FAUNAL REMAINS FROM TWO NORTH CENTRAL PIEDMONT SITES

by

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Mary Ann Holm. Faunal Remains from Two North Central Piedmont Sites. (Under the direction of Roy S. Dickens, Jr.).

Analysis of the faunal remains from the Wall and Fredricks sites indicates that there were no major differences in the utilization of faunal resources between the precontact and postcontact sites. The inhabitants of both sites relied most heavily on deer and catfish. Turtle, squirrel, rabbit, raccoon, and passenger pigeon were important secondary resources. Although the many European artifacts found at the Fredricks site suggest considerable participation in the deerskin trade by the inhabitants of this site, there is no direct evidence for this in the faunal assemblage. When combined with ethnobotanical evidence from the two sites, the faunal remains support the contention that a basic late prehistoric subsistence pattern was maintained well into the Historic period of aboriginal occupation in the Carolina Piedmont.

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

LIST OF FIGURES

LIST OF TABLES

Tables Page

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CHAPTER 1: INTRODUCTION

The Siouan Project

In 1981, the Research Laboratories of Anthropology began a project to investigate culture change among Indian groups that occupied the northern part of the Carolina Piedmont during the Late Prehistoric and Historic Periods (ca. 1300-1740). This five-year project includes both archaeological and ethnohistorical research. Fieldwork during the first two years of the Siouan Project has focused on two sites located on the Eno River near Hillsborough, North Carolina (Figure 1). The Wall site (31Or11), partially excavated by Joffre Coe in 1938, 1940, and 1941 (Coe 1952, 1964), was originally interpreted as the site of the historically documented town of Occaneechi. Further excavations were conducted at this site in 1983 and 1984, and three radiocarbon determinations obtained at this time yielded an average corrected date of A.D. 1545 ± 80 years. This date, along with the paucity of European trade goods on the site, led to the conclusion that the Wall site could not be Occaneechi Town. However, investigations of the nearby Fredricks site (31Or231) revealed numerous European artifacts that have been dated to the late 1600s and very early 1700s. These European goods, together with information from historical accounts, have led to the identification of the Fredricks site as the town occupied by the Occaneechi Indians ca. 1680-1710 and visited by John Lawson in 1701 (Lefler 1967:59-61).

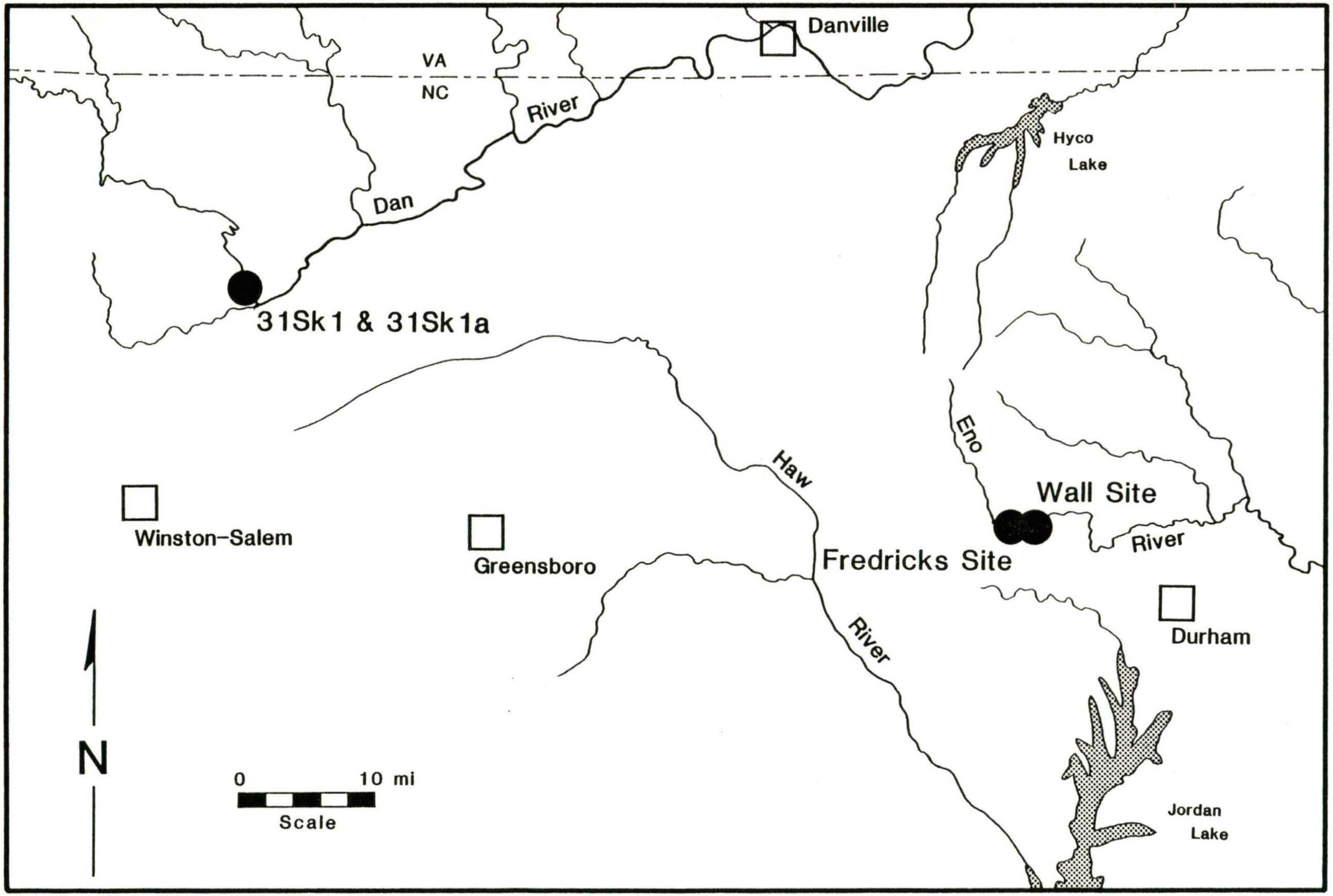


Figure 1. Locations of the Wall and Fredricks Sites.

This thesis presents an analysis and interpretation of the faunal remains recovered from the Wall and Fredricks sites during the 1983 and 1984 field seasons. In many ways these two sites are well situated for comparing prehistoric with historic (i.e. precontact with postcontact) patterns of faunal exploitation of the Carolina Piedmont Indians. The two sites are located within 200 yards of one another and thus share nearly identical natural environments. Further, both sites were exposed to similar factors affecting the preservation of archaeological remains and they were excavated and recorded utilizing the same field techniques. Finally, the remains from the two sites were processed, sampled, and analyzed in an identical manner.

Environmental Setting

The Wall and Fredricks sites are located in the floodplain along the north bank of the Eno River, approximately 0.5 mile east of Hillsborough. They are in the Piedmont physiographic province, which is characterized by gently rolling hills, occassionally punctuated by larger hills or mountains of erosion-resistant rock (Clay et al. 1975:113). Originally, most of the Piedmont was covered by oak-hickory forests. Dominant species of this forest type consist of white, black, scarlet, southern red, and post oaks; mockernut and smooth hickory; black gum; and tulip poplar. Occassionally, shortleaf and loblolly pine are present, and dogwood and sourwood are the most common understory trees. The floodplains of the major streams and rivers of the Piedmont produce hardwood swamp forests that are dominated by sycamore, river birch, ash, elm, sweetgum, willow oak, swamp chestnut oak, and tulip poplar (Clay et al. 1975:132-133).

Animal species that populate the forests and fields of the Piedmont today are nearly the same as those that occupied the area in the Late Prehistoric and Historic periods (Conant 1975; Ernst and Barbour 1973; Fowler 1945; Hamilton 1943; Potter et al. 1980). Although elk, bison, wolves, and bears were observed in the Piedmont in the past (Lefler 1967 54-56,124), they are rarely, if ever, encountered today. The passenger pigeon, observed in large flocks in early historic times (Lefler 1967:50-51; Byrd 1967:216), is now extinct.

RESEARCH QUESTIONS

During the Protohistoric and Historic periods (ca. 1540-1720), Indians of the North Carolina Piedmont were exposed to and participated in activities that changed and ultimately led to the disintegration of their culture. Although its focus is largely archaeological, the project currently being conducted by the Research Laboratories of Anthropology also involves ethnohistoric research to investigate changes in Indian culture brought about by contact with Europeans. The project combines survey, testing, and excavation in the field, and laboratory and documentary research. It is focused on three drainage basins of the northern North Carolina Piedmont (the Upper Dan, Haw, and Eno-Flat) which were occupied by groups such as the Occaneechi, Eno, Shakori, Saxapahaw, and Sara. Although these groups usually have been classed as Siouan speakers (Mooney 1894; Swanton 1946), there is some evidence to suggest that other language families may have been present (Miller 1957, Binford 1959).

The research design of the Piedmont Project involves the integration of studies of intrasite and intersite settlement patterns, aboriginal and European artifacts, human skeletal remains, ethnobotanical and faunal remains, and historic documents. By combining the information from these studies, it is hoped that insights will be gained into the processes leading to the disintegration of Piedmont societies. One goal of the project is to delineate patterns in the archaeological record for the Late Prehistoric period, which may make it possible to recognize trends in the development of aboriginal Piedmont culture prior to European contact. Another major goal is to define the effects of European contact on the Indians of this region. Questions being pursued toward this end are many and varied. After noting that the Piedmont groups experienced rapid reductions in population after contact, Dickens et al. (1984:43) state that

> important questions still remain about how much the populations were actually reduced; how the previously separate groups integrated their lifestyles within the later, more cosmopolitan communities; what kinds of changes in social organization and economy accompanied the population losses; what role was played by the deerskin trade in the change process; what aspects of culture were affected first; what aspects changed the most; and how changes in one component of culture affected other components.

Analysis, interpretation, and comparison of the faunal remains from the Wall and Fredricks sites, especially when related to information from other data categories, provide valuable information about cultural changes experienced by the Piedmont Indian groups.

A series of research questions, based on information from the ethnohistorical record and from previous archaeological work, was formulated prior to the 1983 field season. Although several of these questions later proved to be unsuitable for the particular faunal assemblages found at the Wall and Fredricks sites, they did provide some insights that allowed this researcher to move beyond simple identification and toward an interpretation of faunal exploitation in the context of culture change.

The patterns of exploitation of faunal resources reported for several prehistoric North Carolina and Virginia sites (e.g., Waselkov 1977; Barber and Williams 1978; Runquist 1979; Egloff, Barber, and Reed 1980; Coleman 1982) are similar to the pattern reported by Smith (1974) for Middle Mississippi sites in the Mississippi Valley. In addition to showing a concentration on many of the same species as Smith's groups, the North Carolina and Virginia assemblages reflect a similar pattern of selective, seasonally oriented exploitation. Smith (1974:288) hypothesizes that

> this cycle of selective, seasonal exploitation of certain animal species groups by Middle Mississippi populations was a procurement strategy that concentrated on those sections of the biotic community that would provide a maximum meat yield for a minimum of expended energy.

For the analysis of the faunal remains from the two Eno River sites, Smith's pattern provides two general research questions:

1. How did the overall pattern of faunal exploitation differ between the two sites?

2. Can the subsistence strategies exhibited at the two sites be explained in terms of maximization of meat yield and minimization of energy expenditure?

In order to answer the general research questions, more specific questions were formulated:

1. What was the relative importance of the various

species of animals utilized by the occupants of the two sites?

2. Was faunal exploitation a seasonal activity at the two sites? If so, during what season(s) was each species hunted?

3. What strategies were employed for procuring the exploited species?

4. How selective were the inhabitants of the sites in their exploitation of animal populations?

Other questions formulated prior to the analysis were:

1. Can patterns of butchering of the major species be identified?

2. Is there evidence of hunting species primarily for their hides?

3. How was faunal exploitation related to plant procurement and exploitation?

4. Was the pattern of faunal exploitation altered by the introduction of European technology?

5. Did introductions by Europeans of new plants and animals affect the existing pattern of faunal exploitation?

These questions formed the initial base from which methods were developed to describe and compare the assemblages recovered from the two sites. As the questions indicate, in addition to identifying the patterns of faunal exploitation of the inhabitants of the sites, a major goal of this research was to examine the possible effects of European contact on the use of faunal resources by the inhabitants of the Fredricks site.

Differences between the two assemblages, however, cannot be attributed automatically to European-induced changes in aboriginal subsistence. For example, differences could have resulted from the fact that the faunal remains from the two sites were retrieved from dissimilar contexts. Over 95% of the bones from the Wall site were found in a large midden associated with the palisade lines on the periphery of the village, and the remainder from the fill of a single burial pit. Nearly 88% of the bones from the Fredricks site, on the other hand, was obtained from burial fill and the rest from feature fill. All except one of the burial pits from the Fredricks site contained sizeable quantities of bone fragments in the zones of fill above the human skeletal remains. These deposits seem not to be the result of an overlying midden having slumped into the pits, since the plowzone in the area around the burial pits contained relatively few artifacts. Although the differing contexts of the bones (sheet midden versus pit fill) are significant, the bones from the fill in the tops of the burial pits at the Fredricks site and the bones from the midden at the Wall site can all be considered to represent the disposal of food refuse.

In addition to reflecting different methods of refuse disposal, the different contexts also may not have provided equal conditions for the preservation of bone. The midden at the Wall site probably represents the activities of many people over a period of several years. The remains from the Fredricks site, on the other hand, especially the remains from the burial pits, probably represent much briefer activity of fewer people. Thus, differences in the assemblages from the two sites may reflect differences in seasons of activity or differences in the behavior of large versus small segments of the representative communities.

Also, because the remains from the Fredricks site were primarily from burial fill, they may represent ceremonial activities, which could have been quite different from every-day subsistence practices.

Finally, some of the differences between the two assemblages may relate to the fact that the sample from the Wall site N =30,257) is much larger than that from the Fredricks site (n = 16,393).

In spite of these problems, however, it should be recognized that the assemblages from these two sites offer an excellent opportunity for comparing pre-contact and post-contact patterns of exploitation of animal resources in a setting in which variables of the natural environmental can, for the most part, be held constant.

Given the rapidity with which European diseases and social manipulations succeeded in disrupting and ultimately destroying aboriginal culture in Piedmont North Carolina, it seemed likely that the faunal remains from the Fredricks site would show at least some evidence of a change in patterns of faunal exploitation from prehistoric to historic times. It was also expected that differences in the remains would reflect increased participation in the deerskin trade rather than major changes in subsistence patterns, since ethnohistoric accounts (Lefler 1967:182-184; Swanton 1946:256-257) suggest considerable continuity between prehistoric and historic subsistence practices in North Carolina and Virginia. Late Prehistoric Dan River subsistence was based primarily on corn and bean agriculture, harvesting nuts and deer hunting, with other plants and animals utilized to a lesser extent.

> The seasonal round emphasized deer hunting and food storage in winter, small game capture in spring, fishing and wild and domestic plant food harvesting throughout the summer, and nut gathering and turkey hunting in the fall and early winter (Waselkov 1977:230).

Swanton (1946:256-257) provides an outline of the historic Southeastern subsistence cycle

> Corn, beans, pumpkins, and a few other vegetables were raised, and the fields where these grew usually determined the sites of the towns. This was because they required labor and protection and because most of the crop was stored for later consumption. Dried meat was also stored there, but it was never possible to tell where game animals were to be found, while the location of the field was definite. This, of course meant that the people were generally in or near their villages in summer... Between planting and harvest, they did, however, often get time for a shorter hunt. After harvest they would remain in town until well toward winter to enjoy the produce of their fields and thus place it beyond the reach of human or animal predation.
>
> As the harvest was seldom sufficient to last - nor was it expected to last - until another crop came in, the Indians were obliged to seek natural food supplies elsewhere and, since such supplies were not usually concentrated, this meant that the people themselves scattered about in camps where they remained until planting time...

Swanton (1946:257) also mentions that fish were included in the diet during the summer.

In his account of the diet of the Indian groups of North Carolina, Lawson named as staples many of the species found in the prehistoric sites of the same area (Lefler 1967:182-184; Wilson 1983).

Whereas neither Swanton's nor Lawson's accounts give the kind of information needed to quantify relative dependence upon any particular resource, both accounts indicate that the historic subsistence pattern was similar to the prehistoric pattern.

In both the prehistoric and historic patterns, hunting for food was an important activity. It seems likely that if the inhabitants of the Fredricks site did participate in the deerskin trade, their participation involved (at least initially) only an expansion of the hunting activities which were already of major importance in their adaptive strategy. With continued and perhaps increased participation in the deerskin trade over time it is expected that qualitative (rather than simply quantitative) differences would develop between the hunting activities prior to and after contact. Rather than merely hunting more often or killing a greater number of animals, it is possible that the Indians began to range further from their villages, exploit portions of the environment that previously had been rarely utilized, or hunt species that had not been hunted frequently in the past.

In Evolution and Culture, Sahlins and Service (1982:54) state that

> when acted upon by external forces a culture will, if necessary, undergo specific changes only to the extent of and with the effect of preserving unchanged its fundamental structure and character.

Charles Bishop (1981:50) applied this concept to the Northern Algonkian region, stating that

> the effects of the fur trade from the Indian perspective is a good example of Romer's Rule applied to a cultural context. That is, "the initial survival value of a favorable innovation is conservative in that it renders possible the maintenance of a traditional way of life in the face of changed circumstances (Hockett and Ascher 1967:137). Thus, Indians evolved new adaptive strategies within a new ecological setting so as to attempt to maintain continuity with the past.

Bishop (1981:50) goes on to say that "unfortunately, in the long run, they [the Indians] were unsuccessful for reasons well documented in the ethnohistorical record."

Canouts (1971:82) suggests that, for the Creek Indians, participation in the deerskin trade eventually became maladaptive. "With the influx of European goods, Creek items fell off. Deer were the only raw material necessary to barter for the full range of a technological kit or of processed goods" (Bartram 1928:401). Canouts states further that a scarcity of game developed, that the men were away from their villages for longer periods of time while hunting animals for trade, and that the dependence on the deerskin trade led to a breakdown in social structure by introducing new means of acquiring wealth and prestige and causing shifts in the division of labor (Canouts 1971:82). With the possible exception of the statement that men were frequently away from their villages, which was noted by Lawson (Lefler 1967:46,65,215), these statements are based on little direct evidence and must be treated as assumptions to be tested archaeologically.

We know that during the period at least from 1650-1676, in which they occupied their island in the Roanoke River, the Occaneechi played an important role in the deerskin trade. It is not known, however, whether this participation increased after they moved to the site on the Eno River around 1680. If the Occaneechi maintained their strong participation in the deerskin trade after their move south (and the abundance of trade goods at the Fredricks site indicates that this is likely), the faunal remains from the Fredricks site might be expected to differ from those of the prehistoric Wall site by exhibiting some or all of the following characteristics:

1. more opportunistic hunting patterns - e.g. hunting should be less seasonally oriented and there should be more evidence of hunting at all times of the year.

2. less balance between maximization of meat yield and minimization of energy expenditure.

3. evidence of exploitation of portions of the environment that previously had not been heavily utilized.

4. changes in procurement strategies - e.g., Waselkov (1977) suggests that the method of hunting deer may have evolved from stalking to community drives.

5. possibly less specialization and more variability in the faunal assemblage.

6. increased evidence of hunting for fur and hides rather than for meat, such as increased evidence that animals were butchered in the field with only portions of the carcasses being returned to the site.

7. possible increases in the numbers of tools and features associated with hide-working (such as smudge pits).

The first four expectations would reflect qualitative changes in hunting patterns that might have had the effect of increasing, at least temporarily, the quantity of animals (and thereby skins and furs) obtained. The fifth expectation might have arisen if the Fredricks site inhabitants had begun to hunt any and all fur-bearing animals, including those species that had not been desirable prior to the onset of European trade. The sixth expectation would reflect a marked increase in the number of animals killed beyond those required to fulfill the needs (subsistence and raw material) of the site inhabitants. The final expectation would manifest an increase in the number of tools and features associated with hide-working that might occur with an increase in hide procurement for trade.

Although this list of preliminary expectations is far from exhaustive, it provides a basis on which to compare the two faunal assemblages beyond merely comparing the frequencies of identified species from each site. As work with the assemblages has progressed, the initial list has been reevaluated, further questions added, and others eliminated. Some of these adjustments to the original list of research questions arose when new information was gleaned from the ethnohistorical record. More frequently, the original questions had to be modified because of limitations imposed by the faunal assemblages themselves. These limitations will be discussed in Chapters 3 and 4.

CHAPTER 2: ETHNOHISTORY

Utilization of Faunal Resources

Among the many ethnohistoric accounts for the Piedmont area of North Carolina and Virginia are those of Lederer, Needham and Arthur, Fallam, Bland, Wood (Alvord and Bidgood 1912); and Lawson (Lefler 1967). With the exception of Lawson's account, however, none of these documents provides detailed information about hunting, fishing, and other subsistence activities of the historic North Carolina Indians. In A New Voyage to Carolina, John Lawson described his 1701 exploration of the region from Charleston, South Carolina, through the North Carolina Piedmont, to New Bern, North Carolina. In addition to presenting the scenes and events of his trip, Lawson also wrote a chapter detailing the "Vegetables", "Beasts", "Insects", "Birds", and "Fish" of North Carolina. Lawson's account thus provides a wealth of information on the use of faunal resources by North Carolina Indians.

During his winter journey, in addition to making direct contact with the Occaneechi in their town on the Eno River (Lefler 1967:61), Lawson encountered a number of other groups including the Eno, Keyauwee, Sapona, and Tutelo. Although he gives considerable attention to the ways in which the Piedmont (and also the coastal) Indians utilized faunal resources, he provides only scanty information about the ways in which the animals were procured (hunted, trapped, etc.).

Mammals. According to Lawson, deer was the most important mammalian resource of the North Carolina Indians. He mentioned "barbaku'd" and roasted venison; venison broth thickened with acorn meal; and "a Dish, in great Fashion amongst the Indians, which was Two young Fawns, taken out of the Doe's Bellies, and boil'd in the same slimy Bags Nature had plac'd them in" (Lefler 1967:51,58). Parts of the deer were utilized in a variety of ways in addition to food. For example, deer hides were used for clothing, shoes, and as covers for drums, and were also an important commodity for trade with the Europeans. "The Bone of a Deer's Foot" was used for scraping the hair off of hides, and deer brains (after being baked and then soaked in water) were used in tanning hides (Lefler 1967:217). Lawson also mentioned the use of the "Head of a Buck" as a decoy with which to hunt other deer (Lefler 1967:29).

Swanton (1946:249) lists a number of ways in which Southeastern Indians used various parts of the deer in addition to those mentioned by Lawson. Horns were boiled for glue and made into projectile points, ornaments, and needles; hooves were made into rattles; and sinews and skins were used to make fishnets and bowstrings. Ribs were made into bracelets, and tibiae into flutes. Tools constructed from deer bones that have been recovered from Piedmont archaeological sites (Waselkov 1977; Runquist 1979) include metatarsal beamers, ulna awls, and antler flakers.

In addition to describing the technique of stalking deer, Lawson mentioned that

> when these Savages go a hunting, they commonly go out in great Numbers, and oftentimes a great many

> Days Journey from home, beginning at the coming of Winter;...Thus they go and fire the Woods for many Miles, and drive the Deer and other Game into small Necks of Land and Isthmuses, where they kill and destroy what they please (Lefler 1967:215-216).

Other techniques used by North Carolina and Virginia Indians for hunting deer were stalking them without the use of a decoy, and driving them to water without the use of fire (Waselkov 1977:108).

While visiting Occaneechi Town, Lawson was served "good fat Bear," and the next day, in Adshusheer, he feasted upon "hot Bread, and Bears-oil". The Indians considered the paws to be the most edible part of the bear, whereas the head was always thrown away (Lefler 1967:122). In addition to being eaten, bear's oil was used for frying fish, and was mixed with "a certain red Powder" and daubed on the body and used for greasing the hair (Lefler 1967:121,174). Lawson also mentioned that the "Oil of the Bear is very Sovereign for Strains, Aches, and old Pains" and that bear's fur was used for making muffs and facing caps (Lefler 1967:122-123). The only method of capturing bear mentioned by Lawson involved killing the animals that were flushed during the fire drives used for hunting deer (Lefler 1967:17).

Opossum was used for food by the Indians, but the fur of this animal was "not esteemed nor used" except when it was spun to make baskets, mats, and girdles (Lefler 1967:125-126,195). Raccoon meat was served to Lawson on several occasions during his voyage, and raccoon skins and fur were used by the Indians for clothing and blankets (Lefler 1967:23,126,200). Although skunks (or polecats) were used for food, Lawson stated that their skins were not used in any way (Lefler 1967:124).

Rabbits (or hares), and squirrels were roasted without being gutted, and their skins were used for clothing and blankets. Although Lawson stated that rabbits were caught during fire drives, he did not provide a description of the ways in which opossums, raccoons, skunks, or squirrels were hunted (Lefler 1967:182,200).

Beavers were prized for their thick fur, and their skins were used in making shoes, mittens, and other clothes (Lefler 1967:125,200). Beaver meat was eaten, and its tail was considered a delicacy (Lefler 1967:66,125). Lawson encountered a Saponi Indian who maintained traps for capturing beaver (Lefler 1967:54).

Lawson listed a variety of rodents and insectivores that were found around the houses and fields of the Indians (Lefler 1967:120,130-131). These animals may have been used for food, although Lawson did not mention such a practice.

European-introduced animals present in North Carolina and utilized by the Indians encountered by Lawson during his voyage include horses and pigs. Lawson also mentioned cattle but it is not clear whether the Piedmont Indians were using this animal. According to Lawson, no use was made of the horse by the Indians except for carrying deer back to their villages (Lefler 1967:44). Although Lawson alluded to hog stealing by the Indians, he did not indicate that hogs were raised by them (Lefler 1967:64). He did mention, however, that the "Paspitank" Indians kept cattle at one time, although he was not sure if they were still raising these animals at the time of his travels.

All of the mammals identified from the 1983-1984 faunal assemblages from the Wall and Fredricks sites (with the exception of the shrew and vole) were described by Lawson. Mammals mentioned by Lawson that were not identified in these archaeological assemblages are buffalo, panther, "cat-a-mount" (mountain lion), wild cat, wolf, "tyger", otter, muskrat, "minx" (mink), elk, fox, and lion.

Birds. Lawson listed over 110 birds that could be found in North Carolina at the time of his journey (Lefler 1967:140-141). Of these, the turkey and the passenger pigeon were the most important to the Indians as sources of food. Turkey bones were also made into many different kinds of tools (e.g., awls and beamers) and ornaments (e.g., beads). Turkey feathers were used by Southeastern Indians in making feather mantles and fans, and in feathering arrows. Arrow points were also manufactured from turkey spurs (Swanton 1946:251). Turkey meat was offered as food to Lawson so often that it eventually "began to be loathsome" (Lefler 1967:34).

Although the passenger pigeon is now extinct, Lawson's description provides a vivid picture of this bird and the way it was hunted and used by the Indians.

> Pigeons...were so numerous in these parts that you might see many Millions in a flock... You may find several Indian Towns, of not above 17 Houses, that have more than 100 Gallons of Pigeons Oil, or Fat; they using it with Pulse, or Bread, as we do Butter...The Indians take a Light, and go amongst them in the Night, and bring away some thousands, killing them with long Poles, as they roost in the Trees. At this time of the Year, the Flocks, as they pass by, obstruct the Light of the Day (Lefler 1967:50-51).

Another bird identified in the faunal assemblages from the Wall and Fredricks sites is the bobwhite quail. This bird was probably an important source of food and it also provided feathers which could have been used for clothing and decoration. Other birds identified from the faunal assemblages include sparrows, killdeer, bluejay, woodpecker, and lesser scaup. Of these only the lesser scaup could be considered, with any certainty, to have been used for food. Lesser scaup is also the only bird identified in the faunal assemblage that was not mentioned by Lawson.

It is important to note that Lawson stated that "all small game, such as Turkeys, Ducks, and small Vermine, they [the Indians] commonly kill with Bow and Arrow, thinking it not worth throwing Powder and Shot after them" (Lefler 1967:216).

Reptiles. The box turtle was probably the most important reptile utilized by the Indians that Lawson encountered. Box turtle meat was eaten, and the shell was made into rattles, cups, and dippers (Lefler 1967:138). Other turtles represented in the faunal assemblages from the Wall and Fredricks sites were snapping turtle, painted turtle, musk turtle, and mud turtle. None of these others was mentioned specifically by Lawson, but all (with the exception of the musk turtle that was probably not eaten because of its offensive smell) probably were utilized in the same manner as the box turtle.

Vertebrae from a variety of poisonous and nonpoisonous snakes were identified in the two faunal assemblages. Lawson mentioned that "all Indians will not eat them [snakes], tho' some do", that the skin of the king snake was used to make girdles and sashes, and that rattlesnake teeth were used in an instrument for scarifying (Lefler 1967:137,182,223). He also noted that the coastal Indians avoided killing snakes "because their Opinion is, that some of the Serpents

Kindred would kill some of the Savages Relations, that should destroy him" (Lefler 1967:219).

Amphibians. Amphibians identified in the archaeological assemblages were the spadefoot toad, and indeterminate frogs and toads. Although Lawson noted the presence of frogs in North Carolina and listed them among the "Insects", he did not mention whether they were used by the Indians for food or for any other purpose.

Fish. Lawson listed 20 types of fresh water fish in North Carolina (Lefler 1967:156). Of these, two (catfish and suckers) were identified in the faunal assemblages from the Wall and Fredricks sites. The other two species identified archaeologically (gar and sunfish) were not mentioned by Lawson.

Fishing with hooks, weirs, and with bow and arrow (on the coast) were all described by Lawson (Lefler 1967:218).

Summary. In addition to descriptions of the ways in which individual species of animals were procured and utilized by the Indians, Lawson provided some additional information useful for interpreting the two faunal assemblages. He mentioned that the Indians "boil and roast their Meat extraordinary much, and eat abundance of Broth" (Lefler 1967:231). He also stated that "All the Indians hereabouts carefully preserve the Bones of the Flesh they eat, and burn them, as being of the Opinion, that if they omitted that custom, the game would leave their Country, and they should not be able to maintain themselves by their Hunting" (Lefler 1967:58). Both of these statements provide information that is helpful in evaluating how accurately the faunal assemblages from the Wall and Fredricks sites reflect the original assemblages of bone produced at these sites and in interpreting any patterns observed in the surviving archaological assemblages.

Nearly every species identified in the faunal assemblages from the Wall and Fredricks sites was mentioned by Lawson. Although Lawson's descriptions of the ways in which the Indians utilized these animals are not consistently detailed, they do provide information that cannot be obtained from the archaeological record alone.

The Occaneechi and the Deerskin Trade

There is considerable information about the English-Indian trade relations in Virginia, starting with the founding of Jamestown in 1607. Likewise, information about the South Carolina deerskin trade, which began after the founding of Charles Town (Charleston) in 1670, is available. Information about the trade relations between the English and the Indians of the northern North Carolina Piedmont, however, is scarce.

Although scanty, information about the involvement of the Occaneechi in the deerskin trade is more complete than for many other Piedmont groups. Until 1670, the Virginia trade was conducted primarily with those Indians living to the east of the Fall Line. With the settlement of Charles Town, there was increased competition for trade with the Indians, and Virginia began to increase its efforts to expand its trade relations to the south and west. In the 1670s, prosperous Virginia planters began to send factors into the Indian territory to trade for deerskins and beaver pelts. Although the Cherokee were to become the most important commercial contacts for the Virginians, it is apparent that the Occaneechi, with their powerful position on an island in the Roanoke River near the trading path also played an important role as middlemen in the trade (Alvord and Bidgood 1912:80).

The Occaneechi maintained a reputation for fierceness and hostility toward both Europeans and other Indians during the 1670s. John Lederer visited this group in 1670 but cut short his stay with them when, on the second day of his visit , the Occaneechi murdered six Indians who had traveled from the mountains to trade with them (Alvord and Bidgood 1912:68). Needham and Arthur stated that the Occaneechi were "but a handful of people" who increased their numbers by recruiting "vagabonds" and "rogues" to their fortified island home (Alvord and Bidgood 1912:225). Although their position on the island and adjacent to the trading path gave the Occaneechi a unique advantage in controlling the deerskin trade, this statement indicates that by 1673, they may have been suffering depopulation as a result of disease and/or warfare. In one of their last recorded acts of hostility, the Occaneechi murdered James Needham in 1674, during his second voyage from Virginia to the Appalachians (Alvord and Bidgood 1912:215).

Partly as a result of their dominance of the deerskin trade, the Occaneechi were attacked and defeated by Nathaniel Bacon's militia in 1676 (Alvord and Bidgood 1912:124). Reduced in numbers, military strength, and probably in wealth, they were no longer able to maintain their powerful position on the Roanoke River island. Retreating southward, the Occaneechi established a new village on the Eno River by about 1680. This is the village visited by John Lawson in 1701.

In the last decades of the 1700s the effects of disease, warfare, and rum overwhelmed the Occaneechi and other Piedmont Indian groups. Most of the remaining members of these groups seem to have moved out of the Piedmont to join either the Catawba in South Carolina or other fragmented groups living around Fort Christana in Virginia. By 1730, virtually all of the Indians who had formerly occupied what Lawson (Lefler 1967:61) referred to as the "Flower of Carolina" had either died or been forced to move out of the area.

CHAPTER 3: METHODS

Comparison of published analyses of faunal remains from archaeological sites is often difficult because the analysts do not explicitly describe the procedures they used in recovering and processing the faunal remains discussed in their reports. Without information about the procedures used by the excavators and/or analysts, it is not possible to determine with any certainty whether differences between assemblages derive from differences in the behavior of the original site inhabitants or whether they are the result of differences in recovery procedures, sampling techniques, post-excavation storage and handling, etc. In this study, therefore, an attempt will be made to provide full descriptions of the procedures involved in the recovery, sampling, and analysis of the faunal remains from the Wall and the Fredricks sites.

Excavation and Recovery Techniques

At both the Wall and the Fredricks sites, a grid system of 10x10-foot units was utilized for horizontal control. Vertical stratigraphy consisted of a brown clay loam plowzone from 0.5 to 0.9 feet thick overlying a yellow clay subsoil. At the Wall site, portions of a dark humic midden, (from 0.1 to 1.3 feet thick) containing numerous animal bones was preserved between the plowzone and the subsoil on the periphery of the village. Pits, postholes, and other habitation features were evident as dark stains intruding into the lighter subsoil.

Within each 10x10-foot square, the plowzone soil was removed and sifted through 1/2-inch screens. At the Wall site, after the removal of the plowzone, the midden was removed (with shovels in the first square excavated and with trowels in each subsequent square) in two levels. These levels correspond with a slight change in color between the upper and lower midden soil. The soil from each level in each square was kept separate and waterscreened through a sluice box equipped with a sequence of 1/2-inch, 1/4-inch, and 1/16-inch screens. Upon reaching the top of subsoil, the bottom of each excavation unit was troweled (to reveal more clearly all intrusive pits and postholes), photographed, and drawn to scale.

Excavation of burials and other features was performed with small handtools such as trowels, dental probes, and brushes. Each natural zone within a feature was removed separately, and all fill from each zone was waterscreened as a unit through the sequence of graduated screens. Special care was taken with the animal bones to ensure that, although dried thoroughly before being placed in plastic storage bags, they not become cracked and brittle from excessive exposure to sunlight. Ten litre samples of soil from each zone in each feature was processed by flotation. The bones retrieved through this procedure were subsequently screened in the laboratory through 1/2-inch, 1/4-inch, and 1/16-inch screens to permit comparison of these bones with the faunal remains recovered through field waterscreening.

<u>Sampling and Analytic Procedures</u>

Only those bones and bone fragments recovered from undisturbed contexts were included in the material analyzed from the Wall and Fredricks sites. In other words, bone from the plowzone was excluded.

The vast majority of the analyzed faunal remains from the Wall site was from four 10x10-foot units of undisturbed sheet midden. Although several burial pits were excavated at this site in 1983, the fill from only one of those pits contained more than a few poorly preserved bone fragments. Therefore, the remains from the fill of only one burial pit and four squares of midden made up the sample analyzed from this site. The faunal assemblage from the Fredricks site was recovered from the fill of fourteen pits. Nine of these were burial pits, one was a fire pit, one a storage pit, and three were pits of indeterminate function. Classification of the other three pits has not yet been possible. As yet, no sheet midden has been found at the Fredricks site.

Identical analytical procedures were used on the assemblages from both sites. All of the bone recovered in the 1/2-inch and 1/4-inch screens was analyzed. There were numerous tiny, unidentifiable fragments of bone retrieved by the 1/16-inch screen. Because it would have been a time-consuming and (probably) pointless task to separate all of these minute fragments from the fine gravel that was also recovered in this size screen, only those bones and bone fragments which appeared to be identifiable were pulled from the 1/16-inch washings. The bones and bone fragments from each excavated unit (10x10-foot square of midden or feature) and from each level or zone within each excavation unit were kept separate during analysis. Also, bones from different sized screens were not combined during analysis.

The basic procedures followed in identifying and analyzing the faunal remains from the two sites closely follow those outlined by Smith (1976): 1) each bone fragment was initially sorted into one of three groups - unidentifiable, identifiable only to class, or identifiable as to skeletal element; and 2) each of these fragments (whether it was identifiable or not) was examined for evidence of modification such as burning or cutting.

For those bones that could be identified beyond the level of class, the side of the body (when applicable) and portion of the bone (proximal, distal, or shaft) was noted. After that, a taxonomic identification was made for each of the identifiable bones and bone fragments. Several of the variables that affected whether a fragment could be identified beyond family or order were : "(1) the specific skeletal element in question (i.e., rib versus mandible), (2) the amount of diagnostic surface present, (3) the ability of the person identifying the specimen, (4) the size of the comparative collection being employed, and (5) the degree of morphological similarity of species within the taxonomic group" (Smith 1976:281). To help minimize problems introduced by variables (3) and (4), a group of 205 bones and bone fragments was sent for identification to Elizabeth Reitz, at the Zooarchaeological Laboratory, University of Georgia. This sample consisted of bones that appeared to be identifiable but for which the type collection at the Research Laboratories lacked comparative specimens. The results of Reitz's analysis are not yet available. The fragments that she examined are quantified in Tables 1 and 2 of this thesis as unidentified mammal, bird, fish, etc. In addition to determining the total number of fragments in each taxonomic category, all of the fragments in each category were weighed.

When possible, the age and/or sex of the animal represented by a particular fragment was assessed. In most cases, these characteristics could be determined only for the remains of white-tailed deer. For the deer, age was estimated by noting whether or not the epiphyses of the long bones were closed, and by using Severinghaus's (1949) criteria of tooth development and wear. Sex of the deer was determined by using the pelvic girdle criteria set forth by Edwards et al. (1982). Attempts to determine age and/or sex of several other species, such as rabbits, squirrels, and raccoons, were less successful than for deer. This problem resulted , in large part, from characteristics of the faunal assemblages themselves. Many of the bones, or portions of bones, that display the characteristics used to distinguish between animals of different ages or sexes simply were not present in the remains being studied.

Information obtained from the procedures discussed above constitute primary data or "direct quantification of identified material" (Wing 1979:119). Several factors can influence how accurately this primary data reflect the original faunal sample. Not all bones, for example, stand an equal chance of being represented in an archaeological assemblage. The survival of bone after it has been discarded is affected, primarily, by two factors: its physical condition at the time of disposal, and the nature of the environment in which it was placed. Whether a bone was burned, boiled, or roasted affects its chemical and physical properties, which, in turn, influences preservation (Chaplin 1971:15). Also, the basic structure of the bone must be considered. Teeth and phalanges are stronger than bones such as ribs and vertebrae, and, thus, are less likely to be destroyed (Payne 1972:68).

The manner in which a particular bone was discarded further affects its survival. If the bone were buried in a trash pit, for example, the rate of disintegration would depend on factors such as the "acidity or alkalinity, degree of aeration, movement of water, bacterial population, as well as the structure and seasonal properties of the soil" (Chaplin 1971:16). If it remained on the surface of the ground, it would be more likely to be exposed to scavengers, damaged by weather, or stepped on and crushed.

Excavation techniques also affect the number and kinds of bones eventually available for analysis. The portion of the site excavated, sieving techniques utilized, and steps taken to protect the fragile bone after excavation affect the sample.

For these and other reasons, one can assume that any collection of archaeological bone will represent only a portion of the faunal remains originally associated with the site. Thus, the primary data obtained probably will not provide enough information for reliable interpretations of what the assemblage represents in terms of past behavior. For this reason, secondary data, "which involve interpretation, extrapolation, or estimations based on primary data" (Wing 1979:118) are necessary. Examples of secondary data include calculations of minimum numbers of individuals, and estimations of useable meat weight.

Chaplin (1971) lists three of the most commonly named methods for quantifying the species represented by a collection of animal bones: 1) the fragments method, 2) the weight method, and 3) the minimum number method. Whereas there are advantages to each method, Chaplin and many others (e.g., White 1953; Daly 1969; Smith 1976; Styles 1981; and Klein and Cruz-Uribe 1984) prefer the minimum numbers method.

With the fragments method one counts the total number of identifiable bones and fragments of each species and determines the ratio of different bones or different species. The number of identified specimens (bones or bone fragments) per species is sometimes abbreviated as NISP (Payne 1975; Grayson 1979; Klein and Cruz-Uribe 1984). One of the advantages of this approach is its simplicity. Another advantage lies in the fact that it is very easy to combine the results of analyses of assemblages derived from different excavation units within a site by adding the NISP values.

In spite of its appealing simplicity, the fragments method also presents some problems. It ignores the fact that some species of animals have more bones than others. It also ignores the fact that while hunters may bring back the entire carcass of a smaller animal, they are liable to return with only the more useful parts of a larger one. This method is also dependent on the false assumption that:

> all the individual bones of all the species are equally affected by chance or deliberate breakage and will survive equally well the hazards of different methods of cooking, preservation in the soil, excavation and transport (Chaplin 1971:64).

Even if this assumption could be made, the way in which the fragments of bone ought to be counted is ambiguous. For example, should pieces of bone that fit together be counted as one bone? If so, how much time and effort should one expend in matching all the fragments in an assemblage? How should a complete skeleton be counted?

The NISP is little more than a list of bones of different animals present in an assemblage. The number of bones of a particular species represented in an assemblage does not necessarily indicate what percent of the diet of the original inhabitants of an archaeological site was made up of the meat from that animal, and thus only the broadest questions about subsistence can be answered using NISP. Finally, the fragments method should not be the only method of quantification used if the ultimate goal is comparison of the results with other sites because it is difficult both to detect and to define accurately where bias may have been introduced (Chaplin 1971:67).

In another approach, used to arrive more directly at conclusions about the relative dietary importance of each species, the analyst weighs the bone from each species and then multiplies that weight by a factor to determine the amount of meat represented by each type of animal. The weight method shares a number of the drawbacks of the fragments method, which makes it an unsuitable method for determining species ratio. In addition, it has several shortcomings as a method of estimating meat yields. Every scrap of bone must be utilized in order to arrive at an unbiased approximation of the amount of meat (Daly 1969:149). Because much of the bone analyzed is fragmented, however, it is nearly impossible to place each scrap into its appropriate species category. Further, it is impossible to account for all of the bone missing from the site or not retrieved during excavation. Also, the weight of the bone is affected by whether or not it was burned or charred and by the thoroughness with which it was cleaned and dried after excavation.

Another objection to the weight method is the fact that it begins with the assumption that there is a fairly constant relationship between the weight of an animal and the weight of its bones. Although there is a correlation between these two factors, the relationship is variable:

> The use of an estimated live weight value produces accurate meat yield estimates for species that rapidly reach a characteristic maximum adult size, it does, on the other hand, introduce considerable bias when applied to species that show variation in live weight between individuals in the same population (Smith 1975a:100).

White-tailed deer exhibits this variation, and since this species constitutes one of the most important components of the diet of prehistoric Southeastern peoples, the use of this method would have a significant effect on the results of many analyses.

To counteract this bias it would be necessary to apply a different live weight value for each age and sex category for each species analyzed. Because it is not always possible to identify the species to which a fragment belongs, let alone the age or sex of the animal, the weight method is only appropriate for use with the relatively few completely identified fragments. A final objection to this technique has been voiced by Daly (1969:149), who states that the factor used to convert the weight of the bone to absolute meat weight varies widely with the analyst. Like the fragments method, the weight method is likely not to produce data that are comparable between sites.

The minimum numbers of individuals (MNI) method avoids many of the problems that plague the other two methods. Using the simplest form of this procedure, the minimum number of animals of each species is determined by counting the maximum number of any particular bone. When possible, the age, sex, and size of the animal is taken into account to increase the accuracy of this method. This analytical procedure is superior to the other procedures for a number of reasons.

> The minimum number of animals that the bones could have come from is an indisputable fact. It is, moreover, a direct measure of the number of animals involved and is an abstraction of the true number of animals involved only within fixed limits. It also involves no assumptions about differential preservation of bone which can not be checked by examination of the specimens or by a site inspection. It is therefore using verifiable facts throughout (Chaplin 1971:70).

Grayson (1973:70) notes that the minimum numbers method "provides us with units which are necessarily independent of one another, and which may therefore be validly used in further statisitical manipulation."

In spite of its advantages, the minimum numbers method has several shortcomings. First, there is more than one way to derive the minimum number figure from an assemblage. Variation in the way in which faunal material from a site is grouped, for example, affects the results of analysis. If the material is separated into clusters according to the stratum and excavation unit in which it is found, it will yield the largest estimation of MNI. If the excavation unit is ignored, the minimum number decreases, and if neither excavation unit nor stratigraphy is used in grouping the material, the number will be even smaller (Grayson 1973:433). The comparability of the data produced by the minimum numbers method is still suspect unless the analyst explicitly states how he arrived at his figures.

Despite its popularity, the minimum numbers method shares several of the problems of the other two methods. All of the bones of the original animals probably will not be represented in the analyzed sample, and each bone of each species probably will not be equally affected by the various causes of bone loss previously discussed. Bias will be introduced when preservation in one area of the site differs from that in another. Finally, the minimum numbers method tends to overestimate the importance of the rarer species; and, thus, for greater accuracy a large sample is required if this method is used (Payne 1972).

Three methods were used to quantify the faunal remains from the Wall and Fredricks sites. The NISP method was used because it was calculated automatically as the bone fragments were identified. Also, the weight of the bone identified for each taxonomic category was calculated. Comparison of the relative abundance of each species, as revealed by the number of identified fragments and by the weight of these fragments, provided information useful not only in determining the possible importance of these animals to the original inhabitants, but also information about the conditions (such as fragmentation or preservation) that affected how much of the assemblage could be identified and to what taxonomic level. The weights of the identified bones were not converted to meat weights because of the vast array of biases introduced by the use of the weight method.

The minimum numbers of individuals method was relied on most heavily in interpreting the two faunal assemblages. In comparing the assemblages from the Wall and Fredricks sites, MNI was calculated from each site as a whole, with neither the excavation unit nor site stratigraphy taken into consideration. Although it yielded the smallest number of individuals, this method was necessary because of the different contexts from which the two assemblages were recovered.

To follow are discussions of other methods (such as the calculation of diversity and estimation of usable meat weights) used in comparisons of the assemblages from the two sites, along with a presentation of the results of the analysis.

CHAPTER 4: RESULTS OF ANALYSIS

Wall Site

The first excavations at the Wall site were carried out in 1938, 1940, and 1941 (Coe 1952,1964). Analysis of the faunal remains from these excavations was performed by Jeanette Runquist (1979). The majority of the remains that Runquist examined were recovered from a zone of undisturbed midden that was sifted through 1/4-inch mesh screen. A sample of the midden from each 10x10-foot square was waterscreened, as was the fill from the few burials and features included in Runquist's sample. Her total assemblage consisted of 6,000 bones and bone fragments.

The present analysis of the remains from the 1983-1984 excavations at the Wall site concentrated on the bone from four 10x10-foot squares of undisturbed midden located just inside the outermost palisade surrounding the village. Although several burials were excavated at this site in 1983, the fill of only one contained more than a few poorly preserved fragments of bone. The remains from the fill of this one burial were also included in the analysis. As previously mentioned, all fill from the midden and the one burial was waterscreened through a sequence of three sized screens. A total of 30,257 fragments was examined from the 1983-1984 excavations at the Wall site. This total consists of 6,040 fragments from the 1/2-inch screen, 19,688 fragments from the 1/4-inch screen, and 4,529 fragments from the 1/16-inch screen. Approximately 42% of the collection

(12,714 fragments) could not be identified. The majority of these fragments seem to be pieces of long bones of large mammals (probably deer).

A complete account of the faunal remains recovered in the 1983-1984 excavations is provided in Table 1. Burial 1 had two zones of fill containing a total of 1,340 bone fragments. Mammals represented in this pit were white-tailed deer, opossum, rabbit, squirrel, raccoon, and short-tailed shrew. Turkey and passenger pigeon were the only birds identified. The reptiles identified were box turtle and snapping turtle,and the amphibians were spadefoot toad and frog. The fish identified were catfish and gar. The only passenger pigeon remains represented in the 1983-1984 assemblage were recovered in the fill of this burial. As there were no other obvious qualitative differences between the bones recovered from the burial and those recovered from the midden, the assemblage will be treated in the following discussions as though it were retrieved from a single context. Runquist's findings are also included in this discussion of the results of analysis in order to provide the most complete description possible of the animals originally represented at the Wall site. It should be noted that recovery and sampling techniques used with the assemblage analyzed by Runquist (1979) differ from those applied to the 1983-1984 assemblage. (Also, much of the more fragmented bone from the 1938-1941 excavation was discarded and thus was not included in the assemblage examined by Runquist.)

Runquist noted that both fish skeletal elements and amphibian remains were poorly represented at the Wall site. She identified only eight fish bones, representing three individuals (Runquist 1979:345).

Table 1. Animal remains from the Wall Site.

Species	Frag.	% Frag.	Wt.(g)	% Wt.	MNI	% MNI
Odocoileus virginianus, White-tailed Deer	4731	15.64	13287.80	61.34	36	12.72
Didelphis marsupialis, Opossum	23	.08	12.55	.06	1	.35
Sciurus carolinensis, Gray Squirrel	35	.12	5.18	.02	1	.35
Sciurus sp.	297	.98	16.47	.08	9	3.18
Procyon lotor, Raccoon	105	.35	51.85	.24	4	1.41
Sigmodon hispidus, Hispid Cotton Rat	24	.08	.90	.00	2	.71
Peromyscus leucopus, White-footed Mouse	22	.07	.63	.00	2	.71
Blarina brevicauda, Short-tailed Shrew	12	.04	5.40	.02	2	.71
Ursus americanus, Black bear	1	.00	21.70	.10	1	.35
Sylvilagus sp., Cottontail	85	.28	7.70	.04	4	1.41
Castor canadensis, Beaver	1	.00	1.30	.01	1	.35
Microtus pennsylvanicus, Meadow Vole	13	.04	.48	.00	2	.71
Glaucomys volans, Flying Squirrel	1	.00	.11	.00	1	.35
Unidentified Mammal	7660	25.32	4560.75	21.05	-	-

Table 1 Continued.

Species	Frag.	% Frag.	Wt.(g)	% Wt.	MNI	% MNI
Meleagris gallapavo, Wild Turkey	103	.34	194.25	.90	3	1.06
Ectopistes migratorius, Passenger Pigeon	2	.00	.10	.00	1	.35
Colinus virginianus, Bobwhite	4	.01	.30	.00	1	.35
Cyanocitta cristata, Bluejay	4	.01	.27	.00	1	.35
Unidentified Bird	515	1.70	128.07	.59	-	-
Terrapene carolina, Box Turtle	1000	3.30	687.24	3.17	5	1.77
Chelydra serpentina, Snapping Turtle	8	.03	8.50	.04	1	.35
Chrysemys picta, Painted Turtle	6	.02	13.20	.06	1	.35
Kinosternon subrubrum, Mud Turtle	2	.00	0.20	.00	1	.35
Unidentified Turtle	1261	4.17	249.88	1.15	-	-
Crotalid sp., Poisonous Snake	1	.00	.90	.00	1	.35
Unidentified Snake	666	2.20	27.14	.12	-	-
Scaphiopus holbrooki, Spadefoot Toad	1	.00	.10	.00	1	.35
Rana catesbeiana, Bullfrog	19	.06	.20	.00	1	.35

Table 1 Continued.

Species	Frag.	% Frag.	Wt.(g)	% Wt.	MNI	% MNI
Rana sp., Frog	62	.20	3.19	.01	7	2.47
Bufo sp., Toad	23	.08	.72	.00	4	1.41
Unidentified Amphibian	-	-	-	-	-	-
Ictalurus sp., Catfish	194	.64	2.95	0.01	187	66.08
Catostomus sp., Suckers	8	.03	.54	.00	1	.35
Lepisosteus sp., Gar	8	.03	.34	.00	1	.35
Unidentified Fish	646	2.14	10.56	0.05	-	-
Sub-Total (Identified to Class)	17543	57.96	19301.47	89.06	-	-
Sub-Total (Unidentified)	12714	42.02	2362.17	10.90	-	-
Total	30257	99.98	21663.64	99.96	283	99.95

The present findings do not agree with hers in that 856 fish bones representing 189 individuals (66.8% of the total number of individuals for the assemblage) were identified.

The amphibian remains identified by Runquist accounted for 4.5% of the individuals in her sample (Runquist 1979:36). In the present analysis, 105 amphibian bones were identified, accounting for a minimum of 13 individuals (4.6% of the total number of individuals).

In the 1983-1984 analysis, reptiles accounted for 16.7% of the identified bone. Runquist's findings were somewhat similar in that reptiles represented 13.0% of the identified skeletal elements. However, Runquist (1979:60) found that reptiles accounted for 24.0% of the individuals in her sample, whereas in the 1983-1984 sample, reptiles accounted for only 3.2% of the number of individuals identified. This discrepancy can be partly explained by the additional numbers of individuals introduced by the comparatively large numbers of fish elements recovered in the 1983-1984 excavations through the use of the 1/16-inch screen. In both cases, remains of box turtle formed a significant portion of the assemblage. In both the 1938-1941 and the 1983-1984 analyses, the box turtle was second only to white-tailed deer in percent of fragments identified to species. In Runquist's analysis, box turtle was also second in terms of the percent of individuals. In the 1983-1984 analysis, however, box turtle was only the fifth most important animal represented in terms of percent of individuals, behind catfish, white-tailed deer, squirrel, and frog. Snake bones accounted for 0.2% of the total number of fragments recovered in 1938-1941, and for 2.2% of the fragments recovered in 1983-1984.

With the exception of the wild turkey, birds do not seem to have been used frequently by the inhabitants of the Wall site. Eight individuals (turkeys), representing almost 3.0% of the total number of individuals, were identified in Runquist's analysis. Three individuals, representing 1.1% of the total number of individuals, were identified in the present analysis.

From a count of spurs, Runquist determined that three of the eight individuals in her assemblage were males, whereas one of the three individuals in the 1983-1984 sample was male. In both cases, the proportions of males to females are somewhat higher than one might expect. In a study of over 6,000 turkeys harvested over a five-year period in Virginia, for example, only 18.9% of the turkeys captured were adult males (Gwynn 1964). The combined totals from the two Wall site samples indicate that four of the eleven individuals identified are male. This is a considerably higher percentage (36.4% versus 18.9%) than Gwynn's (1964) studies indicate would occur in the same general area today.

Other than turkey, birds identified in the 1983-1984 assemblage from the Wall site consist of bobwhite quail, bluejay, and passenger pigeon. Passenger pigeon is represented by a single individual in the assemblage examined by Runquist and by a single individual in the 1983-1984 assemblage. The bluejay and bobwhite quail also are represented by a single individual in each of the assemblages.

For the 1938-1941 assemblage from the Wall site, Runquist identified approximately 5,000 mammal bones. These fragments represented 208 individuals (Runquist 1979:343). A total of 13,010 bones, representing a minimum of 66 mammals, was identified in the

1983-1984 assemblage. Common to both assemblages were such mammals as white-tailed deer, raccoon, opossom, squirrel, rabbit, beaver, and bear. With the exception of the white-tailed deer (MNI 36), squirrel(MNI 10), raccoon (MNI 4), and rabbit (MNI 4); none of the mammals in the 1983-1984 assemblage accounted for more than two individuals (0.7% of the total number of individuals). In the 1938-1941 assemblage, raccoon accounted for 28 individuals (9.0% of the total).

In the 1983-1984 sample, white-tailed deer comprised 36 individuals (12.7% of the total number of individuals), determined from 4,731 fragments. Because of the small number and fragmentary nature of the deer mandibles in this assemblage, it was not possible to determine the age distribution of all of the deer represented. Of the six mandibles that could be aged, using the method described by Severinghaus (1949), one was approximately 13-17 months old, one was approximately 2 1/2 years old, one was approximately 5 1/2 years old, and three (two lefts and one right) were approximately 7 1/2 years old.

Additional information about the ages of deer hunted by the inhabitants of the Wall site was obtained by examining the epiphyses of the long bones. A minimum of six individuals in the population had open epiphyses (distal femur). This adds another five deer between the ages of 2 1/2 and 4 1/2 years (Lewall and Cowan 1963:635). Using the criteria of pelvic suture closure (Edwards et al. 1982) it was determined that five individuals were less than one year old. Thus, 33.3% of the deer were less than 1 1/2 years old, 46.7% were between 1 1/2 and 5 1/2 years old, and 20% were approximately 7 1/2 years old.

This sample of 15 individuals is clearly too small to provide an accurate indication of the age distribution of the exploited population.

The sample studied by Runquist included 145 individuals (46.0% of the total), 144 of which could be aged. Of these indivuals, 17% were fawns, 63% were between 1 1/2 and 7 1/2 years old, and 20% were 7 1/2 years old or older (Runquist 1979:229).

One method of determining the sex ratio of the deer represented by a faunal assemblage is through an examination of frontal bones for the presence of antlers, antler pedicles, or the denser bone that distinguishes males from females. This method was not useful for the 1983-1984 assemblage from the Wall site because very few deer skull fragments were recovered, and because the few antler fragments that were recovered were very small. However, it was possible to utilize a technique developed by Edwards et al. (1982) which uses characteristics of the pelvic girdle to distinguish male from female deer. For deer in which the sutures between the ilium, ischium, and pubis are fully ossified (deer one year old or older), the shape and position of the ilio-pectilineal eminence are different in males and females. Fourteen right and thirteen left innominate bones complete enough to display the ilio-pectilineal eminence were recovered in the 1983-1984 assemblage. Of these, five right and four left represented individuals below the age of one year and thus could not be used. On one left and one right innominate bone the characteristics of the ilio-pectilineal eminence were neither clearly male nor clearly female. Finally, however, it was possible to determine that five right and five left innominates represented males, and that three left and three right represented females.

An attempt was made to determine the ages of individuals of several species other than deer that were represented in the assemblage. Marks and Erickson (1966) developed criteria for determining ages of black bear based on skull morphology, canine cementum layers, tooth replacement and wear, epiphyseal suture closure, and baculum growth and maturation. As the only element identified as black bear in the Wall site assemblage was a single fragment of thoracic vertebra, it was not possible to determine the age of this individual. Although the age of raccoons can be determined using tooth wear criteria (Grau et al. 1970), this technique could not be applied successfully to the 1983-1984 faunal remains because no intact raccoon mandibles with enough teeth to permit aging were preserved in the assemblage. Age determination in fox and gray squirrels and in cottontail rabbits is based upon criteria of epiphyseal closure. The distal radius and ulna were utilized by Carson (1961) to develop age classes for squirrels. Of the 332 fragments identified as squirrel, only one was a distal radius and no distal ulnae were preserved. The epiphysis of the single distal radius was closed and thus indicated the presence of an indivdual at least 33 weeks old (Carson 1961:91). Hale's (1949) technique for aging cottontail rabbits is based on the degree of epiphyseal closure in the humerus. Four individuals from the present sample were represented by distal humeri, the epiphyses of which were all closed, indicating that these individuals were at least nine months old (Hale 1949:222).

No butchering marks were observed on any of the bones identified from the 1983-1984 Wall site assemblage. Guilday et al.(1962:64) indicate that it is possible to butcher an animal without leaving any marks on the bones, and that the probability that a bone will be cut in some way is greater if the person butchering the animal is unskilled, careless, or in a hurry. The absence of butchering marks on bones in the Wall site assemblage, thus, may indicate that the animals represented by the assemblage were dismembered by skillful and unhurried butchers. Although the majority of the bone from the Wall site was well preserved, the outer surface of most of the bones was somewhat eroded. It is possible, therefore, that if the original butchering marks did not leave deeply cut marks, these marks could have become worn away with the passage of time.

The only bone tools found in the 1983-1984 assemblage were one deer metatarsal beamer, one complete turkey tarsometatarsus awl, and fragments of three more awls. Three small pieces of worked antler and one cut bird bone (that might have ben a bead) were also found.

In sum, analysis of the faunal remains from the 1983-1984 excavations at the Wall site identified a total of 283 individuals representing 27 species. Twelve of these species were mammals, four were birds, five were reptiles, three were amphibians, and three were fish. The five most abundant species in this assemblage (in terms of percent of MNI) were catfish (66.08%), deer (12.72%), squirrel (3.53%), frog (2.82%), and box turtle (1.77%).

Fredricks Site: Overall Assemblage

The faunal remains from the Fredricks site were recovered from the fill of nine burials and five features. A total of 16,393 fragments from this site was examined. This total consists of 3,428 fragments from the 1/2-inch screen, 11,494 fragments from the 1/4-inch screen, and 1,469 fragments from the 1/16-inch screen. A total of 138 individuals representing 31 species was identified.

A full listing of the faunal remains from the Fredricks site is provided in Table 2. A brief discussion of the results of analysis of the site as a whole is provided below. A more detailed treatment is provided in the next section of this chapter with the discussion of the features and burials from which the faunal remains were recovered.

A total of 727 fragments from the assemblage were identified as fish. These fragments represented a minimum of 72 individuals (52.2% of the total number of individuals). The vast majority of these were catfish, the most abundant species (in terms of MNI) in the asemblage. Other fish identified were sunfish, sucker, and gar.

Amphibians accounted for 8 individuals (5.8% of the total), represented by 92 fragments. The only amphibians identified were spadefoot toad, frog, and toad.

Reptiles were represented by 17 individuals (12.3% of the total) determined from 2,397 fragments. Most of the fragments identified as reptiles were small fragments of turtle carapace. Box turtle accounted for 10 of the individuals (7.2% of the total) and was the second most abundant species in terms of MNI. A fairly large number (228 fragments) of snake bones was recovered, but many of these were ribs or fragmented vertebrae and could not be identified as to species.

Turkey and passenger pigeon were the most abundant bird species identified. Passenger pigeon accounted for six individuals (4.40% of

Table 2. Animal remains from the Fredricks Site.

Species	Frag.	% Frag.	Wt.(g)	% Wt.	MNI	% MNI
Odocoileus virginianus, White-tailed Deer	1128	6.88	4211.94	44.14	9	6.52
Didelphis marsupialis, Opossum	1	.01	.30	.00	1	.72
Sciurus carolinensis, Gray Squirrel	8	.05	3.01	.03	2	1.45
Sciurus niger, Fox Squirrel	3	.02	1.70	.02	1	.72
Sciurus sp.	82	.50	4.58	.05	2	1.45
Procyon lotor, Raccoon	22	.13	11.04	.12	1	.72
Mephitis mephitis, Striped Skunk	1	.01	.70	.01	1	.72
Sigmodon hispidus, Hispid Cotton Rat	11	.07	.22	.00	2	1.45
Peromyscus leucopus, White-footed Mouse	29	.18	.29	.00	2	1.45
Blarina brevicauda, Short-tailed Shrew	1	.01	.01	.00	1	.72
Ursus americanus, Black bear	10	.06	90.60	.95	1	.72
Equus caballus, Horse	1	.01	22.70	.24	1	.72
Sus scrofa, Pig	1	.01	24.50	.26	1	.72
Unidentified Mammal	3539	21.59	2354.20	24.67	-	-
Meleagris gallapavo, Wild Turkey	148	.90	221.81	2.32	4	2.90

Table 2 Continued.

Species	Frag.	% Frag.	Wt.(g)	% Wt.	MNI	% MNI
Ectopistes migratorius, Passenger Pigeon	47	.29	18.76	.20	6	4.35
Charadriidae, Plovers	1	.01	.10	.00	1	.72
Fringillidae, Sparrows	7	.04	.15	.00	2	1.45
Colinus virginianus, Bobwhite	3	.02	.11	.00	1	.72
Centurus carolinus, Red-bellied Woodpecker	1	.01	.02	.00	1	.72
Aytha affinis, Lesser Scaup	7	.04	2.50	.03	1	.72
Unidentified Bird	376	2.29	74.36	.78	-	-
Terrapene carolina, Box Turtle	1065	6.50	1013.73	10.62	10	7.25
Chelydra serpentina, Snapping Turtle	2	.01	18.90	.20	1	.72
Chrysemys picta, Painted Turtle	3	.02	8.00	.08	1	.72
Sternothaerus oderatus, Musk Turtle	3	.02	.60	.01	1	.72
Kinosternon subrubrum, Mud Turtle	6	.04	.63	.01	3	2.17
Unidentified Turtle	1090	6.65	244.38	2.56	-	-
Crotalid sp., Poisonous Snake	2	.01	1.56	.02	1	.72
Unidentified Snake	226	1.38	10.05	.10	-	-

Table 2 Continued.

Species	Frag.	% Frag.	Wt.(g)	% Wt.	MNI	% MNI
Scaphiopus holbrooki, Spadefoot Toad	31	.19	.63	.01	3	2.17
Rana sp., Frog	60	.37	2.92	.03	4	2.90
Bufo sp., Toad	1	.01	.80	.01	1	.72
Unidentified Amphibian	-	-	-	-	-	-
Ictalurus sp., Catfish	71	.43	1.71	.02	69	50.00
Catostomus sp., Suckers	57	.35	1.36	.01	1	.72
Lepisosteus sp., Gar	48	.29	1.56	.01	1	.72
Lepomis sp., Sunfish	4	.02	.30	.00	1	.72
Unidentified Fish	547	3.43	12.48	.13	-	-
Sub-Total (Identified to Class)	8643	52.76	8363.21	87.64	-	-
Sub-Total (Unidentified)	7750	47.28	1178.30	12.35	-	-
Total	16393	100.04	9541.51	99.99	138	99.91

the total), identified from 47 fragments. Turkey was represented by 148 fragments, accounting for four individuals (2.9% of the total). Based on the presence of spurs, three of the four individuals were males. Other birds identified were bobwhite quail, red-bellied woodpecker, lesser scaup, and members of the Charadriidae (plover) and Fringillidae (sparrow) families.

Approximately 56% of the identified bone fragments from the Fredricks site were from mammals. With the exception of the white-tailed deer (MNI 9) and squirrel (MNI 5), none of the mammalian species identified was represented by more than two individuals. The presence of European introduced species in the assemblage is indicated by a single pig bone (femur fragment) and a single horse molar.

The presence of a minimum of nine deer (6.5% of the total) was determined from 1,128 fragments. There were four deer mandibles in the assemblage that were complete enough to be aged using the technique based on tooth development and wear described by Severinghaus (1949). Of these four, one was approximately 4 1/2 years old, one 5 1/2 years old, one 7 1/2 years old, and one 8 1/2-9 1/2 years old. Through an examination of the epiphyses of the long bones of the deer, it was determined that two individuals had unfused distal femora and could thus be aged at between 2 1/2 and 4 1/2 years (Lewall and Cowan 1963:635). A sample of six individuals is too small to permit conclusions about possible exploitation strategies employed by the inhabitants of the Fredricks site. Of the deer which could be aged, however, 50.0% were between 2 1/2 and 4 1/2 years old, 16.7% were approximately 5 1/2 years old, 16.7% were approximately 7 1/2 years old and 16.7% were approximately 8 1/2-9 1/2 years old.

There were no innominate bones preserved in the Fredricks site assemblage upon which Edward's (1982) criteria for sex determination could be applied. Two of the deer frontal fragments recovered at this site were fairly delicate and did not possess antlers. One other frontal piece did have an antler attached. These fragments indicate the presence of at least one male and possibly two females.

Of the ten fragments identified as black bear, only one (a proximal metacarpal) could be utilized with the methods described by Marks and Erickson (1966) for determining age. This single bone indicated an individual between the ages of one and two years (Marks and Erickson 1966:404).

The technique proposed by Grau et al. (1970) for determining the age of raccoons could not be applied to the faunal assemblage from the Fredricks site. This technique is based on an analysis of wear on the lower teeth of the raccoon. No mandibles with adequately preserved dentition were recovered.

Although 93 bones and bone fragments were identified as squirrel, none of these were distal radii or distal ulnae. Because of the lack of these elements, it was not possible to use Carson's (1961) technique for determining age of gray and fox squirrels.

Cut marks were observed on a total of twenty of the deer bones in the assemblage. The neck portion of one scapula exhibited several transverse cut marks, as did the distal epiphyses of four humerii. The proximal epiphyses of one tibia and two radii all exhibited several cut marks. One pubis fragment exhibited what appears to be a cut made by an axe and two ilium fragments exhibited cut marks. Three rib fragments, one cervical vertebra, three lumbar vertebrae, and one astragalus also had cut marks. The cut mark on one of the rib fragments may have been inflicted with an axe. These fragments represent 1.8% of the deer bones recovered at the Fredricks site. Because this is such a small percentage, it is difficult to reconstruct the butchering process utilized by the original inhabitants of the Fredricks site.

Procedures for skinning and butchering deer used at several prehistoric sites in the east have been described in detail by Guilday et al. (1962). The first step in the procedure was to skin the animal, sometimes skinning only down to the dewclaws and at other times skinning down to the toes and removing the hooves with the skin. Skinning would then continue over the head. If any cut marks were to be observed as a result of the skinning, they would be located on the shafts of the metacarpals and metatarsals or at the metacarpal- and metatarsal-phalangeal joints. If the animal being skinned was male, cut marks might also be present around the antler pedicles. In the process of dismembering the carcass, the pelvis would be split, leaving marks on the pubic symphysis; and the hind legs would be separated from the spinal column, producing several cuts on the sacrum and innominate. The hind legs were not dismembered at the knee, although the forelimbs were disarticulated at the shoulder, the elbow, and probably the wrist. Cut marks would thus be produced on the neck of the scapula, on the distal end of the humerus, and on the proximal ends of the radius and ulna. Before the carcass was cut into loin, rib cage, and head/neck portions, it would be split down the middle, splitting the sternum; and the diaphragm would be cut away, possibly leaving cut marks on thoracic vertebrae. To remove the brains, the skull was either simply chopped into or split into two halves. After the carcass was dismembered, the long bones were smashed to make the marrow more accessible.

The cut marks observed on the proximal tibia from the Fredricks site indicate that the deer utilized at this site may have been dismembered at the knee in addition to the elbow. All other cut marks observed are consistent with the skinning and butchering procedures described above. Thus, in spite of their probable participation in the deerskin trade, it appears that the inhabitants of the Fredricks site were utilizing the skinning and butchering practices that had been used by other eastern Indian groups prehistorically.

Fragments of three bone knife handles and a highly polished, tapered splinter of bone that might have been a needle were the only worked bone found at the Fredricks site. All four had been manufactured from mammal bones but it was not possible to determine which species had been utilized.

Fredricks Site: Feature Fill

The pit of Burial 1 was 3.55 feet long, 2.55 feet wide, and 2.35 feet deep and contained the remains of four or five year old subadult. This burial was accompanied by numerous European artifacts. There were three zones of fill in this pit, containing a total of 3,169 bone fragments, 504 of which could be identified to species. The majority of the bones (89.2%) were retrieved from the top zone of fill, which was a dark brown organically rich soil. The mammals identified were white-tailed deer, opossum, gray squirrel, squirrel sp., and raccoon. Birds consisted of turkey, passenger pigeon, bobwhite quail, red-bellied woodpecker, and a single fragment belonging to the family

Charadriidae (plovers). The reptiles and amphibians identified were frog, box turtle, and musk turtle. The four types of fish identified from this pit were catfish, sucker, sunfish, and gar.

The pit of Burial 2 was 3.10 feet long, 2.60 feet wide, and 2.10 feet deep. This pit contained the remains of a subadult who was seven to eight years old at the time of death, along with several European and aboriginal artifacts. There were only two zones of fill in this pit, and the top zone, a dark brown humus, contained 84.5% of the bone fragments. The fill of Burial 2 contained only 129 animal bone fragments, 30 of which were identified to species. Deer, squirrel, and raccoon were the only mammals identified, and the only birds identified were turkey and passenger pigeon. Box turtle was the only identifiable reptile, there were no amphibian remains, and there was only one fish bone (catfish).

Burial 3, whose pit was 4.40 feet long, 3.20 feet wide, and 3.0 feet deep, contained the remains of a 30-35 year old male accompanied by many European artifacts. The three zones of fill in this pit contained 5,008 fragments of bone, 873 of which could be identified to species. Of the total number of animal bone fragments recovered from the site, 30.5% were recovered from the fill of Burial 3. Although a few unidentifiable fragments were located in the two lower zones of fill, 99.4% were in the top zone of dark brown humus. Identified mammals consisted of black bear, white-tailed deer, gray squirrel, raccoon, skunk, and cotton rat. A single fragment was identified as domestic pig. The birds identified were turkey, passenger pigeon, and lesser scaup. Reptiles and amphibians were comprised of box turtle, snapping turtle, painted turtle, musk turtle, mud turtle, Crotalidae (poisonous snake), and frog. Fish identified were catfish, gar, and sucker.

Feature 1 was 3.90 feet long, 2.90 feet wide, and 2.80 feet deep. Although no human remains were recovered from this pit, its size, rectangular shape, and alignment with the other burial pits suggest that it was indeed a burial pit, possibly that of a newborn infant whose bones had completely decomposed. There were no artifact associations. The pit had two zones of fill, the uppermost of which contained 95.6% of the 1,539 animal bone fragments. Of these, 257 fragments could be identified to species. The mammals represented were white-tailed deer, squirrel, raccoon, and cotton rat. The only birds represented were turkey and passenger pigeon. Remains of box turtle, mud turtle, poisonous snake, frog, catfish, sucker, and gar were also recovered.

Feature 2/Burial 4 was 3.15 feet long, 2.20 feet wide and 2.11 feet deep and contained the remains of a 20-25 year old male. This burial was unique among those excavated at the Fredricks site in that the human skeletal remains had been disarticulated and placed in a bundle prior to interment. Aboriginal and European artifacts were found in association. Five zones of fill were identified in this burial pit and a total of 982 bone fragments (155 of which could be identified) was recovered. The first zone, a dark brown soil with charcoal fragments, contained 65.6% of the bone in this pit. The second zone, a mottled orange clay, contained 24.1% of the bone, and the rest of the fragments were distributed among the lower three zones of fill. White-tailed deer, raccoon, white-footed deer mouse, turkey, passenger pigeon, and box turtle were identified.

Feature 3/Burial 5 was 5.02 feet long, 2.82 feet wide, and 2.10 feet deep. This pit contained the remains of an adult male who was at least 45 years old at the time of death. Associated with this burial were both European and aboriginal artifacts. Of the 2,375 bone fragments in the fill of this pit, 457 were identified. There were three zones of fill. The uppermost zone (an ashy gray soil) contained 37.5% of the bone, the middle zone (a dark organically rich soil) contained 45.3%, and the third zone (mottled orange clay) contained 17.2% . The mammals represented in the fill were white-tailed deer, gray squirrel, fox squirrel, squirrel sp., raccoon, cotton rat, meadow vole, white-footed deer mouse, short-tailed shrew, and black bear. Turkey and passenger pigeon were the only birds present; whereas toad, frog, box turtle, and mud turtle made up the reptiles and amphibians. Fish identified were catfish and gar.

Feature 4/Burial 6 was 5.60 feet long, 3.95 feet wide, and 2.25 feet deep. The pit contained the remains of an adult male, approximately 25-30 years old at death. Associated artifacts were of both European and aboriginal manufacture. Five zones of fill in Feature 4/Burial 6 contained a total of 301 bone fragments. Only 23 of these fragments could be identified. In the other burial pits, the majority of the animal bone was located in an uppermost zone of dark organic soil. In Feature 4/Burial 6, however, 65.4%, of the bone fragments were from two deeper zones of mottled orange clay, and 23.6% were from two zones of brown loam mottled with orange clay. In this pit, only 11.0% of the bone was retrieved from the uppermost zone of dark organic soil. All of the bone fragments which could be identified from this pit were white-tailed deer.

Feature 5/Burial 7 was 3.35 feet long, 2.30 feet wide, and 1.35 feet deep. The pit contained the poorly preserved remains of a subadult who was 1-2 years old at the time of death. Included with the skeletal remains were over 20 cast brass bells. No animal bone fragments were found in the fill of this pit.

Feature 6/Burial 8 was 3.95 feet long, 2.45 feet wide and 2.49 feet deep and contained the remains of a subadult, 4-5 years old. Aboriginal and European artifacts were found in association. Nine zones of fill were distinguished in this pit. These zones contained a total of 683 bone fragments, 110 of which were identifiable to species. The first zone, a brown loam with numerous small pebbles, contained 39.8% of the bone fragments. The third zone, brown loam, contained 37.2%, Zone 5 contained 10.5%, and the rest (12.5%) was fairly evenly distributed among the other six zones of fill. Animals represented were white-tailed deer, squirrel, raccoon, white-footed deer mouse, passenger pigeon, box turtle, snapping turtle, and painted turtle.

Feature 7/Burial 9 was 5.10 feet long, 3.51 feet wide, and 2.30 feet deep. The pit contained the remains of a 40-45 year old adult of undetermined sex. The left fibula of this adult contained a single, flattened piece of lead shot. There were four zones of fill in this pit, containing 217 fragments of animal bone. Only 15 of these fragments were identifiable, and all were white-tailed deer. The deepest zone of fill, a mottled orange clay with brown loam, contained 65.9% of the bone, and the rest (34.1%) was distributed between the second (brown loam with pebbles) and third (grayish brown loam) zones of fill.

Feature 9 was 5.0 feet long, 4.70 feet wide, and 2.85 feet deep. It has been interpreted as a fire pit associated with Structure 1, probably the remains of a sweat house. The bottom of this pit was lined with charred bark, and clusters of charred maize kernels were found lying within the charred remains of woven containers, probably baskets. Along with the maize kernels, one of these clusters contained the charred foot bones of an unidentified mammal. The bones of this animal accounted for 57.5% of the total number of fragments (134) in the pit. The uppermost zone of fill in this pit (a dark yellowish-brown sandy ash) contained 26.1% of the bone fragments, the center zone (a combination of fill similar to that in Zone 1 mixed with orange clay) contained 6.7%, and the deepest zone (charcoal, reddish clay, and ash), which contained the charred maize, accounted for 67.2% of the bone. All of the bone fragments in this third zone of fill were charred. In addition to a single horse molar, there was white-tailed deer, raccoon, and bear.

Feature 10 was a trash-filled storage pit, 2.60 feet long, 2.30 feet wide, and 3.10 feet deep. There were two zones of fill. The uppermost zone was a dark brown loam, which contained 96.3% of the 722 animal bone fragments. Of these fragments, 134 could be identified as white-tailed deer, squirrel, turkey, and box turtle.

Feature 11 was 3.0 feet long, 2.40 feet wide, and 1.53 feet deep. It contained 13 identifiable bones (from a total of 94 fragments), all of which were identified as white-tailed deer. There was only one zone of fill in this feature.

Feature 12 was an oval pit, 3.40 feet long, 3.20 feet wide, and 1.14 feet deep. There were two zones of fill containing 282 bone fragments. The upper zone, a dark reddish-brown soil, contained 54.2% of the bone, and the lower, a brown sandy loam mottled with orange clay, contained 45.7%. The 75 identifiable bones were comprised of white-tailed deer, squirrel, white-footed deer mouse, black bear, and box turtle.

Feature 13 was a roughly circular pit, 2.80 feet long, 2.40 feet wide, and 1.47 feet deep. There were two zones of fill. An uppermost shallow zone of mottled yellow clay, which contained almost no bone, intruded into a thicker zone of dark brown, highly organic soil, which contained 98.1% of the bone. Of the 755 bone fragments, 209 were identifiable. Animals represented were white-tailed deer, fox squirrel, squirrel sp., raccoon, bear, turkey, passenger pigeon, sparrow, box turtle, and frog.

In summary, of the total of 16,393 bone fragments recovered from the Fredricks site, 14,403 were recovered from the fill of burial pits. This group represents 87.9% of the bone from the entire site.

The burials from the Fredricks site were neatly laid out in a NW-SE direction, suggesting a planned cemetery. The European artifacts found in association with the burials, such as knives, scissors, and spoons, have all been dated to a relatively short time period in the late 1600s to very early 1700s. These two facts suggest that the burials represent a fairly short span of activity.

The four burial pits most similar in terms of fill were Burial 1, Burial 2, Burial 3, and Feature 1. In all of these pits, the vast majority of the animal bone was recovered from the uppermost zone of fill, a dark, organically rich soil. The bone from these pits was well-preserved and each pit contained most of the 31 species identified in the overall assemblage. The four pits were also very closely aligned in terms of spatial arrangement.

Feature 2/Burial 4 is somewhat similar to these four pits in that the majority of the bone fragments were recovered from an upper zone of dark organic fill. Only 65.6% of the bone from this pit was recovered from this zone, however, as opposed to the 84.5-99.4% for the same zone in the other aforementioned pits.

Feature 3/Burial 5 likewise could be grouped with the burial pits mentioned above. Although the majority of the bone was recovered from two rather than one zone of fill, both of these zones consisted of a dark organic soil filling the upper portion of the pit. Also, the species identified in Feature 3/Burial 5 were almost identical to those identified in Feature 1.

Feature 7/Burial 9 and Feature 4/Burial 6 were very similar to one another and quite different from the other pits. In addition to being in adjacent positions, the two pits are similar in that the only identifiable remains recovered in either is white-tailed deer. The remainder of the bone fragments were too poorly preserved to identify. In both pits, approximately 65% of the bone was recovered in a deep zone of mottled orange clay. It is likely that the acidic nature of this clay is responsible for the poor preservation of the bone. Zones of brown loam or humus were identified in each of these pits, but unlike Burials 1-3 and Feature 1, these zones contained very few animal bones.

Feature 6/Burial 8 was unique in that the faunal remains were recovered in zones of brown loamy soil that were separated from one another by zones of orange and brown mottled clay. No single zone contained the vast majority of bone. The preservation of the bone in this pit was not as good as in the other burial pits.

Finally, Feature 5/Burial 7 was unique in that it was the only burial pit from which no faunal remains were recovered. This pit was also more shallow (by 0.75 foot) than any of the other pits and lacked an upper zone of dark organic soil (which may have been plowed away).

Large quantities of plant remains have also been identified from the fill of these burial pits (Gremillion 1985). It has been suggested (Ward 1983) that the food remains, both plant and animal, contained in the fill of these burials represent the refuse from ritual feasting and/or cleaning of the houses in which the deceased had lived.

CHAPTER 5: COMPARISON OF THE TWO ASSEMBLAGES

Preservation

Before a discussion of the use of faunal resources by the inhabitants of the two sites can be attempted, the state of preservation of the two faunal assemblages should be evaluated. As noted earlier, the contexts from which the bones were retrieved at the two sites were dissimilar. The majority of the bones from the Fredricks site were recovered from burial pit fill, whereas the majority of those from the Wall site were recovered from deposits of sheet midden. It has been suggested that "small fragments just would not survive" in a midden deposit (Runquist 1979:342) and that bones deposited in pits are less likely to be stepped on, exposed to scavengers, or damaged by weather than are bones which are not placed in pits (Chaplin 1971:16; Waselkov 1977:84).

At the Wall site, 19.96% of the bone was retrieved from 1/2-inch screen, 65.07% from 1/4-inch screen, and 14.97% from 1/16-inch screen. At the Fredricks site, 20.91% was recovered from 1/2-inch screen, 70.12% from 1/4-inch screen, and 8.96% from 1/16-inch screen. Obviously, more small bone fragments were preserved in the midden deposits from the Wall site than in the pitfill at the Fredricks site. It should be noted that only those bones and bone fragments that appeared to be identifiable were pulled from the material recovered in the 1/16-inch screen. Thus, the percentage of small, identifiable fragments is actually higher in the Wall site assemblage than in the Fredricks site assemblage.

At both sites, much of the bone recovered in the 1/2-inch screen consisted of identifiable fragments of bones of larger animals and complete, or nearly complete bones from medium-sized animals. Identifiable bone from the 1/16-inch screen belonged, for the most part, to smaller species, such as fish and amphibians. The vast majority of the bone recovered in the 1/4-inch screen, however, consisted of fragments of bone that were too small and/or too fragmented to be identified. The fact that a higher percentage of the bone examined was recovered in the 1/4-inch screen at the Fredricks site than at the Wall site may be reflected in the fact that the percentage of bone fragments that could not be identified was higher for the Fredricks site assemblage (47.28%) than it was for the Wall site assemblage (42.02).

Another way in which the condition of the bones from the two sites can be evaluated is by comparing the extent of fragmentation of the bones in the two assemblages. Extent of fragmentation can be determined from the number of fragments of deer bones present per individual identified (Runquist 1979:172). At the Wall site, a minimum of 36 individuals and 4,731 fragments were identified as white-tailed deer, which yields a ratio of 131.42 fragments per individual. For the Fredricks site, nine individuals and 1,128 fragments were identified as white-tailed deer, which yields a ratio of 125.33 fragments per individual. Thus it seems that, at least for the white-tailed deer, the bones in the Fredricks site assemblage are only slightly less fragmented than those in the Wall site assemblage.

As noted earlier, the faunal remains from the Fredricks site may represent refuse cleaned from house floors, which would make the original contexts of the analyzed bone from both sites quite similar. Therefore, the slight difference in the ratios suggests to some extent that large bones deposited in pits may not be subjected to quite as much fragmentation as those deposited in sheet midden.

It should be noted that 30.7% of the bone from the Fredricks site was burned whereas only 8.9% of that from the Wall site was burned. This suggests the possibility that the deposits from which the Fredricks site assemblage were derived represent a limited range of activities such as cleaning house floors or hearths. A higher percentage of activities that did not produce burned bone may be represented by the Wall site assemblage.

Table 3 shows the percentage of deer skeletal elements represented in the Wall and Fredricks site asemblages. With the exception of five elements (innominate, atlas, axis, cervical 3-7 vertebrae, sacrum, and patella) there is a higher percentage of every element represented at the Fredricks site than at the Wall site. This is one indication that the Fredricks site assemblage is better preserved than that from the Wall site. However, it could also be an indication that deer bones were treated differently by the inhabitants of the two sites. If, for example, the inhabitants of one of the sites frequently utilized deer bones as tools, it is possible that certain skeletal elements would not be discarded in the midden as food refuse. These tools would be curated, and thus would not be recovered in the midden in the same percentages as would be expected if preservation were the only factor being considered.

Table 3. Expected and Actual Representation of Deer Skeletal Elements.

Element	Expected Freq./Ind.	Wall (36 Ind.)	Fredricks (9 Ind.)
Occipital	1	11.1	22.2
Frontal	2	4.2	11.1
Hyoid, half	2	1.4	11.1
Mandible, half	2	56.9	61.1
Maxilla	2	23.6	33.3
Atlas	1	11.1	0.0
Axis	1	38.9	33.3
Cervical 3-7 Vertebrae	5	23.3	8.9
Thoracic Vertebrae	13	8.1	17.1
Lumbar Vertebrae	6	24.5	86.1
Sacrum	1	16.7	11.1
Scapula	2	77.8	88.9
Humerus, proximal	2	20.8	44.4
Humerus, distal	2	87.5	100.0
Radius, proximal	2	47.2	61.1
Radius, distal	2	15.3	55.6
Ulna	2	47.2	66.7
Metacarpal, proximal	2	13.9	94.4
Innominate	2	95.8	83.3
Femur, proximal	2	44.4	66.7
Femur, distal	2	37.5	72.2
Tibia, proximal	2	48.6	72.2
Tibia, distal	2	4.2	66.7
Patella	2	11.1	5.6
Metatarsal, proximal	2	45.8	77.8
Metatarsal, distal	4	33.3	72.2
Astragalus	2	27.8	66.7
Calcaneum	2	30.6	94.4
Proximal Phalanx	8	17.4	54.2
Second Phalanx	8	8.3	27.8
Distal Phalanx	8	16.3	23.6

For example, proximal metacarpals and metatarsals should survive better than less-resistant elements such as proximal humeri or frontals. Proximal metacarpals and metatarsals were made into beamers by some Piedmont groups, and several of these hide-working tools have been identified in the Wall site assemblage (one in the 1983-1984 assemblage and 9 in the assemblage examined by Runquist). As yet, however, no tools of this kind have been recovered from the Fredricks site, whose original inhabitants had access to metal tools that may have made bone beamers obsolete. The percentages of proximal metacarpals (13.9) and metatarsals (45.8) recovered at the Wall site are not much higher than the percentages of other elements which could have been expected to be less well-preserved. At the Fredricks site, the percentages of proximal metacarpals (94.4) and of metatarsals (77.8) is considerably higher than the percentages for many of the other elements. Thus, it is likely that the different representation of deer skeletal elements at the two sites is a result of differential patterns of use and/or discard of the bones by the inhabitants of the two sites in addition to the possible effects of differential preservation.

There is no evidence, therefore, that the bone from one site is appreciably better preserved than the bone from the other site. It follows also that there is little indication, in this case, that bones deposited in a pit will be better preserved than those discarded in an open midden. It is possible, however, that large bones deposited in pits will be slightly less fragmented than bones deposited in sheet midden.

Overall, the faunal assemblages from the Wall and Fredricks sites are very similar. Only five species were identified at the Wall site that were not present in the Fredricks site assemblage. These were rabbit, beaver, meadow vole, flying squirrel, and bluejay. With the exception of rabbit (MNI 4) and meadow vole (MNI 2), none of these species was represented by more than a single individual. Whereas meadow vole was represented by two indviduals, it is very likely that these burrowing animals were intrusive in the deposit and were not utilized by the site inhabitants. Rabbit is the only species from the Wall site assemblage that can be considered notable in its absence from the Fredricks site assemblage.

Nine species were identified from the Fredricks site that were not identified in the 1983-1984 assemblage from the Wall site. These were horse, pig, skunk, red-bellied woodpecker, lesser scaup, musk turtle, sunfish, one individual belonging to the family Charadriidae (plover) and one individual belonging to the family Fringillidae (sparrow). As only one of these species, skunk, was present in the assemblage analyzed by Runquist, it is likely that none of these species was utilized to any great extent, if at all, by the inhabitants of the Wall site. With the exception of sparrow (MNI 2), these species were only represented by a single individual each in the Fredricks site assemblage. The presence of two European-introduced mammals, pig and horse, in the Fredricks site assemblage is important. However, pig was represented by only one femur fragment and horse by only one molar.

Thus, based on the presence or absence of individual species, the data suggest there were no major differences in the utilization of faunal resources by the inhabitants of the two sites. The two exceptions noted are the absence of rabbit and the presence of two European domesticates in the Fredricks site assemblage.

Although the gross inventories of species utilized by the inhabitants of the two sites are virtually the same, differences may be present in the ways and/or relative amounts in which these species were procured and/or utilized. In an attempt to determine which species were most important in the diet of the inhabitants of the sites, the amount of meat available from each was calculated, using estimations by Smith (1975a), White (1953), and Cleland (1966). These figures are presented in Table 4. It should be noted that the bones, skins, furs, and carapaces of these animals were often important to the Indians as materials for tools, clothing, utensils, and other material goods. Thus, a particular species would not always have been selected on the basis of its value as a source of food. The presence of only a single molar identified as horse indicates that this animal probably was not used for food by the inhabitants of the Fredricks site. Therefore, the amount of meat provided by this animal was not included in the calculations of available meat at this site.

The most important animals in the Wall site assemblage, listed in rank order of estimated meat yield, were deer, catfish, bear, raccoon, beaver, and turkey. At the Fredricks site the order was deer, bear, catfish, pig, turkey, and raccoon. Again, the assemblages appear to be quite similar.

In an attempt to gain a more detailed indication of the relative importance of the various species utilized, twelve species or species groups were ranked according to a technique proposed by Smith

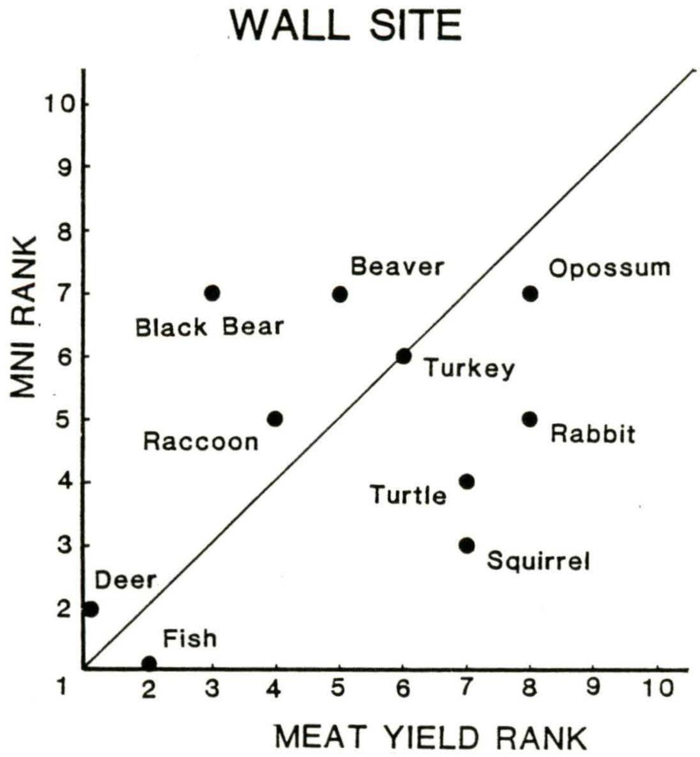
Table 4. Estimated Meat Yield in Pounds.

Species	Estimated Meat Yield/Ind. (Lbs.)	Wall lbs.	Wall %	Fredricks lbs.	Fredricks %
White-tailed Deer	85.0	3060.0	82.4	765.0	61.5
Opossum	8.5	8.5	0.2	8.5	0.7
Gray Squirrel	1.0	1.0	0.0	2.0	0.2
Fox Squirrel	1.5	-	-	1.5	0.1
Squirrel sp.	1.2	10.8	0.3	2.4	0.2
Raccoon	15.0	60.0	1.6	15.0	1.2
Hispid Cotton Rat	0.2	0.4	0.0	0.2	0.0
White-footed Deer Mouse	*	-	-	-	-
Short-tailed Shrew	*	-	-	-	-
Meadow Vole	*	-	-	-	-
Flying Squirrel	0.1	0.1	0.0	-	-
Black Bear	210.0	210.0	5.6	210.0	16.9
Rabbit	2.0	8.0	0.2	-	-
Beaver	31.5	31.5	0.8	-	-
Pig	75.0	-	-	75.0	6.0
Total Mammal	-	3390.3	91.1	1079.6	86.8
Turkey	8.5	25.5	0.7	34.0	2.7
Passenger Pigeon	0.7	0.7	0.0	4.2	0.3
Plover	*	-	-	-	-
Sparrow	*	-	-	-	-
Bobwhite	0.3	0.3	0.0	0.3	0.0
Red-bellied Woodpecker	*	-	-	-	-
Bluejay	0.1	0.1	0.0	-	-
Lesser Scaup	1.0	-	-	1.0	0.1
Total Bird	-	26.6	0.7	39.5	3.1
Frog	*	-	-	-	-
Toad	*	-	-	-	-
Spadefoot Toad	*	-	-	-	-
Total Amphibian	-	-	-	-	-
Box Turtle	0.3	1.5	0.0	3.0	0.2
Snapping Turtle	10.0	10.0	0.3	10.0	0.8
Painted Turtle	0.3	0.3	0.0	0.3	0.0
Musk Turtle	0.3	-	-	0.3	0.0
Mud Turtle	0.3	0.3	0.0	0.9	0.1
Snakes	0.2	0.2	0.0	0.2	0.0
Total Reptile	-	12.3	0.3	14.7	1.1
Catfish	1.5	280.5	7.6	103.5	8.3
Sunfish	1.0	-	-	1.0	0.1
Gar	1.0	1.0	0.0	1.0	0.1
Suckers	4.0	4.0	0.1	4.0	0.3
Total Fish	-	285.5	7.7	109.5	8.8
Total	-	3714.7	99.8	1243.3	99.8

(1975b:125-127). Using this approach, the species were ranked by their relative importance in terms of both the minimum number of individuals and projected meat yield. The results are shown in Figure 2.

At both sites, the species cluster into four groups. Deer and fish (cluster 1) ranked very high on both scales and were evidently the most important faunal resources at the two sites. The second cluster consists of animals that ranked fairly high in terms of meat yield but were not frequently utilized. At the Wall site these animals were black bear and beaver; at the Fredricks site, they were black bear and pig. Smith (1975b:126) notes that the low exploitation of bear and beaver at the Middle Mississippian sites whose faunal remains he analyzed may have been due to the fact that these species have low rates of reproduction. These species were probably rarely encountered by the inhabitants of the Wall and Fredricks sites. It is also unlikely that pig would have been readily available to the inhabitants of the Fredricks site. It is interesting to note, however, that in his description of his visit to Occaneechi Town, Lawson (Lefler 1967:61) mentioned that the Indians brought him "good fat Bear" and that "Their Cabins were hung with a good sort of Tapestry, as fat Bear, and barbakued or dried Venison."

The third cluster consists of species that were utilized in high numbers but which yielded relatively small quantities of meat per individual. At the Wall site, these species were rabbit, squirrel, and turtle. At the Fredricks site, they were turtle, squirrel, and passenger pigeon. At the Fredricks site, turtles were represented in higher numbers than were deer.



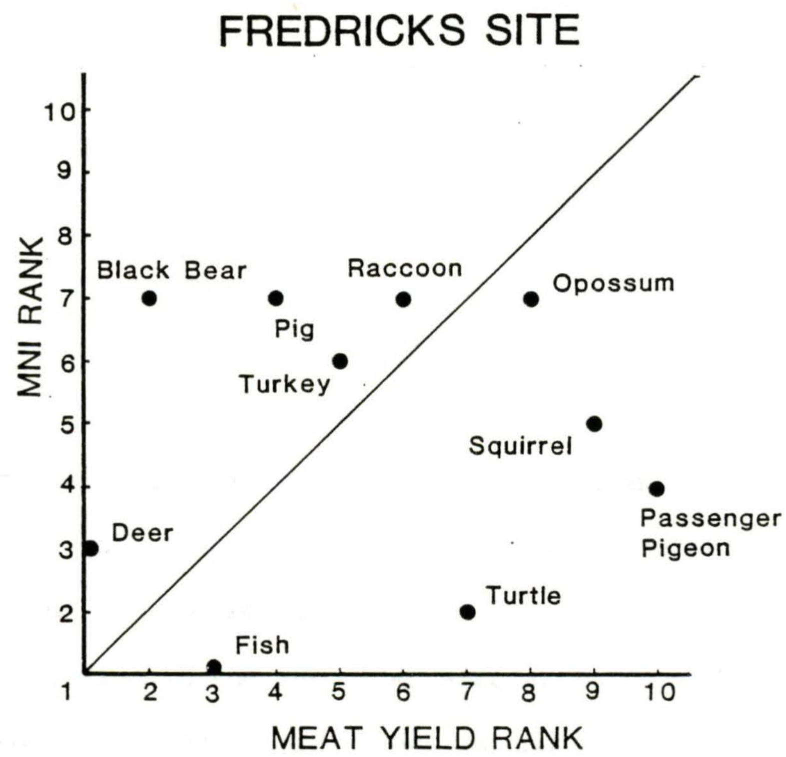


Figure 2. Rank Values of Twelve Species.

The fourth cluster of animals includes those species whose MNI and meat yield ranks were nearly equal. None of these species ranks very highly in terms of either criterion of importance. At both sites these species were raccoon, turkey, and opossum.

At both sites, then, deer and catfish were the most important faunal resources. Turtle and squirrel were major secondary resources, as was rabbit at the Wall site and passenger pigeon at the Fredricks site. Raccoon, turkey, and opossum were utilized on a more limited basis at both sites. Bear, and beaver at the Wall site, and pig at the Fredricks site, provided large quantities of meat but were not as frequently encountered as were other species.

Habitat Preferences and Seasonality

The species utilized by the inhabitants of the Wall and Fredricks sites can be divided into three groups based on their preferred habitats. Evidence for the seasons during which each species would have been procured is very limited.

Fish and all of the turtle species except box turtle are aquatic. Beaver are also dependent on an aquatic habitat. There is no archaeological evidence indicating at what seasons these species were collected. However, both turtles and fish are less readily available for exploitation during the winter. As only one beaver incisor was identified from the Wall site, it was not possible to determine the age of the individual or the season in which it was killed. The lesser scaup (identified in the Fredricks site assemblage) winters in North Carolina and occurs on lakes, rivers and ponds.

Shelford (1963:59-60) lists white-tailed deer, black bear, gray squirrel, fox squirrel, raccoon, opossum, striped skunk, and turkey among the species of the oak-hickory forest. Flying squirrel is also a forest species. Of these animals, deer, gray squirrel, raccoon, and opossum also commonly utilize the forest edge. Other forest edge species identified in the assemblages are cottontail rabbit and bobwhite quail. With the exception of the passenger pigeon, which was present during the fall (Schorger:268,280), all of these forest and forest edge species were year-round residents of the North Carolina Piedmont. Thus, their presence in the assemblages provides little indication of the seasons during which they were exploited. Low representations of juvenile rabbits in the assemblages may indicate that this species was exploited primarily during the spring when the ratio of mobile juveniles to adults would have been lower than at other times of the year (Smith 1975b:100, 115-116). Turkey and passenger pigeons would have congregated in large flocks during the fall in order to take advantage of the mast available at that time, and thus would have been more easily exploitable during those months.

The fact that no rabbits were identified in the faunal assemblage from the Fredricks site, and that passenger pigeon was represented by only one individual at the Wall site, makes it possible that the deposits from which the Fredricks site assemblage was derived are more representative of fall activities, whereas those deposits from which the Wall site assemblage was derived are more representative of spring activities.

Archaeologically, it is possible to determine the season during which deer were killed for those individuals represented by skulls having antlers attached (indicating May-February) or shed (indicating December-May). It is also possible to determine the season during which fawns (less than twenty months old) were killed based on stages of tooth eruption (Severinghaus 1949). At the Wall site it was only possible to determine the season during which two of the 36 individuals were killed. One individual was killed between May and February, as indicated by an antler attached to a frontal fragment, and another individual was killed during the spring or early summer, as indicated by the stage of dental eruption evident in one mandible. From the Fredricks site assemblage, it was possible to determine that one of nine individuals had been killed between May and February. The seasons during which the other individuals had been obtained could not be determined.

There are no clear indications that the inhabitants of one of the sites exploited specific portions of their environment to either a greater or lesser extent than the inhabitants of the other site. Likewise, there are no indications that there were major differences in the seasons during which the species were exploited. This apparent similarity, however, may simply be the result of a lack of evidence discernible in the archaeological record.

Diversity

One way in which it was possible to distinguish differences in the use of faunal resources by the inhabitants of the Wall and Fredricks sites was through the calculation of diversity. The formulas used and their results are shown in Table 5.

Using the Shannon-Weaver Index, species diversity was calcualted as 1.46 for the Wall site assemblage and 2.19 for the Fredricks site assemblage. These numbers indicate that there is a greater diversity of species represented in the Fredricks site assemblage than in the

Table 5. Summary of species diversity measures.

Diversity Measure	Site Fredricks	Wall	31Sk1	31Sk1a
Shannon-Weaver Index[1]	2.19	1.46	2.54	2.29
Lieberson's Diversity Index[2]	0.73	0.55	0.88	0.88
Simpson's Index of Diversity[3]	0.73	0.54	0.85	0.87

1 $H' = \sum P_i \mathrm{Log}_e P_i$,

where P is the percentage of individuals of i species identified (Wing 1977:81).

2 $Dw = 1\text{-}S = [(X_1)^2 + (X_2)^2 + (X_3)^2 \ldots]$,

where D_w stands for diversity within a population and is determined by deriving the sum (S) of the squared percentages of each variable trait and subtracting that sum from one (Dickens 1980:40).

3 $D = 1 \pm (P_i)^2$,

where D is Simpson's Index of Diversity, P_i, is the proportion of individuals of species i in the assemblage (Styles 1981:45).

Wall site assemblage. Using the same formula, Wing (1977) calculated diversity for assemblages from 43 other sites in the Southeast. The diversity indicated for the Wall and Fredricks site assemblages is lower than that indicated for all 43 of Wing's assemblages. The three sites that displayed diversity nearly as low as that of the Wall and Fredricks sites were sites at which the economy was based on specialized fishing (Wing 1977:87). As neither the techniques used in analyzing the faunal remains nor lists of species identified at each site were presented in Wing's discussion, it is difficult to evaluate whether or not a comparison of the Wall and Fredricks site assemblages with those reported by Wing is valid. However, at both the Wall and Fredricks sites, fish represented over 50% of the individuals identified and were the second most important resource, following deer, in terms of meat yield. At both sites, deer and fish were the most important resources. At the Fredricks site these species accounted for 56.68% of the MNI, whereas at the Wall site they accounted for 79.5% of the MNI. It is the dominance of these two resources that accounts for the fact that the two sites appear to be similar, in terms of diversity, to the specialized fishing sites described by Wing (1977).

Another method chosen for calculating diversity is Lieberman's variation of Simpson's Index of Diversity. This method is described by Dickens (1980:40) as providing an "index that represents statistical probability of obtaining unlike characteristics in a population." The percentages of individuals of each species identified from the Wall and Fredricks sites were used with this formula. The resulting percentages were 0.55 for the Wall site and

0.73 for the Fredricks site. This indicates that there were only 55 chances out of 100 that any two individuals identified from the Wall site assemblage will belong to different species, whereas the chances of two individuals from the Fredricks site being different species are 73 out of 100.

The final method is Simpson's Index of Diversity. Using this formula, the lowest possible diversity would be 0 whereas maximum diversity for an assemblage is 1 - 1/s (s being the total number of species). At the Wall site maximum diversity is 0.969 and actual diversity is 0.539. For the Fredricks site assemblage, maximum diversity is 0.966 and actual diversity is 0.726. Thus, using Simpson's Index of Diversity, the Fredricks site assemblage exhibits more diversity than the Wall site assemblage. Also, the Wall site assemblage is only moderately diverse, whereas the Fredricks site assemblage exhibits fairly high diversity.

From the results of these calculations, it is clear that the faunal assemblage from the Fredricks site exhibits more diversity than that from the Wall site. Increased diversity in faunal exploitation may have been a trend already developing in the Piedmont prior to European contact or it may represent a response to increased disruption of the social and natural environments following contact. To further investigate this problem, calculations were made of the diversity exhibited by assemblages from a protohistoric and a historic site, both located in the North Carolina Piedmont on the upper Dan River. Sk1 dates ca. 1650-1675, and Sk1a dates ca. 1680-1690 (Wilson 1983:225). In age, Sk1 falls between the Wall and Fredricks sites, whereas Sk1a may overlap slightly with the early occupation of the

Fredricks site. The later of the two Dan River sites exhibited greater diversity than the earlier site when calculated using the first and third formulas (see Figure 3), whereas the second formula yielded equal values for both sites. The results when each formula was used, however, indicate that the assemblages from Sk1 and Sk1a exhibited greater diversity than either the Wall or the Fredricks site. Thus there is no evidence to indicate that increased diversity in faunal exploitation was a general trend from Protohistoric through Historic times in the Piedmont. Likewise, there is no clear indication that the utilization of a greater diversity of species was necessarily a response to environmental disruption created by the presence of Europeans.

CHAPTER 6: CONCLUSIONS

Although the respective inhabitants of the Wall and Fredricks sites exploited a wide variety of species, both relied most heavily on deer and catfish. Turtle and squirrel were important secondary resources at the two sites, as were rabbit and raccoon at the Wall site and passenger pigeon at the Fredricks site. Turkey and opossum were supplementary resources at both sites, as was raccoon at the Fredricks site. Bear, at both sites, beaver at the Wall site and pig at the Fredricks site were only occasionally utilized.

The lack of data on the age and sex of most of the animals utilized made it impossible to determine with any certainty how selective the inhabitants of the two sites were in their exploitation of particular species. Nor was it possible to determine whether or not the patterns of exploitation can be explained in terms of maximization of meat yield and minimization of energy expenditure. Neither of the two most reliable methods for determining seasonality was very useful in interpreting the assemblages from the two sites. The presence of migratory fowl, passenger pigeon and lesser scaup, indicates some exploitation by the inhabitants of the Fredricks site of fall and winter species. The presence of juveniles of particular species (e.g., rabbit and squirrel) also provides evidence of seasonality. The fact that only adult rabbits were identified is an indication that the inhabitants of the Wall site may have utilized this species in the spring.

It is possible that the reliance upon deer as a primary resource reflects an effort to minimze energy expenditure while maximizing meat yield. Deer congregate in relatively high densitities during the fall and early winter in order to feed upon mast. They are thus easier to exploit at these times of year than at others (Smith 1975:138). Ethnohistoric accounts and prehistoric evidence (Lefler 1967:215-216; Swanton 1946:256-257; Waselkov 1977:230) indicate that Southeastern Indians hunted deer primarily in the fall and winter. As it is not possible to determine the season during which the deer in the Wall and Fredricks site assemblages were killed, it is not possible to determine whether the inhabitants of the two sites utilized the same strategies as other Southeastern groups.

The knowledge of the age and/or sex of a few of the deer identified from the two sites, however, makes it possible to hypothesize about the methods used to hunt this species. At both sites, a nearly equal number of males and females was identified. Because such a low percentage of the total number of individuals could be sexed, though, these figures may not be an accurate reflection of the actual sex distribution of the animals utilized. In both assemblages, the majority of the individuals were neither very young nor very old. This indicates that it is likely that drives or surrounds were the methods used in hunting the deer rather than stalking (Waselkov 1977:120).

Catfish was the second most important resource at both sites in terms of meat yield. The preferred water habitat of this species is small rivers with sluggish current (Smith 1975:61), conditions which are met by the Eno River. Catfish are available in large numbers during the spring spawning season and also in the summer when the water level is low (Smith 1975:60). The seasons during which the inhabitants of the Wall and Fredricks sites exploited this resource cannot be determined. However, Swanton (1946:257) proposes that many Southeastern Indian groups relied on fishing during the summer.

The secondary resources identified from the Wall and Fredricks sites differ from those reported for other sites which seem to represent minimized energy expenditure-maximized meat yield strategies. At the Middle Mississippi sites reported by Smith (1975:137-138) and the prehistoric Dan River sites reported by Waselkov (1977:101) raccoon and turkey were reported as important secondary resources. These species, like deer and catfish, exhibit high population densities during the fall and winter, when they were most likely to have been hunted. With the exception of passenger pigeon (at the Fredricks site) the species identified at both sites as important secondary resources do not congregate in easily exploitable groups at any time of the year. Squirrel, turtle, and rabbit may have been abundant near the sites and fairly easy to capture. That these species were such important resources to the inhabitants of the Wall and Fredricks sites suggests that the exploitative strategy used by these people was not entirely dominated by a concern for maximization.

Calculations of diversity indicated that the inhabitants of the Fredricks site used a greater diversity of species than the inhabitants of the Wall site. There is no indication, however, that this increased diversity through time was a general trend in the Piedmont. Nor is there any clear indication that it was a response to the disruption of the social and natural environments produced by the presence of Europeans.

From the data available thus far, contact (either direct or indirect) with Europeans seems to have had little effect on the basic pattern of faunal exploitation of the inhabitants of the Fredricks site. The presence of one horse molar and one fragment of pig bone indicates that animals introduced by Europeans probably were not important to the diet of these people. The increase in butchering marks found on deer bones from the Fredricks site, however, may be the result of differences in butchering practices following contact.

The many European artifacts found at the Fredricks site indicate considerable participation in the deer skin trade by the inhabitants of this site. There is, however, no direct evidence for this in the faunal assemblage. There is no indication that species were being hunted primarily for their hides rather than for meat, at least not in the near vicinity of the village. Nor is there evidence that portions of the environment were being exploited either more or less heavily than in the past. Even though good evidence for the exact strategies used to hunt deer is lacking, there is an indication that procurement strategies at the Fredricks site were not very different from those at the Wall site. Also, no increase in the number of tools or features associated with hide-working is evident at the Fredricks site. In fact, no hide-working tools have been found at the Fredricks site

There are three possible explanations for the discrepancy between the presence of a large number of European artifacts at the Fredricks site and a lack of evidence for participation in the deerskin trade in the faunal assemblage. The majority of the remains from the Fredricks site were recovered from burial pitfill and may reflect special ceremonial behavior that was not related to hunting activities associated with the deerskin trade. A second possibility is that activities associated with the deerskin trade, in general, were carried out at hunting camps away from the village. A third possibility is that in their role as trade "middlemen", the Occaneechi were not directly involved in the hunting activities associated with the deerskin trade.

Analyses of the ethnobotanical remains from the Wall and Fredricks sites (Gremillion 1984) also do not show evidence of major differences in plant utilization between precontact and postcontact sites. With the exception of peach, no plant species introduced by Europeans were identified at the Fredricks site. Although acorn was not as plentiful at the Fredricks site as at the Wall site and hickory was more abundant at the former, corn, beans, and squash were important resources at both sites. The faunal remains from the Wall and Fredricks sites, when combined with this ethnobotanical evidence, support the contention that a basic late prehistoric subsistence pattern was maintained well into the Historic period of aboriginal occupation in the Carolina Piedmont.

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