Analysis of the Faunal Remains at Zekiah Fort (18CH808)

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Introduction

The location of the Piscataway Indian fort at Zekiah has been searched for and debated by archaeologists in Maryland for decades. This past summer, a three year survey of the Zekiah Swamp, led by Julia King at St. Mary's College of Maryland, culminated in the excavation of 47 test units at the site now believed to be Zekiah Fort (18CH808). During the excavation of the test units, the majority of artifacts recovered were faunal remains. These bones, in conjunction with soil samples taken from each context, provide important information about artifact preservation at the site and the use of animals by the Piscataway Indians as an adaptive strategy in response to English colonialism. Consequently, this paper has two goals. First, soil pH and artifact density and condition will be compared across the site in order to address preservation issues and taphonomy. Secondly, the identified faunal remains will be used to discuss how and why a creolized subsistence pattern was adopted by the Piscataway Indians at Zekiah Fort.

The Zekiah Fort site is located in Charles County, Maryland, approximately seven miles south of Waldorf (Figure 1). Located on and around a knoll near a perennial water source, the site would have provided the Piscataways with adequate defensive capability as well as excellent soil for crop production. Based upon a paucity of artifacts dating from before or after the Zekiah Fort occupation (1680-ca.1695), it appears that the temporal integrity of the site is excellent, thus the faunal remains should all be associated with the Piscataway occupation. The excavation at the site consisted of a trench of 42 5'x5' units excavated across the top of the knoll in a checkerboard fashion in addition to five test units in three other locations on and near the knoll. All of the contexts excavated were screened through ¼" hardware mesh. Additionally, a 1'x1' square column sample was removed from the northeast corner of each context and water-

screened in order to aid in the recovery of seed beads and other small artifacts. All contexts excavated consisted of plowzone, no features were excavated.

History

The Piscataway Indians have been living in southern Maryland since at least 1350 AD, although comparatively little is known of their history prior to English contact in 1634 (Cissna 1986:29-31; Potter 1993:126-132). They were a powerful and important tribe during Maryland's early settlement period. Indeed, Leonard Calvert considered purchasing land from them in 1634 near Piscataway Creek for the site of the Maryland colony's new capitol (Hall 1910:72). Eventually, however, Calvert decided to site the capitol further down the Potomac on land he obtained from the Yaocomoco tribe, which would become St. Mary's City. For much of the 17th century the Piscataways were harassed by Indian groups from the north, including the Susquehannocks and members of the Five Nations (Bauer et al. 2012). This was likely due to the location of their town along the Potomac River, across from what would become Mt. Vernon, which was along the path of raiding northern tribes (Figure 1). Consequently, the Piscataways attempted to maintain a strong relationship with Lord Baltimore's proprietary in order to help defend against these attacks (AOMOL 3:403, 482; AOMOL 5:65; Bauer et al. 2012). This alliance not only helped the Piscataways, but also aided the Maryland colonists because it made their Indian allies a buffer against the raids of the hostile northern tribes (Bauer et al. 2012).

It was the alliance between the Piscataways and Maryland, and the Susquehannock raids that resulted from it, that led to the relocation from the Piscataway town to Zekiah Fort in 1680 (Bauer et al. 2012). During the Susquehannock war of 1675, the Piscataways, as allies of the Maryland colony, participated in a siege of the Susquehannock fort on Piscataway Creek in which numerous Susquehannocks were killed. This siege was the result of a punitive expedition

led by John Washington in retaliation for Susquehannock raids in Virginia that were the precursor to Bacon's Rebellion (Semmes 1937:522-523). The Susquehannocks, however, were not entirely destroyed, and the Piscataways feared retribution for their participation in the siege, going so far as to request military protection from Maryland and ammunition for their own defense by 1679 (AOMOL 15:242). The Piscataway wariness was compounded by the fact that the Susquehannocks had allied themselves with the Five Nations, thereby creating an even greater threat for raids in the near future (Jennings 1984:149-156). Rumors about encroaching northern raiding parties circulated throughout the 1670's until, finally in June of 1680, Lord Baltimore agreed to relocate the Piscataways to Zekiah, closer to English settlements, and instructed them to build fortifications for their defense (AOMOL 15:304).

For the next two years there were numerous references in the Proceedings of the Council of Maryland pertaining to Zekiah fort. Often, they dealt with northern Indians harassing the inhabitants of the fort by destroying the fences around their corn or kidnapping Piscataway Indians (AOMOL 15:373-374; Bauer et al. 2012). There were also references to Maryland Rangers being stationed at the fort for periods of time and supplying the Piscataway people with ammunition (AOMOL 15:330 AOMOL 17:33-34). Additionally, based upon the records, it appears that people from the Mattawoman and Nanjemoy tribes also moved into Zekiah Fort for protection in 1682 (AOMOL 17:112-113). There are no references to the fort between 1682 and 1689. By March of 1689 it appears that the Indians had dispersed from the fort and were only using it during times of threat (AOMOL 8:74; Bauer et al. 2012). The final reference to the Piscataway fort at Zekiah comes in 1692, after Lord Baltimore had lost control of the colony (AOMOL 8:328). By 1697 the Piscataways had left southern Maryland for Virginia due to increasing colonial pressure (Curry 2008). A small group of about 100 Piscataway Indians

eventually returned to Maryland in 1699 and constructed a fort at Heater's Island in modern-day Frederick County, far above the falls of the Potomac (Curry 2008).

Taphonomy

Prior to the analysis and interpretation of the faunal remains from Zekiah Fort the processes effecting the preservation of organic remains at the site must be addressed. Needless to say, these taphonomic processes can significantly bias the data, and affect what research questions can be asked and how to address them best. In order to examine the preservation of bone, and similar organic material on the site, soil samples from each excavated context were collected in the field and the acidity of the soil was tested at the University of Tennessee using a Spectrum Technologies FieldScout SoilStik pH meter, producing measurements to the nearest hundredth. The acidity of soil has been shown to correlate significantly with the preservation of bone on archaeological sites (Cornwall 1956:204-208; Gordon and Buikstra 1981; Miller 1984:202-205). The soil acidity for the plowzone at Zekiah Fort ranged from 4.03 to 7.03 with the average reading being 5.67 (Figure 2; Appendix 1). In his study of faunal remains from the Chesapeake, Henry Miller found that plowzone deposits in Southern Maryland tended to have a pH around 5.3, which is highly destructive to faunal remains (1984:203-205). The ideal pH for bone preservation is around 7.8; however, due to the highly acidic soils of the Chesapeake region, this benchmark is rarely reached, except in sealed features, which usually contain oyster shells that neutralize the high acidity (Miller 1984:204; Scudder 1993).

Another taphonomic process affecting the assemblage is plowing. The major effect that plowing has on bone preservation is related to fragmentation. In general, assemblages from plowzone tend to be highly fragmented and tend to have an extremely high proportion of unidentifiable bones (Lyman and O'Brien 1987:495-497). Compounding this problem is the fact

that Native Americans often broke bones to extract marrow and grease. This problem is clearly noted in the Zekiah assemblage when examining bone size. Bone weight was used as a proxy for size and the results are significant to bone identification. The average weight for a bone fragment in this assemblage identifiable below the class level was 0.57g and the overall average weight for a fragment was 0.12g (Figure 3). These very low weights indicate that the assemblage was highly fragmented, probably due to both pre-depositional and post-depositional processes such as marrow/grease extraction and plowing.

A third taphonomic process that affects this assemblage is heat alteration. Burning usually occurs at temperatures up to 500°C and alters bone by removing the organic material; it generally changes the color of the bone to brown or black. Calcining of bone occurs at temperatures over 500°C and can shrink the bone and make it more brittle and prone to fragmentation; it usually changes the color of the bone to white or blue-gray (Lyman 1994:384-392; Reitz and Wing 1999:133). Heat alteration has a significant effect on this assemblage, with 2/3 of the fragments showing evidence of burning or calcining (Figure 4). Interestingly, the proportion of natural to burned to calcined bone is roughly the same, with each category accounting for about 1/3 of the total count. It is likely that the bone in this assemblage was burned prior to deposition due to the fact that very few of the other artifacts exhibit any evidence of heat alteration. Additionally, due to the acidic nature of the soil, it is not surprising that the majority of the bone is burned, as it tends to preserve better under acidic conditions than non-burned bone (Sobolik 2003:22).

The taphonomic processes affecting this assemblage lead to two hypotheses that can be easily tested with the data. First, due to preservation and fragmentation issues, the majority of identifiable bones should be elements that are particularly dense, and thus resistant to soil acidity

and fragmentation, such as teeth, or they should be unique and easily identifiable elements, such as turtle shells (Reitz and Wing 1999:117-118). The data appear to support this hypothesis since the vast majority of elements that were identified below the class level were either tooth fragments, carpal bones, or turtle carapace fragments (Figure 5).

The second hypothesis assumes that pH on the site should be directly related to the amount of bone recovered. This was tested by graphing the pH from the units in the main excavation trench and comparing these pH values to bone counts and weights from the same units (Figures 2, 6, and 7). The overall pattern seems to indicate a correlation between the two variables, indicating that higher bone counts and weights correspond to higher pH values. It appears upon further examination that the largest bone concentrations on the site occur in units with pH values above 6.2. This correlation may indicate that bone preservation is better in these units because of proximity to a feature that is neutralizing the soil pH or it may show that more bone was deposited in the area of these units, thus lowering the acidity. In fact, when the artifact counts are plotted in relation to pH and bone weight they tend to correlate very well (Figure 8), indicating that the units with high pH are areas of high deposition, and thus lending support to the proposition that the bone deposited in the plowzone may be the reason for lower acidity.

Analysis

With all of the preservation biases in this assemblage, plowzone zooarchaeology may seem like an exercise in futility. However, it has been shown at other sites in the Chesapeake that the analysis of faunal remains from the plowzone can provide useful information if sample bias is understood (Barber 1978; Landon and Shapiro1998). One site in particular that shares a similar context, time period, and preservation issues with Zekiah Fort is the Posey site. Posey (18CH281) is located approximately 20 miles west of Zekiah (Figure 9) and is interpreted as a

single Native American occupation, probably Mattawoman, dating from 1650-1700 (Chesapeake Archaeology 2009). All of the faunal remains analyzed from this site also came from plowzone deposits, all were highly fragmented, and a significant proportion of the assemblage was heat altered. Despite these biases, Landon and Shapiro were still able to demonstrate that the assemblage was significantly different from that of an English household of the same period because it showed many of the elements of a traditional native diet (1998:17). This study serves as an important comparison to the Zekiah assemblage, especially since it dates to a slightly earlier period and allows for the examination of change in diet over time. Additionally, it illustrates that plowzone zooarchaeology can be interpretively powerful if research questions are formulated while being mindful of the limitations of an assemblage.

The Zekiah Fort faunal assemblage consisted of a total of 7991 bone and shell fragments (Figure 10; Appendix 2). Of the total, only 173 fragments were identifiable below the class level due to the taphonomic processes affecting the bone, discussed above. Nevertheless, at least 9 species of mammal, two species of fish, one species of reptile, and two species of invertebrate were represented. The assemblage was analyzed using standard zooarchaeological methods. Fragments were identified to species, where possible, and element, portion, and side of the bone were recorded. Bone modification, such as butchering marks and burning were noted and all bone was weighed. NISP (number of identified specimens present), MNI (minimum number of individuals), and biomass were all calculated for the assemblage (White 1953; Reitz and Cordier 1983; Reitz et al. 1987; Reitz and Wing1999:72).

The secondary data generated from this assemblage (NISP, MNI, and biomass) all show deer to be the most important contributor to diet at the site with turtle, cow, and pig also contributing significantly (Figures 11, 12, and 13). However, these measures of dietary

contribution for this assemblage should be critically examined before they are interpreted. First of all, the most commonly used measure for dietary contribution, biomass, relies upon a biological relationship between bone weight and the meat it supports (Reitz and Cordier 1983; Reitz et al. 1987; Reitz and Wing1999:72). As such, it is an average, and requires an assemblage to have at least some elemental diversity. The elemental distribution within the Zekiah assemblage is skewed heavily toward bones that preserve well in acidic soils, which are not elements that support a great deal of meat. In fact, the majority of the assemblage is composed of teeth, which support no edible meat, unless the gums are taken into account. Therefore, biomass does little to aid in the interpretation of this assemblage.

The MNI for this assemblage is a somewhat better indicator of meat contribution at Zekiah, but only if the size of the animals in question are taken into consideration. However, the MNI is also flawed in this case because of the high degree of fragmentation present and the small sample size of only 15 total individuals. Thus, MNI is ruled out as a unit of comparison within and among sites. NISP shares the same problems of fragmentation with MNI for determining dietary preference at the site (Reitz and Wing 1999:192, 195). Additionally, fragmentation greatly affects the utility of NISP for comparison between sites, since taphonomic processes may degrade bone differently at different sites.

With the numerous preservation and sample problems that plague this data set it is evident that secondary data derived from the assemblage will misrepresent the use of animals by the Piscataway Indians at Zekiah Fort. However, a simple analysis of the presence or absence of certain species can offer insight into the experience of the people at Zekiah Fort when placed in the proper historical context. The comparison of species present at the Posey site, which dates slightly before Zekiah, to those at Zekiah Fort reveal a change in subsistence strategy. When this

change is viewed in relation to the circumstances for the Piscataway relocation to Zekiah Fort it becomes evident that subsistence strategies were a way for the Piscataway Indians to gain favor with the Maryland proprietary government and secure protection from raiding northern Indians.

Comparison and Interpretation

The faunal remains from Posey represent a broad range of wild species that occur with frequency in the area, including deer, mink, squirrel, raccoon, duck, gar, perch, catfish, sucker, and turtle (Figure 14). The only domestic animal represented at Posey is pig, which could have easily been hunted like deer, since the Chesapeake husbandry system led to large numbers of feral swine roaming the forests (Anderson 2004:108; Miller 1988:194; Carr et al. 1991:47-48). Despite the presence of pigs at the site, it would probably not have significantly affected the culture of the Native Americans living at Posey, from a meat subsistence perspective, since the inhabitants of the site would have probably acquired pork and treated it in a similar way to deer hunted in the woods or dogs that scavenged the village (Anderson 2004:213). However, the effects of feral and free-ranging livestock on Native American plant-based subsistence practices would have been significant due to crop destruction (Anderson 2004:188-189).

The faunal remains from Zekiah Fort contain many of the same major species as the Posey site, including deer, squirrel, pig, turtle, and gar (Figure 14). However, the Zekiah assemblage also contains fox, both gray and red, domestic dog, and cow. There are also no birds represented in the Zekiah assemblage, and only two fish species. Overall, the Zekiah faunal remains appear somewhat less diverse than the Posey site. This lack of diversity is probably a result of geographic location, since Posey is located adjacent to the Potomac River. The residents of the Posey site would have had greater access to numerous fish species and waterfowl compared to the occupants of Zekiah, which does not have a large body of water nearby. The

livestock species present in the Zekiah assemblage may be the most important difference between the two sites, especially since the presence of both cows and pigs at Zekiah indicate a change in Native subsistence practices and possibly a rearrangement of cultural roles within the community.

The introduction of livestock to the New World created a crisis within Native American societies in the Chesapeake and New England. According to historian Virginia Anderson, Native Americans found it difficult to grapple with the idea of animals as personal property and, as a result, numerous social and cultural problems arose out of contact with European domesticates (2004:175-208). On the other hand, the European colonizers in the Chesapeake and New England saw domestic animals as agents of civilization (Anderson 2004:123, 209-242). Therefore, strong efforts were made to introduce livestock to Native peoples and force the adoption of livestock husbandry upon them as a means of conversion to Christianity and acculturation. These efforts took the form of laws that gave Indians cattle as payment for wolf bounties in Virginia and the presentation of cattle to prominent members within the indigenous community as gifts (Anderson 2004:107, 201). The push toward civilizing Indians through the use of livestock was met with great resistance early on, especially since there was little cultural precedent in native societies for dealing with livestock (Anderson 2004:15-42, 175-208).

The adoption of cattle and swine by the occupants of Zekiah Fort may have acted as a means of negotiating with the Maryland government for protection from raiding northern Indians. By incorporating English livestock into their daily lives, the Piscataways were conspicuously, and knowingly, signaling their alliance with the Maryland colonists. The use of cattle particularly, which were often less feral than hogs and required more attention, would have made the Piscataways appear more “civilized” to the Marylanders and would have placed the

residents of Zekiah Fort in stark contrast to the northern Indians who had not adopted livestock husbandry and still engaged in “barbaric” practices, such as raiding.

Clearly, the Piscataways maintained good relations with the Maryland government, evidenced by the fact that Lord Baltimore supplied them with ammunition and corn on numerous occasions, in addition to providing military protection both before and after the relocation to Zekiah Fort. Perhaps the adoption of livestock was a way of reminding the Maryland government that the Piscataways were not like other Indian groups, but were making an effort to act as Englishmen, at least on the surface. However, despite the visible presence of cows and pigs at Zekiah fort, the Piscataways still maintained their traditional subsistence practices through the use of deer, turtles, and other locally available wildlife.

The presence of livestock in and around the fort would have been clearly visible and would have given the impression to people visiting or observing the site that the Piscataways were making strides toward Anglicization, and thus deserved the protection of Lord Baltimore. However, a closer examination of the Piscataway cooking pots would have revealed a diet quite similar to the traditional fare enjoyed by people at sites such as Posey. Therefore, the continued acquisition and consumption of wild game in addition to the incorporation of English domestic animals acted as a means of negotiating the political landscape of Maryland for the Piscataways at Zekiah Fort.

Conclusion

The interpretation of faunal assemblages from the plowzone is a difficult proposition, at best. Often times, standard zooarchaeological measures and calculations fail to accurately represent the use of animals at a plowed site due to preservation and sampling issues. The assemblage from Zekiah Fort is an excellent example of how taphonomic processes can wreak

havoc on faunal remains and skew the data. By understanding the processes that affect the faunal remains on a site, however, better types of analyses can be selected and interpretations can carry more weight.

While plowzone faunal assemblages are not ideal, their analysis becomes important when there is no other data concerning diet from a site. Situating the faunal remains from Zekiah Fort in historical and cultural context allows the data to contribute to the narrative of Native American and European interaction in Maryland in a way that might not have otherwise been possible. Hopefully, this analysis has shown that faunal remains from the plowzone can be important to site interpretation if all of the biases and limitations of the data are understood.

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Figures

Figure 1: Map Showing Location of Zekiah Fort. Map Modified from Crystal Ptacek.

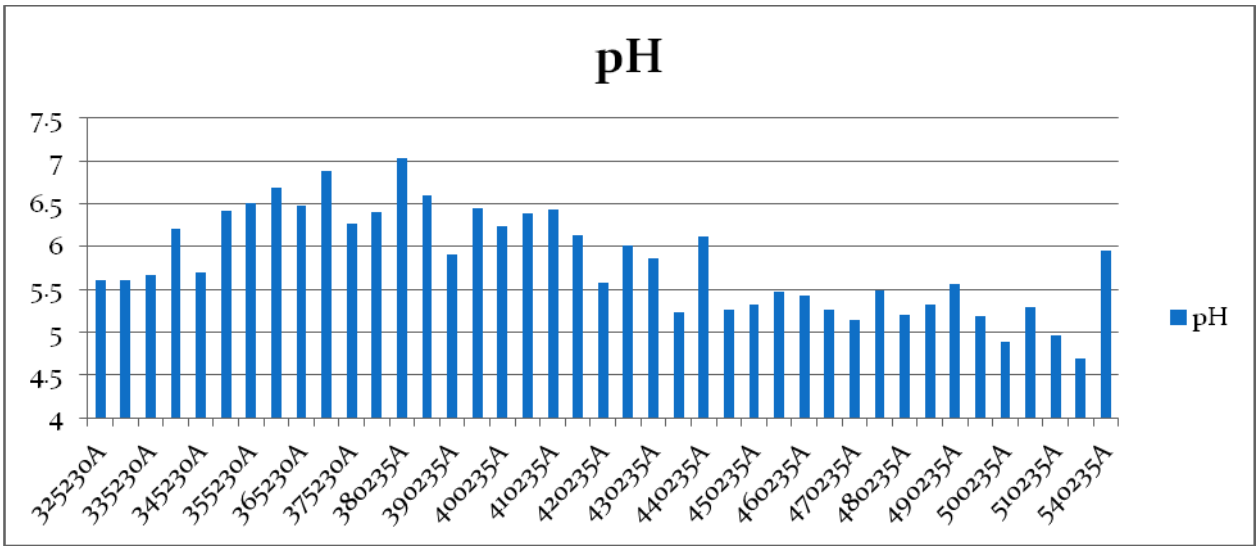

Figure 2: pH Readings for Units in Excavation Trench.

Taxon	Weight per fragment
Artiodactyla	1.07875
Bos taurus	2.613333333
Canis familiaris	0.585
Gastropod	0.006666667
Lepisosteus osseus	0.02
Odocoileus virginianus	0.632727273
Oyster Shell	0.101304348
Scalopus aquaticus	0.18
Sciurius sp.	0.22
Sus scrofa	0.41
Silvilagus floridanus	0.07
Testudines	0.267777778
Urocyon cineoargentus	0.025
Vulpes fulva	0.71
Cyprinidae	0.12
UID Mammal	0.325082742
UID	0.101387612
Total	0.120937304

Figure 3: Table Showing Average Weight per Fragment Based on Taxon.

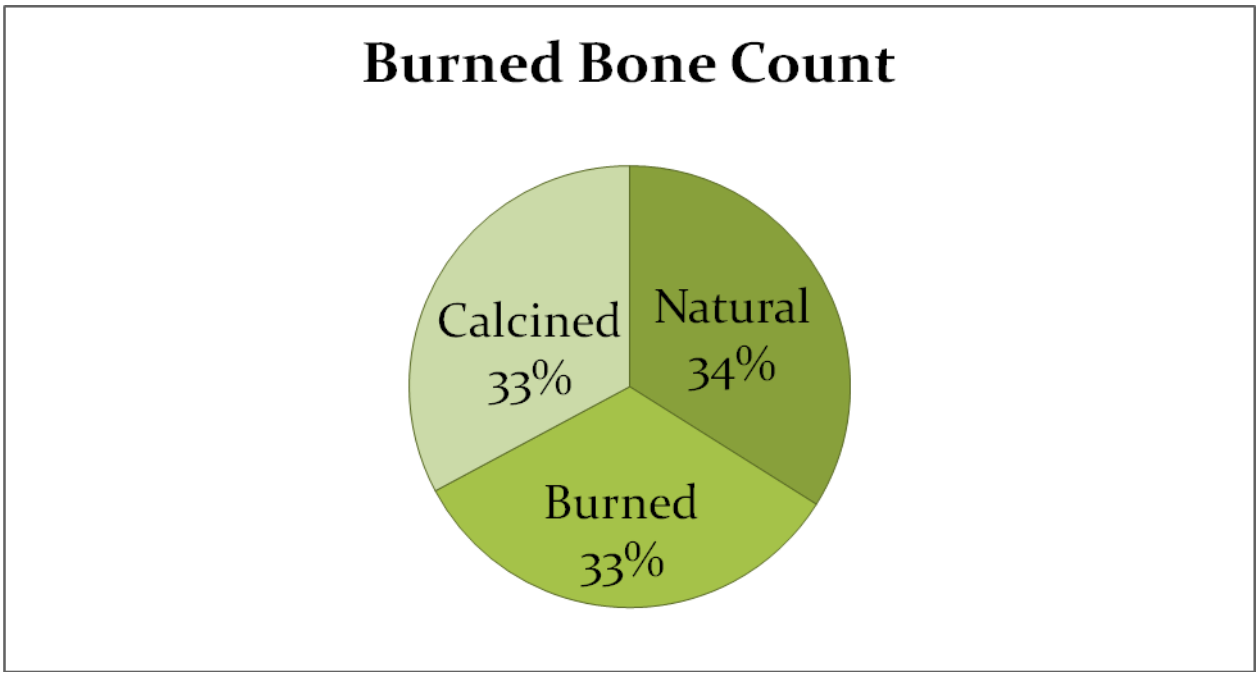

Figure 4: Chart Comparing Burning on Fragments.

Bone Type	Number Identified Below Class
Teeth	65
Turtle Shell	54
Dense Elements	9
Other	46

Figure 5: Table Showing Number of Bones Identified Below Class Based on Bone Type.

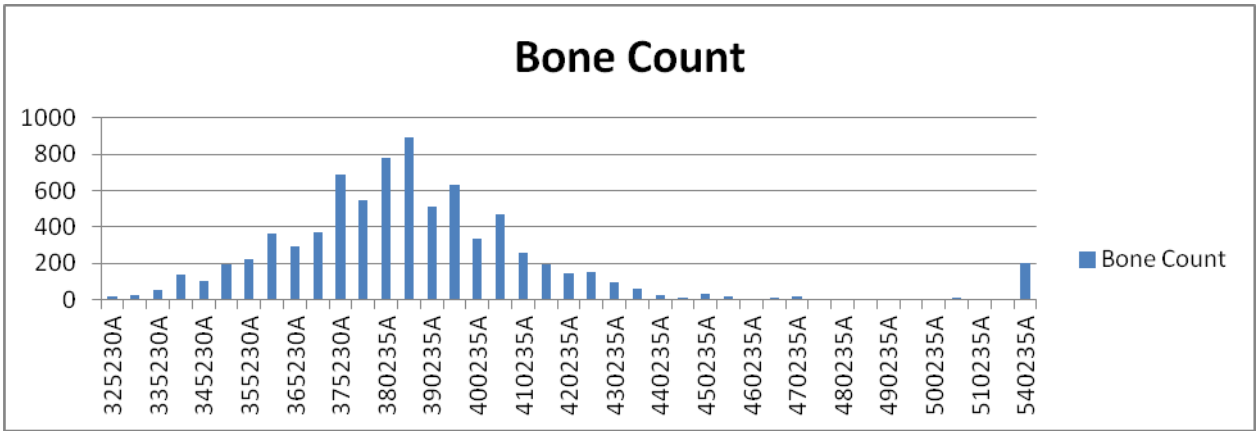

Figure 6: Graph Showing Bone Fragment Counts across the Excavation Trench.

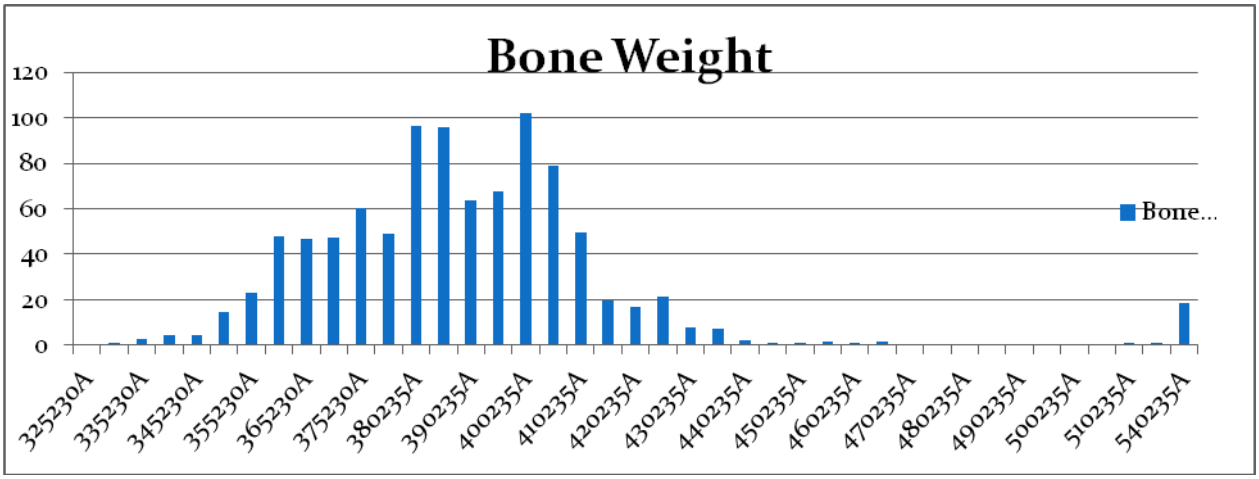

Figure 7: Graph Showing Bone Weights across the Excavation Trench.

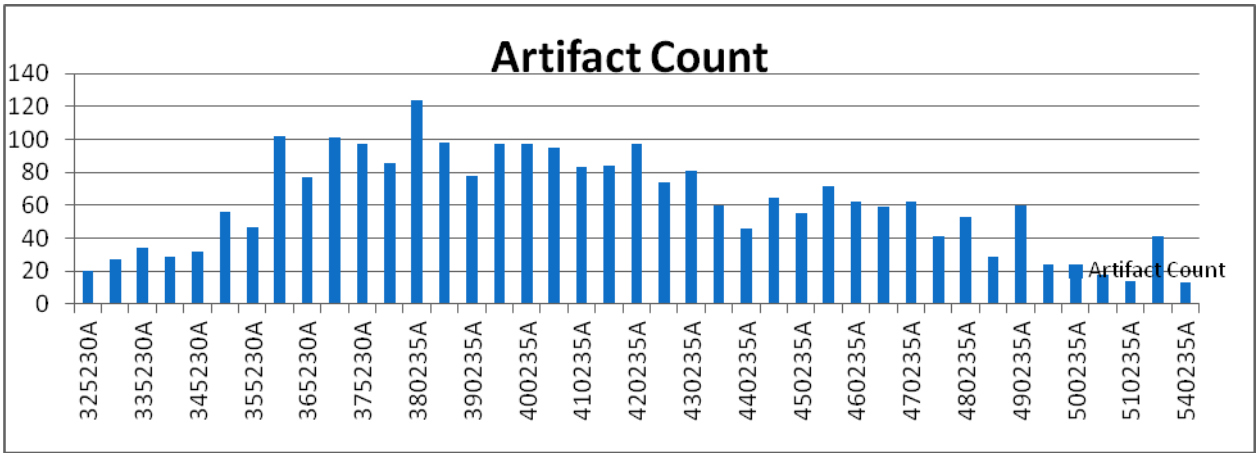

Figure 8: Graph Showing Artifact Counts across the Excavation Trench.

Figure 9: Map Showing Location of Posey Site. Map Modified from Crystal Ptacek.

Taxon	NISP	MNI	Biomass (kg)	Weight (g)
Artiodactyla	8		0.183	8.63
Bos taurus	3	1	0.168	7.84
Canis familiaris	2	1	0.03	1.17
Gastropod	6			0.04
Lepisosteus osseus	1	1	0.001	0.02
Odocoileus virginianus	66	5	0.756	41.76
Oyster Shell	23			2.33
Scalopus aquaticus	1	1	0.006	0.18
Sciurius sp.	1	1	0.007	0.22
Sus scrofa	4	1	0.041	1.64
Silvilagus floridanus	1	1	0.002	0.07
Testudines	54		0.189	14.46
Urocyon cineoargentus	2	1	0.002	0.05
Vulpes fulva	1	1	0.019	0.71
Cyprinidae	1	1	0.006	0.12
UID Mammal	423		2.211	137.51
UID	7394			749.66
Total	7991	15	3.621	966.41

Figure 10: Table of Taxa Identified at Zekiah Fort.

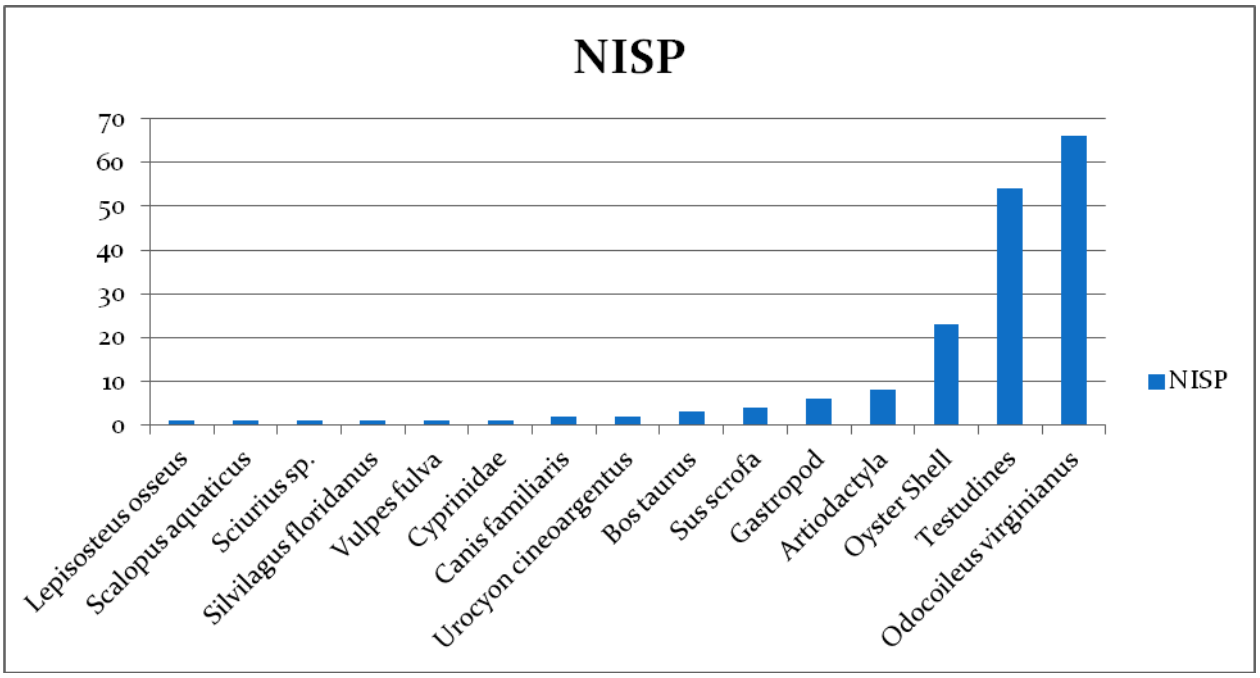

Figure 11: Graph Showing NISP for Bones Identified below Class.

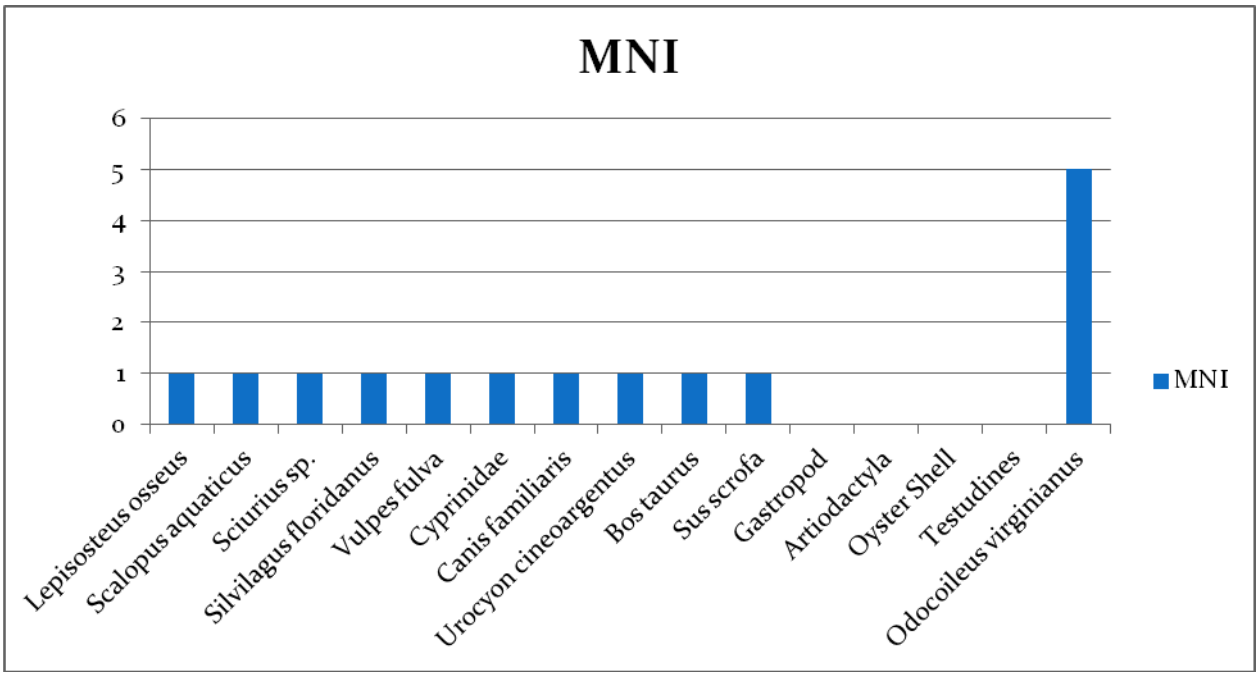

Figure 12: Graph Showing MNI for Bones Identified below Class.

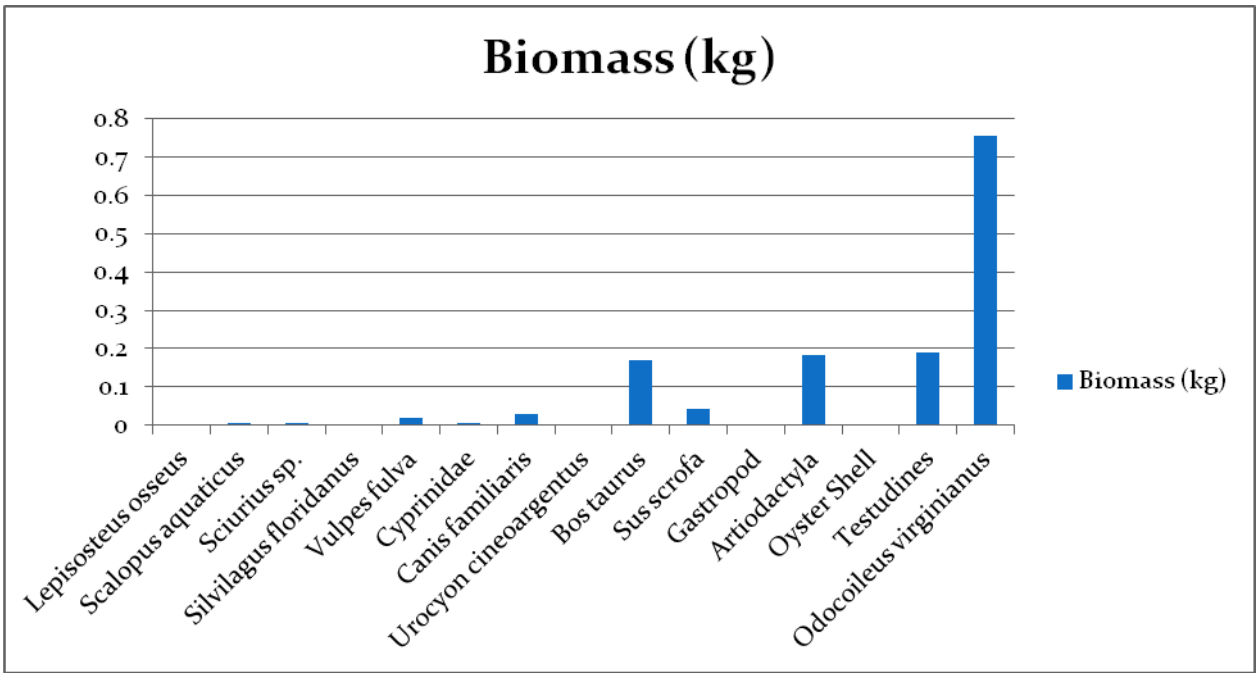

Figure 13: Graph Showing Biomass for Bones Identified below Class.

Species	Posey	Zekiah Fort
Gastropod	X	X
Lepisosteus osseus	X	X
Odocoileus virginianus	X	X
Oyster Shell	X	X
Sciurius sp.	X	X
Sus scrofa	X	X
Testudines	X	X
Castomidae	X	
Chelydra serpentina	X	
Chrysemys picta	X	
Clam Shell	X	
Crab	X	
Cygninae	X	
Emydidae	X	
Ictaluridae	X	
Morone americana	X	
Mussel Shell	X	
Mustela vison	X	
Ondatra zibethicus	X	
Procyon lotor	X	
Terrapene carolina	X	
Bos taurus		X
Canis familiaris		X
Cyprinidae		X
Scalopus aquaticus		X
Silvilagus floridanus		X
Urocyon cineoargentus		X
Vulpes fulva		X

Figure 14: Chart Comparing the Presence and Absence of Species at Posey and Zekiah Fort.

Appendices

Appendix 1: Soil pH Values for Contexts

Unit No.	pH
325230A	5.6
330235A	5.6
335230A	5.67
340235A	6.21
345230A	5.69
350235A	6.41
355230A	6.51
360235A	6.69
365230A	6.48
370235A	6.88
375230A	6.26
375235A	6.4
380235A	7.03
385230A	6.6
390235A	5.91
395230A	6.45
400235A	6.23
405230A	6.39
410235A	6.43
415230A	6.13
420235A	5.57
425230A	6.01
430235A	5.86
435230A	5.24
440235A	6.11
445230A	5.27
450235A	5.32
455230A	5.47
460235A	5.43
465230A	5.26
470235A	5.15
475230A	5.49
480235A	5.2
485230A	5.32
490235A	5.56
495230A	5.19
500235A	4.89

505230A	5.3
510235A	4.96
515230A	4.69
540235A	5.95
575110A	5.22
575120A	4.68
620625A	4.03
620625B	5.45
645600A	4.34
645600B	4.42
405325A	5.13

Appendix 2: Catalog of Faunal Remains

Context#	Species	NISP	Element	Portion	Side	Weight (g)	Comments
325230A	UID	2				0.44	
325230A	UID	13				0.19	
325230A	UID	1				0.07	
325230A	UID Mammal	1	tooth			0.02	
330235A	UID	21				0.41	
330235A	UID	2				0.09	
330235A	UID Mammal	1				0.31	Burned on interior, only partially on exterior and sides (where broken after burning)
335230A	Odocoileus virginianus	1	Molar/premolar			0.09	
335230A	UID	10				1.59	
335230A	UID	5				0.37	
335230A	UID	1				0.09	Appears to be burned on interior, but unburned on exterior surfaces
335230A	UID	23				0.38	
335230A	UID	5				0.16	
335230A	UID	7				0.1	
340235A	Oyster Shell	1				0.31	
340235A	Sus scrofa	2	incisor			0.64	From two separate incisors
340235A	UID	2				0.53	
340235A	UID	3				0.94	
340235A	UID	104				1.16	
340235A	UID	18				0.34	
340235A	UID	9				0.17	
340235A	UID Mammal	1				0.13	
345230A	Odocoileus virginianus	1				0.03	
345230A	Oyster Shell	1				0.02	
345230A	UID	2				0.61	
345230A	UID	8				0.56	
345230A	UID	3				1.02	
345230A	UID	73				0.79	

345230A	UID	8				0.31	
345230A	UID	5				0.07	
345230A	UID Mammal	1				0.81	Small area of burning on break
345230A	UID Mammal	1	tooth			0.01	
350235A	Odocoileus virginianus	2	Molar/Premolar			0.53	
350235A	Testudines	1	carapace			0.11	
350235A	UID	16				2.69	
350235A	UID	17				4.21	
350235A	UID	1				0.32	Only burned on a portion of the bone
350235A	UID	29				0.8	
350235A	UID	46				2.11	
350235A	UID	75				1.73	
350235A	UID Mammal	8				1.8	
350235A	UID Mammal	1	tooth			0.03	
355230A	Odocoileus virginianus	1	Molar/premolar			0.15	
355230A	Oyster Shell	1				0.51	
355230A	UID	40				8.42	
355230A	UID	18				4.31	
355230A	UID	26				1.49	
355230A	UID	75				4.02	
355230A	UID	48				1.76	
355230A	UID Mammal	11				2.01	
355230A	UID Mammal	1	Tooth			0.15	Possibly deer
355230A	UID Mammal	1	tooth			0.09	
360235A	Odocoileus virginianus	1	Molar/premolar			0.12	
360235A	Oyster Shell	1				0.01	
360235A	Testudines	1	carapace			0.53	
360235A	UID	88				16.8	
360235A	UID	59				11.38	
360235A	UID	55				2.43	
360235A	UID	59				3.23	
360235A	UID	61				1.91	
360235A	UID Mammal	2	Tooth			0.22	Possibly Deer
360235A	UID Mammal	39				11.07	
360235A	UID Mammal	1	tooth			0.04	
365230A	Odocoileus virginianus	3	Molar/Premolar			1.12	
365230A	Odocoileus virginianus	1	Molar/Premolar			0.31	
365230A	Oyster Shell	1				0.2	
365230A	UID	47				9.21	

365230A	UID	60				16.76	
365230A	UID	52				12.05	
365230A	UID	40				2.77	
365230A	UID	34				2.63	
365230A	UID	53				1.76	
365230A	UID Mammal	3	tooth			0.2	
370235A	Odocoileus virginianus	1	Molar/Premolar			0.18	
370235A	Odocoileus virginianus	1	Molar/Premolar			0.1	
370235A	Testudines	1	carapace			0.4	
370235A	Testudines	3	carapace			0.37	
370235A	UID	18				3.54	
370235A	UID	88				15.96	
370235A	UID	42				8.5	
370235A	UID	60				2.97	
370235A	UID	61				3.77	
370235A	UID	69				2.43	
370235A	UID Mammal	7				2.52	
370235A	UID Mammal	7				2.55	
370235A	UID Mammal	6				3.54	
370235A	UID Mammal	5				0.25	
370235A	UID Mammal	3				0.09	
375230A	Artiodactyla	2	Tooth			0.42	
375230A	Gastropod Shell	2				0.02	
375230A	Lepisosteus osseus	1	scale			0.02	
375230A	Odocoileus virginianus	6	Molar/Premolar			0.87	
375230A	Oyster Shell	3				0.51	
375230A	Oyster Shell	1				0.08	
375230A	Sylvilagus floridanus	1	metatarsal	distal		0.07	
375230A	Testudines	1	carapace			0.17	
375230A	UID	50				8.14	
375230A	UID	77				13.71	
375230A	UID	61				13.25	
375230A	UID	304				11.47	
375230A	UID	78				4.02	
375230A	UID	84				2.82	
375230A	UID Fish	1	pharengeal			0.12	Probably a minnow
375230A	UID Mammal	4				3.3	
375230A	UID Mammal	1				0.88	
375230A	UID Mammal	7	tooth			0.63	
375230A	Urocyon cineoargentus	1	phalange	proximal		0.04	

375235A	Gastropod Shell	2				0.01	
375235A	Odocoileus virginianus	2	Molar/Premolar			0.44	
375235A	Oyster Shell	3				0.04	
375235A	UID	45				7.26	
375235A	UID	42				9.52	
375235A	UID	207				7.63	
375235A	UID	89				3.71	
375235A	UID	103				3.32	
375235A	UID Mammal	32				5.91	
375235A	UID Mammal	5				6.25	
375235A	UID Mammal	11				4.13	
375235A	UID Mammal	1	Tooth			0.41	Probably a canine, possibly from a canid
375235A	UID Mammal	1	Tooth			0.11	Root
375235A	UID Mammal	5	tooth			0.26	
375235A	Urocyon cineoargentus	1	I3 incisor			0.01	
380235A	Bos taurus	1	Molar/Premolar			0.46	
380235A	Odocoileus virginianus	1	Scapula	Articular surface		1.52	
380235A	Odocoileus virginianus	12	Molar/Premolar			1.63	
380235A	Oyster Shell	2				0.11	
380235A	Oyster Shell	1				0.01	
380235A	Testudines	10	carapace			1.42	
380235A	UID	92				19.57	
380235A	UID	93				18.76	
380235A	UID	172				29.92	
380235A	UID	181				7.95	
380235A	UID	92				4.59	
380235A	UID	104				2.72	
380235A	UID Mammal	1				1.83	
380235A	UID Mammal	2				4.5	
380235A	UID Mammal	3	Long bone	shaft		1.36	Exterior appears polished
380235A	UID Mammal	4	tooth			0.22	
380235A	UID Mammal	2	tooth			0.07	
380235A	UID Mammal	3	tooth			0.09	
385230A	Odocoileus virginianus	1	Femur	shaft		1.31	
385230A	Odocoileus virginianus	3	Molar/Premolar			0.48	
385230A	Oyster Shell	1				0.01	
385230A	Sciurius sp.	1	Femur	head	left	0.22	
385230A	Sus scrofa	1	premolar			0.43	
385230A	Testudines	6	carapace			1.1	

385230A	UID	72				18.58	
385230A	UID	172				35.81	
385230A	UID	59				14.91	
385230A	UID	348				13.27	
385230A	UID	173				6.27	
385230A	UID	47				3.16	
385230A	UID Mammal	4	tooth			0.14	
385230A	UID Mammal	3	tooth			0.11	
390235A	Artiodactyla	1	Long bone	shaft		4.92	Probably pig or deer
390235A	Canis familiaris	1	premolar			0.36	
390235A	Odocoileus virginianus	5	Molar/Premolar			1.39	
390235A	Oyster Shell	1				0.36	
390235A	Oyster Shell	2				0.07	
390235A	Testudines	5	carapace			1.18	
390235A	Testudines	1	carapace			0.42	
390235A	UID	73				17.04	
390235A	UID	44				10.51	
390235A	UID	28				5.88	
390235A	UID	143				6.71	
390235A	UID	111				5.57	
390235A	UID	85				2.69	
390235A	UID Mammal	3				3.18	
390235A	UID Mammal	3				2.37	
390235A	UID Mammal	1	maxilla			0.59	
390235A	UID Mammal	5	tooth			0.34	
390235A	UID Mammal	1	tooth			0.06	
390235A	UID Mammal	1	tooth			0.03	
395230A	Artiodactyla	2	Tooth			0.38	
395230A	Odocoileus virginianus	1	Molar/Premolar			0.13	
395230A	Oyster Shell	1				0.01	
395230A	Sus scrofa	1	2nd metacarpal	proximal		0.57	
395230A	Testudines	4	carapace			1.25	
395230A	Testudines	1	carapace			0.32	
395230A	UID	53				11.47	
395230A	UID	100				23.88	
395230A	UID	41				8.76	
395230A	UID	192				6.7	
395230A	UID	105				5.58	
395230A	UID	111				2.55	

395230A	UID	1				0.11	Highly polished, possibly part of a tool
395230A	UID Mammal	6				4.74	
395230A	UID Mammal	1				0.67	
395230A	UID Mammal	5	tooth			0.26	
395230A	UID Mammal	4	tooth			0.05	
400235A	Artiodactyla	1	Scapula		left	0.99	Possibly deer
400235A	Bos taurus	1	Rib	proximal		2.46	
400235A	Odocoileus virginianus	2	Carpal/tarsal			2.69	
400235A	Odocoileus virginianus	1	Humerus	distal	left	15.35	
400235A	Odocoileus virginianus	2	Molar/Premolar			0.54	
400235A	Odocoileus virginianus	1	Molar/Premolar			0.21	
400235A	Testudines	1	carapace			0.6	
400235A	Testudines	4	carapace			1.24	
400235A	UID	104				26.32	
400235A	UID	50				15.49	
400235A	UID	5				0.24	
400235A	UID	23				1.57	
400235A	UID	50				1.85	
400235A	UID Mammal	89				31.77	
400235A	UID Mammal	1	tooth			0.04	
400235A	Vulpes fulva	1	Carnassial	upper	left	0.71	
405230A	Artiodactyla	1	Tooth			0.2	
405230A	Odocoileus virginianus	1	Ulnar carpal		left	1.72	
405230A	Odocoileus virginianus	2	Femur	shaft		2.36	2 fragments mend with at least 3 cut marks, probably made with metal tool
405230A	Oyster Shell	1				0.01	
405230A	Scalopus aquaticus	1	Humerus		left	0.18	
405230A	Testudines	1	carapace			1.34	Copper staining present
405230A	Testudines	1	carapace			0.16	
405230A	Testudines	3	carapace			0.36	
405230A	UID	66				15.25	
405230A	UID	158				30.14	
405230A	UID	34				6.84	
405230A	UID	56				2.23	
405230A	UID	77				3.88	
405230A	UID	49				1.67	
405230A	UID Mammal	4				2.85	
405230A	UID Mammal	10				6.93	

405230A	UID Mammal	3				2.87	
405230A	UID Mammal	4	tooth			0.18	
405325A	UID	5				0.09	
405325A	UID	2				0.1	
405325A	UID Mammal	1				0.2	
410235A	Canis familiaris	1	phalange			0.81	Burned after breaking
410235A	Odocoileus virginianus	1	Carpal			0.87	
410235A	Oyster Shell	1				0.06	
410235A	Testudines	2	carapace			0.72	
410235A	Testudines	3	carapace			1.34	
410235A	UID	94				25.47	
410235A	UID	22				7.32	
410235A	UID	30				2.12	
410235A	UID	37				3.46	
410235A	UID	51				2.32	
410235A	UID Mammal	15				4.94	
410235A	UID Mammal	3	tooth			0.14	
415230A	Odocoileus virginianus	1	Carpal			0.74	
415230A	Odocoileus virginianus	2	Molar/premolar			0.15	
415230A	Odocoileus virginianus	3	Molar/Premolar			0.56	
415230A	Testudines	1	carapace			0.18	
415230A	UID	27				5.48	
415230A	UID	12				2.54	
415230A	UID	28				1.05	
415230A	UID	44				1.85	
415230A	UID	62				1.36	
415230A	UID Mammal	12				3.44	
415230A	UID Mammal	6				2.27	
420235A	Odocoileus virginianus	1	Molar/Premolar			0.31	Unidentifiable fragment
420235A	Odocoileus virginianus	1	P1 Premolar	upper	right	0.89	
420235A	UID	19				3.32	
420235A	UID	14				2.69	
420235A	UID	25				1.1	
420235A	UID	11				1.49	
420235A	UID	55				1.95	
420235A	UID Mammal	17				4.97	
425230A	Testudines	1	carapace			0.07	
425230A	UID	55				10.1	
425230A	UID	29				5.16	

425230A	UID	51				1.11	
425230A	UID	2				0.07	
425230A	UID	1				0.03	
425230A	UID Mammal	13				4.55	
425230A	UID Mammal	2	Tooth			0.14	Possibly deer
425230A	UID Mammal	1	tooth			0.05	
430235A	UID	7				1.63	
430235A	UID	7				1.58	
430235A	UID	13				2.73	
430235A	UID	1				0.13	Only burned on a small portion of the bone
430235A	UID	50				1.24	
430235A	UID	9				0.47	
430235A	UID	5				0.11	
430235A	UID Mammal	2	Tooth			0.11	Two fragments
430235A	UID Mammal	1	tooth			0.02	
435230A	Bos taurus	1	Petrous Process		right	4.92	
435230A	Odocoileus virginianus	2	Tooth			0.23	Two fragments, but probably deer teeth
435230A	UID	10				0.14	
435230A	UID	5				0.69	
435230A	UID	35				0.88	
435230A	UID	9				0.29	
435230A	UID Mammal	1				0.28	
440235A	Odocoileus virginianus	1	Molar			0.27	Molar fragment
440235A	UID	2				0.14	
440235A	UID	4				0.6	
440235A	UID	14				0.91	
440235A	UID	2				0.07	
440235A	UID	1				0.01	
440235A	UID Mammal	1	tooth			0.01	
445230A	UID	7				0.87	
445230A	UID	3				0.02	
450235A	UID	3				0.21	
450235A	UID	25				0.46	
450235A	UID	2				0.1	
455230A	UID	3				0.3	
455230A	UID	13				1.15	
460235A	UID	1				0.25	
460235A	UID	1				0.02	
460235A	UID Mammal	4				0.46	Fragments of same

							bone
460235A	UID Mammal	1	tooth			0.08	
465230A	Artiodactyla	1				1.72	Unfused possible femur head or humerus head
465230A	UID	8				0.12	
465230A	UID	1				0.02	
470235A	UID	2				0.33	
470235A	UID	10				0.08	
470235A	UID	1				0.02	
470235A	UID	1				0.02	
470235A	UID Mammal	1				0.13	
470235A	UID Mammal	1	tooth			0.03	
475230A	UID	1				0.1	
475230A	UID	4				0.08	
475230A	UID	1				0.01	
480235A	Gastropod Shell	2				0.01	
480235A	UID	4				0.07	
480235A	UID	1				0.06	
485230A	UID	2				0.01	
490235A	UID	3				0.05	
490235A	UID	1				0.01	
500235A	UID	1				0.01	
500235A	UID	1				0.01	
505230A	UID	6				0.03	
510235A	UID	10				0.12	
515230A	Odocoileus virginianus	1	M1 Molar	lower	left	0.96	
515230A	UID	1				0.03	
540235A	Oyster Shell	1				0.01	
540235A	UID	2				0.79	
540235A	UID	2				0.16	
540235A	UID	3				0.04	
575110A	Odocoileus virginianus	1	Molar/Premolar			0.08	
575110A	Testudines	2	carapace			0.86	
575110A	UID	6				1.07	Fragments of the same bone
575110A	UID	67				10.99	
575110A	UID	118				3.6	
575110A	UID	1				0.02	
575110A	UID Mammal	5				1.8	
575110A	UID Mammal	1	tooth			0.01	

575120A	Odocoileus virginianus	1	Rib	shaft		1.49	Probably somewhat modern
575120A	Odocoileus virginianus	1	Metatarsal	shaft		1.94	Possibly modern bone
575120A	Testudines	1	carapace			0.32	
575120A	UID	6				1.05	
575120A	UID	10				0.41	
575120A	UID	1				0.01	
620625A	UID	1				0.02	
620625A	UID	11				0.23	
620625A	UID	3				0.02	
620625B	UID	18				0.96	
620625B	UID Mammal	5				0.91	
645600A	UID	2				0.06	
645600A	UID	1				0.01	
645600B	UID	9				0.22	