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An Analysis of Faunal Remains From Fort Stanwix, New York: 1758-1781

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AN ANALYSIS OF FAUNAL REMAINS FROM FORT STANWIX, NEW YORK: 1758-1781

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This research analyzes the faunal remains from Fort Stanwix from the period 1758 to 1781 in order to examine the lifeways of the soldiers and officers garrisoned at the fort during this period. This analysis aims to determine if differences between where soldiers were living and where officers were living can be seen in the faunal assemblage, and it also attempts to address temporal differences between the French and Indian War period and the Revolutionary War period occupations at the site. The methods utilized in order to answer these research questions included number of identified specimens (NISP), biomass, and skeletal frequencies. The Fort Stanwix assemblage showed a reliance on cow, followed by pig, with wild species such as white-tailed deer supplementing the diet.

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CHAPTER ONE

INTRODUCTION

This project is an analysis of 1758-1775 faunal remains from Fort Stanwix, for the purpose of examining the lifeways of those garrisoned at the fort through diet, specifically meat consumption. While previous faunal analysis has been conducted on material from the fort, it only focused on one feature and was limited in scope. This project seeks to expand current understanding of the diet of those garrisoned at the fort and further the literature on frontier forts of this period.

Constructed by the British military in 1758 during the French and Indian War, Fort Stanwix served as a strategic outpost to prevent French forces travelling from the Great Lakes from gaining access to New York's inland rivers, while also keeping this route open for British forces. The fort was built on a ridge between the Mohawk River and Wood Creek known as the Oneida Carrying Place or the Carry (Figure 1), a stretch of land easily crossed by foot to travel from one waterway to the other. The Mohawk River flows eastward to the Hudson River and from there to the Atlantic Ocean. Wood Creek connected to Oneida Lake and the Oswego River, which provided passage to the Great Lakes. The Carry was the second shortest route from the Atlantic Ocean to the Great Lakes (Hanson and Hsu 1975; Luzader et al. 1976). The fort was occupied during both the French and Indian War and the American Revolution but was abandoned shortly after the conclusion of the Revolution when the majority of the fort burnt down.

Figure 1. Map showing the approximate location of Fort Stanwix (marked by the red star) in the state of New York. The red triangle is the approximate location of Schenectady and the green triangle is the approximate location of Albany (Geology.com 2016).

From the period 1828 to 1850, large houses were constructed over the site of Fort Stanwix, eventually covering the site where the fort once stood. A small plot of land was bought in 1927 by the State of New York for the purpose of commemorating the fort. Fort Stanwix was declared a National Monument in 1935, and the Urban Renewal District of the City of Rome purchased the land. In 1973, the site was donated to the United States Federal Government, and the entire fort was reconstructed based on archaeological evidence along with fort plans from 1758, 1759, and 1764. Elements from the American Revolution

period were included in the design of the fort reconstruction (Hanson and Hsu 1975; Luzader et al. 1976).

In July 1970, full-scale archaeological excavations began at Fort Stanwix under the direction of Dick Ping Hsu. It is estimated that 33% of the main fort was excavated and the excavators found that approximately 15% of the fort had been disturbed in the 19th and 20th centuries. Only one previous faunal analysis for this time period has been conducted on the materials from Fort Stanwix. This analysis, conducted by Hanson, looked at the remains from the sally port area and only utilized minimum number of individuals or MNI (Hanson and Hsu 1975). The current project differs from Hanson's analysis in that it looks at three different areas of the site and examines multiple features. Other methods of analysis were utilized as well, such as number of identified specimens (NISP), biomass, and body part analysis. Further explanation of these methods of analysis will be discussed in the methods section of this paper.

The next section, Chapter Two, further explores the history of Fort Stanwix, the archaeological investigations conducted there, and presents the research questions for this project. Chapter Three discusses the sampling strategy and the methods utilized for analyzing the Fort Stanwix faunal remains. Chapter Four presents the results of the analysis, and Chapter Five interprets the results of the analysis and offers suggestions for future research.

CHAPTER TWO

HISTORICAL CONTEXT AND ARCHAEOLOGICAL BACKGROUND

Not only did Fort Stanwix play an important role in both the French and Indian War and the American Revolution by defending the Oneida Carrying Place, it is known for other events important to American history. In October 1768, a grand council consisting of British and Iroquois representatives was called at Fort Stanwix. This meeting resulted in the Treaty of Fort Stanwix, which established a boundary between the colonies and the Indian nations that extended from Fort Stanwix in a southwesterly direction to the mouth of the Tennessee River in present-day western Kentucky (Hanson and Hsu 1975, Schmidt 2014). Fort Stanwix also holds archaeological significance. The literature documents few occations of analysis of faunal remains from forts dating to either the French and Indian War period or the American Revolution. Analysis of faunal remains from Fort Stanwix adds to the information that currently exists about forts from these periods, as well as provides insight into the quality of the lives of the soldiers and officers garrisoned at the fort.

Historical Background of Fort Stanwix

Fort Stanwix initially garrisoned 400 men and the structures present within the fort included five casemates (structures under the ramparts that provided cover from artillery fire), a cluster of officers' huts on the parade ground, and a powder magazine in the southeast bastion (Hanson and Hsu 1975). By 1761, there were only 50 men stationed at the fort. During the conflict known as Pontiac's Conspiracy in 1763, three barracks were constructed around the

parade ground replacing the officers' huts in case the fort was needed as a defensive measure. Pontiac's Conspiracy, also known as Pontiac's Rebellion, was a result of American Indian discontent with British Indian policy, colonial persecution, and religion (Schmidt 2014). The conflict began with the siege of Fort Detroit in 1763, with several other British forts besieged and colonial frontier settlements destroyed during the course of the conflict until its end in 1764 (National Park Service [NPS] 2016, Luzader et al. 1976). It was feared that the Iroquois Confederacy would join the uprising, resulting in Fort Stanwix being rebuilt. However, it never encountered conflict during this rebellion. When the conflict ended, Fort Stanwix was no longer needed, and by 1765, it had fallen into poor condition. A garrison remained at the fort until 1767 that served to pass on supplies and post to forts further west.

Due to tensions with the Indians after Pontiac's Rebellion and land disputes, Sir William Johnson, the British Superintendent of Indian Affairs, called for a council to be held at Fort Stanwix in order to begin to resolve these issues. In anticipation of this council a council house, living quarters for colonial officials, a storage building, and structures for craftsmen were constructed (NPS 2016). In August of 1768, representatives for the Mohawk, Oneida, Tuscarora, Onondaga, Cayuga, and Seneca began arriving at the fort. Negotiations lasted until these representatives signed the treaty on November 5, 1768 (NPS 2016). This treaty became known as the Treaty of 1768 or The Treaty of Fort Stanwix (Hanson and Hsu 1975). A few men remained at Fort Stanwix to forward mail and supplies to

western forts until the barracks accidentally burned to the ground in 1774 (Hanson and Hsu 1975, Luzader et al. 1976).

By 1776, during the Revolutionary War, American military forces had control of the Carry and began rebuilding Fort Stanwix. During the reconstruction period, the British besieged the fort in August of 1777. The siege lasted only three weeks before the British retreated due to the arrival of American reinforcements (NPS 2002). By the end of July 1778, there were 450 men garrisoned at the fort. During the occupation of Fort Stanwix by American garrisons, five casemates and three barracks around the parade ground were rebuilt, while a guardhouse, a storehouse, and northwest and southwest bombproofs were newly constructed (Hanson and Hsu 1975; Luzader et al. 1976). The fort remained active until 1781, when the barracks caught fire and the fort burned again. The garrison was ordered to evacuate within a few days after the fire (Hanson and Hsu 1975).

In 1785, the land that Fort Stanwix stood on was surveyed and divided into allotments and was purchased by Dominick Lynch in 1786. Lynch had the land surveyed and a map drawn of a village plan. According to this plan the village, to be called Lynchville, was divided into lots. The lots where the fort had stood were sold to three different owners; and by the 1830s, buildings erected on each of the four bastions destroyed the essential features of the fort. There were residential houses constructed on the site of Fort Stanwix as well as an enclosed tennis court and outbuildings such as a carpenter's shop and a twentieth century stone garage. At least 40% of the site of the fort was covered at various times

with buildings. All buildings on the site were demolished in 1971 in preparation for archaeological investigations and the reconstruction of Fort Stanwix (Waite 1972).

Provisioning the Fort

Historical accounts suggest that it was difficult to provision Fort Stanwix. In his letter dated December 12, 1777, Colonel Peter Gansevoort wrote that he expected their supply of beef and pork to be "wholly expended" by the 19th of that month. He continues to say that from the sixth of May he had only been supplied "from hand to mouth" and was "obliged to kill milk cows, hogs, and pigs" that had been retained in the fort ditch (Peter Gansevoort to Major Genl. Gates, letter, 12 December 1777, Gates Papers [X00700], National Parks Service Fort Stanwix National Monument, Rome, New York).

Provisions were shipped from Albany, but the fort was separated from Albany by more than 90 miles of heavily wooded areas. During the warmer seasons, provisions were shipped by bateaux—large, shallow, flat-bottomed boats—via the Mohawk River. Men hired to operate the bateaux often stole supplies. In the winter, supplies were shipped on wagons and sleighs over inland routes, which proved dangerous due to enemy attacks. It took several days for provisions to arrive by bateaux or wagon; with the lack of refrigeration, food would often arrive spoiled, and the quantity of the food and supplies was often insufficient (Luzader et al. 1976). The letter from Gansevoort to Major General Gates hints at this lack of supplies when he says that he has been living hand to mouth since the sixth of May. According to the faunal analysis

conducted by Lee Hanson (Hanson and Hsu 1975) on the remains from the sally port area, the soldiers at Fort Stanwix did exploit wild game, primarily deer. Some meat, such as goose and turkey, was also purchased from sutlers and neighboring farmers (Hanson and Hsu 1975).

Contemporary Frontier Forts

British forts from the French and Indian War and the American Revolution were located throughout the state of New York, but only a handful has been excavated. Such forts include Fort Ticonderoga, Fort Niagara, Fort Edward, Fort William Henry, Fort Montgomery, His Majesty's Fort at Crown Point, and Fort Haldimand. Unfortunately, much of the literature published about the archaeology at Fort Ticonderoga or Fort Niagara is in the form of gray literature, making it difficult to access. Fort Ticonderoga and Fort Niagara were originally constructed by the French and was eventually captured by the British. Studies looking at differences between the living situations of soldiers and officers have been conducted at both Fort Montgomery (Starbuck 2011) and His Majesty's Fort at Crown Point (Feister 1984). At Fort Montgomery, the ceramic collection indicated that food preparation and consumption differed among different social groups. Creamware was often associated with officers while slip decorated yellowware was primarily associated with soldiers. Vessel form also differed among social groups (Starbuck 2011). Building materials used to construct the barracks showed status differentiation at Crown Point. Specifically, differences in flooring and fireplace construction were indicators of the status of the occupants of each of the barracks (Feister 1984). A study at Fort Haldimand, New York

also examined the lives of British soldiers (Pippin 2010). Fort Haldimand is discussed in more detail below and throughout this study.

In order to place Fort Stanwix in a larger context in terms of frontier forts, three other forts were examined for comparison; Fort Michilimackinac, Fort Haldimand, and Fort Ligonier. Analyses conducted at Fort Michilimackinac studied socioeconomic differences at the fort. Fort Haldimand and Fort Ligonier were each selected because they were single occupation sites. Figure 2 shows the approximate locations of the other forts examined in this study that were contemporary to Fort Stanwix. French missionaries, traders, and soldiers founded Fort Michilimackinac, located in the northern tip of the lower peninsula of Michigan, in 1715. The British came in control of the fort at the conclusion of the French and Indian War, but the French and Metis were allowed to remain at Fort Michilimackinac. The fort was taken over and came under control of the Ojibwa in 1763 until the British returned to Fort Michilimackinac in 1764. From 1761, Fort Michilimackinac had a heterogenous community consisting of British, French-Canadian, Metis, and American Indian residents. This community remained at the fort until 1781, when they were relocated to a safer area. Fort Michilimackinac was isolated during the winter months with little or no shipping on the Upper Great Lakes from November until March or April. Because of this isolation, the residents depended on local resources for food and other supplies (Scott 1991).

The second fort used for comparison in this study was Fort Ligonier. The British built Fort Ligonier in central Pennsylvania in 1758. The area was located

in a forested area removed from the river, making the transportion of supplies to the fort difficult. The British had to rely primarily on horse transport. Because of the difficulty in transport provisions could take some time to reach the fort, making livestock important to the provisioning at the fort. Some hunting was done in order to supplement the occupants' diet, despite orders forbidding hunting because it was seen as too dangerous (Grimm 1970).

The third fort used for comparison in this study was Fort Haldimand. Fort Haldimand was constructed in 1778 at the head of the St. Lawrence River in order to protect a vital supply route between the interior of North America and regions of Canada. Pippin's (2010) dissertation focused on the lives of the soldiers garrisoned at Fort Haldimand. The soldiers at Fort Haldimand depended primarily on the British military transport system for their provisions, a system that was already under strain. To supplement their diet and daily rations, soldiers utilized local resources such as fish.

Local resources were utilized at all three forts, but perhaps more heavily relied upon at Fort Michilimackinac and Fort Haldimand than at Fort Ligonier. The locations of Fort Michilimackinac and Fort Haldimand required that provisions be shipped due to the difficulty of land transport, making barreled meat more convenient for this type of transportation than livestock. Therefore, if the occupants at these locations desired fresh meat, they would have to utilize the local resources through hunting or fishing. The occupants of Fort Ligonier were unable to rely heavily upon hunting due to the dangers that existed in the forested areas surrounding the fort, causing reliance upon livestock. Fort

Ligonier was removed from river transport; therefore, land transport was the most plausible form of provisioning.

Figure 2. Map showing approximate locations of other contemporary forts being compared to Fort Stanwix.

Socioeconomic Differences Through Diet

Scott (1991, 2008) describes the differences that may have been expected between the wealthy and lower/middle classes of British society. She based these differences on two eighteenth century cookbooks, one by Amelia Simmons that was written for the lower and middle classes and the second by Susannah Carter directed towards cooking for the upper classes. All British diet included the consumption of beef in a wide variety of portions or cuts, followed by

pork. The wealthier British diet could be characterized through the use of bony portions in addition to meatier cuts, a wider variety of pork dishes using all portions of the pig, and the consumption of lamb. The upper class diet also utilized the feet and head of cows or pigs that would be made into time-intensive dishes such as stews, soups, hashes, pies, and fricassees (Scott 1991, 2008). Less variety in the types of cuts for beef, pork, veal, and mutton characterized the lower and middle class diets. The variety of wild birds consumed by the upper classes was only slightly greater than that of the lower classes. Based on these differences in meat consumption between upper and lower class households, a similar trend might be expected when looking at officer versus enlisted diets.

Archaeological Investigations

In 1965, Colonel J. Duncan Campbell began excavations at the site of Fort Stanwix for the Rome Urban Renewal Agency. It was feared that most of the fort had been destroyed, but Campbell's excavation found that substantial parts of the fort's foundations were still intact (Hanson and Hsu 1975). Dick Ping Hsu began his excavations at the site for the National Park Service in 1970. These continued for three consecutive seasons. Most of the artifacts related to the fort were found in cellars, the barracks, pits in the casemates, garbage dumps on the east scarp, and in the sally port area (Figure 3). The faunal remains analyzed for this project were recovered during these excavations, and the highest

concentrations of animal bone were recovered from cellar holes, the sally port area, and beneath the north end of the bridge (Hanson and Hsu 1975).

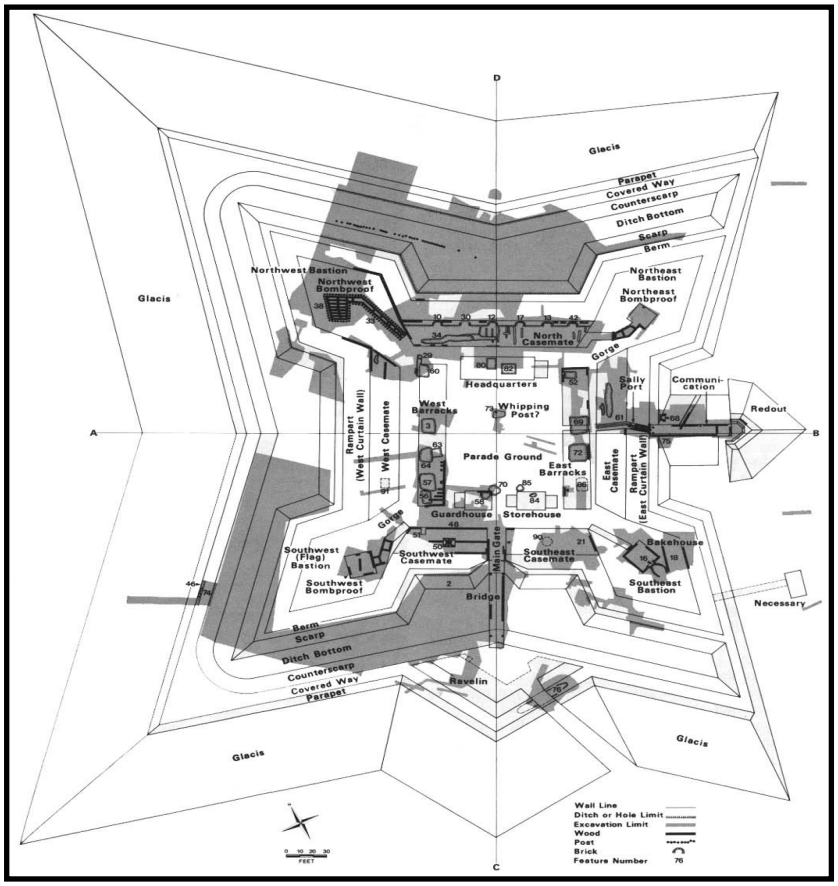


Figure 3. Excavation map of Fort Stanwix. Areas shaded in gray are where excavations were completed (Hanson and Hsu 1975).

Hanson's Analysis of the Sally Port Area

Lee Hanson analyzed faunal remains from Level II of the sally port area (see figure 3) for the 1975 report on the Fort Stanwix excavations. Level II of this feature was a dark gray loam deposited between 1776 and 1781 based on the presence of Revolutionary War period buttons. Level I differs from Level II in that it contained artifacts from the eighteenth to the twentieth century. The

feature measured 30 feet long by 10 feet wide by two feet deep. The sally port is an underground passage that leads from the inner portion of the fort to the outer portion (Hanson and Hsu 1975). Hanson identified the faunal remains by species and body parts; and a minimum number of individuals was estimated for each species. The analysis found that the faunal assemblage (Table 1) consisted of cow, pig, small bovid, deer, bear, fox, muskrat, dog, turtle, snake, chicken, pigeon, duck, goose, grouse, rail, and fish (species not identified). Lee concluded that if this feature was representative of the entire site, then beef made up 55 percent of the meat available to the garrison, with pork and venison making up the remainder of the primary types of meat consumed (Hanson and Hsu 1975). Saw marks were not present on bones from the eighteenth century context, and the larger bones showed evidence of being split to get at the marrow (Hanson and Hsu 1975).

Table 1. Summary of Hanson's Faunal Analysis Findings (Hanson and Hsu 1975).

Species	Minimum Number of Individuals (MNI)	Count Based On:
Cow	24	Right radii, left femora, right calcanei and horn cores
Pig	13	Lower left second molars, left radii
Small bovid	1	Horn core
Deer	13	Right calcanei
Bear	1	Premolar
Fox	2	Left calcanei
Muskrat	1	Lower jaw
Dog	2	Right humeri
Turtle	2	Scapulae
Snake	1	Lower jaw
Chicken	9	Right femora
Pigeon	5	Right ulnae
Duck	1	Left coracoid and carpometacarpus
Goose	1	Right tarsometatarsus
Grouse	1	Right tibiotarsus
Rail	1	Right tarsometatarsus
Fish	N/A	Vertebrae and ribs

Artifact Analysis of the Barracks

Hanson and Hsu (1975) analyzed French gunflints, buttons, ceramics, and pipestems from wood-lined and clay-lined cellar features to determine if there was a temporal difference between the two types of cellars. French gunflints began to be widely distributed after 1740, and were commonly used by the English (Hanson and Hsu 1975). Hanson and Hsu found that nearly half of the gunflints found in the clay-lined cellars were French, but the sample size of gunflints in these cellars was too small and inconsistent to make any inferences. No French gunflints were found in the wood-lined cellars. The use of buttons for a temporal determination also proved fruitless. The same types of buttons were found in both cellar types and the sample size was too small. Sample size was also a problem for dating ceramics using Stanley South's mean ceramic date formula. While it showed that clay-lined cellars were filled later than wood-lined cellars, both contained fill that dated to the same time: 1759.8 for clay-lined cellars and 1757.1 for wood-lined cellars. Again, sample size was too small to make a proper temporal designation using pipestem bore diameter.

Hanson and Hsu (1975) point out that stratigraphy was not helpful in making a temporal differentiation. The fill in the cellars was too similar to be able to make a temporal differentiation. This similarity was attributed to the short seven-year period between occupations at the fort with little change in artifacts, the compactness of brickbats in the holes, and the absence of lensing. The absence of lensing indicates a rapid filling. Pre-1776 material could have been shoveled into clay-lined cellars along with post-1776 materials.

Research Questions

Through the following research questions, this study aims to go beyond simple taxonomic identification and make meaningful interpretations about the lives of the soldiers and officers at the fort.

Research Question One: Can the faunal assemblage be used in combination with other artifactual data from the fort to differentiate between the English military occupation and the American military occupation?

According to Hanson and Hsu (1975), no differentiation could be made between the two occupations at the fort based on the current data. By looking at the faunal information according to provenience in combination with other artifactual data, such as ceramic, it may be possible to better date the deposits and find evidence of the two separate occupations. The differentiation between the two periods of occupation is important for answering the second research question because the British military had a stricter division between classes than that of the provincial or American military (Fisher 1995).

Research Question Two: Using records of other forts, can the faunal remains help identify a distinction between areas where enlisted soldiers were living and areas where officers were living? How do the areas being analyzed in this study compare with the faunal assemblage from the sally port area?

The faunal remains analyzed for this thesis were recovered from the barracks (the living quarters) at the site. Comparing this faunal assemblage to that identified by Hanson from the sally port area allows for a well-rounded

interpretation of diet at the site, and provides information about taphonomic processes. Barracks were constructed in different ways according to station within the military. Soldiers would have lived in separate quarters from the officers. A combination of documentary and archaeological data was used to attempt to determine the barracks in which soldiers lived and barracks in which officers lived.

Research Question Three: How does the faunal assemblage from Fort Stanwix compare with faunal assemblages from other contemporary frontier forts?

Faunal analyses have been conducted on three other frontier forts contemporary to Fort Stanwix (Figure 3): Fort Haldimand in New York (Pippin 2010), Fort Ligonier in Pennsylvania (Grimm 1970), and Fort Michilimackinac in Michigan (Cleland 1971; Scott 1991, 2008). Comparing the faunal assemblage from Fort Stanwix to contemporary frontier forts places Fort Stanwix in context and provides a better understanding of the provisioning of frontier forts and the soldiers' adaptations to their situation. Supplying forts in geographically isolated areas often caused delays in delivery or damage to the supplies. A comparison of forts in similar situations shows how the soldiers dealt with their situation and the ways in which this may have varied according to geographical region.

CHAPTER THREE

METHODS

The faunal remains for eight cellar features and three fireplaces dating to the 1758-1781 period were analyzed (Figure 6). While worked bone was present in the assemblage, only unworked bone was identified and analyzed. The worked bone was stored separately from the unworked bone at Fort Stanwix National Monument. The eight cellar features were stratified, but only those levels that were undisturbed by nineteenth and twentieth century construction activities were analyzed (Table 2). Only four cellar features from the East Barracks were located and excavated by Hsu; however, there were a total of six cellar features from the West Barracks that were located and excavated. These cellar features from the West Barracks were sampled according to their location within the barracks. One feature for each end and two features of the center portion of the barracks were selected for analysis. Feature 60 was the only cellar feature associated with the north end of the barracks. Features 3 and 64 were selected as representative samples for the center portion of the barracks. Feature 63 was not selected because faunal remains found in this feature were only from Level II, which was disturbed by a 1910 foundation wall and intruded upon by Feature 64. Feature 57 provided a representative sample for the south end of the barracks. Selecting features according to their location in the barracks were expected to help answer Research Question One regarding spatial aspects of the site. Three of the fireplace features from the North Casemates were selected to provide a representative sample for that area of the site. These three

features contained the highest bone counts of the excavated North Casemates features. The casemates may have been used for troops' or officers' quarters (Hanson and Hsu 1975, Luzader et al 1976), and analysis of these features may show differences from the cellar features within the barracks and help address Research Question One. Level I of features 69, 72, 3, 57, 60, and 30 was excluded from analysis because the level did not date to the period under study. Figures 4 and 5 show how the levels of these features correlate to one another.

The faunal remains excavated from these features could have arrived through a number of refuse disposal practices. While no evidence of fireplaces was discovered during the excavation of either barracks, that does not mean that they did not exist, simply that no archaeological trace remained. Soldiers could have either prepared meals over fireplaces within the barracks or just outside and then discarded the bones into the cellars. Even if meals were not being prepared within the barracks, soldiers may have consumed their meals there and discarded any food remains. These food remains could have been discarded on the floors and then swept into the cellars, or remains could have been discarded directly into the cellars. Given the presence of livestock at Fort Stanwix, butchering may have been practiced near the barracks as well, with the remains being swept or discarded into the cellars. Animal remains recovered from the North Casemates features were most likely tossed directly into the fireplaces after preparation, consumption, and/or butchering.

Table 2. Features and Levels Analyzed by Area.

North Casemates	
Feature	**Levels Analyzed**
10	II, III
12	II
30	II

West Barracks	
Feature	**Levels Analyzed**
3	IV, V
57	II, III, IV
60	II, III, IV
64	III, IV

East Barracks	
Feature	**Levels Analyzed**
52	III, IV
69	II, III
72	II, III
86	II, III

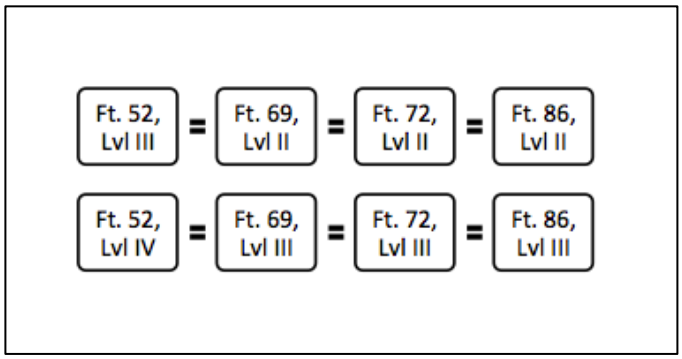


Figure 4. Correlation between levels in East Barracks features.

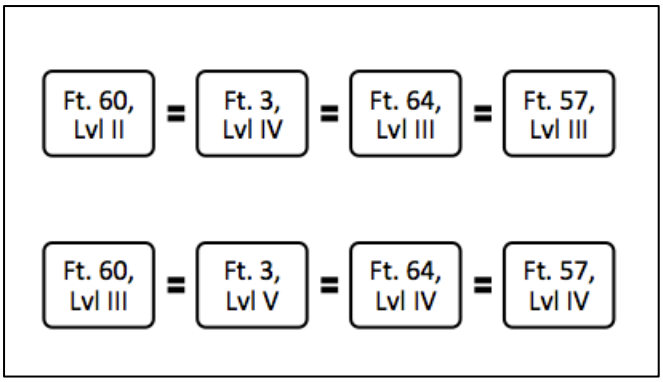


Figure 5. Correlation between levels in West Barracks features.

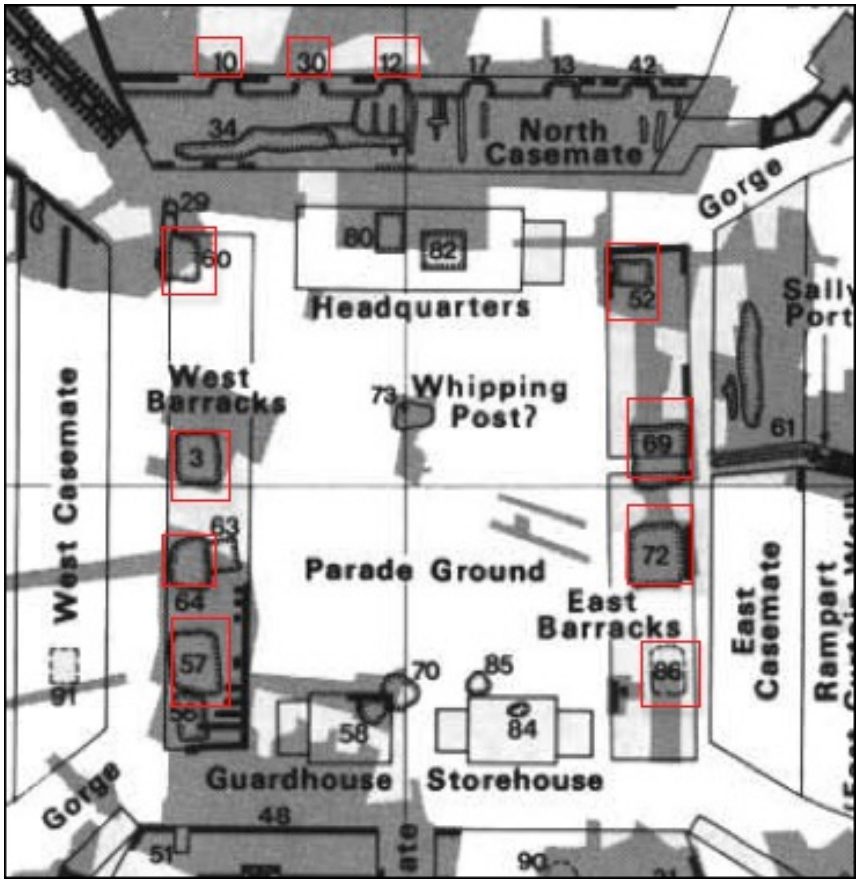


Figure 6. Close-up of the center portion of the Fort Stanwix excavation map with analyzed features outlined in red.

Using the comparative skeletal collection at Indiana University of Pennsylvania (IUP), bone, shell, and teeth were identified to the lowest possible taxonomic level. Information about the faunal specimens was recorded using the IUP Faunal Coding Format. Table 3 lists the variables used in this coding format. Where possible, skeletal element was identified, and the bones were examined for cut marks and evidence of butchering. Evidence of butchering includes saw marks, cut (knife) marks, scratch marks, chop marks, blunt force marks, and multiple types of butcher marks. All faunal fragments were counted and weighed in order to calculate dietary contributions using bone weight (Reitz and Wing 2008).

Table 3. List of Variables Recorded for Analysis using IUP Coding Format.

Provenience Variables	**Modification Variables**	**Identification Variables**
Site Number	Weathering	Taxon
Bag Number	Cultural Modification	Certainty
Specimen Number	Animal Modifications	Element
Provenience 1	Fracture Pattern	Element Side
Provenience 2	Burning Modification	Complete
Unit Number	Butcher Marks	Proximity
Feature Number	Breakage	Axiality
Context Type		Laterality
Type of Excavation		Structure
Hold		Maturity
		Count
		Weight
		Comments

Identification alone is not enough for drawing conclusions about a faunal assemblage. Analyses beyond identification that quantify the remains are necessary in order to interpret what is happening in an assemblage. A principal objective in quantifying animal remains is measuring relative abundance (Peres 2010). The number of faunal species present at a site often presented as species lists simply shows the range of taxa identified in an assemblage. Analyses that go beyond species lists, such as of minimum number of individuals, are aimed at attempting to estimate the relative abundance of these identifiable taxa in the assemblage (Crabtree 1985). Because there are many methods for measuring relative abundance of an assemblage, this analysis utilized minimum number of individuals (MNI), biomass, and Number of Identified Specimens (NISP) as the primary methods for calculating the relative abundance of taxa within the assemblage. Each of these analytical methods produces an estimate of the importance of a particular taxon to a group. NISP is a primary method of estimating relative abundance because it is simply a count of each bone fragment, tooth, shell, antler, horn, or scale (Peres 2010). For the purposes of this analysis, the Number of Identified Specimens (NISP) were those specimens identifiable to the order level and below. MNI is a secondary form of analysis based off of NISP. MNI is determined by counting the greatest number of paired left and right elements for a taxon, thereby determining the smallest number of a taxon that could account for the specimens identified. MNI was estimated in this analysis using the greatest number of paired right or left elements from a given

species, taking into account completeness of the element, proximity, and maturity. However, MNI figures can vary based on how the analyst decides to aggregate the sample. Different methods of aggregation can result in different MNI figures (Grayson 1984). For the Fort Stanwix assemblage, MNI was determined for each feature as a whole instead of on a level-by-level basis. This method was important for answering research questions regarding spatial analysis of the site and differences between different areas of the fort. In an effort to thoroughly quantify the relative abundances of taxa within the assemblage, biomass was also calculated. Biomass is a secondary form of analysis based on bone weights and does not take into account what parts of an animal were edible or inedible; rather it is based on a biological relationship that exists for all organisms and holds true through time (Peres 2010; Reitz and Wing 2008).

In order to calculate biomass, the following allometric formula was used:

$$Y = aX^b$$

or

$$\log_{10} Y = \log_{10} a + b\,(\log_{10} X)$$

Where:

Y= the estimated sample biomass (kg) contributed by the archaeological specimen(s) for a taxon

X= specimen weight of the archaeological specimens for a taxon

a= the Y-intercept of the linear regression line

b= slope of the regression line

(Reitz and Wing 2008:241)

General biomass estimates were calculated using the values for *a* and *b* in *Zooarchaeology* by Reitz and Wing (2008:68).

Breakage and Weathering

Breakage refers to the fragmentation of bone that occurs at all stages from initial procurement up through excavation and examination. It can provide information about the history of a specimen through the type of fracture and extent of breakage. For this analysis, breakage was recorded as new, old, or both new and old. New breakage on a bone fragment was lighter in color than the rest of the specimen and showed no signs of weathering where the break had occurred. Old breakage was weathered where the fracture occurred and was uniform in color to the rest of the bone fragment (Reitz and Wing 2008). A fragment that possessed new fractures and old fractures were recorded as having both new and old breakage.

Weathering is a continuous natural process of nutrient recycling in and on the soil that causes deterioration and destruction of bone through time. The weathering process causes physical and chemical changes to the composition of bone by separating the organic and inorganic components and destroying them (Lyman and Fox 1989; Madgewick and Mulville 2011). Some skeletal elements,

particularly small and compact ones, may weather at a slower rate than other skeletal elements. Bones from different taxa may also weather at a different rate, especially if there is a difference in body weight (Lyman and Fox 1989; Reitz and Wing 2008). It is possible to classify degrees of weathering to six categories, but for this analysis a specimen was recorded as being weathered, root-etched, or weathered and root-etched. Surface cracking, flaking, disintegration, or splitting are characteristics of weathering (Madgewick and Mulville 2011).

Methods of Comparison to Other Forts

Three forts were examined as a comparison to Fort Stanwix: Fort Michilimackinac (1761-1781) in Michigan, Fort Haldimand (1778-1784) in New York, and Fort Ligonier (1758-1766) in Pennsylvania. Each of these forts dates to a period of occupation in which Fort Stanwix was utilized. The NISP of artiodactyl taxa (cow, pig, small bovid, and cervid) identified at these forts were compared to those of Fort Stanwix. This method of comparison was chosen because NISP was the only common zooarchaeological analysis conducted at the three other sites.

Differentiation in Diet Between Social Classes

Based on Scott's (1991, 2007, 2008) research, differentiation in diet between social classes could tentatively be defined. Those of the wealthy class consumed the bony and meatier portions and cuts such as loin, rump, leg, and chops. All portions of pig were utilized, and the feet and head of both cow and pig were utilized. Lamb was only consumed by the wealthy. A lower and middle

class diet included less variety in cuts of beef, pork, veal and mutton. All classes consumed a variety of domestic and game birds, with the exception of pheasant, which was only consumed by the wealthy. Lamb was not a part of the lower or middle class diet. Table 4 lists the cuts of meat that were consumed by middle and lower class households. A similar trend would be expected when looking at differences in diet between enlisted soldiers and officers.

Table 4. Cuts of Meat Consumed by Middle and Lower Class Households (Scott 1991;164).

Beef	**Mutton**	**Veal**	**Pork**
Round	Breast	Leg	Leg
Calf's head	Leg	Loin	Ham
Calf's feet	Chine	Shoulder	Bacon
Neat's feet	Saddle		
Neat's tongue			

Mean Ceramic Dating

Mean ceramic dates were calculated using Stanley South's mean ceramic date formula:

$$Y = \frac{\sum_{i=1}^{n} X_i * f_i}{\sum_{i=1}^{n} f_i}$$

Where:

Y= mean ceramic date

Xi= median date for the manufacture of each ceramic type

fi= frequency of each ceramic type

n= number of ceramic types in the sample (sherd count)

(South 1977:220)

Ceramics that had a wide date range, such as redware and stoneware, were not included in the calculations.

CHAPTER FOUR

RESULTS

Summary of Fort Stanwix Faunal Analysis

The total number of specimens (NSP) examined for this analysis was 9,031. NSP is a general count of bone fragments, regardless of identification. Unidentified large mammal accounted for 73.5% of this assemblage (NSP=6,642). Medium or large mammal represented 11.6% of the assemblage (NSP=1,052), and the remaining portion of the unidentifiable assemblage consisted of ten other higher order taxonomic categories (Table 5). There were a total of 794 specimens, or 8.8% of the assemblage, identifiable to the order level or below, represented as NISP. There were 737 fragments, or 8.16%, of the identifiable assemblage that came from large mammals. The low figure of identifiable specimens may reflect either heavy fragmentation or the processing of carcasses at this location. Figure 7 illustrates the breakdown of identifiable taxa. The presence of fish in the identifiable assemblage is noteworthy due to the small size and fragility of these remains; however, bird remains are in higher proportion in the identifiable assemblage than fish. Categories that are missing from the identifiable assemblage include snakes, frogs/toads, and invertebrate taxa.

Table 5. NSP and Percent NSP for Higher Order Taxonomic Categories.

Unidentifiable Taxon	NSP	Percent NSP

Large mammal	6645	73.58%
Medium or large mammal	1052	11.6%
Medium mammal	168	1.86%
Small or medium mammal	37	0.41%
Small mammal	10	0.11%
Mammalia	22	0.24%
Aves	45	0.50%
Aves or mammalia	6	0.07%
Osteichthyes	237	2.62%
Pelecypoda	14	0.16%
Invertebrata	1	0.01%
Identifiable Large Mammal	737	8.16%
Other Identifiable Taxon	57	0.63%

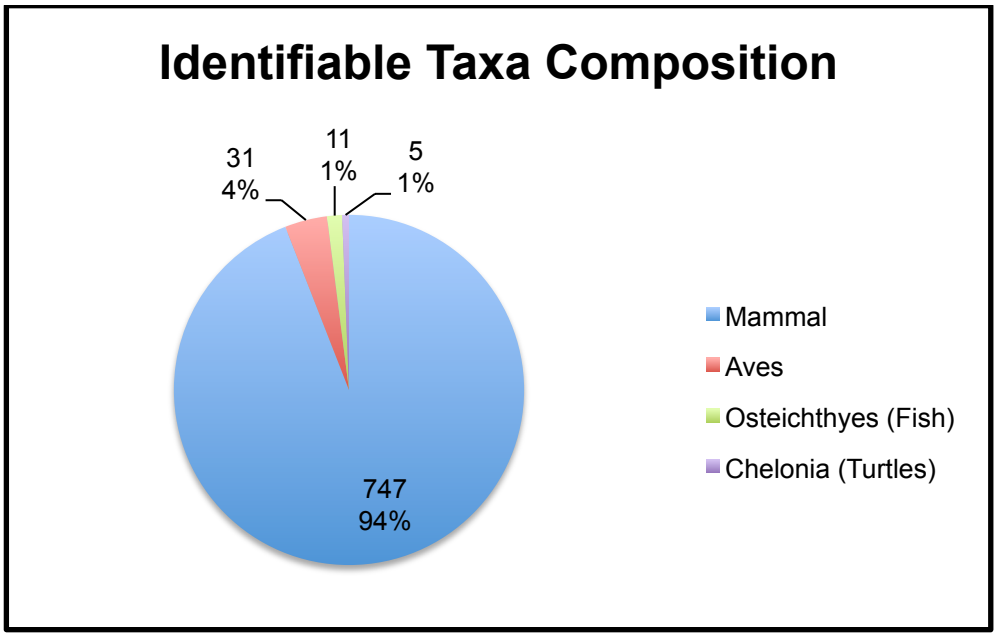


Figure 7. Breakdown of identifiable taxa composition.

Table 6 lists all of the taxa identified to the order level or below in the Fort Stanwix assemblage. There is a high NISP for Bovidae (cow), Artiodactyla, and *Sus scrofa* (domestic pig). These will be discussed in further detail below. Other domestic species identified in the assemblage include *Gallus domesticus* (domestic chicken), small bovid (goat or sheep), and *Equus caballus* (horse). Domestic chicken was identified previously in Hanson's analysis. The presence of horse is not surprising in the assemblage given their use at the fort. *Odocoileus virginianus* (white-tailed deer) and large cervid were expected to be present in the assemblage based on Hanson's analysis of the sally port area and the fort's location in the wilderness. Leporidae (rabbits and hares) were also expected given the fort's location. The presence of *Vulpes or Urocyon* (red or gray fox) does not necessarily indicate that this animal was consumed, but it may have been utilized for its pelt. The *Zapus* sp. (mouse) and Microtinae (voles, lemmings, and muskrats) were probably scavengers and intrusive in the

assemblage. Due to location of Fort Stanwix between two bodies of water and previous faunal analysis, the presence of Chelonian (turtle) and Emydidae (pond or marsh turtles) was also expected in the assemblage. While Hanson (1975) attributes turtles as a curiosity rather than a food source, it is possible that they were consumed.

A surprising discovery in the assemblage was the pheasant species. The pheasant specimens compared favorably to Ring-necked Pheasant, but were not an exact match. The Ring-necked Pheasant was not successfully introduced to North America until 1881 (State of Connecticut Department of Energy and Environmental Protection 2015); therefore, this specimen could potentially be attributed to another species of pheasant. Based on letters dating to the 1780s between George Washington and the Marquis de Lafayette, it is known that Lafayette gifted pheasants to Washington (Irmscher 1999). Pheasants were strictly limited to wealthy class possession in the eighteenth century. There was also some pheasant present at Fort Haldimand, so its presence in the Fort Stanwix assemblage is plausible.

The domestic pigeon is also a species that is non-native to North America; however, this bird was introduced to the Atlantic coast in the seventeenth century (American Museum of Natural History 2011), so its presence in the Fort Stanwix assemblage is also plausible. In his analysis, Hanson identified six individuals of pigeon. Based on his notes from the National Park Service Fort Stanwix National Monument, Hanson identified the bones as either passenger pigeon or domestic pigeon (rock dove). The passenger pigeon was a native species and not

domesticated. Pigeons would have been hunted for sport, and were utilized by all social classes.

Table 6. NISP of all Species Identified in Fort Stanwix Assemblage.

Taxon	NISP
Vulpes or *Urocyon* (Red or Gray Fox)	4
Odocoileus virginianus (White-tailed deer)	16
Large cervid	11
Bovidae (Cow)	322
Small bovid (Goat and sheep)	14
Artiodactyla	128
Sus scrofa (Domestic Pig)	236
Indeterminate *Sus*	9
Equus caballus (Horse)	1
Leporidae (Rabbits and hares)	1
Sylvilagus floridanus (Eastern cottontail)	2
Tamias striatus (Eastern chipmunk)	1
cf *Zapus sp.* (Jumping Mouse)	1
cf Microtinae (Voles, Lemmings and Muskrats)	1
Anseriformes	2
Aix sposa (Wood duck)	2

Taxon	NISP
Galliformes	3
Bonasa umbellus (Ruffed grouse)	3
Gallus domesticus (Domestic chicken)	2
Pheasant sp. cf *Phasianus colchicus* (Ring-necked pheasant)	12
Columbidae cf *Columba livia* (Domestic Pigeon/Rock dove)	5
Strigidae (Typical owls)	1
Turdus migratorius (Robin)	1
Chelonia	2
Emydidae (Pond or marsh turtles)	3
Lepisosteus (Gars)	1
Siluriformes	1
Ictalurus (Freshwater catfishes)	1
I. punctatus or furcatus (Blue or channel catfish)	1
cf *Catostomus sp. (*Suckers*)*	4
Esox Lucius (Northern pike)	3

The order Artiodactyla comprised 92.7% of the identifiable assemblage. Cow was the predominant species representing 43.8% of the artiodactyls, followed by pig, which made up 32.1% of the artiodactyls identified in this analysis. The category small bovid included specimens that could have been identified as either goat or sheep. Figure 8 shows the comparison of NISP of artiodactyls in the assemblage.

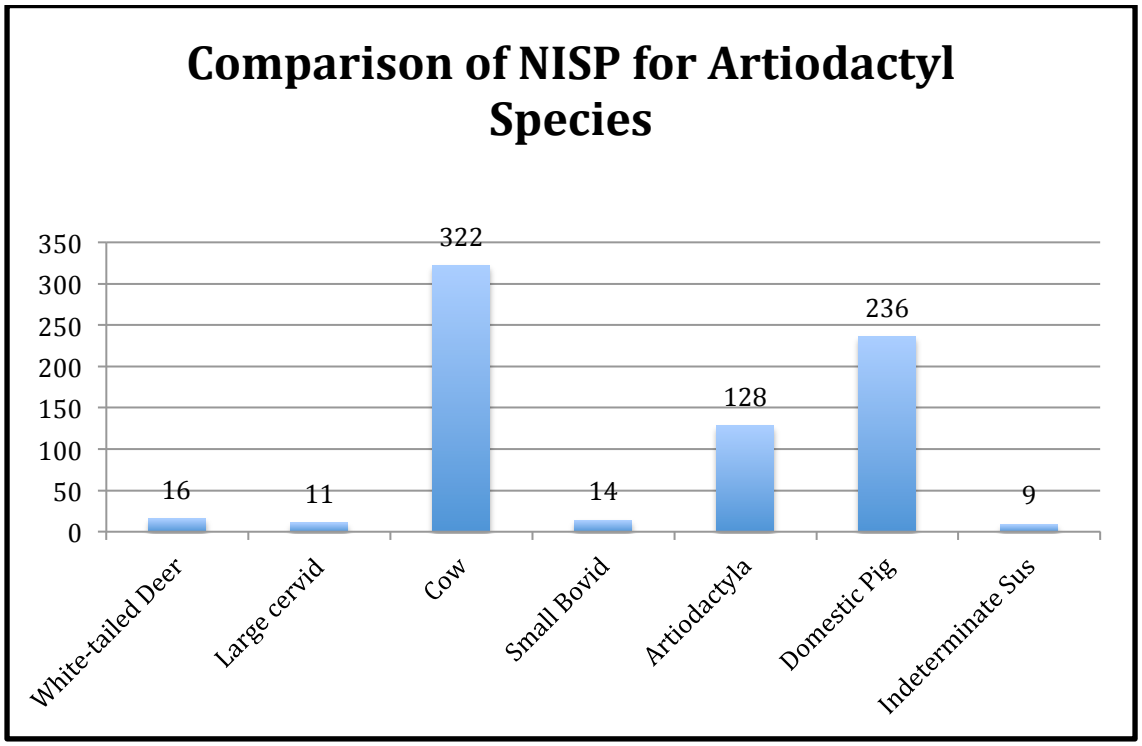


Figure 8. Comparison of NISP for artiodactyl species within the entire Fort Stanwix assemblage.

Analysis of East Barracks, West Barracks, and North Casemates

Looking at the assemblage according to the three areas of the site that were analyzed the NSP for the North Casemates was 414, the NSP for the West

Barracks was 3,200, and the NSP for the East Barracks was 5,417. Unidentified large mammal represented 74.6% of the North Casemates assemblage, while identifiable large mammal represented 4.8% of the assemblage. In the West Barracks unidentified large mammal made up 61.7% and identifiable large mammal made up 9% of the assemblage. A similar breakdown was seen in the East Barracks where unidentified large mammal represented 80.5% of the assemblage and identifiable large mammal made up 7.9% of the assemblage. The low percentage of identifiable large mammal in both the East and West Barracks could potentially be attributed to heavy fragmentation or carcass processing (butchering). Sample size might have affected the low percentage of identifiable taxa in the North Casemates.

East Barracks

There were 461 identifiable specimens in the East Barracks assemblage. Cow accounted for 42% of the identifiable assemblage, and pig made up 29.9% of the assemblage. Domesticated artiodactyl species (cow, pig, and small bovid) represented 75% of the East Barracks identifiable faunal remains, compared to 1% for cervids. Artiodactyla, which made up 17% of the East Barracks assemblage, could include both wild and domesticated taxa. Figure 9 illustrates the division between identifiable taxa in the East Barracks.

Four cellar features from the East Barracks were analyzed for the purpose of this research. These were features 52, 69, 72, and 86. Feature 52 contained 14 identified specimens; Feature 69 contained 162 identified specimens; Feature 72 contained 87 identified specimens; and Feature 86 contained 141 identified

specimens. Cow and pig were the predominant taxa present in each of these features. While there were 15 other taxa present that were identifiable to the species level, the NISP only ranged from one to three for these species. Cow was the predominant species in Features 52, 72, and 86, with pig being predominant in Feature 69 (Figure 10). Figure 11 shows the artiodactyl taxa across the features, expressed in %NISP. These figures correlate with the NISP figures, showing cow as predominant in Features 52, 72, and 86, and pig as predominant in Feature 69.

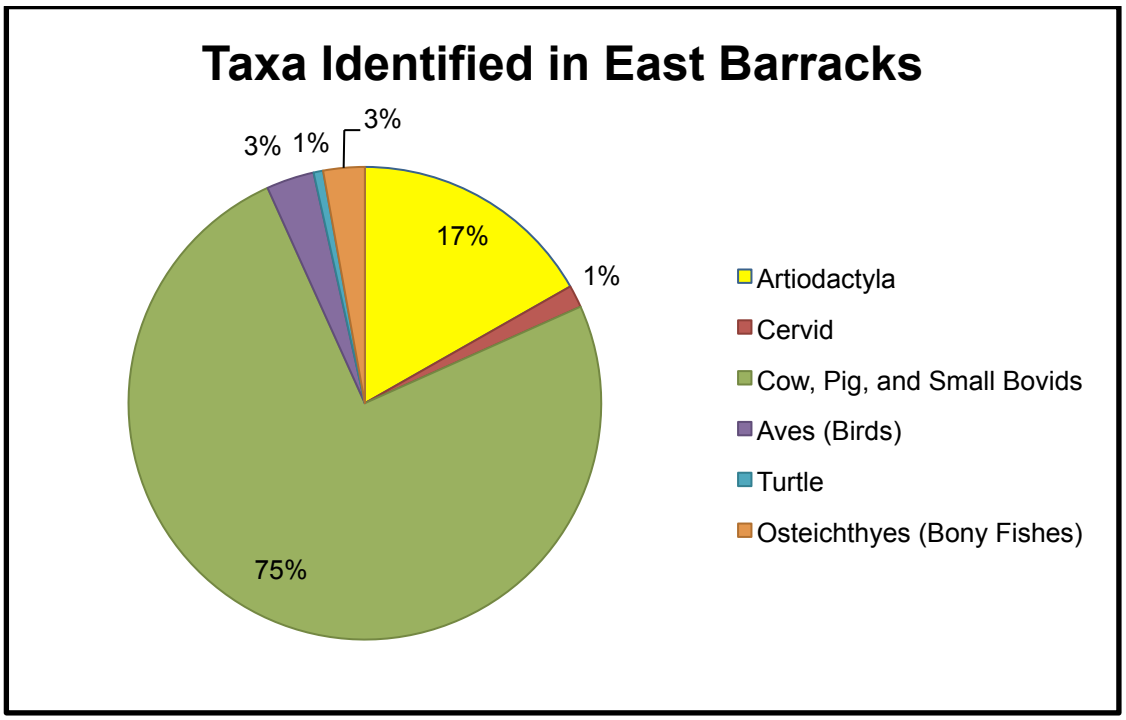


Figure 9. Taxa identified in the East Barracks.

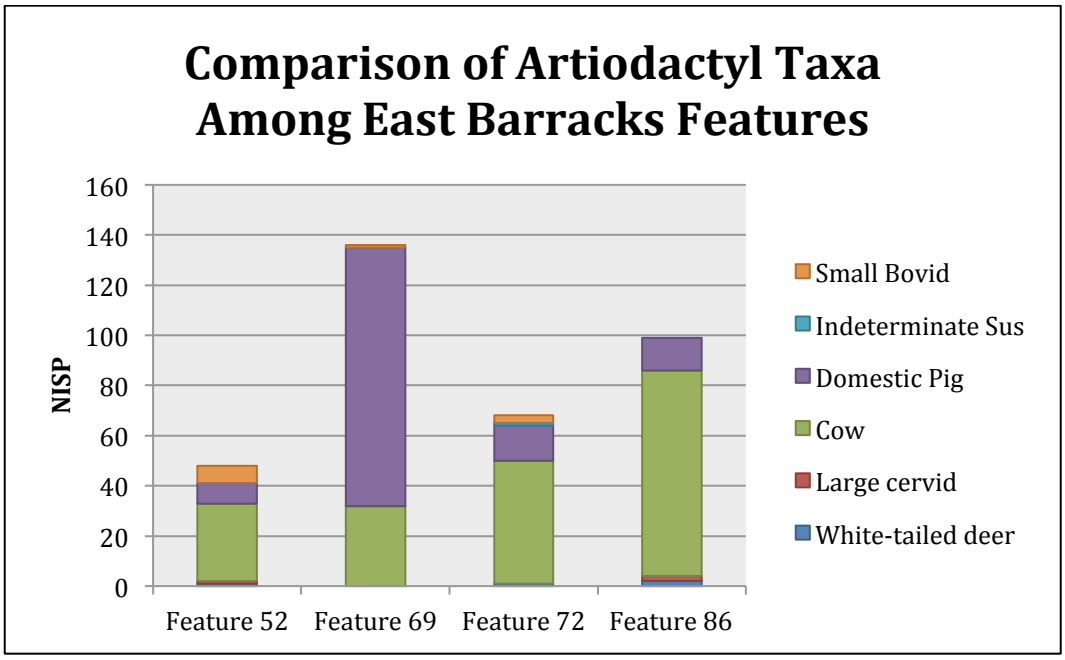
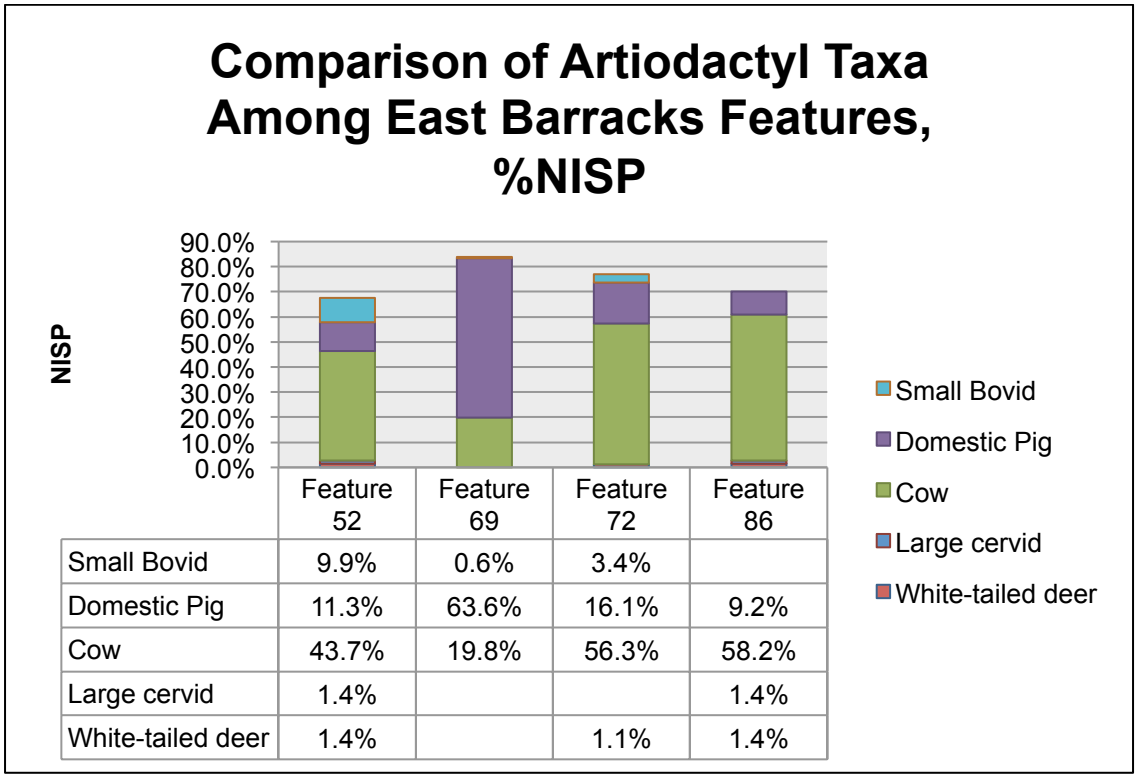


Figure 10. A comparison of artiodactyl taxa among East Barracks features.



	Feature 52	Feature 69	Feature 72	Feature 86
Small Bovid	9.9%	0.6%	3.4%	
Domestic Pig	11.3%	63.6%	16.1%	9.2%
Cow	43.7%	19.8%	56.3%	58.2%
Large cervid	1.4%			1.4%
White-tailed deer	1.4%		1.1%	1.4%

Figure 11. Comparison of artiodactyl taxa among East Barracks features, expressed as %NISP.

Both MNI and NISP correlate with each other, showing cow as the dominant taxa in features 52, 72, and 86 and pig dominant in Feature 69 (Table 7). Using a chi square analysis, the null hypothesis that there was no difference in the frequency between cow and pig among the East Barracks features was tested. The results of this analysis obtained $p<.05$, rejecting the null hypothesis. Thus, there was a significant difference between cow and pig among the East Barracks features.

Table 7 NISP and MNI of Artiodactyl Taxa in the East Barracks.

East Barracks	Feature 52		Feature 69		Feature 72		Feature 86	
Taxon	**NISP**	**MNI**	**NISP**	**MNI**	**NISP**	**MNI**	**NISP**	**MNI**
Odocoileus virginianus (White-tailed deer)	1	1			1	1	2	1
Large cervid	1						2	
Bos taurus (Cow)	31	2	32	2	49	3	82	3
Sus scrofa (Domestic Pig)	8	1	103	2	14	2	13	1
Indeterminate *Sus*					1	1		
Small Bovid	7	1	1	1	3	1		

Comparing domestic taxa (cow, pig, small bovid, and chicken) to wild taxa for each feature shows that domestic taxa were dominant in each assemblage. In Feature 52, 22.5% of the identifiable assemblage was wild and 64.8% was domesticated. The remaining 12.7% was attributed to the taxon Artiodactyla that encompassed both wild and domesticated species. In Feature 69, 4.3% of the assemblage were wild taxa, 84% were domestic taxa, and 11.7% was Artiodactyla. Similar ratios were seen in features 72 and 86 as well with Feature

72 being 2.3% wild taxa, 77% domesticated, and 20.7% Artiodactyla. Feature 86 was comprised of 9.9% wild taxa, 68.1% domesticated taxa, and 22% Artiodactyla. The other species identified in the East Barracks features are listed in Table 8.

Table 8. NISP and MNI of Other Taxa Identified in the East Barracks.

Taxon	Feature 52		Feature 69		Feature 72		Feature 86	
	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI
cf *Zapus sp.* (Jumping Mouse)							1	1
cf Microtinae (Voles, Lemmings and Muskrats)							1	1
Aix sponsa (Wood duck)	1	1	1	1				
Galliformes							1	
Bonasa umbellus (Ruffed Grouse)	2	1	1	1				
Gallus domesticus (Chicken)							1	1
Pheasant sp. cf *Phasianus colchicus* (Ring-necked pheasant)	1	1	3	1				
Colombidae cf *Columba livia* (Domestic Pigeon)	1	1			1	1		
cf *Turdus migratorius* (Robin)	1	1						
Strigidae (Typical Owls)							1	1
Testudines			2					
Emydidae							1	1
Siluriformes	1	1						
Ictalurus							1	1
I. punctatus or *furcatus* (Blue or Channel catfish)							1	1
cf *Catostomus sp. (*Suckers*)*							1	1
Esox lucius (Northern Pike)	7						2	1

Sample biomass of the East Barracks produced a similar result to that of the NISP figures, with cow being the dominant species followed by pig. Figure 12 illustrates the biomass for each artiodactyl taxa identified in the East Barracks. According to this information, cow was the dominant source for meat for those living in the East Barracks at Fort Stanwix, followed by pig and then a variety of other local resources.

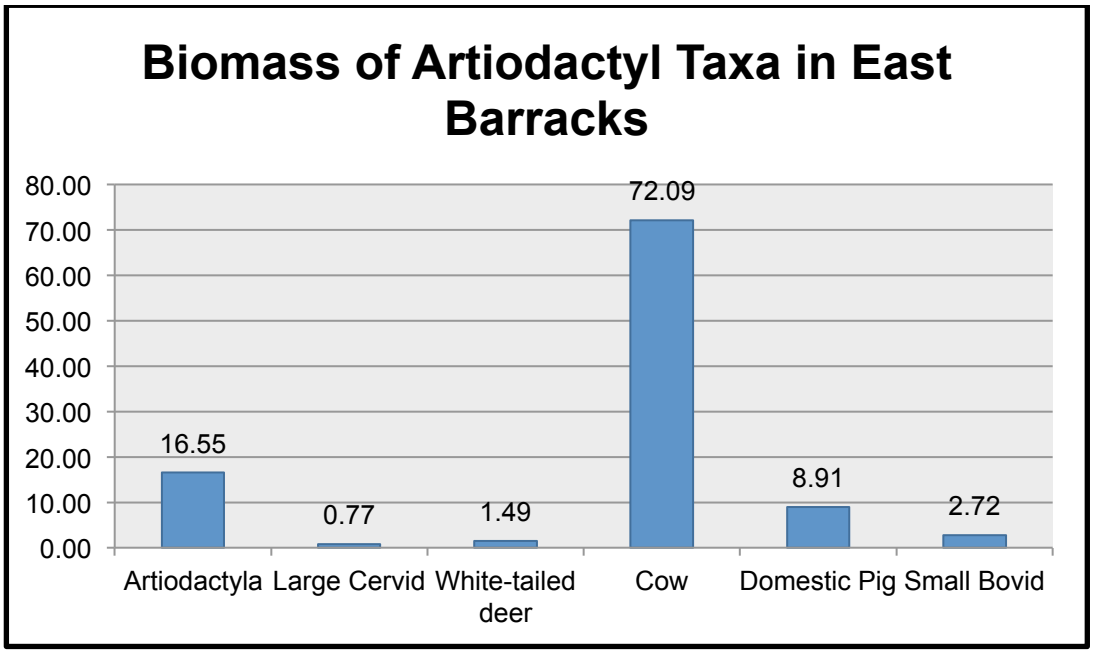
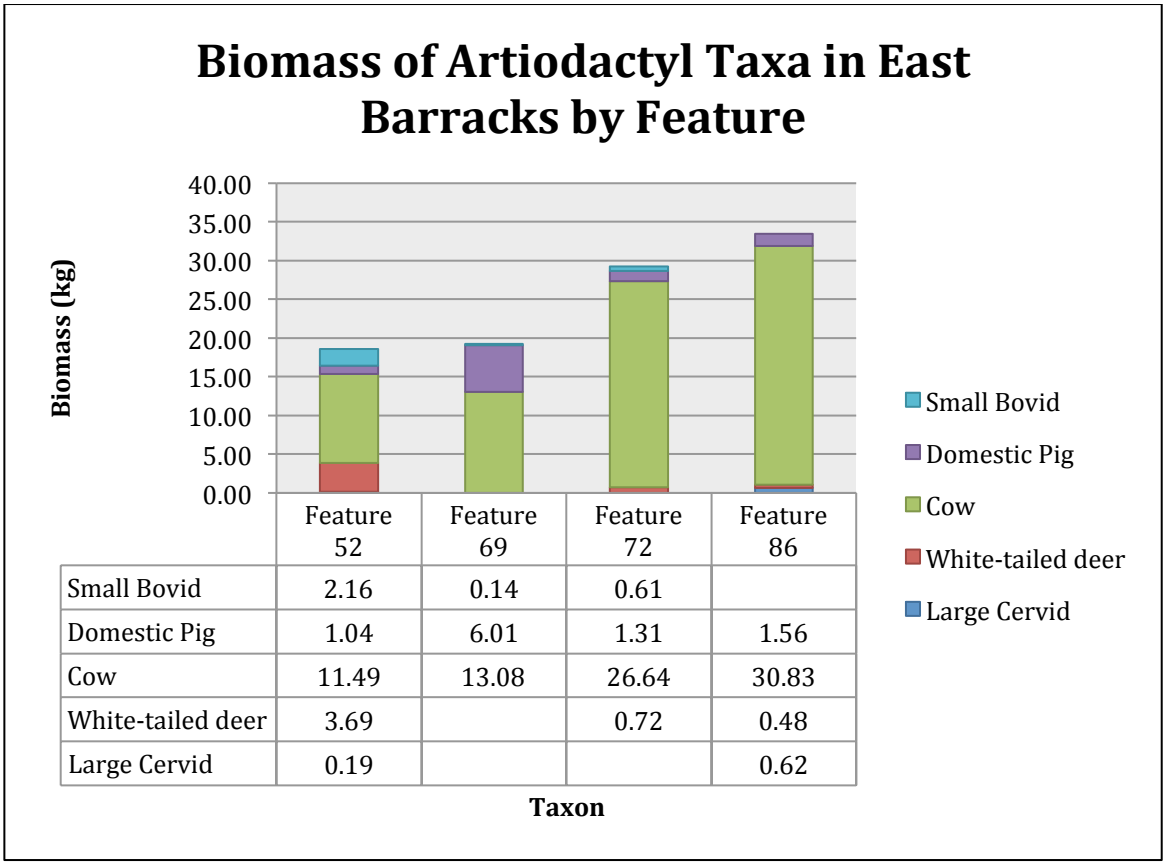


Figure 12. Biomass of artiodactyl taxa in the East Barracks.

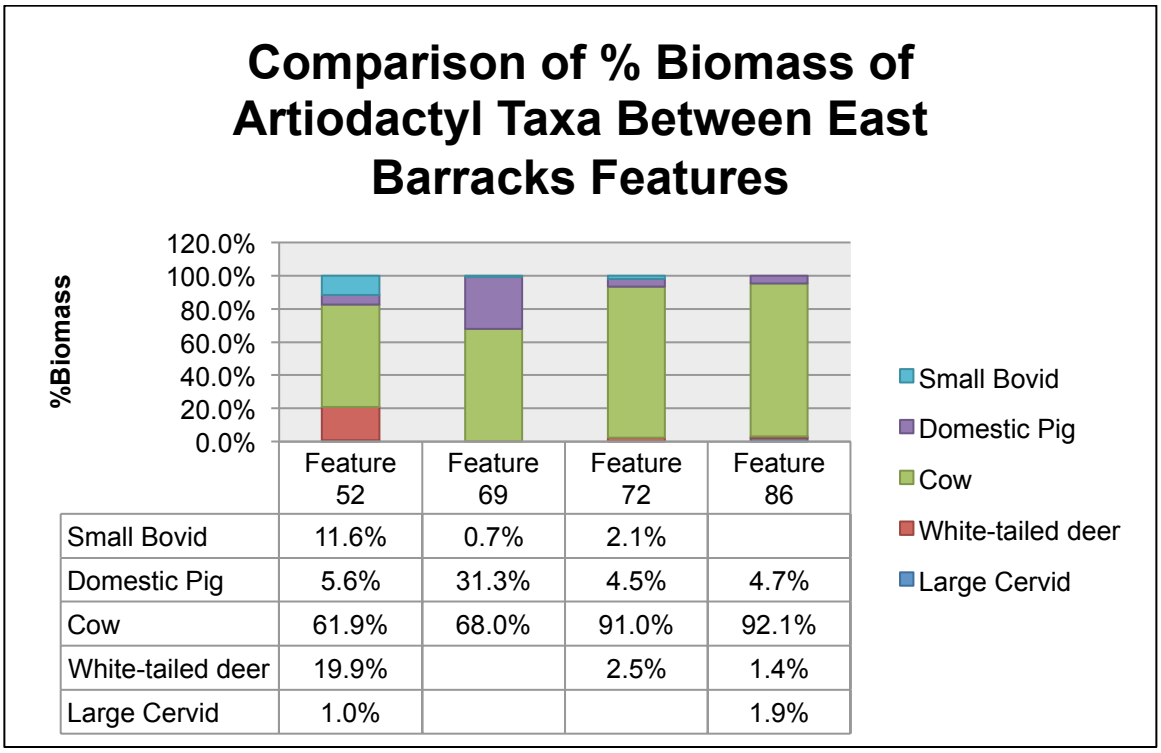
Looking at the biomass of taxa identified in the features in the East Barracks shows similar results with cow as the dominant species in all four features. This is slightly different from the NISP results that showed pig as the dominant species in Feature 69. This difference may have been due to smaller fragmentation of the pig bone than cow, which would give a weight significantly smaller than the weight of cow bone, even when NISP is higher. Figure 13 compares the biomass for each artiodactyl taxa identified in the East Barracks according to feature. Features 72 and 86 contain the largest quantities of cow; almost double that of the other two features. In Feature 52 the biomass of white-tailed deer is triple that of pig. Figure 14 displays the percent biomass of

artiodactyl taxa in the East Barracks by feature. The percent biomass figures correlate with the biomass figures in Figure 13.



	Feature 52	Feature 69	Feature 72	Feature 86
Small Bovid	2.16	0.14	0.61	
Domestic Pig	1.04	6.01	1.31	1.56
Cow	11.49	13.08	26.64	30.83
White-tailed deer	3.69		0.72	0.48
Large Cervid	0.19			0.62

Figure 13. Biomass of artiodactyl taxa in the East Barracks by feature.



	Feature 52	Feature 69	Feature 72	Feature 86
Small Bovid	11.6%	0.7%	2.1%	
Domestic Pig	5.6%	31.3%	4.5%	4.7%
Cow	61.9%	68.0%	91.0%	92.1%
White-tailed deer	19.9%		2.5%	1.4%
Large Cervid	1.0%			1.9%

Figure 14. % Biomass of Artiodactyl Taxa in the East Barracks by feature.

The biomass of the other taxa identified in the East Barracks was so low in comparison to that of the artiodactyl taxa that it was insignificant, therefore the calculations for the biomass of these other taxa are not shown. Looking at both NISP and biomass, Feature 86 contains the highest quantity of fish taxa. The only other feature containing fish is Feature 52. Features 52, 69, and 86 contain similar quantities of bird taxa. No other identifiable taxa other than white-tailed deer, cow, pig, and small bovid were identified in Feature 72.

West Barracks

There were 318 identifiable specimens in the West Barracks assemblage. Cow made up 36.5% of the identifiable assemblage, and pig made up 30.5% of the assemblage. Domesticated artiodactyl taxa (cow, pig, and small bovid) accounted for 71% of the West Barracks identifiable assemblage compared to wild artiodactyl that made up 5% of the assemblage. Wild artiodactyl taxa included white-tailed deer and large cervid, while the Artiodactyla category included both wild and domestic taxa. Figure 15 illustrates the comparison of taxa identified in the West Barracks assemblage.

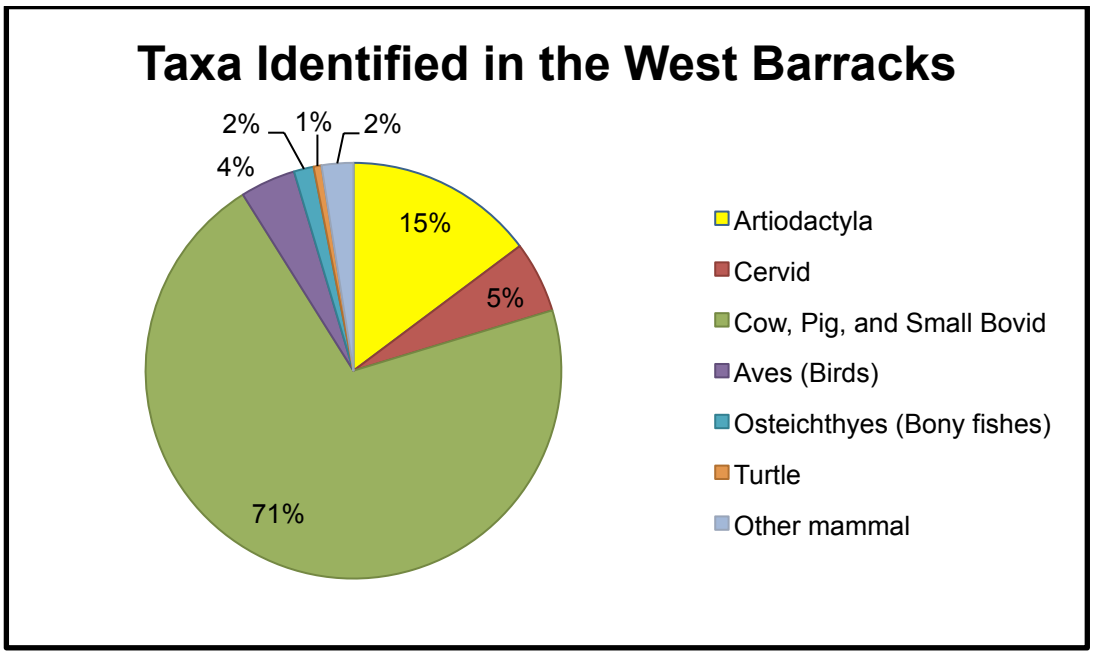


Figure 15. Taxa identified in the West Barracks.

Four cellar features were also analyzed for the West Barracks; Features 3, 57, 60, and 64. Feature 3 contained 38 identifiable specimens, Feature 57

contained 186 identifiable specimens, Feature 60 contained 82 identifiable specimens, and Feature 64 contained 12 identifiable specimens. Table 9 shows NISP and MNI of artiodactyl taxa identified in the West Barracks. Cow and domestic pig were the predominant species present in the West Barracks with cow comprising 36.5% of the assemblage and pig comprising 30.5% of the assemblage. The taxon Artiodactyla, which could include both wild and domestic taxa, made up 15.1% of the West Barracks assemblage, and white-tailed deer comprised 3.1% of the assemblage. The remaining portion of the assemblage consisted of 12 wild species, small bovid, horse, and chicken; however, each of these taxa was represented by a low NISP (Table 10). Cow was the predominant species in features 3 and 60, but was almost equal to pig in feature 57 (Figure 16). Figure 17 shows a comparison of the artiodactyl taxa between the West Barracks features expressed as percent NISP. These figures correlate with the NISP figures. Feature 64 only contained four specimens identifiable as cow with the remaining specimens identified as Artiodactyla, Galliformes, and pheasant.

Table 9. NISP and MNI of Artiodactyl Taxa in the West Barracks.

West Barracks	**Feature 3**		**Feature 57**		**Feature 60**		**Feature 64**	
Taxon	**NISP**	**MNI**	**NISP**	**MNI**	**NISP**	**MNI**	**NISP**	**MNI**
Odocoileus virginianus (White-tailed deer)	1	1	7	2	2	1		
Large cervid	1		7					
Bos taurus (Cow)	28	2	63	3	21	2	4	2
Sus scrofa (Domestic Pig)			66	3	31	2		
Indeterminate *Sus*	1	1	4	1	2	1		
Small Bovid			1	1	1	1		

Table 10. NISP and MNI of Other Identified Taxa in the West Barracks by Feature.

	Feature 3		Feature 57		Feature 60		Feature 64	
Taxon	**NISP**	**MNI**	**NISP**	**MNI**	**NISP**	**MNI**	**NISP**	**MNI**
Vulpes or *Urocyon*			4					
Equus caballus (Horse)					1	1		
Lepridae (rabbits and hares)			1					
Sylvilagus floridanus (Eastern cottontail)	1	1	1	1				
Tamias striatus (Eastern chipmunk)			1	1				
Anseriformes			1					
Galliformes							2	
Gallus domesticus (Chicken)			1	1				
Pheasant sp. cf *Phasianus colchicus* (Ring-necked pheasant)	1	1	6	1			1	1
Colombidae cf *Columba livia* (Domestic Pigeon)			2	1				
Emydidae					2	1		
Lepisosteus (Gar)			1	1				
cf *Catostomus sp. (Suckers)*			2	1	1	1		
Esox lucius (Northern Pike)			1	1				

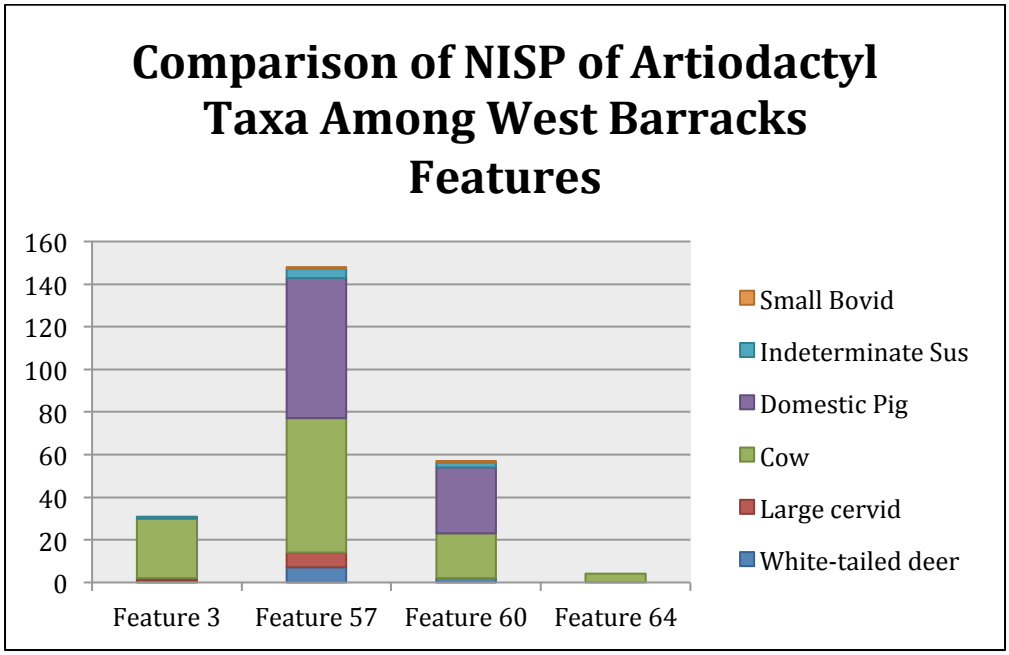
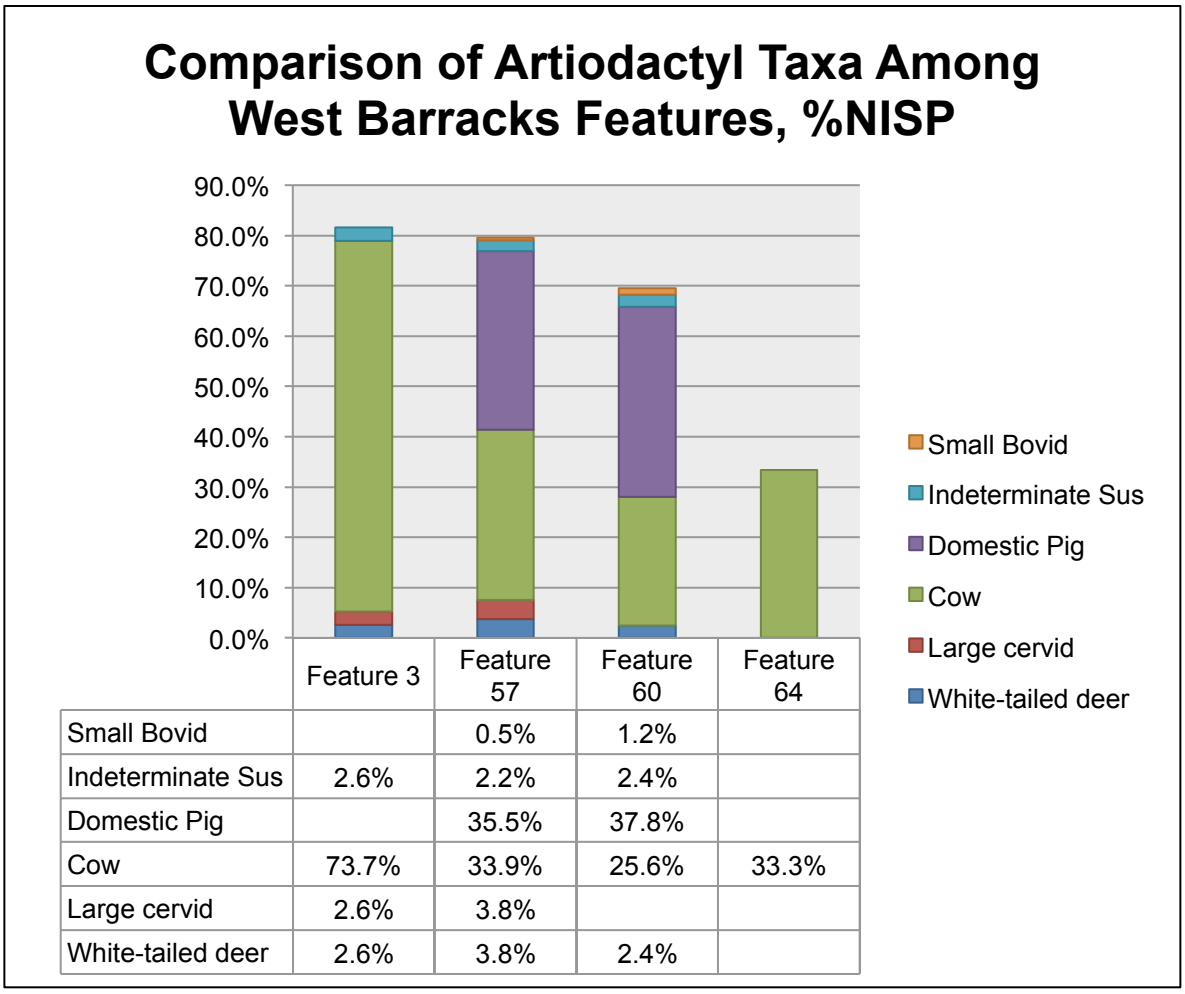


Figure 16. Comparison of artiodactyl taxa among the West Barracks features.



	Feature 3	Feature 57	Feature 60	Feature 64
Small Bovid		0.5%	1.2%	
Indeterminate Sus	2.6%	2.2%	2.4%	
Domestic Pig		35.5%	37.8%	
Cow	73.7%	33.9%	25.6%	33.3%
Large cervid	2.6%	3.8%		
White-tailed deer	2.6%	3.8%	2.4%	

Figure 17. Comparison of artiodactyl taxa among the West Barracks features, expressed as % NISP.

Figure 18 shows the sample biomass for the artiodactyl taxa identified in the West Barracks. According to the biomass results, cow was the dominant source for meat, followed by pig. Artiodactyla, which could include both wild and domestic taxa, also formed a large portion of the biomass assemblage.

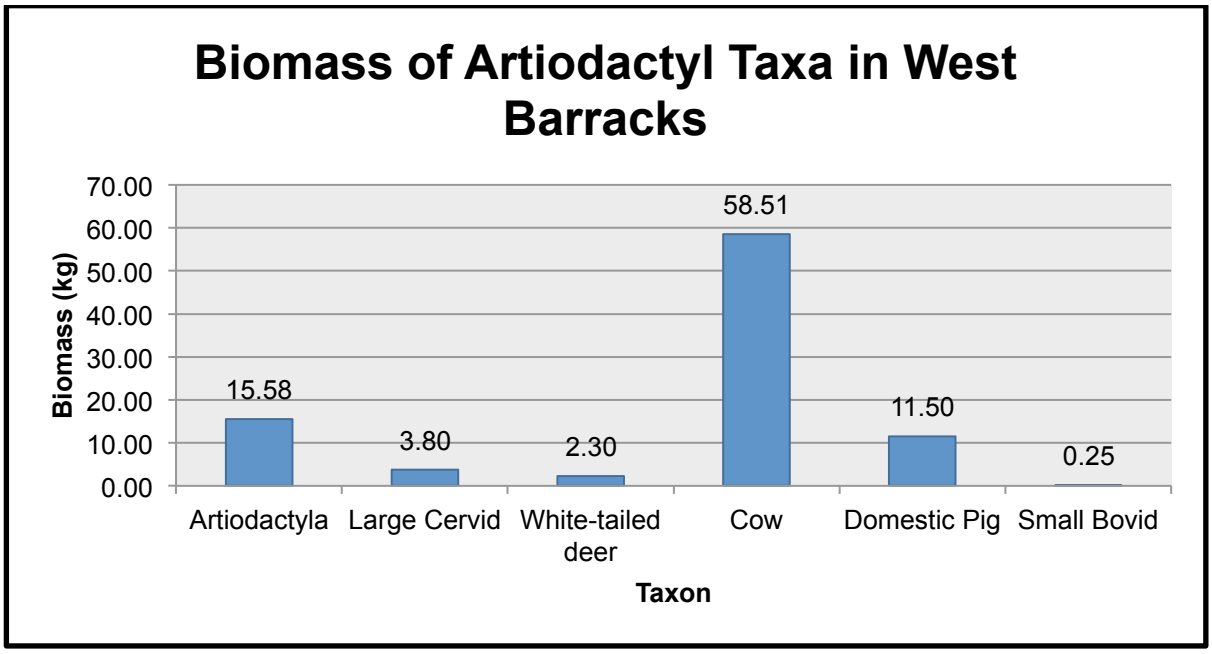
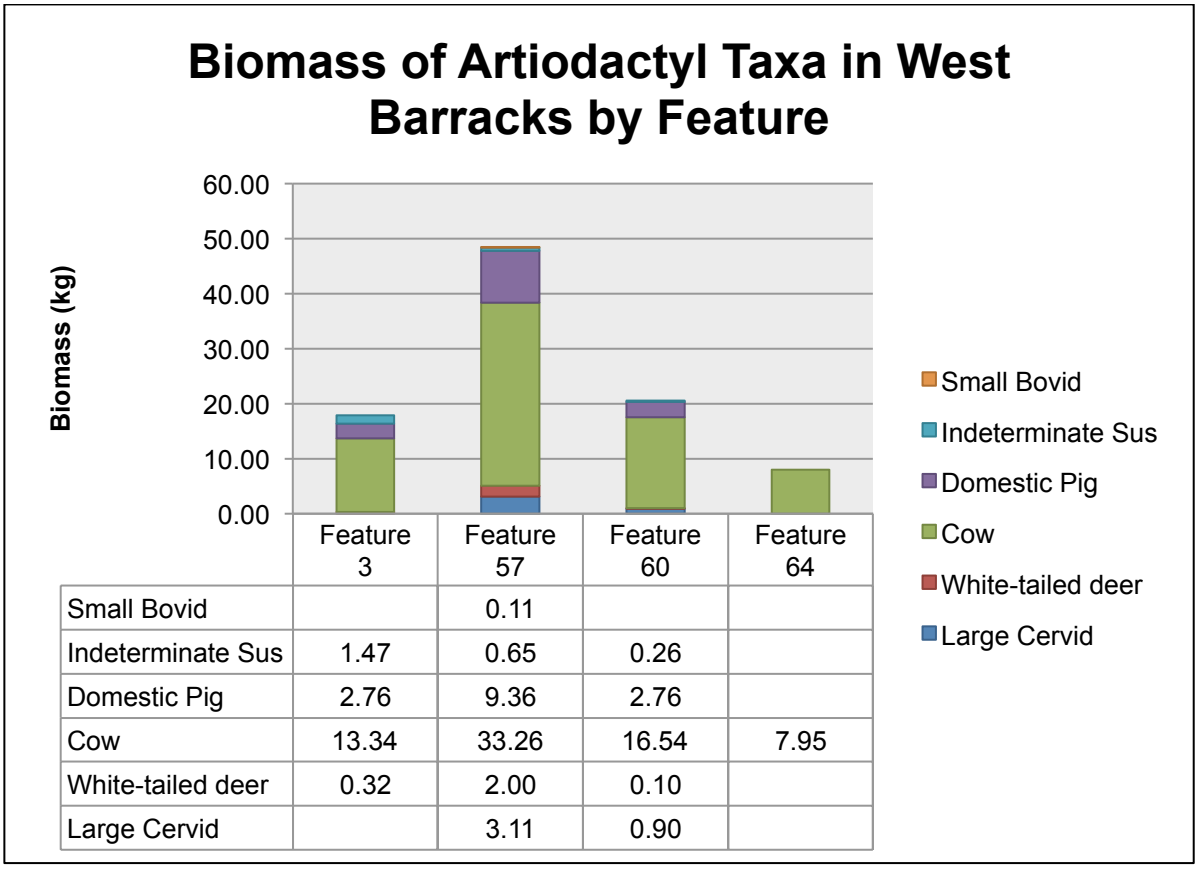


Figure 18. Biomass of artiodactyl taxa in the West Barracks.

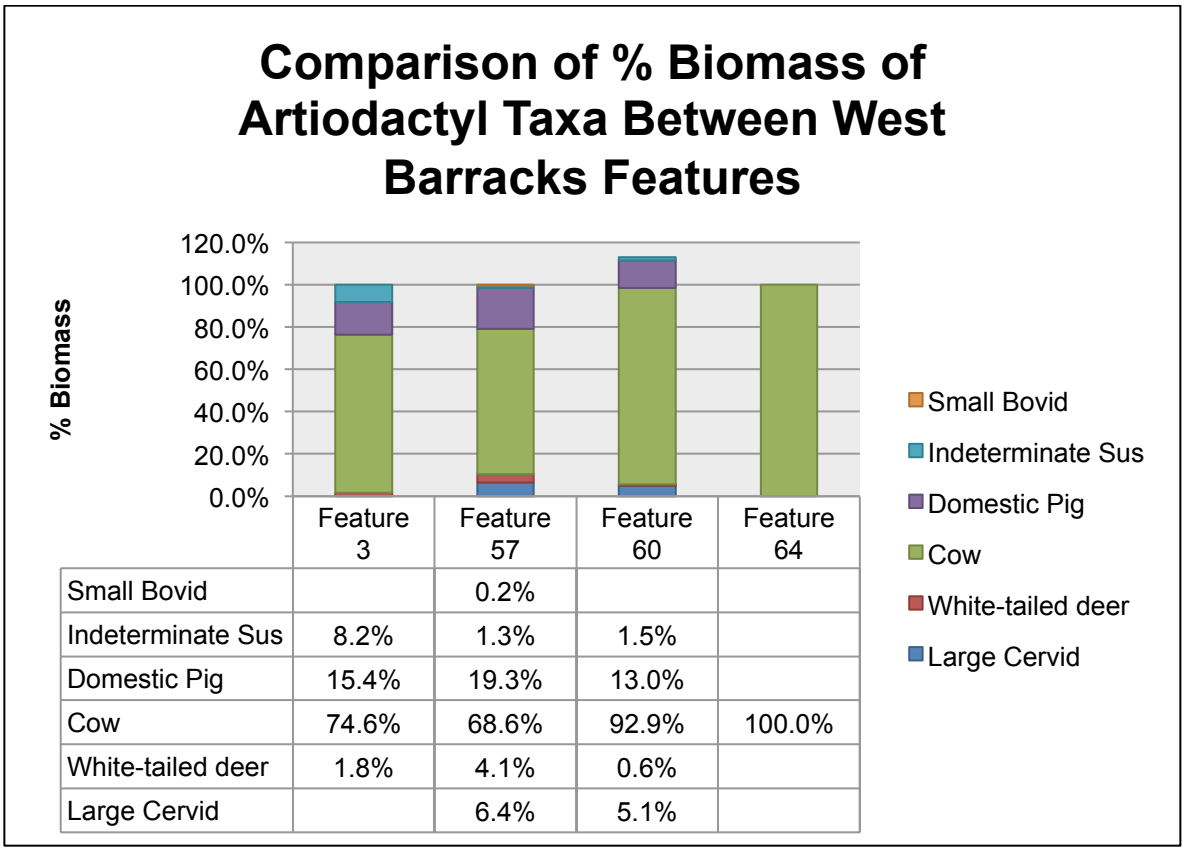
The biomass of taxa identified in the features in the West Barracks shows similar results with cow as the dominant species in all features. These results correlate with those based on NISP. Figure 19 compares the biomass for each artiodactyl taxa identified in the West Barracks according to feature. Feature 57 contains the largest quantity of cow; almost double what was found in either Feature 57 or Feature 60. The biomass of pig in Feature 57 is approximately three times that of pig in Feature 3. Figure 20 compares the percent biomass of artiodactyl taxa between the West Barracks features. The percent biomass figures correlate with the biomass figures, with cow as the predominant taxa across all features. The percent biomass figures also still show cow as much higher in Feature 60 than either Features 57 or 3. Feature 60 contained no specimens identifiable as domestic pig, only indeterminate *Sus* that has a biomass of 0.26 kg. The biomass of the other taxa identified in the West Barracks

was so low in comparison to that of the artiodactyl taxa that it was meaningless, therefore the calculations for the biomass of those taxa are not shown. Feature 57 contains the highest quantity of fish taxa, and it contains the most species that are not Artiodactyla. This may have to do with the sample size of Feature 57. The only other feature containing fish is Feature 60.



	Feature 3	Feature 57	Feature 60	Feature 64
Small Bovid		0.11		
Indeterminate Sus	1.47	0.65	0.26	
Domestic Pig	2.76	9.36	2.76	
Cow	13.34	33.26	16.54	7.95
White-tailed deer	0.32	2.00	0.10	
Large Cervid		3.11	0.90	

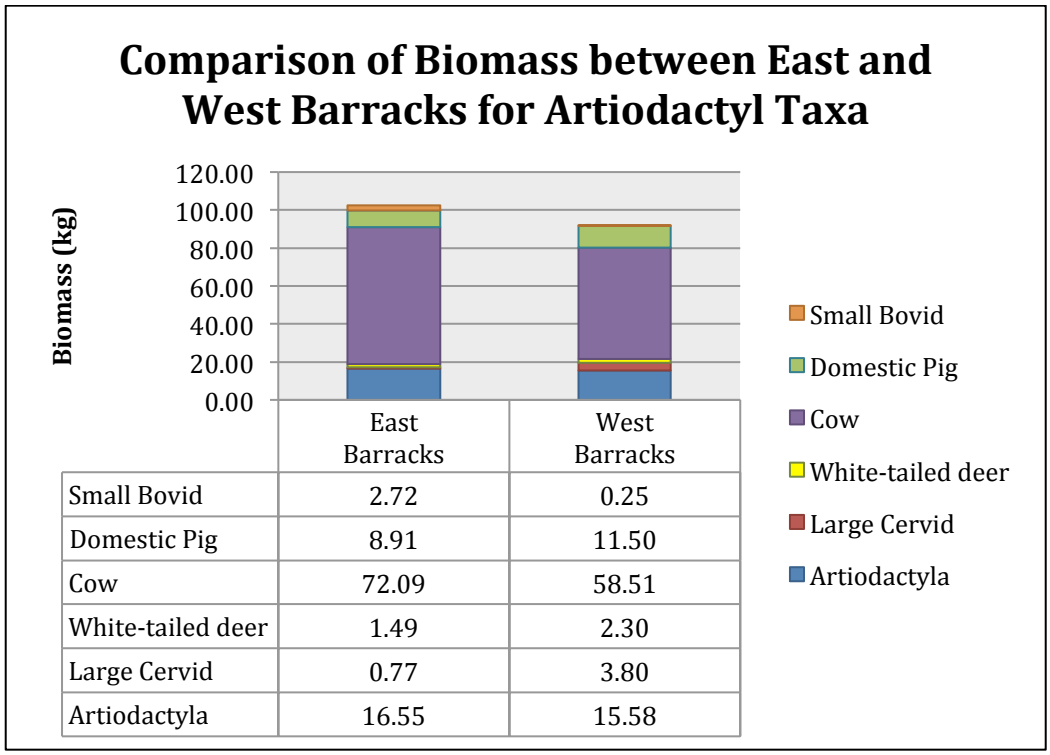
Figure 19. Biomass of artiodactyl taxa in the West Barracks by feature.



	Feature 3	Feature 57	Feature 60	Feature 64
Small Bovid		0.2%		
Indeterminate Sus	8.2%	1.3%	1.5%	
Domestic Pig	15.4%	19.3%	13.0%	
Cow	74.6%	68.6%	92.9%	100.0%
White-tailed deer	1.8%	4.1%	0.6%	
Large Cervid		6.4%	5.1%	

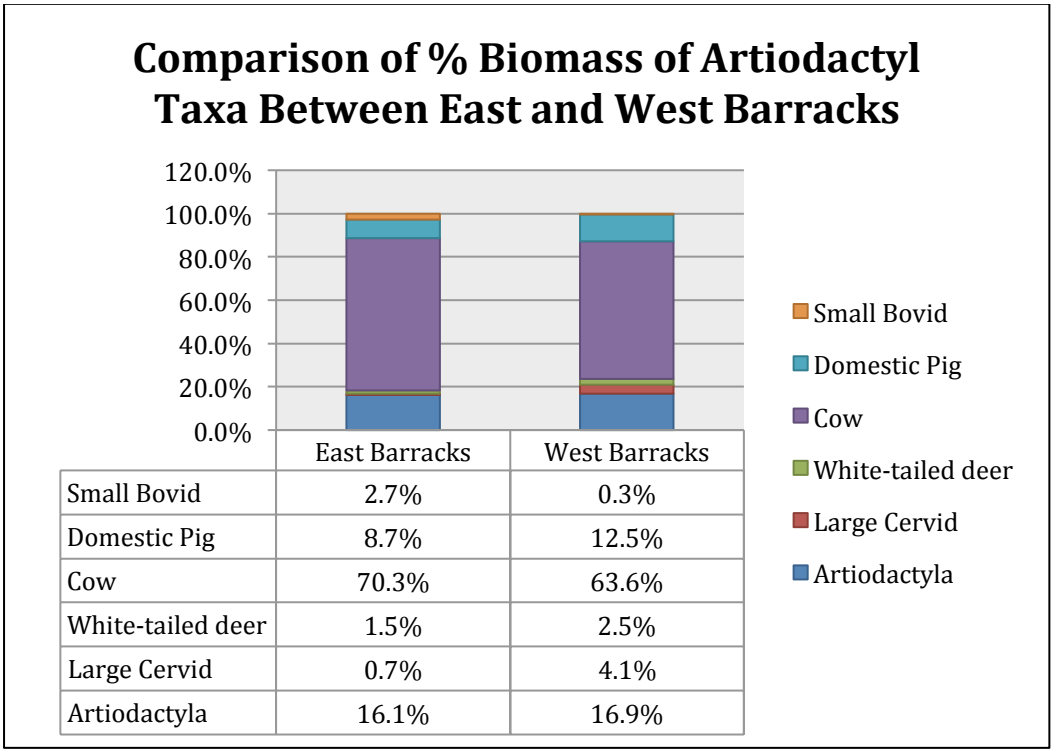
Figure 20. Comparison of the % biomass of artiodactyl taxa between the West Barracks features.

The biomass of small bovid in the West Barracks was less than half than that in the East Barracks, and large cervid biomass was approximately three times higher in the West Barracks than in the East Barracks (Figure 19). The biomass of cow was 13.5 kg more in the East Barracks than the West Barracks, and the biomass of pig was only slightly higher in the West Barracks than in the East Barracks. Looking at the percent biomass of artiodactyl taxa between the East Barracks and the West Barracks, the same results are obtained, with cow as predominant in both, followed by pig (Figure 20).



	East Barracks	West Barracks
Small Bovid	2.72	0.25
Domestic Pig	8.91	11.50
Cow	72.09	58.51
White-tailed deer	1.49	2.30
Large Cervid	0.77	3.80
Artiodactyla	16.55	15.58

Figure 21. Comparison of biomass between the East and West Barracks for Artiodactyla.



	East Barracks	West Barracks
Small Bovid	2.7%	0.3%
Domestic Pig	8.7%	12.5%
Cow	70.3%	63.6%
White-tailed deer	1.5%	2.5%
Large Cervid	0.7%	4.1%
Artiodactyla	16.1%	16.9%

Figure 22. Comparison of % biomass of artiodactyl taxa between the East and West Barracks.

A chi square analysis was conducted to test the null hypothesis that there was no difference in wild and domestic taxa between the East and West Barracks. The value $p<.05$ was obtained, thus rejecting the null hypothesis. There was a significant difference in wild and domestic taxa between the East and West Barracks. There was a significantly higher amount of wild taxa in the East Barracks than in the West Barracks. There was also a difference in the quantity of domestic taxa in the East Barracks than in the West Barracks, but perhaps not as significant a difference as in wild taxa.

North Casemates

Only 21 specimens were identifiable in the North Casemates sample. Cow made up 57.1% of the identifiable assemblage, and pig made up 9.5% of the assemblage. Domesticated artiodactyl taxa (cow, pig, and small bovid) accounted for 71% of the North Casemates identifiable assemblage compared to wild artidactyl that made up 10% of the assemblage. Wild artiodactyl taxa consisted of white-tailed deer only as no large cervid was identified in the sample. Figure 23 illustrates the comparison of taxa identified in the North Casemates assemblage. The identifiable assemblage for the North Casemates was significantly smaller than that of the East and West Barracks and included fewer species. The smaller identifiable assemblage was predictable due to the sample size.

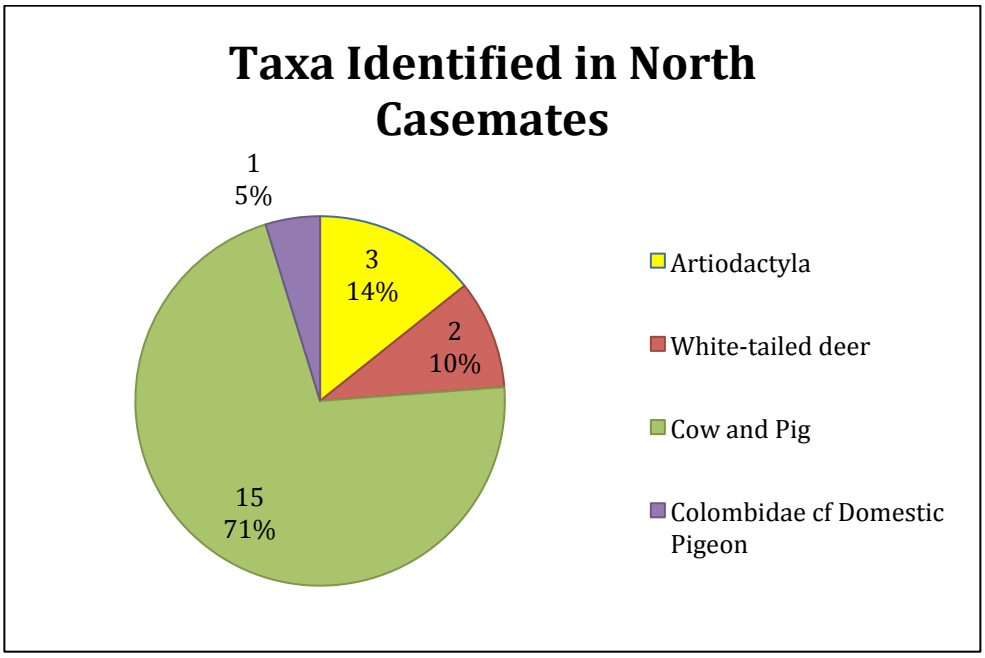
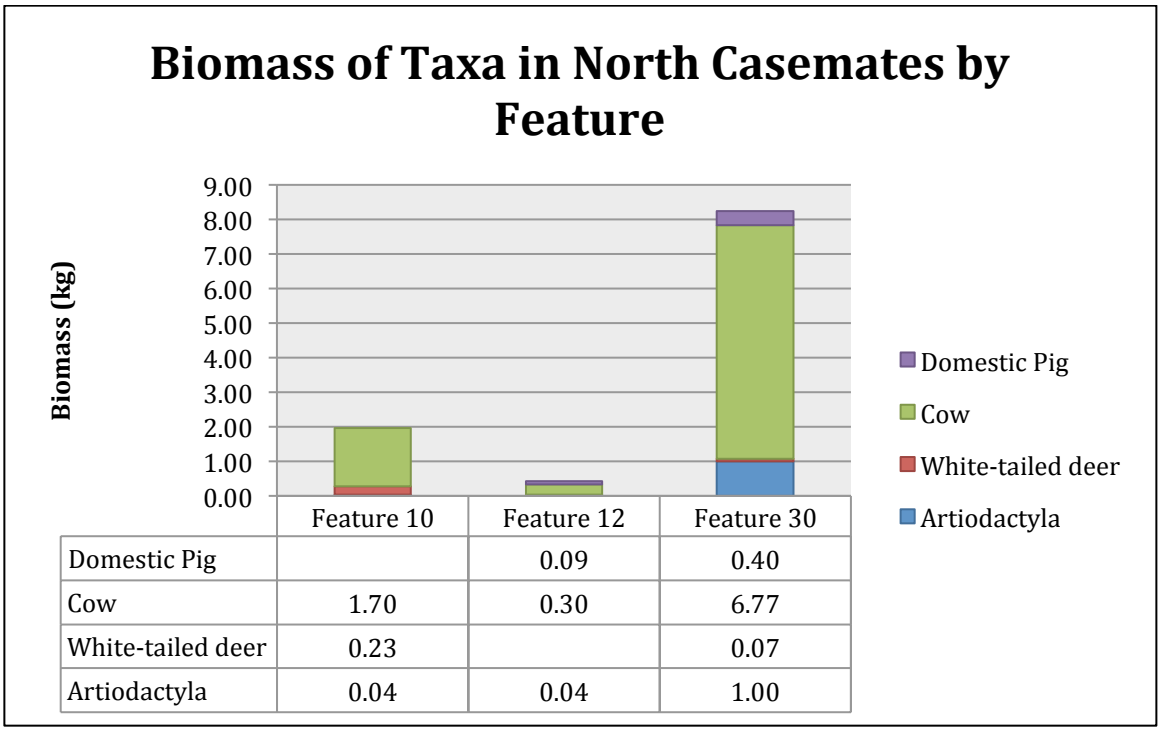


Figure 23. Taxa identified in the North Casemates

The three features sampled from the North Casemates were all fireplace features. Feature 10 contained six identifiable specimens, Feature 12 contained four identifiable specimens, and Feature 30 contained 11 identifiable specimens. Cow was the predominant species in features 10 and 30, and it was equal to the other taxa identified in Feature 12. Domestic pigeon was the only non-artiodactyl species identified in the North Casemates with an NISP of one.

Looking at biomass, cow was the dominant source of meat in the North Casemates. Because of the small sample size, biomass figures were significantly lower than those in the East and West Barracks. Figure 24 illustrates the biomass of artiodactyl taxa in the north casemates. Feature 30 contained the highest quantity of cow, followed by feature 10. Domestic pig was

only identified in features 12 and 30, and the biomass for it was low in both of these features.



	Feature 10	Feature 12	Feature 30
Domestic Pig		0.09	0.40
Cow	1.70	0.30	6.77
White-tailed deer	0.23		0.07
Artiodactyla	0.04	0.04	1.00

Figure 24. Biomass of taxa in the North Casemates by feature

Skeletal Frequency Analysis

In order to learn more about taphonomic processes and animal part usage such as butchering practices at the site, skeletal part frequency was analyzed. This analysis looks at the skeletal frequency according to anatomical regions of cow and pig, the two most common species present in the sample assemblage. The anatomical regions used for the analysis were head, axial, forequarter, hindquarter, forefoot, hindfoot, and foot. Table 11 shows what elements were

attributed to these regions. Skeletal frequency analysis was based on NISP for an element, which was then categorized under one of the above listed regions. Only the East and West Barracks sample assemblages were analyzed as the North Casemates lacked enough identifiable elements to do an adequate analysis of skeletal part frequency in that area.

Table 11. Elements Assigned to Anatomical Regions (Reitz and Wing 2008).

Head	Axial	Forequarter	Hindquarter	Foot
Skull	Vertebrae	Humerus	Innominate	Tarsals
Mandible	Ribs	Ulna	Sacrum	Metatarsals
		Radius	Femur	Metapodials
		Scapula	Patella	Carpals
			Tibia	Metacarpals

Table 12 shows the results of the West Barracks skeletal frequency analysis. There were a total of 145 fragments identifiable to element for cow and 105 for pig. Features 3 and 57 contained the highest NISP by element for cow, and Features 60 and 57 contained the highest NISP by element for pig. The NISP by element was fairly equal in Features 57 and 60 for both cow and pig, but there were a far greater number of identifiable elements for cow in Feature 3 than pig. All parts of the cow were identified in Features 3 and 57, and all parts of the cow except the head were identified in Feature 60. The only feature in which parts from all skeletal groups of pig were identified was Feature 57. More fragments from the head of pig were identified in Features 60 and 57 than what was identified for cow. The head skeletal group was the highest represented group for pig in both features 60 and 57. Fragments were fairly evenly

distributed from the head, forequarter, hindquarter, and foot of cow in Feature 57. In Feature 3 the head, forequarter, and hindquarter portions of cow were the highest represented groups.

Table 13 shows the results of the skeletal frequency analysis for the East Barracks. There were 174 fragments identifiable to element for cow and 140 for pig. The total number of fragments identifiable to element were higher for cow than pig in all features except Feature 69, where pig was drastically higher. Fragments were identified for all skeletal groups of cow in all features except Feature 52 where the axial group was not represented. This was not true for pig. The only skeletal groups identified for pig were head, forequarter, hindquarter, and foot. Of these skeletal groups that were identified, Feature 72 did not contain any fragments for the hindquarter or foot groups. Feature 86 did not contain fragments for the foot group. Of interest is the high number of fragments in the head group in Feature 69. This number far exceeds any other fragment counts for any of the groups for either cow or pig. Fragment frequencies for cow were fairly evenly distributed among the skeletal groups in features 52 and 69. In Feature 52, the group represented by the highest NISP was the hindquarter group, with the rest of the fragments distributed fairly evenly among the remaining groups. In Feature 86 the forelimb, forequarter, and hindquarter groups had the highest number of fragments with the remaining fragments distributed fairly evenly among the remaining groups. This skeletal frequency analysis shows that entire cow skeletons were being utilized across all areas of the site, and that perhaps there was not as much barreled beef being consumed.

The only feature that indicates that the entire skeleton of pig is utilized is in Feature 57. In all other features, only a portion of the pig skeleton was being utilized, which might indicate that barreled pork was more relied upon than fresh pork.

Table 12. West Barracks Skeletal Frequency Analysis.

Feature 3		
Skeletal Group	**Cow**	**Pig**
Head	23	3
Axial	2	
Forequarter	10	1
Hindquarter	13	2
Foot	12	1
Total	60	7

Feature 60		
Skeletal Group	**Cow**	**Pig**
Head		25
Axial	1	
Forequarter	6	4
Hindquarter	5	
Foot	9	1
Total	21	30

Feature 57		
Skeletal Group	**Cow**	**Pig**
Head	11	43
Axial	1	4
Forequarter	12	8
Hindquarter	18	5
Foot	18	4
Total	60	64

Feature 64		
Skeletal Group	**Cow**	**Pig**
Head		
Axial		
Forequarter		
Hindquarter	3	
Foot	1	
Total	4	

Table 13. East Barracks Skeletal Frequency Analysis.

Feature 52		
Skeletal Group	**Cow**	**Pig**
Head	8	4
Axial		
Forequarter	3	2
Hindquarter	3	1
Foot	17	1
Total	31	8

Feature 72		
Skeletal Group	**Cow**	**Pig**
Head	4	10
Axial	3	
Forequarter	8	4
Hindquarter	19	
Forefoot	15	
Total	49	14

Feature 69		
Skeletal Group	**Cow**	**Pig**
Head	4	95
Axial	8	
Forequarter	6	4
Hindquarter	7	5
Foot	7	1
Total	32	105

Feature 86		
Skeletal Group	**Cow**	**Pig**
Head	7	10
Axial	3	
Forequarter	16	2
Hindquarter	15	
Foot	21	1
Total	62	13

Archaeological Formation and Taphonomic Processes

Archaeological formation processes are the processes that allowed the archaeological record to be formed. Two types of archaeological formation processes are recognized, cultural and natural. Cultural processes are the result of people, and natural processes are the result of the environment and were not a result of culture (Fagan 1996). Items in an archaeological site undergo taphonomic processes from the time they are deposited to the present. Some of these processes are only natural and have no cultural causes (Lyman 2010). However, cultural processes can impact a site such as chemical dumping and depositional movement of sediments. Examples of taphonomic processes include rodent or carnivore gnawing, fragmenting, and weathering. Artifacts can undergo alterations or modifications before and after becoming part of an archaeological site. When discussing faunal remains, first-order changes that originate culturally are modifications made by people during the capture and use of animals and their parts (Reitz and Wing 2008:124). These modifications provide information about the history of an assemblage. In order to learn more about the taphonomic and formation processes at Fort Stanwix, this analysis looked at burning, weathering, and breakage of the faunal remains.

Burning

A total of 2,216 fragments in the Fort Stanwix assemblage were burnt. This figure accounts for 24.5% of the total assemblage. Different types of burning were recorded such as calcined, reddened, blackened, blue-black,

multiple-mostly blackened, and multiple-mostly calcined. Calcined fragments accounted for the largest portion of the burned assemblage at 62.3%. Fragments that had multiple burning types but were mostly calcined accounted for 13% of the assemblage. This type was followed by multiple-mostly calcined (9.5%) and blackened (7%). Reddened made up 3.7% of the burnt assemblage, and blue-black and indeterminate burning were the least common burn types at .3% and .7% respectively.

A total of 1,258 fragments in the East Barracks were burnt. This figure accounts for 58.9% of the total burnt assemblage and 23.22% of the East Barracks assemblage. A little under a third of the bones from each feature were burned, except for Feature 52 in which only 10% was burned (Table 14).

Table 14. Percent of the East Barracks Burned Assemblage.

Feature	% of East Barracks Sample Burnt
52	10%
69	28.90%
72	29.30%
86	31.60%

Because Fort Stanwix was reported to have burned twice in its history, burning was analyzed in each feature according to level. Table 15 displays the results of this analysis. The percent of level burned is how many fragments in each total level assemblage were burned. In features 69, 72 and 86 there is a much higher percent of burnt fragments in the assemblage in Level II than in

Level III. The percentage of burnt fragments in Feature 52 was only slightly higher in Level IV than in Level III.

Table 15. Burnt Fragments in the East Barracks by Feature and Level.

Provenience	# of Burnt Fragments	% of Level Burned
Ft 52, Lvl III	35	13.6%
Ft 52, Lvl IV	93	18.9%
Ft 69, Lvl II	280	39.6%
Ft 69, Lvl III	84	9.4%
Ft 72, Lvl II	354	31.2%
Ft 72, Lvl III	15	7.7%
Ft 86, Lvl II	157	63.1%
Ft 86, Lvl III	240	16.1%

A total of 33.4% of the burned specimens from the site came from the West Barracks. Burned fragments made up 22.3% of just the West Barracks assemblage. Feature 57 contained the largest percentage of burnt fragments at 16.8% of its assemblage burned. The other three features possessed much lower percentages of burnt fragments (Table 16).

Table 16. Percent of Burned Fragments by Feature in the West Barracks Burned Assemblage.

Feature	% of West Barracks Sample Burned
3	3.5%
57	16.8%
60	1.7%
64	.3%

Looking at the burnt assemblage in the West Barracks according to feature and level, no clear pattern emerges (Table 17). It is interesting to note that Level IV of Feature 60 contained no burnt fragments. Feature 64, not shown in the table below, only contained 11 burnt fragments.

Table 17. Burnt Fragments in the West Barracks by Feature and Level.

Provenience	# of Burnt Fragments	% of Level Burned
Ft 3, Lvl IV	79	14.4%
Ft 3, Lvl V	33	55.9%
Ft 57, Lvl II	81	28.1%
Ft 57, Lvl III	333	41.7%
Ft 57, Lvl IV	124	13.4%
Ft 60, Lvl II	42	14.0%
Ft 60, Lvl III	11	30.6%
Ft 60, Lvl IV	0	0%

The North Casemates burned assemblage represented 7.7% of the Fort Stanwix burned assemblage, and burnt fragments made up 39.9% of the North Casemates sample. Feature 10 comprised 15.2% of the North Casemates sample, Feature 12 made up 5.3%, and Feature 30 made up 19.3% of the sample. Considering these features were fireplaces, it is surprising that these figures are not higher. This lack of bone may suggest that the features were cleaned out. Feature 10 was the only stratified feature sampled in this area at the site. Level II of Feature 10 contained 48 burnt fragments that represented 71.6% of the level II assemblage. Level III of the same feature contained 15 burnt fragments, making up 42.9% of the level III assemblage.

Breakage and Weathering

In the Fort Stanwix assemblage, specimens with both new and old breakage accounted for the highest percentage of the sample, followed by old breakage (Figure 25). Specimens that displayed no breakage were complete skeletal elements. There were 143 specimens in the Fort Stanwix assemblage that were complete skeletal elements.

In the North Casemates assemblage 5.1% had old breakage, .2% had new breakage, 94.4% had both new and old breakage, and .2% displayed no breakage. In the East Barracks, 3.5% of the assemblage had old breakage, .3% had new breakage, 83.8% had both new and old breakage, and 1.7% was complete skeletal elements. The West Barracks had similar ratios of breakage types with specimens with old breakage making up 3.5% of the sample, .33% had new breakage, 94.5% had both new and old breakage, and 1.7% displayed no signs of breakage. This trend follows the same pattern as the ratios for the whole Fort Stanwix assemblage with specimens displaying both new and old breakage making up the largest percentage of breakage type in the sample.

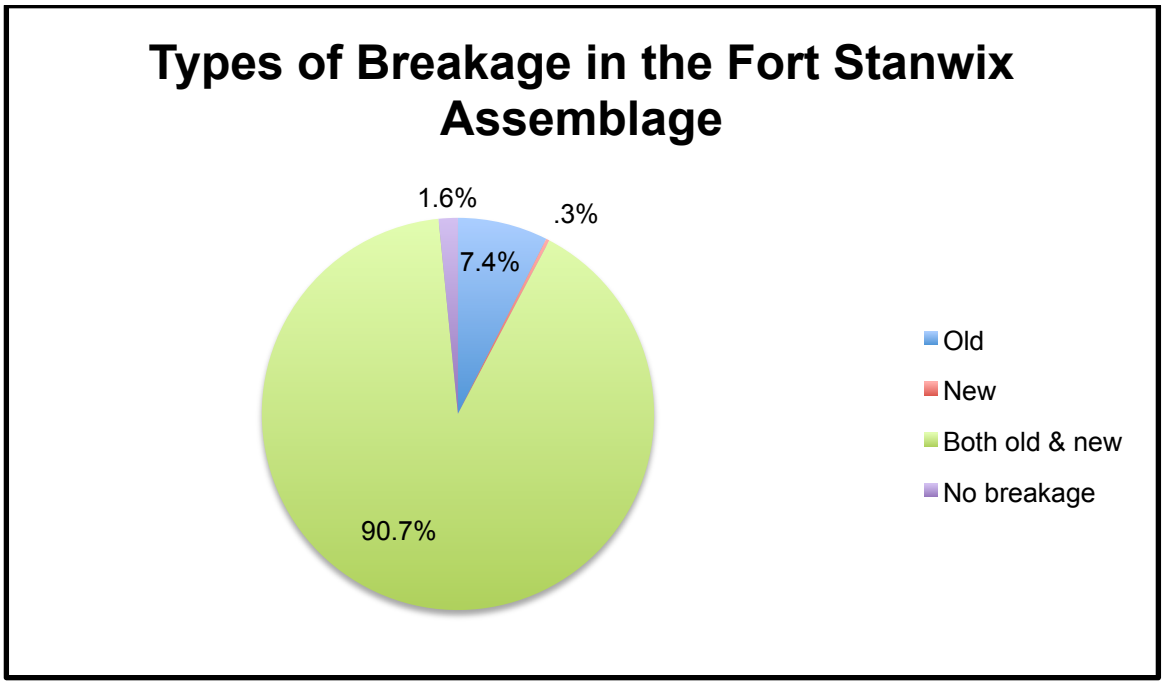


Figure 25. Type and percentage of breakage in the Fort Stanwix assemblage.

A total of 4,085 specimens, or 45.2% of the Fort Stanwix assemblage, were weathered. Specimens that were both root-etched and weathered made up 54.7% of the assemblage (4,942 specimens). In the North Casemates Assemblage, weathered specimens represented 42% of the assemblage, and weathered and root-etched specimens accounted for 58% of the assemblage. Weathered specimens made up 44% of the assemblage in the West Barracks, and both weathered and root-etched specimens made up 56% of the assemblage. In the East Barracks, weathered specimens accounted for 46% of the assemblage with both weathered and root-etched specimens making up 54% of the assemblage. Specimens that were both weathered and root-etched accounted for a slightly higher percentage of the assemblage in each area and for the whole assemblage than specimens that were only weathered. That all of

the specimens in the assemblage were weathered signifies that the assemblage was exposed to the elements at some point in the taphonomic process. This weathering could have resulted from the assemblage being exposed for a period of time after its disposal or after excavation. The root etching would signify that plant-life was impacting the faunal remains during its deposition.

Other Contemporary Fort Faunal Assemblages

The faunal assemblage from Fort Stanwix was compared to three other contemporary fort assemblages to examine ways in which this fort was similar to forts of this period and ways in which it differed. This comparison allowed researcher to determine how frontier forts of this period adapted to their situation and if geography had an impact on diet. The fort faunal assemblages examined were Fort Michilimackinac, Fort Ligonier, and Fort Haldimand.

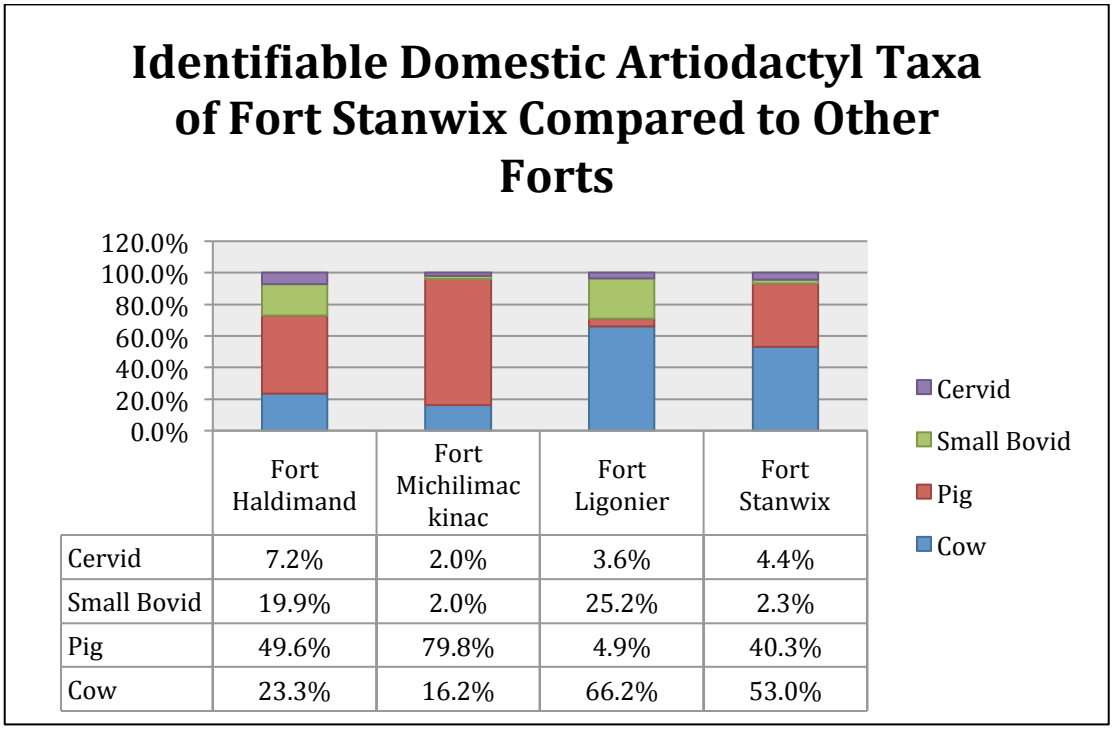
In his analysis of Fort Michilimackinac, Cleland (1971) analyzed and compared the faunal remains from French and British refuse pits. For this research, the information from the British refuse pits (1760-1780) was utilized. Cleland found that the faunal assemblage from the British refuse pits fit with what would be expected of a typical British diet. There were eight species of mammals identified, 16 species of birds, and four species of fish. Cow represented 4.1% of the assemblage, and pig made up 22.2% of the collection. Cervidae and small bovid were identified, but each only made up a fraction of a percent of the collection (.6% and .3% respectively). A high number of passenger pigeon was identified with a minimum of 22 individuals. Cleland concluded that the British were not heavily dependent on local food sources, and

the meat of domestic species basically replaced game meats. From this collection, it is estimated that the British occupants at Fort Michilimackinac obtained more than three quarters of their meat from domestic animals and less than one tenth from wild big game. Elizabeth Scott's analysis (1991, 2007) looked at several assemblages from different houses on the site in order to determine if socioeconomic and ethnic differences could be inferred from the faunal remains. Only one of the houses in Scott's analysis related to a military occupation, House A-B, which was occupied by a British officer. Examining the biomass of the faunal collection from this household, fish represented the largest contribution of meat at 23.4%. Chicken represented 12.4%, followed by pig at 5.7%. Scott concluded that, in general, domesticated animals other than chicken were less important in the diet at Fort Michilimackinac. The only wild mammal used was hare, but only made up less than 1% of the meat in the diet. The lack of dependence on wild mammals combined with the importance of chicken, game birds, and fish indicated a stereotypically British diet. The difference between Cleland's and Scott's studies could have been attributed to the assemblages each researcher was examining. Cleland's research primarily focused on British and French military assemblages, while Scott was examining various ethnic households within Fort Michilimackinac. Looking at these two studies, a typical British military diet would most likely resemble that which Cleland describes. A common factor between these two assemblages that is characteristic of a typical British diet is the lack of wild mammals and the presence of game birds.

The faunal assemblage from Fort Ligonier and analyzed by Grimm (1970) was excavated from a number of areas at the site. A total of 40,537 bone fragments were recovered. Over one-half of the identified bones were cattle, small bovid was secondary in the collection, and white-tailed deer was the third most common animal. Pig followed and appeared to have been secondary as a source of fresh meat, most likely because pork would have been supplied as salt pork that leaves no archaeological trace. Wild species such as bear, raccoon, beaver, bobcat, and turkey was also present. Birds were present in small numbers and included domestic chickens and ducks, turkey, grouse, wild duck, and passenger pigeon. Drumfish and sucker were the only two species of fish identified. Some turtle was also present in the assemblage.

A total of 6,300 bone fragments were analyzed from Fort Haldimand, 1000 of which were burned. Approximately 50% of the faunal collection was fish, with catfish as the most abundant fish species followed by bass and pike species. Only six turtle bones were identified. There were 241 bird bone fragments with duck and pigeon as the two most abundant species. Most of the bird species identified were wild species. Pig, cattle, and small bovid were the most abundant mammal species with some deer present but in much smaller quantities than the domestic large mammals. A full range of body parts were identified for both pig and cow. Among the diagnostic faunal elements, small bovid remains were almost as common as cattle. The only large wild mammal exploited was white-tailed deer (Pippin 2010).

Figure 26 shows how the percent NISP of artiodactyl taxa compared between the forts. Pig was present in higher quantities at both Fort Haldimand and Fort Michilimackinac than cow. The figures for cow at these forts were much lower than what was found at either Fort Ligonier or Fort Stanwix. Cervid was present in similar quantities among all four forts, but small bovid was higher at Fort Haldimand and Fort Ligonier. At Fort Stanwix, there was not a large difference between the percent NISP of cow and pig, setting it apart from the other three forts.



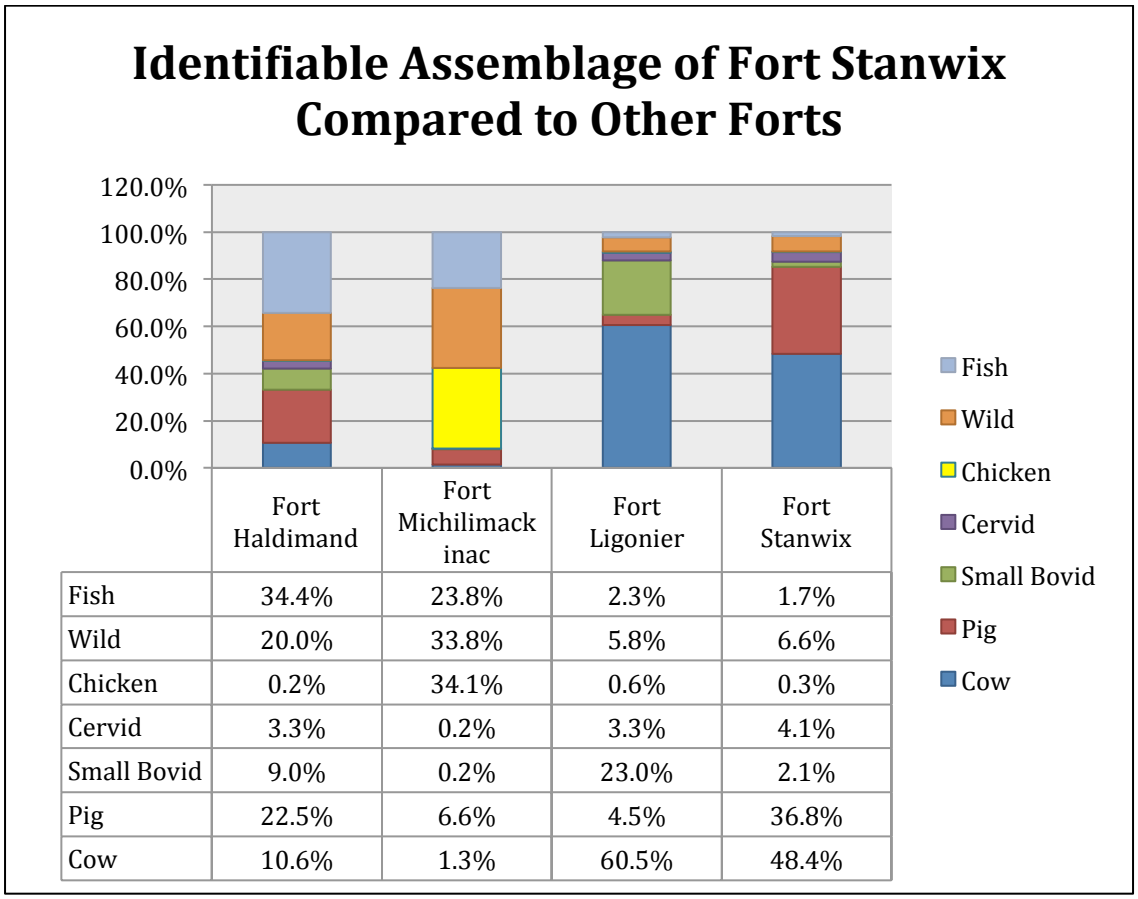
	Fort Haldimand	Fort Michilimackinac	Fort Ligonier	Fort Stanwix
Cervid	7.2%	2.0%	3.6%	4.4%
Small Bovid	19.9%	2.0%	25.2%	2.3%
Pig	49.6%	79.8%	4.9%	40.3%
Cow	23.3%	16.2%	66.2%	53.0%

Figure 26. A comparison of the %NISP Artiodactyla between Fort Stanwix and other forts.

A chi square analysis was conducted to test the null hypothesis that there was no difference in artiodactyl taxa between the four forts. A value of $p<.05$ was obtained, thus the null hypothesis was rejected. There was a significant difference in artiodactyl taxa between the four forts. Fort Haldimand, Fort

Ligonier, and Fort Stanwix had much higher quantities of pig than at Fort Michilimackinac. Fort Ligonier had much higher quantities of cow and small bovid than at the other three forts.

Figure 27 compares the identifiable assemblage of Fort Stanwix to the identifiable assemblages of Fort Haldimand, Fort Michilimackinac, and Fort Ligonier. The comparison is expressed in percent NISP. Each fort is unique in the distribution of taxa in the assemblage. However, both Fort Haldimand and Fort Michilimackinac contain higher quantities of identifiable fish than at either Fort Ligonier or Fort Stanwix. Fort Ligonier is unique with the high quantity of cow compared to other taxa in its assemblage. It is also set apart by the high percent NISP of small bovid. Looking at wild taxa, Fort Haldimand and Fort Michilimackinac also contain higher percent NISP of wild taxa than at either Fort Stanwix or Fort Ligonier. Also of note is the high amount of chicken at Fort Michilimackinac. The other three forts have low quantities of chicken in their assemblages. Other than chicken, domestic taxa are in fairly low amounts at Fort Michilimackinac compared to the other forts. Fort Haldimand and Fort Stanwix both contain a higher percent NISP of pig than at either Fort Ligonier or Fort Michilimackinac.



	Fort Haldimand	Fort Michilimackinac	Fort Ligonier	Fort Stanwix
Fish	34.4%	23.8%	2.3%	1.7%
Wild	20.0%	33.8%	5.8%	6.6%
Chicken	0.2%	34.1%	0.6%	0.3%
Cervid	3.3%	0.2%	3.3%	4.1%
Small Bovid	9.0%	0.2%	23.0%	2.1%
Pig	22.5%	6.6%	4.5%	36.8%
Cow	10.6%	1.3%	60.5%	48.4%

Figure 27. Identifiable assemblage of Fort Stanwix compared to other forts, expressed in %NISP.

A chi square analysis was conducted to test the null hypothesis that there was a difference in wild and domestic taxa between the four forts. A value of $p<.05$ was calculated, thus the null hypothesis was rejected. There was a significant difference in wild and domestic taxa between the four forts. Fort Michilimackinac and Fort Haldimand each had much higher quantities of wild taxa than at either Fort Ligonier or Fort Stanwix. Fort Ligonier also had a much higher quantity of domestic taxa than the other three forts.

Comparison to Hanson's Analysis of Sally Port Area

Because Hanson only used MNI for the method of analysis, rank order is used here to compare the Fort Stanwix assemblage from this study to the sally port area. Table 18 shows the top rank orders for this comparison. NISP was used for the assemblage in this paper. Both assemblages rank cow as the number one species present and pig as number two. Hanson's analysis has deer tied with pig as number two. Number three is chicken in Hanson's analysis and white-tailed deer in this analysis. Chicken only ranked as number nine for this analysis. The two analyses are similar in terms of rank order, with the exception of chicken.

Table 18. Rank Order Comparison between Hanson's Analysis of the Sally Port and the Current Fort Stanwix Assemblage.

Taxon	Minimum Number of Individuals (MNI)	Rank Order	NISP	Rank Order
Cow	24	1	322	1
Pig	13	2	236	2
Deer	13	2	16	3
Chicken	9	3	2	9

Associated Artifact Analysis

In order to determine if any temporal differentiation could be detected, other diagnostic artifacts such as ceramics were examined. Other than a button and some half pennies, ceramics were the only other diagnostic artifact present

in enough quantities on which to run any kind of analysis. The sample size of diagnostic ceramic for each level of each feature was still very low and did not allow for any conclusive results.

Using South's formula, mean dates obtained ranged from 1755 to 1763 (Table 19).

Table 19. Mean Ceramic Dates Calculated for the Fort Stanwix Assemblage.

Ft 60, Lvl II	1755.38
Ft 57, Lvl III	1756.38
Ft 57, Lvl IV	1758.6
Ft 52, Lvl III	1758
Ft 52, Lvl IV	1756.36
Ft 69, Lvl II	1760.39
Ft 69 Lvl III	1759.67
Ft 72, Lvl II	1762.67
Ft 72, Lvl III	1755.73

In Feature 69 level III the mean ceramic date calculated was 1760; however, a button dating to the Revolutionary War period was found in the same level. Mean ceramic date could only be calculated for nine proveniences out of a total of 16. As stated previously, the ceramic sample sizes where mean ceramic date could be calculated were fairly small. Only one provenience had a sample size in the 20s, the remaining samples were much smaller. These results are similar to those found by Hanson and Hsu (1975). Median dates for many of the ceramic types ranged from 1753 to 1763. Even when equivalent levels across

features were analyzed as a whole, similar date ranges were calculated, ranging from 1755.74 to 1760.2.

CHAPTER FIVE

DISCUSSION AND CONCLUSIONS

The results from the faunal analysis convey much about the diet of the occupants at Fort Stanwix. When looking at NISP and percent NISP, there were some features that appeared to contain much higher quantities of pig than cow, particularly Feature 69. However, according to the biomass figures, cow was relied upon much more heavily than pig or any other animal, at least as a source of meat that was not salted or barreled. This difference between NISP and biomass may be explained by heavy fragmentation or lighter weight of the pig bones. The skeletal frequency shows that there were a high number (n=95) of head fragments in Feature 69, which may account for the high NISP and the low biomass. Feature 57 also contained a high number (n=43) of head fragments, which may also explain the difference between NISP and biomass results. The presence of white-tailed deer, wild bird species such as ruffed grouse, and fish species indicates that hunting was done at Fort Stanwix, but the low quantities in which wild taxa were present indicates that this may not have been done on a regular basis. Low quantities of fish and some smaller bird species may also have been a result of excavation practices. More specific conclusions follow, presented according to the research questions asked in this study.

Research Question One: Can the faunal assemblage be used in combination with other artifactual data from the fort to differentiate

between the English military occupation and the American military occupation?

The number of diagnostic artifacts associated with each level of the cellar features was small. Most of the levels had less than 20 diagnostic artifacts. When South's mean ceramic date formula was performed, mean dates ranging from 1755 to 1763 were reached. When looking at the dates according to level, the dates calculated were effectively not different. For example, the date for Feature 52 level III was 1758 and the date for level IV was 1756. The periods of occupation at Fort Stanwix were too close together to be able to utilize this method of dating, and the sample size was not large enough to make any clear interpretation. Hanson and Hsu (1975) had indicated that during excavation there was no difference in stratigraphy that might have signified a temporal difference. It is possible that the American Revolutionary War period refuse was deposited directly on top of preceding refuse, leaving little archaeological trace of temporal separation if that preceding refuse had not been buried or covered. The presence of pheasant, which was kept by Washington in the 1780s and was also present at American Revolutionary War period Fort Haldimand, may be indicative of the American Revolutionary war period occupation at this site.

Because of the two times that the barracks were burned down, burning on the faunal remains was analyzed to see if any patterns emerged. In the East Barracks there was a higher quantity and percentage of burnt fragments in the upper levels of the features in that area, but no other pattern emerges to tell of any temporal difference. No pattern emerged in the West Barracks features. A

temporal differentiation could not be determined at Fort Stanwix using these lines of evidence.

Research Question Two: Using records of other forts, can the faunal remains help identify a distinction between areas where enlisted soldiers were living and areas where officers were living? How do the areas being analyzed in this study compare with the faunal assemblage from the sally port area?

There was limited data based on faunal remains from other forts regarding differences between soldiers and officers. Scott's study at Fort Michilimackinac in Michigan looked at socioeconomic differences of the occupants living at the fort, but the demographics differed from that of Fort Stanwix. The results from the analysis of Fort Stanwix do characterize an eighteenth century British diet with the high quantity of cow followed by pig. There was also greater variety in the skeletal portions of cow than in pig. The pheasant that was discovered in Features 52, 69, 3, 57, and 64 may be an indicator of where officers were living. The higher quantities of pheasant were in Features 69 and 57, so these areas have potential for officers' quarters. These results also correspond with the skeletal frequency analysis where a high number of head fragments are seen in both of these features. The consumption of the head was common for the wealthy in the eighteenth century. Feature 57 was also the only feature that contained all parts of the pig, another indicator of a wealthy status.

When looking at NISP and biomass for wild species at Fort Stanwix, it is apparent that wild resources were utilized, but were not relied upon. These results are comparable to Hanson's faunal analysis of the sally port area. In his analysis, cow was predominant followed by domestic pig and then white-tailed deer. He also identified several other wild species, some of which differed from those identified in this research. Other species identified in this study that were not identified in Hanson's analysis include species such as horse, small bovid, large cervid (possibly elk), rabbit, pheasant species, and American robin. A few diagnostic fish bones were also discovered during the identification process that allowed some fish to be identified to the family, genus, or species level.

Research Question Three: How does the faunal assemblage from Fort Stanwix compare with the faunal assemblages from other contemporary frontier forts?

Each fort had its own unique assemblage, but some similarities could be drawn from the comparison. Fort Stanwix and Fort Haldimand both had higher quantities of pig than Fort Ligonier and Fort Michilimackinac. Fort Haldimand and Fort Michilimackinac each had higher quantities of fish and wild taxa than at either Fort Ligonier or Fort Stanwix. As at Fort Ligonier, cow was the most common animal in the Fort Stanwix assemblage; however, whereas small bovid was the second most common animal at Fort Ligonier, pig was the second most common animal at Fort Stanwix. White-tailed deer was the third most common animal at both forts. Additionally, the types of wild species present at Fort

Ligonier varied slightly from those at Fort Stanwix with the presence of raccoon, beaver, bobcat, and turkey. It was interesting that no turkey was identified in either faunal analysis of the Fort Stanwix faunal assemblage, as it would have been expected given the fort's location.

At Fort Michilimackinac, pig was present in higher quantities than cow, the opposite of what was found at Fort Stanwix. There was also a greater quantity of chicken, wild birds, and fish. At Fort Haldimand the parts of pig and cow also differed from those at Fort Stanwix. There was a full range of pig remains identified at Fort Haldimand, but cow elements varied. At Fort Stanwix, only one feature contained a full range of pig elements, and a full range of cow elements were found in almost all of the features.

The faunal assemblages of Fort Haldimand and Fort Michilimackinac show that the occupants of these forts heavily utilized wild resources to supplement the provisions provided to them, but the occupants of Fort Stanwix and Fort Ligonier only utilized some wild resources to supplement their provisions. The hunting restrictions placed on the soldiers at Fort Ligonier would explain the small quantity of wild species, and it is possible that a similar situation occurred at Fort Stanwix given the danger of enemy attacks in the area. While Fort Michilimackinac was remote, it was a multi-ethnic community including American Indians so a reliance on wild species was expected. The large fish assemblage at Fort Haldimand reflected its island locale. It appears that geographical location largely reflected resource utilization at these forts. Because Fort Stanwix and Fort Ligonier were more accessible by land routes

than either Fort Michilimackinac or Fort Haldimand, supplying beef or pig on the hoof would have been more plausible at these locations. A ship ride would have been required to supply provisions at Fort Michilimackinac and Fort Haldimand, making barreled pork easier to transport than livestock.

Each of these forts served as supply hubs, but their geographical locations were what made each of them unique in their assemblages. Fort Stanwix could be supplied via land or water routes, and this is reflected with the high percentage of cow and pig at the site. It would have been feasible to provision both types of livestock at the site. Fort Ligonier was removed from river transport, making cows and small bovids more efficient livestock to transport over land because they could be herded in large groups. This method would have been difficult with pigs. The main supply route to Fort Michilimackinac would have been ships, therefore pigs would have been more efficient to provision, however; given its relative isolation and the difficulty of provisioning this fort, local resources would have been the most convenient method of obtaining meat. The location to water especially made fish a common staple. A similar trend is seen at Fort Haldimand where the mode of provisioning would have been through ships. Because of its location on an island, larger wild resources such as deer may not have been as readily available, thus making fish the more convenient meat source.

Further analyses using more historical documentation and other types of artifactual data could potentially allow these questions to be answered. For example, using the information on class differentiation at Crown Point (Feister

1984) in combination with other artifacts and faunal remains from that site may be helpful since they have a clearly defined British military occupation during the American Revolutionary period with distinct indicators of where officers and enlisted soldiers were living. Due to time and budgetary constraints, the information from Crown Point was not used in this study. Future research could also include analyzing more artifacts and faunal remains from single occupation fort sites from both the French and Indian War period and the American Revolution period in order to differentiate between these two periods of occupation at Fort Stanwix. Analyzing the worked bone in the Fort Stanwix assemblage may also prove to be a useful analytical tool and may provide more information about trade or ethnicity at the site given the fort's proximity to the Iroquois Nation. There is still much more to be done with the Fort Stanwix faunal assemblage and other artifact assemblages.

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Appendix A

IUP Faunal Coding Format

IUP Archaeology
Faunal Analysis Coding Instructions

Always right justify when typing into computer file. Make notes about modifications in this format at the beginning of the computer file.

A blank field in the database is an indicator of non-evidence of that attribute.

Site Number: 9 digits
Smithsonian system number or other site/collection designation.

Bag Number: 8 digits
Field bag or FS number as assigned by the archaeologist in the field. This might also be a catalog number
if one has been assigned for an accessioned collection.

Specimen Number: 3 digits
An item number assigned to each unique bone or group of bones as analysis is done. Numbering begins
again for each unit, quad, & level. Assign specimen number consecutively within each bag/provenience. Use the following rules.

1. Each worked bone must have a separate specimen number.
2. Each hold bone must have a separate specimen number.
3. All bones in a single level & quad Number with identical coding on all variables may have the same catalog number. DO NOT assign more than one bone the same catalog number unless their coding including taxon, element, side, portion, and condition, etc. match. This means that most identifiable bone will have individual catalog numbers, but indeterminate fragments can be lumped up to 99 (see Number of Items).
4. Separate cf (compares favorably) from certain and assign two catalog numbers.

Provenience 1: 4 digits
Usually the north/south coordinate or provenience for the bag of bone. Use numbers given by
archaeologists with N or S followed by 3 digit coordinate (N440).

Provenience 2: 4 digits
Usually the east/west coordinate or provenience for the bag of bone. Use numbers given by
archaeologists with E or W followed by 3 digit coordinate (E220).

Unit Number: 7 digits
The 3 digit unit or square number assigned by the archaeologist that the specimens were recovered from

Feature Number: 3 digits
A three digit feature designation assigned by the archaeologist. Do not include F or FT.

Context Type: 1 digit

A single digit designation for midden, feature, excavation unit, burial, etc. based on information provided by the archaeologist. Establish numeric codes as needed.

1-midden
2-feature
3-Plowzone
4-square level
5-burial
6-other

Type of Excavation: 1 digit

A single digit designation for additional excavation techniques based on information provided by the archaeologist.

1-Flotation
2-waterscreen
3-dry screen

Level/Special Provenience: 10 digits

Alphanumeric variable for additional provenience information such as horizon, level and/or feature part. (e.g. H11-70, North Side of Feature or Level 3C)

Hold: 1 digit

A single digit code for indication that a specimen is being held for further examination.

0-no hold
1-hold

Weathering: 1 digit

Code as follows for evidence of weathering:

1-weathered
2-root-etched
3-both weathered & root etched

Cultural Modification: 1 digit

Code as follows for evidence of cultural modification:

1-worked tool or decorative item
2-polish
3-grooving
4-drilling
5-Unidentified modification
6-multiple types (write in details under comments)

Animal Modifications: 1 digit

Code as follows for evidence of animal modifications:

1-rodent tooth marks
2-carnivore tooth marks
3-indeterminate tooth or animal-made marks
4-pitting from digestion or saliva
5-more than one

Fracture Pattern: 2 digits

Code as follows for evidence of fracture patterns:

01- Medial stepped or columnar
02- Lateral stepped or columnar
03- Sawtoothed
04- V-shaped
05- Flaking
06- Irregular perpendicular
07- Smooth perpendicular
08- Medial spiral
09- Lateral spiral
10- Medial longitudinal
11- Lateral longitudinal
12- Pattern evident but indeterminate
13 – Multiple Fracture Patterns (details in Comments)

Burning Modification: 1 digit

Code as follows for evidence of burning modifications:

1-calcined
2-blackened
3-reddened
4-blue-black
5-indeterminate
6-Multiple Mostley Blackened
7-Multiple Mostly Calcined

Butcher Marks: 1 digit

Code as follows for evidence of butcher marks:

1-cut (knife) marks
2-scratch marks
3-chop marks
4-blunt force marks
5-saw marks
6-multiple types of butcher marks- write type details in comments

Breakage: 1 digit

Use these columns to record the age of breakage whether or not breakage can clearly be attributed to human agencies.

1- old
2- new
3- both old and new breaks

Taxon: 4 digits

This variable records the taxonomic assignment for the bone and shell.
Assign indeterminate items as follows:

Vertebrata, unidentifiable/uncertain 0000
Invertabrata, unidentifiable/uncertain 0100
Mammalia, unidentifiable 1000
Mammalia, medium or large (≥ 4 kg) 1100
Mammalia, medium (4 -30 kg) 2000
Mammalia, large (> 30 kg) 3000
Mammalia, small (< 4 kg) 4000
Mammalia, small or medium 4900
Mammalia or Aves 5000
Aves, indeterminate 6000

Aves, large (informally determined, turkey or eagle size).....6001
Aves, medium (informally determined, duck size).....6002
Aves, small (informally determined, Passeriform size).....6003
Reptilia, indeterminate.....7000
Herpivore.....7500
Amphibia, indeterminate.....8000
Osteichthyes, indeterminate.....9000

Assign indeterminate items as follows:

Mammalia

Marsupialia

Didelphidae

Didelphis Virginia
(Opposum).....4901

Insectivora.....4050

Talpidae (moles).....4051

Parascalops
Parascalops breweri
(Hairy-tailed Mole).....4052

Condylura
Condylura cristata
(Star-nosed Mole).....4053

Soricidae.....4060

Sorex (Long-tailed shrews).....*4061*
Sorex cinereus
(Masked Shrew).....4062
Sorex palustris
(Water Shrew).....4063
Sorex fumeus
(Smoky Shrew).....4064

Microsorex
Microsorex hoyi
(Pygmy Shrew).....4066
Cryptotis
Cryptotis parva
(Least Shrew).....4067
Blarina (Short-tailed shrews)
Blarina brevicauda
(Short-tailed shrew).....4068
Chiroptera.....4100

Vespertilionidae

Myotis *4111*
Myotis lucifugue
(Little Brown Bat) 4112
Myotis keenii
(Kenn's Bat) 4113
Myotis leibii
(Small-footed Bat) 4114
Lasionycteris
Lasionycteris noctivagans
(Silver-haired Bat) 4115
Pipistrellus
Pipistrellus subflavus
(Eastern Pipistrelle) 4116
Eptesicus
Eptesicus fuscus
(Big Brown Bat) 4117
Lasiurus *4118*
Lasiurus borealis
(Red Bat) 4119
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Certainty: 1 digit

Indicates confidence in taxonomic classifications.
Certain = 1
Uncertain = 2

Element: 3 digits

If additional elements are required, add to the codes for the appropriate body segments. Articulated bones generally should be coded separately on multiple lines. Try to avoid element designations such as skull or entire skeleton, unless these are TRULY represented entirely.

Indeterminate:

- Unidentifiable bone fragment....001
- Unidentifiable bone....002
- Longbone shaft fragment....003
- Articular fragment....004
- Cancellous fragment....005
- Unidentifiable longbone....006
- Unidentifiable epiphysis....007
- Unidentifiable skull fragment....008
- Unidentifiable shell fragment....009
- Pelecypoda teeth....010
- Pelecypoda hinge....011
- Unidentifiable tooth....012
- Unidentifiable tooth fragment....013
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- Petrous....106
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- Palatine....108
- Nasal....109
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- Parietal....111
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- Lacrimal....116
- Interparietal....117
- Jugal....118
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Pleural 711
Pleural 2, 4, or 6 712
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Pleural 1 714
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Pleural 4 717
Pleural 5 718
Pleural 6 719
Pleural 7 720
Pleural 8 721
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Peripheral 1 725
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Peripheral 4 728
Peripheral 5 729
Peripheral 6 730
Peripheral 7 731
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Peripheral 9 733
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Nuchal....769

Element Side: 1 digit

Indicates which side of the body bone comes from.

indeterminate = 0
Right = 1
Left = 2
Not a sideable element = 3

Complete: 1 digit

Use this column to record the amount of the skeletal part present.

Entire/Almost Entire 1
Three-Fourths 2

Two-Thirds....3
One-Half....4
One-Third....5
One-Fourth....6
Fragment....7
Unknown/Not Applicable....8

THE NEXT THREE VARIABLES CALLED PROXIMITY, AXIALITY AND LATERALITY PROVIDE INFORMATION ON THE LOCATION OF THE FRAGMENT BASED ON COMMON DIRECTIONALITY TERMS. DIAGRAMS ILLUSTRATING THESE DIRECTIONS FROM VON DEN DREISCH (1976) ARE ATTACHED.

Proximity: 1 digit

Use this column, where applicable, to record the location of a fragment in relation to a plane bisecting the element parallel to the plane of support (the ground). In the case of the head assume it is oriented horizontally rather than diagonally.

Unknown or not applicable....0
Proximal....1
Distal....2
Medial....3
Medial and proximal....4
Distal and medial....5
Dorsal....6
Ventral....7
Basal....8

Axiality: 2 digit

Use this column, where applicable, to record the location of a fragment in relation to a plane which bisects the element lengthwise into front and back halves.

Unknown or not applicable....0
Cranial/anterior....1
Caudal/posterior....2
Dorsal....3
Palmar/volar....4
Plantar/posterior....5
Nasal/oral....6
Nuchal/aboral....7
Medial....8
Labial (for teeth)....9
Lingual (for teeth)....10

Laterality: 1 digit
Use this column, where applicable, to record the location of a fragment in relation to a plane parallel to the median or sagittal plane which bisects the element into right and left halves.

Unknown or not applicable....0
Lateral/labial....1
Mesial/medial/lingual....2

Structure: 2 digits

This variable is intended as a further aid in defining the portion of a bone present. However, it should not be used as a replacement for the portion variables above, rather as a supplement when the fragment being coded is a specific structure only. If the fragment is larger than or contains more of a skeletal part than the structure described here, it should not be coded for this variable. Add additional codes as needed.

Antler tine....01
Antler beam fragment....02
Antler brow tine....03
Tooth root....10
Tooth crown....11
Tooth neck....12
Tooth indeterminate enamel fragment....13
Mandible coronoid process....15
Mandible angular process....16
Mandible alveolar process....17
Mandible horizontal ramus....18
Mandible ascending ramus....19
Frontal postorbital process....20
Frontal pedicel....21
Frontal zygomatic process....22
Sphenoid sella turcica....25
Sphenoid lesser wing....26
Sphenoid greater wing....27
Occipital condyles....28
Occipital jugular or paraoccipital process....29
Occipital nuchal crest/cruciate eminence....30
Zygomatic maxillary process....32
Zygomatic temporal process....33
Zygomatic postorbital process....34
Temporal petrous portion....35
Temporal zygomatic process....36
Temporal squamous portion....37
Temporal mastoid....38
Temporal auditory bulla....39
Maxilla alveolar process....40
Maxilla zygomatic process....41
Maxilla palatine process....42
Maxilla nasal process....43
Vertebra spinous process....50
Vertebra centrum....51
Vertebra transverse process....52
Vertebra odontoid process....53
Vertebra ventral process....54
Vertebra zygopophysis....55
Vertebra prezygopophysis....56
Vertebra postzygopophysis....57
Vertebra neural arch....58
Vertebra centrum and meural arch....59
Rib capitulum....60
Rib tuberculum....61
Rib uncinate process....62
Sternum caudal or xiphoid process....63
Sternum keel....64
Sternum coracoidal facets....65
Sternum costal facets....66

Sternum carinal margin....67
Scapula glenoid fossa....68
Scapula acromium process....69
Scapula metacromial process....70
Scapula coracoids process....71
Scapula blade fragment....72
Scapula blade and spine....73
Scapula spine....74
Innominate acetabulum....80
Innominate auricular surface....81
Innominate iliac crest....82
Innominate ala/wing....83
Innominate ischial tuberosity....84
Innominate pubic symphysis....85
Innominate illium and ischium....86
Innominate ischium and pubis....87
Innominate ilium and pubis....88
Innominate ilium and acetabulum....89
First sacral segment....90
Metapodial, both distal condyles....91
Metapodial, right condyle....92
Metapodial, left condyle....93
Metapodial condyle indeterminate....94
Longbone complete articular end....95
Longbone mesial condyle....96
Longbone lateral condyle....97
Ulna semilunar notch....98
Femur head....99
Mandibular condyle....04
Occlusal Surface....05
Humerus Head....06
Vertebral Centrum....07
Occipital Styloid Process....31

Maturity (age): 2 digits
Use these columns to record observations on the maturity of the animal represented by each bone.

Immature, precise age unknown....01
Mature, precise age unknown....50
Mature, epiphysis fully fused....26
Mature, epiphyseal line not visible....27
Immature, epiphysis not fused....02
Immature, epiphysis fused with line present....03
Immature, proximal epiphysis only not fused....04
Immature, distal epiphysis only not fused....05
Immature, medial epiphysis only not fused....06
Immature, less than 3 weeks old....07
Immature, 3-6 weeks old....08
Immature, 2-3 months old....09
Immature, 3-6 months old....10

Immature, less than 1 year old 11
Immature, fetal.....12
Immature, sutures not fused 13
Immature, teeth show no wear 14
Immature, teeth show slight wear.....15
Mature, teeth show moderate wear 51
Mature, teeth show heavy wear.....52
Immature, only deciduous teeth 16
Immature, deciduous teeth still erupting.....17
Immature, permanent M1 erupting, M2-5 not erupted.....18
Immature, M1 erupted, M2 erupting, M3 not erupted 19
Immature, M1 and M2 erupted, M3 erupting 20
Milk premolars gone but permanent not yet erupted 21
Permanent P3 erupting, P4-M3 erupted.....22
Immature, diaphysis not fused.....23
Mature, teeth show slight wear.....24

Count: 2 digits
Use these columns to record the number of identical specimens fitting the description contained in this record. If you have more than 99 specimens fitting this description use two lines. Never code specimens that are not identical on the same line.

Weight: 5 digits
This column will be used to record the weight of the specimens described by the record. Measurements are to be completed in grams, to the accuracy of a hundredth of a gram

COMMENTS: This is a memo variable used for additional information .

Appendix B

Faunal Analysis Results

North Casemates

Table 20. NISP and MNI of All Taxa Identified in Feature 10.

Feature 10		
Taxon	**NISP**	**MNI**
Bivalvia	1	
Medium or Large mammal	60	
Large mammal	32	
White-tailed deer	1	1
Cow	4	1
Medium mammal	2	
Small mammal	1	
Colombidae cf Domestic Pigeon	1	1

Table 21. NISP and MNI of All Taxa Identified in Feature 12.

Feature 12		
Taxon	**NISP**	**MNI**
Medium or large mammal	6	
Large mammal	115	
Cow	1	1
Artiodactyla	1	
Domestic Pig	1	1
Indeterminate *Sus*	1	1
Aves, small	1	

Table 22. NISP and MNI of All Taxa Identified in Feature 30.

Feature 30		
Taxon	**NISP**	**MNI**
Medium or large mammal	11	
Medium mammal	2	
Large mammal	162	
White-tailed deer	1	1
Cow	7	1
Artiodactyla	2	
Domestic Pig	1	1

Table 23. NISP and MNI of All Taxa Identified in Feature 3.

Feature 3		
Taxon	**NISP**	**MNI**
Medium or large mammal	857	
Large mammal	650	
Canis	1	1
Red or Gray Fox	1	1
Ungulate	1	
Artiodactyla	16	
Cervidae	2	
Large Cervid	2	
White-tailed deer	9	2
Cow	65	3
Small Bovid	1	1
Domestic Pig	7	1
Indeterminate *Sus*	7	1
Eastern Cottontail	1	1
Medium mammal	166	
Small or medium mammal	29	
Aves, medium	2	
Aves, large	1	
Galliformes (cf Ruffed Grouse)	1	1
Chicken	1	1
Phasianidae cf Ring-necked pheasant	1	1
Turtle	3	
Fish	1	

Table 24. NISP and MNI of All Taxa Identifed in Feature 57.

Feature 57		
Taxon	**NISP**	**MNI**
Pelecypoda	8	
Medium or large mammal	309	
Large mammal	1375	
Red or Gray Fox	4	
Artiodactyla	17	
Large Cervid	7	
White-tailed deer	7	2
Cow	63	3
Small Bovid	1	1
Domestic Pig	66	3
Indeterminate *Sus*	4	1
Medium mammal	72	
Small or medium mammal	1	
Small mammal	9	
Lepridae (rabbits and hares)	1	
Eastern Cottontail	1	1
Eastern Chipmunk	1	1
Bird or mammal	3	
Aves, large	2	
Anseriformes	1	
Chicken	1	1
Phasianidae cf Ring-necked pheasant	6	1
Colombidae cf Domestic Pigeon	2	1
Fish	19	
Lepisosteus (Gar)	1	1
cf *Catostomus sp.* (Suckers)	2	1
Northern Pike	1	1

Table 25. NISP and MNI of All Taxa Identified in Feature 60.

Feature 60		
Taxon	**NISP**	**MNI**
Medium or large mammal	117	
Large mammal	311	
Artiodactyla	21	
White-tailed deer	2	1
Cow	21	2
Small Bovid	1	1
Domestic Pig	31	2
Indeterminate *Sus*	2	1
Horse	1	1
Medium mammal	5	
Aves, large	1	
Emydidae (pond/marsh turtles)	2	1
cf *Catostomus sp.* (Suckers)	1	1

Table 26. NISP and MNI of All Taxa Identified in Feature 64.

Feature 64		
Taxon	**NISP**	**MNI**
Medium or large mammal	1	
Large mammal	51	
Large carnivora	1	
Cow	4	2
Artiodactyla	5	
Aves, Medium	1	
Aves, Small	1	
Galliformes	2	
Phasianidae cf Ring-necked pheasant	1	1

East Barracks

Table 27. NISP and MNI of All Taxa Identifed in Feature 52.

Feature 52		
Taxon	**NISP**	**MNI**
Unidentifiable vertebrate	1	
Bivalvia	5	
Medium or large mammal	16	
Large mammal	472	
Artiodactyla	9	
Large Cervid	1	
White-tailed deer	1	1
Cow	31	2
Small Bovid	7	1
Domestic Pig	8	1
Medium mammal	7	
Small or medium mammal	2	
Aves Large	3	
Aves, Medium	6	
Aves, Small	3	
Wood Duck	1	1
Ruffed Grouse	2	1
Phasianidae cf Ring-necked pheasant	1	1
Colombidae cf Domestic Pigeon	1	1
Robin	1	1
Fish	171	
Siluriformes	1	1

Table 28. NISP and MNI of All Taxa Identified in Feature 69.

Feature 69		
Taxon	**NISP**	**MNI**
Unidentifiable Vertebrate	1	
Medium or large mammal	231	
Large mammal	1173	
Artiodactyla	19	
Cow	32	2
Small Bovid	1	1
Domestic Pig	103	2
Medium mammal	7	
Aves, Medium	5	
Wood Duck	1	1
Ruffed Grouse	1	1
Phasianidae cf Ring-necked pheasant	3	1
Turtle	2	
Fish	24	

Table 29. NISP and MNI of All Taxa Identified in Feature 72.

Feature 72		
Taxon	**NISP**	**MNI**
Medium or large mammal	85	
Large mammal	1150	
Artiodactyla	18	
White-tailed deer	1	1
Cow	49	3
Small Bovid	3	1
Domestic Pig	14	2
Indeterminate *Sus*	1	1
Bird or mammal	3	
Aves, Medium	1	
Aves, Small	1	
Colombidae cf Colombidae cf Domestic Pigeon	1	1

Table 30. NISP and MNI of All Taxa Identified in Feature 86.

Feature 86		
Taxon	**NISP**	**MNI**
Invertebrate, Indeterminate	1	
Medium or large mammal	4	
Large mammal	1562	
Large carnivora	2	
Artiodactyla	31	
Large Cervid	2	
White-tailed deer	2	1
Cow	82	3
Domestic Pig	13	1
cf *Zapus sp.* (Jumping Mouse)	1	1
cf Microtinae (Voles, Lemmings and Muskrats)	1	1
Aves, Large	2	
Aves, Medium	1	
Galliformes	1	1
Chicken	1	1
Strigidae (Typical Owls)	1	1
Emydidae (pond/marsh turtles)	1	1
Fish	22	
Ictalurus	1	1
I. punctatus or *furcatus* (Blue or Channel catfish)	1	1
Cf *Catostomus sp.* (Suckers)	1	1
Northern Pike	2	1