae	Shads/Herrings	4	.40	1	6.25	-	-
Ariidae	Sea catfishes	3	.30	2	12.50	.3	1.23
Opsanus sp.	Toadfish	1	.10	1	6.25	.1	.41
Fundulus sp.	Killifish	1	.10	1	6.25	-	-
Caranx cryos	Blue runner	3	.30	1	6.25	.2	.82
Caranx hippos	Crevalle jack	4	.40	1	6.25	.9	3.69
Lagodon rhomboides	Pinfish	7	.70	2	12.50	.1	.41
Cynoscion sp.	Sea trout	2	.20	1	6.25	-	-
Pogonias cromis	Black drum	1	.10	1	6.25	3.8	15.57
Mugil sp.	Mullet	7	.70	1	6.25	.3	1.23
Ostraciidae	Boxfishes	1	.10	1	6.25	-	-
Total Actinopterygii		847	99.18	14	87.50	18.7	76.64
Total Vertebrata		854	100.00	16	100.00	24.4	100.00
Grand Total		9830		2217		6857.4	

[1]UID Actinopterygii and UID Invertebrata resorted.

Table E-25. Faunal remains from Shell Mound (8LV42) TU 1 Str V - Lower, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	1143.2	14.72
Mytilidae	Mussels	35	.55	13	.53	.6	.01
Argopecten sp.	Scallops	1	.02	1	.04	-	-
Crassostrea virginica	Eastern oyster	1018	15.87	409	16.57	6353.9	81.80
Ostrea equestris	Crested oyster	85	1.33	44	1.78	92.5	1.19
Parastarte triquetra	Brown gem clam	5	.08	3	.12	-	-
Total Bivalvia		1144	17.85	470	19.04	6447	83.00
Gastropoda	UID marine gastropod	4	.06	4	.16	-	-
Cerithium sp.	Cerith	4	.06	4	.16	-	-
Crepidula sp.	Slippersnail	758	11.82	758	30.70	8.2	.11
Cerithiopsidae	Marine snails	26	.41	26	1.05	-	-
Seila adamsi	Seila snail	7	.11	7	.28	-	-
Triphoridae	Triphorid	26	.41	26	1.05	-	-
Urosalpinx perrugata	Gulf oyster drill	3	.05	3	.12	1.2	.02
Melongena corona	Crown conch	3	.05	3	.12	63.9	.82
Nassarius vibex	Bruised nassa	1	.02	1	.04	-	-
Astyris lunata	Lunar dovesnail	31	.48	31	1.26	-	-
Parvanachis ostreicola	Oyster dovesnail	8	.12	8	.32	-	-
Prunum apicinum	Common Atlantic Marginella	1	.02	1	.04	-	-
Bittolum varium	Grass cerith	14	.22	14	.57	-	-
Boonea impressa	Impressed odostome	403	6.28	403	16.32	1.7	.02
Odostomia sp.	Ovoid odostome	2	.03	2	.08	-	-
cf. Hydrobiidae	Mud snails	1	.02	1	.04	-	-
cf. *Cerithidea* sp.	Horn snail	1	.02	1	.04	-	-
Gastrocopta contracta	Bottleneck snaggletooth	2	.03	2	.08	-	-
Gastrocopta pellucida	Slim snaggletooth	3	.05	3	.12	-	-
Polygyroidea	Land snail	22	.34	22	.89	.1	-
Glyphyalinia umbilicata	Texas glyph	13	.20	13	.53	-	-
Hawaii miniscula	Minute gem	49	.76	49	1.98	-	-
Total Gastropoda		1382	21.56	1382	55.95	75.1	.97
Balanidae	Barnacles	3877	60.45	616	24.95	101.9	1.31
Decapoda	Crabs	11	.17	1	.04	.1	-
Total Arthropoda		3888	60.62	617	24.99	102.0	1.31
Total Invertebrata		6414	100.00	2469	100.00	7767.3	100.00

Table E-25. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Vertebrata	UID Vertebrates	-	-	-	-	42.0	69.42
Aves	Birds	1	.22	1	1.96	.5	.83
Total Aves		1	.22	1	1.96	.5	.83
Kinosternidae	Mud/Musk turtles	1	.22	1	1.96	.2	.83
Total Reptilia		1	.22	1	1.96	.2	.83
Chondrichthyes	Sharks/rays	1	.22	1	1.96	-	-
Total Chondrichthyes		1	.22	1	1.96	-	-
Actinopterygii[1]	UID Fishes	284	62.14	-	-	6.9	11.40
Elops saurus	Ladyfish	13	2.84	1	1.96	.2	.33
Clupeidae	Shads/Herrings	4	.88	1	1.96	-	-
Ariidae	Sea catfish	53	11.60	16	31.37	1.5	2.48
Opsanus sp.	Toadfish	2	.44	1	1.96	-	-
Fundulus sp.	Killifish	1	.22	1	1.96	-	-
cf. *Lepomis* sp.	Warmouth	1	.22	1	1.96	-	-
Caranx hippos	Crevalle jack	39	8.53	3	5.88	6.5	10.74
Orthopristis chrysoptera	Pigfish	3	.66	2	3.92	-	-
Lagodon rhomboides	Pinfish	28	6.13	16	31.37	.1	.17
Bairdiella chrysoura	Silver perch	3	.66	2	3.92	.2	.33
Cynoscion sp.	Sea trout	3	.66	2	3.92	1.0	1.65
Leiostomus xanthurus	Spot	1	.22	1	1.96	-	-
Mugil sp.	Mullet	19	4.19	1	1.96	1.4	2.31
Total Actinopterygii		454	99.39	48	94.10	17.8	29.41
Total Vertebrata		457	100.00	51	100.00	60.5	100.00
Grand Total		8798		2520		7821.6	

[1]UID Actinopterygii resorted.

Table E-26. Faunal remains from Shell Mound (8LV42) TU 1 Str VIA, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	320.7	15.56
Mytilidae	Mussels	1	.09	1	.29	-	-
Crassostrea virginica	Eastern oyster	525	48.88	147	42.73	1666.4	80.88
Ostrea equestris	Crested oyster	14	1.30	7	2.03	3.6	.17
Cyrtopleura costata	Angelwing	1	.09	1	.29	.4	.02
Mercenaria sp.	Quahog clam	1	.09	1	.29	38.3	1.86
Total Bivalvia		542	50.45	157	45.63	1708.7	82.93
Littorina sp.	Periwinkle	1	.09	1	.29	.3	.01
Crepidula sp.	Slippersnails	19	1.77	19	5.52	.1	-
Melongena corona	Crown conch	3	.28	2	.58	24.1	1.17
Boonea impressa	Impressed odostome	72	6.70	72	20.93	.2	.01
cf. *Cerithidea* sp.	Horn snail	1	.09	1	.29	-	-
Gastrocopta contracta	Bottleneck snaggletooth	2	.19	2	.58	-	-
Gastrocopta pellucida	Slim snaggletooth	4	.37	4	1.16	-	-
Polygyroidea	Land snails	3	.28	3	.87	-	-
Haplotrema concava	Lancetooth	5	.47	5	1.45	-	-
Hawaii miniscula	Minute gem	9	.84	9	2.62	-	-
Total Gastropoda		119	11.08	118	34.29	24.7	1.19
Balanidae	Barnacles	412	38.36	68	19.77	6.3	.31
Decapoda	Crabs	1	.09	1	.29	-	-
Total Arthropoda		413	38.45	69	20.06	6.3	.31
Total Invertebrata		1074	100.00	344	100.00	2060.4	100.00
Vertebrata	UID Vertebrates	-	-	-	-	9.1	76.47
Aves	Birds	3	1.56	1	5.88	-	-
Total Aves		3	1.56	1	5.88	-	-
Testudines	Turtles	5	2.60	1	5.88	.9	7.56
Total Testudines		5	2.60	1	5.88	.9	7.56
Chondrichthyes	Sharks/rays	12	6.25	1	5.88	.2	1.68
Total Chondrichthyes		12	6.25	1	5.88	.2	1.68
Actinopterygii[1]	UID Fishes	113	58.85	-	-	1.5	12.61
Lepisosteus sp.	Gar	8	4.17	1	5.88	-	-
Clupeidae	Shads/Herrings	1	.52	1	5.88	-	-
Ariidae	Sea catfishes	3	1.56	1	5.88	-	-
Opsanus sp.	Toadfish	2	1.04	1	5.88	-	-

Table E-26. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Fundulus sp.	Killifish	26	13.54	2	11.76	-	-
Carangidae	Jack	1	.52	1	5.88	-	-
Orthopristis chrysoptera	Pigfish	1	.52	1	5.88	-	-
Lagodon rhomboides	Pinfish	8	4.17	4	23.53	-	-
Bairdiella chrysoura	Silver perch	1	.52	1	5.88	-	-
Mugil sp.	Mullet	8	4.17	1	5.88	.2	1.68
Total Actinopterygii		172	89.58	14	82.33	1.7	14.29
Total Vertebrata		708	100.00	17	100.00	12.6	100.00
Grand Total		1782		361		2073.0	

[1]UID Actinopterygii resorted.

Table E-27. Faunal remains from Shell Mound (8LV42) TU 2 Str II, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	466.7	7.20
Mytilidae	Mussels	44	.79	12	.78	1.4	.02
Crassostrea virginica	Eastern oyster	723	13.05	410	26.52	5751.8	88.75
Ostrea equestris	Crested oyster	21	.38	10	.65	6.8	.10
Cyrtopleura costata	Angelwing	2	.04	1	.06	2.2	.03
Parastarte triquetra	Brown gem clam	1	.02	1	.06	-	-
Mercenaria sp.	Quahog clam	2	.04	1	.06	57.4	.89
Total Bivalvia		793	14.32	435	28.13	5819.6	89.79
Gastropoda	UID small marine gastropod	3	.05	3	.19	-	-
Cerithium eburneum	Ivory cerith	1	.02	1	.06	.7	.01
Crepidula sp.	Slippersnails	164	2.96	164	10.61	2.6	.04
Cerithiopsidae	Marine snails	32	.58	32	2.07	-	-
cf. *Bittiolum varium*	Grass cerith	5	.09	5	.32	-	-
Triphoridae	Triphorid	3	.05	3	.19	-	-
Busycon contrarium	Lightning whelk	2	.04	2	.13	61.3	.95
Melongena corona	Crown conch	6	.11	4	.26	9.2	.14
Astyris lunata	Lunar dovesnail	15	.27	15	.97	-	-
cf. *Cerithidea* sp.	Horn snail	1	.02	1	.06	-	-
cf. *Costoanachis* sp.	Dovesnail	4	.07	4	.26	-	-
cf. Hydrobiidae	Marine snails	1	.02	1	.06	-	-
Boonea impressa	Impressed odostome	124	2.24	124	8.02	.2	-
Gastrocopta pellucida	Slim snaggletooth	1	.02	1	.06	-	-
Polygyroidea	Land snails	7	.13	7	.45	-	-
Haplotrema concava	Lancetooth	5	.09	5	.32	-	-
Hawaii miniscula	Minute gem	8	.14	8	.52	-	-
Total Gastropoda		382	6.90	380	2455	74.0	1.14
Balanidae	Barnacles	4359	78.65	728	47.09	120.1	1.85
Decapoda	Crabs	4	.07	1	.06	-	-
Menippe sp.	Stone crab	4	.07	2	.13	.8	.01
Total Arthropoda		4367	78.79	731	47.28	120.9	1.86
Total Invertebrata	.	5542	100.00	1546	100.00	6481.2	100.00
Vertebrata	UID Vertebrates	-	-	-	-	12.0	46.88
cf. Mammalia	Mammals	1	.71	1	7.14	-	-
Total Mammalia		1	.71	1	7.14	-	-

Table E-27. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
cf. Kinosternidae	Mud/musk turtles	5	3.57	1	7.14	2.7	10.55
Total Reptilia		5	3.57	1	7.14	2.7	10.55
Amphibia	UID Amphibian	2	1.43	1	7.14	-	-
Total Amphibia		2	1.43	1	7.14	-	-
Chondrichthyes	Sharks/rays	3	2.14	-	-	.3	1.17
Euselachii	Sharks	1	.71	1	7.14	-	-
Total Chondrichthyes		4	2.85	1	7.14	.3	1.17
Actinopterygii[1]	UID Fishes	69	49.29	-	-	3.0	11.72
Elops saurus	Ladyfish	7	5.0	1	7.14	-	-
Clupeidae	Shads/Herrings	2	1.43	1	7.14	-	-
Ariidae	Sea catfishes	1	.71	-	-	-	-
Ariopsis felis	Hardhead catfish	7	5.00	1	7.14	.8	3.13
Fundulus sp.	Killifish	5	3.57	1	7.14	-	-
Caranx crysos	Bluerunner	2	1.43	1	7.14	.3	1.17
Caranx hippos	Crevalle jack	9	6.43	1	7.14	1.4	5.47
Lagodon rhomboides	Pinfish	1	.71	1	7.14	-	-
Cynoscion sp.	Sea trout	2	1.43	1	7.14	.2	.78
Pogonias cromis	Black drum	19	13.57	1	7.14	4.1	16.02
Mugil sp.	Mullet	4	2.86	1	7.14	.8	3.13
Total Actinopterygii		128	91.43	10	71.4	10.6	41.42
Total Vertebrata		140	100.00	14	100.00	25.6	100.00
Grand Total		6056		1560		6504.3	

[1]UID Actinopterygii resorted.

Table E-28. Faunal remains from Shell Mound (8LV42) TU 2 Str III, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	589.6	8.15
Mytilidae	Mussels	55	2.54	9	1.17	4.9	.07
Crassostrea virginica	Eastern oyster	731	33.78	437	56.75	6359.8	87.91
Ostrea equestris	Crested oyster	31	1.43	19	2.47	21.7	.30
Total Bivalvia		817	37.75	465	60.39	6386.4	88.28
Crepidula sp.	Slippersnails	30	1.39	30	3.90	.5	.01
Cerithiopsidae	Marine snails	1	.05	1	.13	-	-
Melongena corona	Crown conch	19	.88	11	1.43	228.3	3.16
Astyris lunata	Lunar dovesnail	1	.05	1	.13	-	-
Parvanachis ostreicola	Oyster dovesnail	2	.09	2	.26	-	-
Boonea impressa	Impressed odostome	40	1.85	40	5.19	.1	-
Gastrocopta pellucida	Slim snaggletooth	1	.05	1	.13	-	-
Polygyroidea	Land snails	1	.05	1	.13	-	-
cf. *Haplotrema concava*	Land snails	2	.09	2	.26	-	-
Total Gastropoda		97	4.50	89	11.56	228.9	3.17
Balanidae	Barnacles	1240	57.30	212	27.53	29.0	.40
Decapoda	Crabs	10	.46	4	.52	.4	.01
Total Arthropoda		1250	57.76	216	28.05	29.4	.41
Total Invertebrata		2164	100.00	770	100.00	7234.3	100.00
Serpentes	Snakes	1	.11	1	6.67	.1	.46
Testudines	Turtles	4	.43	1	6.67	.2	.92
Total Reptilia		5	.54	2	13.34	.3	1.38
Actinopterygii	UID Fishes	862	92.69	-	-	16.7	76.96
Ariopsis felis	Hardhead catfish	7	.75	1	6.67	1.0	4.61
Fundulus sp.	Killifish	12	1.29	3	20.00	-	-
Lepomis sp.	Warmouth	1	.11	1	6.67	-	-
Caranx hippos	Crevalle jack	23	2.47	1	6.67	2.3	10.60
Orthopristis chrysoptera	Pigfish	1	.11	1	6.67	-	-
Lagodon rhomboides	Pinfish	2	.22	1	6.67	-	-
Bairdiella chrysoura	Silver perch	1	.11	1	6.67	-	-
Cynoscion sp.	Sea trout	3	.32	1	6.67	.7	3.23
Sciaenops ocellatus	Red drum	3	.32	1	6.67	.3	1.38
Mugil sp.	Mullet	10	1.08	2	13.33	.4	1.84
Total Actinopterygii		925	99.47	13	86.69	21.4	98.62

Table E-28. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Total Vertebrata		930	100.00	15	100.00	21.7	100.00
Grand Total		3094		785		7256.0	

Table E-29. Faunal remains from Shell Mound (8LV42) TU 2 Str IV, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	355.9	4.59
Bivalvia	UID Bivalves	2	.04	2	.14	-	-
Mytilidae	Mussels	11	.19	6	.41	-	-
Crassostrea virginica	Eastern oyster	995	17.53	459	31.40	7162.2	92.42
Ostrea equestris	Crested oyster	11	.19	6	.41	3.5	.05
Parastarte triquetra	Brown gem clam	1	.02	1	.07	-	-
Total Bivalvia		1020	17.97	474	32.43	7165.7	92.47
Gastropoda	UID small marine gastropod	1	.02	1	.07	-	-
Urosalpinx sp.	Oyster drills	2	.04	2	.14	-	-
Crepidula sp.	Slippersnails	88	1.55	88	6.02	2.8	.04
Neverita duplicata	Sharkseye	1	.02	1	.07	1.6	.02
Cerithiopsidae	Marine snails	4	.07	4	.27	-	-
cf. *Bittiolum varium*	Grass cerith	1	.02	1	.07	-	-
Seila adamsi	Seila snail	2	.04	2	.14	-	-
Triphoridae	Triphorid	2	.04	2	.14	-	-
Melongena corona	Crown conch	4	.07	4	.27	137.5	1.77
Astyris lunata	Lunar dovesnail	1	.02	1	.07	-	-
cf. Hydrobiidae	Marine snails	1	.02	1	.07	-	-
Parvanachis ostreicola	Oyster dovesnail	3	.05	3	.21	-	-
Boonea impressa	Impressed odostome	111	1.96	111	7.59	.4	.01
cf. *Odostomia* sp.	Ovoid odostome	1	.02	1	.07	-	-
Gastrocopta pellucida	Slim snaggletooth	2	.04	2	.14	-	-
Polygyroidea	Land snails	3	.05	3	.21	-	-
Haplotrema concava	Lancetooth	2	.04	2	.14	-	-
Hawaii miniscula	Minute gem	1	.02	1	.07	-	-
Total Gastropoda		230	4.09	230	15.76	142.3	1.84
Balanidae	Barnacles	4421	77.88	756	51.71	85.8	1.11
Decapoda	Crabs	6	.11	2	.14	.1	-
Total Arthropoda		4427	77.99	758	51.85	85.9	1.11
Total Invertebrata		5677	100.00	1462	100.00	7749.8	100.00
Vertebrata	UID Vertebrates	39	8.16	1	7.14	-	-
Aves	Birds	4	.84	1	7.14	.4	4.49
Total Aves		4	.84	1	7.14	.4	4.49
Serpentes	Snakes	8	1.67	1	7.14	-	-

Table E-29. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Sirenidae	Sirens	1	.21	1	7.14	-	-
Testudines	Turtles	2	.42	2	14.29	.6	6.74
Total Reptilia		11	2.3	4	28.57	.6	6.74
Actinopterygii	UID Fishes	404	84.52	-	-	5.9	66.29
Clupeidae	Shads/Herrings	1	.21	1	7.14	-	-
Ariidae	Sea catfishes	3	.63	1	7.14	.2	2.25
Fundulus sp.	Killifish	5	1.05	1	7.14	-	-
Carangidae	Jack	1	.21	-	-	1.4	15.73
Caranx crysos	Bluerunner	2	.42	1	7.14	.1	1.12
Caranx hippos	Crevalle jack	4	.84	1	7.14	.2	2.25
Bairdiella chrysoura	Silver perch	1	.21	1	7.14	-	-
Mugil sp.	Mullet	2	.42	1	7.14	.1	1.12
Paralichthys sp.	Flounders	1	.21	1	7.14	-	-
Total Actinopterygii		424	88.72	8	57.12	7.9	88.76
Total Vertebrata		478	100.00	14	100.00	8.9	100.00
Grand Total		6155		1476		7758.7	

Table E-30. Faunal remains from Shell Mound (8LV42) TU 6 Str III E1/2, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	1422.6	35.80
Argopecten sp.	Scallops	1	.07	1	.18	.2	.01
Crassostrea virginica	Eastern oyster	862	63.34	216	39.06	2308.0	58.08
Ostrea equestris	Crested oyster	13	.96	4	.72	3.9	.10
Dinocardium robustum	Atlantic giant cockle	5	.37	1	.18	1.1	.03
Mercenaria sp.	Quahog clam	13	.96	2	.36	99.9	2.51
Total Bivalvia		894	65.7	224	40.50	2413.1	60.73
Cerithium muscarum	Flyspeck cerith	2	.15	2	.36	.1	-
Littorina sp.	Periwinkle	22	1.62	9	1.63	10.1	.25
Crepidula sp.	Slippersnails	52	3.82	52	9.40	3.7	.09
Cerithiopsidae	Marine snails	4	.29	4	.72	-	-
Triphoridae	Triphorid	3	.22	3	.54	-	-
cf. *Urosalpinx tampaensis*	Tampa oyster drill	3	.22	3	.54	.1	-
Melongena corona	Crown conch	48	3.53	15	2.71	121.6	3.06
Fasciolaridae	Tulips	1	.07	1	.18	-	-
Astyris lunata	Lunar dovesnail	6	.44	6	1.08	-	-
Parvanachis ostreicola	Oyster dovesnail	12	.88	12	2.17	-	-
Bittolum varium	Grass cerith	1	.07	1	.18	-	-
Boonea impressa	Impressed odostome	142	10.43	142	25.68	.3	.01
cf. *Gastrocopta contracta*	Bottleneck snaggletooth	6	.44	6	1.08	-	-
Gastrocopta pellucida	Slim snaggletooth	6	.44	6	1.08	-	-
Polygyroidea	Land snails	17	1.25	17	3.07	-	-
cf. *Helicodiscus parallelus*	Compound snail	19	1.40	19	3.44	-	-
cf. *Lobosculum pustula*	Land snails	9	.66	9	1.63	-	-
cf. *Zonitoides arboreus*	Quick gloss	3	.22	3	0.54	-	-
Total Gastropoda		356	26.15	310	56.03	135.9	3.41
Balanidae	Barnacles	111	8.16	19	3.44	2.2	.06
Total Arthropoda		111	8.16	19	3.34	2.2	.06
Total Invertebrata		1361	100.00	553	100.00	3973.8	100.00
Vertebrata	UID Vertebrates	-	-	-	-	1.9	2.66
Mammalia	Mammals	1	.03	1	2.56	.1	.14
Didelphis virgiana	Opossum	1	.03	1	2.56	1.3	1.82
Sigmodon hispidus	Hispid cotton rat	2	.07	1	2.56	-	-
Total Mammalia		4	1.3	3	7.68	1.4	1.96

Table E-30. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Aves	Birds	3	.10	1	2.56	.7	.98
Total Aves		3	.10	1	2.56	.7	.98
Serpentes	Snakes	1	.03	1	2.56	-	-
Total Serpentes		1	.03	1	2.56	-	-
Chondrichthyes	Sharks/rays	3	.10	-	-	-	-
Rajiformes	Rays/skates	11	.37	1	2.56	.2	.28
Total Chondrichthyes		14	.47	1	2.56	.2	.28
Actinopterygii	UID Fishes	2871	95.99	-	-	55.6	77.76
Lepisosteus sp.	Gar	26	.87	1	2.56	.3	.42
Elops saurus	Ladyfish	2	.07	1	2.56	.1	.14
Brevoortia smithi	Yellowfin menhaden	1	.03	1	2.56	.1	.14
Ariopsis felis	Hardhead catfish	9	.30	2	5.13	1.2	1.68
Opsanus sp.	Toadfish	2	.07	1	2.56	.1	.14
Fundulus sp.	Killifish	9	.30	1	2.56	-	-
Caranx sp.	Jack	2	.07	-	-	-	-
Caranx cryos	Bluerunner	4	.13	1	2.56	.2	.28
Caranx hippos	Crevalle jack	3	.10	1	2.56	2.8	3.92
cf. *Eucinostomus* sp.	Mojarra/jenny	1	.03	1	2.56	-	-
Archosargus probatocephalus	Sheepshead	2	.07	2	5.13	1.4	1.96
Calamus artifrons	Grass porgy	1	.03	1	2.56	-	-
Lagodon rhomboides	Pinfish	11	.37	9	23.08	.1	.14
Cynoscion sp.	Sea trout	3	.10	2	5.13	1.1	1.54
Leiostomus xanthurus	Spot	6	.20	3	7.69	-	-
Pogonias cromis	Black drum	2	.07	1	2.56	.8	1.12
Sciaenops ocellatus	Red drum	2	.07	1	2.56	2.9	4.06
Mugil sp.	Mullet	6	.20	2	5.13	.4	.56
Paralichthys sp.	Flounder	2	.07	1	2.56	.2	.28
Diodontidae	Burrfishes	4	.13	1	2.56	-	-
Total Actinopterygii		2969	99.27	33	84.57	67.3	94.14
Total Vertebrata		2991	100.00	39	100.00	71.5	100.00
Grand Total		4352		592		4045.3	

Table E-31. Faunal remains from Shell Mound (8LV42) TU 6 Str III W1/2, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	932.7	39.28
Argopecten sp.	Scallops	2	.28	2	.64	.3	.01
Crassostrea virginica	Eastern oyster	490	68.34	152	48.41	1283.7	54.06
Ostrea equestris	Crested oyster	6	.84	2	.64	3.3	.14
Plicatula gibbosa	Kittenpaw	1	.14	1	.32	.3	.01
Mercenaria sp.	Quahog clam	4	.56	1	.32	32.1	1.35
Total Bivalvia		503	70.16	158	50.33	1319.7	55.57
Gastropoda	UID marine gastropod	3	.42	3	.96	-	-
Crepidula sp.	Slippersnails	21	2.93	21	6.69	.4	.02
Cerithiopsidae	Marine snails	1	.14	1	.32	-	-
cf. *Seila adamsi*	Minature cerith	4	.56	4	1.27	-	-
Triphoridae	Triphorid	1	.14	1	.32	-	-
Urosalpinx sp.	Oyster drills	3	.42	3	.96	2.6	.11
Melongenidae	Whelks/conchs	5	.70	1	.32	13.2	.56
Melongena corona	Crown conch	11	1.53	9	2.87	104.6	4.41
Astyris lunata	Lunar dovesnail	3	.42	3	.96	-	-
cf. *Costoanachis* sp.	Dovesnail	1	.14	1	.32	-	-
Parvanachis ostreicola	Oyster dovesnail	8	1.12	8	2.55	-	-
cf. *Turritella* sp.	Turritella snail	1	.14	1	.32	-	-
Bittolum varium	Grass cerith	1	.14	1	.32	-	-
Boonea impressa	Impressed odostome	76	10.60	76	24.20	.2	.01
cf. *Cerithidea* sp.	Horn snail	1	.14	1	.32	-	-
Polygyroidea	Land snails	9	1.26	8	2.55	-	-
Haplotrema concava	Lancetooth	3	.42	3	.96	-	-
Total Gastropoda		152	21.22	145	46.21	121	5.11
Balanidae	Barnacles	62	8.65	11	3.50	1.1	.05
Total Arthropoda		62	8.65	11	3.50	1.1	.05
Total Invertebrata		717	100.00	314	100.00	2374.5	100.00
Vertebrata	UID Vertebrates	-	-	-	-	5.0	12.89
Rodentia	Rodents	2	.09	1	5.26	-	-
Total Mammalia		2	.09	1	5.26	-	-
Testudines	Turtles	1	.05	1	5.26	.2	.52
Total Reptilia		1	.05	1	5.26	.2	.52
Chondrichthyes	Sharks/rays	8	.38	-	-	.1	.26

Table E-31. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Euselachii	Sharks	1	.05	1	5.26	-	-
Rajiformes	Rays/skates	1	.05	1	5.26	.1	.26
Total Chondricthyes		10	.48	2	10.52	.2	.52
Actinopterygii	UID Fishes	2079	97.47	-	-	28.7	73.97
Lepisosteus sp.	Gar	6	.28	1	5.26	-	-
Clupeidae	Shads/Herrings	1	.05	1	5.26	-	-
Ariopsis felis	Hardhead catfish	8	.38	4	21.05	1.7	4.38
Fundulus sp.	Killifish	6	.28	1	5.26	-	-
Caranx sp.	Jack	7	.33	-	-	1.4	3.61
Caranx cryos	Bluerunner	1	.05	1	5.26	.1	.26
cf. *Eucinostomus* sp.	Mojarra/jenny	1	.05	1	5.26	-	-
Archosargus probatocephalus	Sheepshead	4	.19	3	15.79	1.4	3.61
Lagodon rhomboides	Pinfish	2	.09	1	5.26	-	-
Bairdiella chrysoura	Silver perch	3	.14	1	5.26	.1	.26
Mugil sp.	Mullet	2	.09	1	5.26	-	-
Total Actinopterygii		2120	99.40	15	78.92	33.4	86.09
Total Vertebrata		2133	100.00	19	100.00	38.8	100.00
Grand Total		2850		333		2413.3	

Table E-32. Faunal remains from Shell Mound (8LV42) TU 6 Str V, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	88.7	13.05
Ostreidae	Oysters	1	.42	-	-	1.5	.22
Crassostrea virginica	Eastern oyster	224	94.51	52	86.67	557.4	82.03
Total Bivalvia		225	94.93	52	86.67	558.9	82.25
Melongena corona	Crown conch	3	1.27	3	5.00	31.9	4.69
Boonea impressa	Impressed odostome	3	1.27	3	5.00	-	-
Hawaii miniscula	Minute gem	1	.42	1	1.67	-	-
Total Gastropoda		7	2.96	7	11.67	31.9	4.69
Balanidae	Barnacles	5	2.11	1	1.67	-	-
Total Arthopods		5	2.11	1	1.67	-	-
Total Invertebrata		237	100.00	60	100.00	679.5	100.00
Testudines	Turtles	3	1.16	1	14.29	1.2	22.22
Total Reptilia		3	1.16	1	14.29	1.2	22.22
Chondrichthyes	Sharks/rays	2	.77	1	14.29	-	-
Total Chondrichtyes		2	.77	1	14.29	-	-
Actinopterygii	UID Fishes	249	96.14	-	-	3.6	66.67
Ariidae	Sea catfishes	1	.39	1	14.29	0.6	11.11
Fundulus sp.	Killifish	1	.39	1	14.29	-	-
Lagodon rhomboides	Pinfish	1	.39	1	14.29	-	-
Mugil sp.	Mullet	1	.39	1	14.29	-	-
Ostraciidae	Boxfishes	1	.39	1	14.29	-	-
Total Actinopterygii		254	98.09	5	71.45	4.2	77.78
Total Vertebrata		259	100.00	7	100.00	5.4	100.00
Grand Total		496		67		684.9	

Table E-33. Faunal remains from Shell Mound (8LV42) TU 6 Fea-03, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	513.7	39.33
Crassostrea virginica	Eastern oyster	262	75.72	63	47.37	680.4	52.09
Dinocardium robustum	Giant Atlantic cockle	1	.29	1	.75	-	-
cf. *Mercenaria* sp.	Quahog clam	3	.87	1	.75	5.3	.41
Total Bivalvia		266	76.88	65	48.87	685.7	52.50
Gastropoda	UID small marine gastropod	3	.87	3	2.26	-	-
Modulus modulus	Buttonsnail	1	.29	1	.75	.1	.01
Littorina sp.	Periwinkle	2	.58	2	1.50	.5	.04
Crepidula sp.	Slippersnails	1	.29	1	.75	-	-
Neverita duplicata	Sharkseye	1	.29	1	.75	.9	.07
cf. *Cerithium* sp.	Cerith	1	.29	1	.75	-	-
Busycon contrarium	Lightning whelk	1	.29	1	.75	22.3	1.71
Melongena corona	Crown conch	10	2.89	5	3.76	81.8	6.26
Boonea impressa	Impressed odostome	3	.87	3	2.26	-	-
cf. Hydrobiidae	Marine snails	1	.29	1	.75	-	-
Euglandina rosea	Rosy wolfsnail	1	.29	1	.75	.3	.02
Gastrocopta contracta	Bottleneck snaggletooth	2	.58	2	1.50	-	-
Oligogyra orbiculata	Globular drop	1	.29	1	.75	.1	.01
Polygyroidea	Land snails	20	5.78	19	14.29	.4	.03
Haplotrema concava	Lancetooth	6	1.73	6	4.51	-	-
Hawaii miniscula	Minute gem	18	5.20	18	13.53	-	-
Total Gastropoda		72	20.82	66	49.61	106.4	8.15
Balanidae	Barnacles	8	2.31	2	1.50	.4	.03
Total Arthropoda		8	2.31	2	1.50	.4	.03
Total Invertebrata		346	100.00	133	100.00	1306.2	100.00
Vertebrata	UID Vertebrates	-	-	-	-	.4	3.54
cf. *Anolis* sp.	Anolis lizards	1	.13	1	25.00	-	-
Testudines	Turtles	2	.25	1	25.00	.2	1.77
Total Reptilia		3	.38	2	50.00	.2	1.77
Actinopterygii	UID Fishes	782	99.24	-	-	9.9	87.61
Fundulus sp.	Killifish	1	.13	1	25.00	-	-
Sciaenops ocellatus	Red drum	2	.25	1	25.00	.8	7.08
Total Actinopterygii		785	99.62	2	50.00	10.7	94.69
Total Vertebrata		788	100.00	4	100.00	11.3	100.00

Table E-33. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Grand Total		1134		137		1317.5	

Table E-34. Faunal remains from Shell Mound (8LV42) TU 6 Fea-07 E1/2, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	1080.1	28.01
Bivalvia	UID Bivalves	10	.35	3	.31	1.1	.03
Mytilidae	Mussels	10	.35	1	.10	.6	.02
Crassostrea virginica	Eastern oyster	755	26.32	206	21.04	2367.9	61.40
Ostrea equestris	Crested oyster	14	.49	4	.41	2.3	.06
Mercenaria sp.	Quahog clam	39	1.36	2	.20	115.8	3.00
Parastarte triquetra	Brown gem clam	1	.03	1	.10	-	-
Total Bivalvia		829	28.9	217	22.16	2487.7	64.51
Gastropoda	UID marine gastropod	15	.52	15	1.53	-	-
Gastropoda	UID Gastropod	6	.21	4	.41	2.0	.05
Crepidula sp.	Slippersnails	77	2.68	77	7.87	1.6	.04
Bittolum varium	Grass cerith	4	.14	4	.41	-	-
Cerithiopsidae	Marine snails	6	.21	6	.61	-	-
Cerithium sp.	Cerith	1	.03	1	.10	-	-
Seila adamsi	Seila snail	7	.24	7	.72	.1	-
Triphoridae	Triphorid	5	.17	5	.51	-	-
Urosalpinx sp.	Oyster drills	3	.10	3	.31	.6	.02
Melongena corona	Crown conch	27	.94	13	1.33	235.7	6.11
Astyris lunata	Lunar dovesnail	19	.66	19	1.94	-	-
cf. Hydrobiidae	Marine snails	10	.35	10	1.02	-	-
Parvanachis ostreicola	Oyster dovesnail	11	.38	11	1.12	.1	-
Prunum sp.	Marginella	1	.03	1	.10	.1	-
Boonea impressa	Impressed odostome	196	6.83	196	20.02	.3	.01
cf. *Cerithidea* sp.	Horn snail	5	.17	5	.51	-	-
cf. *Melampus* sp.	Melampus	1	.03	1	.10	-	-
Gastrocopta contracta	Bottleneck snaggletooth	4	.14	4	.41	-	-
Gastrocopta pellucida	Slim snaggletooth	20	.70	20	2.04	-	-
Oligogyra orbiculata	Globular drop	4	.14	4	.41	.3	.01
Polygyroidea	Southern flatcoil	28	.98	28	2.86	.6	.02
cf. *Haplotrema concava*	Lancetooth	24	.84	24	2.45	-	-
cf. *Hawaii miniscula*	Minute gem	56	1.95	56	5.72	.2	.01
cf. *Zonitoides arboreus*	Quick gloss	8	.28	8	.82	-	-
Total Gastropoda		538	18.72	522	53.32	241.6	6.27
Balanidae	Barnacles	1453	50.64	239	24.41	17.8	.46

Table E-34. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Decapoda	Crabs	49	1.71	1	.10	29.3	.76
Total Arthropoda		1502	52.35	240	24.51	47.1	1.22
Total Invertebrata		2869	100.00	979	100.00	3856.5	100.00
Vertebrata	UID Vertebrates	-	-	-	-	3.1	3.67
Rodentia	Rodents	4	.10	1	3.70	.1	.12
Total Mammalia		4	.10	1	3.70	.1	.12
Serpentes	Snakes	3	.07	1	3.70	.2	.24
Total Serpentes		3	.07	1	3.70	.2	.24
Chondrichthyes	Sharks/rays	15	.37	-	-	.3	.36
Euselachii	Sharks	1	.02	1	3.70	.1	.12
Rajiformes	Rays/skates	3	.07	1	3.70	.1	.12
Total Chondrichthyes		19	.46	2	7.40	.5	.60
Actinopterygii	UID Fishes	3939	97.65	-	-	73.9	87.46
Lepisosteus sp.	Gar	9	.22	1	3.70	.3	.36
Elops saurus	Ladyfish	2	.05	1	3.70	.1	.12
Ariopsis felis	Hardhead catfish	15	.37	2	7.41	1.3	1.54
Opsanus sp.	Toadfish	2	.05	1	3.7	-	-
Fundulus sp.	Killifish	4	.10	2	7.41	-	-
cf. *Orthopristis chrysoptera*	Pigfish	3	.07	2	7.41	-	-
Archosargus probatocephalus	Sheepshead	4	.10	1	3.70	2.8	3.31
Lagodon rhomboides	Pinfish	4	.10	3	11.11	.1	.12
Bairdiella chrysoura	Silver perch	1	.02	1	3.70	.1	.12
cf. *Leiostomus xanthurus*	Spot	1	.02	1	3.70	-	-
Sciaenops ocellatus	Red drum	3	.07	2	7.41	1.1	1.30
Mugil sp.	Mullet	18	.45	4	14.81	.8	.95
Paralichthys sp.	Flounders	1	.02	1	3.70	.1	.12
Diodontidae	Burrfishes	2	.05	1	3.70	-	-
Total Actinopterygii		4008	99.34	23	85.16	80.6	95.40
Total Vertebrata		4034	100.00	27	100.00	84.5	100.00
Grand Total		6903		1006		3941.0	

Table E-35. Faunal remains from Shell Mound (8LV42) TU 6 Fea-07 W1/2, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	1290.2	23.75
Bivalvia	UID Bivalves	1	.02	1	.06	-	-
Mytilidae	Mussels	73	1.46	4	.24	5.4	.10
Argopecten sp.	Scallops	1	.02	1	.06	.5	.01
Crassostrea virginica	Eastern oyster	920	18.37	273	16.59	3236.6	59.57
Ostrea equestris	Crested oyster	16	.32	4	.24	1.9	.03
Dinocardium robustum	Giant Atlantic cockle	2	.04	1	.06	.9	.02
Trachycardium sp.	Cockle	1	.02	1	.06	.1	-
Parastarte triquetra	Brown gem clam	2	.04	1	.06	-	-
Mercenaria sp.	Quahog clam	80	1.60	2	.12	537.5	9.89
Total Bivalvia		1096	21.89	288	17.49	3782.9	69.62
Gastropoda	UID Gastropod	23	.46	23	1.40	-	-
Littorina sp.	Periwinkle	2	.04	2	.12	1.8	.03
Truncatella sp.	Truncatella	15	.30	15	.91	.1	-
Crepidula sp.	Slippersnails	79	1.58	79	4.80	.7	.01
Cerithiopsidae	Marine snails	13	.26	13	.79	-	-
Cerithium sp.	Cerith	4	.08	4	.24	-	-
cf. *Bittiolum varium*	Grass cerith	16	.32	16	.97	-	-
Seila adamsi	Seila snail	7	.14	7	.43	-	-
Triphoridae	Triphorid	10	.20	10	.61	-	-
cf. *Urosalpinx* sp.	Oyster drills	1	.02	1	.06	-	-
Busycon sp.	Whelk	1	.02	1	.06	.2	-
Busycon contrarium	Lightning whelk	3	.06	2	.12	45.9	.84
Melongena corona	Crown conch	37	.74	14	.85	271.4	5.00
cf. *Nassarius vibex*	Bruised nassa	1	.02	1	.06	-	-
Astyris lunata	Lunar dovesnail	49	.98	49	2.98	.1	-
cf. *Costoanachis* sp.	Dovesnail	3	.06	3	.18	-	-
cf. Hydrobiidae	Marine snails	10	.20	10	.61	-	-
Parvanachis ostreicola	Oyster dovesnail	12	.24	12	.73	.1	-
Prunum sp.	Marginella	1	.02	1	.06	.3	.01
Boonea impressa	Impressed odostome	252	5.03	252	15.31	.3	.01
cf. *Cerithidea* sp.	Horn snail	5	.10	5	.30	-	-
Melampus sp.	Melampus	13	.26	13	.79	.8	.01
cf. *Gastrocopta contracta*	Bottleneck snaggletooth	8	.16	8	.49	-	-

Table E-35. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
cf. *Gastrocopta pellucida*	Slim snaggletooth	36	.72	36	2.19	-	-
Euglandina rosea	Rosy wolfsnail	1	.02	1	.06	.1	-
Oligogyra orbiculata	Globular drop	10	.20	10	.61	1.0	.02
Polygyroidea	Land snails	97	1.94	97	5.89	2.5	.05
Haplotrema concava	Lancetooth	51	1.02	51	3.10	-	-
Hawaii miniscula	Minute gem	132	2.64	132	8.02	.1	-
Total Gastropoda		892	17.83	868	52.74	325.4	5.98
Balanidae	Barnacles	3010	60.12	488	29.65	33.8	.62
Decapoda	Crabs	8	.16	1	.06	.5	.01
Menippe menippe	Stone crab	1	.02	1	.06	.5	.01
Total Arthropoda		3019	60.30	490	29.77	34.8	.64
Total Invertebrata		5007	100.00	1646	100.00	5433.3	100.00
Vertebrata	UID Vertebrates	-	-	-	-	2.4	1.89
Anolis sp.	Anolis lizards	2	.02	1	2.70	-	-
Testudines	Turtles	12	.15	1	2.70	1.6	1.26
Total Reptilia		14	.17	2	5.40	1.6	1.26
Chondrichthyes	Sharks/rays	1	.01	-	-	-	-
Rajiformes	Rays/skates	19	.23	1	2.70	.3	.24
Total Chondricthythes		20	.24	1	2.70	.3	.24
Actinopterygii	UID Fishes	8029	98.53	-	-	112.8	88.89
Lepisosteus sp.	Gar	10	.12	1	2.70	.6	.47
cf. *Acipenser* sp.	Sturgeon	1	.01	1	2.70	.2	.16
Clupeidae	Shads/Herrings	2	.02	1	2.70	-	-
Ariopsis felis	Hardhead catfish	8	.10	1	2.70	1.6	1.26
Opsanus sp.	Toadfish	1	.01	1	2.70	-	-
Belonidae	Needlefish	4	.05	1	2.70	.2	.16
Fundulus sp.	Killifish	4	.05	1	2.70	-	-
Caranx sp.	Jack	5	.06	1	2.70	.7	.55
cf. *Orthopristis chrysoptera*	Pigfish	1	.01	1	2.70	-	-
Archosargus probatocephalus	Sheepshead	2	.02	1	2.70	.8	.63
Calamus artifrons	Grass porgy	1	.01	1	2.70	-	-
Lagodon rhomboides	Pinfish	10	.12	10	27.03	-	-
Leiostomus xanthurus	Spot	4	.05	4	10.81	-	-
Micropogonias undulatus	Atlantic croaker	2	.02	1	2.70	-	-

Table E-35. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Sciaenops ocellatus	Red drum	3	.04	2	5.41	2.2	1.73
Mugil sp.	Mullet	23	.28	4	10.81	2.5	1.97
Paralichthys sp.	Flounders	4	.05	1	2.70	.7	.55
Diodontidae	Burrfishes	1	.01	1	2.70	.3	.24
Total Actinopterygii		8115	99.56	34	91.86	122.6	96.61
Total Vertebrata		8149	100.00	37	100.00	126.9	100.00
Grand Total		13156		1683		5560.2	

Table E-36. Faunal remains from Shell Mound (8LV42) TU 3 Str II, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	8.9	7.81
Crassostrea virginica	Eastern oyster	16	94.12	7	87.50	105.1	92.19
Total Bivalvia		16	94.12	7	87.50	105.1	92.19
Crepidula sp.	Slippersnails	1	5.88	1	12.50	-	-
Total Bivalvia		1	5.88	1	12.50	-	-
Total Invertebrata		17	100.00	8	100.00	114.0	100.00
Vertebrata	UID Vertebrates	-	-	-	-	1.0	18.18
Mammalia	Mammals	1	.50	1	12.50	.6	10.91
Total Mammalia		1	.50	1	12.50	.6	10.91
Serpentes	Snakes	1	.50	1	12.50	.1	1.82
Testudines	Turtles	2	1.00	1	12.50	.2	3.64
Total Reptilia		3	1.50	2	25.00	.3	5.46
Chondrichthyes	Sharks/rays	2	1.00	-	-	-	-
Negaprion brevirostris	Lemon shark	1	.50	1	12.50	-	-
Total Chondrichthyes		3	1.50	1	12.50	-	-
Actinopterygii	UID Fishes	189	94.50	-	-	3.6	65.45
Lepisosteus sp.	Gar	1	.50	1	12.50	-	-
Elops saurus	Ladyfish	1	.50	1	12.50	-	-
Carangidae	Jack	1	.50	1	12.50	-	-
Mugil sp.	Mullet	1	.50	1	12.50	-	-
Total Actinopterygii		193	96.50	4	50.00	3.6	65.45
Total Vertebrata		200	100.00	8	100.00	5.5	100.00
Grand Total		217		16		119.5	

Table E-37. Faunal remains from Shell Mound (8LV42) TU 4 Str II, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	165.2	77.34
Crassostrea virginica	Eastern oyster	30	47.62	14	36.84	45.5	21.30
Total Bivalvia		30	47.62	14	36.84	45.5	21.30
Crepidula sp.	Slippersnails	1	1.59	1	2.63	-	-
Neverita duplicata	Sharkseye	1	1.59	1	2.63	1.8	.84
Melongena corona	Crown conch	1	1.59	1	2.63	.8	.37
Gastropoda	UID small marine gastropod	1	1.59	1	2.63	-	-
Boonea impressa	Impressed odostome	5	7.94	5	13.16	-	-
Polygyroidea	Land snails	16	25.40	13	34.21	.2	.09
Total Gastropoda		25	39.70	22	57.89	2.8	1.30
Balanidae	Barnacles	8	12.70	2	5.26	.1	.05
Total Arthropoda		8	12.70	2	5.26	.1	.05
Total Invertebrata		63	100.00	38	100.00	213.6	100.00
Vertebrata	UID Vertebrates	-	-	-	-	1.2	30.77
Chondrichthyes	Sharks/rays	1	.37	1	50.00	-	-
Total Chondrichthyes		1	.37	1	50.00	-	-
Actinopterygii	UID Fishes	266	99.25	-	-	2.7	69.23
Fundulus sp.	Killifish	1	.37	1	50.00	-	-
Total Actinopterygii		267	99.62	1	50.00	2.7	69.23
Total Vertebrata		268	100.00	2	100.00	3.9	100.00
Grand Total		331		40		217.5	

Table E-38. Faunal remains from Shell Mound (8LV42) TU 5 Str II, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	357.2	42.35
Mytilidae	Mussels	1	.31	1	.85	-	-
Crassostrea virginica	Eastern oyster	205	63.86	43	36.75	382.8	45.38
Total Bivalvia		206	64.17	44	37.60	382.8	45.38
Gastropoda	UID small marine gastropod	1	.31	1	.85	-	-
Crepidula sp.	Slippersnails	4	1.25	4	3.42	-	-
cf. *Bittiolum varium*	Grass cerith	1	.31	1	.85	-	-
Melongena corona	Crown conch	7	2.18	4	3.42	93.3	11.06
cf. *Nassarius vibex*	Bruised nassa	1	.31	1	.85	-	-
Fasciolaridae	Tulips	1	.31	1	.85	8.4	1.00
Boonea impressa	Impressed odostome	11	3.43	11	9.40	-	-
cf. *Odostomia* sp.	Ovoid odostome	1	.31	1	.85	-	-
Gastrocopta contracta	Bottleneck snaggletooth	2	.62	2	1.71	-	-
Polygyroidea	Land snails	29	9.03	28	23.93	.8	.09
cf. *Haplotrema concava*	Lancetooth	11	3.43	11	9.40	-	-
Hawaii miniscula	Minute gem	1	.31	1	.85	-	-
Total Gastropoda		70	21.80	66	56.38	102.5	12.15
Balanidae	Barnacles	45	14.02	7	5.98	1.0	.12
Total Arthropoda		45	14.02	7	5.98	1.0	.12
Total Invertebrata		321	100.00	117	100.00	843.5	100.00
Vertebrata	UID Vertebrates	-	-	-	-	.9	3.86
Serpentes	Snakes	1	.09	1	10.00	-	-
Testudines	Turtles	8	.71	1	10.00	2.4	10.30
Total Reptilia		9	.80	2	20.00	2.4	10.30
Chondrichthyes	Sharks/rays	3	.27	1	10.00	-	-
Total Chondrichtyes		3	.27	1	10.00	-	-
Actinopterygii	UID Fishes	1104	97.87	-	-	19.5	83.69
Ariopsis felis	Hardhead catfish	1	.09	1	10.00	.2	.86
Fundulus sp.	Killifish	6	.53	2	20.00	-	-
Caranx sp.	Jack	1	.09	1	10.00	.1	.43
Archosargus probatocephalus	Sheepshead	1	.09	1	10.00	.2	.86
Lagodon rhomboides	Pinfish	1	.09	1	10.00	-	-
Mugil sp.	Mullet	2	.18	1	10.00	-	-
Total Actinopterygii		1116	98.94	7	70.00	20.0	85.84

Table E-38. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Total Vertebrata		1128	100.00	10	100.00	23.3	100.00
Grand Total		1449		127		866.8	

Table E-39. Faunal remains from McClamory Key (8LV288) TU 2 Str I, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	402.2	11.02
Mytilidae	Mussels	1	.12	1	.29	1.0	.03
Crassostrea virginica	Eastern oyster	694	85.68	266	78.01	3002.0	82.28
Dinocardium robustum	Atlantic giant cockle	1	.12	1	.29	.3	.01
Trachycardium sp.	Cockles	3	.37	1	.29	.8	.02
Total Bivalvia		699	86.29	269	78.88	3004.1	82.34
Crepidula sp.	Slippersnails	6	.74	6	1.76	-	-
Melongenidae	Whelks/conchs	4	.49	1	.29	2.5	.07
Busycon contrarium	Lightning whelk	1	.12	1	.29	33.8	.93
Melongena corona	Crown conch	12	1.48	11	3.23	202.1	5.54
Fasciolaridae	Tulips	1	.12	1	.29	1.9	.05
Oligyra orbiculata	Globular drop	9	1.11	9	2.64	.3	.01
Polygyroidea	Land snails	50	6.17	38	11.14	.9	.02
Total Gastropoda		83	10.23	67	19.64	241.5	6.62
Balanidae	Barnacles	28	3.46	5	1.47	.6	.02
Total Arthropoda		28	3.46	5	1.47	.6	.02
Total Invertebrata		816	100.00	341	100.00	3649.2	100.00
Vertebrata	UID Vertebrates	-	-	-	-	3.8	6.70
Sylvilagus palustris	Marsh rabbit	2	.15	1	4.76	.4	.71
Total Mammalia		2	.15	1	4.76	4	.71
Serpentes	Snakes	1	.07	1	4.76	.4	.71
Testudines	Turtles	49	3.60	-	-	11.3	19.93
Emydidae	Pond turtles	3	.22	1	4.76	1.6	2.82
Malaclemmys terrapin	Diamondback terrapin	1	.07	1	4.76	.5	.88
Total Reptilia		54	3.96	3	14.28	13.8	24.34
Amphibia	Amphibians	1	.07	1	4.76	.2	.35
Total Amphibia		1	.07	1	4.76	.2	.35
Chondrichthyes	Sharks/rays	1	.07	1	4.76	-	-
Total Chondrichthyes		1	.07	1	4.76	-	-
Actinopterygii	UID Fishes	1254	92.14	-	-	32.9	58.02
Lepisosteus sp.	Gar	7	.51	1	4.76	.3	.53
Elops saurus	Ladyfish	1	.07	1	4.76	-	-
Ariidae	Sea catfishes	14	.03	-	-	.9	1.59
Ariopsis felis	Hardhead catfish	1	.07	1	4.76	-	-

Table E-39. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Leiostomus xanthurus	Spot	1	.07	1	4.76	-	-
Belonidae	Needlefishes	4	.29	1	4.76	.1	.18
Caranx sp.	Jack	2	.15	-	-	.1	.18
Caranx hippos	Crevalle jack	1	.07	1	4.76	.1	.18
Archosargus probatocephalus	Sheepshead	3	.22	1	4.76	.8	1.41
Lagodon rhomboides	Pinfish	7	.51	4	19.05	.1	.18
Bairdiella chrysoura	Silver perch	1	.07	1	4.76	-	-
Cynoscion sp.	Sea trout	2	.15	1	4.76	.6	1.06
Mugil sp.	Mullet	4	.29	1	4.76	.3	.53
Diodontidae	Burrfishes	1	.07	1	4.76	2.3	4.06
Total Actinopterygii		1303	94.71	15	71.41	38.5	67.92
Total Vertebrata		1361	100.00	21	100.00	56.7	100.00
Grand Total		2171		362		3705.1	

Table E-40. Faunal remains from McClamory Key (8LV288) STP 1 Str I, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	140.4	14.38
Mytilidae	Mussels	1	s.30	1	.83	-	-
Crassostrea virginica	Eastern oyster	275	82.58	75	62.50	833.6	85.39
Ostrea equestris	Crested oyster	2	.60	1	.83	.5	.05
Total Bivalvia		278	83.18	77	64.16	834.1	85.44
cf. *Truncatella* sp.	Truncatella	1	.30	1	.83	-	-
Melongenidae	Whelks/conchs	2	.60	1	.83	1.5	.15
Boonea impressa	Impressed odostome	15	4.50	15	12.50	.1	.01
Gastrocopta pellucida	Slim snaggletooth	1	.30	1	.83	-	-
Haplotrema concava	Quick gloss	10	3.00	10	8.33	.1	.01
Hawaii miniscula	Minute gem	7	2.10	7	5.83	-	-
Polygyra cereolus	Southern flatcoil	6	1.80	6	5.00	-	-
Total Gastropoda		42	12.60	41	34.15	1.7	.17
Balanidae	Barnacles	13	3.90	2	1.67	-	-
Total Arthropoda		13	3.90	2	1.67	-	-
Total Invertebrata		333	100.00	120	100.00	976.2	100.00
Vertebrata	UID Vertebrates	-	-	-	-	1.3	6.47
Odocoileus virginianus	White-tailed deer	1	.19	1	7.14	.8	3.98
Total Mammalia		1	.19	1	7.14	.8	3.98
Testudines	Turtles	1	.19	1	7.14	.1	.50
Total Reptilia		1	.19	1	7.14	.1	.50
Chondrichthyes	Sharks/rays	1	.19	1	7.14	-	-
Total Chondrichthyes		1	.19	1	7.14	-	-
Actinopterygii	UID Fishes	492	94.25	-	-	15.7	78.11
Lepisosteus sp.	Gar	2	.38	1	7.14	-	-
Clupeidae	Shads/Herrings	2	.38	1	7.14	-	-
Ariopsis felis	Hardhead catfish	12	2.30	2	14.29	1.7	8.46
Belonidae	Needlefishes	1	.19	1	7.14	-	-
Caranx hippos	Crevalle jack	2	.38	1	7.14	.2	1.00
Archosargus probatocephalus	Sheepshead	2	.38	1	7.14	.1	.50
Lagodon rhomboides	Pinfish	1	.19	1	7.14	-	-
Bairdiella chrysoura	Silver perch	1	.19	2	14.29	.1	.50
Mugil sp.	Mullet	4	.77	1	7.14	.1	.50
Total Actinopterygii		519	99.41	11	78.56	17.9	89.07

Table E-40. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Total Vertebrata		522	100.00	14	100.00	20.1	100.00
Grand Total		855		134		996.3	

Table E-41. Faunal remains from Richards Island (8LV137) TU 2 Str IV, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	104.3	14.34
Crassostrea virginica	Eastern oyster	51	40.80	12	33.33	231.0	31.76
Ostrea equestris	Crested oyster	1	.80	1	2.78	.2	.03
Total Bivalvia		52	41.60	13	36.11	231.2	31.79
Crepidula sp.	Slippersnail	2	1.60	2	5.56	.3	.04
Seila adamsi	Seila snail	1	.80	1	2.78	-	-
Busycon contrarium	Lightning whelk	3	2.40	2	5.56	47.2	6.49
Melongena corona	Crown conch	7	5.60	5	13.89	343.0	47.15
Boonea impressa	Impressed odostome	4	3.20	4	11.11	-	-
Total Gastropoda		17	13.6	14	38.9	390.5	53.68
Balanidae	Barnacles	56	44.80	9	25.00	1.4	.19
Total Arthropoda		56	44.80	9	25.00	1.4	.19
Total Invertebrata		125	100.00	36	100.00	727.4	100.00
Vertebrata	UID Vertebrates	-	-	-	-	.1	.14
Aves	Birds	3	.10	1	7.14	.1	.14
Total Aves		3	.10	1	7.14	.1	.14
Testudines	Turtles	3	.10	1	7.14	.7	1.00
Total Reptilia							
Actinopterygii	UID Fishes	2876	98.39	-	-	61.7	88.52
Lepisosteus sp.	Gar	1	.03	1	7.14	-	-
Ariopsis felis	Hardhead catfish	8	.27	1	7.14	.7	1.00
Belonidae	Needlefish	1	.03	1	7.14	.1	.14
Fundulus sp.	Killifish	4	.14	1	7.14	-	-
Caranx sp.	Jack	5	.17	1	7.14	1.8	2.58
Archosargus probatocephalus	Sheepshead	1	.03	1	7.14	1.0	1.43
Lagodon rhomboides	Pinfish	4	.14	2	14.29	-	-
Cynoscion sp.	Sea trout	2	.07	2	14.29	-	-
Sciaenops ocellatus	Red drum	8	.27	1	7.14	2.8	4.02
Mugil sp.	Mullet	7	.24	1	7.14	.7	1.00
Total Actinopterygii		2917	99.78	12	85.70	68.8	98.69
Total Vertebrata		2923	100.00	14	100.00	69.7	100.00
Grand Total		3048		50		797.1	

Table E-42. Faunal remains from Richards Island (8LV137) TU 2 Fea-01, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	250.8	27.75
Crassostrea virginica	Eastern oyster	166	33.00	17	11.64	599.4	66.31
Dinocardium robustum	Giant Atlantic cockle	2	.40	1	.68	1.9	.21
Total Bivalvia		168	33.40	18	12.32	601.3	66.52
Gastropoda	UID marine gastropod	2	.40	2	1.37	-	-
Crepidula sp.	Slippersnails	13	2.58	13	8.90	.9	.10
Cerithium sp.	Cerith	1	.20	1	.68	.1	.01
Seila adamsi	Seila snail	2	.40	2	1.37	.1	.01
Triphoridae	Triphorid	11	2.19	11	7.53	-	-
Melongena corona	Crown conch	2	.40	1	.68	46.2	5.11
Astyris lunata	Lunar dovesnail	3	.60	3	2.05	-	-
Parvanachis ostreicola	Oyster dovesnail	2	.40	2	1.37	-	-
Boonea impressa	Impressed odostome	50	9.94	50	34.25	.2	.02
Polygyra cereolus	Southern flatcoil	1	.20	1	.68	.1	.01
Total Gastropoda		87	17.31	86	58.88	47.6	5.26
Balanidae	Barnacles	242	48.11	41	28.08	3.9	.43
Decapoda	Crabs	6	1.19	1	.68	.3	.03
Total Arthropoda		248	49.30	42	28.76	4.2	.46
Total Invertebrata		503	100.00	146	100.00	903.9	100.00
Aves	Birds	2	.09	1	5.26	1.8	2.51
Total Aves		2	.09	1	5.26	1.8	2.51
Chondrichthyes	Sharks/rays	2	.09	1	5.26	-	-
Total Chondrichtyes		2	.09	1	5.26	-	-
Actinopterygii	UID Fishes	2128	96.73	-	-	56.6	78.94
Lepisosteus sp.	Gar	1	.05	1	5.26	.1	.14
Clupeidae	Herring/Shad	1	.05	1	5.26	.1	.14
Ariopsis felis	Hardhead catfish	26	1.18	2	10.53	2.4	3.35
Fundulus sp.	Killifish	3	.14	1	5.26	-	-
Caranx hippos	Crevalle jack	2	.09	1	5.26	.6	.84
Archosargus probatocephalus	Sheepshead	6	.27	3	15.79	5.8	8.09
Lagodon rhomboides	Pinfish	7	.32	2	10.53	.2	.28
Bairdiella chrysoura	Silver perch	1	.05	1	5.26	-	-
Cynoscion sp.	Sea trout	3	.14	2	10.53	.8	1.12
Sciaenops ocellatus	Red Drum	5	.23	1	5.26	1.6	2.23

Table E-42. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Mugil sp.	Mullet	12	.55	1	5.26	1.6	2.23
Diodontidae	Burrfishes	1	.05	1	5.26	.1	.14
Total Actinopterygii		2196	99.85	17	89.46	69.9	97.5
Total Vertebrata		2200	100.00	19	100.00	71.7	100.00
Grand Total		2703		165		975.6	

Table E-43. Faunal remains from Ehbar (8LV282) TU 1 Str IIB, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	1084	12.04
Bivalvia	UID Bivalves	6	.11	3	.20	.5	.01
Guekensia demissa	Ribbed mussel	97	1.82	43	2.85	23.9	.27
Mytilidae	Mussels	10	.19	5	.33	-	-
Argopecten sp.	Scallops	816	15.27	90	5.96	1410.3	15.66
Crassostrea virginica	Eastern oyster	1252	23.43	406	26.89	6139.9	68.17
Ostrea equestris	Crested oyster	93	1.74	46	3.05	34.3	.38
Carditamera floridana	Broad-ribbed cardita	25	.47	8	.53	3.1	.03
cf. *Mercenaria* sp.	Quahog clam	2	.04	1	.07	12.4	.14
Anomalocardia auberiana	Pointed venus	1	.02	1	.07	-	-
Parastarte triquetra	Brown gem clam	5	.09	3	.20	-	-
Total Bivalvia		2307	43.18	606	40.15	7624.4	84.66
Gastropoda	UID Gastropod	10	.19	10	.66	.1	-
Anomia simplex	Jingle	14	.26	14	.93	2.0	.02
Crepidula sp.	Slippersnail	83	1.55	83	5.50	4.5	.05
Crepidula aculeata	Spiny slippersnail	3	.06	3	.20	1.0	.01
Neverita duplicata	Sharkseye	2	.04	2	.13	16.6	.18
Seila adamsi	Seila snail	1	.02	1	.07	-	-
Bittolum varium	Grass cerith	5	.09	5	.33	-	-
Cerithiopsidae	Marine snails	6	.11	6	.40	-	-
Triphoridae	Triphora snail	2	.04	2	.13	-	-
Urosalpinx sp.	Oyster drills	3	.06	3	.20	4.3	.05
Busycon contrarium	Lightning whelk	6	.11	4	.26	49.7	.55
Busycotypus spiratus	Pear whelk	2	.04	1	.07	16.9	.19
Melongena corona	Crown conch	4	.07	3	.20	39.1	.43
Fasciolaria sp.	Tulip	7	.13	7	.46	64.0	.71
Astyris lunata	Lunar dovesnail	4	.07	4	.26	-	-
cf. *Costoanachis* sp.	Dovesnail	1	.02	1	.07	-	-
Parvanachis ostreicola	Oyster dovesnail	2	.04	2	.13	-	-
Boonea impressa	Impressed odostome	54	1.01	54	3.58	.1	-
cf. *Cerithidea* sp.	Horn snail	9	.17	9	.60	-	-
Prunum apicinum	Marginella	1	.02	1	.07	-	-
Gastrocopta pellucida	Slim snaggletooth	31	.58	31	2.05	-	-
Hawaii miniscula	Minute gem	169	3.16	169	11.19	.2	-

Table E-43. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Polygyra cereolus	Southern flatcoil	23	.43	23	1.52	.1	-
Total Gastropoda		442	8.27	438	29.01	198.6	2.19
Balanidae	Barnacles	2484	46.49	458	30.33	47.7	.53
Decapoda	Crab	24	.45	-	-	4.0	.04
Menippe menippe	Stone crab	86	1.61	8	.53	47.4	.53
Total Arthropoda		2594	48.55	466	30.86	99.1	1.1
Total Invertebrata		5343	100.00	1510	100.00	9006.1	100.00
Vertebrata	UID Vertebrates	-	-	-	-	71.8	47.68
Mammalia	UID Mammal	2	.09	1	.90	.1	.07
Didelphis virgiana	Opossum	1	.04	1	.90	.9	.60
Rodentia	Rodents	13	.57	1	.90	.1	.07
Total Mammalia		16	.7	3	2.7	1.1	.74
Aves	Birds	1	.04	1	.90	.1	.07
Total Aves		1	.04	1	.90	.1	.07
Serpentes	Snake	2	.09	1	.90	-	-
Alligator mississippiensis	Alligator	1	.04	1	.90	.2	.13
Emydidae	Pond turtle	3	.13	1	.90	1.6	1.06
Total Reptilia		6	.26	3	2.70	1.8	1.19
Chondrichthyes	Sharks/rays	54	2.36	-	-	.2	.13
Euselachii	Sharks	16	.70	1	.90	.5	.33
Rajiformes	Rays	3	.13	1	.90	-	-
Total Chondrichthyes		73	3.19	2	1.80	.7	.46
Actinopterygii[1]	UID Fishes	1487	64.96	-	-	59.4	39.44
Lepisosteus sp.	Gar	17	.74	1	.90	.1	.07
Elops saurus	Ladyfish	7	.31	1	.90	.5	.33
Clupeidae	Shads/Herrings	28	1.22	2	1.80	1.4	.93
Ariidae	Sea catfishes	4	.17	2	1.80	-	-
Opsanus sp.	Toadfish	14	.61	2	1.80	.6	.40
Belonidae	Needlefish	3	.13	2	1.80	-	-
Fundulus sp.	Killifish	390	17.04	9	8.11	1.6	1.06
Lepomis sp.	Warmouth	1	.04	1	.90	-	-
Orthopristis chrysoptera	Pigfish	18	.79	5	4.50	.6	.40
Calamus artifrons	Grass porgy	23	1.01	5	4.50	3.1	2.06
Lagodon rhomboides	Pinfish	125	5.46	47	42.34	2.9	1.93

Table E-43. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Cynoscion sp.	Sea trout	5	.22	3	2.70	.9	.60
Leiostomus xanthurus	Spot	24	1.05	14	12.61	.3	.20
Mugil sp.	Mullet	36	1.57	6	5.41	3.3	2.19
Paralichthys sp.	Flounder	11	.48	2	1.80	.4	.27
Total Actinopterygii		2193	9580	102	91.87	75.1	49.88
Total Vertebrata		2289	100.00	111	100.00	150.6	100.00
Grand Total		3056		1643		9156.4	

[1]UID Actinopterygii resorted.

Table E-44. Faunal remains from Ehrbar (8LV282) TU 1 Str IIC, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	1042.1	12.53
Bivalvia	UID Bivalves	3	.07	2	.21	.2	-
Guekensia demissa	Ribbed mussel	173	3.98	19	2.04	45.2	.54
Argopecten sp.	Scallops	2172	49.94	165	17.72	2678.3	32.21
Crassostrea virginica	Eastern oyster	428	9.84	226	24.27	4150.2	49.90
Ostrea equestris	Crested oyster	86	1.98	53	5.69	82.8	1.00
Carditamera floridana	Broad-ribbed cardita	10	.23	6	.64	7.3	.09
Mercenaria sp.	Quahog clam	1	.02	1	.11	3.0	.04
Anomalocardia auberiana	Pointed venus	2	.05	1	.11	-	-
Parastarte triquetra	Brown gem clam	4	.09	2	.21	-	-
Total Bivalvia		2879	66.2	475	51.00	6967.1	83.78
Gastropoda	UID Gastropod	8	.18	8	.86	-	-
Anomia simplex	Jingle	25	.57	25	2.69	7.3	.09
Modulus modulus	Buttonsnail	4	.09	4	.43	.7	.01
Crepidula sp.	Slippersnail	73	1.68	73	7.84	7.2	.09
Neverita duplicata	Sharkseye	6	.14	6	.64	104.2	1.25
cf. *Cerithidea* sp.	Horn snail	2	.05	2	.21	-	-
cf. Cerithiopsidae	Marine snails	3	s.07	3	.32	-	-
cf. *Bittiolum varium*	Grass cerith	1	.02	1	.11	-	-
Seila adamsi	Seila snail	1	.02	1	.11	-	-
cf. *Urosalpinx* sp.	Oyster dovesnail	4	.09	4	.43	3.2	.04
Busycon sp.	Whelk	2	.05	2	.21	4.8	.06
Busycon contrarium	Lightning whelk	3	.07	3	.32	42	.51
Melongena corona	Crown conch	7	.16	7	.75	55.3	.66
cf. *Astyris lunata*	Lunar dovesnail	2	.05	2	.21	-	-
cf. *Costoanachis* sp.	Dovesnail	1	.02	1	.11	-	-
Fasciolaridae	Tulips	13	.30	11	1.18	40.6	.49
cf. *Conus* sp.	Cone shell	1	.02	1	.11	-	-
Boonea impressa	Impressed odostome	50	1.15	50	5.37	.4	-
cf. *Odostomia* sp.	Ovoid odostome	1	.02	1	.11	-	-
Prunum apicinum	Marginella	1	.02	1	.11	-	-
Gastrocopta pellucida	Slim snaggletooth	11	.25	11	1.18	-	-
Hawaii miniscula	Minute gem	59	1.36	59	6.34	.2	-
Polygyra cereolus	Southern flatcoil	3	.07	3	.32	-	-

Table E-44. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Total Gastropoda		281	6.38	279	29.96	265.9	3.20
Balanidae	Barnacles	1093	25.13	175	18.80	27.4	.33
Decapoda	Crab	84	1.93	-	-	9.8	.12
Menippe menippe	Stone crab	12	.28	2	.21	4.2	.05
Total Arthropoda		1189	27.24	177	19.01	41.4	.50
Total Invertebrata		4349	100.00	931	100.00	8316.0	100.00
Vertebrata	UID Vertebrates	-	-	-	-	95.2	50.45
Mammalia	UID Med. Mammal	4	.16	1	.62	.7	.37
Total Mammalia		4	.16	1	.62	.7	.37
Aves	Birds	5	.20	1	.62	1.3	.69
Total Aves		5	.20	1	.62	1.3	.67
Serpentes	Snakes	2	.08	1	.62	.1	.05
Testudines	Turtles	6	.24	1	.62	2.0	1.06
cf. Cheloniidae	Sea Turtle	11	.43	1	.62	5.8	3.07
Total Reptilia		19	.75	3	1.86	7.9	4.18
Rajiformes	Rays/skates	75	2.96	1	.62	1.0	.53
Total Chondrichthyes		75	2.96	1	.62	1.0	.53
Actinopterygii[1]	UID Fishes	1853	73.01	-	-	65.3	34.61
Lepisosteus sp.	Gar	3	.12	1	.62	-	-
Elops saurus	Ladyfish	4	.16	1	.62	.2	.11
Clupeidae	Shads/Herrings	22	.87	2	1.23	.3	.16
Ariidae	Sea catfishes	10	.39	3	1.85	.8	.42
Opsanus sp.	Toadfish	42	1.65	9	5.56	1.6	.85
Belonidae	Needlefish	2	.08	2	1.23	-	-
Fundulus sp.	Killifish	183	7.21	23	14.20	.5	.26
Caranx hippos	Crevalle jack	5	.20	1	.62	.3	.16
Orthopristis chrysoptera	Pigfish	9	.35	6	3.70	.2	.11
Archosargus probatocephalus	Sheepshead	27	1.06	1	.62	3.9	2.07
cf. *Calamus* sp.	Porgy	11	.43	5	3.09	.3	.16
Lagodon rhomboides	Pinfish	136	5.36	65	40.12	.7	.37
Bairdiella chrysoura	Silver perch	63	2.48	19	11.73	1.4	.74
Cynoscion sp.	Sea trout	3	.12	3	1.85	.4	.21
Leiostomus xanthurus	Spot	26	1.02	8	4.94	.2	.11
Sciaenops ocellatus	Red drum	1	.04	1	.62	.4	.21

Table E-44. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Mugil sp.	Mullet	29	1.14	3	1.85	2.4	1.27
Paralichthys sp.	Flounder	3	.12	2	1.23	.8	.42
Chilomycterus schoepfii	Striped burrfish	3	.12	1	.62	2.9	1.54
Total Actinopterygii		2435	95.93	156	96.3	82.6	43.78
Total Vertebrata		2538	100.00	162	100.00	188.7	100.00
Grand Total		6887		1093		8504.7	

[1]UID Actinopterygii resorted.

Table E-45. Faunal remains from Ehrbar (8LV282) TU 1 Str IID, 1 mm and larger.

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Invertebrata	UID Invertebrates	-	-	-	-	1733.5	15.03
Mytilidae	Mussels	241	3.62	10	.81	43.6	.38
Argopecten sp.	Scallops	3113	46.81	252	20.34	3349.5	29.04
Crassostrea virginica	Eastern oyster	812	12.21	297	23.97	5756.9	49.91
Ostrea equestris	Crested oyster	96	1.44	47	3.79	95.7	.83
Carditamera floridana	Broad-ribbed cardita	22	.33	9	.73	1.4	.01
Cardiidae	Cockles	5	.08	1	.08	.2	-
Mercenaria sp.	Quahog clam	2	.03	1	.08	44.6	.39
Parastarte triquetra	Brown gem clam	2	.03	1	.08	-	-
Total Bivalvia		4293	6455	618	49.88	9291.9	80.56
Anomia simplex	Jingle	7	.11	4	.32	2	.02
Modulus modulus	Buttonsnail	6	.09	6	.48	1.2	.01
Crepidula sp.	Slippersnails	64	.96	64	5.17	7.2	.06
Neverita duplicata	Sharkseye	2	.03	2	.16	15.9	.14
Cerithiopsidae	Marine snails	2	.03	2	.16	-	-
cf. *Seila adamsi*	Minature cerith	1	.02	1	.08	-	-
Urosalpinx perrugata	Gulf oyster drill	3	.05	3	.24	.3	-
Melongenidae	Whelks/conches	34	.51	-	-	35.7	.31
Busycon contrarium	Lightning whelk	2	.03	2	.16	31.0	.27
Busycotypus spiratus	Pear whelk	10	.15	7	.56	69.3	.60
Melongena corona	Crown conch	19	.29	10	.81	166.0	1.44
Fasciolaria sp.	Tulips	14	.21	9	.73	73.4	.64
Parvanachis ostreicola	Oyster dovesnail	3	.05	3	.24	-	-
Boonea impressa	Impressed odostome	84	1.26	84	6.78	.2	-
cf. *Bittiolum varium*	Grass cerith	1	.02	1	.08	-	-
cf. *Cerithidea* sp.	Horn snail	4	.06	4	.32	-	-
Gastrocopta pellucida	Slim snaggletooth	11	.17	11	.89	-	-
Polygyroidea	Landsnail	2	.03	2	.16	-	-
Haplotrema concava	Lancetooth	14	.21	14	1.13	-	-
Hawaii miniscula	Minute gem	54	.81	54	4.36	.1	-
Helicoidea	Landsnail	4	.06	4	.32	.3	-
Total Gastropoda		341	5.15	287	23.15	402.6	3.49
Balanidae	Barnacles	1918	28.84	331	26.72	67.1	.58
Decapoda	Crabs	98	1.47	3	.24	38.4	.33

Table E-45. Continued

Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Total Balanidae		2016	30.31	334	26.96	105.5	.91
Total Invertebrata		6650	100.00	1239	100.00	11533.5	100.00
Vertebrata	UID Vertebrates	-	-	-	-	171.2	45.05
Mammalia	Mammals	6	.13	-	-	2.7	.71
cf. Rodentia	Rodents	1	.02	1	.66	.1	.03
Odocoileus virginianus	White-tailed deer	1	.02	1	.66	-	-
Total Mammalia		8	.17	2	1.32	2.8	.74
Aves	Birds	4	.09	1	.66	1.1	.29
Total Aves		4	.09	1	.66	1.1	.29
Serpentes	Snakes	8	.17	1	.66	-	-
Testudines	Turtles	3	.06	-	-	.3	.08
Cheloniidae	Sea turtles	2	.04	1	.66	2.1	.55
Anolis sp.	Anolis lizards	1	.02	1	.66	-	-
Total Reptilia		14	.29	3	1.98	2.4	.63
Chondrichthyes	Sharks/rays	27	.58	-	-	.6	.16
Euselachii	Sharks	17	.37	1	.66	-	-
Total Chondrichthyes		44	.95	1	.66	.6	.16
Actinopterygii	UID Fishes	3962	85.20	-	-	182.5	48.03
Lepisosteus sp.	Gar	4	.09	1	.66	-	-
Brevoortia smithi	Yellowfin menhaden	3	.06	1	.66	-	-
Clupeidae	Shads/herrings	21	.45	-	-	.6	.16
Ariidae	Sea catfishes	4	.09	-	-	.2	.05
Ariopsis felis	Hardhead catfish	2	.04	2	1.32	.4	.11
Bagre marinus	Gafftopsail catfish	1	.02	1	.66	-	-
Opsanus sp.	Toadfish	46	.99	4	2.65	2.7	.71
Belonidae	Needlefishes	17	.37	15	9.93	.1	.03
Fundulus sp.	Killifish	254	5.46	6	3.97	1.1	.29
Centropomus undecimalis	Common snook	1	.02	1	.66	1.1	.29
Lepomis sp.	Warmouth	1	.02	1	.66	-	-
cf. *Caranx hippos*	Crevalle jack	1	.02	1	.66	.3	.08
Orthopristis chrysoptera	Pigfish	4	.09	4	2.65	-	-
Calamus sp.	Porgy	15	.32	3	1.99	1.9	.50
Lagodon rhomboides	Pinfish	118	2.54	65	43.05	1.2	.32
Bairdiella chrysoura	Silver perch	82	1.76	24	15.89	2.6	.68

Table E-45. Continued							
Taxon	Common Name	NISP	%NISP	MNI	%MNI	Wt (g)	%Wt
Cynoscion sp.	Sea trout	10	.22	4	2.65	2.7	.71
Leiostomus xanthurus	Spot	6	.13	5	3.31	-	-
Sciaenops ocellatus	Red drum	3	.06	1	.66	.8	.21
Mugil sp.	Mullet	22	.47	2	1.32	3.5	.92
Paralichthys sp.	Flounder	1	.02	1	.66	-	-
Diodontidae	Burrfishes	2	.04	2	1.32	.2	.05
Total Actinopterygii		4580	98.48	144	95.33	201.9	53.14
Total Vertebrata		4650	100.00	151	100.00	380.0	100.00
Grand Total		11300		1390		11913.5	

APPENDIX F
SPECIES LISTS FROM GENERAL LEVEL CONTEXTS

Table F-1. Species list for Bird Island (8DI52) TU 3 Level A, ¼-in and larger fauna.

Taxon	Common Name	NISP	% NISP	MNI	% MNI	Wt (g)	% Wt
Mammalia	Mammals	32	1.88	-	-	20.9	4.35
Odocoileus virginianus	White-tailed deer	7	.41	1	1.20	5.2	1.08
Didelphis virginiana	Oppossum	1	.06	1	1.20	1.7	.35
Rodentia	Rats	3	.18	1	1.20	.5	.10
Total Mammalia		43	2.53	3	3.60	28.3	5.88
Aves	Birds	4	.23	1	1.20	1.1	.23
Total Aves		4	.23	1	1.20	1.1	.23
cf. *Alligator mississippiensis*	Alligator	1	.06	1	1.20	.9	.19
Serpentes	Snakes	1	.06	1	1.20	.4	.08
Testudines	Turtles	40	2.35	1	1.20	14.1	2.94
cf. Cheloniidae	Sea turtles	181	10.62	1	1.20	94.1	19.60
Malaclemmys terrapin	Diamondback terrapin	9	.53	1	1.20	5.5	1.15
Total Reptilia		232	13.62	5	6.00	115.0	23.96
Chondrichthyes	Sharks/rays	14	.82	-	-	6.4	1.33
Carcharhinidae	Sharks	1	.06	1	1.20	.1	.02
Rajidae	Rays	1	.06	1	1.20	.2	.04
Total Chondrichthyes		16	.94	2	2.40	67	1.39
Actinopterygii	UID Fishes	874	51.26	-	-	139.3	29.01
Acipenser sp.	Sturgeon	3	.18	1	1.20	.8	.17
Lepisosteus sp.	Gar	85	4.99	1	1.20	17.1	3.56
Elops saurus	Ladyfish	6	.35	1	1.20	.3	.06
Clupeidae	Herrings/shads	2	.12	1	1.20	.1	.02
Ariidae	Sea catfishes	27	1.58	18	21.69	5.1	1.06
Ariopsis felis	Hardhead catfish	232	13.61	-	-	52.0	10.83
Bagre marinus	Gafftopsail catfish	12	.70	-	-	2.3	.48
Opsanus sp.	Toadfish	9	.53	3	3.61	1.9	.40
Caranx hippos	Crevalle jack	26	1.52	2	2.41	23.0	4.79
Archosargus probatocephalus	Sheepshead	34	1.99	6	7.23	14.1	2.94
Calamus cf. *artifrons*	Grass porgy	2	.12	1	1.20	.1	.02
Sciaenidae	Drums/croakers	1	.06	-	-	8.9	1.85
Cynoscion sp.	Sea trout	14	.82	4	4.82	6.3	1.31
Mugil sp.	Mullet	12	.70	2	2.41	1.4	.29
Chilomycterus schoepfii	Striped burrfish	62	3.64	28	33.73	48.1	10.02
Total Actinopterygii		1401	82.17	68	81.9	320.8	66.81

Table F-1. Continued

Taxon	Common Name	NISP	% NISP	MNI	% MNI	Wt (g)	% Wt
Total Vertebrata		1705	100.00	83	100.00	480.2	100.00

Table F-2. Species list for Bird Island (8DI52) TU 3 Level E, ¼-in and larger fauna.

Taxon	Common Name	NISP	% NISP	MNI	% MNI	Wt (g)	% Wt
Vertebrata	UID Vertebrates	-	-	-	-	2.7	1.53
Didelphis virginiana	Opossum	2	.37	1	4.00	4.4	2.50
Total Mammalia		2	.37	1	4.00	4.4	2.50
Aves	Birds	18	3.31	1	4.00	5.3	3.01
Anatidae	Migratory ducks/geese	1	.18	1	4.00	.9	.51
Total Aves		19	3.49	2	8.00	6.2	3.52
Testudines	Turtles	1	.18	-	-	.5	.28
Malaclemmys terrapin	Diamondback terrapin	3	.55	1	4.00	4.4	2.50
cf. Cheloniidae	Sea turtle	37	6.81	1	4.00	40.7	23.09
Total Reptilia		41	7.54	2	8.00	45.6	25.87
Chondrichthyes	Sharks/rays	4	.74	1	4.00	.5	.28
Total Chondrichthys		4	.74	1	4.00	.5	.28
Actinopterygii	UID Fishes	351	64.64	-	-	63.2	35.85
Lepisosteus sp.	Gar	11	2.03	1	4.00	2.6	1.47
Elops saurus	Ladyfish	2	.37	1	4.00	.1	.06
Ariopsis felis	Hardhead catfish	55	10.13	4	16.00	16.8	9.53
Opsanus sp.	Toadfish	3	.55	1	4.00	.7	.40
Centropomus undecimalis	Snook	2	.37	1	4.00	.3	.17
Caranx hippos	Crevalle jack	5	.92	1	4.00	4.5	2.55
Archosargus probatocephalus	Sheepshead	14	2.58	3	12.00	8.0	4.54
Cynoscion sp.	Sea trout	5	.92	1	4.00	1.6	.91
Pogonias cromis	Black drum	3	.55	1	4.00	9.1	5.16
Sciaenops ocellatus	Red drum	7	1.29	2	8.00	5.1	2.89
Mugil sp.	Mullet	11	2.03	1	4.00	1.5	.85
Paralichthys sp.	Flounder	6	1.10	1	4.00	.6	.34
Chilomycterus schoepfii	Striped burrfish	2	.37	1	4.00	2.8	1.59
Total Actinopterygii		477	87.85	19	76.00	116.9	66.31
Total Vertebrata		543	100.00	25	100.00	176.3	100.00

Table F-3. Species list for Bird Island (8DI52) TU 3 Level J, ¼-in and larger fauna.

Taxon	Common Name	NISP	% NISP	MNI	% MNI	Wt (g)	% Wt
Vertebrata	UID Vertebrates	-	-	-	-	10.1	6.18
Odocoileus virginianus	White-tailed deer	21	4.67	1	3.03	26.4	16.15
Total Mammalia		21	4.67	1	3.03	26.4	16.15
Aves	Bird	7	1.56	1	3.03	2.5	1.53
Total Aves		7	1.56	1	3.03	2.5	1.53
Serpentes	Snake	2	.44	1	3.03	.7	.43
Testudines	Turtles	63	14.00	-	-	26.2	16.02
Emydidae	Pond turtle	21	4.67	1	3.03	15.0	9.17
Malaclemmys terrapin	Diamondback terrapin	5	1.11	1	3.03	6.2	3.79
Kinosternidae	Mud/musk turtle	9	2.00	1	3.03	2.3	1.41
Total Reptilia		100	22.22	4	12.12	50.4	30.82
Rajidae	Rays/skates	3	.67	1	3.03	.9	.55
Total Chondrichthyes		3	.67	1	3.03	.9	.55
Actinopterygii	UID Fishes	208	46.22	-	-	34.4	21.04
Lepisosteus sp.	Gar	14	3.11	1	3.03	5.5	3.36
Ariopsis felis	Hardhead catfish	17	3.78	1	3.03	3.6	2.20
Bagre marinus	Gafftopsail catfish	2	.44	1	3.03	.7	.43
Opsanus sp.	Toadfish	23	5.11	4	12.12	4.0	2.45
Lagodon rhomboides	Pinfish	26	5.78	9	27.27	4.9	3.00
Sciaenops ocellatus	Red drum	4	.89	1	3.03	1.3	.80
Cynoscion sp.	Sea trout	3	.67	1	3.03	1.3	.80
Mugil sp.	Mullet	3	.67	1	3.03	0.7	.43
Paralichthys sp.	Flounder	6	1.33	1	3.03	1.4	.86
Chilomycterus schoepfii	Striped burrfish	13	2.89	6	18.18	15.4	9.42
Total Actinopterygii		319	70.89	26	78.78	73.2	44.79
Total Vertebrata		450	100.00	33	100.00	163.5	100.00

Table F-4. Species list for Shell Mound (8LV42) TU 1 Level B, ¼-in and larger fauna.

Taxon	Common Name	NISP	% NISP	MNI	% MNI	Wt (g)	% Wt
Vertebrata	UID Vertebrates	-	-	-	-	2.5	.59
Mammalia	Mammals	2	.26	1	4.17	.9	.21
Didelphis virginiana	Opossum	2	.26	1	4.17	1.6	.38
Procyon lotor	Raccoon	1	.13	1	4.17	.6	.14
Total Mammalia		5	.65	3	12.51	3.1	.73
Aves	Birds	2	.26	1	4.17	.8	.19
Total Aves		2	.26	1	4.17	.8	.19
Testudines	Turtles	33	4.21	1	4.17	12.6	3.00
Total Reptilia		33	4.21	1	4.17	12.6	3.00
Chondrichthyes	Sharks/rays	11	1.40	-	-	1.8	.43
Euselachii	Sharks	1	.13	1	4.17	.1	.02
Total Chondrichthyes		12	1.53	1	4.17	1.9	.45
Actinopterygii	UID Fishes	554	70.66	3	12.50	83.6	19.90
Elops saurus	Ladyfish	2	.26	1	4.17	.1	.02
Ariopsis felis	Hardhead catfish	20	2.55	1	4.17	4.8	1.14
Caranx hippos	Crevalle jack	71	9.06	6	25.00	295.9	70.42
Sciaenidae	Drums/croakers	2	.26	2	8.33	1.7	.40
Cynoscion sp.	Sea trout	4	.51	1	4.17	1.3	.31
Sciaenops ocellatus	Red drum	2	.26	1	4.17	.7	.17
Mugil sp.	Mullet	65	8.29	1	4.17	8.6	2.05
Paralichthys sp.	Flounder	8	1.02	1	4.17	.8	.19
Total Actinopterygii		728	92.87	17	70.85	397.5	94.6
Total Vertebrata		784	100.00	24	100.00	420.2	100.00

Table F-5. Species list for Shell Mound (8LV42) TU 1 Level E, ¼-in and larger fauna.

Taxon	Common Name	NISP	% NISP	MNI	% MNI	Wt (g)	% Wt
Vertebrata	UID Vertebrates	10	.67	-	-	1.5	.55
Aves	Birds	8	.53	1	3.57	1.3	.48
Total Aves		8	.53	1	3.57	1.3	.48
Testudines	Turtles	3	.20	-	-	3.6	1.32
Emydidae	Pond turtles	1	.07	-	-	.3	.11
Malaclemmys terrapin	Diamondback terrapin	1	.07	1	3.57	.9	.33
Kinosternidae	Mud/musk turtles	1	.07	1	3.57	.2	.07
Total Reptilia		6	41	2	7.14	5	1.83
Chondrichthyes	Sharks/rays	1	.07	1	3.57	.1	.04
Total Chondrichthyes		1	.07	1	3.57	.1	.04
Actinopterygii	UID Fishes	1194	79.71	-	-	129.6	47.65
Acipenser sp.	Sturgeon	6	.40	1	3.57	1.3	.48
Ariopsis felis	Hardhead catfish	11	.73	1	3.57	1.6	.59
Opsanus sp.	Toadfish	1	.07	1	3.57	.1	.04
Caranx hippos	Crevalle jack	136	9.08	5	17.86	98.1	36.07
Archosargus probatocephalus	Sheepshead	1	.07	1	3.57	.2	.07
Sciaenidae	Drums/croakers	6	.40	-	-	7.0	2.57
Cynoscion sp.	Sea trout	14	.93	3	10.71	3.2	1.18
Scianenops ocellatus	Red drum	2	.13	1	3.57	.2	.07
Pogonias cromis	Black drum	16	1.07	1	3.57	6.0	2.21
Mugil sp.	Mullet	57	3.81	3	10.71	6.0	2.21
Paralichthys sp.	Flounder	1	.07	1	3.57	.1	.04
Chilomycterus schoepfii	Striped burrfish	5	.33	1	3.57	2.7	.99
Total Actinopterygii		1450	96.8	19	67.84	256.1	94.17
Total Vertebrata		1498	100.00	28	100.00	272.0	100.00

Table F-6. Species list for Shell Mound (8LV42) TU 1 Level F, ¼-in and larger fauna.

Taxon	Common Name	NISP	% NISP	MNI	% MNI	Wt (g)	% Wt
Vertebrata	UID Vertebrates	-	-	-	-	4.1	3.30
Didelphis virginiana	Opossum	2	.27	1	4.00	1.4	1.13
Total Mammalia		2	.27	1	4.00	1.4	1.13
Testudines	Turtles	11	1.49	1	4.00	2.0	1.61
Total Reptilia		11	1.49	1	4.00	2.0	1.61
Actinopterygll	UID Fishes	557	75.27	-	-	47.6	38.26
Elops saurus	Ladyfish	1	.14	1	4.00	.1	.08
Ariopsis felis	Hardhead catfish	15	2.03	2	8.00	1.7	1.37
Opsanus sp.	Toadfish	2	.27	1	4.00	.1	.08
Epinephelus itajara	Goliath grouper	1	.14	1	4.00	.1	.08
Caranx hippos	Crevalle jack	109	14.73	8	32.00	59.2	47.59
Lagodon rhomboides	Pinfish	1	.14	1	4.00	.1	.08
Sciaenops ocellatus	Red drum	2	.27	1	4.00	.6	.48
Cynoscion sp.	Sea trout	5	.68	2	8.00	.7	.56
Pogonias cromis	Black drum	1	.14	1	4.00	2.7	2.17
Mugil sp.	Mullet	30	4.05	3	12.00	3.3	2.65
Chilomycterus schoepfii	Striped burrfish	2	.27	1	4.00	.2	.16
Total Actinopterygii		726	95.13	22	88	116.4	93.56
Total Vertebrata		740	100.00	25	100.00	124.4	100.00

Table F-7. Species list for Shell Mound (8LV42) TU 2 Level B, ¼-in and larger fauna.

Taxon	Common Name	NISP	% NISP	MNI	% MNI	Wt (g)	% Wt
Vertebrata	UID Vertebrates	-	-	-	-	3.5	.68
Aves	Birds	36	1.81	-	-	10.4	2.03
Ardeidae	Herons	5	.25	1	2.38	.7	.14
Total Aves		41	2.06	1	2.38	11.1	2.17
Serpentes	Snakes	1	.05	1	2.38	-	-
Apalone ferox	Softshell turtle	1	.05	1	2.38	.2	.04
Gopherus sp.	Tortoise	1	.05	1	2.38	2.9	.57
Total Reptilia		3	.15	3	7.14	3.1	.61
Rajidae	Rays	12	.60	1	2.38	4.1	.80
Total Chondrichthyes		12	.60	1	2.38	4.1	.80
Actinopterygii	UID Fishes	1398	70.46	-	-	269.0	52.53
Lepisosteus sp.	Gar	3	.15	1	2.38	.6	.12
Elops saurus	Ladyfish	1	.05	1	2.38	-	-
Ariopsis felis	Hardhead catfish	18	.91	2	4.76	3.9	.76
Bagre marinus	Gafftopsail catfish	15	.76	1	2.38	5.6	1.09
Carangidae	Jacks	43	2.17	-	-	113.4	22.14
Caranx hippos	Crevalle jack	231	11.64	13	30.95	60.7	11.85
Archosargus probatocephalus	Sheepshead	16	.81	3	7.14	7.0	1.37
Lagodon rhomboides	Pinfish	6	.30	1	2.38	.2	.04
Sciaenidae	Drums/croakers	9	.45	-	-	2.0	.39
Cynoscion sp.	Sea trou	4	.20	1	2.38	1.8	.35
Micropogonias undulatus	Atlantic croaker	1	.05	1	2.38	-	-
Pogonias cromis	Black drum	10	.50	1	2.38	1.2	.23
Sciaenops ocellatus	Red drum	8	.40	4	9.52	2.7	.53
Mugil sp.	Mullet	156	7.86	5	11.90	17.7	3.46
Paralichthys sp.	Flounders	6	.30	1	2.38	1.1	.21
Diodontidae	Puffers	3	.15	2	4.76	3.4	.66
Total Actinoptergyii		1928	97.16	37	88.07	490.3	95.73
Total Vertebrata		1984	100.00	42	100.00	512.1	100.00

Table F-8. Species list for Shell Mound (8LV42) TU 2 Level D, ¼-in and larger fauna.

Taxon	Common Name	NISP	% NISP	MNI	% MNI	Wt (g)	% Wt
Vertebrata	UID Vertebrates	-	-	-	-	4.1	3.30
Aves	Birds	7	1.27	1	4.00	2.0	1.75
Total Aves		7	1.27	1	4.00	2.0	1.75
Testudines	Turtles	4	.73	1	4.00	2.4	2.10
Total Reptilia		4	.73	1	4.00	2.4	2.10
Chondrichthyes	Sharks/rays	1	.18	1	4.00	.2	.17
Total Chondrichthyes		1	.18	1	4.00	.2	.17
Actinopterygii	UID Fishes	363	66.00	-	-	43.3	37.85
Ariopsis felis	Hardhead catfish	29	5.27	3	12.00	5.6	4.90
Belonidae	Needlefish	1	.18	1	4.00	.1	.09
Caranx hippos	Crevalle jack	60	10.91	4	16.00	45.3	39.60
Orthopristis chrysoptera	Pigfish	1	.18	1	4.00	.1	.09
Archosargus probatocephalus	Sheepshead	1	.18	1	4.00	.1	.09
Calamus cf. *artifrons*	Grass porgy	1	.18	1	4.00	.1	.09
Cynoscion sp.	Sea trout	10	1.82	1	4.00	4.3	3.76
Sciaenops ocellatus	Red drum	9	1.64	3	12.00	2.7	2.36
Mugil sp.	Mullet	58	10.55	5	20.00	6.8	5.94
Paralichthys sp.	Flounder	1	.18	1	4.00	.4	.35
Total Actinopterygii		534	97.09	21	84.00	108.8	95.12
Total Vertebrata		550	100.00	25	100.00	114.4	100.00

Table F-9. Species list for Shell Mound (8LV42) TU 2 Level F, ¼-in and larger fauna.

Taxon	Common Name	NISP	% NISP	MNI	% MNI	Wt (g)	% Wt
Vertebrata	UID Vertebrates	-	-	-	-	16.2	8.43
Mammalia	Mammals	4	.52	-	-	2.0	1.04
Didelphis virginiana	Opossum	3	.39	1	5.88	3.2	1.67
Total Mammalia		7	.91	1	5.88	5.2	2.71
Aves	Birds	81	10.62	-	-	26.0	13.53
Ardeidae	Herons	7	.92	1	5.88	1.3	.68
Total Aves		88	11.54	1	5.88	27.3	14.21
Testudines	Turtles	3	.39	1	5.88	1.0	.52
Total Reptilia		3	.39	1	5.88	1.0	.52
Rajidae	Rays	1	.13	1	5.88	-	-
Total Chondrichthyes		1	.13	1	5.88	-	-
Actinopterygii	UID Fishes	539	70.64	-	-	89.3	46.49
Elops saurus	Ladyfish	1	.13	1	5.88	-	-
Ariopsis felis	Hardhead catfish	9	1.18	1	5.88	2.3	1.20
Carangidae	Jacks	2	.26	-	-	.9	.47
Caranx hippos	Crevalle Jack	30	3.93	2	11.76	34.4	17.91
Lagodon rhomboides	Pinfish	3	.39	1	5.88	-	-
Sciaenidae	Drums/croakers	12	1.57	-	-	3.3	1.72
Cynoscion sp.	Sea trout	1	.13	1	5.88	.6	.31
Pogonias cromis	Black drum	9	1.18	1	5.88	2.0	1.04
Sciaenops ocellatus	Red drum	8	1.05	4	23.53	2.9	1.51
Mugil sp.	Mullet	48	6.29	1	5.88	6.7	3.49
Paralichthys sp.	Flounders	2	.26	1	5.88	-	-
Total Actinopterygii		664	87.01	13	76.45	142.4	74.14
Total Vertebrata		763	100.00	17	100.00	192.1	100.00

Table F-10. Species list for Shell Mound (8LV42) TU 3 Level C, ¼-in and larger fauna.

Taxon	Common Name	NISP	% NISP	MNI	% MNI	Wt (g)	% Wt
Vertebrata	UID Vertebrates	-	-	-	-	5.4	8.04
Mammalia	Mammal	10	7.04	-	-	2.6	3.87
Odocoileus virginianus	White-tailed deer	1	.70	1	9.09	4.8	7.14
Total Mammalia		11	7.74	1	9.09	7.4	11.01
Aves	Birds	3	2.11	1	9.09	.8	1.19
Total Aves		3	2.11	1	9.09	.8	1.19
Testudines	Turtles	4	2.82	-	-	1.0	1.49
Malaclemmys terrapin	Diamondback terrapin	10	7.04	1	9.09	2.9	4.32
Kinosternidae	Mud/musk turtle	1	.70	1	9.09	.4	.60
Total Reptilia		15	10.56	2	18.18	4.3	6.41
Actinopterygii	UID Fishes	70	49.30	-	-	11.5	17.11
Lepisosteus sp.	Gar	1	.70	1	9.09	.3	.45
Ariidae	Sea catfishes	2	1.41	1	9.09	.2	.30
Caranx crysos	Bluerunner	1	.70	1	9.09	.2	.30
Caranx hippos	Crevalle jack	33	23.24	2	18.18	35.7	53.13
Archosargus probatocephalus	Sheepshead	2	1.41	1	9.09	.6	.89
Mugil sp.	Mullet	4	2.82	1	9.09	.8	1.19
Total Actinopterygii		113	79.58	7	63.63	49.3	73.37
Total Vertebrata		142	100.00	11	100.00	67.2	100.00

Table F-11. Species list for Shell Mound (8LV42) TU 3 Level E, ¼-in and larger fauna.

Taxon	Common Name	NISP	% NISP	MNI	% MNI	Wt (g)	% Wt
Vertebrata	UID Vertebrates	-	-	-	-	2.9	8.87
Mammalia	Mammal	7	10.94	-	-	8.1	24.77
Odocoileus virginianus	White-tailed deer	1	1.56	1	11.11	2.9	8.87
Total Mammalia		8	12.50	1	1.11	11.0	33.64
Testudines	Turtles	14	21.88	1	11.11	5.3	16.21
cf. Cheloniidae	Sea turtle	10	15.63	1	11.11	3.1	9.48
Total Reptilia		24	37.51	2	22.22	8.4	25.69
Actinopterygii	UID Fishes	21	32.81	-	-	5.1	15.60
Lepisosteus sp.	Gar	2	3.13	1	11.11	.4	1.22
Ariopsis felis	Hardhead catfish	1	1.56	1	11.11	.1	.31
Caranx sp.	Jack	3	4.69	1	11.11	3.3	10.09
Archosargus probatocephalus	Sheepshead	1	1.56	1	11.11	.5	1.53
Sciaenops ocellatus	Red drum	1	1.56	1	11.11	.6	1.83
Mugil sp.	Mullet	3	4.69	1	11.11	.4	1.22
Total Actinopterygii		32	50.00	6	66.66	10.4	31.8
Total Vertebrata		64	100.00	9	100.00	32.7	100.00

Table F-12. Species list for Shell Mound (8LV42) TU 5 Level D, ¼-in and larger fauna.

Taxon	Common Name	NISP	% NISP	MNI	% MNI	Wt (g)	% Wt
Vertebrata	UID Vertebrates	-	-	-	-	9.2	7.02
Odocoileus virginianus	White-tailed deer	2	.36	1	5.26	2.5	1.91
Total Mammalia		2	.36	1	5.26	2.5	1.91
Serpentes	Snake	2	.36	1	5.26	.7	.53
Testudines	Turtles	120	21.47	2	10.53	25.6	19.54
cf. Cheloniidae	Sea turtle	2	.36	1	5.26	.9	.69
Total Reptilia		124	22.19	4	21.05	27.2	20.76
Galeocerdo cuvier	Tiger shark	1	.18	1	5.26	.2	.15
Carcharhinus leucas	Bull shark	1	.18	1	5.26	.1	.08
Rajidae	Rays	3	.54	1	5.26	.7	.53
TotalChondrichthyes		5	.9	3	15.78	1.0	.76
Actinopterygii	UID Fishes	348	62.25	-	-	42.5	32.44
Ariopsis felis	Hardhead catfish	7	1.25	1	5.26	.9	.69
Opsanus sp.	Toadfish	2	.36	1	5.26	.6	.46
Caranx hippos	Crevalle jack	60	10.73	7	36.84	46.6	35.57
Archosargus probatocephalus	Sheepshead	2	.36	1	5.26	.4	.31
Mugil sp.	Mullet	9	1.61	1	5.26	.1	.08
Total Actinopterygii		428	76.56	11	57.88	91.1	69.55
Total Vertebrata		559	100.00	19	100.00	131.0	100.00

Table F-13. Species list for Shell Mound (8LV42) TU 5 Level E, ¼-in and larger fauna.

Taxon	Common Name	NISP	% NISP	MNI	% MNI	Wt (g)	% Wt
Vertebrata	UID Vertebrates	-	-	-	-	1.7	9.88
Mammalia	Mammal	2	4.08	-	-	1.5	8.72
Odocoileus virginianus	White-tailed deer	2	4.08	1	16.67	2.7	15.70
Total Mammalia		4	8.16	1	1667	4.2	24.42
Testudines	Turtles	17	34.69	-	-	3.5	20.35
Malaclemmys terrapin	Diamondback terrapin	1	2.04	1	16.67	.3	1.74
Total Reptilia		18	36.73	1	16.67	3.8	22.09
Actinopterygii	UID Fishes	21	42.86	-	-	4.4	25.58
Ariopsis felis	Hardhead catfish	2	4.08	1	16.67	.2	1.16
Caranx sp.	Jack	2	4.08	1	16.67	2.4	13.95
Sciaenops ocellatus	Red drum	1	2.04	1	16.67	.2	1.16
Mugil sp.	Mullet	1	2.04	1	16.67	.3	1.74
Total Actinoptergyii		27	55.10	4	66.68	7.5	43.59
Total Vertebrata		49	100.00	6	100.00	17.2	100.00

APPENDIX G
ISOTOPIC DATA FROM PRESENT-DAY SAMPLES

Table G-1. Ontogenetic δ18O ‰ and δ13C ‰ values for oyster 0312T-01 (1 = earliest, 17 = most recent growth).

Sample	δ18O ‰ SMOW	δ13C ‰ PDB	Comments
0312T-01 1	-3.94	-10.18	
0312T-01 2	-4.35	-9.22	
0312T-01 3	-3.08	-7.81	
0312T-01 4	-2.37	-6.95	
0312T-01 5	-2.00	-5.64	
0312T-01 6	-1.25	-6.77	
0312T-01 7	-0.86	-5.90	
0312T-01 8	-2.57	-7.25	
0312T-01 9	-3.21	-7.06	
0312T-01 10	-	-	Lost - trap error
0312T-01 11	-3.26	-7.06	
0312T-01 12	-2.97	-7.12	
0312T-01 13	-2.63	-6.34	
0312T-01 14	0.71	-5.01	
0312T-01 15	-	-	Lost - machine crash
0312T-01 16	-	-	Lost - machine crash
0312T-01 17	-	-	Lost - machine crash

Table G-2. Ontogenetic δ18O ‰ and δ13C ‰ values for oyster 0312T-04 (1 = earliest, 18 = most recent growth).

Sample	δ18O ‰ SMOW	δ13C ‰ PDB	Comments
0312T-04 1	-1.70	-6.57	
0312T-04 2	-0.24	-5.44	
0312T-04 3	-2.41	-7.74	
0312T-04 4	-3.19	-7.61	
0312T-04 5	-	-	too small - not loaded
0312T-04 6	-2.81	-6.40	
0312T-04 7	-4.11	-8.34	
0312T-04 8	-	-	too small - not loaded
0312T-04 9	-3.49	-7.88	
0312T-04 10	-	-	too small - not loaded
0312T-04 11	-0.20	-5.57	
0312T-04 12	-1.65	-6.61	
0312T-04 13	-2.04	-6.89	
0312T-04 14	-	-	too small - not loaded
0312T-04 15	-	-	too small - not loaded
0312T-04 16	-	-	too small - not loaded
0312T-04 17	0.41	-5.17	
0312T-04 18	-	-	too small - not loaded

Table G-3. δ18O‰ and δ2H ‰ values for water sample, 0312-water.

Sample	δ18O ‰ SMOW	δ2H ‰ SMOW
0312-water	0.44	5.19
0312-water	0.48	5.21

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BIOGRAPHICAL SKETCH

Andrea Palmiotto earned a B.A. in anthropology from the University of South Carolina in 2007. She earned an M.A. in 2011 and a Ph.D. in 2015, both in anthropology, from the University of Florida. Since 2005, Andrea has participated in archaeological excavations in South Carolina, Georgia, and Florida, both in academic and CRM contexts. Specializing in zooarchaeology, she has analyzed faunal materials from numerous sites in Florida, which have included diverse marine, freshwater, and terrestrial species. Andrea also participated in the Joint POW/MIA Accounting Command (JPAC) Forensic Science Academy in 2014 where she expanded her osteological analytical knowledge to human forensic cases and participated in archaeological recovery of MIA/POW remains in Vietnam.