Analysis of Plant and Animal Remains from 44RN348

prepared by:
Amber M. VanDerwarker

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INTRODUCTION

Archaeological plant and animal assemblages represent only a small fraction of what was originally used and deposited by humans in open-air settings. Natural and cultural factors can significantly modify organic remains, resulting in recovered assemblages that differ dramatically from the original deposits. As archaeologists, we examine collections that have undergone a series of processes—from the original selection of plants and animals by humans, to food preparation, cooking, discard, animal and insect scavenging, burial, decay, and weathering, to the recovery of food residues by archaeologists. Using standard methodological procedures for sampling, quantification, and analysis allows us to make sense of our assemblages in spite of the deleterious effects of these processes.

Here I report on the identification and analysis of the archaeobotanical and zooarchaeological assemblages from 44RN348. I treat the plant data first, followed by the animal data. In each section, I present a basic discussion of recovery/ preservation issues, quantitative methods, and laboratory procedures. This is followed by the results and analysis of the data. Discussion of the faunal data is restricted to a basic report of the results as sample sizes were too small for an indepth analysis. Finally, I discuss the patterns identified in each assemblage as a means to reconstruct more general subsistence practices at the site.

THE ARCHAEOBOTANICAL ASSEMBLAGE

Recovery and Preservation Bias

The circumstances under which plants preserve best archaeologically involve extreme conditions (e.g., exceptionally wet, dry, or cold environments) that prohibit decomposition of organic matter (Miksicek 1987). Plants can also preserve through exposure to fire, which can transform plant material from organic matter into carbon (Miksicek 1987). The likelihood that a plant will become carbonized varies according to the type of plant, how it is prepared and used, and whether it has a dense or fragile structure (Scarry 1986). Plants that are eaten whole are less likely to produce discarded portions that may find their way into a fire. Plants that require the removal of inedible portions (e.g., hickory nutshell, corn cobs) are more likely to find their way into a fire, and thus into the archaeological record. Inedible plant parts represent intentional discard that is often burned as fuel. Moreover, because inedible portions tend to be dense and fibrous, they are more likely to survive the process of carbonization than the edible parts (e.g., hickory nutshell vs. nutmeats). Physical characteristics are also important for determining whether or not a plant will survive a fire. Thick, dense nutshells are more likely to survive a fire than smaller, more fragile grass seeds. Food preparation activities also affect potential plant carbonization. The simple process of cooking provides the opportunity for carbonization through cooking accidents. Foods that are conventionally eaten raw, however, are less likely to be deposited in fires than cooked foods.

Some plants that find their way into the archaeological record in carbonized form were not eaten at all. Wood fuel is the most obvious example. Burned house structures can also yield carbonized plant deposits, and these deposits often differ dramatically from refuse deposits (Scarry 1986). Other non-food plants that become carbonized are incidental inclusions, such as seeds blown by wind dispersal (Miksicek 1987; Minnis 1981; Scarry 1986). Indeed, most secondary invaders are weedy species with lots of seeds (e.g., cheno/am plants) (Minnis 1981).

While we cannot ever hope to know the absolute quantities or importance of different plants in any past subsistence economy, the preservation and recovery biases discussed above do not prohibit quantitative analyses of archaeobotanical assemblages. The most commonly used plant resources in any subsistence economy are more likely to be subject to activities that result in carbonization (e.g., through fuel use and accidental burning) and ultimately, deposition (Scarry 1986; Yarnell 1982). Thus, we can quantitatively examine the relative importance of commonly-used plant resources through time and across space.

Methods of Quantification

Quantitative methods in archaeobotany have developed significantly over the past several decades, and as a result, have been a subject of much critical discussion (Hastorf and Popper 1988). The most common methods for recording and quantifying plant remains are counts and weights. Because of problems with comparability between different types of plant taxa, however, raw (or absolute) counts and weights are not appropriate comparative measures (Scarry 1986). For example, denser taxa yield higher weights than more fragile taxa, and some taxa yield higher seed counts than others (e.g., grasses versus fruits) (Scarry 1986). Thus, using absolute counts or weights to summarize plant data is highly problematic. Most archaeobotanists agree that absolute counts are inadequate for assessing past people-plant interactions in that they do not control for biases related to preservation and sampling error (Kandane 1988; Miller 1988; Popper 1988; Scarry 1986). Absolute counts and weights are simply raw, unstandardized data.

One way to avoid the problems of absolute counts/weights is through the use of ubiquity measures (Godwin 1956; Hubbard 1975, 1976, 1980; Popper 1988, Willcox 1974). This type of analysis is essentially a presence/absence analysis that sidesteps the problems of counts and weights by measuring the frequency of occurrence instead of abundance. In other words, ubiquity analysis measures the number of samples in which a taxon was identified, as opposed to the number of specimens represented by that taxon. The researcher first records the presence of a specific taxon in each sample, and then computes the percentage of all samples in which the taxon is present (Popper 1988). For example, if hickory shell is present in four out of ten samples, then its ubiquity value is 40%. Thus, each taxon is evaluated independently (Hubbard 1980). Because different types of plants are disposed of differently, direct comparisons of ubiquity values between taxa are problematic (Hubbard 1980:53). For example, a 70% ubiquity value for hickory nutshell would not be equivalent to a 70% ubiquity value for beans as these categories have different preservation opportunities—hickory nutshell represents a processing by-product often used as fuel, while beans represent edible portions.

As with any quantitative measure, ubiquity analysis has its disadvantages. A sufficient number of samples is necessary to provide meaningful results as using too few samples creates a high likelihood of sampling error. Hubbard (1976:60) suggests a minimum of 10 samples. Moreover, although ubiquity analysis may mitigate for preservation biases, it is not immune to them (Hubbard 1980:53; Scarry 1986:193). Most importantly, because ubiquity deals with occurrence frequency and not abundance, it can potentially obscure patterns where occurrence frequency does not change but abundance does (Scarry 1986). As Scarry (1986:193) notes: "the frequency with which a resource is used may remain constant, while the quantity used varies." For example, a family may consistently eat corn on a daily basis, but the quantity they consume may vary from day to day. Despite these weaknesses, ubiquity analysis is a good starting point and can provide meaningful results when used alongside other measures.

While ubiquity measures may sidestep the problems inherent in absolute counts, it does not provide a means for calculating relative abundances of different plant taxa. Using comparative ratios is one way of determining the relative abundances of different plants. For the purposes of this analysis, I use dependent ratios to calculate relative abundances of different categories of plants. In addition, I also used independent ratios (counts standardized to plant weight) to assess relative differences in the use of the most abundant plant resources at the site.

Laboratory Procedures

Both the light and heavy fractions of the 44RN348 flotation samples were analyzed. Although the materials from the light and heavy fractions were processed and sorted separately, data from the two fractions were combined for analysis. According to standard practice, the light fractions were weighed and then sifted through 2.0 mm, 1.4 mm, and 0.7 mm standard geological sieves. Carbonized plant remains from both fractions were sorted in entirety down to the 2.0 mm sieve size with the aid of a stereoscopic microscope (10–40 X). Residue less than 2.0 mm in size was scanned for seeds, which were removed and counted; in addition, taxa encountered in the 1.4 mm sieve that were not identified from the 2.0 mm sieve were also removed, counted, and weighed.

Botanical materials were identified with reference to a seed identification manual (Martin and Barkley 1961) and the author's archaeobotanical comparative collection. All plant specimens were identified to the lowest possible taxonomic level. Taxonomic identification was not always possible—some plant specimens lacked diagnostic features altogether or were too highly fragmented. As a result, these specimens were classified as "unidentified" or "unidentified seed." In other cases, probable identifications were made—for example, if a specimen closely resembled a corn kernel, but a clear taxonomic distinction was not possible (e.g., the specimen was highly fragmented), then the specimen was identified as a probable corn cupule and recorded as "corn kernel cf.".

Once the plant specimens were sorted and identified, I recorded counts, weights (in grams), portion of plant (e.g., corn kernels versus cupules), and provenience information. Wood was weighed but not counted, and no wood identification was conducted. Generally, most of the seeds identified in the samples were too small to weigh, and thus only counts were recorded. Hickory nutshell and corn remains were identified only as fragments, and were both counted and weighed. Other than counts and weights, no other measurements were taken on any specimens.

Basic Results: Flotation Samples

This section presents the results of the identification of the carbonized plant remains from 44RN348, which forms the basis for the quantitative analysis that follows. Plant data from flotation samples are summarized for the site in Table 1. Raw counts and weights are provided for each taxon (except for the "other seeds" category in which only counts are provided); plant weight, wood weight, and soil volume are also provided. Seasonality data are provided in Table 2. Macrobotanical data recovered through ¼-inch screening are listed according to feature/unit contexts in Table 3. Plant data are also reported by individual contexts (e.g., test units & features) in Appendix A.

A total of 72 flotation samples from 3 postholes and 39 features were collected and analyzed, representing a total of 2,516 liters of soil with a total plant weight of 641.04 grams. Combined, these samples yielded 23 plant taxa, including corn, bean, acorn, hazelnut, hickory, walnut, and several different types of fruits and miscellaneous seeds (Table 1). Corn (*Zea mays*) and bean (*Phaseolus* sp.) were the only definitive field cultigens present in the samples, although two possible sumpweed seeds (*Iva annua* cf.) were also identified. Nutshell recovered from the flotation samples includes acorn (*Quercus* sp.), hazelnut (*Corylus* sp.), hickory (*Carya* sp.) and walnut (*Juglans* sp.). While the nutmeats of walnuts can be easily extracted from the shell, hickory nuts require extensive processing before they are rendered palatable. The hickory kernels are so tightly enmeshed in the interior shell that picking the nutshells from the cracked shell casing is a time-consuming task. Instead, hickory nuts were generally pounded into pieces and boiled to extract the oil (Ulmer and Beck 1951). The process of boiling the pounded hickory nuts separates the pieces of shell, which sink to the bottom of the pot, from the oil, which rises to the top as the nutmeats dissolve and can be skimmed off or decanted. This oil or milk would then be used as an added ingredient in soups and stews, as a condiment for vegetables, or as a general sauce or beverage (Scarry 2003; Talalay et al. 1984).

Acorn processing depends upon whether the nuts derive from white or red oak trees. Nuts from the red oak are high in tannin and are extremely bitter as a result. White oaks, however, yield sweeter nuts; the nutmeats from these acorns can be used for cooking immediately after extraction from the shell (Scarry 2003). The tannin present in the bitter acorns, however, requires an additional processing step. Leaching the tannin from acorns can be accomplished either by soaking them in water, or parching and then boiling them with an alkaline substance such as wood ash. Once processed, acorns were generally ground into a fine meal, which could then be used to make gruel, bake bread, or thicken stews. Less often, acorns were boiled and the oil extracted (Swanton 1946:260, 277).

The hazelnut identified in the assemblage probably represents the American hazelnut (*Corylus americana*). Unlike the other nuts which come from trees, hazels are shrubs; they prefer open and anthropogenic habitats, and form dense thickets (Scarry 2003). While the nuts begin to ripen in the late summer, they don't fall to the ground until October/November, at which time they are quickly comsumed by animals (Scarry 2003). These factors would have resulted in low collection rates for this type of nut (Scarry 2003; Talalay et al. 1984). Hazelnuts are high in fat and were probably processed for the nutmeats themselves, as opposed to the oil they produce (Scarry 2003).

Several wild grape (*Vitis* sp.) seeds were also identified, in addition to a blackberry/raspberry seed (Rubus sp.), two persimmon seeds (*Diospyros virginiana*), and a possible hawthorn seed (*Crataegus* sp.). Because fruits are often eaten uncooked, their seeds have fewer opportunities for carbonization. Thus, the paucity of fruits in the assemblage does not indicate their unimportance in the diet.

Table 1. Summary of plant taxa for 44RN348 flotation samples

N of samples	72		
Volume (liters)			
Plant Weight (grams)	647.05		
Wood Weight (grams)	597.65		
Common Name	*Taxonomic Name*	Count	Weight (g)
CROPS			
Bean	*Phaseolus vulgaris*	62	1.33
Bean cf.	*Phaseolus vulgaris* cf.	5	0.02
Bean family	Fabaceae	1	0.00

Corn cupule	*Zea mays*	1538	8.05
Corn kernel	*Zea mays*	403	2.84
NUTS			
Acorn	*Quercus* sp.	463	1.38
Acorn cf.	*Quercus* sp. cf.	2	0.00
Acorn meat cf.	*Quercus* sp. cf.	1	0.02
Hazelnut	*Corylus* sp.	329	1.36
Hazelnut cf.	*Corylus* sp. cf.	22	0.06
Hickory	*Carya* sp.	2690	28.97
Hickory cf.	*Carya* sp. cf.	4	0.10
Walnut	*Juglans* sp.	130	2.56
Walnut family cf.	*Juglandaceae*	1	0.01
FRUITS			
Blackberry/Raspberry	*Rubus* sp.	1	
Grape	*Vitis* sp.	16	
Grape cf.	*Vitis* sp. cf.	5	
Hawthorn cf.	*Crataegus* sp.	1	
Persimmon	*Diospyros virginiana*	2	
OTHER SEEDS			
Amaranth	*Amaranthus* sp.	6	
Bearsfoot	*Polymnia uvedalia*	11	
Bearsfoot cf.	*Polymnia uvedalia* cf.	1	
Bedstraw	*Galium* sp.	6	
Chenopod	*Chenopodium* sp.	10	
Cheno/Am		3	
Copperleaf	*Acalypha virginica*	46	
Goosegrass	*Eleusine indica*	1	
Grass family	Poaceae	1	
Knotweed	*Polygonum* sp.	2	
Morninglory	*Ipomoea/Convolvulus*	3	
Pine	*Pinus* sp.	1	
Purslane	*Portulaca* sp.	9	
Sumpweed cf.	*Iva annua* cf.	2	
Tick Clover	*Desmodium* sp.	1	
MISCELLANEOUS			
Stem/Peduncle		2	
Unidentified		5	
Unidentified seed		21	

The remaining taxa identified in the assemblage include of variety of seed types. These include amaranth, bearsfoot (*Polymnia uvedalia*), bedstraw (*Galium* sp.), chenopod (*Chenopodium* sp.), copperleaf (*Acalypha virginica*), goosegrass (*Eleusine indica*), knotweed (*Polygonum* sp.), morninglory (*Ipomoea/Convolvulus* sp.), pine (*Pinus* sp.), purslane (*Portulaca* sp.), tick clover (*Desmodium* sp.), and a few seeds from the grass family (Poaceae). Weedy seeds that probably represent incidental inclusions in the assemblage include bedstraw, copperleaf, goosegrass, pine, purslane, and tickclover. People may have consumed the seeds of amaranth, bearsfoot, chenopod[1], knotweed, and purslane. Chenopod and knotweed may also have been eaten green or as potherbs (Hedrick 1972; Medsger 1966, Ulmer and Beck 1951). Some species of morninglory produce edible tubers, although the seeds identified in the samples might simply be field weeds (Medsger 1966). While some of these seed species may have been eaten as food or may represent weedy inclusions, many have documented medicinal uses as well. Bearsfoot was used by native Indians in poultices and salves, and as a laxative and stimulant (Chevallier 1970; Grieve 1984; Usher 1974). The root can be rendered and taken orally for the treatment of indigestion and liver malfunction (Chevallier 1970). Bearsfoot root can also be made into a salve for treating burns, cuts, and skin inflammations (Moerman 1998). Although bedstraw is widely known for its use as bedding (e.g., stuffing in pillows and mattresses), it also boasts several medicinal purposes, including use as a diuretic, astringent, and antispasmodic, in addition to treatment of kidney problems (Coffey 1993). Bedstraw may also have been consumed as a tea and the weedy legume may have been used as food (Coffey 1993; Hedrick 1972; Peterson 1977). In addition to its use as food, chenopod is also known as a treatment for worms in children (Coffey 1993) and as an antispasmodic (Coon 1979), and can therefore also be considered a medicinal plant. The root of the knotweed has astringent properties and is also a natural emetic/purgative; it can be used to treat diarrhea, constipation, dysentery, and uterine bleeding (Porcher 1970). The leaves of the knotweed can be made into an infusion to stop bleeding in the mouth (Coffey 1993).

An assessment of seasonality for these plants indicates the harvesting and collection of resources from May through November (Table 2). Most fruits are available from mid to late summer. Corn and beans begin to ripen in the mid-summer and continue to be harvested throughout the early fall. The ripening of the fall nut mast begins in September with acorns; hickories and walnuts begin to ripen in October. Hazelnuts begin to ripen even earlier, beginning in July with continued availability through September. The remaining taxa (classified as “other seeds”) ripen and are available in the late spring and summer. Collectively, the seasonality information gleaned from the plant remains points to the collection and harvesting of plant foods spanning the late spring through mid-Fall.

Table 2. Seasonality of 44RN348 plant taxa in ascending order by bloom.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Blackberry/Raspberry					X	X						
Bedstraw					X	X	X	X				
Purslane					X	X	X	X	X			
Copperleaf						X	X	X	X	X		
Amaranth							X	X	X			
Hazelnut							X	X	X			
Bearsfoot							X	X	X			
Corn							X	X	X			
Bean							X	X	X	X		

[1] It is unlikely that the chenopod seeds identified here represent domesticates as seed coat thickness for these specimens is more consistent with wild chenopod. Domesticated and wild chenopod can be distinguished based on thickness of the inner seed coat; domesticated chenopod has a much thinner seed coat than its wild counterpart (Smith 1985).

Chenopod	X	X	X	X	X
Goosegrass	X	X	X	X	X
Knotweed	X	X	X	X	X
Morninglory	X	X	X	X	X
Grape		X	X	X	
Tick Clover		X	X	X	
Hawthorn cf.			X	X	
Persimmon			X	X	
Sumpweed cf.			X	X	X
Acorn			X	X	X
Hickory				X	
Walnut				X	

Basic Results: Screened Samples

Taxa identified from the macrobotanical remains were limited to large specimens greater than 2.0 mm in size (Table 3). Not surprisingly, no carbonized seeds were identified among the macrobotanical specimens. The macrobotanical assemblage does, however, consist of a variety of cultigens and nuts, including, corn, bean, hazelnut, acorn, hickory, and walnut. In addition, large wood specimens and fragments of persimmon were also identified in the macro assemblage.

Table 3. Identified plant remains from 44RN348 macrobotanical samples.

Provenience	Wood	Corn		Bean		Acorn		Hazelnut		Hickory		Walnut		Persimmon		UID	
	(g)	(n)	(g)	(n)	(g)	(n)	(g)	(n)	(g)	(n)	(g)	(n)	(g)	(n)	(g)	(n)	(g)
<u>Features</u>																	
14	15.33									5	0.08			1	0.14		
16	1.12																
17	0.35																
18	1.64									3	0.54					2	0.01
19	0.62																
20	4.53			2	0.12			1	0.01	8	0.76	1	0.06				
21	12.53									2	0.1	3	0.15				
22	0.04									3	0.14						
23												5	0.36				
25	1.88																
29	0.13																
31	0.36									8	0.73	2	0.33				
32	7.62																
33	81.3	1	0.05	1	0.02					1	0.01	6	0.36				
35	2.97																
37	4.13					1	0.01			1	0.01						
38	2.05																
39	0.16																
40	7.27																
41	1.96									6	0.02						
42	97.86									1	0.01						
43	5.45																
45	3.67																
46	92.53									13	0.44						
49	36.01									3	0.29						

50	2.18																
51	6.43																
53	0.21																
55	26.92																
56	3.37											1	0.24				
58	0.37									1	0.06						
59	0.12									35	2.28					2	0.01
60	0.01									2	0.23						
62	2.06	1	0.01							2	0.21						
Test Units																	
11	0.1																
22	0.02																
23	0.05																
34	0.2																
Human Burial																	
2	0.32																

Data Analysis

The analysis presented in this section focuses on summarizing generalities in plant subsistence at the site level as well as exploring how certain features depart from these central tendencies. Central tendencies at the site level are summarized using ubiquity measures, relative percentages, and standardized counts. Variation in the data is then explored through a principle components analysis of features and taxa, followed by a consideration of outliers in standardized counts of corn.

Ubiquity values are presented in descending order in Table 4. Taxa can be broken up into four major groups based on these values. Wood, hickory nutshell, and corn are by far the most ubiquitous taxa at the site, present in more than 86% of flotation samples. The second group of taxa is present in 47-51% of samples and consists of nutshell of walnuts and acorns. The third major group consists of grape, bean, and chenopod, present in 11-17% of the samples. The final group of taxa is present in less than 10% of the samples, and includes the remaining fruits and seeds identified in the samples, in addition to hazelnut. To summarize the ubiquity data, it appears that corn and nuts were the most common food resources recovered at the site.

Table 4. Ubiquity Values in descending order for plants identified at 44RN348.

Common Name	Samples Present	Total Samples	Ubiquity Value
Wood	71	72	98.6%
Hickory	66	72	91.7%
Corn	62	72	86.1%
Walnut	37	72	51.4%
Acorn	34	72	47.2%
Grape	12	72	16.7%
Bean	11	72	15.3%
Chenopod	8	72	11.1%
Copperleaf	7	72	9.7%
Bearsfoot	6	72	8.3%
Bedstraw	6	72	8.3%
Amaranth	4	72	5.6%
Purslane	4	72	5.6%
Hazelnut	2	72	2.8%
Knotweed	2	72	2.8%
Sumpweed cf.	2	72	2.8%
Tick Clover	2	72	2.8%
Blackberry/Raspberry	1	72	1.4%
Hawthorn cf.	1	72	1.4%
Persimmon	1	72	1.4%
Goosegrass	1	72	1.4%
Morninglory	1	72	1.4%
Pine (seed)	1	72	1.4%

Relative percentages of taxon counts lend support to the ubiquity values. Nutshell and cultigens (corn, bean, sumpweed) compose 97.8% of the assemblage, with nutshell representing the majority of the sample. Of course, this high representation of nutshell is to be expected, given that nutshell was likely used as fuel in hearth fires. If we look more closely at the "nut" and "cultigen" categories, we see that they are dominated by hickory and corn, respectively. A comparison of the standardized counts of these taxa reveal a significant difference in their relative abundances. Counts are standardized by plant weight for each sample and then the distributions are presented as box plots (Figure 1). If the notched areas of any two box plots do not overlap, then the two boxes (distributions) are significantly different at the 0.05 level. The notches of the two box plots presented in Figure 1 do not overlap, thus indicating that the distributions of corn and hickory are statistically different. It appears that there is significantly more hickory relative corn in the deposits from the site. This analysis supports the ubiquity data and the relative percentages.

Table 5. Relative Percentages in descending order for plants identified at 44RN348.

	Count	Percentage
Nuts	3642	63.0%
Cultigens	2011	34.8%
Other Seeds	101	1.7%
Fruits	25	0.4%
Totals	5779	100.0%

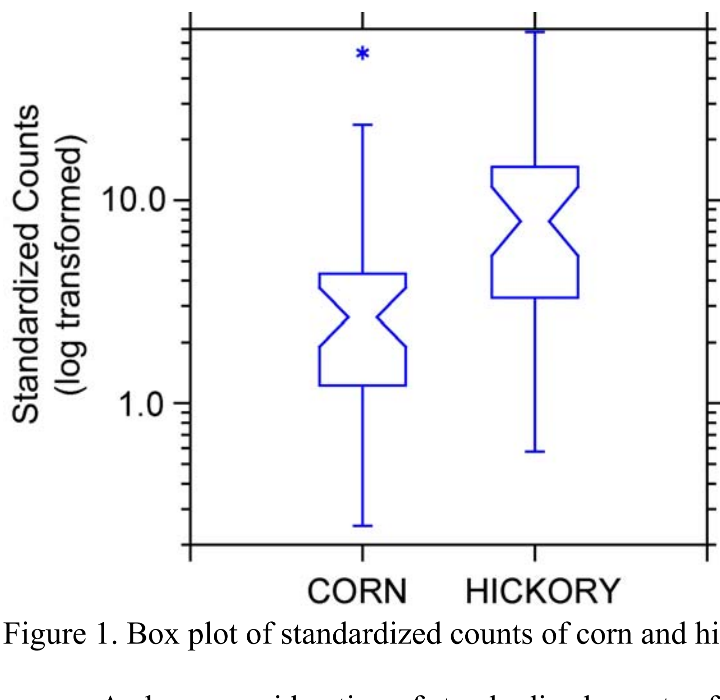

Figure 1. Box plot of standardized counts of corn and hickory remains.

A closer consideration of standardized counts of different types of nutshell reveals that hickory is also significantly more abundant than both acorn and walnut. Figure 2 presents box plots of acorn, hickory, and walnut. While hickory is clearly more abundant than the other nut types, it is interesting that the distributions of acorn and walnut are similar and overlapping.

While the middle 50% of the walnut distribution is more restricted than its counterpart, the medians and ranges are nearly identical.

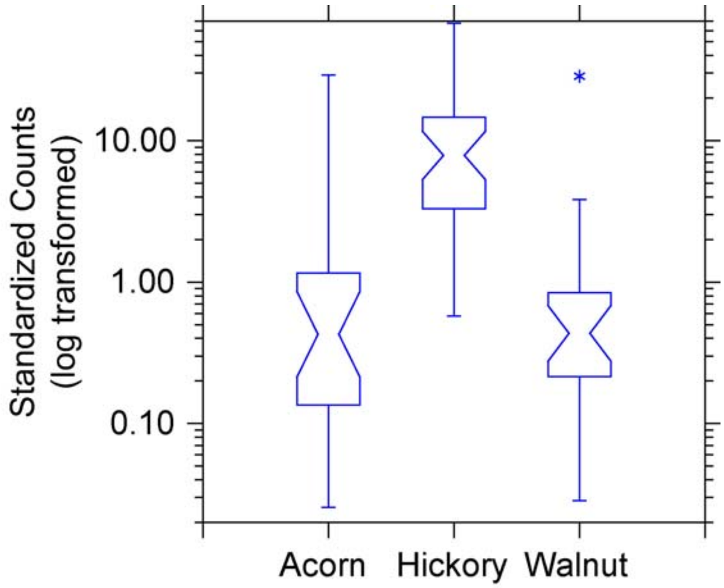

Figure 2. Box plot of standardized counts of acorn, hickory, and walnut remains.

Now that I have presented general patterns in the data at the site level, I want to consider variation in the data. In other words, how do the features at the site differ with respect to their inventories/abundances of plant taxa? Given the sheer number of features and taxa present at the site, I turned to multivariate analysis as a means to simplify the dataset. I used principle components analysis to consider the covariation between plants and features. Fruit taxa were collapsed into a single category, as were weedy seed taxa. Principle components analysis (PCA) is an ordination technique that uses a Pearson's r coefficient to determine the relationships between multiple cases (features) and variables (plants). The analysis that I conducted uses a correlation matrix as a measure of association. The first two components produced by the analysis explain 50% of the variance in the data.

Although these two components only explain about half of the variance, I believe it is still worthwhile to consider the component scores more closely. The component scores are plotted in Figures 3 and 4. Figure 3 plots the component scores for the features, and figure 4 plots the component scores for the plant taxa. Close spatial proximity indicates a close relationship; the greater the distance between two variables, the weaker the relationship. The closer the values are to zero, where the two axes intersect, the closer they are to the average expected value. In the first plot, all but four features cluster at zero, where the two axes intersect; these features are all very similar, both to the average expected value and to each other, in terms of plant inventories/abundances. Four features, however, fall outside of this cluster: features 14, 17, 20, and 33. If we consider these features more closely, we see some interesting patterns. First, beans are present in all four features; this is interesting because bean has a low ubiquity score and is only present in 8 features at the site. Second, feature 20 is the only feature in which hazelnut was identified. Finally, all features appear to have a wide array of taxa present. If we look at Figure 3 more closely, we find that features 14 and 33 are pulled away from the cluster only along the 1st component; both features fall near the zero value for the 2nd

component. Only features 17 and 20 are pulled significantly away from the zero values for both components. A comparison of the feature plot and the taxa plot (figure 4) reveals a clear relationship between certain plants and features 17 and 20. Feature 17 plots similarly to corn cupules, walnuts, and fruits; Feature 20 plots similarly to hazelnuts. Thus, these features differ significantly from the other features in terms of their relative abundances of these plant taxa.

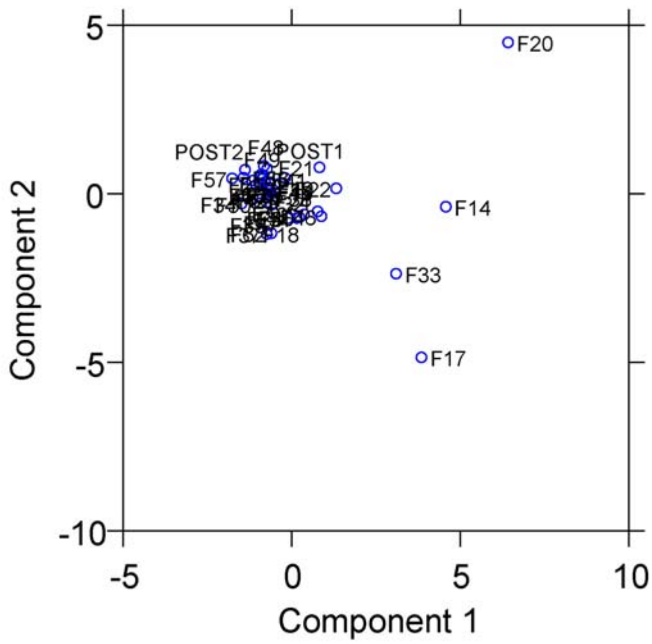

Figure 3. Principle components plot of features.

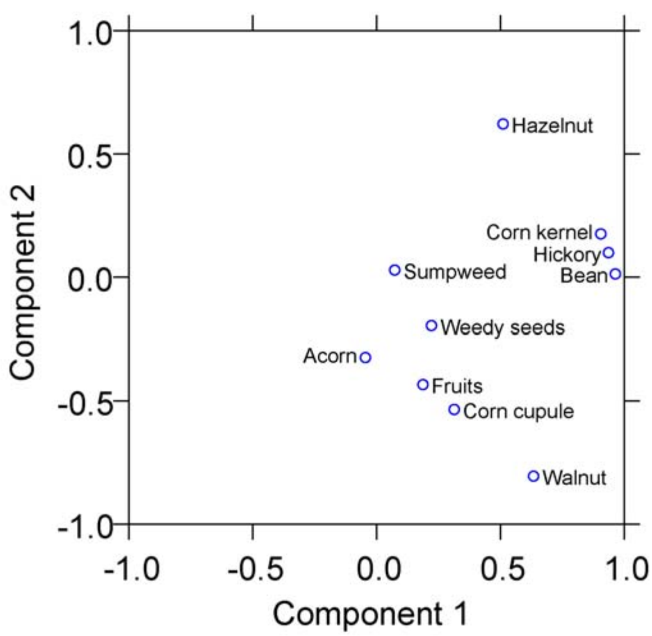

Figure 4. Principle components plot of plant taxa.

The patterns identified in the PCA are bolstered by a consideration of outliers in terms of standardized corn counts. The box plot presented in Figure 5 reveals the presence of four high outliers, two of which are features 20 and 33; both of these features were cases that separated out in the principle components analysis.

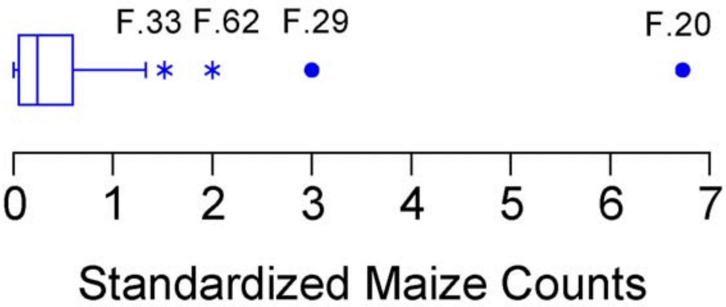

Figure 5. Box plot of standardized maize counts with outliers labeled.

THE ZOOARCHAEOLOGICAL ASSEMBLAGE

Recovery and Preservation Bias

The interpretation of zooarchaeological data depends upon the careful consideration of preservational biases affecting bone assemblages. As with any archaeological assemblage, what is recovered and studied by archaeologists does not directly represent what was originally discarded and deposited by humans. As with carbonized plant remains, whether or not a bone survives deposition to be recovered archaeologically depends in part on its structural density (Binford and Bertram 1977; Brain 1969; Voohries 1969; Lyman 1993, 1994). Denser, compact bones with more cortical tissue are more likely to survive than are fragile bones with more cancellous tissue. Thus, long bone diaphyses will be more resilient than epiphyses, skull fragments more than vertebral fragments, large mammal bones more than small mammal bones, and mammal bones more than bird bones, etc. Thus, generally speaking, we can expect a bias towards the preservation of larger mammalian remains relative to that of smaller, non-mammalian remains. In addition to preservation bias, we also must consider the affects of size bias in recovery techniques. Most field projects use standard ¼-inch mesh screens for recovering animal bones[2]—while this mesh size recovers a significant amount of bone from the surrounding dirt matrix, skeletal elements from smaller animals (e.g., fish vertebrae and ribs) will often fall through ¼ inch mesh.

Methods of Quantification

Most zooarchaeologists calculate a standard set of summary measures that form the basis for further analysis. The most basic statistic is the Number of Identified Specimens (NISP). NISP is the count of identified specimens per animal taxon (Grayson 1984). While NISP is relatively easy to calculate, there are disadvantages to using it as an estimate for the relative abundance of different animal taxa in an assemblage. Different taxa vary in the number of elements that compose their skeletons, and NISP is unable to control for this (Grayson 1979,1984; Reitz and Wing 1999). Another problem with NISP is that it does not account for differential preservation or bone fragmentation (Grayson 1984; Klein and Cruz-Uribe 1984; Reitz and Wing 1999). Clearly the bones of a white-tailed deer have more surface area than those of a cottontail and are thus likely to fragment into more pieces, significantly inflating the NISP of deer relative to cottontail. Thus, NISP may overestimate the contribution of larger animals relative to smaller animals.

[2] The screened faunal assemblage from 44RN348 was recovered using ¼-inch mesh screens.

MNI (Minimum Number of Individuals) is a secondary measure based in part on NISP. MNI is estimated for each species by calculating the occurrence of the most abundant element of the animal, while accounting for the side of the element (if applicable), portion represented, and relevant age information (Grayson 1984; Reitz and Wing 1999). For example, if the most abundant element of a white-tailed deer is the proximal end of a femur (n=12), and eight come from the right side of the animal and four from the left site, the minimum number of white-tailed deer would be eight. MNI has several advantages over NISP, the primary one being that it provides units that are independent of each other (Grayson 1973, 1984). While NISP does not account for the fact that different taxa are composed of varying numbers of skeletal elements, MNI is totally unaffected by this problem. Moreover, MNI is much less affected by the problems of fragmentation and preservation than NISP.

As with NISP, however, there are also disadvantages to using MNI, including the inflation of rarer species in the assemblage and the problem of aggregation (Grayson 1984; Reitz and Wing 1999). NISP and MNI can best be understood as separate ends of a spectrum in which NISP represents the maximum number of individuals identified in an assemblage. NISP overestimates the importance of larger, more common taxa. At the other end of the spectrum, MNI (through setting a minimum) has the opposite effect and overestimates rarer taxa. Moreover, MNI calculations can vary based on how the analyst aggregates the data. There are many ways that the data can be grouped and MNI values calculated—by site, feature, feature type, stratigraphic level, etc. For example, calculating MNI on a feature by feature basis would yield a larger total MNI for each taxon than simply calculating MNI for the site as a whole. In my analysis below, I tabulate NISP and MNI for the site as a whole. NISP and bone weight are presented for individual contexts in Appendix B, C, and D.

Laboratory Procedures

Screened bone specimens were sorted to the lowest possible taxonomic category. Specimens were identified with reference to the author's zooarchaeological comparative collection. Identification of screened materials included the recording of provenience, animal class, genus and species, element, percentage and portion of the element represented, number of specimens, side of element (when applicable), basic observations regarding the age of the animal and extent of bone modification (whether natural or cultural), and weight (grams). Each specimen was first assigned to the appropriate animal class whenever possible (e.g., mammal, bird, etc.). The anatomical element was recorded when identified. When the element could not be identified, it was placed in an unidentified category.

Basic Results

The data are summarized by NISP, MNI, and weight for the site as a whole (Tables 6 & 8) and for each test unit and feature (see Appendix B & C). Counts and percentages are provided for each animal class designation (e.g., mammals, birds; see Tables 7 & 9). The screened faunal assemblage yielded a total of 1,739 bone specimens weighing 935.24 grams. The faunal assemblage from flotation contexts yielded 2,025 specimens weighing 294.50 grams. A total of ten taxa were identified from both screened and floated assemblages, in addition to unidentified fish and unidentified turtle remains.

Few bird specimens were encountered, and those that were identified as bird were mostly turkey bones (*Meleagris gallopavo*). Turkeys are terrestrial birds that prefer grassy fields and woodlands with thick understories (Benyus 1989; Sutton and Sutton 1985). The majority of animal bones that could be identified were classified as mammals. One possible (*Didelphis virginianus*) specimen was identified. The opossum prefers disturbed habitats, including areas along forest edges, secondary growth, and weedy areas (Reid 1997:43–44, 192). Four squirrel (*Scuirus* sp.) specimens were also identified; squirrels prefer forests, forest edges, and secondary growth (Reid 1997:183–186). Two possible gopher (*Geomys* sp. cf.) specimens were identified in the flotation samples, but their identification is uncertain. One possible cottontail (*Sylvilagus* sp. cf.) specimen was identified, probably eastern cottontail (*Sylvilagus floridanus*), which tends to inhabit forest edges and areas of secondary growth, and is known to be an agricultural pest (Benyus 1989; Sutton and Sutton 1985). Two canid (*Canis* sp.) specimens, probably domesticated dog, were also encountered. Domestic dogs probably lived on site, where they scavenged for food and provided warning to the sites' inhabitants. The inclusion of dog/coyote remains in ordinary domestic refuse at the site suggests that dogs may have been a food resource as well. Beaver (*Castor canadensis*) represents the only aquatic mammal identified in the assemblage. Beavers can be found in/near a variety of water bodies, including lakes/ponds, rivers/streams, and marshes. One specimen from a possible black bear (*Ursus americanus* cf.) was also identified. White-tailed deer (*Odocoileus virginianus*), however, was by far the most numerous taxon encountered in the site assemblage. Deer inhabit a variety of different ecozones, including forests, forest edges, grasslands, disturbed areas, and occasionally agricultural fields (Benyus 1989; Sutton and Sutton 1985). Finally, three human teeth were identified in the assemblage, in both screened and floated contexts. Given that humans routinely lose teeth throughout their lives, it is not surprising to find them in domestic contexts; indeed, these teeth do not appear to come from burial contexts.

Overall, mammals dominate the assemblage in terms of both NISP and bone weight (Table 6). Fish, reptiles, and birds were less represented in the assemblage, probably a result of differential preservation. Generally, the animals identified in the assemblage inhabit three major habitat zones: aquatic, forested, and secondary/domestic (e.g., near human habitations/agricultural fields). People probably used a variety of techniques for procuring animals, including traps and snares in forests, gardens, agricultural fields; more direct hunting methods (e.g., stalking prey) for deer and turkeys; and line and net fishing for fish and turtles. Traps, snares, and nets could have been set in the course of gathering wild plant foods and tending to gardens and agricultural fields. More direct hunting methods, however, would have required more focused attention, and thus would have probably required scheduling around other tasks.

Table 6. Summary of animals from screened samples (MNI calculated for the site total).

Common Name	**Taxon**	**NISP**	**MNI**	**Wt (g)**
Unidentified turtle		63		24.24
Turkey	*Meleagris gallopavo*	1	1	0.88
Turkey cf.	*Meleagis gallopavo* cf.	2		1.20
Unidentified bird		8		2.41
Squirrel	*Scuirus* sp.	2	1	0.27
Beaver	*Castor canadensis*	7	1	11.45
Raccoon	*Procyon lotor*	6	1	7.00
Dog/Coyote	*Canis* sp.	2	1	0.23
Black bear cf.	*Ursus americanus* cf.	1	1	3.90
White-tailed deer	*Odocoileus virginianus*	177	3	300.05

White-tailed deer cf.	*Odocoileus virginianus* cf.	1		
Human	*Homo sapiens*	2	1	0.17
Unidentified mammal		1075		401.64
Unidentified		392		181.80
TOTALS		**1739**	**10**	**935.24**

Table 7. Summary of animal class statistics from screened samples

	NISP	%NISP
Fish	0	0.0
Reptile	63	4.7
Amphibian	0	0.0
Bird	11	0.8
Mammal	1273	94.5

Table 8. Summary of animals from flotation samples

Common Name	Taxon	NISP	MNI	Wt (g)
Unidentified fish		23		1.07
Unidentified turtle		95		30.26
Turkey	*Meleaagis gallopavo*	3	1	7.86
Unidentified bird		34		5.16
Opossum	*Didelphis virginianus*	1	1	0.46
Squirrel	*Scuirus* sp.	2	1	0.16
Gopher cf.	*Geomys* sp. cf.	2	1	1.50
Cottontail cf.	*Sylvilagus* sp. cf.	1	1	0.21
White-tailed deer	*Odocoileus virginianus*	96	1	40.62
Human	*Homo sapiens*	1	1	0.16
Unidentified mammal		791		130.30
Unidentified		976		76.73
TOTALS		**2025**	**7**	**294.5**

Table 9. Summary of animal class statistics from flotation samples

	NISP	%NISP
Fish	23	2.2
Reptile	95	9.1
Amphibian	0	0.0
Bird	37	3.5
Mammal	894	85.2

SUMMARY OF SUBSISTENCE DATA FOR 44RN348

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Appendix A. Plant remains identified from flotation samples listed by context.

	Post #1		Post #2		Post #3		Feature 14		Feature 15		Feature 16		Feature 17	
N of samples	1		1		1		2		1		5		3	
Volume (liters)	8		7		2		40		37		117		113	
Plant Weight (grams)	0.21		0.14		0.05		57.9		3.98		11.49		14.45	
Wood Weight (grams)	0.21		0.13		0.05		55.05		3.43		10.00		8.47	
	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)
CROPS														
Bean							24	0.33					2	0.05
Bean cf.											1	0.01		
Bean family														
Corn cupule	2	0					85	0.53	2	0	84	0.51	745	3.79
Corn kernel							114	0.89			10	0.05	27	0.1
NUTS														
Acorn	1	0					2	0	3	0			7	0.01
Acorn cf.											1	0		
Acorn meat cf.													1	0.02
Hazelnut											2	0.01		
Hazelnut cf.														
Hickory			1	0.01			80	1.06	78	0.55	112	0.77	191	1.52
Hickory cf.														
Walnut							9	0.14			9	0.14	22	0.48
Walnut family cf.														
FRUITS														
Blackberry/Raspberry													1	
Grape							3				1		2	

Grape cf.														
Hawthorn cf.														
Persimmon														
<u>OTHER SEEDS</u>														
Amaranth													1	
Bearsfoot											1			
Bearsfoot cf.														
Bedstraw											1			
Chenopod							1							
Cheno/Am														
Copperleaf			1				1							
Goosegrass														
Grass family														
Knotweed														
Morninglory							3							
Pine														
Purslane														
Sumpweed cf.														
Tick Clover														
<u>MISCELLANEOUS</u>														
Stem/Peduncle														
Unidentified														
Unidentified seed							1						3	

Appendix A cont'd. Plant remains identified from flotation samples listed by context.

	Feature 18		*Feature 19*		**Feature 20**		**Feature 21**		**Feature 22**		**Feature 23**		**Feature 24**	
N of samples	8		1		1		1		5		1		1	
Volume (liters)	123		19		46		47		71		88		37	
Plant Weight (grams)	20.98		8.63		38.53		12.85		25.14		6.01		3.31	
Wood Weight (grams)	19.70		7.62		30.71		10.39		20.12		3.80		2.72	
	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)
CROPS														
Bean					16	0.62			4	0.05				
Bean cf.	1	0.00												
Bean family														
Corn cupule	34	0.11	3	0	10	0.03	46	0.25	17	0.05	132	1.02	13	0.06
Corn kernel	12	0.07			74	0.76	11	0.04	11	0.03	10	0.10	4	0.01
NUTS														
Acorn	2	0					2	0	2		3	0.01	4	0
Acorn cf.	1	0												
Acorn meat cf.														
Hazelnut					327	1.35								
Hazelnut cf.														
Hickory	87	0.94	76	1.01	443	5.03	234	2.14	210	2.61	97	0.95	60	0.44
Hickory cf.														
Walnut	13	0.16			4	0.03	2	0.03	5	0.07	6	0.13	3	0.06
Walnut family cf.														
FRUITS														
Blackberry/Raspberry														
Grape							1		1					

Grape cf.														
Hawthorn cf.														
Persimmon														
OTHER SEEDS														
Amaranth									3				1	
Bearsfoot	1													
Bearsfoot cf.														
Bedstraw	1										1			
Chenopod	1								2				1	
Cheno/Am	1													
Copperleaf														
Goosegrass														
Grass family														
Knotweed														
Morninglory														
Pine														
Purslane														
Sumpweed cf.							1		1					
Tick Clover														
MISCELLANEOUS														
Stem/Peduncle													2	0.02
Unidentified														
Unidentified seed	1				1									

Appendix A cont'd. Plant remains identified from flotation samples listed by context.

	Feature 26		Feature 29		Feature 31		Feature 32		Feature 33		Feature 34		Feature 37	
N of samples	1		1		1		1		10		1		1	
Volume (liters)	13		48		73		75		168		13		50	
Plant Weight (grams)	0.29		2.92		2.74		4.61		206.34		0.07		11.02	
Wood Weight (grams)	0.29		2.57		2.52		4.37		203.55		0.07		9.32	
	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)
CROPS														
Bean									11	0.22				
Bean cf.									1	0.00				
Bean family														
Corn cupule			2	0.00	5	0.01	10	0.03	20	0.06			15	0.05
Corn kernel	1	0.00	9	0.02	1	0.00	5	0.03	32	0.20			9	0.04
NUTS														
Acorn					2	0.00			57	0.17			321	1.05
Acorn cf.														
Acorn meat cf.														
Hazelnut														
Hazelnut cf.														
Hickory			14	0.33	87	1.20	15	0.11	119	1.60	2	0.00		
Hickory cf.									3	0.10				
Walnut			1	0.00	2	0.01	2	0.07	12	0.47	2	0.00	3	0.03
Walnut family cf.														
FRUITS														
Blackberry/Raspberry														
Grape									3					

Grape cf.									3					
Hawthorn cf.														
Persimmon														
OTHER SEEDS														
Amaranth														
Bearsfoot	5								1					
Bearsfoot cf.														
Bedstraw									1					
Chenopod														
Cheno/Am					1				1					
Copperleaf									39				3	
Goosegrass														
Grass family														
Knotweed			1											
Morninglory														
Pine														
Purslane					1									
Sumpweed cf.														
Tick Clover									1					
MISCELLANEOUS														
Stem/Peduncle														
Unidentified														
Unidentified seed			1						1					

Appendix A cont'd. Plant remains identified from flotation samples listed by context.

	Feature 38		**Feature 39**		**Feature 40**		**Feature 41**		**Feature 42**		**Feature 44**		**Feature 46**	
N of samples	1		1		1		1		2		1		2	
Volume (liters)	44		87		41		72		33		51		145	
Plant Weight (grams)	13.63		2.60		3.58		14.57		35.07		1.44		39.04	
Wood Weight (grams)	13.40		2.02		2.55		13.85		33.87		1.27		37.16	
	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)
CROPS														
Bean	1	0.02							2	0.01				
Bean cf.							2	0.01						
Bean family														
Corn cupule	8	0.02	7	0.03	37	0.22	18	0.08	92	0.56	3	0.00	9	0.03
Corn kernel	2	0.01	4	0.01	1	0.00	11	0.10	9	0.13	2	0.00	10	0.09
NUTS														
Acorn	6	0.02	8	0.03	4	0.00	6	0.01	7	0.01			1	0
Acorn cf.														
Acorn meat cf.														
Hazelnut														
Hazelnut cf.									14	0.03			3	0.02
Hickory	15	0.15	34	0.30	82	0.69	34	0.51	38	0.44	17	0.14	117	0.53
Hickory cf.							1	0.00						
Walnut			10	0.21	5	0.12			1	0.02	1	0.03	9	0.21
Walnut family cf.														
FRUITS														
Blackberry/Raspberry														
Grape			2						1					

Grape cf.													2	
Hawthorn cf.														
Persimmon														
OTHER SEEDS														
Amaranth														
Bearsfoot														
Bearsfoot cf.									1					
Bedstraw	1													
Chenopod											1			
Cheno/Am														
Copperleaf							1							
Goosegrass													1	
Grass family	1													
Knotweed														
Morninglory														
Pine														
Purslane														
Sumpweed cf.														
Tick Clover														
MISCELLANEOUS														
Stem/Peduncle														
Unidentified							2		1					
Unidentified seed					1		2				1			

Appendix A cont'd. Plant remains identified from flotation samples listed by context.

	Feature 47		Feature 48		Feature 49		Feature 50		Feature 51		Feature 52		Feature 54	
N of samples	1		1		1		1		1		1		1	
Volume (liters)	45		23		50		55		98		25		40	
Plant Weight (grams)	8.08		0.34		58.24		2.43		8.09		0.00		1.24	
Wood Weight (grams)	7.53		0.23		57.43		2.13		6.80		0.00		1.24	
	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)
CROPS														
Bean									2	0.03				
Bean cf.														
Bean family														
Corn cupule	1	0.00	1	0.00	45	0.17			58	0.29				
Corn kernel	1	0.00			7	0.04			15	0.08				
NUTS														
Acorn					6	0.03	2	0.00						
Acorn cf.														
Acorn meat cf.														
Hazelnut														
Hazelnut cf.									5	0.01				
Hickory	27	0.46	23	0.11	34	0.53	32	0.30	71	0.83				
Hickory cf.														
Walnut	3	0.09							4	0.04				
Walnut family cf.					1	0.01								
FRUITS														
Blackberry/Raspberry														
Grape									1					

Grape cf.														
Hawthorn cf.	1													
Persimmon					2									
OTHER SEEDS														
Amaranth														
Bearsfoot							2							
Bearsfoot cf.														
Bedstraw														
Chenopod							1							
Cheno/Am														
Copperleaf			1											
Goosegrass														
Grass family														
Knotweed									1					
Morninglory														
Pine					1									
Purslane														
Sumpweed cf.														
Tick Clover														
MISCELLANEOUS														
Stem/Peduncle														
Unidentified									2					
Unidentified seed					1		4		4					

Appendix A cont'd. Plant remains identified from flotation samples listed by context.

	Feature 55		**Feature 56**		**Feature 57**		**Feature 58**		**Feature 59**		**Feature 60**		**Feature 62**	
N of samples	1		2		1		1		1		1		1	
Volume (liters)	20		81		69		62		26		36		53	
Plant Weight (grams)	0.82		6.08		0.33		2.16		8.40		0.74		8.51	
Wood Weight (grams)	0.80		5.78		0.30		1.99		5.80		0.71		7.70	
	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)	count	wt (g)
CROPS														
Bean														
Bean cf.														
Bean family									1	0.00				
Corn cupule	2	0.01	10	0.05	1	0.00	6	0.01	14	0.08	1	0.00		
Corn kernel			2	0.00			6	0.03	1	0.00			2	0.01
NUTS														
Acorn			14	0.03			1	0.00			1	0.00	1	0.01
Acorn cf.														
Acorn meat cf.														
Hazelnut														
Hazelnut cf.														
Hickory	2	0.01	27	0.23	2	0.03	16	0.13	147	2.52	5	0.03	61	0.76
Hickory cf.														
Walnut													2	0.02
Walnut family cf.														
FRUITS														
Blackberry/Raspberry														
Grape					1									

Grape cf.														
Hawthorn cf.														
Persimmon														
OTHER SEEDS														
Amaranth									1					
Bearsfoot							1							
Bearsfoot cf.														
Bedstraw									1					
Chenopod									3					
Cheno/Am														
Copperleaf														
Goosegrass														
Grass family														
Knotweed														
Morninglory														
Pine														
Purslane									4		1		3	
Sumpweed cf.														
Tick Clover														
MISCELLANEOUS														
Stem/Peduncle														
Unidentified														
Unidentified seed														

Appendix B. 44RN348 Faunal Data from screened contexts listed by feature and test unit.

	Feature 14			Feature 16			Feature 17			Feature 18			Feature 20		
Common Name	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)
Unidentified turtle													47		16.82
Turkey															
Turkey cf.															
Unidentified bird															
Squirrel															
Beaver															
Raccoon															
Dog/Coyote															
Black Bear cf.															
White-tailed deer													38	2	58.99
White-tailed deer cf.															
Human															
Unidentified mammal	5		1.32	14		1.48	1		0.17	15		3.51	335		188.38
Unidentified	9		0.85	--		14.15	1		0.01	--		0.03	--		32.25

Appendix B cont'd. 44RN348 Faunal Data from screened contexts listed by feature and test unit.

	Feature 21			Feature 22			Feature 23			Feature 24			Feature 25		
Common Name	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)
Unidentified turtle															
Turkey															
Turkey cf.															
Unidentified bird															
Squirrel															
Beaver															
Raccoon															
Dog/Coyote															
Black Bear cf.															
White-tailed deer															
White-tailed deer cf.															
Human															
Unidentified mammal	42		12.43	38		3.28	10		0.76	20		4.23	96		4.79
Unidentified				--		0.22	1		0.13	--		2.06	--		0.52

Appendix B cont'd. 44RN348 Faunal Data from screened contexts listed by feature and test unit.

	Feature 26			Feature 28			Feature 31			Feature 32			Feature 33		
Common Name	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)
Unidentified turtle															
Turkey															
Turkey cf.													2		1.20
Unidentified bird													8		2.41
Squirrel													2	1	0.27
Beaver													1	1	1.71
Raccoon															
Dog/Coyote															
Black Bear cf.															
White-tailed deer							4	1	3.48				22	1	10.63
White-tailed deer cf.													1		0.56
Human													2	1	0.17
Unidentified mammal				49		2.58	62		1.35	1		0.14	61		30.61
Unidentified	--		0.18	--		0.40	--		0.84				--		2.20

Appendix B cont'd. 44RN348 Faunal Data from screened contexts listed by feature and test unit.

	Feature 37			**Feature 38**			**Feature 39**			**Feature 41**			**Feature 42**		
Common Name	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)
Unidentified turtle															
Turkey															
Turkey cf.															
Unidentified bird															
Squirrel															
Beaver															
Raccoon															
Dog/Coyote															
Black Bear cf.															
White-tailed deer	26	1	3.20							25	2	33.86			
White-tailed deer cf.															
Human															
Unidentified mammal	29		6.56	4		0.27	13		0.26	12		4.81	36		2.70
Unidentified	--		5.50				--		0.12	165		5.60	--		0.02

Appendix B cont'd. 44RN348 Faunal Data from screened contexts listed by feature and test unit.

	Feature 43			Feature 46			Feature 56			Feature 58			Feature 59		
Common Name	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)
Unidentified turtle	13		6.92	3		0.5									
Turkey	1	1	0.88												
Turkey cf.															
Unidentified bird															
Squirrel															
Beaver	6	1	9.74												
Raccoon	6	1	7.00												
Dog/Coyote				2		0.23									
Black Bear cf.				1		3.90									
White-tailed deer	12	1	32.58	1	1	60.89	47	1	92.74	1	1	0.06			
White-tailed deer cf.															
Human															
Unidentified mammal	39		47.57	69		8.65	40		60.28						
Unidentified	--		51.83	--		18.97	183		42.96	5		0.10	1		10.29

Appendix B cont'd. 44RN348 Faunal Data from screened contexts listed by feature and test unit.

	Feature 62			TU 16			TU 18			TU 19			Locus A Backfill		
Common Name	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)
Unidentified turtle															
Turkey															
Turkey cf.															
Unidentified bird															
Squirrel															
Beaver															
Raccoon															
Dog/Coyote															
Black Bear cf.															
White-tailed deer													1	1	3.62
White-tailed deer cf.															
Human															
Unidentified mammal	40		1.51	42		3.53	1		0.18						
Unidentified	--		0.54	25		2.19				3		0.11			

Appendix C. 44RN348 Faunal Data from flotation heavy fractions listed by feature.

	Feature 14			Feature 16			Feature 17			Feature 18			Feature 19		
Common Name	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)
Unidentified fish										1		0.02			
Unidentified turtle															
Turkey															
Unidentified bird															
Opossum															
Squirrel															
Gopher cf.															
Cottontail cf.															
White-tailed deer															
Human															
Unidentified mammal				1		0.30							99		3.72
Unidentified	17		0.99	9		0.39	13		0.42	8		0.52	--		9.69

Appendix C cont'd. 44RN348 Faunal Data from flotation heavy fractions listed by feature.

	Feature 20			Feature 21			Feature 22			Feature 23			Feature 24		
Common Name	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)
Unidentified fish	18		0.95												
Unidentified turtle	51		23.28												
Turkey															
Unidentified bird	1		0.01												
Opossum															
Squirrel	1	1	0.11												
Gopher cf.	2	1	1.50												
Cottontail cf.				1	1	0.21									
White-tailed deer	4	1	6.33												
Human															
Unidentified mammal	50		40.98				12		1.79	18		1.62	12		0.70
Unidentified	440		40.72	12		1.81	4		0.20						

Appendix C cont'd. 44RN348 Faunal Data from flotation heavy fractions listed by feature.

	Feature 25			Feature 31			Feature 32			Feature 33			Feature 37		
Common Name	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)
Unidentified fish										2		0.09			
Unidentified turtle										8		1.33			
Turkey										3	1	7.86			
Unidentified bird										33		5.15			
Opossum										1	1	0.46			
Squirrel										1	1	0.05			
Gopher cf.															
Cottontail cf.															
White-tailed deer										56	1	15.50	18	1	1.08
Human															
Unidentified mammal	6		2.00							136		35.46	28		4.06
Unidentified				40		1.76	6		0.20	272		15.28			

Appendix C cont'd. 44RN348 Faunal Data from flotation heavy fractions listed by feature.

	Feature 38			Feature 39			Feature 41			Feature 42			Feature 43		
Common Name	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)
Unidentified fish															
Unidentified turtle										17		3.57	18		2.08
Turkey															
Unidentified bird															
Opossum															
Squirrel															
Gopher cf.															
Cottontail cf.															
White-tailed deer							6	1	0.60				9	1	16.79
Human															
Unidentified mammal				1		0.39	82		6.65	12		1.83	150		13.38
Unidentified	5		0.08							66		1.79	--		0.58

Appendix C cont'd. 44RN348 Faunal Data from flotation heavy fractions listed by feature.

	Feature 46			Feature 47			Feature 48			Feature 50			Feature 51		
Common Name	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)
Unidentified fish															
Unidentified turtle															
Turkey															
Unidentified bird															
Opossum															
Squirrel															
Gopher cf.															
Cottontail cf.															
White-tailed deer															
Human				1	1	0.16									
Unidentified mammal							1		0.05						
Unidentified	14		0.45	9		0.19	2		0.07	1		0.08	2		0.14

Appendix C cont'd. 44RN348 Faunal Data from flotation heavy fractions listed by feature.

	Feature 53			Feature 56			Feature 57			Feature 58			Feature 62		
Common Name	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)	NISP	MNI	Wt (g)
Unidentified fish				2		0.01									
Unidentified turtle															
Turkey															
Unidentified bird															
Opossum															
Squirrel															
Gopher cf.															
Cottontail cf.															
White-tailed deer															
Human															
Unidentified mammal				173		16.33							10		1.03
Unidentified	30		0.96	22		0.27	1		0.08	3		0.06			