

ZOOARCHAEOLOGICAL ANALYSIS OF THE NORTHEAST PLAZA AT THE SMITH
CREEK MOUND SITE (22WK526), WILKINSON COUNTY, MISSISSIPPI

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ABSTRACT

Oscar Leonardo Aguila. "Zooarchaeological Analysis of The Northeast Plaza at The Smith Creek Mound Site (22Wk526), Wilkinson County, Mississippi"
(under the direction of Drs. Megan C. Kassabaum and Katherine M. Moore)

This thesis presents the data and interpretation of a faunal assemblage excavated from a midden in the Northeast Plaza of the Smith Creek site, a Native American mound site in Wilkinson County, Mississippi. Previous analysis of the faunal material from a flank midden on Mound A at the site revealed various taxa present at the site and led to a discussion of whether Smith Creek hosted large-scale feasting or elite provisioning activities. The analysis presented here focuses on comparing the Northeast Plaza and Mound A faunal assemblages in order to gather more information about Smith Creek's usage of animal resources as a whole.

Comparisons between the two contexts focus on characteristics such as taxa abundance, heat-alteration, and element completeness. In addition, the differences between taxa lists allow for a more thorough understanding of which animals were being consumed at the site, and the potential reasons for their presence in the various middens. A reexamination of both the feasting and provisioning hypotheses concludes that the data from the Northeast Plaza continue to support the provisioning hypothesis suggested by the analysis of the Mound A materials.

The addition of data from the Northeast Plaza to the overall Smith Creek faunal assemblage situates Smith Creek as an important site in both the Lower Mississippi Valley and the greater Southeast region. By combining both mound and plaza contexts, Smith Creek can be broadly compared to sites that were occupied during the same cultural periods. Further analysis of faunal material from other parts of the site is a logical next step for faunal research at Smith Creek.

Table of Contents

List of Figures	iii
List of Tables	iv
CHAPTER ONE: INTRODUCTION	1
CHAPTER TWO: THE SMITH CREEK SITE	4
Introduction to Smith Creek.....	4
Previous Excavations and Research at Smith Creek.....	8
CHAPTER THREE: 2018 INVESTIGATIONS OF SMITH CREEK'S NORTHEAST PLAZA	11
Excavation Methods at Smith Creek.....	11
Northeast Plaza Stratigraphy.....	12
CHAPTER FOUR: ANALYSIS OF THE NORTHEAST PLAZA FAUNAL ASSEMBLAGE.....	17
Analyzed Material.....	17
Faunal Processing Methods	18
Skeletal Element Measurements of Large Mammals and Fish.....	20
Species Identified.....	22
Representation of Vertebrate Remains at Smith Creek.....	22
CHAPTER FIVE: COMPARATIVE ANALYSIS OF MOUND A AND THE NORTHEAST PLAZA..	28
Differences in Analysis Methodology	28
Differences in Excavated Units	28
Newly Identified Species	29

Comparisons of Abundance.....	30
Comparisons of Heat Alteration	31
Comparisons of Completeness.....	33
CHAPTER SIX: CONCLUSIONS.....	35
Importance of Animals at Smith Creek and in the Southeast	35
Fish Exploitation and Aquatic Resources	36
A Look at Bears at Smith Creek and Lower Mississippi Valley	40
Revisiting Feasting and Provisioning at Smith Creek	44
Summary	47
WORKS CITED	49

List of Figures

Figure 2.1. Contour map of the Smith Creek mound site with the locations of all modern excavation units	5
Figure 2.2. Chronology of the Natchez Bluffs region of the Lower Mississippi Valley	6
Figure 2.3. Radiocarbon dates provided by Smith Creek excavations showing occupation during Tchefuncte, Coles Creek, and Plaquemine times.....	7
Figure 3.1 Colorized map of the stratigraphy of a West Block wall in the Northeast Plaza.....	15
Figure 6.1 Distribution of centrum widths, calculated from a sample of 173 vertebrae from the Northeast Plaza.....	37

List of Tables

Table 3.1. Stratigraphic Zones and Descriptions for Units in the Northeast Plaza.....	15
Table 4.1. Species Identified in the 2018 Northeast Plaza Excavation Units.	23
Table 4.2. NISP and Weight for All Species Identified in the Analyzed Sample.....	24
Table 5.1. Counts of Burned Bone for Taxa in the Northeast Plaza and Mound A at Smith Creek.....	32
Table 5.2. Counts of Burned Bone within Mammal and Fish Taxa in the Northeast Plaza and Mound A at Smith Creek	32
Table 5.3. Rates of Fragmentation for Taxa Represented at Smith Creek	33
Table 6.1. Fish Vertebra Measurements by Taxon	38
Table 6.2. Comparison of Bear Statistics across Time Periods in the Southeast.....	42

CHAPTER ONE

INTRODUCTION

Zooarchaeology, or the study of faunal remains recovered from archaeological excavations, is an interdisciplinary subfield of archaeology that seeks to understand the intricate relationships between people and animals of the past (Broughton and Miller 2016). As with present-day human populations, animals were an essential resource for people of the past, being both an incredibly nutritious food resource and an important symbol in people's lives. Through the analysis of faunal remains, archaeologists can obtain a more complete picture of site occupation, especially when combined with the analysis of archaeobotanical remains and ceramics, by identifying the foods being consumed on site.

In the American Southeast, zooarchaeology focuses primarily on past human subsistence through the study of animal foods, and the relationship between these foods and sociopolitical organization (Peres 2014:5-6). By using animal remains to infer past human choices about foodways, zooarchaeological analysis can be useful in looking at how food was obtained, processed, cooked, served, consumed, and discarded, and how each of these steps was affected by the social structure present in societies. In addition, this analysis can aid in understanding the relationship between animals as a food resource and the socioeconomic aspects of pre-contact society in the Southeast (Peres 2014:7-8). The archaeological record and the faunal material within it can be used to track how subsistence patterns change over time as other aspects of society change, such as whether animal consumption changes with the transition to a maize-based agriculture.

This thesis, which aims to investigate the subsistence patterns of past people based on zooarchaeological analysis of material recovered from the Northeast Plaza excavations at the Smith Creek mound site (22Wk526) in southwestern Mississippi, is situated within this broad field of southeastern zooarchaeology. Through the identification of the species within the Smith Creek assemblage and the quantification of data gathered from the remains of these animals, I look at what specific animal populations were being preyed upon by the site's human occupants. Previous research on an assemblage from a flank midden excavated from Smith Creek's Mound A has revealed evidence of food-related activities occurring on the mounds themselves (Terry 2017), yet information on the use of the spaces between the mounds requires further examination, which could result in different understandings of how various site areas were used. Moreover, the Mound A and Northeast Plaza deposits represent different time periods, which allows me to contribute to important discussions about broad patterns of social change in the Lower Mississippi Valley through time.

Through these investigations, I aim to answer the following three questions: (1) What taxa are represented in the archaeological assemblage of the Northeast Plaza context? (2) What does the varying size of the animals represented by these faunal remains indicate about past human preferences in hunting and food consumption? (3) How do the faunal assemblages from Mound A (previously analyzed) and the Northeast Plaza differ in terms of taxa and size? By combining results from the mound context with my own results from the plaza context, the goal is to create a bigger picture of Smith Creek's faunal assemblage and how it changed through time and varied across space and to compare it to selected other sites in the region.

Following this Introduction, Chapter Two provides necessary background about the Smith Creek site and the zooarchaeological research that has taken place with the Mound A

assemblage. Chapter Three elaborates on the 2018 excavations in the Northeast Plaza, specifically discussing the field methods used for the recovery of faunal remains. Chapter 4 describes the results of my faunal analysis, covering the laboratory methods and providing a guide to the species identified during my analysis. Chapter Five explores the importance of animals as a nutritional source for Smith Creek's occupants and explains how the patterns observed in the assemblage relate to issues of subsistence. Chapter Six summarizes my conclusions regarding the comparison between Mound A and the Northeast Plaza, places Smith Creek in relation to other mound sites, and reflects on the importance of faunal analysis at this and other sites in the Lower Mississippi Valley.

CHAPTER TWO

THE SMITH CREEK SITE

This chapter will introduce Smith Creek, review the precontact history of the site through various cultural periods, describe the excavations that took place at the site during the 2013, 2015, 2016, and 2018 seasons, and explore the previous zooarchaeological research conducted on Mound A. This section will also introduce the Southeast region, the Lower Mississippi Valley, and Smith Creek's place in broad regional patterns.

Introduction to Smith Creek

Smith Creek is a precontact Native American mound site consisting of three mounds surrounding an open plaza area (Nelson et al. 2013). A contour map of the site shows the location of the three mounds in relation to each other, as well as the location of all units excavated at Smith Creek (Figure 2.1). The largest of the three mounds, Mound A, located to the west, is a platform mound with a height of approximately 10 meters. Mound B, situated in the northern area of the site, is a burial mound that is surrounded by a moat or ditch. Because this mound is known to include human remains, it has not been excavated since the 1960s. Mound C, located to the east, has partially eroded into Smith Creek, and is currently the smallest of the mounds. A central plaza is located between the three mounds. The area of the site referred to as the Northeast Plaza is situated between Mound B and Mound C (Kassabaum et al. 2014).

Smith Creek was occupied during three distinct precontact periods (Figure 2.2). The earliest known occupation was by the Tchefuncte culture (500 BC–AD 1) which dates chronologically to the Early Woodland period. People of the Coles Creek culture (AD 750–1200) occupied the site next during the Late Woodland period. It is during this period that the mounds

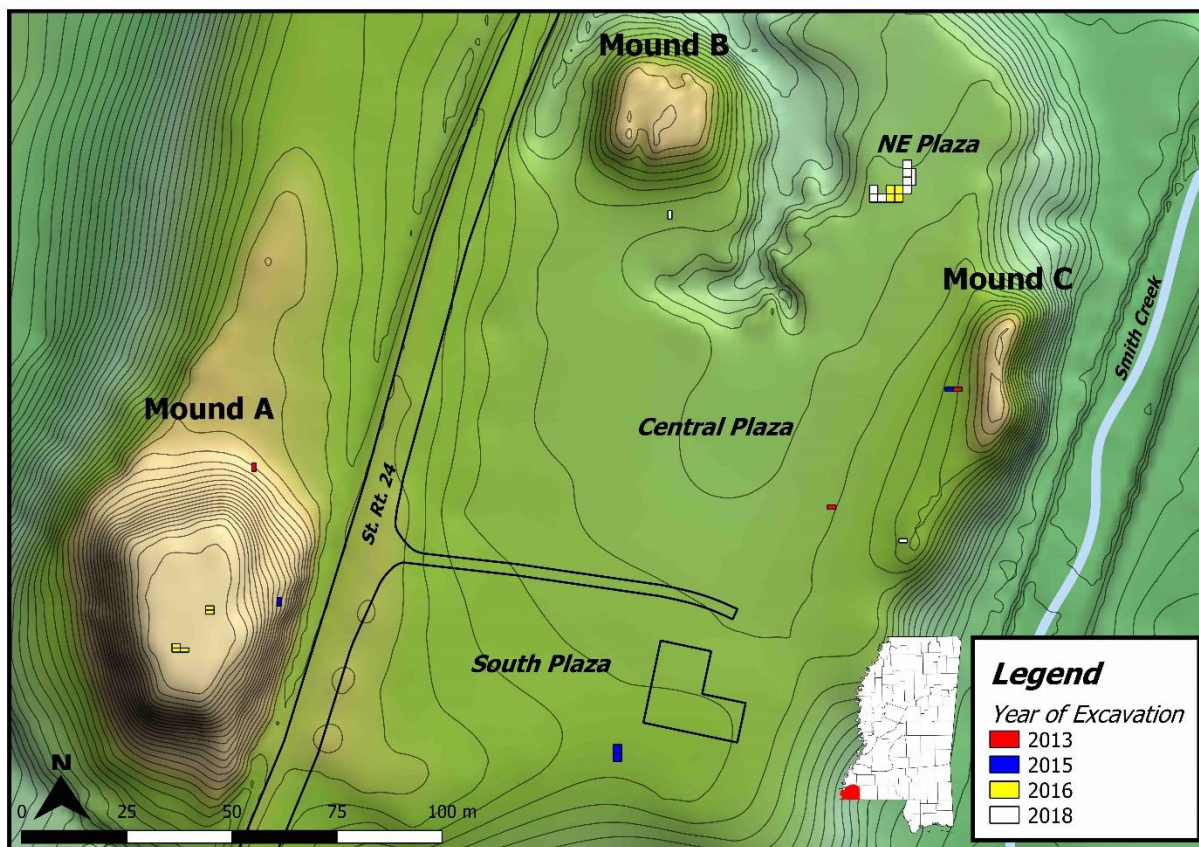


Figure 2.1. Contour map of the Smith Creek mound site with the locations of all modern excavation units (Kassabaum et al. 2014).

Temporal Units		Cultural Units	
Period	Date	Phase	Culture
Historic	AD 1730	Natchez	Plaquemine
Mississippi 2	AD 1682	Emerald	
	AD 1500	Foster	
	AD 1350	Anna	
	AD 1200	Gordon	
Mississippi 1	AD 1100	Balmoral	Coles Creek
Late Woodland 2	AD 1000	Ballina	
	AD 850	Sundown	
	AD 750	Hamilton Ridge	
Late Woodland 1	AD 400	Issaquena	Marksville
Middle Woodland	AD 200	Grand Gulf	
Early Woodland	AD 1	Homochitto	Tchefuncte
Late Archaic 2	500 BC		Poverty Point
Late Archaic 1	1700 BC		
Middle Archaic	3000 BC		
Early Archaic	6000 BC		
Paleoindian	8000 BC		

Figure 2.2. Chronology of the Natchez Bluffs region of the Lower Mississippi Valley (Kassabaum 2014).

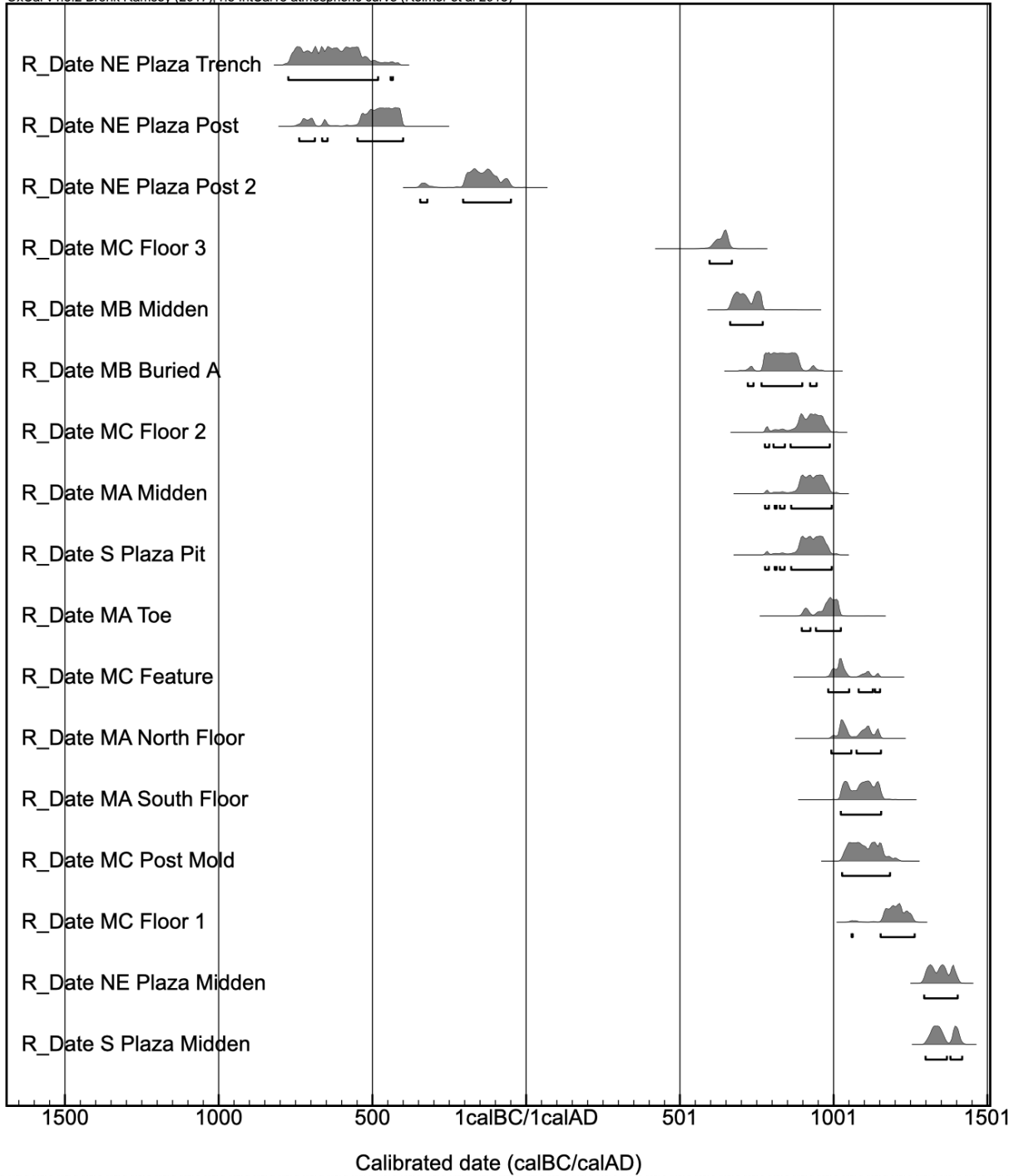


Figure 2.3. Radiocarbon dates provided by Smith Creek excavations showing occupation during Tchefuncte, Coles Creek, and Plaquemine times (Kassabaum and Graham 2020).

were constructed. Finally, a Plaquemine occupation (AD 1200–1730) occurred during the Mississippi period, which was when the site was used as a residential center, though mound construction likely continued as well (Figure 2.3). Based on previous excavations in different areas of the site, there appears to be an absence of evidence for the intervening Marksville and Baytown cultures, but further excavations may reveal such an occupation in the future (Kassabaum and Graham 2018).

Previous Excavations and Research at Smith Creek

Preliminary excavations at Smith Creek took place in 2013 as part of the Mississippi Mound Trail project, during which test units were placed in Mound A, Mound C, and the Plaza (colored red in Figure 2.1). Unit 1058R460, located near the base of Mound A revealed multiple episodes of mound construction, as well as ceramics, daub, and lithics, though no faunal remains were recovered. Unit 1077R627, located on the western flank of Mound C, consisted of an upper mound surface that lay between two zones of mound fill, and contained a dense deposit of ceramics and bone. Unit 1049R597, located in the eastern edge of the plaza, also contained bone fragments, although ceramics dominated the unit overall (Kassabaum et al. 2014).

The 2015 field season featured the excavation of four units spread between Mound A, Mound C, and the South Plaza (colored blue in Figure 2.1). The Mound A excavation of unit 1026R466 provided the assemblage of faunal remains analyzed by Terry for her master's thesis (2017). Faunal material was also recovered in both Mound C (1077R625) and the South Plaza (989–991R546), and if this material were to be analyzed, it could provide even more data for zooarchaeological research in the Lower Mississippi Valley. The Mound C assemblage is dominated by fish remains that were likely consumed by Coles Creek people on the mound summit immediately before the next phase of mound construction began, suggesting similarities

with the deposits in Mound A and tying food consumption to mound construction. The South Plaza assemblage more closely resembles that which forms the basis of this thesis and its analysis might reveal neighborhood-level differences between the Plaquemine habitation areas surrounding the Smith Creek plaza (personal communication, Megan Kassabaum 2020).

In her research, Terry (2017) investigated faunal material recovered using 1/2” and 1/4” dry screen, 1/2”, 1/4”, and 1/16” water screen, and flotation methods. She identified 24 distinct taxa in the assemblage and concluded that Mound A, along with the Smith Creek site more broadly, did not represent a typical Coles Creek mound site where large-scale feasting occurred (cf., Feltus, as discussed by Kassabaum 2014), but rather had more evidence for elite provisioning. This was based on two primary observations: (1) white-tailed deer did not compose a large proportion of the assemblage by count or weight when compared to examples of known feasting sites like Cahokia in Illinois or Feltus in Jefferson County, Mississippi; (2) there was no evidence of food processing near or on the surface of Mound A (Terry 2017). She argues that, had feasting occurred in that location, one would expect to find large mammals (e.g., white-tailed deer) being processed and consumed on the summit of Mound A. In addition to this evidence against a feasting interpretation, the archaeological record of the Mound A flank midden also exhibited two characteristics which are particular to elite provisioning: (1) particular cuts of meat, and (2) rare taxa representation. The recovery of appendicular elements (e.g., long bone fragments) as opposed to cranial and axial elements (e.g., vertebrae and ribs) indicate that deer segments with high value were of importance and given preferential selection. Terry also concludes that elite provisioning occurred at the site because of the presence of red fox, gray fox, mountain lion, and black bear. These animals likely appear because of the belief that the

consumption of “dangerous” animals could imbue the consumer with power and dominion, as well other characteristics associated with leadership (Jackson and Scott 2003).

During the 2016 field season, units were excavated in the Northeast Plaza and on the summit of Mound A (colored yellow on the map in Figure 2.1). Four adjacent units were opened in the Northeast Plaza (1122–1124R611–613), which led to the discovery of a wall trench related to a wooden structure. This trench produced new radiocarbon dates dating to the Early Woodland period, which was supported by the ceramic analysis, indicating a Tchefuncte occupation (Kassabaum and Graham 2018; see Figure 2.3). This structure was overlain by a dense midden laid down during Plaquemine times, which contained abundant bone fragments. The faunal material recovered from these units is not included in the dataset analyzed for this thesis; however, if further zooarchaeological analyses are performed on these faunal remains, the resulting data should be added to my dataset, creating a more complete picture of the faunal record of the Northeast Plaza. The two units on the summit of Mound A (1015R443 and 1025R449) revealed evidence of multiple stages of mound construction and a series of previous mound summits, but little to no faunal material was recovered (Reamer et al. 2016).

The 2018 excavations form the basis for this thesis. In addition to the expansion of the Northeast Plaza excavations, which will be discussed in detail in the next chapter, units were also opened on Mound C and off the southern flank of Mound B (colored white in Figure 2.1). Mound C excavations (1041R614) suggest that the mound was much larger than had been previously anticipated but did not include many faunal materials. Mound B excavations (1118R559) focused on a constructed platform that surrounded the mound, an indication of the degree to which humans altered their surrounding landscape to suit their own needs. Again, these excavations recovered very few faunal materials.

CHAPTER THREE

2018 INVESTIGATIONS OF SMITH CREEK'S NORTHEAST PLAZA

The Northeast Plaza at Smith Creek is an off-mound area that is situated between Mound B and Mound C. As mentioned above, the Northeast Plaza was excavated during the 2016 and 2018 field seasons. This chapter details the 2018 excavations in the Northeast Plaza, which form the basis of this thesis, and summarizes the field excavation and recovery methods used to sample zooarchaeological and other material types.

Excavation Methods at Smith Creek

Excavations in 2018 began with the opening of four additional units in the Northeast Plaza: 1126R615, 1124R615, 1122R607, and 1122R609. These four units were placed adjacent to the 2016 units in order to uncover more of the Tchefuncte structure discovered during that field season and to gain a larger sample of the Plaquemine midden. Later in the season, an additional four units were excavated to follow the arc of the trench even further: 1126R617, 1128R615, 1130R615, and 1124R607 (see Figure 2.1).

The decision to focus on the Northeast Plaza in this thesis was made for two primary reasons: (1) There was a large amount of well-preserved bone present in the Plaquemine midden context; and (2) I served as part of the 2018 field crew. Though previous excavations revealed plenty of faunal material that needed to be analyzed, particularly those in the South Plaza, my preference was to analyze material from the area of the site I was most familiar with, allowing me to apply my first-hand knowledge of excavation methods, stratigraphic details, and the bone being recovered.

Each unit was characterized by a series of stratigraphic zones that I have utilized to organize my analysis. Nearest the surface was a soil layer referred to as the plow zone, which contained a mix of historic and pre-contact material. Once the plow zone was removed, the underlying midden deposit was excavated in multiple, usually arbitrary levels. It is likely that these levels also contain material from the buried A-horizon soils that underlie the midden because it was impossible to differentiate these during the process of excavation due to organic staining of the buried A-horizon from the overlying midden. These levels contained abundant ceramic, lithic, faunal, and archaeobotanical materials. Once the midden and buried A-horizon soils were removed, the underlying subsoil revealed an abundance of post-hole and pit features. This feature assemblage included a large number of Plaquemine features cutting down from the overlying midden as well as the post-hole features embedded in the trench, which had been previously identified as being associated with the Tchefuncte structure.

All excavations during the 2018 season were conducted with shovels (flat and rounded), trowels (point and margin), and spoons for the excavation of features. Shovels were used until the transition to trowels was made for feature excavation and surface cleaning of the units' floors and walls. All soil from the plow zone and most soil from the midden layers were processed through 1/2" dry screens, while all features and a subsample of midden were processed through 1/4" and 1/16" water screens. Flotation samples were also taken from all features and the midden in order to recover small and fragile archaeobotanical and faunal remains. Flotation samples and water screen samples were not pre-screened.

Northeast Plaza Stratigraphy

In this section, I will discuss the stratigraphic zones of the Northeast Plaza, with a particular focus on physical properties of the sediments (e.g., thickness, soil color, soil texture,

and inclusions) and elaborate on any interpretations that were made while mapping the profiles in the field. A typical profile from one of our units is shown in Figure 3.1 and described in Table 3.1. All measurements of depth are expressed in centimeters below the datum point (cmbd), which is represented by the specific unit's southwestern corner.

For the purposes of this analysis, all faunal materials from the Northeast Plaza are being considered one continuous deposit, made up of the eight units from the 2018 field season, unless they could be definitively associated with a historic mixed context or with the Early Woodland occupation of the site. This deposit is thus made up of two distinct zones of midden, the buried A-horizon, and any associated Plaquemine features. The decision to lump these contexts was made because these contexts in the Northeast Plaza share the same categories of archaeological material (e.g., ceramic, lithic, paleobotanical, and faunal material), are situated in a continuous area of the site dominated by a large, sheet midden, and exhibit similar preservation of artifacts. Importantly, this allows my analysis to be collective rather than unit-by-unit or bag-by-bag. That said, the raw data are reported by bag number in order to allow these contexts to be separated out in future analyses if necessary.

Zone A

Zone A, which is interpreted as the Plow Zone, was composed of a dark grayish-brown silt (10YR4/2). The zone extended to approximately 14 cmbd and contained a mix of material from historic and precontact periods. Ceramics dominated the assemblage with all other material categories occurring in smaller quantities. Bone preservation was poorer than in the deeper deposits. Grass and plant roots were present, though the majority were cleared prior to beginning the excavation process. The materials from this zone are not included in this analysis.

Zone B

Zone B, which is designated as “Midden Zone A,” was made up of very dark grayish-brown silt (10YR3/2), mottled with very pale brown silt (10YR7/4) and reddish-yellow silt (7.5YR6/6). It was differentiated from the midden zone below it based on a higher density of fired clay inclusions and darker color. This dense midden zone extended to approximately 34 cmbd, averaging about 20 cm in thickness. The presence of well-preserved faunal material was noted in this layer, along with ceramic, lithic, and paleobotanical remains. Post-hole features were also present across some of the units indicating that there was a potential living surface within this midden deposit.

Zone C

Zone C, or the “Midden Zone B,” was characterized by a very dark brown silt (10YR2/2) mottled with very dark grayish-brown silt (10YR3/2) and reddish-yellow silt (7.5YR6/6). This midden layer extended to a depth of 46 cmbd, averaging a thickness of 12 cm. Midden Zone B was lighter and less dense than Midden Zone A and had noticeably lower quantities of fired clay inclusions. Artifacts recovered included ceramic, lithic, paleobotanical, and faunal material. Features from Midden Zone A continued down through this layer, but they were kept separate during excavation. New post-hole features were also identified indicating that structures were built on this location during the early stages of the midden’s accumulation.

Zone D

Zone D, interpreted as the buried A-horizon, is defined by very dark brown silt (10YR2/2). Zone D extends to 56 cmbd, averaging a thickness of 10 cm. This zone marks the occupation layer that people at Smith Creek would have been using prior to the deposition of the

Table 3.1. Stratigraphic Zones and Descriptions for Units in the Northeast Plaza.

Zone Designation	Soil Color and Type (Munsell Value)	Thickness (cm)	Brief Description
A	Dark grayish brown silt (10YR4/2)	14	Plow zone; historic context; plant roots
B	Very dark grayish brown silt (10YR, mottled with very pale brown silt (10YR7/4) and reddish yellow silt (7.5YR6/6)	20	Midden Zone A; dense midden; fired clay; well-preserved faunal material
C	Very dark brown silt (10YR2/2), mottled with very dark grayish brown silt (10YR3/2) and reddish-yellow silt (7.5YR6/6)	12	Midden Zone B; less dense midden; well-preserved faunal material
D	Very dark brown silt (10YR 2/2)	20	Buried A-horizon; lower material density
E	Brown silt (7.5YR4/2)	-	E-horizon subsoil; sterile soil

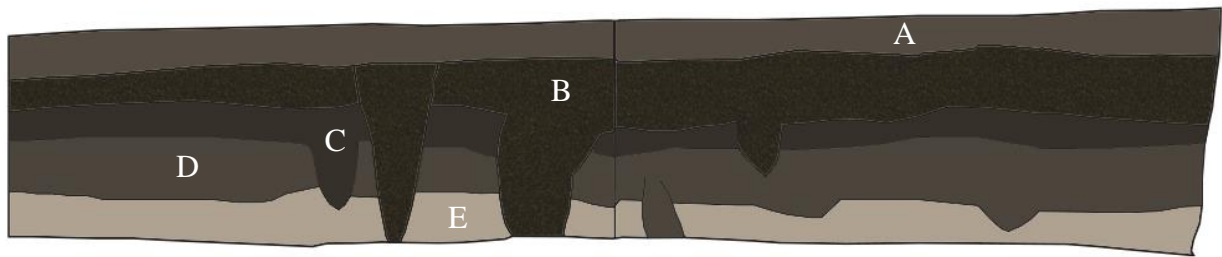


Figure 3.1. Colorized map of the stratigraphy of a West Block wall in the Northeast Plaza, depicting the plow zone, midden zone A, midden zone B, buried A-horizon, and E-horizon with features extending down from numerous levels.

midden. The date of this zone is currently unknown, though it is likely associated with either a Coles Creek or Plaquemine use of the site. Post-hole features from the overlying midden extended into this layer but were kept separate during excavation; in addition, new ones were identified at the base of this soil horizon. Artifact abundance decreased overall, including faunal remains.

Zone E

Zone E, which is interpreted as the E-horizon subsoil, is composed of brown silt (7.5YR4/2). This natural soil horizon extends past the base of our excavations. This layer is generally considered sterile subsoil, though it is possible that it contains Early Woodland materials (Kassabaum and Graham 2020). Regardless, it was not included in this analysis. Post-hole features continued down into this zone from above but were excavated separately. Artifact density was exceptionally low, and the few bone fragments recovered showed very bad levels of preservation.

CHAPTER FOUR

ANALYSIS OF THE NORTHEAST PLAZA FAUNAL ASSEMBLAGE

This chapter discusses the methods and results of this study. The first part outlines the methods used in the analysis of faunal material from the Northeast Plaza, with particular focus on the laboratory methods used for sorting, analyzing, and recording recovered material. The second part includes the presentation of results, including a list of species identified and their relative abundances, a description of any taphonomic evidence identified on the bone assemblage, and biomass estimation.

Analyzed Material

As previously noted, all analyzed material originated from the 2018 excavation season, which consisted of eight units totaling 31 square meters. However, only a sample of the recovered material was analyzed for this thesis. This includes material from six of the eight units: 1122R609, 1124R615, 1126R615, 1126R617, 1128R615, and 1130R615, totaling 23 square meters. Only material that was excavated from levels containing the midden zones, buried A-horizon, and/or Plaquemine features were considered in my analysis. Any bags from the plow zone, or bags that contained faunal material from wall cleaning or other mixed contexts were placed aside and sorted back into their distinct storage boxes. In addition, any bags associated only with the Tchefuncte occupation of the Northeast Plaza were also eliminated. Finally, only 1/2" and 1/4" material was considered in this analysis due to time constraints imposed by the scale of an undergraduate thesis as well as the sheer size of the assemblage from the Northeast Plaza. However, it is important to note the value of the 1/16" water screening and flotation samples. By not analyzing such material, one misses out on the potential micro-remains of

smaller animals or fragmented remains that will otherwise be unaccounted for. This would be a logical next step if analysis of this assemblage continues.

Faunal Processing Methods

Methods discussed in this chapter, including identification, occurred in the University of Pennsylvania Museum of Anthropology and Archaeology's zooarchaeology laboratory, located in the Center for the Analysis of Archaeological Material (CAAM) under the supervision of Dr. Katherine Moore. Due to the unforeseen COVID-19 pandemic that hit Philadelphia during Spring 2020, the remaining analysis of the faunal material was generously completed by Dr. Moore in the laboratory located in her home after I was unable to return to campus. More detail will be given on the process of analysis during the COVID-19 pandemic and how it differed from my own later in this chapter.

Material Recovered from 1/2" and 1/4" Fractions

Upon returning from the field, the entire Smith Creek collection was washed and rough sorted by students in the North American Archaeology Lab within the Department of Anthropology at Penn. Washing was done using water and a toothbrush; no soaps or solvents were used. Rough sorting involved separating the assemblage by material type, including ceramic, stone, bone, shell, fired clay, and numerous, less-common categories. At the start of this research project, all faunal material was separated from the other material types and transported to the zooarchaeology laboratory in CAAM. Material was initially processed bag-by-bag and unit-by-unit in order to maintain context and proceed in a controlled manner. The bag number system used for Smith Creek ties the site name, site number, unit name, current level or zone being excavated, the recovery method, excavators' initials, and the date to a unique number

recorded on each field bag. If a level within a unit was open on more than one day, a separate bag number was assigned for each day. In this way, bag numbers at Smith Creek may be treated as equivalent to field specimen numbers, meaning that everything within a single bag number can be assumed to have come from the same archaeological context.

Upon arriving in the zooarchaeology laboratory, bags were separated by unit and then further separated by level or zone. The material was then sorted into seven general taxonomic categories: large mammal, medium mammal, small mammal, fish, reptile, bird, and amphibian. Any fragments that were unidentifiable at this level were placed into their own category and labeled as “indeterminate;” these will be reserved for more thorough analysis in the future. There were two instances in which non-bone material, which was accidentally rough sorted into the faunal material post-excavation, was pulled out and reinserted with its appropriate material type and context.

Once the faunal materials were sorted into these general taxonomic categories, identification proceeded to the highest taxonomic designation possible, generally to the species level. If a bone fragment was unidentifiable at the species level, it would remain in its original general category (i.e., large mammal, small mammal, etc.). Every bag in a given unit was completed before moving on to the next unit, as to prevent chaos and maintain careful control of context through the identification process.

After all sorting and identification based on taxa was complete, each category was then further sorted by element. This involved starting at the broadest level, which was body segment (i.e., axial, appendicular, cranial, postcranial) and proceeding up to skeletal element (e.g., vertebra, tibia, phalange). Any fragmented bone that was unable to be sorted by element was designated as “indeterminate.”

Cataloguing of all recorded information was performed in Microsoft Excel. During the period when I was the primary analyst, the following information was recorded for each individual bone: bag number, unit number, recovery technique, taxonomic order, species common name, body segment, skeletal element, completeness (complete, fragment, proximal, distal, shaft fragment), symmetry (right vs. left), weight (in grams), number of fragments (generally one, but sometimes numerous in the case of post-depositional breakage), maturity (unfused vs. fused), dental wear (stages of wear), various taphonomic alterations (e.g., burning, cut marks, erosion, weathering, staining, ravaging), pathology (if present, the pathology was identified), miscellaneous notes, and up to three measurement codes recording element size if the fragment was complete (in millimeters). A detailed explanation of these measurement codes will be given in the next section.

When the COVID-19 pandemic hit, I was unable to complete the remaining analysis on my own. Dr. Moore conducted the rest of the identification and recording for the sample of the Northeast Plaza faunal assemblage described above. During this analysis period, bones were grouped into their distinct element categories and weighed as a whole (i.e., all deer phalanges were recorded together, leading to a wider variation in the number of fragments column of my spreadsheet). This allowed me to still gather the data I needed, but the individual bone was no longer recorded as a separate entry in the spreadsheet in order to save time in the lab. All of the information listed above was still gathered however, ensuring that the data I had collected before the pandemic was consistent with the data obtained after the pandemic.

Skeletal Element Measurements of Large Mammals and Fish

As previously mentioned, measurements were performed and recorded using respective codes on fragments that were designated as complete enough to give accurate data. All

measurements were taken using calipers accurate to 0.1 mm. The goal of taking these measurements was to obtain further data that could be used to describe the size of the animals at time of death. This step was only performed on large mammals and fish due to time constraints, my familiarity in the identification of skeletal elements for these taxonomic groups, and established standards within the field of southeastern zooarchaeology. Large mammals and fish, as will be explained later in the chapter, are the most highly represented taxa at many southeastern riverine sites, including Smith Creek. Large mammals are more likely to be preserved and have features that are still measurable. Fish are common due to the proximity of the major waterways, but also preserve well and have easily measurable vertebral elements.

For fish vertebrae, measurements were performed mediolaterally across their centra and respective cranial and caudal sides. They were measured across all species, but measurement was not performed if the bone suffered from severe fragmentation. A majority of the measurements taken on large mammals were from appendicular fragments, specifically long bones and podials. Long-bone measurements focused on proximal or distal ends and recorded greatest length across the long bone and width across the articulate ends. Podial measurements included length from distal to proximal end, and width on both ends (Driesch 1976). Measurements on large mammal bones were only taken if either the distal or proximal end was present and not severely fragmented. Once all possible measurements were collected and recorded, the data from the fish were used to create a histogram to depict the distribution of element sizes (see Chapter 6). This graphic representation follows previous research techniques used by Terry (2017) and allows for comparisons to be made between these two datasets.

Species Identified

Twenty-five distinct taxa were identified in the sample from the 2018 Northeast Plaza excavations; they can be lumped into the following categories: twelve mammal taxa, one bird taxa, four reptile taxa, one amphibian taxa, and seven fish taxa (see Table 4.1). Of the twenty-five total taxa, twelve were identifiable to species—white-tailed deer (*Odocoileus virginianus*), black bear (*Ursus americanus*), mountain lion (*Puma concolor*), bobcat (*Lynx rufus*), raccoon (*Procyon lotor*), otter (*Lontra canadensis*), turkey (*Meleagris gallopavo*), snapping turtle (*Chelydra* or *Macrochelys*), softshell turtle (*Trionyx*), box turtle (*Terrapene* spp.), bowfin (*Amia calva*), and fresh water drum (*Aplodinotus grunniens*). Bowfin and freshwater drum have species-level identifications only because *Amia calva* is the sole-surviving member of the order Amiiformes and because *Aplodinotus grunniens* is the only drum species to inhabit non-marine locations.

Unfortunately, many fragmented remains were unidentifiable due to the limited nature of the comparative material being used, as well as the lack of access to quality online identification resources. Future collaboration with the Academy of Natural Sciences, located in Philadelphia, or other universities with larger comparative collections related to the archaeology of the American South may allow more extensive identification.

Representation of Vertebrate Remains at Smith Creek

Following the identification and cataloguing of the bone fragments, the raw data were compiled and transformed in order to more easily quantify and describe the animal assemblage recovered from the Northeast Plaza (see Table 4.2). This process was achieved through the creation of percentages and the use of pivot tables in Microsoft Excel. These pivot tables were

Table 4.1. Species Identified in the 2018 Northeast Plaza Excavation Units.

	Common Name	Scientific Name
Mammal	Black Bear	<i>Ursus americanus</i>
	White-tailed Deer	<i>Odocoileus virginianus</i>
	Mountain Lion	<i>Puma concolor</i>
	Bobcat	<i>Lynx rufus</i>
	Cat	Felidae
	Dog	Canidae
	Raccoon	<i>Procyon lotor</i>
	Field Mouse	Mus
	Opossum	Didelphidae
	Otter	<i>Lontra canadensis</i>
	Rabbit	<i>Sylvilagus</i> spp.
	Eastern Grey Squirrel	<i>Sciurus carolinensis</i>
Bird	Turkey	<i>Meleagris gallopavo</i>
Reptile	Snake	Serpentes
	Snapping Turtle	<i>Chelydra</i> or <i>Macrochelys</i>
	Softshell Turtle	<i>Trionyx</i>
	Box Turtle	<i>Terrapene</i> spp.
Amphibian	Salamander	Urodela
Fish	Bass	Centrarchidae
	Bowfin	<i>Amia calva</i>
	Catfish	Ictaluridae
	Freshwater drum	<i>Aplodinotus grunniens</i>
	Gar	Lepisosteidae
	Sucker	Catostomidae
	Carp/Minnow	Cyprinidae

Table 4.2. NISP and Weight for All Species Identified in the Analyzed Sample.

Taxon	NISP	% NISP	Weight (g)	% Weight
Bear (<i>Ursus americanus</i>)	35	1.13	166.3	3.56
Deer (<i>Odocoileus virginianus</i>)	301	9.7	2079.22	44.53
IND Large Mammal	1029	33.17	1552.86	33.26
Subtotal Large Mammal	1365	44	3798.38	81.34
Mountain Lion (<i>Puma concolor</i>)	1	0.03	4.4	0.09
Bobcat (<i>Lynx rufus</i>)	1	0.03	0.3	0.01
Cat (Felidae)	1	0.03	7.3	0.16
Dog (Canidae)	1	0.03	5.1	0.11
Raccoon (<i>Procyon lotor</i>)	2	0.06	3.8	0.08
IND Medium Mammal	3	0.10	1.2	0.03
Subtotal Medium Mammal	9	0.29	22.1	0.47
Field Mouse (Mus)	1	0.03	0.09	-
Opossum (Didelphidae)	2	0.06	4.11	0.09
Otter (<i>Lontra canadensis</i>)	2	0.06	3.2	0.07
Rabbit (<i>Sylvilagus</i> spp.)	13	0.42	11.8	0.25
Eastern Grey Squirrel (<i>Sciurus Carolinensis</i>)	5	0.16	2.05	0.04
IND Small Mammal	55	1.77	19.96	0.43
Subtotal Small Mammal	78	2.51	41.21	0.88
Turkey (<i>Meleagris gallopavo</i>)	32	1.03	22.9	0.49
Subtotal Bird	32	1.03	22.9	0.49
Snake (Serpentes)	5	0.16	1.62	0.03
Snapping Turtle (<i>Chelydra</i> or <i>Macrochelys</i>)	78	2.51	40.18	0.86
Softshell Turtle (<i>Trionyx</i>)	13	0.42	19.97	0.43
Box Turtle (<i>Terrapene</i> spp.)	1	0.03	0.8	0.02
IND Reptile	1	0.03	0.17	-
Subtotal Reptile	98	3.16	62.74	1.34
Salamander (Urodela)	1	0.03	0.34	0.01
Subtotal Amphibian	1	0.03	0.34	0.01

Table 4.2 (continued). NISP and Weight for All Species Identified in the Analyzed Sample

Bass (Centrarchidae)	1	0.03	0.1	-
Bowfin (<i>Amia calva</i>)	99	3.19	19.93	0.43
Catfish (Ictaluridae)	514	16.57	307.14	6.58
Freshwater Drum (<i>Aplodinotus grunniens</i>)	15	0.48	16.4	0.35
Gar (Lepisosteidae)	202	6.51	196.73	4.21
Sucker (Catostomidae)	20	0.64	10.69	0.23
Carp/Minnow (Cyprinidae)	1	0.03	0.4	0.01
IND Fish	209	6.74	56.87	1.22
Subtotal Fish	1061.00	34.2	608.26	13.03
Unidentified	458	14.76	113.57	2.43
Subtotal Unidentified	458.00	14.76	113.57	2.43
Total Assemblage	3102	100	4669.5	100

used to sort data by NISP, weight, completeness, and heat alteration for each taxonomic category. These data will be described and interpreted in the next chapter. As previously mentioned, all bags analyzed from the Northeast Plaza are being considered one continuous deposit made up of the two midden zones, the buried A-horizon, and associated Plaquemine features.

Large mammals were the best represented taxa in the Northeast Plaza assemblage, with a count representation of 44%. The weight of large mammals is expectedly high, representing 81.34% of the assemblage (see Table 4.2). This high percentage is due both to the number of unidentifiable fragments that were classified as large mammal (with the majority of these being unidentifiable long bone elements) and to the large average size of these fragments when compared to other taxa groups.

Of these large mammals, white-tailed deer compose about 9.7% of the faunal assemblage by count and 44.53% by weight (see Table 4.2). White-tailed deer are thus the best-represented

species in the large mammal category and in the Smith Creek assemblage more broadly. Only 7.8% of the white-tailed deer remains were identified as burned, a trend that will be further discussed in Chapter 6.

Bear remains are another large mammal category that reflect interesting results. These fragments compose 1.13% of the total assemblage by count and 3.56% by weight (see Table 4.2). The bear assemblage is dominated by paw elements, which make up 68.5% of the total bear fragments by count. This pattern correlates with patterns identified through southeastern zooarchaeological research regarding the consumption of bear paws (Peles and Kassabaum 2020; Peres 2014). Differing from the deer remains, 31.4% of the bear bone fragments were burned to either a charred or calcined state. Further discussion on bear podial elements and the burning of bear fragments will occur in Chapter 6.

Fish were the second best-represented general taxonomic category in the 2018 units by number of fragments identified, consisting of 34.2% of the total assemblage. By weight, the fish assemblage made up 13.03%, with the majority of the bones coming from catfish and gar. Gar in particular are overrepresented in both NISP and weight measurements due to the number of scales that are recovered in the archaeological record; gar scales preserve extremely well in the due to the enamel-like dentine that characterizes the ganoid scales (Wheeler 1989). Catfish fragments mostly consisted of postcranial elements, particularly vertebrae.

Unidentifiable fragments were the third most-represented group in the faunal assemblage by count. These fragments composed 14.76% of the total count and 2.43% of the assemblage by weight. This low weight percentage can be explained by the small size of the fragmented bone that was recovered in 1/4" water screening samples.

Reptilian bone fragments are the fourth most common group in the Northeast Plaza assemblage and compose 3.16% by count and 1.34% by weight. This category is dominated by snapping turtle remains, which make up 75.9% of the reptilian assemblage. Small mammal remains were the fifth most-represented category and compose 2.51% by count and only 0.88% by weight. This category is dominated by unidentified fragments, which compose 70%. This is expected, as small mammal bones are prone to more fragmentation due to their reduced size when compared to other taxa like large mammals or reptiles.

Bird, medium mammal, and amphibian fragments are the least-represented groups in the Northeast Plaza midden assemblage. When count is considered, birds compose 1.03%, medium mammals constitute 0.29%, and amphibians only form 0.03% of the assemblage. These low percentages may be a result of screening bias, as most of these fragments may fall through 1/2" and 1/4" screens. Another reason may be that the deposition of these taxa was limited in the Northeast Plaza and may be more abundant in other areas of the site. Finally, the use of these animals, either for consumption or other reasons, may not have been that frequent at Smith Creek overall when compared to both large mammals and fish.

CHAPTER FIVE

COMPARATIVE ANALYSIS OF MOUND A AND THE NORTHEAST PLAZA

This chapter provides an overview of the findings from the Northeast Plaza units at Smith Creek and compares these findings with those of Terry's (2017) analysis of the Mound A flank midden. Specifically, discussion of the differences will focus on methodology, area excavated, newly identified species, abundance, heat-alteration, and element completeness.

Differences in Analysis Methodology

One important difference between Terry's analysis and my own is her inclusion of 1/16" material and the fine fraction of the flotation samples in creating her taxa list. As mentioned above, my analysis did not include 1/16" material due to several factors, which makes a comparison of the two assemblages harder to complete. This difference must be considered when noting the difference in sample sizes and must also be considered in thinking about what types of faunal material may have been missed in my sample. As previously noted, this is an obvious area for future research. For the comparative purposes of this chapter however, I have been able to convert Terry's data because she reported them by screen size.

Differences in Excavated Units

Terry (2017) and this thesis both focus on the analysis of faunal material present in discrete midden deposits at Smith Creek, but the number of units (and thus the quantity of midden) that were excavated and analyzed differ dramatically. The 2015 excavations featured one unit opened in Mound A, while the 2018 excavations in the Northeast Plaza yielded a total of eight units opened, though only six were analyzed here. Therefore, it is imperative to discuss the

system of standardizing the recorded data that was used in order to make the comparisons that follow.

In order to quantify the amount of material being analyzed, the total surface area of the units must be calculated. Unit 1026R466, a single 1 x 2-meter unit which contains the flank midden on Mound A, has a surface area of two square meters (Terry 2017). In the Northeast Plaza, six units were analyzed for faunal material; five of those (1122R609, 1124R615, 1126R615, 1128R615, 1130R615) were 2 x 2-meter units, and one (1126R617) was a 3 x 1-meter unit, yielding a total surface area of 23 square meters. Though the midden in the Mound A unit was a thicker than that encountered in most of the Northeast Plaza units, this is still the easiest and most effective way to quantify the difference. While future analyses may want to calculate and consider cubic meters of midden, this calculation was not attempted here.

Newly Identified Species

As described in Chapter 4, the analysis of the faunal material from the Northeast Plaza identified twenty-five taxa (see Table 4.1), as compared to twenty-four identified taxa on Mound A. That said, there are important differences in which taxa were identified (Terry 2017). Missing from the taxa list created for the Northeast Plaza assemblage but present on Mound A are muskrat (*Ondatra zibethicus*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), cotton rat (*Sigmodon* spp.), buffalo (*Ictiobus* spp.), frog/toad (*Rana/Bufo* sp.), and crawfish (Asteroidea). On the other hand, the Northeast Plaza units introduced eight taxa that had yet to be recovered and identified at Smith Creek: bobcat (*Lynx rufus*), cat (Felidae), dog (Canidae), field mouse (*Mus*), otter (*Lontra canadensis*), softshell turtle (*Trionyx*), box turtle (*Terrapene* spp.), and carp/minnow (Cyprinidae). The identification of these different species may be attributed to factors such as element completeness, preservation conditions, or access to additional

identification resources; however, this could also imply differences in cultural behavior associated with food choice or depositional practices between the two site areas.

Comparisons of Abundance

Analysis of the Mound A flank midden recorded a total of 11,600 bone fragments over an area of two square meters for a total weight of 4977.4 grams. This count and weight correspond only to the 1/2" and 1/4" fraction of the assemblage. Terry's 1/16" fraction weighed 231.64 grams, and when combined with the 1/2" and 1/4" assemblages, her analyzed material weighed a total of 5209.09 grams (Terry 2017:31). To compare Terry's analysis and my own directly, I will be only be using data from material recovered in 1/2" and 1/4" screens.

My Northeast Plaza analysis recorded 3,102 fragments and 4,669.5 grams of bone in a 23 square meter area. When taking into consideration the differences between the surface area included in these two samples, the flank midden from Mound A contained 5,800 bones per square meter, while the units analyzed Northeast Plaza held on average 135 bones per square meter. While some of this may be due to the fact that the Mound A flank midden was thicker than the Northeast Plaza midden, this difference in thickness is not significant enough to explain this dramatic of a difference in count. There are three additional possible explanations: (1) that the Mound A midden was much more fragmented and/or consisted of smaller elements than the Northeast Plaza midden; (2) that the Mound A midden was much denser than the Northeast Plaza midden; and (3) that the Mound A midden showed much better preservation than the Northeast Plaza midden. Based on the figures provided above, the fragments from the Mound A midden had an average weight of 0.42 grams while those from the Northeast Plaza had an average weight of 1.51 grams. This suggests that fragmentation and element size likely did play a role in

creating the variability between these assemblages, though density and preservation may also have been important factors.

Mound A and the Northeast Plaza differ in important ways when specifically comparing number of bone fragments and weight of mammals and fish. The flank midden in Mound A was primarily composed of fish bones when count is considered, making up 50.3% of the total assemblage, yet mammal fragments are the best-represented category by weight, composing 51.4% (Terry 2017:34); meanwhile, the Northeast Plaza analysis showed that large mammals are more common in the assemblage by weight (44%) and count (81%). My analysis thus shows significant focus on mammal resources over fish resources in the Northeast Plaza when compared to Mound A, which helps to explain the difference in element size noted above.

Comparisons of Heat Alteration

The next comparable measurement is heat alteration. I measured heat alteration as the degree of evidence for burning present on the bone, using the categories charred and calcined. Burned bone may indicate evidence of food processing during cooking, waste management, or natural fires that came in contact with the faunal material (Gifford-Gonzalez 2018:320-321). In the Northeast Plaza, 12.1% of the assemblage was charred or calcined. Further breaking down the patterns, 63.5% of the heat-altered assemblage were classified as mammal, unidentifiable bone fragments composed roughly 21.8%, and fish fragments made up 11.5% (Table 5.1). Bird, reptilian, and amphibian bone all showed very low rates of burning.

Terry's analysis had the same three taxonomic categories at the top of the heat-alteration rankings. This may be attributed to cultural behaviors related to cooking large mammals and fish for consumption, ritual burning of some animal remains, or the potential use of bone as fuel

Table 5.1. Counts of Burned Bone for Taxa in the Northeast Plaza and Mound A at Smith Creek.

	Mammal		Unidentified		Fish		Bird		Reptile		Amphibian	
	Count	% by count	Count	% by count	Count	% by count	Count	% by count	Count	% by count	Count	% by count
Northeast Plaza (n = 469)	298	63.5%	102	21.8%	54	11.5%	6	1.3%	9	1.9%	0	0%
Mound A (n=1232)	554	44.9%	310	25.2%	263	21.3%	17	1.5%	88	7.1%	0	0%

Table 5.2. Counts of Burned Bone within Mammal and Fish Taxa in the Northeast Plaza and Mound A at Smith Creek.

	Mammal		Fish	
	Northeast Plaza	Mound A	Northeast Plaza	Mound A
Burned/Calcined	298	554	54	263
% by count within taxa	20.5%	25.8%	5.08%	4.5%

(Kassabaum and Peles 2020; Sandrine et al. 2002). Looking in particular at both mammal and fish taxa, similar heat-alteration percentages were reported by both analyses when the percentage of heat-altered bone is calculated within taxa (Table 5.2): Mound A contains 25.8% of the total count of mammals burned, compared to 20.5% of mammals burned in the Northeast Plaza; burned fish bones at Mound A make up 4.5% by count, compared to 5.08% in the Northeast Plaza (Terry 2017:41). When standardized by surface area, the Mound A midden contained more heat-altered bone, at 616 burned bones per square meter, versus the Northeast Plaza, which contained 20 burned bones per square meter.

Comparisons of Completeness

The Northeast Plaza assemblage, like the flank midden assemblage from Mound A, is highly fragmented. As mentioned in Chapter 4, bone completeness was recorded as either complete (if little to no fragmentation was observed) or fragmented (if the remains were substantially incomplete). If long bone or podial elements were identified, further designation was assigned as either a proximal end, a shaft fragment, or a distal end; if none of these designations applied, the bone was recorded as a general fragment. Only 13.5% of the total Northeast Plaza assemblage was classified as complete; fragmented remains thus made up 86.5% of the total assemblage (Table 5.3). Breaking the data down even further, bones recorded as proximal fragments make up 3% of the total fragmented assemblage, long bone shaft fragments compose 15.75%, distal fragments are 3.18%, and general fragments 78.07%.

Table 5.3. Rates of Fragmentation for Taxa Represented at Smith Creek.

	Mammal		Unidentified		Fish		Bird		Reptile		Amphibian	
	Count	% by count	Count	% by count	Count	% by count	Count	% by count	Count	% by count	Count	% by count
Complete	93	6.4%	1	0.2%	317	29.9%	1	3.13%	10	10.2%	0	0%
Fragmented	807	55.6%	457	99.8%	744	70.1	4	12.5%	85	85.7%	1	100%
Proximal	73	5.03%	0	0%	0	0%	4	0.28%	2	0.14%	0	0%
Shaft	404	27.8%	0	0%	0	0%	17	1.17%	0	0%	0	0%
Distal	75	5.17%	0	0%	0	0%	6	0.4%	1	0.07	0	0%

Mammal bone represents the category that suffered the highest rates of fragmentation; mammals composed 50.4% of the total fragmented assemblage, whereas only 22.6% of the total complete assemblage is composed of mammal remains. This same pattern holds true in the Mound A assemblage, allowing for conclusions to be drawn about the intensity of food processing that may be occurring on-site. Fish make up 28.2% of the fragmented assemblage from the Northeast Plaza, while composing 74.5% of the complete assemblage. These numbers are expected and similar to those reported from Mound A. This consistency can be explained by the number of fish vertebrae that still have centra intact and the number of gar scales present in the fish assemblage, both of which have high resistance to taphonomic processes.

CHAPTER SIX

CONCLUSIONS

This section will focus on discussions pertaining to the importance of studying faunal remains from archaeological sites, revisiting questions about the importance of animals' intrinsic qualities, the nutrition that they provide upon consumption, and the role they play in rituals. Discussion will then transition to specific questions regarding the exploitation of fish, the potential use of bear at Smith Creek, and evidence for feasting and provisioning at the site. Finally, I focus on the conclusions of my analysis by returning to my initially posed research questions.

Importance of Animals at Smith Creek and in the Southeast

Faunal material recovered from Smith Creek allows us to better understand the important roles that animals played as a food resource and in ritual activities that occurred at the site. Combined, these two aspects can help to explain the relationship between animals and humans, which clearly goes beyond mere consumption (Kassabaum and Peles 2020). The samples analyzed from Mound A and the Northeast Plaza show many of the same taxa in two different site contexts. With that being said, it is essential to discuss details regarding the use of animals within these two areas of Smith Creek, and to examine the evidence for hunting and butchering practices that was found in these assemblages.

First and foremost, the use of animals as food must be carefully considered. The creation and consumption of food, a necessity in life for all beings, requires the use of technology coupled with a wide variety of behavioral choices. In the American Southeast, and especially in the Lower Mississippi Valley, pre-contact communities had access to a wide variety of species, in

part thanks to the large quantities of aquatic and terrestrial resources supported by the Mississippi River and its floodplains; these include fish, deer, bear, and other abundant species (Peres 2017:11; Galloway and Peacock 2015). In interpreting the assemblages recovered from archaeological sites, knowledge of the natural world is also important, with factors such as the environment and seasonality impacting subsistence patterns and the methods that people used to catch their prey.

Animals also play a key role in the rituals that humans take part in and help them to make meaning out of the world that they inhabit. A prime example of this are bears, who are often seen as having the ability to “navigate between the human and spirit worlds,” and would have been an important as both a food source and a ritual material (Kassabaum and Peles 2020:114). This more ritual use of animals will be discussed in more detail later in this chapter.

Fish Exploitation and Aquatic Resources

Based on the data presented in this thesis, there is clear evidence for the large-scale exploitation of fish at Smith Creek. Fish make up 34.5% by count of the analyzed Northeast Plaza assemblage, the second-largest category of identifiable taxa. This can be explained by the two riverine environments that are in direct proximity to the site: the Mississippi River and its associated backwater landscape, and Smith Creek, the tributary stream that gives the site its name. My analysis recorded seven identifiable fish taxa and a large category of unidentifiable fish fragments. In comparison, six fish species were identified on Mound A. While five taxa were identified in both the contexts—Ictaluridae (catfish), Lepisosteidae (gar), Amiidae (bowfin), Catostomidae (sucker), and Sciaenidae (drum)—Perciformes were identified only on Mound A, while bass and carp/minnow were identified only in the Northeast Plaza context.

Not only do we see a wide variety of species being utilized at the site, but we also see a wide variety of size elements (e.g. vertebrae, scales, otoliths). Fish follow a growth pattern known as indeterminate growth, which can be defined as “growth that continues throughout the life span of an individual such that body size and age are correlated” (Sebens 1987: 378). This information can be applied to determine the size and age of fish species by measuring vertebrae and otoliths recovered from the archaeological record and displaying these measurements as a histogram (Figure 6.1). Thus, fish with larger vertebrae (measured medio-laterally across the centra in mm) are both larger and older when compared to others of their same species.

The fish from the Northeast Plaza are, on average, larger than the fish from 1/2” and 1/4” assemblage from Mound A based on centra width (see Table 6.1). In Mound A, the following average vertebra widths were recorded for four important species: catfish (8.3 mm), gar (8.9 mm), bowfin (8.2 mm), and sucker (8.4 mm). These widths are consistent across different fish species, indicating that people at who deposited the remains in Mound A were fishing for a

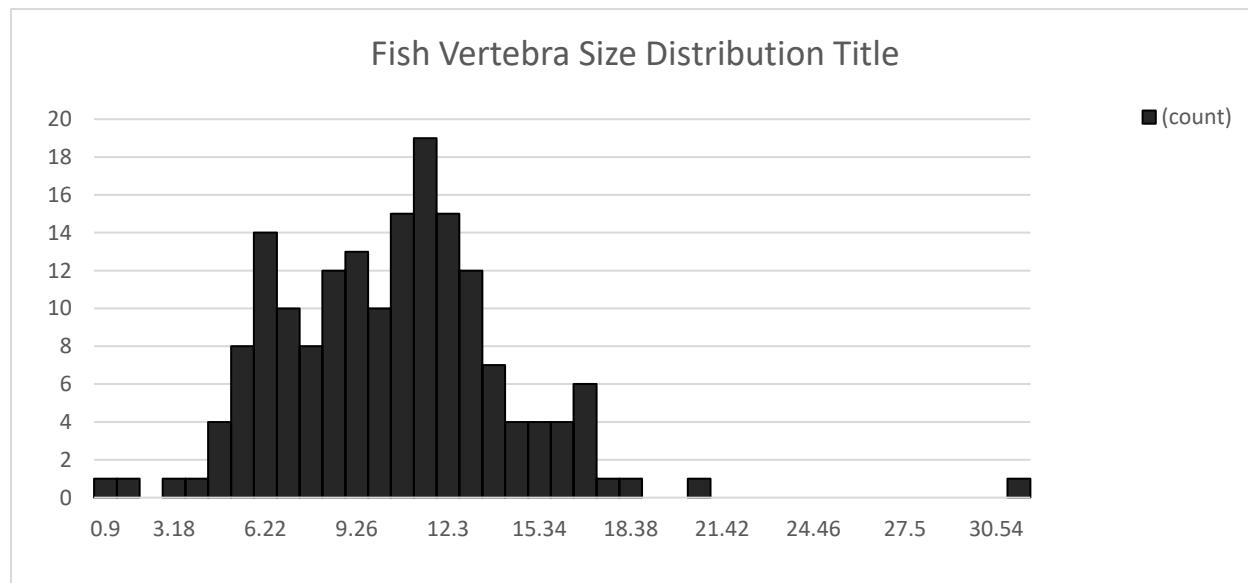


Figure 6.2 Distribution of centrum widths, calculated from a sample of 173 vertebrae from the Northeast Plaza

particular size of fish (Terry 2017:59). In the Northeast Plaza, the following average vertebrae widths were recorded for the same four species: catfish (10.95 mm), gar (10.52 mm), bowfin (7.79 mm), and sucker (12.66 mm). The Northeast Plaza centrum widths follow a fairly consistent trend as well, with most fish vertebra sizes ranging between 10 mm and 13 mm; notably, the bowfin is considerably smaller, and represent the only species where the Northeast Plaza examples are smaller in size than those from Mound A.

Table 6.1. Fish Vertebra Measurements by Taxon from the Northeast Plaza and Mound A.

	Mean Width (mm)		Standard Deviation		Maximum Width (mm)		Minimum Width (mm)	
	Northeast Plaza	Mound A	Northeast Plaza	Mound A	Northeast Plaza	Mound A	Northeast Plaza	Mound A
Catfish	10.95	8.3	3.1	2.8	18	26.3	0.9	2.8
Gar	10.52	8.9	4.98	1.5	31.3	30.1	3.1	5.4
Bowfin	7.79	8.2	2.66	1.5	17.2	17.1	4.4	5.1
Sucker	12.66	8.4	0.55	1.5	13.2	12	11.2	5.4

Looking across the Southeast more generally, the gar is a fish that consistently appears at other sites, including Feltus, a Coles Creek site that shares many similarities with Smith Creek. Twenty-eight different sites report gar elements recovered from a variety of contexts (e.g., mound, midden, wall trenches) with elements such as vertebrae, scales, and dentaries, all elements also identified at Smith Creek (Peres and Deter-Wolf 2016:106). The recovery of gar remains from Late Woodland and Mississippian sites like Smith Creek often results in interpretations associated with feasting activities, either elite or communal (Kassabaum 2013:7); however, ethnographic evidence suggest that gar teeth and jaws were also used in scratching and tattooing, and archaeological evidence exists for the use of scales as arrows used for hunting (Peres and Deter-Wolf 2016:109).

The environment played a dramatic role in determining the capture and consumption of fish in the Lower Mississippi Valley. In order to discuss Mississippi's past landscape, one must look at the present Mississippi River to understand how it affects both human and animal worlds. In the present-day, the Mississippi River is subject to intense floods, which change that natural world as well as the artificial landscapes that humans use to try to control it. Buildings are destroyed, roads are submerged, and people's lives change dramatically. Though less common, these events also occurred in the past, as the Mississippi River has a long history of flooding and meandering through the land (Harrison 1951). The occurrence of these events in the past may have contributed to periodic increases in the exploitation of fish (Kelley 1992:44). For example, a flooded landscape around Smith Creek would bring fish much closer to the site than usual. In addition, such floods would impact the wildlife in the natural wooded areas around the site, perhaps driving deer and other creatures to locations outside of their usual range. This flooding would also affect Smith Creek itself, which would have risen dramatically and flowed much more quickly. The impact of the environment thus cannot be ignored must be incorporated into the interpretations that archaeologists make about past societies.

Fishing technology must also be researched to understand the patterns of consumption and use found in the Smith Creek faunal assemblages. Ethnohistoric accounts describe the use of fishing nets, as well as weirs (Swanton 1946:332). Unfortunately, there is not much archaeological evidence for such technology due to the fact that fishing weirs have not preserved well in the Southeast (Lutins 1992) and nets are made of highly perishable materials. Poison may also have been used to acquire fish, which would have required the use of plants to create such toxins. After being poisoned, fish may have been "grabbed" with one's bare hands (Swanton 1946:333). Fish that are either large (e.g., carp and catfish) or predatory (e.g., gar and bowfin)

could also have been obtained through the use of spears, arrows, or lines and hooks (Swanton 1911:72, 346).

A Look at Bears at Smith Creek and Lower Mississippi Valley

Previous discussions about bears in faunal assemblages have focused on their use as both food and ritual resources. Smith Creek's mounds and plaza suggest that the site was used as a ceremonial area (Terry 2017:18). Given the inclusion of bear fragments in both the Mound A and Northeast Plaza contexts, their use for both consumption and ritual purposes may be indicated. However, one must comprehend the importance of bears in the Lower Mississippi Valley and in the Southeast more broadly in order to construct an argument for or against this interpretation. Bears are commonly seen by southeastern Native groups as blurring the line between human and non-human beings because their actions and behavior are often similar to those of humans. These actions, such as the ability to walk on two legs, the consumption of a closely related diet, or the close resemblance in their skeletal and muscular anatomy contribute to the widespread belief that bears are social beings. Specifically, bears are viewed as kin by many Native American groups (Kassabaum and Peles 2020:111).

Looking at the bear assemblage from the Northeast Plaza, bears make up only 2.5% of the total large mammal assemblage, with 35 bone fragments identified. Of the 35 bear bones, 94.2% are part of appendicular skeleton, which includes long-bone and paw fragments. The other two fragments represent a vertebra and a partial mandible.

The abundance of bear at Smith Creek has been cited in previous publications but must be reanalyzed with the addition of the data presented in this thesis. To be consistent across sites and comparable to other faunal assemblages, a ratio of bear NISP to deer NISP has been used to

quantify the counts of bear remains recovered across sites in the Southeast (Peles and Kassabaum 2020:245; Waselkov and LaGrange 2009). Prior to the addition of the Northeast Plaza data to the total Smith Creek faunal assemblage, Smith Creek (10.00) and Feltus (12.35) had the highest bear to deer ratios among southeastern archaeological sites. The addition of the Northeast Plaza assemblage to the total faunal assemblage at Smith Creek provides a bear (NISP=48) to deer (NISP=431) proxy ratio of 11.13. After this consideration, Smith Creek and Feltus are still ranked as the sites having the highest ratios (Table 6.2).

Bear element analyses have often proceeded on the assumption that most bear fragments originate from paw bones, or podial elements. The Northeast Plaza assemblage fits this pattern, as 68.5% of the bear fragments were podial elements. Moreover, 33% of these paw fragments were burned. This information supports two conclusions that relate to discussions presented by Peles and Kassabaum (2020:122–123): (1) the dominance of paw bones may indicate an increase in bear paw use and consumption through time, and (2) the burning of bear bone may indicate consumption, and thus burning through the actions of cooking, or may represent ritualized discard. At Feltus, bear paws were abundant in the assemblage from a flank midden on Mound A; out of the 71 bear bone fragments recovered, more than 92% originated from paws. Mound B at Feltus also contained a flank midden, which contained 26 bear bones, all which came from paws. However, since this thesis focuses on a plaza midden deposit, we must also look at the South Plaza at Feltus, which interestingly presents a case where elements besides paw bones were also present in relatively high quantities. Bear fragments from this area totaled 30 “including part of a cranium a maxilla, a mandible, a scapula fragment, a pelvis fragment, three femurs, a tibia fragment, two lumbar vertebrae, and 19 paw parts” (Kassabaum and Peles 2020:119). Based on the comparison of Mound A and the South Plaza at Feltus, I conclude that

the Smith Creek assemblage from the Northeast Plaza is more similar to the Mound A and Mound B contexts at Feltus, given the prevalence of paw elements when compared to the South Plaza at Feltus. This interpretation will be further explained in the paragraphs below.

The burning of bear bone is also an important characteristic to analyze, given that burned bear bone is associated with the process of cooking as well as ritualized disposal (Kassabaum

Table 6.2. Comparison of Bear Statistics across Time Periods in the Southeast (after Peles and Kassabaum 2020:246-248).

	Site Name	Site Number	Region	Bear NISP	Deer NISP	Bear/Deer Ratio
MIDDLE WOODLAND (AD 1-400)	Mansford Plantation	16MA40	Lower Mississippi Valley	8	118	6.78
LATE WOODLAND (AD 400-1100)	Bayou St. John	1BA21	Coastal Alabama	46	2,089	2.2
	Bruly St. Martin	16IV6	Lower Mississippi Valley	6	137	4.38
	Feltus	22JE500	Lower Mississippi Valley	137	1,109	12.35
	Hedgeland (Late Woodland) 1	16CT19	Lower Mississippi Valley	1	109	0.92
	Jackson Landing	22HA515	Lower Mississippi Valley	10	141	7.09
	Panther Lake	16MA22	Lower Mississippi Valley	24	312	7.69
	Paw Paw	3OU22	Lower Mississippi Valley	4	866	0.46
	Smith Creek	22WK526	Lower Mississippi Valley	48	431	11.13
MISSISSIPPI (AD 1100-1682)	Toltec	3LN42	Lower Mississippi Valley	2	3,457	0.06
	Crenshaw	3MI6	SW Arkansas	4	2,180	0.18
	Hedgeland (Mississippi)	16CT19	Lower Mississippi Valley	1	110	0.91

and Peles 2020). Kassabaum and Peles state that paw elements make up nearly 90% of burned bear fragments at Feltus. In comparison, 72.7% of the burned bear fragments consist of paw elements in the Northeast Plaza assemblage. This suggests a focus on the burning of paw elements instead of axial or other appendicular elements, which may indicate a preference of the consumption of paws. Furthermore, Terry's Mound A analysis did not identify any of the 13 bear elements, which included mainly podial elements but also cranial and forelimb elements, as burned or calcined (Terry 2017:64). Kassabaum and Peles (2020:123) suggest that the burned bear remains at Feltus were due to the process of roasting, suggesting that bear paws would have been cooked. However, ritual disposal of bear remains may also explain the burning of bear bone.

To investigate this further, we must consider the concept of bears as kin. Feltus showed evidence of the special treatment of bear remains, with only 5% of the total bear fragments being burned. This is much lower than what is observed at Smith Creek, where 31% of bear remains were burned. The Feltus analysis concluded that this trend could be explained by the special relationship people had to bears, resulting in reduced counts of burned bear bone. The same might be said for the Mound A assemblage from Smith Creek. However, following this logic, the bear assemblage in the Northeast Plaza at Smith Creek does not appear to support the idea that Plaquemine people at Smith Creek saw bear as kin, or, if they did, that they showed their respect for that relationship in different ways. Instead, I conclude that the bear fragments from the Northeast Plaza indicate the consumption of bear primarily through roasting, with particular focus on paw elements, rather than the ritualized disposal of bear remains. This conclusion is further supported by the claim that the consumption of bear paws is considered a delicacy according to ethnohistorical accounts (Swanton 1946:67).

These two sites, which are known to be occupied during the Late Woodland period, appear to represent a peak in the usage of bear (Peles and Kassabaum 2020:254). However, the Northeast Plaza context at Smith Creek dates to the Mississippi Period, suggesting that bear consumption at Smith Creek increased through time. This trend could be explained by a change in focus towards paw consumption. Peles and Kassabaum (2020:250-253) state that Feltus's South Plaza, with activity dating to the early Late Woodland (AD 700-850), contain varied bear elements, while the later Late Woodland Mound A and Mound B flank middens contain more paw elements. The temporal differences between the Mound A flank midden and the Northeast Plaza at Smith Creek thus demonstrate the same pattern of increased bear paw consumption through time. Based on these observations, I agree that the Lower Mississippi Valley is a central area for bear usage during the pre-contact period, strongly suggesting a regional pattern of both ritual and consumption characterized by increased usage of bear paws through time. As stated previously, with the addition of the entirety of the Northeast Plaza assemblage, and the inclusion of faunal material from Smith Creek's South Plaza, we may be able to gather more data to further support or refute this claim.

Revisiting Feasting and Provisioning at Smith Creek

Feasting in the Southeast is an important subject when discussing zooarchaeological evidence. Terry's analysis of the Smith Creek Mound A flank midden concluded that there was not enough evidence "to support the notion that large-scale feasting was occurring" (Terry 2017:108). With the addition of more data, this time from the Northeast Plaza, it becomes essential to revisit this question and see whether data from the newly analyzed midden deposit can support or refute her conclusions.

Terry cited two reasons for her claim that the faunal assemblage at Smith Creek did not support feasting. The first came from the analysis of deer fragments in comparison to case studies from Cahokia and Feltus, sites that are thought to have significant archaeological evidence for feasting (Terry 2017:105–109). Deer from Smith Creek’s Mound A compose 1% of the total faunal assemblage, while Cahokia’s sub-mound 51 faunal assemblage is made up of 99.7% deer; at Feltus, deer compose 5.23% of the total faunal assemblage (Kassabaum 2014; Kelly 2001; Terry 2017). If we combine the Northeast Plaza and Mound A at Smith Creek, deer make up 2.93% of the entire faunal assemblage. Given these updated figures, Smith Creek and Feltus are more comparable, though Smith Creek is still lower. In addition, the faunal assemblage at Feltus showed an “abundance of large mammals and low diversity of other classes” (Kassabaum 2014). When looking at Smith Creek, we observe that the Northeast Plaza also contained a high abundance of large mammals (see Table 4.2). This interpretation leads me to reconsider Terry’s conclusion and suggest that there is some evidence in the large mammal abundances at Smith Creek that supports the claim that large-scale feasting may have occurred at the site.

The second reason cited by Terry as evidence against a feasting interpretation is the high numbers of unidentified large mammal fragments within the assemblage, which indicate the on-location processing of white-tailed deer (Terry 2017:109). Analysis of the Sub-Mound 51 deposits from Cahokia, which represents one of the best-case examples for feasting, revealed a low abundance of unidentified large mammal long bone fragments and a high percentage of bones left intact when deposited (Kelly 2001:347–348). At Smith Creek, on the other hand, Terry’s analysis showed that long-bone fragments belonging to both deer and unidentifiable large mammals were common. Long-bone fragments in the Northeast Plaza comprised 36.5% of

the deer assemblage, and 58.8% of the unidentifiable large mammal assemblage. The large percentage of long bone fragments in both assemblages is an indication of intensive processing occurring on-site at Smith Creek. Contrary to the argument presented above, this aspect of the material from the Northeast Plaza supports the interpretation made by Terry (2017) that Smith Creek did not support large-scale feasting.

Terry did offer another explanation for Smith Creek's assemblage by invoking elite provisioning. This time using Moundville in Alabama as a comparative site, she looked at two specific criteria within the assemblages from Mounds Q and G. Criteria one focused once again on the white-tailed deer bone fragments and element representation. At Moundville, the provisioning hypothesis was supported by the relatively low number of cranial and axial elements and high number of appendicular elements (Jackson and Scott 2003). Analysis of the faunal assemblage from the Northeast Plaza reveals that appendicular elements compose 64.5% of the white-tailed deer assemblage, while cranial elements only represent 35.5%. In comparison, appendicular elements comprised 69.2% of the deer assemblage at Mound A, while axial and cranial elements comprised 30.8% (Terry 2017:63). I thus conclude that evidence from the Northeast Plaza supports criteria one of the elite provisioning hypothesis.

Criteria two relies on the presence of dangerous animals, such as the bear and mountain lion. The Mound A analysis revealed these mammals in the assemblage, with 13 bear fragments and 4 mountain lion remains (Terry 2017:35). The Northeast Plaza assemblage contained more bear than Mound A, a total of 35 bear fragments, and less mountain lion, with only 1 fragment recovered. Terry also included the presence of birds of prey in her list of dangerous animals, yet the Northeast Plaza did not contain any. However, bobcat and snake could be included as

“dangerous” animals. Thus, the presence of these animals in the Northeast Plaza further supports the provisioning hypothesis Terry proposed for Smith Creek.

After taking both the feasting and provisioning hypotheses into account and looking at the conclusions drawn by Terry, data from the Northeast Plaza appears to support the argument that elite provisioning may have been occurring at Smith Creek. In addition, feasting may have been an activity associated with the ceremonial use of the site. Overall, the data from the Northeast Plaza thus support Terry’s conclusions but potentially broaden our understanding of the range of activities taking place at Smith Creek.

Summary

In the Introduction of this thesis, I stated that I would address the following questions: (1) What taxa are represented in the archaeological assemblage of the Northeast Plaza context? (2) What does the varying size of the animals represented by these faunal remains indicate about past human preferences in hunting and food consumption? (3) How do the faunal assemblages from Mound A (previously analyzed) and the Northeast Plaza differ in terms of taxa and size? This section will review these questions based on data presented in previous chapters.

Excavations in the Northeast Plaza at Smith Creek recovered a total of twenty-five distinct taxa (see Table 4.1). When comparing the Northeast Plaza with previously analyzed data from Mound A, we see some differences among the taxa identified. The muskrat, red fox, gray fox, cotton rat, buffalo, frog/toad, and crawfish were exclusive to Mound A, while the bobcat, cat, dog, field mouse, otter, softshell turtle, box turtle, and carp/minnow were exclusive to the Northeast Plaza. The age and size of the various taxa can tell a zooarchaeologist a great deal about patterns in hunting and consumption. The measurements of the Northeast Plaza fish

vertebra demonstrate that fish of a consistent size were captured and consumed regardless of species. Looking at the mean size of fish vertebra in both assemblages, the Northeast Plaza exhibited large fish remains than that of Mound A. This indicates a trench in fishing preferences toward larger, and thus older, fish.

The analysis of faunal material from the Northeast Plaza demonstrates the importance of faunal research in the Southeast, and more specifically, the Lower Mississippi Valley. The data provided in this thesis allows for a better understanding of pre-contact use of animal resources, through the exploration of consumption trends that are present at Smith Creek. In conjunction with ceramic, lithic, and paleobotanical data, the investigation of faunal remains and the interpretation of their significance allow for a more complete picture of the activities performed by the occupants at Smith Creek and will allow us to compare that to other sites in the Southeast.

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