# THE HURON OF THE KAWARTHA LAKES: FAUNAL EXPLOITATION STRATEGIES AS INDICATORS OF CHANGE DURING THE PRE, PROTO AND HISTORIC PERIODS



JENNIFER CAMPBELL

# The Huron of the Kawartha Lakes: Faunal Exploitation Strategies as Indicators of Change During the Pre, Proto and Historic Periods

by

© Jennifer Campbell

A thesis submitted to the School of Graduate Studies
in partial fulfillment of the
requirements for the degree of
Masters of Arts

Department of Anthropology
Memorial University of Newfoundland

August 19th, 2004

St. John's Newfoundland

*Your file Votre référence*
*ISBN: 0-494-02333-3*
*Our file Notre référence*
*ISBN: 0-494-02333-3*

Abstract

This research involves the analysis of the faunal remains from three Huron village sites and two Huron hamlets in order to reconstruct the subsistence strategies practiced by the Huron of the Upper Trent River Valley, south central Ontario, throughout the 16th century. Examination of the faunal remains allows for the shifting exploitation patterns of the period to be addressed in relation to increased contact with the St. Lawrence Iroquois and increased exposure to European goods acquired through trade. The most important economic shift seen in the faunal remains is the increasing relative importance of beaver and dog exploitation to the determent of deer exploitation. This increased beaver specialization is interpreted in relation to the early onset of a European motivated fur trade, and the arrival of St. Lawrence Iroquois peoples at Huron habitation sites in the Upper Trent River Valley.

Acknowledgments

First I must acknowledge the unwavering support and constant encouragement I received from my supervisor Dr. Lisa Rankin. She subtlety guided this research, allowing me the freedom to find my own path and to arrive at the end of this journey knowing that the work I produced was my own. I must also acknowledge the assistance of Dr. Peter Ramsden who was always willing to listen to my theories, and who also allowed me to "go my own way". These talented individuals could have, at any point in this research, dictated the best way to proceed, instead they trusted in my abilities and allowed me to justify my interpretations, for this I am grateful and I feel that I am better academic, researcher and archaeologist because of it. I wish to thank Dr. Priscilla Renouf and Dr. Sunny Jerkic, who have always provided me with excellent advice and encouragement.

Funding for research at the Canadian Museum of Nature was provided by the Institute for Social and Economic Research. While I was at the museum Steve Cumbaa took the time to assist in my general faunal identifications, and helped to analyze the fish remains so that I could make some suggestions about exploitation strategies. My analysis benefited immeasurably from Steve's assistance. The contributions of Dr. Lisa Hodgetts in my first year can never be fully and properly acknowledged. She provided my first introduction to zooarchaeology as an undergraduate and has since guided my research in many ways. I am grateful for, and honored to have received, the help of these two faunal researchers.

I also wish to thank the Social Sciences and Humanities Research Council of Canada for the Canada Graduate Fellowship that I received in my second year of study.

Finally, I must thank my friends and family who made this entire experience worthwhile and who provided me with an outlet for frustrations and a touch spot with reality. Thank you; Stephen, Kendra, Susan, Gail, Crystal, Brad, Mindy, Patty, Amanda, Heather, Aaron, Natalie, Scott, Mark, Catherine, Lori, John, Cathy, Stacey, Mom, Dad, and many others too innumerable to name here. You have all shaped me in ways that you may never truly understand.

A man who has once looked with the archaeological eye will never see quite normally. He will be wounded by what other men call trifles. It is possible to refine the sense of time until an old show in the bunch of grass or a pile of nineteenth century beer bottles in an abandoned mining town tolls in ones head like a hall clock. This is the price one pays for learning to read time from surfaces other than an illuminated dial. It is the melancholy secret of an artifact, the humanly touched thing (Eiseley 1971).

# TABLE OF CONTENTS

## LIST OF FIGURES

<u>LIST OF TABLES</u>

## Introduction
## Chapter One

> You can lodge where you please; for this Nation above all others is exceedingly hospitable towards all sorts of persons, even towards strangers; and you may remain as long as you please, being always well treated according to the fashion of the country (Jesuit Relations, 8:93-95).

This thesis analyzes and interprets the faunal remains from five Huron sites in the Upper Trent River Valley, focusing on the changing dog, beaver and deer exploitation patterns throughout the region in the $16^{th}$ century. The goal of this research has been to demonstrate that the Huron of the Upper Trent River Valley went through a period of economic realignment in the mid to late $16^{th}$ century and that this realignment was related to increased access to European goods facilitated by increased contact with the St. Lawrence Iroquois. The faunal remains examined in this thesis were collected as part of the Upper Trent Valley Archaeological Project, a research program undertaken by Dr. P. G. Ramsden. The sites examined in this research include, in relative order from earliest to latest, Rumney Bay, Kirche, Coulter, Benson and Wet Back (Ramsden 1977a). The faunal remains from the Rumney Bay, Kirche, Coulter and Wet Back sites were analyzed by other researchers but the information that they provided had never before been used in any manner other than descriptive. I completed the in-depth analysis of the Benson site faunal materials, as well as a re-analysis of the Rumney Bay and Wet Back sites faunal materials. This data was then incorporated into the research aims of this project.

The sites discussed in this research were selected for two main reasons. First, they provided a range of sites that dated from the early to late $16^{th}$ century, the period during which the Huron of the Trent River Valley were experiencing intense internal changes. Second, they had faunal assemblages that had been collected under the same general excavation practices, including ¼ inch mesh screening. These constraints allowed me to develop valid research questions and to establish attainable goals for this project.

In order to address the economic realignment of the Huron in the 16th century it was necessary to focus my research on the species that contributed the most to the subsistence practices of the Huron and that played an economic role in the burgeoning fur trade. This focused my research on the dog, beaver, and deer exploitation patterns displayed at each of the sites and the relative exploitation of these animals over time.

Deer remains are the most common faunal remains found on prehistoric Huron sites. The importance of deer meat in the subsistence strategy of the prehistoric Huron is demonstrated by their dominance in the faunal record and the multiple uses of portions of their carcasses. Deer were exploited for their meat and their skin (Trigger 1969:31). Their bones were used in the manufacture of tools: corn scrapers, shafts, awls, and various worked phalanx artifacts. The Jesuit Relations reveal that deer were very important to the Huron and had been even more so in the pre-contact era (Tooker 1964). By the historic period, however, we see a Huron exploitation pattern that had already been altered in advance of direct European contact. By the time the Europeans arrived in Huronia the Huron had become trade facilitators for their Algonquian and Neutral neighbors and had largely stopped hunting beaver opting to gather these animals and their pelts through trade (Tooker 1964:25). This meant that deer were not exploited in the same manner as they were in the early 1500's. Instead, the focus had turned to other animals (Trigger 1969:31-32).

This economic realignment led to the increased exploitation of dog during the late prehistoric and protohistoric Huron periods. Dogs were kept by the Huron as pets and were allowed, at least in the historic period, to roam freely in the village, even eating from the same bowls as their masters (Tooker 1964). Dogs, however, were also used as ceremonial animals at various feasts and celebrations where they were butchered and eaten (Trigger 1969:33-34). The French have remarked that dogs were kept in Huron villages much like sheep were in France, domesticated and eaten as desired (Tooker 1964:66). The treatment of dog bones on Huron sites does not suggest that they were only consumed in ritual contexts. The dog remains from all of the sites examined in this research have a discard pattern that suggests frequent and usual consumption. In most cases the remains are found scattered throughout middens. This homogenous scattering of dog remains does not suggest that the animals had been consumed in a ceremonial context, rather it seems most likely that these animals were part of the day to day subsistence of the people living at these sites. In addition, if ceremonial, the high incidences of dog remains on these sites would suggest that ceremonial feasting was an almost daily activity. This is not borne out by the archaeological evidence. Dogs provided a reliable and steady food source that could supplement the diet in times of need or at times when other meat resources were unavailable. The incidence of dog remains on sites in the Trent River Valley increases over time, suggesting that these animals were being increasingly relied upon as food sources. As the presence of dog remains on sites in the Trent River Valley increases, the presence of deer remains decreases. This suggests that dogs were replacing deer as a major source of meat for the Huron (Ramsden 1990a, 1990b, 1988a, 1978b, 1977a, Ramsden et. al. 1981). No other species come close to the importance of dog and deer on Huron sites.

Why did the Huron begin to favor dog over deer in terms of subsistence mammals? This research suggests that beaver exploitation played a pivotal role in this economic realignment. The frequency of beaver remains increases steadily on Huron sites in the Trent River Valley throughout the $16^{th}$ century. Beaver were economically exploited animals and not likely taken as a food source (Tooker 1964:67). Specialization in beaver exploitation, however, necessitates that certain times of the year, which were once devoted to the acquisition of other species, such as deer, were instead devoted to trapping beaver (Trigger 1969:32). Beaver pelts were used by the prehistoric Huron, and the beaver were likely eaten and treated as any other opportunistically exploited animal. However, beaver remains recovered in the Trent Valley suggest that these animals were being skinned off site and that their meat was not being returned to camp. The beaver had become an economic resource and their acquisition was profit driven rather than subsistence based. This increase in beaver exploitation, however, had an impact on the subsistence practices of the protohistoric Huron. Time once dedicated to deer hunting was being spent trapping beaver. In order to compensate for the decrease in deer meat the Huron could consume dog meat. Dog meat was already a part of their diet and it was a natural replacement for deer due to its size and meat return. Also, since dog could be acquired within the village, it did not require any commitment of hunting time. Thus, reliance on dog allowed the Huron to concentrate more completely on their specialized exploitation of beaver.

This body of research addresses the shifting importance of dog, beaver and deer in Huron animal exploitation throughout the 16th century in the Trent River Valley. It uses various lines of evidence to suggest a period of Huron economic realignment. The relationship between the Huron and the St. Lawrence Iroquois figures highly in this interpretation. It order to understand the motivation for the Huron specialization in beaver exploitation it is necessary to understand what the political and economic situation of the Huron was during the period in question.

Chapter Two begins with a discussion of who the Huron of the Trent River Valley were. It then introduces the research goals that have governed this project and also discusses past research in the Trent River Valley, focusing on The Upper Trent Valley Archaeological Project. A brief overview of the proposed relation of the Huron to the St. Lawrence Iroquois and the Huron to Europeans is introduced. This develops a framework for the interpretation of the faunal remains from each of the sites and for the proposed period of realignment occurring in the Trent River Valley in the late 16th century.

Chapter Three reviews the environmental conditions in south central Ontario both today and in the 16th and 17th centuries. It then reviews the potential effects of the Little Ice Age on species availability during the 16th century. This chapter concludes with a review of the animal resources available in south central Ontario, establishing a context within which the subsistence practices employed at each of the sites can be interpreted.

Chapter Four introduces the methodology and quantification techniques employed in this research. It discusses at length the validity of intersite faunal comparisons and explains the methodological approaches taken in this research.

Chapter Five presents the faunal data for each of the sites. Intrasite analysis is then completed. Within each site the general subsistence pattern is discussed and the specific dog, beaver, and deer exploitation trend is focused on. In addition to this, any spatial patterns represented by the faunal remains are addressed and evidence of interaction with the St. Lawrence Iroquois and Europeans is detailed. The chapter concludes with intersite faunal analysis of the dog, beaver and deer exploitation patterns. This intersite analysis highlights the changing emphasis on deer and dog subsistence exploitation and the increasing economic beaver specialization occurring throughout the 16$^{th}$ century.

Chapter Six addresses the St. Lawrence Iroquois and their movement as refugee groups onto Huron occupation sites. The role of the St. Lawrence Iroquois in the distribution of European trade goods is also discussed.

Chapter Seven incorporates the faunal analysis generated by this research into the picture of Huron realignment occurring in the 16$^{th}$ century. The relation of the Huron to the St. Lawrence Iroquois is fully developed, focusing on the Huron incorporation of refugee St. Lawrence Iroquois into their villages. This relationship is key to understanding the Huron motivation for an economic realignment centered on beaver specialization and European trade. The archaeological evidence supporting this realignment period and the adoption of refugee groups is presented and interpretations are made about the true nature of these changes and the degree of interaction between the two populations.

Research Context
Chapter Two

To study human history is to try to get at purpose and thought. In the human sciences it is inadequate simply to describe correlations between objects (Hodder 1986:91).

Introduction:

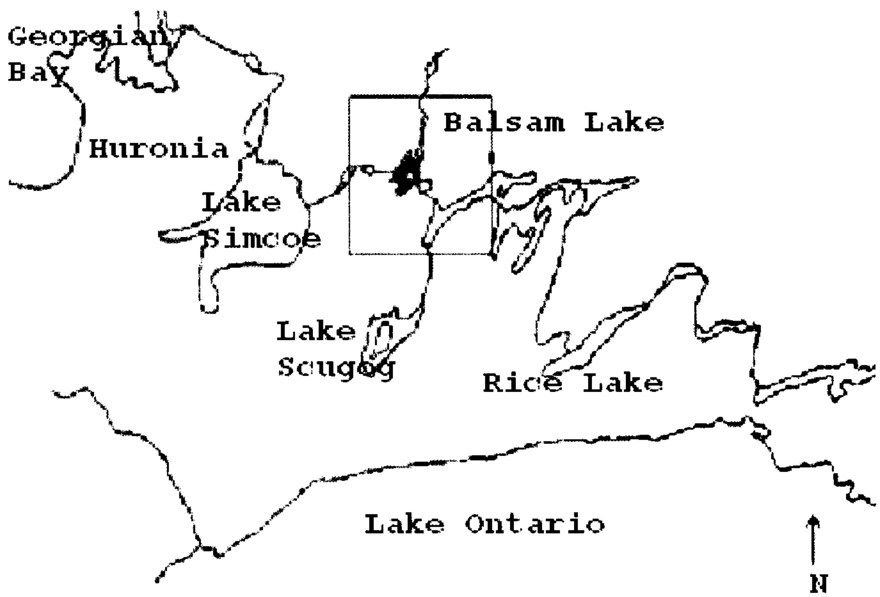



***Figure. 2.1***
*Geographic Location of Huronia and Area of Research (adapted from Nasmith 1989:2)*

This chapter will briefly summarize our basic knowledge of the historic Huron. It will then review the research questions and goals that have governed this analysis. It then introduces The Upper Trent Valley Archaeological Project from which the material and data analyzed in this thesis was taken. The research will then be put into the context of past research completed on cultural interaction and the Huron in the Upper Trent River Valley. Finally, a brief overview of the relationship between the Huron, the St. Lawrence Iroquois and Europeans will be outlined. The nature of the relationship between the

Huron, the St. Lawrence Iroquois and Europeans will be used to establish a framework for interpreting the economic realignment suggested by the changes in the dog, beaver and deer exploitation patterns of the Trent River Valley Huron throughout the 16th century.

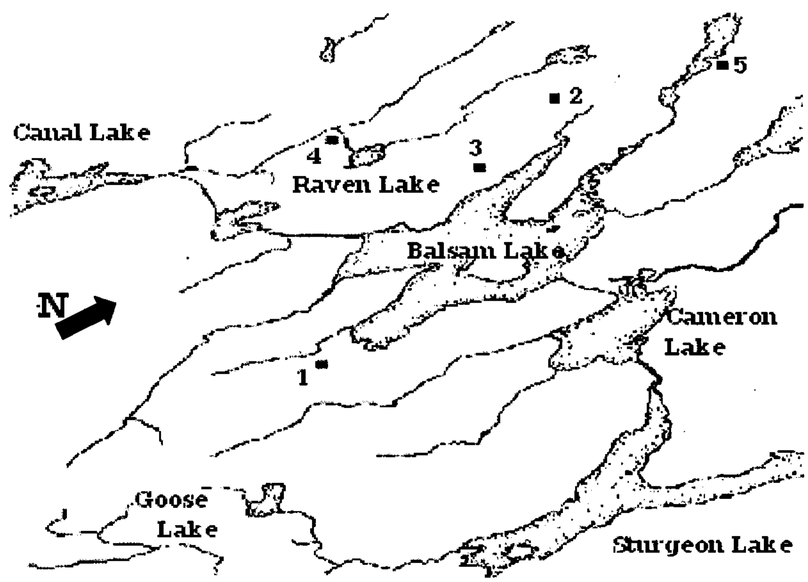
<u>The Huron:</u>

The Huron are historically understood as a confederacy of four, possibly five, related Iroquoian tribes that lived in the region centered on the isthmus separating Georgian Bay and Lake Simcoe in south central Ontario (see Figure 2.1). The Huron typically lived in palisaded villages or in smaller satellite villages that allowed for ritual and defense. Each village was composed of several long houses that contained multiple families (Trigger 1976:32; Warrick 1984). These family units are understood as the primary units of production within the village, with each unit working together as tasks required (Hayden 1977). The Huron were horticulturalists that supplemented their diet with gathered plants, hunted game, and fish from the local lakes and streams (O'Shea 1989:64-65). The Huron of the 16th century may have lived a life similar to the Huron of the historic period. The Huron of the historic period were in direct contact with Europeans and this caused immediate changes to their economy; however, the Huron of the 16th century were already beginning to adjust their economy to better exploit the burgeoning European fur trade (Ramsden 1988a). The proto historic Huron in the Upper Trent River Valley had a similar life to the historic Huron in Huronia. The main difference between these two periods was the intensity of economic change occurring to support the European fur trade. As James Bradley (1987:43) has noted it is important to remember that during the 16th century wide spread economic changes were affecting the northeast. This thesis looks specifically at the economic realignment experienced by the Huron of the Trent River Valley. This realignment involves the incorporation of a European trade system driven by commercial markets into indigenous Native exchange networks often based on social storage and obligatory reciprocity. "One of the reasons the sixteenth century is of such interest is that it provides the opportunity to see how these two radically different systems interacted and with what results" (Bradley 1987:43).

Review of Research Goals:

The objectives of this research were to illustrate the Huron subsistence and faunal exploitation patterns in the Trent River Valley throughout the pre and proto-historic periods, focusing on the relative abundance of dog, beaver and deer remains from five archaeological sites. Ramsden (1978b, 1988a, 1990a) suggested that the Huron of the Upper Trent River Valley had a changing economy during the 16th century. He suggested, but never quantified though faunal analysis, that this period of economic realignment was related to indirect European contact, St. Lawrence Iroquois dispersal and subsequent changes to networks of exchange. This research generates quantifiable faunal data about the Huron of the 16th century to support or refute the concept of an economic realignment originally proposed by Ramsden (1978b). Another goal of this research was to incorporate the existing analysis of the five sites into a rough temporal sequence, acknowledging their inevitable overlap, so that additional evidence supporting or refuting Ramsden's claim could be garnered.

In order to address the governing research objectives I examined a group of Huron sites from Victoria County, in the Trent River Valley of south central Ontario. These sites range in date from AD 1450 to 1615 and include both village and associated resource exploitation sites (Ramsden 1977a). From earliest to most recent in terms of relative age the sites are, Rumney Bay (BeGq-2), Kirche (BcGr-1), Coulter (BdGr-6), Benson (BdGr-1) and Wet Back (BeGr-1) (Ramsden et. al. 1981). These sites were largely located through the work of Dr. P.G. Ramsden who surveyed and excavated the area looking for Late Iroquoian occupations from 1976 to 1978 (see Figure 2.2 for their geographic locations).




(1) Kirche (2) Wetback (3) Coulter (4) Benson (5) Rumney Bay

***Figure. 2.2***
*Location of Sites Along the Upper Trent River Valley*

Review of the Upper Trent Valley Archaeological Project:

The Trent Valley has been the subject of several archaeological investigations. Col. G.E. Laidlaw, who recorded a number of sites in his 1917 field report, was the 1st to work in this region (Laidlaw 1981; 1900; 1917). Following Laidlaw, Dr. J.N. Emerson sample-excavated a number of middens in the area in his 1951 field season (Emerson 1954). Dr. L. Rankin examined the area from 1999 through 2000 in order to address Algonquian/Iroquoian relations (Rankin 1999). The largest project carried out in the region was the large-scale survey and excavation project directed by Dr. P.G. Ramsden from 1976 to 1978 titled The Upper Trent Valley Archaeological Project. Dr. Ramsden returned to the region into order to expand on the work done by Emerson (1954:254) and Wright (1966), who had used ceramic analysis to suggest that two Huron complexes originally occupied south central Ontario. Ramsden (1977b) had already expanded on this idea in his Ph.D dissertation concluding that there was evidence for a cultural division within the Huron of south central Ontario. The two major aims of The Upper Trent Valley Archaeological Project were to (1) shed light on the suggestion that two distinct Huron groups occupied the region and (2) to determine the effects of the fur trade on these two Iroquoian populations (Ramsden 1977a). Ramsden and his students have published much of the data relating to the sites important to this research including the results of the full-scale excavations at the Coulter (Damkjar 1990), and Kirche (Nasmith 1989) sites.

Ramsden et al. (1981) divided the 12 known Huron sites in the Upper Trent Valley into two, perhaps three, distinct groups based largely on the temporal period of occupation. The earliest sites, Rumney Bay, Jamieson, and Hardrock represent one major group. Kirche, Coulter, Ward, Dawn, Benson and Trent represent the second (Ramsden 1990a; Ramsden et. al. 1981:254-268). For the sake of clarification these groups are called the Hardrock and Benson groups respectively. A third possible group involves the separation of Kirche, Coulter and Benson into a distinct group based largely on their ceramic collection and their date of occupation (Ramsden et al. 1981:266-268).

Ramsden (Ramsden et. al. 1981) believes that the Hardrock group represents an early group of people that had not been exposed to changes stemming from increased trade following European contact in the northeast. These sites represent a traditional indigenous Trent Valley Iroquoian population. They are characterized by little to no St. Lawrence Iroquois pottery and little evidence of European materials.

Within the Benson group of sites we begin to see St. Lawrence Iroquoian pottery, European materials, and an increase in dog and beaver exploitation (Ramsden et. al. 1981:254-268). Ramsden believes that all of these were related to the arrival of Europeans and, in some capacity, increased interactions with St. Lawrence Iroquois groups (Ramsden et. al. 1978b:102-104).

Cultural Contact Research:

Recent research on the Huron of south central Ontario has focused on the relations and interactions of the Huron with other ethnic and cultural groups in the region such as the relationship between the Huron, the St. Lawrence Iroquois and Europeans

(Pendergast 1993, 1991, 1985; Ramsden 1990a, 1988b; Trigger 1979, 1976, 1972). It is on these two interaction spheres that this research focuses.

The Saint Lawrence Iroquois:

The St. Lawrence Iroquois were a discrete indigenous people that occupied the St. Lawrence Valley during the late pre-contact and early contact period (Pendergast 1998:157). Figure 2.3 shows the known occupation zones of the St. Lawrence Iroquois along the St. Lawrence River. It has been suggested that the St. Lawrence Iroquois disappeared from the archaeological record due to warfare and European introduced diseases (Bailey 1933; Douglas 1897; Hunt 1940; Jamieson 1990; Pendergast 1985, 1993, 1998; Ramsden 1977a; Trigger 1972). Historic accounts suggest that they were at war with the Abenaki, Mohawk and Onondaga nations, and that as trade with Europeans increased Huron populations may have also attacked them in order to establish a direct link to European goods (Pendergast 1998:10).

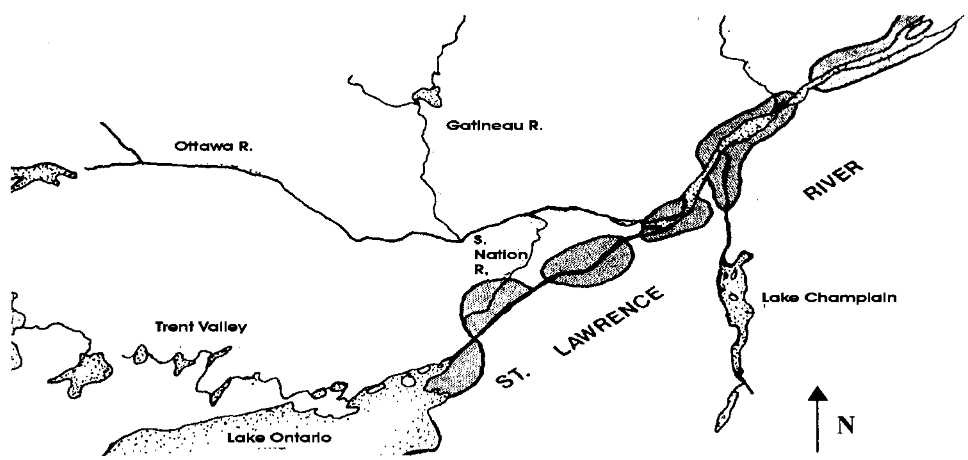



***Figure. 2.3***
Clusters of St. Lawrence Iroquois Occupation Sites

In order to explain the presence of St. Lawrence Iroquois style pottery on some of the late prehistoric and early historic Huron sites in the Upper Trent Valley Pendergast (1993), and originally Ramsden (1977a), suggested that the presence of St. Lawrence Iroquois pottery on Huron sites was an indication of warfare and the presence of female St. Lawrence Iroquois captives. They suggested that the Huron would capture both men and women during raids and attacks (Pendergast 1993:10; Ramsden 1977a:95-96). The men would then be killed and the women held captive at Huron villages (Pendergast 1993:10; Ramsden 1977a:95-96). Since women are traditionally associated with pottery production (Tooker 1964:59) the suggestion was that St. Lawrence Iroquois pottery indicated the presence of St. Lawrence Iroquois women. The lack of St. Lawrence Iroquois style pipes on these sites implied a lack of St. Lawrence Iroquois men. It thus seemed appropriate to suggest that only female captives were present on these sites (Pendergast 1993:10; Ramsden 1977a:95-96).

Ramsden also explored other possible explanations. In 1977 Ramsden hypothesized that the presence of women on these sites may be a result of intermarriage encouraged by increased trade relations with St. Lawrence Iroquois groups (Ramsden 1977a:95-96). In 1988 Ramsden suggested that the St. Lawrence Iroquois pottery on Trent Valley Huron sites may have come as a result of a movement of St. Lawrence Iroquois refugee groups into the region after experiencing attacks from the Mohawk and the Onondaga (Ramsden 1988a). They may also have been suffering the effects of population reduction as a result of European introduced disease. These factors may have resulted in the St. Lawrence Iroquois fleeing their homeland to the homes of their trade contacts for protection (Laidlaw 1891; Ramsden 1978b; Pendergast 1993:10).

The suggestion of intermarriage supports the hypothesis of refugee groups coming to the region. Intermarriage strengthens bonds and creates social networks and ties. Should the St. Lawrence Iroquois have felt the need to leave their homeland it is likely that they could turn to their trade partners for protection and help.

A later re-evaluation of the situation by Ramsden (1990a) has led to the belief that both St. Lawrence Iroquois men and women were present on the Huron sites in the Upper Trent Valley. Ramsden feels that if men and women arrived in the Upper Trent Valley as refugees then the men would adopt and utilize the Huron style pipes in order to blend into the community (Ramsden 1990a:94). Less publicly, within their households, the St. Lawrence Iroquois women would continue to make pottery in the traditional style. This would result in more St. Lawrence Iroquois style pottery than pipes showing up on sites (Ramsden 1990a).

The Hardrock-type sites show little in the way of links to the St. Lawrence Iroquois. The Hardrock site itself is the only one in this grouping that has St. Lawrence Iroquois style pottery in its assemblage. The later sites in the Benson group all have evidence of contact with the St. Lawrence Iroquois and Europeans. These sites usually demonstrate palisade expansion in order to encompass a sudden significant population increase (Damkjar 1990; Nasmith 1989). The Coulter and Benson sites include remains of Huron and St. Lawrence Iroquois pottery and also a hybrid style that is a combination of both (Damkjar 1990:33; Ramsden 1988a). These factors support the suggestion that St.

Lawrence Iroquois refugee groups were moving into the area and were being incorporated into these Huron villages.

The increased presence of St. Lawrence Iroquois style pottery and European materials on the Benson-type sites indicates a shift in trade networks and access to materials or people over time. As is demonstrated through this research, the exploitation of dog, beaver and deer shifted throughout the pre and proto-historic periods in reaction to economic shifts among the Huron. These economic shifts can be related to intense contact with the St. Lawrence Iroquois and increasing access to European goods.

The Influence of European Contact:

The effect of European contact on the Huron of the Trent River Valley is related to the nature of their interactions with the St. Lawrence Iroquois. It is commonly thought that exposure to European goods during the late $15^{th}$ and early $16^{th}$ century was extremely limited. However, the evidence of European material on Huron sites in the Trent Valley dating from this period suggests otherwise. Contact with the eastern seaboard through the St. Lawrence Iroquois would have allowed the Huron to have indirect contact with, and indirect access to, European goods. The presence of these goods on village sites such as Benson, Coulter and Kirche supports this suggestion. Furthermore, if the St. Lawrence Iroquois moved onto Huron sites as refugee groups they would have brought knowledge of these new trade partners with them. The historic practices of the Huron suggest that the people who first establish a trade link were given the right to govern and control that link (Tooker 1964:25). If the St. Lawrence Iroquois moved onto Huron ground they may have transferred their 'right' to European trade routes to the Huron in these communities. This suggestion is further supported by Huron-St. Lawrence Iroquois adoption and intermarriage, both of which would have established kinship ties and lines of ritual and familial obligation. The transfer or sharing of trade rights may have provided the St. Lawrence Iroquois with the bargaining leverage needed to ensure their complete integration into these new Huron communities.

Conclusion:

This chapter has introduced the Huron and briefly discussed their settlement in the Trent River Valley. It has presented the research goals and questions that have governed this study and discussed the relationship of these goals to the work of The Upper Trent Valley Archaeological Project. An introduction to the St. Lawrence Iroquois and Europeans and to their relationship with the Huron during the periods in question followed. The next chapter will define the environmental context and resources of south central Ontario during the 16th century.

# Environmental Context and Resources
# Chapter Three

It is of the highest importance in the art of detection to be able to recognize, out of a number of facts, which are incidental and which are vital, otherwise, your energy and attention must be dissipated instead of being concentrated
(Sherlock Holmes quoted in Feder 1990:43).

## Introduction:

This chapter reviews the environmental data regarding south central Ontario. Much of the environmental data is garnered from Heidenreich's study of historic Huronia (Heidenreich 1971). Though located slightly north west of the Trent River Valley, I suggest that conditions in Huronia would have been similar to those in the Trent River Valley. The Little Ice Age will be addressed in order to comprehend its affect, if any, on the Huron faunal exploitation patterns in the 16$^{th}$ century. Finally, the animal resources available in the Trent River Valley will be introduced to frame the subsistence discussion that will follow in Chapter Five.

Southern Ontario (Figure 3.1) is one of the most fertile areas of Canada. Due to the ameliorating influence of the Great Lakes, southern Ontario has smaller variations in temperature and higher precipitation than one would expect for the heart of the continent. In the summer, the lakes act as thermal reserves, absorbing the heat from the air. In the fall the lakes release this heat, having a moderating affect on the climate. Winters in the region, though cold, are again buffered from severe weather by these large bodies of water. Overall, there are usually no long wet or dry periods in southern Ontario. Instead there is steady precipitation throughout the year.

Contemporary Climate and Vegetation of South Central Ontario:

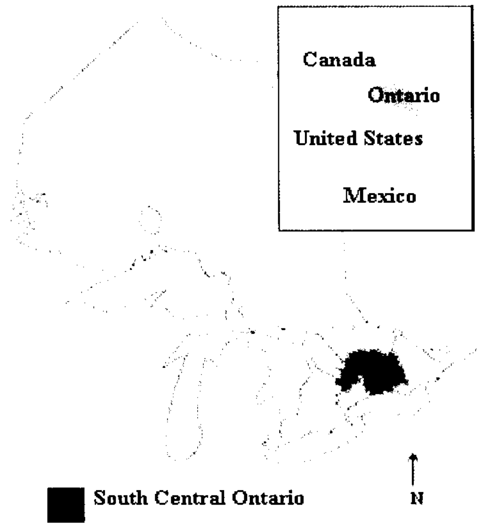



***Figure. 3.1***
*Geographic Location of South Central Ontario*

At present, summer in southern Ontario is defined as the period of the year when the mean daily temperature exceeds 19ºC. The fall begins in the last half of September when average daily temperatures are under 16ºC. During this time the first frost will usually occur. Winter arrives when the mean daily temperature is below 0ºC and typically lasts 3 to 4 months. Spring arrives when the mean daily temperature rises above 0ºC. It will remain near this 0°C mark until the end of March. April's average is between 3°C and 6°C while the regions mean in May rises to 10°C.

Native peoples, who were likely of Iroquoian or Algonquian origin, were the first to cultivate the fertile land of southern Ontario. People of the Iroquoian language family placed an emphasis on growing the three sisters; corn, beans and squash. Forest clearance for these agricultural pursuits was in many ways substantial but it pales in comparison to the large-scale forest clearance practiced in the region today.

Heidenreich states that in the $17^{th}$ century, "winters may have been slightly longer with a slightly shorter frost free season but not short enough to hinder agricultural activities appreciably" (1971:59). The corn would have been planted in the late spring, middle or end of May, and harvested in the early fall, end of August or early September. Indian corn required 120 frost-free days to mature and was harvested on much the same schedule as is practiced by the farmers in the region today (Heidenreich 1971:56-57). Heidenreich has stated that, "if vegetation can be used as a rough indicator of climate, one can safely conclude that on the basis of the species mentioned by the early writers, the vegetation and climate of Huronia was very much as it is today" (1971:61). This fact is further supported by a review of the research into the effects of the Little Ice Age.

The Little Ice Age:

The Little Ice Age (LIA) was a period of global climatic cooling that in southern Ontario spanned from AD 1450 to AD 1850, during this period temperatures on average were 1°C to 3°C cooler year round (Campbell and Campbell 1989:13). Since the LIA was not an abrupt climatic change but a gradual process, these dates mark a general period of cooling as opposed to the start and end dates of the LIA. The intensity of the effects of the LIA on the environment of southern Ontario is important to consider in relation to Huron animal exploitation occurring from AD 1450 to AD 1850. If the temperature fluctuations of this period were significant enough to alter the environment, and therefore the species that depended on that environment, then it would be possible to argue that changes in faunal trends during this period are reflections of environmental fluctuations instead of cultural manifestations.

There are two main hypotheses about the effects of the LIA (Campbell and Campbell 1989; Griffin 1961). The first hypothesis suggests that the LIA caused shifts in dominant plants species, mainly trees (Campbell and Campbell 1989). Changes in forest composition would have had an impact on animal habitats and therefore on the populations of various animals that were available to be exploited by the Huron. Furthermore, it is suggested that the climate would have become unfavorable for corn, bean and squash horticulture, and, as a result, increased exploitation of animal foods would have been required as dietary compensation (Campbell and Campbell 1989). The second hypothesis states that the effects of the LIA were ameliorated in southern Ontario by the surrounding Great Lakes (Griffin 1961). As a result, the temperature would not have fluctuated as severely in southern Ontario and the environment would not have changed significantly enough to require specific cultural adaptations. Both of these hypotheses have garnered support from pollen cores studies.

Campbell and Campbell (1989) published a paper discussing the impact of the LIA on the Neutral Iroquois who occupied the extreme southern region of Ontario. They found that between AD 1450 and AD 1650 the faunal assemblages from Neutral sites decrease in field dwelling species and increase in deer and dog representation (Campbell and Campbell 1989:13). They suggest that the LIA made corn horticulture difficult and an increased dependence on meat was required resulting in greater dog and deer consumption (Campbell and Campbell 1989:24).

Campbell and Campbell (1989:28) also suggest that climatic changes and an increase in the human population would have led to the cultivation of more horticultural fields. The slight decrease in average annual temperatures would have meant that the harvest sizes of these fields would have been smaller. The presence of more fields would have attracted more deer, and as a result deer exploitation would increase. Dogs, used to control animals that feed on the corn, were kept as pets and were used as a food source (Campbell and Campbell 1989:28). More fields meant more dogs were needed and more dogs would have ensured the decrease of field dwelling species (Campbell and Campbell 1989:13). Campbell and Campbell see these faunal changes as representative of the impact of increased forest clearance along with climatic deterioration associated with the LIA.

There are several concerns with this argument and its applicability to the Huron of the Trent River Valley. Recent research by Fitzgerald (2001) has revealed that between AD 1450-1850 the climate was not simply undergoing a period of cooling but was actually ameliorating and deteriorating in cycles. From AD 1450-1550 the climate was ameliorating in response to the decrease in temperature seen at the beginning of the 15$^{th}$ century. From AD 1550-1880 the temperature again began to drop, by approximately 1°C. The data presented in Table 3.1 shows the periods of climate fluctuation now understood to have taken place around the Great Lakes during the LIA. The research presented by Campbell and Campbell (1989) does not have this kind of regional applicability. Their focus was on a small number of Neutral sites in extreme southern

Ontario and it is entirely possible that the observed decrease in field dwelling species coupled by an increase in deer and dog is the result of some other process.

***Table 3.1***
*Climatic Fluctuations Seen in the Greats Lakes Region from AD 1250 to Present (adapted from Fitzgerald 2001)*

| | | |
|---|---|---|
| Pacific I Stage | 1250-1450 | Decrease in Rainfall, Decrease in Temperature |
| Pacific II Stage | 1450-1550 | Climatic Amelioration |
| Neo Boreal | 1550-1880 | Climatic Deterioration, cooling of 1°C. |
| Recent Stage | 1880-Present | General Warming Trend |

The Huron occupying the Trent River Valley did not experience the same shifts in faunal exploitation as seen on the Neutral sites reviewed by Campbell and Campbell (1989). The Huron of the historic period had a mixed subsistence based on agriculture, hunting, gathering, and fishing. They successfully grew corn, beans, squash, and sunflowers (Tooker 1964:58-60). This subsistence pattern extends back into the 16th century Huron occupations of southern Ontario. Also, as suggested in Chapter Five of this research, the number of deer elements found on Huron sites in the Trent River Valley decreases throughout the 16th century. This is contrary to the pattern for the Neutral sites that show an increase in deer remains (Campbell and Campbell 1989; Fitzgerald 2001). These varying trends suggest that the Neutral faunal changes observed during the late 15th to mid 16th centuries are likely the result of some other cultural action, or localized environmental change. Regardless of what that motivation was, what remains important is that the fluctuation identified by Campbell and Campbell (1989) appears to be an isolated phenomenon. Variations in temperature during the LIA were slight and would not have effected corn growth cycles dramatically. The Huron, at least, continued to produce a surplus of corn in the historic period of the LIA, such that they could use this surplus corn as trade leverage in the acquisition of beaver pelts (Tooker 1964).

The second hypothesis on the effect of the LIA in southern Ontario proposes that the affects of this global cooling were ameliorated by the proximity of the Great Lakes (Griffin 1961). Large bodies of water act as temperature sinks and are capable of maintaining an elevated average temperature in a region despite changes that may have been occurring elsewhere. This is similar to the ameliorating effects of the Atlantic and Pacific Oceans seen along the coasts of North America. The Huron culture does not appear to deteriorate during what should have been a period of climatic change and environmental adjustment. In fact the population coalesces during this period by moving into a spatially bounded region defined by Huronia thereby increasing their reliance on corn horticulture (Trigger 1969:25). This does not support the hypothesis that horticulturalists would have been struggling to adjust to changing climatic and environmental conditions. Evidence of climatic deterioration is often taken from the analysis of pollen diagrams. However, the pollen diagrams may not be depicting the true nature of environmental and climate change. Pollen, like faunal remains, can be greatly affected by preservation and deposition issues. "Fossil pollen percentages do not accurately represent the forest around the site of a pollen diagram because species vary in their pollen production, dispersivity and preservability" (McAndrews 1994:186).

What can the pollen data really tell us? The variability of the affects of the LIA on the microenvironments of southern Ontario is certain. The trends that we can be assured of are most satisfactorily explained by land clearance in advance of increased agriculture, coupled by small local forest fluctuations brought about by climate change. Table 3.1 offers a summary of the climatic fluctuations seen in the Great Lakes area during the LIA.

Many animals were available to the Huron for exploitation in south central Ontario. The persistence of these animals in the area during the LIA further indicates that the temperature and environmental fluctuations in the region were not significant enough to have necessitated any extreme animal exploitation changes by the Huron.

Resource Availability:

A large number of species would have been available for exploitation to any groups living in southern Ontario. An in-depth discussion of each of the species habitats and behaviors has been compiled and appears in Appendix A.

Mammals:

The mammals available in south central Ontario today are likely similar to those mammals that were available in the region in the 15$^{th}$ and 16$^{th}$ centuries. Mammals ranging in size from that of a deer mouse to something as large as bear or moose were exploited in the centuries preceding direct European contact. Due to the great number of mammals available for exploitation, only those that have been identified from the sites in this study are discussed here. These mammals are listed in Table 3.2. For further discussion of these mammals, their habitats and their annual cycles see Appendix A.

***Table 3.2***

*Terrestrial Mammals Native to South Central Ontario*

| Scientific Name | Common Name |
|---|---|
| Alces alces | Moose |
| Canis familiaris | Domestic Dog |
| Canis latraus | Coyote |
| Canis lupus | Wolf |
| Castor canadensis | Beaver |
| Erethizon dorsatum | Porcupine |
| Lepus americanus | Snowshoe Hare |
| Lutra canadensis | River Otter |
| Marmota monax | Woodchuck |
| Martes americanus | Marten |
| Mephitis mephitis | Striped Skunk |
| Microtinae | Vole |
| Mustela sp. | Mink/Weasel |
| Odocoileus virginianus | White Tailed Deer |
| Ondatra zibethicus | Muskrat |
| Peromysucs maniculates | Deer Mouse |
| Peromyscus leucopus | White Footed Mouse |
| Procyon lotor | Raccoon |
| Tamiasciurus hunsonieus | Red Squirrel |
| Tamius striatus | Eastern Chipmunk |
| Urocvon cinereoargenteus | Grey Fox |
| Ursus americanus | Black Bear |
| Vulpes vulpes | Red Fox |
| Sylvilagus floridanus | Cottontail Rabbit |
| Lynx lynx | Lynx |

Aquatic Resources:

The proximity of all sites in this study to bodies of freshwater explains why large numbers of aquatic resources were being exploited. Balsam Lake, its feeder streams and tributaries, are known today as centers for sports fishing (Rankin, Tuck and Ramsden 2003:5). The species listed in Table 3.3 represent only those identified in this study and are discussed in-depth in Appendix A.

***Table 3.3***
*Aquatic Species Native to South Central Ontario*

| Scientific Name | Common Name |
|---|---|
| Angiulla rostrata | American Eel |
| Aplodinotus grunnieus | Freshwater Drum |
| Catostomus commersoni | White Sucker |
| Esox | Pike or Muskellunge |
| Catostomidae | Sucker Family |
| Ictaluridae | Freshwater Catfish Family |
| Lepomis gibbosus | Pumpkinseed |
| Lota lota | Burbot |
| Microterus sp. | Bass |
| Percidae | Perch Family |
| Salvelinus sp. | Trout |
| Stizostedion vitreum | Walleye |
| Ictalurus punctatus | Channel Catfish |
| Semotilus carporalis | Fallfish |
| Chelydra serpentina | Snapping Turtle |
| Chrysemys picta | Painted Turtle |
| Rana catesbeiana | Bullfrog |

Avian Resources:

The Huron in the Trent River Valley exploited a wide range of bird species. Most of the smaller species of bird may have been hunted to acquire feathers and bones used to make decorative objects. The larger species were likely taken for their meat as well as for their contributions of raw material. Again Table 3.4 only represents those species identified at the sites used in this research, and their in-depth habitat and behavioral information can be found in Appendix A.

*Table 3.4*
*Avian Species Native to South Central Ontario*

| Scientific Name | Common Name |
|---|---|
| Accipitridae | Hawk |
| Aquila or Haliaetus | Eagle |
| Aytha affinis | Scaup |
| Bonasa umbellus | Ruffed Grouse |
| Branta canadensis | Canada Goose |
| Cyanocitta cristata | Blue Jay |
| Gravia immer | Common Loon |
| Ardea herodias | Great Blue Heron |
| Ectopistes migratorius | Passenger Pigeon |
| Grus canadensis | Sandhill Crane |
| Meleagris gallopavo | Turkey |
| Sphyrapicus | Yellow-bellied Sapsucker |
| Turdus migratorius | Robin |
| Nyctea scandiaca | Snowy Owl |

Conclusion:

This chapter introduced the environment and climate of south central Ontario. A discussion of the minimal affects of the Little Ice Age on this region followed. The LIA lasted approximately from AD 1450 to AD 1850, during which, the average temperatures in North America dropped by 1 to 2°C. The affects of the LIA on the Huron were not substantial. The proximity of the Trent River Valley to Lake Ontario allowed the region to be protected from temperature fluctuations. There is no evidence that the Huron were adversely affected by climatic changes caused by the LIA. A brief introduction to the species that were exploited by the Huron in the Trent River Valley followed the LIA discussion. This species overview has created a context through which the subsistence patterns described in Chapter Five are to be interpreted.

# Methodology
# Chapter Four

> Subsistence strategies are the target of most current zooarchaeological research. Subsistence strategies encompass procurement decisions and technologies; economic, political, and social institutions; and ritual activities. These studies include efforts to identify general subsistence patterns; settlement patterns and cachement areas…
> (Reitz and Wing 1999:28).

## Introduction:

This chapter introduces the quantification techniques and methodologies associated with intra- and intersite faunal analysis. Several factors affecting the validity of intersite faunal analysis are reviewed. Most of these factors relate to the recovery and identification of faunal remains. The quantification techniques used in this research are then outlined. Finally, the procedure used to record the faunal information from the five sites in this study is explained, emphasizing the importance of creating valid data that is comparable between sites.

## Intersite Faunal Analysis, Methodology:

Zooarchaeology involves the study of faunal remains from archaeological sites and generally addresses one of two main goals, "to understand the biology and ecology of animals, and to understand human behavior through time and space" (Reitz and Wing 1999:12). When used on an individual site, zooarchaeology allows a researcher to address site-specific issues. However, analysis can be applied to a series of sites in order to understand changes and trends between sites and throughout time periods.

In recent years, much zooarchaeological research has been focused on the analysis of regional and temporal trends and changes, established through the application of intersite comparisons. Intersite comparisons, such as those used in this research, can involve the comparison of sites analyzed by the same researcher or those analyzed by any number of researchers.

The analysis of zooarchaeological material is hindered by several factors. These factors include: the recovery techniques used on the collections, the bias of the analyst, the strength of the comparative collections, the occurrence of differential preservation, the quantitative methods used to manipulate the data, and the size of the faunal sample. Some of these factors are mitigated if the same excavation techniques and faunal analysts are used on all sites (e.g. Munro 1999), and some apply to all intersite comparisons. The main limiting factor for intersite faunal comparisons is the nature of the questions being asked of the data. Research has shown that general trends in data remain the same despite the analysis being performed by different researchers and despite variances in the sample size (Amorosi et al. 1996). If the questions being asked can be answered by wide ranging general trends that are found within each site's data then any comparisons made are valid.

Recovery techniques used in the field affect the validity of intersite comparisons of zooarchaeological assemblages. The standard recovery techniques used by archaeologists include the use the ¼ inch screens for the dry sieving of excavated earth. This process works well for the recovery of large faunal remains but it will not recover many of the small faunal remains that may be on a site. When sieving is not employed, the only remains collected are those visible to the naked eye, small bones or those covered in soil are often not noticed and therefore not collected. This results in the over representation of animals with large bones and an under representation of animals with smaller bones. It can also lead to a misrepresentation in element counts since the largest of the large bones are the most likely to be recovered. Large bones, and therefore large-boned species tend to be seriously over-represented at the expense of small bones (O'Connor 2000:31). Payne (1972) completed a study on the recovery of faunal remains using varying screen sizes and concluded that the smaller the screen mesh the more complete the recovery of faunal remains. However, "an entire spectrum of small and medium-sized animals is often under-represented or not recovered with the use of ¼ inch mesh, yet this screen size has become the 'industry standard' in North American archaeology" (James 1997:385). The use of ⅛ inch screening corrects for some of these errors, but small remains still pass through the screen and do not become a part of the assemblage. In this study all but the Coulter site were excavated with the use of ¼ inch mesh screening, the excavations at the Coulter site used ⅛ inch mesh screening (Damkjar 1990:5).

Using smaller screen sizes allows for an increased recovery of small remains. However, wet sieving guarantees almost complete recovery. This process frees small bones from earth and when incorporated with flotation liberates small less dense bones and even plant remains. Though archaeologists are aware that smaller screen sizes give better recovery rates, the degree of screening implemented on a site usually relates to the length of the field season and the amount of manpower and money associated with the project. Screening takes time and when performed on a large scale can seriously slow the progress of an excavation (Amorosi et al. 1996:130). Often the degree of screening implemented is the highest degree that the project can manage while still being productive and meeting excavation goals. All of the excavation procedures followed in the Upper Trent Valley Archaeological Project were limited by time and proceeded in the best way to meet the aims of the project (Ramsden 1977a: iii).

The techniques used to recover faunal remains on a site will affect the interpretive value of the resulting data. It is important to understand the techniques that were used on the site when analyzing the faunal remains so that biases in the data can be accounted for. "We should all expect to see a statement in every bones publication about the manner of recovery used to obtain the samples" (Legge and Rowley-Conwy 1991:3). This is especially important when comparing data from two or more sites that may have had varying strategies for faunal recovery, a frequent problem in the comparison of recently excavated collections to older collections.

Archaeologists generally focus on the conclusions drawn by zooarchaeologists about their faunal collections and give little attention to the actual analysis carried out by zooarchaeologists. "Archaeologists seem to have an uncritical confidence in the findings of those whose expertise they utilize" (Gobalet 2001:377). Often in academic publications the identity of the analyst is not given, nor are their credentials or information on how they analyzed the collection (Gobalet 2001:377). It is not uncommon for researchers to introduce their faunal analysis by saying, "specialists then identified the faunal remains to the most specific taxonomic group" (Erlandson 1994:56). This statement does not provide the critical reader with any information that explains who analyzed the collection or the methods they used in their analysis. Any individual wanting to use such data in their own work may find it impossible to track down either the researcher who first worked with the collection or the collection itself.

In light of these issues, it is important to maintain a critical perspective when reading faunal reports since not all researchers are created equal. Every researcher will analyze a collection differently. Individual analysts use varying techniques to record information about the bones and some may be more skilled at identifying a species or may have differential access to comparative collections. Based on these differences, the outcome of the analysts' work can vary. It is important that all researchers include in their publications explanations of how they analyzed the collections and what types of quantitative calculations were used. For the calculations relevant to this study I have been able to obtain the faunal reports from all of the researchers involved. However, in many cases information has been lost. As a result, relationships between stratigraphic information and species distributions cannot be explored and certain calculations on the specimens cannot be carried out since the recording procedures are not available. This has limited the research questions that can be asked of these data sets, but as will be discussed in the faunal review for each site, the general dog, beaver, and deer trends have remained intact.

Gobalet (2001) organized a blind study to determine how much variation could be seen in faunal analysis performed by several researchers on the same collection. He found that the level of identification varied from researcher to researcher, with some identifying almost all of the bones to specific taxonomic levels, while others left the majority of the bones in general family categories (Gobalet 2001:380). Table 4.1 presents a general summary of the identifications of fish remains by four zooarchaeologists in Gobalet's (2001) study. The analysts, alpha, beta, gamma, and delta all identified the remains with varying degrees of precision. Table 4.1 illustrates that analysts working on the same collection will often not produce the same results. It is important to note that for the archaeologist, these differences in identification may not be as significant as they are for biologists or zoologists. Archaeology is often concerned with the general faunal trends. Even if the collections were analyzed only to the family level, the general exploitation trends would be the same. However, differences in more specific identifications would affect those doing research in zoology and biology. These researchers are looking for species trends, not general exploitation trends (Gobalet 2001:380), and as such, misidentified species or inflated/deflated species counts can have serious impacts on their studies.

Despite the fact that different people will identify remains to varying levels, the general trends that they identify will remain the same.

***Table 4.1***
*General Summary of Identifications of Fish Remains from CA-SLO-165 by Four Analysts (adapted from Gobalet 2001:379)*

| | Alpha | Beta | Gamma | Delta |
|---|---|---|---|---|
| Number of elements identified | 69 | 68 | 65 | 53 |
| Number of species identified | 18 | 9 | 5 | 4 |
| Number of elements designated to family | 0 | 2 | 7 | 4 |
| Number of elements designated to higher grouping | 0 | 3 | 3 | 3 |

In order to address the validity of intersite faunal comparisons based on analysis done by different researchers Amorosi et al. (1996) examined the trends produced from faunal data that was analyzed by two researchers. They concluded that trends in faunal data would continue even if there were variations in the techniques used in the collection, identification and quantification of the remains. In contrast to the work done by Gobalet (2001), Amorosi et al. (1996:140) suggest that "any working zooarchaeologist would be astounded to produce precisely the same count of bones from the same site collection in two blind tests". Instead of focusing on researcher differences, the focus needs to be on looking for the overall trends in the numbers; "we might instead look for correspondences between overall patterns rather than in specific numbers" (Amorosi et al. 1996:141).

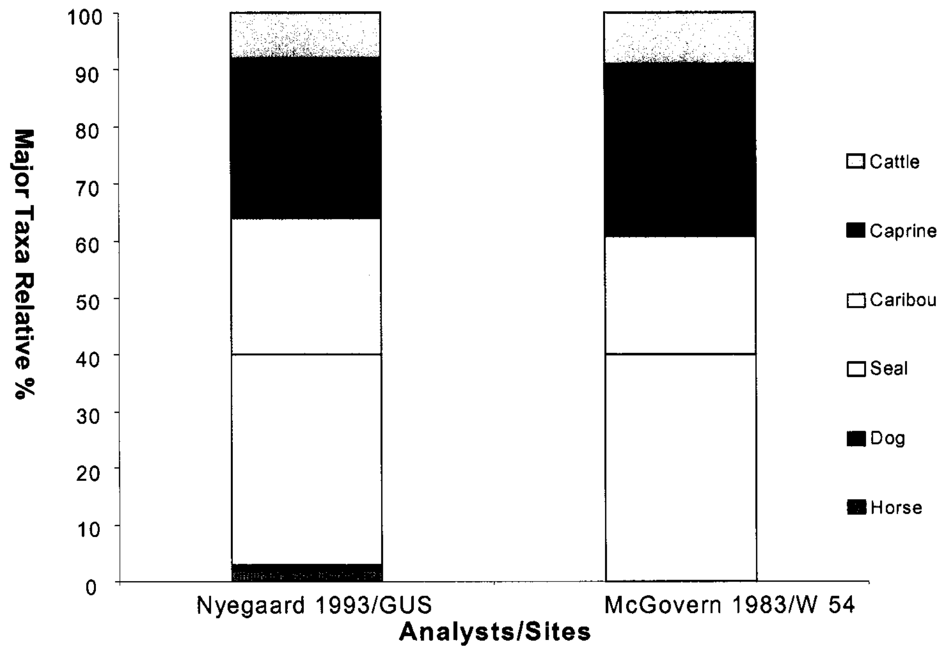



***Figure. 4.1***

*Relative Frequency of Taxa for Two Similar Sites Analyzed Ten Years Apart with Various Differences in Recovery and Analysis Techniques (adapted from Amorosi et al. 1996:141).*

Figure 4.1 compares the results of the faunal analysis from two sites in the same region. The sites were inhabited at the same time, and different individuals completed the analysis at each site. The similarity in the faunal trends is striking, especially considering that the two researchers used different methods of analysis and were working ten years apart. This kind of data comparison supports the conclusion that the general trends will prevail despite any differences in the nuances of the analysis. As Amorosi et al. state, examples such as this support the existence of "underlying regularities in the zooarchaeological record… We do appear to be measuring something besides ourselves" (1996:141). This means that questions dealing with the general trends for a series of sites will still be valid despite the fact that different researchers may have analyzed each collection.

Comparative collections can also affect the precision at which a site is analyzed. Generally, the more complete and diverse the comparative collection, the more accurate the assignment of species to the bone assemblage will be. If a researcher only has access to a limited number of comparative species, these species are generally over represented, and there may be large categories of unidentified bones. On the other hand, a researcher with a comprehensive comparative faunal collection will often assign a greater number of species to the bones and will be able to make more precise suggestions about resource exploitation. However, there will be differences in analysis regardless of the nature of the comparative collection based on the experience and expertise of the analyst. This issue comes into play when the faunal exploitation strategies for each of the sites in this study are examined. In relation to the overall aim of this faunal research, to isolate the changing dog, beaver and deer exploitation patterns, all of the faunal analysts who worked on the sites in this study had access to comparative skeletons for these species. Thus, a high level of confidence can be assigned and the most basic of the faunal trends examined.

Differential preservation is another issue that plagues intersite comparisons. The level of faunal preservation, even on sites within the same region, can vary greatly based on taphonomic factors. The differences in preservation can result in dramatically different faunal assemblages that may have looked almost identical prior to deposition.

Ringrose (1993:123) and Klein and Cruz-Uribe (1984:3) have detailed the stages that a faunal collection goes through on the path to becoming a sample assemblage. In order to correct for these problems, a researcher must look at, and be aware of, all of the taphonomic process that may have affected the collection pre- and post-deposition. These processes can include: weathering, animal scavenging, soil acidity, erosion, rodent activity and human modification. "Only with a detailed knowledge of the taphonomic processes involved can we hope to tell how fossil assemblages relate to past events" (Ringrose 1993:136). Understanding the effects of taphonomic processes on archaeological collections allows valid statements to be made about general trends and changes through intersite comparisons. Differential preservation will affect what becomes part of the archaeological sample assemblage, but if these factors are taken into consideration when formulating research questions then valid and insightful conclusions from zooarchaeological data can still be made. The taphonomic factors affecting the collections in this research are quite homogenous throughout. However, where differences have occurred, they have been discussed in relation to the reconstruction of faunal exploitation at the site. In this research the taphonomic processes have varied only in relation to the differential treatment of certain animal elements. In the Kirche and Benson faunal collections it has been possible to isolate the differential treatment of beaver and deer elements. Beaver are represented on these sites by cranial and extremity elements while deer have a high incidence of phalanx recovery. These trends are cultural in nature. Beaver are likely being processed outside of the village resulting in the selected transport of certain elements back to the villages. Deer phalanges were often modified and are therefore being selected for preservation by the cultural value attributed to them.

This differential treatment of elements is really an issue of degree. The treatment intensifies throughout the 16th century, but no new treatments are introduced.

The quantitative methods used to manipulate the raw faunal data can also affect the strength of intersite comparisons. Calculations of values such as minimum number of individuals (MNI) typically begin with the calculation of the number of identified specimens (NISP). From this common start, MNI values may then be derived in different ways. Each method has its own associated strengths and weaknesses (see Grayson 1984; Klein and Cruz-Uribe 1984; Lyman 1994; Ringrose 1993). It is difficult to validly compare data from different sites when the methods of quantification are not explained. The data may be incomparable based on the way these measures were derived. The general trends inherent in faunal data are apparent without complex statistical manipulation and "highly quantitative analysis of vertebrate faunal data are, in general, not appropriate due to the very nature of the subject" (Ringrose 1993:151). This is not to say that quantification is without a purpose. It is very useful in that it can make data comparable to other data and make trends within the data more apparent. "Knowing what cannot be done with the data is just as important as knowing what can" (Ringrose 1993:122). Similar to all other factors previously discussed, the most important step in quantification is the explicit explanation of how calculations were derived and determinations made. "The increased demands made upon faunal data for explanations has resulted in extensive methodological research" (Reitz and Wing 1999:28). This methodological information should be made available so that in the future researchers using the data will be able to see how the calculations were made and if the methods altered the output and final analysis.

For the purpose of this research calculations of NISP have been significant. MNI values were only calculated when they could aid in the data's interpretation. The decision to rely on NISP values was linked to the lack of information available for the faunal collections. For example, the identification recording procedures, including how each element was recorded, or even which elements the NISP represent were absent. When in-depth information was available it has been incorporated into the discussion. In certain instances the use of MNI has assisted in revealing the trends in the faunal data, allowing the conclusions drawn from this research to be strengthened.

MNI calculations at the village sites were also problematic for another reason. In order to use MNI to look at the intrasite faunal patterns the entire site would have had to be broken down into smaller aggregates be they middens, palisades or house sections. Since MNI values are not additive, they are greatly affected by how one clusters the data (Grayson 1984:28-29). As the number of specimens, or the NISP value of each aggregate, becomes smaller and smaller the MNI values calculated from these deflated NISP's will actually approach the basic NISP values for the aggregate (Grayson 1984:63).

A corollary problem exists for those sites that appear to be resource exploitation camps, or at least short-term occupations. The smaller sample sizes of these sites make them appear as small aggregates and therefore relative trends are masked by over inflated MNI values drawn from small samples of bone. It is also important to note that MNI values over inflate the relative importance of rare taxa (Grayson 1984:50). In this case, as exampled in Table 4.2, if we look at the associated NISP values we can often identify the over inflation being introduced by the MNI calculations.

***Table 4.2***
*Example of How MNI Values can Over Inflate the Frequency of Rare Taxa*

| | NISP | MNI |
|---|---|---|
| Deer | 47 | 2 |
| Dog | 36 | 1 |
| Seal | 1 | 1 |

MNI calculations are based on NISP values, and "as a result, the information on relative abundance that resides in MNI counts generally resides as well in NISP counts, and if relative abundance is the target of analysis, there would seem little reason to spend the time and effort to calculate minimum numbers" (Grayson 1984:63). Since the relative abundance of dog, beaver and deer is the focus of this research a concentration on the comparison of NISP values has been implemented as the general strategy.

Sample size is also an issue when trying to decide the validity of intersite comparisons. Sample size is a measure of how many bones or fragments of bone were recovered from a site. In some cases, the sample size is taken to be the NISP for the site. The sample size must be large enough so that we can confidently say that any observed trends are the result of cultural actions and not the result of insufficient or incomplete data (Klein and Cruz-Uribe 1984:5). The sample size can relate to the general trends apparent in the sample. When sample sizes are big enough, the general trends remain the same whichever method of quantification is used (e.g. Crabtree 1990). It has generally been assumed that small collections derived from poor recovery techniques, and therefore having small or depleted sample sizes, possess little information, but in reality this is not the case. Again, it is most important to focus on the nature of the questions being asked. In intersite comparisons "we will have to work with the inevitably uneven data as it exists, and try to develop strategies that help us match research questions with collection characteristics" (Amorosi et al. 1996:131).

Intersite comparisons allow archaeologists to address questions on the regional and temporal scale. Through these types of comparisons, social and cultural trends and changes through time can be explored. "The new generation of zooarchaeological research attempts to move toward more complex inferences about the systems or contexts in which the agents acted and hence toward such life relationships" (Gifford-Gonzalez 1991:226). There is a need to be aware of the affects of recovery techniques, analyst differences, comparative collections, taphonomic processes, quantitative methods, and sample sizes when comparing faunal data, but it is most important to focus on the trends apparent in these data. These trends are the indications of changes between sites and over time. Though precise and in-depth data from each and every site is the ideal, in order to make use of all the data, the questions asked must be tailored to suit the data that is available. Though "there is no reason to accept every bone collection as equally valuable, ...there is even less reason to assert that sites are inherently incomparable or that nothing can be done with low-to-medium quality zooarchaeological evidence" (Amorosi et al. 1996:151). Such evidence can be used if inherent biases are understood and the questions asked are appropriate to the data it contains.

One means of supporting the conclusions derived from faunal analysis is to look at other archaeological evidence that addresses the same questions. Bone assemblages do not say much about the larger processes affecting them and governing their creation especially if they are studied in isolation (Binford 1987). In order to validate any faunal analysis, and any intersite comparisons based on this analysis, supporting evidence must be isolated in the archaeological record and applied to the trends where applicable. Many forms of evidence need to be used to support valid re-creations of social and cultural systems and processes. Within zooarchaeology, conclusions can be strengthened through the use of differing lines of archaeological investigation to determine if all evidence suggests the same conclusion. As Amorosi et al. have stated, "multi-context comparisons are both feasible and productive if they are carried out with an informed understanding of the limitations as well as the potentials of basic zooarchaeological data" (1996:128). For each of the sites in this study I have attempted to relate their faunal trends to the larger economic and political context in which they occurred. I have also strengthened my interpretations with material culture evidence. The discussion of the faunal trends and subsistence strategies for each of the sites follows in Chapter Six. They will be presented chronologically from earliest to latest based on relative dating.

In order to organize the faunal data generated by this research I developed a database that allowed for the faunal information from each of the sites to be entered, quantified and compared. The largest of the three sites that I completed the faunal identification for, the Benson site, has its own coding system that I developed to facilitate the recording of detailed information about each faunal specimen. This coding system can be seen in Appendix E. In order to make the data comparable for each of the sites I calculated the percent NISP values for the various remains identified. In many situations bone fragmentation highly affects NISP calculations and their effective use as interpretive tools. High bone fragmentation over emphasizes the faunal contributions of smaller species with less dense bones. The fragmentation of the faunal collections in this study was limited. If fragmentation is occurring at a higher rate on small mammal bones we would expect to see an equivalent increase across the small mammal category. This would mean that if fragmentation was introducing a significant error than all the small mammal categories should be greatly elevated and the large mammal categories decreased. This is not the case. Only beaver remains increase appreciably in the small mammal category. Likewise, dog remains increase, while deer remains decrease. In this study the use of NISP as the primary quantification technique has not been affected by a high degree of small bone fragmentation. Percent NISP shows the relative importance of each of the species analyzed, and it allows for comparisons between samples and sites. Table 4.3 shows an example of how calculating percent NISP can allow for comparisons between sites to be drawn based on the relative importance of the species at each site.

***Table 4.3***
*Example of the use of Percent NISP to Make Site Specific Species Frequencies Comparable Between Sites.*

| | Mammal NISP | Dog NISP | %DOG NISP |
|---|---|---|---|
| Alpha Site | 1256 | 400 | 31.8 |
| Beta Site | 2800 | 600 | 21.4 |

As can be seen in Table 4.3, it would appear that the Beta site had more dogs, and this is likely true. However, due to possible differences in site size or occupation length, the use of, or dependence on, dog as compared to the Alpha site is not adequately reflected. By calculating the dog remains as a percentage of the overall mammal remains a picture of the relative importance of dog on site and between sites becomes clear. Though there are fewer dog remains at the Alpha site than at the Beta, the relative importance of dog is higher at the Alpha site as reflected by the percent NISP calculation. This is the general strategy that has been employed in this research when comparing the shifting importance of dog, beaver and deer between Huron sites in the Upper Trent

River Valley. It is of equal importance to remain aware that when dealing with frequencies an increase in one component must be matched by a decrease in another. Thus, faunal patterns revealed through this statistical methodology are slightly over emphasized, however, as discussed earlier the general trends in the faunal patterns remain intact and relevant.

## Conclusion:

This chapter began by discussing various factors that affect the validity of intersite faunal analysis. It then introduced the methodologies and quantification techniques employed in this research in order to examine the intra- and inter-site faunal trends for five Huron sites in the Upper Trent River Valley. This outlined the use of NISP and MNI as quantitative and interpretive techniques. This chapter has laid out the faunal techniques and methodological considerations that have been used to gather and interpret the faunal data for each of the five sites that will be discussed in Chapter Five.

# Species Abundance and Exploitation Patterns
## Chapter Five

[Beaver were] the main inducement for many merchants of France to cross the great ocean... Such a quantity of them is brought every year that I can not think but that the end is in sight. (Saggard quoted in Tooker 1964:67).

### Introduction:

This chapter begins by addressing the faunal data available for each of the sites in this study, paying particular attention to intrasite spatial patterning as well as to the dog, beaver and deer exploitation trend exhibited at each site. The presence of St. Lawrence Iroquois and European materials is also reviewed for each site. The final section of this chapter looks at the intersite faunal trends by first analyzing the dog, beaver and deer trend for the hamlets and then looking at the same trend for the larger villages. This process explains the animal exploitation patterns apparent at each of the sites and then for the Upper Trent River Valley region in general.

### The Rumney Bay Site (BeGq-2):

The Rumney Bay site is located in Somerville Township, Victoria County, south central Ontario (Figure 5.1) (Ramsden et. al. 1981:20). The site is located on a series of terraces and centered on the second of these. A modern quarry has destroyed a portion of the site as has a dirt road used by local cottagers (Ramsden et. al. 1981:20). A freshwater stream is located approximately 100m west of the site. A total of 28 test pits were dug at the site and four middens were located. The ceramic attributes of the material recovered from these middens clearly relate the site to the Hardrock grouping (Ramsden et. al.

1981:22). These attributes suggest an early date for this site in the Trent Valley progression.

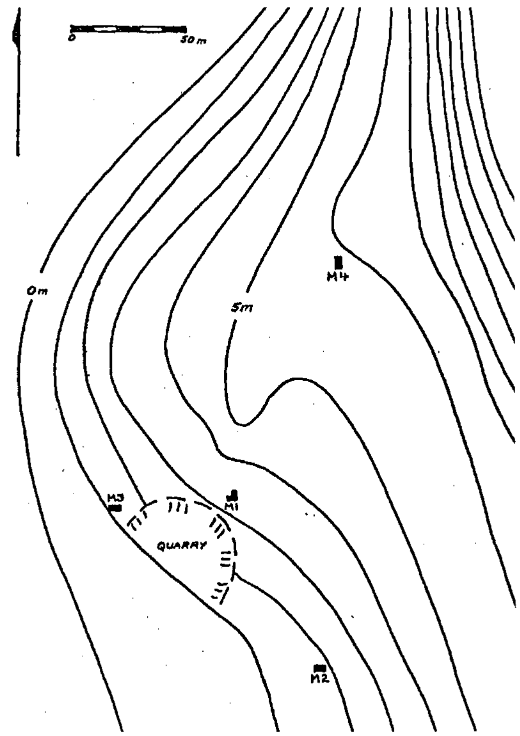



***Figure. 5.1***
*Map of the Rumney Bay Site (adapted from Ramsden 1981:20)*

The bone artifacts recovered consisted of awls, beads, arm bands, and various modified bone pieces (Ramsden et. al. 1981:23). There are no artifacts indicative of the St. Lawrence Iroquois material culture associated with the site. No longhouses were uncovered through site testing and excavations, although local folklore suggests that a longhouse was once excavated on the site (Ramsden 1977a:116). Ramsden (pers. com. 2004), however, attests that after thoroughly testing the site he is certain that there are no houses to be found in the area. The lack of longhouses suggests that the site functioned as a resource exploitation camp or a short-term occupation camp. The middens explored in association with the site were shallow, being only 30cm deep. Faunal recovery was low despite the use of ¼ inch mesh screening strategy (Ramsden et. al. 1981:20).

Faunal Analysis:

The Rumney Bay faunal collection was first analyzed by Dr. David Black of McMaster University who identified a portion of the collection and calculated MNI values for the remains that he analyzed in 1987. This report was made available to me. However, studying the report it became apparent that I would require NISP values. The inherent problems of MNI calculations, especially on small samples, have already been discussed. Since the faunal collection from Rumney Bay was accessible I quickly sorted the bones into fish, mammal, bird, dog, beaver and deer categories and created rough NISP calculations. Any other mammal species recorded by Black (1987) were again recorded though intensive analysis was not done on any specimen that did not fall into the dog, beaver, or deer category. This has resulted in some identifiable species being lumped into the mammal category, but for the purpose of this study I focused on the dog, beaver and deer remains. The faunal collection from the Rumney Bay site consists of 863 bone fragments of which 6.5% were identifiable to species. Within the mammal category 16% of the remains were identifiable.

Black's (1987) general MNI values are presented in Table 5.1. By comparing Black's (1987) MNI values with the new NISP values the over inflation of MNI values in species such as birds is apparent (Table 5.2).

***Table 5.1***
*MNI Values for Rumney Bay*

| | MNI | %MNI |
|---|---|---|
| Mammal | 7 | 19 |
| Birds | 4 | 11 |
| Fish | 26 | 70 |

The differences in the trends for dog, beaver and deer are not apparent when you look only at the MNI calculations (see Table 5.2). This is because the remains were from such a small collection that any trends in the faunal data are removed by calculating the MNI values for the species.

***Table 5.2***
*MNI Values for Rumney Bay Mammals*

| Mammal | MNI | %MNI |
|---|---|---|
| Beaver | 1 | 14 |
| Dog | 1 | 14 |
| Fur Bearers | 4 | 57 |
| Deer | 1 | 14 |

The NISP values, presented in Table 5.3, demonstrate that fish played an important role in the subsistence practices of the Rumney Bay people. Mammals, whose NISP value is second to fish, would have contributed a significant meat source to the people at the Rumney Bay site.

***Table 5.3***
*NISP Values for Rumney Bay*

| | NISP | %NISP |
|---|---|---|
| Fish | 620 | 71.8 |
| Mammal | 223 | 25.8 |
| Bird | 20 | 2.3 |

The mammal analysis (Table 5.4) indicates that dog appears to have played a greater role in the subsistence structure than deer. Deer, which would have been expected to be the primary mammal resource, falls second to dog. Beaver is equivalent to chipmunk as the third highest ranked mammal, but if we consider that chipmunk provides little in the way of meat we can safely rank beaver third based on its utility to the people at the site. Beaver were useful in many ways, they could be eaten, either fresh or smoked, and their fur was highly valued for clothing even before the fur trade (Trigger 1969:32). Smaller animals such as chipmunks were also hunted but with a more opportunistic strategy (Trigger 1969:32).

***Table 5.4***
*NISP Values for Rumney Bay Mammals*

| | NISP | %NISP |
|---|---|---|
| Dog | 13 | 40.6 |
| Deer | 6 | 18.8 |
| Beaver | 4 | 12.5 |
| Chipmunk | 4 | 12.5 |
| Porcupine | 3 | 9.4 |
| Muskrat | 1 | 3.1 |
| Squirrel | 1 | 3.1 |

The implications of these trends in relation to the other sites in this study will be discussed later in the section titled Intersite Variability of Subsistence Patterns. The raw faunal data, from both my NISP calculations and Black's (1987) MNI calculations, can be found in Appendix B.

Evidence of Interaction:

No St. Lawrence Iroquois pottery was recovered from the Rumney Bay site. Ramsden et al. (1981:263) suggest that this is because Rumney Bay is an early site and therefore may represent a more traditional Huron group of people as opposed to the later sites where we begin to see the potential mixing of people and cultural groups. In accordance with this fact no European materials were recovered from the site.

The Kirche Site (BcGr-1):

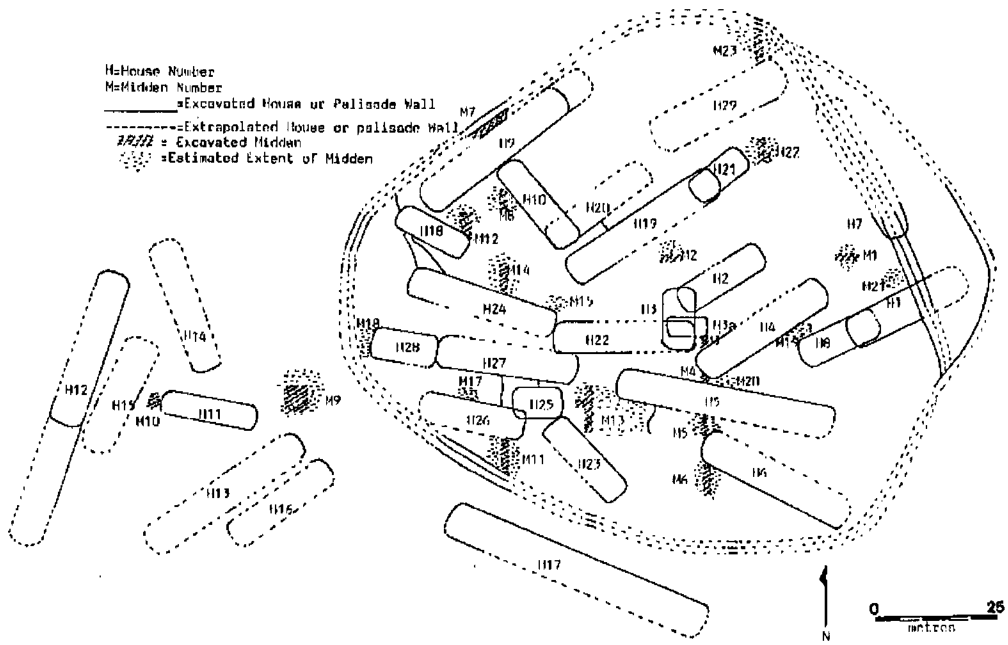



***Figure. 5.2***
*Map of the Kirche Site (adapted from Nasmith 1989)*

The Kirche site is a 16th century Huron village in Fenelon Township, Victoria County in south central Ontario (Figure 5.2). Carol Nasmith (1989) analyzed the site as part of the Upper Trent Valley Archaeological Project. The site has been dated to AD 1500-1550. This date is based on radiocarbon analysis, ceramic seriation, and historical references (Nasmith 1989:67). The village covers approximately 1.4 hectares of land and includes at least 27 longhouses, 20 of which were encompassed by a palisade and seven of which were not (Nasmith 1989:7). The palisade was extended on at least one occasion, either to accommodate new or relocated houses. Those houses located outside of the palisade have higher amounts of St. Lawrence Iroquois style pottery and this may indicate that the people occupying these houses were either seasonal visitors or members of trade parties (Rankin, Tuck and Ramsden 2003:9). This could also be indicative of the arrival of different people to the region. People attaching themselves to a village for protection might build their houses near the village, awaiting an invitation of acceptance by community members before moving within the palisade's protection (Ramsden 1988b). These issues will be explored further in later chapters.

The excavations at the Kirche site were undertaken to establish the settlement pattern for the village and to determine what role it played in the developing dynamic of the Trent River Valley. Due to this focus the excavation did not concentrate on the intensive exposure of house interiors. This decision was supported by the fact that most of the houses had no intact living floor since the majority were located in a plough zone (Nasmith 1989:4). As a result, excavations concentrated on house and palisade walls, which were trenched to delineate their location. Furthermore, both disturbed and undisturbed middens were excavated and were screened through ¼ inch mesh (Nasmith 1989:4). Faunal remains were encountered in both house walls and middens. The majority of the remains were recovered through troweling and ¼ inch screening and, as such, the faunal remains are likely a comprehensive sample of the remains deposited on site.

Faunal Analysis:

Steve Cumbaa of the Zooarchaeological Information Center, National Museum of Natural Sciences, Ottawa carried out the faunal analysis for the Kirche site. His focus was on the identification of species in order to determine the minimum number of species represented by the collection. Steve Cumbaa did not complete an intense analysis of the bones and there is no information available about the recording procedures followed for individual specimens. Likewise, modifications made to individual bones, though recorded, were not available for this study since these records have since been misplaced. The main focus of Cumbaa's work was to record the specimens to the lowest possible taxonomic level, with observations being made on the provenience of the specimens, element, side, part, age, and modifications such as cuts, burning, and carnivore and rodent gnawing. This data was recorded on the misplaced cards making the review of the sample difficult. Never the less, several patterns are still apparent.

***Table 5.5***

*NISP Values for Kirche*

| | NISP | %NISP |
|---|---|---|
| Mammal | 4703 | 58 |
| Bird | 152 | 2 |
| Fish | 3195 | 40 |
| Total | 8050 | 100 |

The Kirche collection consisted of 8270 bone fragments of which 35.8% were identifiable to species. Of the 4703 bones in the mammal category 20.6% were identifiable. Mammal remains make up 58% of the identifiable faunal material, indicating that mammals made up a large part of the diet of the people at the site (Table 5.5). A variety of fish made up the second largest segment of the diet.

The overall mammal exploitation pattern at Kirche seems to be dominated by deer and dog remains (Table 5.6). Deer account for 52.1% of the mammal sample, while dog makes up a little less than half of this value at 21.7%. Beaver are the third most common species on the site, forming 7.3% of the mammal assemblage.

***Table 5.6***
*NISP Values for Kirche Mammals*

| | NISP | %NISP |
|---|---|---|
| Deer | 549 | 52.1 |
| Dog | 229 | 21.7 |
| Beaver | 77 | 7.3 |
| Woodchuck | 45 | 4.3 |
| Bear | 45 | 4.3 |
| Muskrat | 20 | 1.9 |
| Moose | 13 | 1.2 |
| Chipmunk | 10 | 0.9 |
| Hare | 16 | 1.5 |
| Otter | 8 | 0.8 |
| Raccoon | 7 | 0.7 |
| Marten | 5 | 0.5 |
| Mouse | 5 | 0.5 |
| Fox | 9 | 0.9 |
| Squirrel | 4 | 0.4 |
| Rodent | 3 | 0.3 |
| Skunk | 2 | 0.2 |
| Vole | 2 | 0.2 |
| Wolf | 2 | 0.2 |
| Weasel | 1 | 0.1 |
| Porcupine | 1 | 0.1 |

An almost complete dog skeleton was located in a pit in the northwest section of the palisade. The skeleton was disarticulated and many of the bones had skinning or butchery marks (Nasmith 1989:19-20). This pit likely represents a single phase of activity and may be the result of a ritual activity. The pit also contained a high concentration of bear bones. Bears are also associated with ritualistic behavior (Nasmith 1989:20). All of the bear bones found in the excavation were located inside the palisade.

With the exception of beaver, the mammal species exploited at the Kirche site are represented by numerous elements. This suggests that all but beaver would have been transported whole without any special treatment accorded to their skeletal elements. Beaver were being treated differently perhaps reflecting off site skinning. Only elements that are difficult to remove or had some alternate value (as the modified incisors appear to have had) were represented in the assemblage.

The role that beaver played in the Kirche villager's economy was likely not the same as other species. Of the beaver remains found on the site, 52 of 77 of the specimens were modified beaver incisors (Nasmith 1989:46). It becomes clear in Figure 5.3 that the beaver remains were being processed and treated differently from the other remains on site. In addition to the high incidence of incisors, the second and third most common beaver elements are extremity elements and skull sections. This suggests that beaver were being skinned off site and that only the beaver pelts and incisors were brought back to the village. The fact that these elements dominate the beaver assemblage from the Kirche site suggests that beaver were being exploited for their fur and not as a food resource. Since the extremities and skull would have been difficult to remove without damaging the fur these elements would have been returned to the village for further processing (Behrensmeyer and Hill 1980).

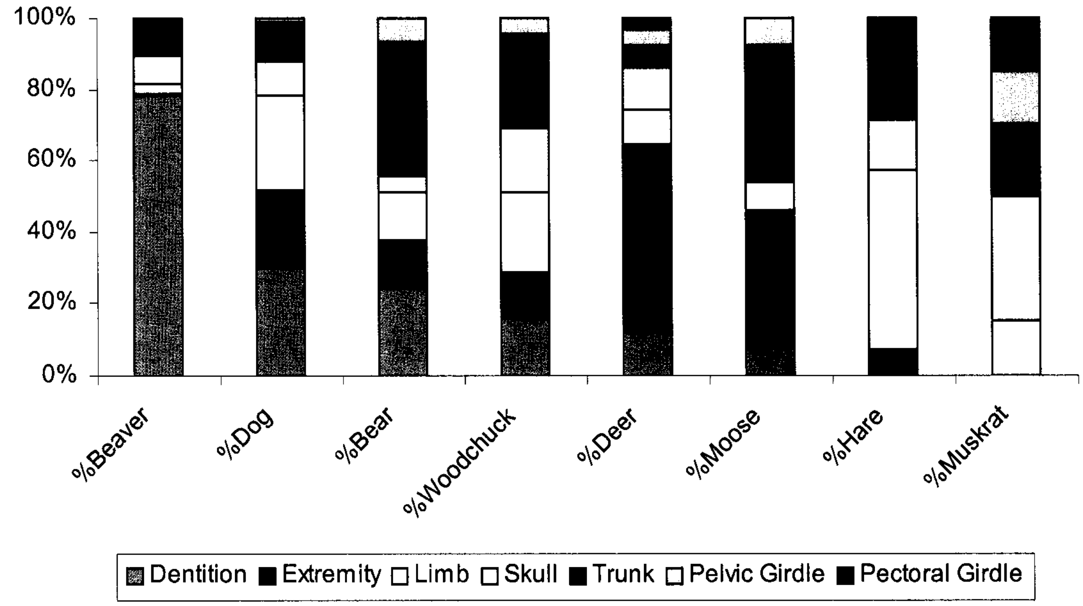



***Figure. 5.3***
*Percent Element Frequency for all Mammals at Kirche Showing an NISP Value Greater than Ten (adapted from Nasmith 1989:74-77)*

The differential treatment of deer extremities is also of note (Figure 5.3). Deer extremities are the most common deer element on site. This reflects the use of deer phalanges as ritual objects that are often modified (McCullough 1978). There are 52 modified deer phalanges on the site. Modification may include toggle style, cup and pin, and miscellaneous grinding and drilling (Nasmith 1989:47). It is likely that the occurrence of these phalanges is slightly over inflated in relation to other elements since these modified phalanges would have had a cultural use and could have been transported between sites and kept over long periods of time. These same factors will also inflate NISP values for deer. If the deer phalanges were removed from the deer sample, the NISP for deer would drop from 549 to 497. The relative contribution of deer to the mammal assemblage would drop from 52% to 50%, still greatly exceeding the contribution of dog at almost 22%. These numbers demonstrate that the inclusion of deer phalanges in the assemblage has not had any real impact on the overall exploitation trends observed at the site.

***Table 5.7***
*NISP Values for Kirche Birds*

| Birds | NISP | % NISP |
|---|---|---|
| Hawk | 1 | 2 |
| Eagle | 1 | 2 |
| Scaup | 1 | 2 |
| Ruffed Grouse | 7 | 13 |
| Canada Goose | 5 | 9 |
| Blue Jay | 1 | 2 |
| Sandhill Crane | 3 | 5 |
| Crane | 1 | 2 |
| Passenger Pigeon | 10 | 18 |
| Wild Turkey | 8 | 15 |
| Yellow Bellied Sapsucker | 4 | 7 |
| Grouse Family | 12 | 22 |
| Robin | 1 | 2 |

The avian species recovered from the Kirche site are dominated by grouse family (35%), passenger pigeon (18%) and wild turkey (15%) (Table 5.7). Grouse and wild turkey are largely ground species. They are also quite large birds that would have provided a worthwhile return of meat for the time expended in their pursuit. These birds provide a source of bone that was used to produce many of the bone beads found on the site. Since bird bone beads are almost impossible to identify to taxon we can only assume that birds of an appropriate size would have had a dual use in the economy. Passenger pigeon remains are a common occurrence on Native sites in this area. Since passenger pigeons were plentiful during the 16$^{th}$ century it is reasonable to expect their remains to occur in high frequencies on sites dating to this period. They would have been easy to exploit due to their shear volume. Their bones, however, are smaller then those used for most bead production. Birds would have also been acquired for their feathers, which were important in the decoration of clothing (Nasmith 1989:77-78). The need for decorative feathers may account for the exploitation of birds that had little, to no, meat value and possessed bones smaller then those used to make standard bird bone beads.

In total, fish remains account for 40% of the faunal remains at the site. These remains are scattered throughout the site with no apparent pattern in deposition (Nasmith 1989:77). The majority of the fish bones represent bottom feeders that would have been easily caught with the use of nets or by hand catching (Rankin 2004 pers. com.). The high incidence of bass, trout, pike, and perch speak to the use of hook and line for acquiring fish (see Table 5.8).

***Table 5.8***

*NISP Values for Kirche Fish Procurement*

| | NISP | %NISP |
|---|---|---|
| Netted/Hand | 1301 | 40.9 |
| Hooked | 523 | 16.4 |
| Unidentified | 1356 | 42.6 |

Fishing was obviously an important activity for the people living at Kirche and their proximity to fishing locations such as Balsam Lake would have made acquiring these fish quite easy. It is likely that the role of fish in the subsistence economy has been grossly underrepresented at Kirche and many other Iroquoian sites. This is due largely to recovery techniques and the lack of analysis preformed on the available faunal collections because of the difficulty with identifying highly friable fish remains. It must suffice to acknowledge the enormous role that fish must have played in the Huron subsistence strategy in the Upper Trent River Valley.

The spatial relationships of the bones uncovered in the excavations at Kirche have been considered and no obvious pattern has been revealed. Bear bones are found only within the palisade, as discussed previously, and there is a limited distribution of muskrat and otter bones (Nasmith 1989:74). Muskrat bones are found only in Midden 13 and 11 and only in House five. Only 20 muskrat bones were recovered. A total of eight otter bones were found in Midden 13. The mammal bone counts and the overall element variation suggest that these two species were hunted opportunistically and are the result of one time activities by individuals/households. Since these bones were not treated any differently from the other small mammal bones on site it is unlikely that these deposits represent any sort of differential access to, or differential preference for, resources.

The raw faunal data used in this analysis is available for review in Appendix C.

Evidence of Interaction:

It is important to discuss the presence of St. Lawrence Iroquois pottery found at the Kirche site and the relevance of this pottery to interpretations of trade and interaction between the Huron and these peoples. It is also important to examine the indications of indirect European contact at the Kirche site.

Of the analyzed rim sherds from the Kirche site, 90% can be attributed to the Huron. The remainder have St. Lawrence Iroquois motifs (Nasmith 1989:26-32). There are also St. Lawrence Iroquois style pipes found at the site, perhaps indicating the presence of

St. Lawrence Iroquois men. Pipes are most often associated with male activities, while women are associated with pottery production (Tooker 1964:59). This mixture of St. Lawrence Iroquois materials at the Kirche site may suggest that a peaceful relationship with the St. Lawrence people existed and that both men and women could have been present on the site (Nasmith 1989:64). It is also important to note that the highest frequency of St. Lawrence Iroquois ceramics was found outside of the palisade. The area of the village within the palisade has a 0.8% frequency of St. Lawrence Iroquois rim sherds, while the area outside of the palisades has a 7.5% frequency of St. Lawrence Iroquois rim sherds (Nasmith 1989:69). An $x^2$ test indicated that the frequency of St. Lawrence Iroquois vessels inside and outside of the palisade, $x^2=77.51$, was statistically significant at the 0.01 level (Nasmith 1989:69-71). It may be that the people outside of the palisade had different ceramic assemblages to those people inside the palisade since these people were either visiting trade parties or social/political delegations or were from a different region waiting to be adopted into the Kirche community. A deer scapula pipe was also recovered from the site. These pipes are most commonly associated with the St. Lawrence Iroquois, and this example may represent a specimen manufactured by these people (Ramsden et al. 1981:182-183).

As mentioned previously, there is evidence of palisade expansion at the Kirche site. This expansion was made to accommodate two more houses within the village (Ramsden et al. 1981:116). This palisade expansion could represent internal population growth, the addition of new people to the village from the outside, or the building of houses for people visiting for trade or social/political interactions. The evidence of St. Lawrence Iroquois materials suggests that new people may have been moving into the area either for short term trade or for permanent relocation. It was impossible to analyze the material remains from the two houses that were accommodated by the palisade expansion because these houses overlay the old palisade wall, and as such, they are built on the refuse of the people from the original village occupation (Ramsden et al. 1981:116). The houses that were located outside of the palisade, and never incorporated, may represent late arrivals in the occupation period for the village, or the houses of people visiting for trade or for other social and political reasons. It is also possible that the people dwelling in the houses outside of the palisade abandoned these houses and were incorporated into subsequently extended houses within the palisade. The post holes associated with these 'outside' houses are smaller then the holes seen in the older areas of the village. This difference may indicate that these houses were built during a time when the trees in the area had already been heavily exploited. This would mean that smaller, younger trees, were the only ones available for construction (Ramsden et al. 1981:118). It is also possible that these smaller trees were used because the houses were not intended to be occupied for an extensive period of time. However, the palisade expansion was completed with posts of smaller sizes as well and it is unlikely that a defensive structure would have been made of less sturdy material if something stronger was available. All of this evidence suggests that the houses outside of the village palisade were either those of late arrivals to the village who were not accommodated within the palisade before the village was abandoned, or were occupied by people uninterested in being incorporated into the village such as seasonal trade visitors. For a more detailed explanation of village expansion phases see Ramsden (1988b).

Two pieces of copper were recovered from the site. One was European in origin and the other was a piece of Native copper. The fragment of European copper sheet was identified as European due to the quantities of Antimony, Nickel, and Tin found within (Nasmith 1989:58). The presence of this material on site is direct evidence that the people living at the Kirche village had some kind of knowledge about Europeans and the goods that they could provide through trade. Given the presence of St. Lawrence Iroquois materials at Kirche, it is likely that the people of the village were well informed about the nature of trade with the Europeans. The implications of this evidence will be discussed in Chapters Six and Seven.

The Coulter Site (BdGr-6):

The Coulter site is a large Huron village located in Bexley Township, Victoria County, south central Ontario. It was excavated and analyzed by Eric Damkjar as part of the Upper Trent Valley Archaeological Project (Figure 5.4) (Damkjar 1990:3). The site has been dated to AD 1550. The site covers a total of 3.3 hectares and is enclosed by a palisade. Palisade movement indicates five stages of expansion, which were made to enclose new, extended, and relocated houses. A total of 26 houses were located and excavated.

Damkjar (1990:50) has suggested that the site represents the coalescence of at least two groups of Huron. Damkjar (1990) sees the extensions made to both the houses and the palisade as evidence of the addition of new groups of people to the village. This suggestion is supported by the fact that the amount of St. Lawrence Iroquois ceramics on the site increases through time (Damkjar 1990:33). Damkjar (1990) relates this increasing frequency of St. Lawrence Iroquois ceramics to increasing contact between the occupants of Coulter and the St. Lawrence Iroquois. This contact may be either direct, through the arrival of St. Lawrence Iroquoians, or indirect, by the addition of Huron people to the village who had stronger relations with the St. Lawrence Iroquois.

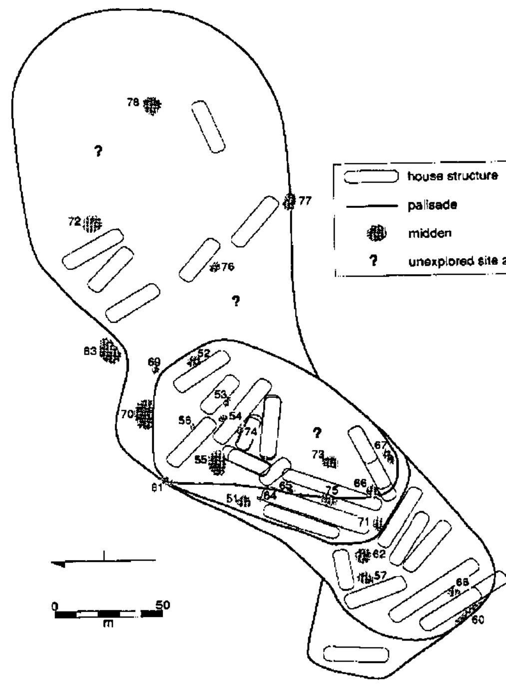



***Figure 5.4***
*Map of the Coulter Site (adapted from Damkjar 1990)*

There is evidence from Coulter of hybrid pottery styles. There are pots that display Huron motifs, pots that display St. Lawrence Iroquois motifs and pots that have a combination of St. Lawrence Iroquois and Huron motifs (Damkjar 1990:33). Three explanations for the presence of these pots have been suggested (Damkjar 1990). They may represent pots acquired through trade and gift exchange, or they may represent pots made by brides or war captives. Ramsden (1988a:48) has suggested that these pots may also be representative of St. Lawrence Iroquois refugee groups moving into the area. The periods of expansion apparent at the Coulter site are evidence of the aggregation of populations into larger communities. The nature and purpose of this aggregation will be expanded on later.

Faunal Analysis:

Coulter had at least five discrete phases of village growth (Figure 5.5). Damkjar stated that each subsequent phase of habitation at the Coulter site is linked with stylistic differences in ceramic decoration, which may reflect ethnic changes as well as temporal changes (Damkjar 1990). The sequence of village occupation suggested by Damkjar is supported by the thermoluminescence dates that Ramsden and Volterra (1995) generated by testing ceramic specimens from each of the recognized phases of occupation at the site. Thermoluminescence dates were generated from ceramic samples from all of the phases of expansion. Some of the dates generated are aberrant. However, dates generated for the overall occupation sequence of the site support the phases of occupation presented by Damkjar (1990) and shown in Figure 5.5 (Ramsden and Volterra 1995:9). As the additions were made to the village there is an increase in the amount of St. Lawrence Iroquois pottery on site. Damkjar suggests that the original population at the Coulter site was joined by ethnically distinct St. Lawrence Iroquois peoples (1990:46-48).

Virginia Elliot of the Zooarchaeological Identification Center analyzed the faunal remains from the Coulter site in 1983. She estimated the total number of bone from the Coulter site to be approximately 20,000 (Elliot 1983:1). Fish made up the largest part of this sample. Mammals made up the second largest portion. Few avian remains were found, except for a relatively large component of passenger pigeon.

Elliot's (1983) analysis of the faunal remains from Coulter aimed to identify the remains to the lowest possible taxonomic level. Provenience was also recorded. This allows for the spatial relationships of remains to be reviewed. However, siding, zoning and even the recording of element were not completed. Therefore, it is impossible to look at the remains beyond the level of NISP.

The Coulter site faunal collection consists of approximately 20,000 bone fragments, of which 27.7% were identifiable to species. All of the faunal material from the Coulter site was recovered from middens. This was done to ensure the largest return for excavation time (Damkjar 1990). Furthermore, most of the houses at Coulter remain unexcavated. Only 8% of the site was excavated, but due to the excavation strategy employed this was enough to enable settlement analysis and reconstruction (Damkjar 1990:5). The recovery techniques used at Coulter were more stringent than those used at any of the other sites. Midden soils were sieved through ⅛ inch mesh screens. This may account for the large collection of fish remains. Of the 2580 $m^2$ of land that was excavated 16 % of the soil was screened through ⅛ inch mesh (Damkjar 1990:5). It is likely that the role of fish at the other sites is under emphasized since the recovery of fish bones obviously relates to the size of the mesh used to screen soils.

Elliot (1983:2) remarked that there is some evidence of butchery on the remains, but information about the techniques employed is lacking. She also remarks on the presence of fragmentary remains that have be burned, charred and calcined (Elliot 1983:2). These bones are likely the by-product of cooking and the disposal of fragmented bones in the fire. Elliott (1983:2) suggests that these bones may have become calcined since they were used as a fuel source. This explanation seems unlikely since a plentiful supply of wood was available and it would been unnecessary to resort to burning animal remains.

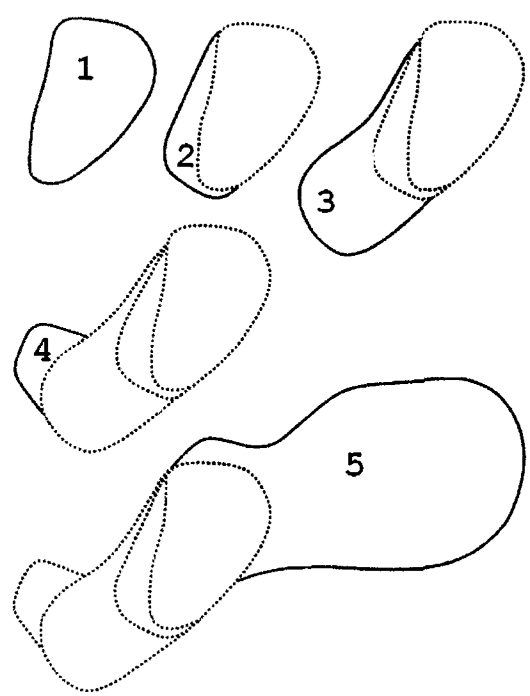



***Figure 5.5***
*Coulter: Proposed Phases of Expansion (adapted from Damkjar 1990)*

It is important to clarify the difference between phases and sections as applied in this analysis. The phases of occupation at Coulter are representative of the entire village at a specific stage in its development. Sections represent only the additions made to the village. For example Section 3 includes only the third expansion made to the village, while, Phase 3 includes the Section 3 expansion as well as the portion of the village that existed prior to its expansion.

I begin with a brief summary of Virginia Elliot's (1983) analysis that deals with the faunal remains from the entire site. I deal with the faunal remains from the site's specific phases of occupation later.

***Table 5.9***
*NISP Values for Coulter Mammals*

| | NISP | %NISP |
|---|---|---|
| Deer | 174 | 38.4 |
| Dog | 74 | 16.3 |
| Chipmunk | 60 | 13.2 |
| Beaver | 36 | 7.9 |
| Squirrel | 24 | 5.3 |
| Woodchuck | 19 | 4.2 |
| Muskrat | 15 | 3.3 |
| Rabbits/Hares | 12 | 2.6 |
| Bear | 9 | 2.0 |
| Snowshoe Hare | 8 | 1.8 |
| Marten | 5 | 1.1 |
| Moose | 3 | 0.7 |
| Shrew | 2 | 0.4 |
| Mole | 2 | 0.4 |
| Cottontail | 2 | 0.4 |
| Raccoon | 1 | 0.2 |
| Porcupine | 1 | 0.2 |
| Otter | 1 | 0.2 |
| Mink | 1 | 0.2 |
| Man | 1 | 0.2 |
| Fisher | 1 | 0.2 |
| Caribou | 1 | 0.2 |

The NISP for mammals recovered from the entire site are shown in Table 5.9. It can be seen from Table 5.9 that moose and caribou, though the largest of the mammals represented, appear to have been an incidental food source (Elliott 1983:2). Two moose bones were identified along with one cervid incisor that has tentatively been identified as Caribou. Deer are represented in the sample by both mature and juvenile specimens. This can be seen from tooth wear eruption sequences and the epiphyseal fusion of long bones (Elliott 1983:4). Deer remains comprise the largest portion of the mammal remains recovered from the entire site. I return to the contribution of deer in greater detail shortly.

Domestic dog, both small and large, is well represented on the site (Elliott 1983:4). Elliott reports that several of the dog bones were charred or showed signs of burning, but butchery scars were absent (1983:4). Several of the bones could only be identified as Canis sp. and may represent dog/wolf/coyote elements. Bear is poorly represented. Only five bones were identified, limiting the MNI to one.

***Table 5.10***
*NISP Values for Coulter Amphibians*

| | NISP | %NISP |
|---|---|---|
| Turtle | 46 | 66.7 |
| Water snake | 1 | 1.4 |
| Frog | 11 | 15.9 |
| Toad | 11 | 15.9 |

The NISP values for amphibians at the Coulter site are shown in Table 5.10. Turtle were identified from fragments of shell, representing five species. There was also a single vertebra of a northern water snake (Elliott 1983:4). Frog and toad were also identified. The toad is of a size that would provide a worthwhile amount of meat. The frog and toad may be intrusive, as could any of the small rodents and reptiles found on the site, or they could represent opportunistic small animal hunting.

***Table 5.11***

*NISP Values for Coulter Birds*

| | NISP | %NISP |
|---|---|---|
| Pigeon | 311 | 88.6 |
| Grouse | 12 | 3.4 |
| Thrush Family | 4 | 1.1 |
| Perching Birds | 4 | 1.1 |
| Goose | 4 | 1.1 |
| Turkey | 3 | 0.9 |
| Loon | 2 | 0.6 |
| Hawk | 2 | 0.6 |
| Crane | 2 | 0.6 |
| Yellow-bellied Sapsucker | 1 | 0.3 |
| Swan | 1 | 0.3 |
| Robin | 1 | 0.3 |
| Pine grosbeak | 1 | 0.3 |
| Ovenbird | 1 | 0.3 |
| Eagle | 1 | 0.3 |
| Blackbird | 1 | 0.3 |

The only avian species that seem to have been hunted in a concentrated fashion was the passenger pigeon (see Table 5.11). The bones from this species are found throughout the site in concentrated pockets. This likely reflects their opportunistic exploitation. It is likely that they would have been harvested in large quantities when these birds would pass by the site in large numbers. The episode of exploitation would have been brief, resulting in a concentrated dumping period. In addition, the presence of medullary bone in the tibotarsus of a passenger pigeon indicates that the species must have nested in the area. Medullary bone occurs in the longbones of female birds during the period when they are producing eggs. When an element contains this kind of porous bone then the animal was killed during its nesting period (Driver 1982). The presence of passenger pigeon medullary bone on the site indicates that these birds were likely hunted in the spring and summer, as this is their nesting period. These birds would have frequented the area in the fall and spring while moving through on their migratory route.

***Table 5.12***
*NISP Values for Coulter Fish*

| | NISP | %NISP |
|---|---|---|
| Sucker | 1733 | 39.1 |
| Perch | 1596 | 36.0 |
| Catfish | 553 | 12.5 |
| Sunfish | 247 | 5.6 |
| Bass | 197 | 4.4 |
| Minnows | 36 | 0.8 |
| Pike | 26 | 0.6 |
| Eel | 10 | 0.2 |
| Burbot | 8 | 0.2 |
| Whitefish | 4 | 0.1 |
| Muskellunge | 4 | 0.1 |
| Longnose gar | 3 | 0.1 |
| Trout | 1 | 0.0 |
| Walleye | 17 | 0.4 |

Of the fish recovered from the site the most common are perch, smallmouth bass, sunfish, brown bullhead, and white sucker (see Table 5.12) (Elliot 1983:3). This collection of fish is dominated by spring spawner's suggesting that the inhabitants of the village may have been exploiting these species seasonally during the spawning period. Tooker (1964:62-63) notes that this is the period during which they can be easily taken. Since a large portion of the fish remains seem to come from small fish it is likely that they were being harvested in nets or being taken by hand during spawning as opposed to by hook and line (Elliot 1983:3).

It is now necessary to look at the faunal remains from each of the sections relating to the multiple phases of Coulter's occupation and expansion.

My analysis of the faunal remains at the Coulter site examines each expansion individually. This was done in order to isolate any patterns from the faunal remains that might reflect changes occurring in each subsequent realignment of the village. In order to achieve this it is necessary to associate middens to particular phases of expansion. Once this is accomplished it is possible to compare faunal remains from different periods of village occupation.

If the mammal remains specific to each section are examined it is possible to focus the analysis on the differential representation of dog/beaver/deer within each section of village expansion. Each occupation section is un-influenced except by those occupation periods that come before it. I discuss the relationship of these phases of occupation to each other at the end of this section in order to compare the changing faunal trend throughout the entire occupation of the village.

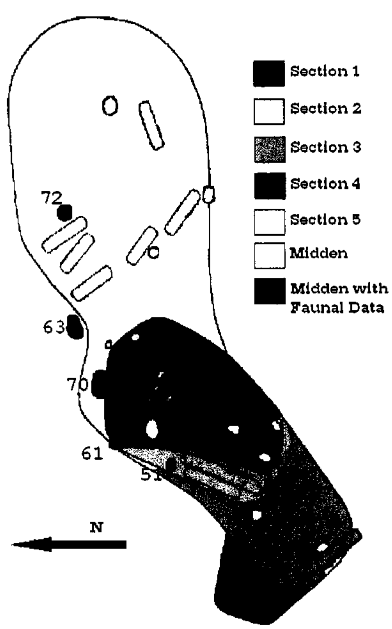



***Figure 5.6***
*Site Map of Coulter with Middens and Section Limits Highlighted*

Section 1:

Section 1 has the deepest middens due to its long occupation period. Middens 61 and 70 produced faunal material (Figure 5.6). Midden 61 was a basin shaped depression with an average depth of 50cm (Damkjar 1990:124-125). The midden matrix of grey humus/ash was divided by two light grey ash layers. These ash deposits may represent the periodic deposit of hearth material. Midden 61 lies against the palisade wall of the original section one palisade. Midden 61 was likely used throughout the village occupation by the people living in section one. Midden 70 is located outside of section one and inside of section five. It is likely that this deposit began with the occupation of section one, as Damkjar (1990:126) has suggested. Damkjar (1990:126) bases this on both location and artifact types. Midden 70 may have continued to have been used throughout the subsequent additions including the addition of Section 5 (Damkjar 1990:126).

The faunal deposit contains mammal, bird and fish remains (Table 5.13). As can be seen by the information listed in Table 5.13, fish remains dominate the assemblage from section one of the Coulter village. The number of fish remains recovered can be linked to the use of ⅛ inch mesh screen during excavation. Second to the fish remains are the remains of passenger pigeon. As discussed previously, pigeon were opportunistically and seasonally exploited. This led to discrete dumping periods, that result in large amounts of pigeon remains turning up in specific middens. Other avian remains were found in smaller amounts. This again highlights the seasonal and opportunistic exploitation of passenger pigeons. Deer rank the highest of the mammal remains deposited in section one's middens. Dog remains are the third most abundant identified mammal species. There is a relatively large deposit of miscellaneous mouse remains in midden 61. These are likely intrusive. Beaver, squirrel, and muskrat rank low in the mammal representation.

***Table 5.13***

*NISP Values for Section 1 of Coulter*

| Taxon | 61 NISP | 70 NISP | Total NISP | %NISP |
|---|---|---|---|---|
| Misc. Fish | 517 | | 517 | 40.4 |
| Sucker | 252 | 2 | 254 | 19.9 |
| Catfish | 110 | 1 | 111 | 8.7 |
| Pigeon | | 108 | 108 | 8.4 |
| Perch | 90 | 1 | 91 | 7.1 |
| Bass | 48 | | 48 | 3.8 |
| Deer | 25 | | 25 | 2.0 |
| Turtle | 5 | 15 | 20 | 1.6 |
| Mouse | 16 | | 16 | 1.3 |
| Misc. Mammal | 11 | | 11 | 0.9 |
| Woodchuck | 11 | | 11 | 0.9 |
| Grouse | 1 | 7 | 8 | 0.6 |
| Walleye | 8 | | 8 | 0.6 |
| Dog | 7 | | 7 | 0.5 |
| Sunfish | 6 | | 6 | 0.5 |
| Misc. Bird | 4 | | 4 | 0.3 |
| Bear | 3 | | 3 | 0.2 |
| Frog | | 3 | 3 | 0.2 |
| Perching Birds | | 3 | 3 | 0.2 |
| Thrush Family | | 3 | 3 | 0.2 |
| Turkey | | 3 | 3 | 0.2 |
| Chipmunk | 2 | | 2 | 0.2 |
| Goose | 1 | 1 | 2 | 0.2 |
| Muskrat | 2 | | 2 | 0.2 |
| Squirrel | 2 | | 2 | 0.2 |
| Beaver | 1 | | 1 | 0.1 |
| Burbot | 1 | | 1 | 0.1 |
| Eagle | | 1 | 1 | 0.1 |
| Eel | 1 | | 1 | 0.1 |
| Hawk | | 1 | 1 | 0.1 |
| Loon | 1 | | 1 | 0.1 |
| Moose | 1 | | 1 | 0.1 |
| Ovenbird | 1 | | 1 | 0.1 |
| Pike | 1 | | 1 | 0.1 |
| Robin | | 1 | 1 | 0.1 |
| Toad | | 1 | 1 | 0.1 |

The faunal patterns for dog, beaver and deer will be discussed shortly once the overall faunal pattern for each section(s) has/have been presented.

The remains found in Section 1's middens represent the accumulation of remains throughout the multi-phased occupation of the village. Section 1 was the first portion of the village to be occupied and was occupied throughout all of the following addition phases. It is important to note that due to the continued occupation of Section 1 the faunal remains discussed here are not a discrete measure of Section 1's subsistence/exploitation patterns but an accumulation of the all of the patterns that followed. Since the stratigraphic information is unavailable for the midden remains I was unable to determine when remains were deposited. Therefore, the faunal material recovered from Section 1 reflects the entire occupation of the Coulter site.

Section 2:

Section 2 represents the first expansion of the village. A portion of the original palisade is removed and rebuilt around a new group of houses. The middens excavated in section two include Midden 51, 75 and 71 (Damkjar 1990:40). These middens represent the accumulation of faunal remains throughout the second phase of expansion and in the subsequent three phases that followed it.

Midden 51 was 38cm deep and had some deposit layering. Midden 75 was 42 cm deep and overlaid the earlier palisade wall (Damkjar 1990:123-127). It contained one cultural layer interspersed with ash lenses. The top 20cm of the midden were in the plough zone and were disturbed. Midden 71 was 40cm deep and contained four main layers including a plough zone component. These layers were humus, humus-ash and basal layers.

***Table 5.14***

*NISP Values for Section 2 of Coulter*

| Taxon | 51 | 71 | 75 | NISP | %NISP |
|---|---|---|---|---|---|
| Sucker | | 12 | 335 | 347 | 36.2 |
| Perch | | 26 | 294 | 320 | 33.4 |
| Catfish | | 2 | 103 | 105 | 10.9 |
| Sunfish | | 1 | 49 | 50 | 5.2 |
| Bass | | | 24 | 24 | 2.5 |
| Minnows | | 1 | 15 | 16 | 1.7 |
| Mouse | | | 14 | 14 | 1.5 |
| Deer | | | 13 | 13 | 1.4 |
| Squirrel | | | 8 | 8 | 0.8 |
| Dog | | | 7 | 7 | 0.7 |
| Chipmunk | | | 6 | 6 | 0.6 |
| Beaver | | | 5 | 5 | 0.5 |
| Rabbits/Hares | | | 5 | 5 | 0.5 |
| Turtle | | | 4 | 4 | 0.4 |
| Bear | 3 | | | 3 | 0.3 |
| Burbot | | | 3 | 3 | 0.3 |
| Longnose gar | | | 3 | 3 | 0.3 |
| Toad | | | 3 | 3 | 0.3 |
| Crane | | | 2 | 2 | 0.2 |
| Eel | | | 2 | 2 | 0.2 |
| Grouse | | | 2 | 2 | 0.2 |
| Marten | | | 2 | 2 | 0.2 |
| Whitefish | | 1 | 1 | 2 | 0.2 |
| Caribou | | | 1 | 1 | 0.1 |
| Cottontail | | | 1 | 1 | 0.1 |
| Fisher | | | 1 | 1 | 0.1 |
| Man | | | 1 | 1 | 0.1 |
| Mink | | | 1 | 1 | 0.1 |
| Muskrat | | | 1 | 1 | 0.1 |
| Perching Birds | | | 1 | 1 | 0.1 |
| Pike | | | 1 | 1 | 0.1 |
| Pine grosbeak | | | 1 | 1 | 0.1 |
| Porcupine | | | 1 | 1 | 0.1 |
| Snowshoe Hare | | | 1 | 1 | 0.1 |
| Walleye | | | 1 | 1 | 0.1 |
| Woodchuck | | | 1 | 1 | 0.1 |

Again, the faunal remains from these middens are dominated by fish remains (see Table 5.14). The highest ranked mammals are mouse followed by deer, squirrel, dog, chipmunk, and beaver. The mouse remains found in these middens are likely intrusive. Bird remains were uncommon in section two's middens. There are no remains from passenger pigeon. Various other small mammals, fish and bird remains are found infrequently in Section 2's midden deposits (Table 5.14). The remains of dog, beaver and deer will be discussed in relation to all sections at the end of the individual Coulter section(s) analysis.

Section 3:

The third phase of village expansion is defined by the addition to the village of Section 3. Section three includes a relatively large expansion to the palisade to incorporate a number of houses. Only one midden excavated in this section had faunal remains that were analyzed, Midden 57. These remains represent the faunal exploitation practices of the individuals who occupied the village from Phase 3 through 5.

Midden 57 is an open area midden and relatively large and deep in comparison to the other middens excavated (Damkjar 1990:124). It was 70cm in depth and extended 5m horizontally. The deposit was made up of a matrix of ash, humus, and subsoil interspaced with small ash lenses. A 25cm deep plough zone formed the top section of the deposit.

The faunal remains identified from this deposit are presented in Table 5.15. Fish continue to dominate the collection. After fish, deer, chipmunk, dog and beaver dominate the Section 3 faunal collection. Mouse remains are represented by three bones and these are likely intrusive. The bird remains are comprised of two specimens. These represent a single goose and a single grouse. Small amounts of various other mammals, fish, birds and amphibians round out the remainder of the faunal material collected from Section 3 (Table 5.15). Again dog, beaver and deer will be focused on more specifically after all of the sections have been introduced.

***Table 5.15***
*NISP Values for Section 3 of Coulter*

| Taxon | 57 NISP | %NISP |
|---|---|---|
| Sucker | 210 | 44.8 |
| Perch | 113 | 24.1 |
| Bass | 34 | 7.2 |
| Catfish | 29 | 6.2 |
| Deer | 24 | 5.1 |
| Chipmunk | 14 | 3 |
| Dog | 11 | 2.3 |
| Beaver | 7 | 1.6 |
| Sunfish | 7 | 1.6 |
| Turtle | 4 | 0.9 |
| Mouse | 3 | 0.6 |
| Walleye | 3 | 0.6 |
| Squirrel | 2 | 0.4 |
| Burbot | 1 | 0.2 |
| Eel | 1 | 0.2 |
| Goose | 1 | 0.2 |
| Grouse | 1 | 0.2 |
| Pike | 1 | 0.2 |
| Rabbits/Hares | 1 | 0.2 |
| Snowshoe Hare | 1 | 0.2 |
| Whitefish | 1 | 0.2 |

Section 4:

Section 4 of the village expansion has been omitted from this discussion since no faunal remains were analyzed from this section. Section 4 is a small village expansion made to incorporate a single longhouse.

Section 5:

Section 5 is perceived as the last expansion made to the village (Damkjar 1990:8-10). It was a large expansion that almost doubled the size of the village. Section 5 is odd for a number of reasons. The five houses located within this section are significantly more dispersed from each other than in any of the preceding sections. Damkjar (1990:36-40) tested the entire Section 5 addition and found little evidence of additional houses. Section 5 also expands the village onto what Damkjar (1990:36-40) has argued is less accommodating soil. The land slopes considerably within Section 5 and the soil contains large amounts of gravel which would have made house and palisade construction more difficult. It is possible that Section 5 was made in anticipation of the arrival of a large group of people and that these people never materialized or that the village at Coulter was abandoned before they were able to incorporate themselves (Damkjar 1990).

The faunal remains analyzed from Section 5 came from Midden 72 (Damkjar 1990:123-126). Midden 72 is a 35 cm deep undisturbed feature. It consists of 4 main layers formed by topsoil, ashy soil, humus and basal matrices. It is located in an open area close to the cluster of three houses within section five. This deposit is dominated by fish remains and also contains a large deposit of pigeon remains (see Table 5.16). It is likely that these remains represent a single exploitation of pigeon or several small exploitations of pigeon over a brief period of time. The other species of bird found in the faunal remains of Section 5 include six bones representing six separate species. The mammal remains are dominated by what are likely intrusive mouse remains. After mouse, deer then dog are the most common mammal species. Turtle, frog and toad remains make up a small percentage of the Section 5 faunal assemblage. Beaver, at first glance, appear to play a minimal role in the exploitation practices of the people occupying Section 5 at the Coulter site. The dog, beaver and deer exploitation patterns for this section will be expanded on later.

***Table 5.16***
*NISP Values for Section 5 of Coulter*

| Taxon | 72 NISP | %NISP |
|---|---|---|
| Perch | 860 | 37.6 |
| Sucker | 570 | 24.9 |
| Catfish | 234 | 10.2 |
| Pigeon | 191 | 8.3 |
| Sunfish | 127 | 5.5 |
| Mouse | 88 | 3.8 |
| Bass | 48 | 2.1 |
| Deer | 34 | 1.5 |
| Dog | 20 | 0.9 |
| Chipmunk | 19 | 0.8 |
| Pike | 16 | 0.7 |
| Minnows | 13 | 0.6 |
| Turtle | 9 | 0.4 |
| Muskrat | 8 | 0.3 |
| Frog | 7 | 0.3 |
| Toad | 7 | 0.3 |
| Walleye | 5 | 0.2 |
| Muskellunge | 4 | 0.2 |
| Beaver | 3 | 0.1 |
| Burbot | 3 | 0.1 |
| Marten | 3 | 0.1 |
| Rabbits/Hares | 3 | 0.1 |
| Squirrel | 3 | 0.1 |
| Woodchuck | 3 | 0.1 |
| Eel | 2 | 0.1 |
| Cottontail | 1 | 0.0 |
| Goose | 1 | 0.0 |
| Grouse | 1 | 0.0 |
| Loon | 1 | 0.0 |
| Snowshoe Hare | 1 | 0.0 |
| Swan | 1 | 0.0 |
| Thrush Family | 1 | 0.0 |
| Whitefish | 1 | 0.0 |
| Yellow-bellied Sapsucker | 1 | 0.0 |

The remains analyzed from Section 5 are likely the only remains analyzed that relate to a single period of expansion. Since the people who occupied the expansion represented by Section 5 were the last people to have been incorporated into the village no subsequent expansion phases altered the remains found in Section 5 middens. It is possible, though unlikely, that people occupying other areas of the village could have used the middens associated with Section 5. However, it is unlikely that people would need, or want, to carry their waste to another area of the village for disposal.

Midden 63:

Midden 63 is located outside of the palisade surrounding Section 5. It is probable that this midden relates to the occupation of Section 5 as its location was defined by the creation of the new palisade wall. Unless the wall was built in order to circumvent an extant midden. It seems likely that Midden 63 is associated with the section of expansion that is closest to it (Damkjar 1990:40).

Midden 63 has been described by Damkjar in his report on the excavations undertaken at the Coulter site (1990:123-125). The midden was only 25 cm deep. This supports the interpretation that it was used only briefly in association with the occupation of Section 5. Midden 63 contains no distinct ash layers and is made up of a matrix of ash, humus, and subsoil. It is located outside of the plough zone perhaps because it is on the gravelly soil of the site. The faunal remains are dominated by fish. Deer, mouse, dog and beaver are the four most common mammals in Midden 63. The mouse remains are likely intrusive. Twelve pigeon bones were recorded making them the most common bird found in this assemblage. Other identified birds include the blackbird and hawk. The only example of a water snake in this research comes from Midden 63. The water snake is represented by a single element. Various other small mammals, fish and amphibians round out the faunal remains from Midden 63 (Table 5.17). The contributions of dog, beaver and deer will again be discussed later.

***Table 5.17***
*NISP Values for Midden 63 of Coulter*

| Midden 63 | NISP | %NISP |
|---|---|---|
| Sucker | 352 | 34.3 |
| Perch | 212 | 20.1 |
| Deer | 78 | 7.6 |
| Catfish | 74 | 7.2 |
| Mouse | 62 | 6 |
| Sunfish | 57 | 5.6 |
| Bass | 43 | 4.2 |
| Dog | 29 | 2.8 |
| Beaver | 20 | 1.9 |
| Chipmunk | 19 | 1.9 |
| Pigeon | 12 | 1.2 |
| Squirrel | 9 | 1 |
| Turtle | 9 | 1 |
| Minnows | 7 | 0.8 |
| Pike | 7 | 0.8 |
| Snowshoe Hare | 5 | 0.5 |
| Eel | 4 | 0.4 |
| Muskrat | 4 | 0.4 |
| Woodchuck | 4 | 0.4 |
| Bear | 3 | 0.3 |
| Rabbits/Hares | 3 | 0.3 |
| Mole | 2 | 0.2 |
| Moose | 2 | 0.2 |
| Shrew | 2 | 0.2 |
| Blackbird | 1 | 0.1 |
| Frog | 1 | 0.1 |
| Hawk | 1 | 0.1 |
| Otter | 1 | 0.1 |
| Raccoon | 1 | 0.1 |
| Trout | 1 | 0.1 |
| Water snake | 1 | 0.1 |

Faunal Trends for all Sections:

It has been difficult to isolate what the faunal trends are for each section of expansion since the middens for each section represent deposits from their inception to the abandonment of the site. We can therefore deduce that the first section has the most mixture in its middens since it represents the deposits made by people throughout the entire occupation of the site. The faunal exploitation information from each section of occupation was affected by subsequent occupations. In order to approach what, if any, impact each subsequent expansion had on faunal exploitation strategies it is necessary to try to define each section independent of the other sections that might have altered it. This task would have been facilitated by analysis of midden stratigraphy but since this information is unavailable alternate methods have been implemented. It is important to remember throughout this discussion that the Phases of occupation at Coulter occurred over the life of the village but at unknown and likely irregular intervals. What we can be assured of is that as new populations were added to the community a shift away from a predominantly deer-oriented hunting strategy to a more beaver-trapping-oriented economy took place.

It is, "generally assumed that midden deposits were built up, over time, primarily by people living in close proximity to the midden" (Damkjar 1990:20). Thus, new people to the village were unlikely to make substantial contributions to the older midden deposits. However, the faunal exploitation changes that resulted from their presence in the village would have affected the older population's exploitation practices. The oldest middens would then contain a mix of remains from an altering faunal exploitation strategy. When we look at the dog, beaver and deer exploitation trend exhibited on the site over time we can see that the relative contributions of these species associated with each phase of expansion may be muddied by the subsequent subsistence/exploitation shifts introduced by occupants of the next phase of expansion (see Figure 5.7). Figure 5.7 shows that there was a significant increase in beaver exploitation between Section 1's occupation and the subsequent occupations/expansions. The fact that the contribution of beaver peaks in Section 2 suggests that occupation duration and overlap may be clouding the true faunal trend for dog, beaver and deer over time.

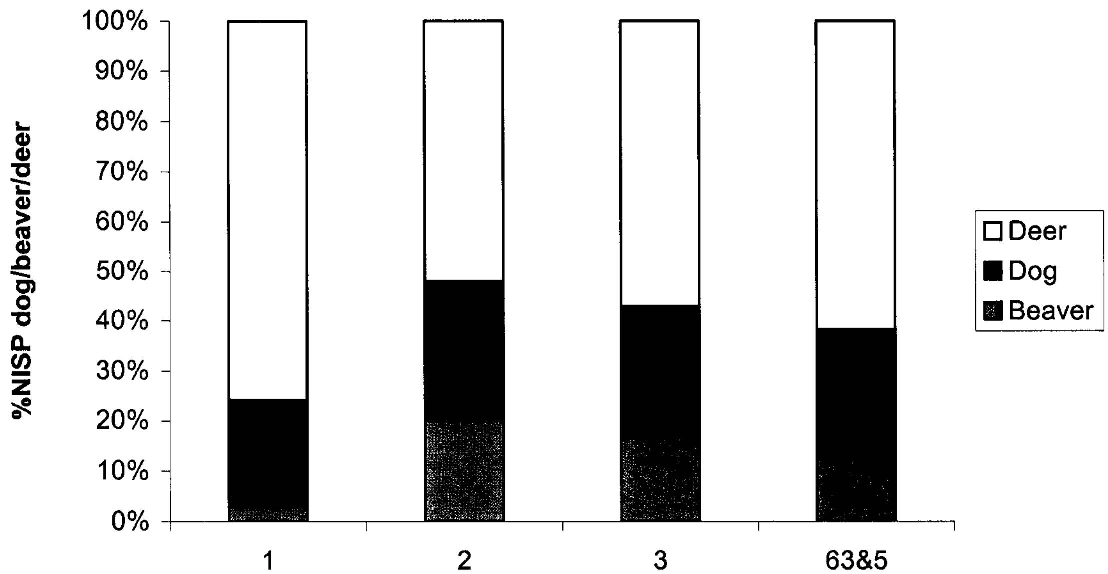



***Figure. 5.7***
*Relative Exploitation of Dog, Beaver and Deer in Each of the Village Sections at Coulter, as Expressed by Percent NISP*

In an attempt to isolate the faunal trend for each phase of village occupation the average contribution of dog, beaver and deer was calculated for each of the occupation phases (Table 5.18). There are five phases of occupation at the Coulter site, however, only four of the expansion sections had faunal materials associated with them therefore only four phases of occupation will be addressed. This removes Section 4, since it provided no faunal remains. Phase 1 was the original village occupation represented by Section 1. Phase 2 includes Sections 1 and 2. Phase 3 includes Sections 1, 2 and 3. Phase 4 includes Sections 1, 2, 3, 4 and 5. Because Section 1 was the only section occupied during the first phase of village occupation its relative frequencies of dog, beaver and deer have been used as representations of the Phase 1 exploitation strategy (see Table 5.18). This may seem counter intuitive since Section 1 was also occupied throughout all Phases of village occupation. The logic in this is that Section 1 appears, at least faunally, to display a persistent traditional faunal exploitation strategy. The premise then is that Sections 1's faunal exploitation is an example of the original exploitation strategy of the founders of the Coulter village. Therefore, using Sections 1's faunal trend as a base it is possible to tease out the faunal exploitation trends for the other phases of village occupation. In order to create totals for the other three phases of occupation averages were calculated. For example, the total percent contribution of deer in Phase 2, 63.9%, was found by summing the total for deer in Section 1 and 2 then dividing this result by two and converting the answer to a percent (see Table 5.18). The same principle was used to calculate the rest of the average phase totals seen in the last row of Table 5.18. Though not 100% accurate, these phase totals give further evidence of the shifting faunal trend that is seen in Figure 5.7. Over time at the village the relative importance of deer decreases, as the relative importance of dog and beaver increases.

***Table 5.18***

*Dog, Beaver and Deer Exploitation Trends for Sections and Phases at Coulter.*

<table>
<tr><th></th><th>Phase 4</th><th>Phase 3</th><th>Phase 2</th><th>Phase 1</th></tr>
<tr><td>Section 1</td><td colspan="4">Deer 75.8%<br>Dog 21.2%<br>Beaver 3%</td></tr>
<tr><td>Section 2</td><td colspan="3">Deer 52%<br>Dog 28%<br>Beaver 20%</td><td></td></tr>
<tr><td>Section 3</td><td colspan="2">Deer 57.1%<br>Dog 26.2%<br>Beaver 16.7%</td><td></td><td></td></tr>
<tr><td>Section 5</td><td>Deer 59.6%<br>Dog 35.1%<br>Beaver 5.3%</td><td></td><td></td><td></td></tr>
</table>

| | Phase 4 | Phase 3 | Phase 2 | Phase 1 |
|---|---|---|---|---|
| Phase Totals | Deer 61.2%<br>Dog 27.6%<br>Beaver 11.2% | Deer 61.6%<br>Dog 25.1%<br>Beaver 13.3% | Deer 63.9%<br>Dog 24.6%<br>Beaver 11.5% | Deer 75.8%<br>Dog 21.2%<br>Beaver 3.3% |

If we return to the analysis of the trends from the different section(s) some preliminary suggestions about the exploitation practices of the people using these middens can be made (see Figure 5.7). The people occupying Section 1 favored deer highly over dog. Section 1 also has a low incidence of beaver (see Figure 5.7). This may suggest that the people occupying Section 1 maintained their original exploitation strategy throughout the occupation of the site. Section 2 has a marked increase in the contribution of beaver. This is coupled by an increase in dog exploitation and a decrease in deer. It is possible that Section 2 represents the original addition of people to the village that had a different economic strategy centered on the exploitation of beaver or that it is representative of the first expansion of the original population. The subsequent additions to the village, Section 3 and Section 5, were then of beaver-oriented individuals which would account for the continued importance of beaver remains in these middens. Section 3 and 5 are large additions to the area of the village. Each accommodates several houses. It is likely that these expansions represent the additions of entire villages or portions of them. Therefore, it is likely that Section 3 and 5 may represent the arrival of different communities of people with different economics, cultural backgrounds, and values. As such the faunal progression throughout the occupation of the village reveals the changing economic strategy of the entire coalesced Coulter population. Section 2 might show the highest contribution of beaver remains since it was the longest occupied area under the new subsistence/exploitation directive and therefore was accounted more time to fully developed this strategy. Sections 3 and 5 were each occupied for less time than Section 2 and as such their relative dog, beaver and deer trend may be influenced by the brevity of their occupation.

It is possible to separate the sections into three categories. The first is the faunal remains from Section 1 and 2, the second comprises those from Section 3, and the third is made up of the remains from Section 5 and Midden 63. As previously discussed Sections 1 and 2 appear to represent the continued practice of the traditional exploitation pattern despite the addition of new individuals with new exploitation strategies to the community. It therefore has been taken as the representative of the original Coulter occupation and their related dog, beaver and deer exploitation trends. Section 3 has been isolated since it was a large expansion to the village that likely marks the addition of new people to the community. The third category then considered is the subsistence pattern for the Section 5 expansion. Since Section 5 was the final village expansion we can assume that these people were not influenced by any people that came after, though they may have been influenced by those that came before. When we isolate these three categories we can see that there is a marked difference in the dog/beaver/deer contributions on the site over time (see Figure 5.8). We see the increase in dog and beaver contributions with the resulting decrease in the deer contribution. This suggests that as Coulter was being expanded and new people were joining the community, the economic focus of these people was changing. In light of this change we see a subsequent shift in their faunal exploitation strategy. This economic realignment comes in the form of a significant shift in mammal exploitation. A specialization towards beaver remains was being cultivated and in light of this dog were being relied on as a food source with less deer being taken due to hunting constraints.

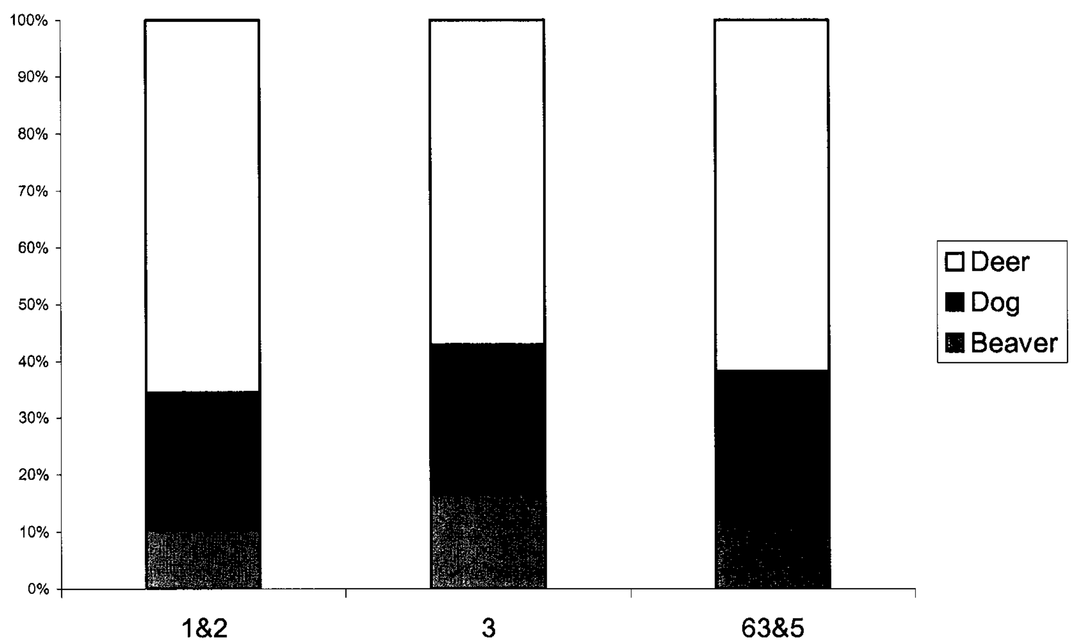



***Figure 5.8***
*Relative Exploitation of Dog, Beaver and Deer in Section 1& 2, Section 3, and Section 5 Including Midden 63 at Coulter, as Expressed by Percent NISP*

The faunal data used for this analysis has been made available in Appendix D.

Evidence of Interaction:

Evidence of interaction is drawn from the analysis of the ceramic materials from various locations in the village as well as the distribution of the European materials recovered from the site. The ceramic materials, consisting largely of pottery sherds, were analyzed by Damkjar (1990) and will be addressed first.

Damkjar (1990:46) calculated the "measure of difference" between the Huron pottery styles found within the various sections of the site (Table 5.19). Damkjar (1990:46) modeled this analysis after a procedure established by Ramsden (1977b). In this calculation, the lower the resultant coefficient, the more similar the two sections (Damkjar 1990:46). From this analysis two patterns have emerged. The first is that the new expansions differed increasingly from the original village and the second was that there is a general trend toward increased inter-unit differences. This is reflected in the fact that each expansion most closely relates to the one before and not the one after (Damkjar 1990:46).

***Table 5.19***
*Measure of Differences (adapted from Damkjar 1990:46)*

| Section | 1 | 2 | 3 | 5 |
|---|---|---|---|---|
| 1 | | 21.0 | 37.3 | 72.0 |
| 2 | | | 52.3 | 85.6 |
| 3 | | | | 48.7 |
| 5 | | | | |

It is important to consider the patterning and occurrence of St. Lawrence Iroquois ceramics. The ceramics attributed by motif analysis to the St. Lawrence Iroquois were likely produced at the Coulter village and not acquired by trade or social/political interaction as one might suspect. Damkjar (1990:47) presents various facts supporting this. First, juvenile St. Lawrence Iroquois style pots are found at the Coulter site. These pots suggest that children were being taught how to produce pots and they were being taught in a style that was characteristically not Huron. This indicates that there were women available at the Coulter site to teach these techniques. Second, within the Coulter ceramic collection there are a number of pots that display both Huron and St. Lawrence Iroquois motifs. These hybrid pots suggest that ideas about designs and their applications were shared between two populations. It is unlikely that Huron women would have learned these techniques while on trading visits since women would have remained at the village to tend the fields in the summer when most of the trading trips occurred (Trigger 1969:30-31). It is more likely that women would have shared these ideas at the village. Finally, the pottery at the Benson site was analyzed in order to determine where the manufacturing clay had come from. From this analysis it was surmised that the clay was of a southern Ontario origin and not from the St. Lawrence River (Trigger et al. 1980:129). The matrix of the pots at Coulter is very similar to those found at the Benson site. Therefore, it is likely that these pots were also made at the site and not traded in from the St. Lawrence region.

***Table 5.20***

*Ceramic Presence for Sections of Expansion (adapted from Damkjar 1990:47)*

| | Huron | | S.L.I | |
|---|---|---|---|---|
| Section | N | % | N | % |
| 1 | 417 | 98.6 | 6 | 1.4 |
| 2 | 152 | 97.5 | 4 | 2.5 |
| 3 | 175 | 97.2 | 5 | 2.8 |
| 5 | 152 | 95.0 | 8 | 5.0 |

Table 5.20 indicates that the amount of St. Lawrence Iroquois pottery increased on the site with each addition of new people. Pottery, unlike bones, can often be assigned to a cultural group. It is useful because it can show increased interaction between certain people over time. G-tests were used to determine the association between the amount of St. Lawrence Iroquois pottery in a given section of the village to another section. With G-tests the frequency of occurrence of observed values is compared with the expected frequency. If the difference is too great to be attributed to chance, then the sample did not come from the expected distribution. It was found that Section 1 and 5 are significantly associated, "with section 5 having significantly more St. Lawrence Iroquoian pottery than section 1 at <0.05% level of significance" (Damkjar 1990:47). This suggests that the phases of occupation at the Coulter village were marked by the addition of culturally distinct individuals, most likely people with an increased relation to the St. Lawrence Iroquois.

The location of the St. Lawrence Iroquois style pottery on the site and it's frequency change over time suggests that either new people or new ideas were arriving at the village and influencing the economic activities of those people who lived there. The analysis of the ceramics also suggests that the people who occupied Section 1 may have been more traditional and less willing to change their strategies to reflect the practices of the incoming people. Section 1 demonstrates the most homogeneity in its ceramic assemblage (Damkjar 1990:47).

The European goods found at the Coulter site include two tubular rolled brass beads and one brass fragment, all of which were found in Midden 60 which is associated with Section 3 of the village expansion (Ramsden 1978:86). In addition to these, 27 other metal pieces were recovered from areas throughout the village. The presence of this material suggests that people occupying the village had some access to European goods. Given the relationship between the Huron and the St. Lawrence Iroquois it is likely that these goods were coming from the St. Lawrence region (Ramsden 1977a).

The analysis of the pottery and ceramic goods from the Coulter site demonstrates that the site was changing over time by incorporating more people. The new people arriving on site appear to have had greater access to the St. Lawrence region and to European goods. Furthermore, their exploitation strategy was better adapted to acquire these increasingly important economic resources.

The Benson Site (BdGr-1):

The Benson site is a protohistoric Huron village dating to approximately AD 1550-1600 (see Figure 5.9) (Ramsden 1977a:94). It is located in northern Victoria County, Ontario and covers 4.5 acres of land. Col. George E. Laidlaw (Laidlaw 1891, 1900, 1917) first recorded the site in 1917 and since this time work has been done on the site by Emerson (Emerson 1954) and Ramsden (Ramsden 1977a). A total of 16 houses were uncovered and were excavated to varying degrees of completion. The site is surrounded by a multi-row palisade and is laid out in an orderly fashion. The apparent abrupt extension of houses and palisades seen at the Coulter and Kirche sites is absent at the Benson site. There is no evidence of village expansion, though in a few instances there is evidence of house abandonment. Middens were located that covered earlier walls and floors of houses, (Rankin, Tuck, Ramsden 2003:10) showing that once houses were abandoned they fell into disuse and became refuse locations. There are several houses outside of the palisade and these may represent summer occupations, visiting trade groups or the appearance of refugee groups at the village (Ramsden 1988b). There is a high percentage of St. Lawrence style pottery on the site, and chemical analysis has revealed that these St. Lawrence motifs may have been made on local clays. This assertion is based on the analysis of the ceramic matrix of the St. Lawrence Iroquois vessels. This analysis revealed that the matrix was most similar to the Huron ceramics found in the region and not to vessels from the St. Lawrence River (Trigger et.al. 1980). However, local clay sources were not isolated and matched to the ceramic composition thus, the exact location of creation can not be determined. There are also hybrid pots of the same nature as those found at Coulter (Ramsden 1988a). These ceramics further support the hypothesis that contact with the St. Lawrence Iroquois was extending beyond trade.

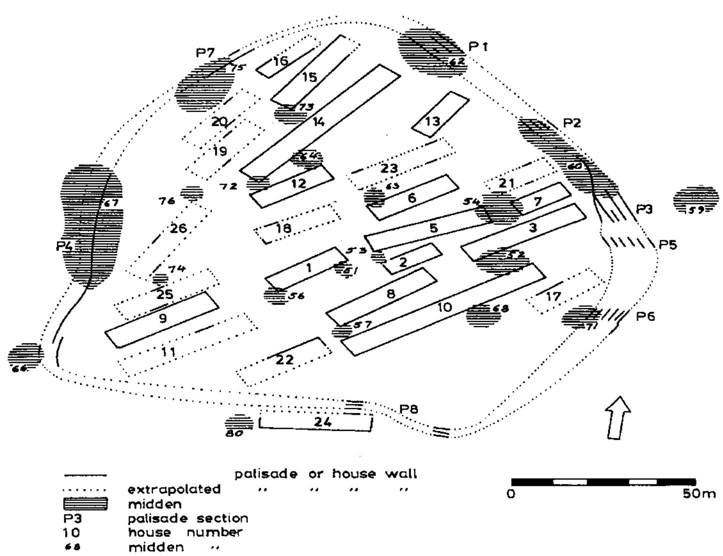



***Figure 5.9***
*Map of the Benson Site (adapted from Ramsden 1977)*

Faunal analysis:

The faunal remains from the Benson site were first looked at by Peter Ramsden and later by Eric Damkjar at McMaster University. Their preliminary analysis revealed a general faunal shift towards beaver specialization with increased dependence on domesticated dog as a food source coupled by a decrease in the exploitation of deer (Ramsden 1990a, 1990b, 1988a, 1978a, 1978b, 1977a, Ramsden et al. 1981). In order to explore this suggestion of shifting subsistence practices I conducted a complete faunal analysis on the Benson collection. The Benson faunal collection consists of 12,866 bone fragments of which 24% were identifiable to species. Within the mammal category 38.8% of the bones were identifiable.

Intensive analysis was completed on the mammal and avian remains from the Benson site. The fish remains were analyzed largely to a general "fish" category with the assistance of Steve Cumbaa, from the Canadian museum of Nature, in order to develop the general exploitation trends for fish (Cumbaa 2003 pers. com.).

The analysis of the mammal and avian remains assigned bones to the lowest possible taxonomic level. While completing this process observations were made on several other variables. These variables included, specimen provenience, element, zone, side, fusion, length, weight, modification, fracture type, bone type, and applicable measurements. A detailed reference for the information recorded can be seen in Appendix E. The intense nature of the analysis proved time consuming and rewarding, and though the application of all scales of data collection will not be implemented in this study, future analysis of the data will be able to provide evidence on site seasonality, exploitation and butchery practices and the ceremonial and ritual treatment of faunal remains.

My completion of the faunal analysis was aided by a research trip to the Canadian Museum of Nature in Alymer, Quebec. This trip allowed for identifications to be verified through comparison to a comprehensive collection of southern Ontario mammals. It was also during this trip that Steve Cumbaa roughly analyzed the fish remains and fish exploitation patterns were suggested.

The general mammal, fish and bird NISP values are presented in Table 5.21. The mammalian remains accounted for the majority of the faunal remains. Of these remains 38.8% were identifiable to taxon. It is obvious from the mammal counts, shown in Table 5.22, that deer and dog were of great importance to the Benson population's economy. Beaver also played a significant role in this economy, and was likely used for a purpose other than standard dietary subsistence as is evidenced by the element representations of mammal bones found on site.

***Table 5.21***
*General NISP Values for Benson*

| | NISP |
|---|---|
| Mammal | 5886 |
| Bird | 691 |
| Fish | 3044 |
| Unidentified | 432 |

***Table 5.22***
*NISP Values for Benson Mammals*

| | NISP | %NISP |
|---|---|---|
| Deer | 917 | 39.8 |
| Dog | 874 | 38.0 |
| Beaver | 288 | 12.5 |
| Mouse | 42 | 1.8 |
| Bear | 32 | 1.4 |
| Woodchuck | 29 | 1.3 |
| Squirrel | 26 | 1.1 |
| Chipmunk | 20 | 0.9 |
| Muskrat | 14 | 0.6 |
| Raccoon | 9 | 0.4 |
| Otter | 9 | 0.4 |
| Snowshoe hare | 8 | 0.3 |
| Moose | 8 | 0.3 |
| Mink | 7 | 0.3 |
| Skunk | 5 | 0.2 |
| Martin | 4 | 0.2 |
| Lynx | 3 | 0.1 |
| Fox | 3 | 0.1 |
| Vole | 2 | 0.1 |
| Porcupine | 2 | 0.1 |
| Cottontail | 1 | 0.0 |

When looking at element representation it is important to be aware of the problems of differential transport and differential preservation. Certain elements are more common in a specie's skeletal remains and as such may be more apparent in a faunal collection simply because they occur most often in the skeleton. Analysis of element representation frequencies is further complicated by bone density. Dense bone has a greater chance of surviving depositional processes. The taphonomic factors affecting bones will play a role in creating variable element representations. However, if we include with the beaver other small mammals, or furbearers, and look at the element frequencies we would expect to see common representations across the board. Since these mammals are in the same size category and have similar skeletal composition, differences in element survival for these species are more likely to be related to some cultural processes and not natural bone destruction processes.

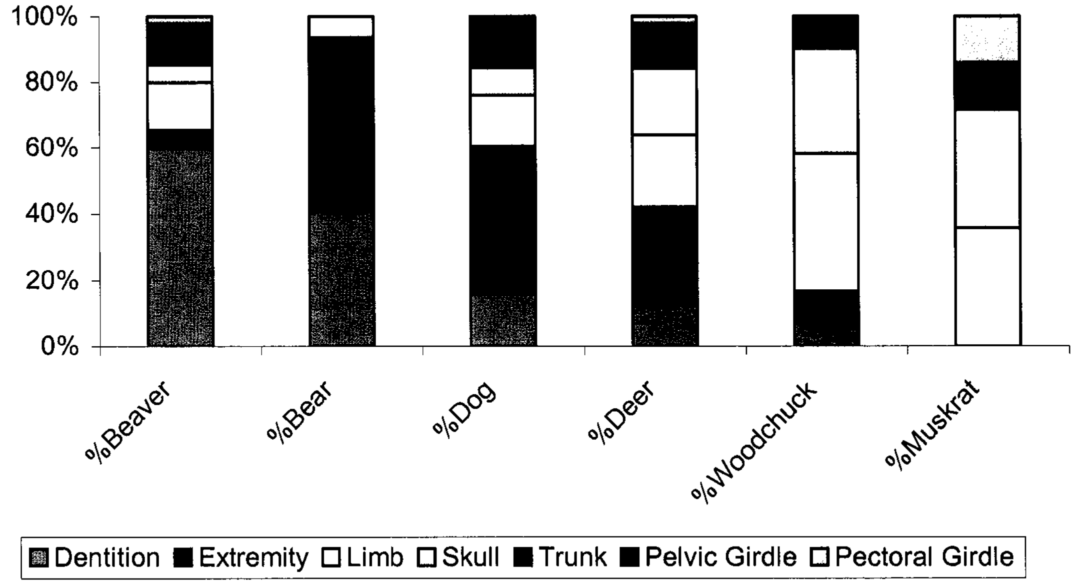



***Figure 5.10***
*Percent Element Representation for all Mammals at Benson Showing an NISP Value Greater than Ten*

The differential treatment of elements in certain species is apparent in Figure 5.10. It can be seen from this graph that the beaver remains are largely represented by dental fragments, primarily incisors. This pattern of body part representation is similar to the one expressed at the Kirche site. Since the elements from the Coulter site were inaccessible I was unable to analyze and compare the body part representations at that village to the other villages. The body part representation for beaver, at Kirche and Benson, suggests that beaver were being hunted for their fur (see Chapter Seven). A combination of dentition and extremity elements dominate the bear remains. This may relate to the religious and ritual significance ascribed to bears (Tooker 1964:72-73). Their canine teeth are often made into pendants or used as knives. The high incidence of extremity elements for both the dog and the deer remains may reflect two things. First, the dog remains are represented by varied elements of which the phalanges, carpals, and tarsals are the largest category in the complete dog skeleton. Therefore, the presence of these dog elements may simply reflect the differential occurrence of these elements in the skeleton. The deer pattern is slightly different. Deer phalanges were often modified and used in some ritual or at best cultural process (McCullough 1978). As a result, the high proportion of deer phalanges may be related to the selection of these elements for modification by the people living at the site.

The woodchuck and muskrat element representations are what would be expected for species being brought back to the site and butchered there. Unlike the beaver, which are likely to have been skinned off site, it is likely that these smaller mammals were being hunted and brought back to site whole. If beaver were being exploited in a specialized large-scale manner, then it would make more sense to skin the animal quickly before returning it to camp for further processing (Behrensmeyer and Hill 1980).

It was possible to calculate the MNI values for the mammal species at the Benson site. When based on large enough samples, the MNI values can reveal the minimum number of species that would be required to account for the various mammal remains. Once the MNI's were calculated for the Benson site, a shift in the exploitation of dog, beaver and deer becomes more apparent. Since beaver were likely being butchered off site the number of actual beaver bones deposited at the site was already reduced. The dog and deer that were being processed within the village were not as effected by differential transportation of elements (except as was already discussed for the presences of deer phalanges). When these factors are taken into consideration it is likely that the percent NISP ratios for dog, beaver, and deer are skewed in favor of an over representation of dog and deer. Because it is possible to calculate the MNI's for these species, we can see how many of each animal is represented by the Benson faunal assemblage.

When we look at the MNI values for the Benson site we see that beaver dominates the MNI category (Figure 5.11). This pattern further suggests that the population of the Benson site was specializing in beaver exploitation. This fact, coupled with the dominance of beaver incisors over other elements, suggests that beaver were being hunted for their pelts and expedient tools were being made out of their incisors. These elements would have likely been transported back to the site after the animal had been skinned elsewhere.

The dog and deer MNI values are close to equivalent. Ramsden (1977a:90) has suggested that, "The nearly equal amount of dog, however, suggests either that wild animal sources may at times have been scarce, or that dogs were purposely raised as a domesticated food source". Using dog as a domesticated food source may have been a means of adjusting to a decrease in time attributed to deer hunting. The seasonal exploitation patterns may have been shifting to exploit beaver, and as such, time once devoted to the deer hunt was lost. We know that in the historic period, beaver were typically trapped in the winter (Tooker 1964:67) while deer hunting happened in the late fall and winter (Trigger 1969:30-31). It is likely that these patterns are reflections of the precontact hunting patterns.

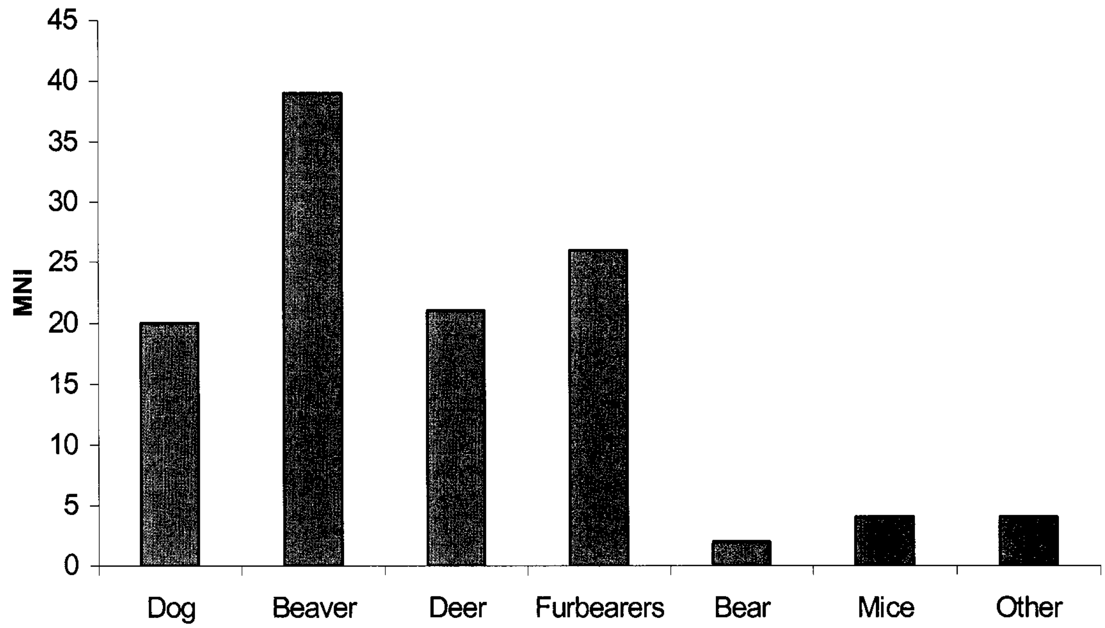



***Figure 5.11***
*MNI Values for Benson Mammals*

Spatial Analysis:

It would have been interesting, if the sample had been large enough, to have calculated the MNI values for the dog, beaver and deer remains associated with the middens, houses and palisades of the Benson site. However, since MNI's are not additive and since they approach NISP values as you divide them into smaller and smaller defined samples it was not beneficial to do this. Instead the relative percent NISP values for the dog, beaver, and deer were calculated for the houses, palisades and middens. These sections of the village were then examined to look for any spatial patterning in the remains that might relate to task specialization/division, differential access to goods, or to the occupation of the village by individuals with different faunal exploitation strategies.

It has been suggested that the houses at the Benson site can be divided into two groups based on their orientation (Ramsden 1977a:45). "Each of these groups consists of one very long house and several shorter ones, suggesting the existence of two social clusters of people, each having a dominant family or lineage" (Ramsden 1977a:67). This could suggest that the people at the Benson site were not one unified group but rather a combination of factions that had come together for some economic or social motivation.

This separation of the village based on house orientation is reflected again in the distribution of cornet and mortice pipes (Ramsden 1977a:79). Mortice pipes are found exclusively in the eastern most section of the village with cornet pipes centered on the northern area (see Figure 4.10). This may relate to the difference between the factions that these village sections are hypothesized to represent.

It has also been suggested by Fogt and Ramsden (1996) that these two groups may actually represent two phases of occupation. In this scenario, the people living in the southeast section of the village slowly moved to the northern section through group fission and fusion.

In order to further explore these intrasite differences, the faunal remains were examined to look for any spatial patterning in the distribution of the faunal remains. The results of this examination follow.

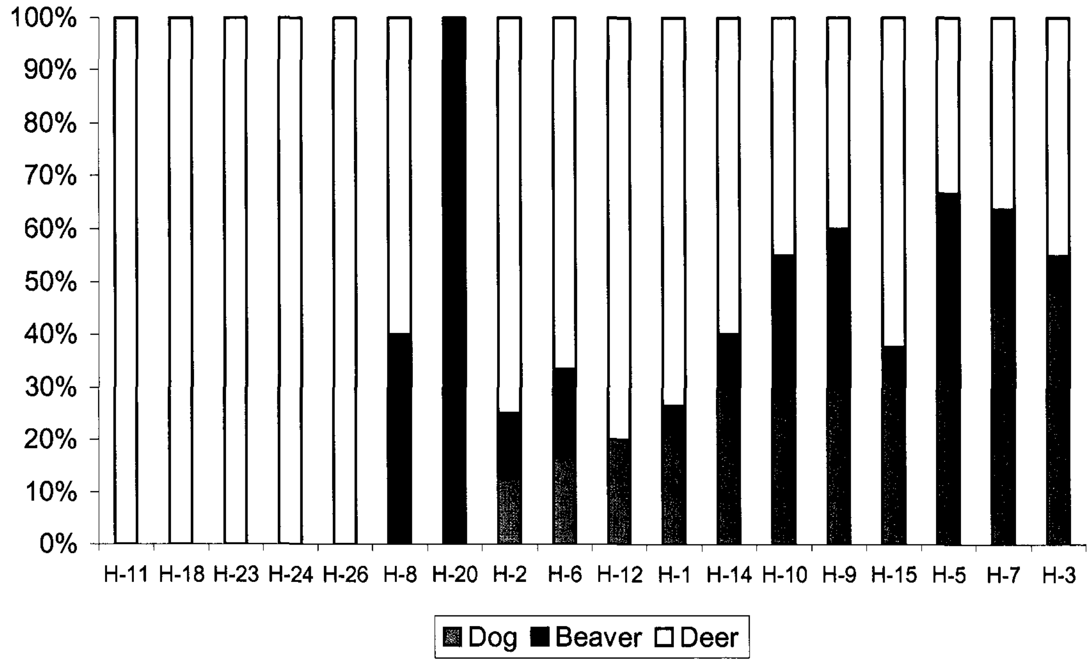



***Figure 5.12***

*Relative Frequencies of Dog, Beaver and Deer in Benson Houses, as Expressed by Percent NISP*

There are no apparent relationships between the dog, beaver, and deer remains and house locations or their proximity to St. Lawrence Iroquois materials. The houses, as shown in Figure 5.12, are all dominated by deer remains, particularly modified deer phalanges. With the exception of house eight and house 20, dog is the second most common of the three species in each of the houses. House 20 does contain varied faunal remains but has no dog or deer. House eight contained no dog remains.

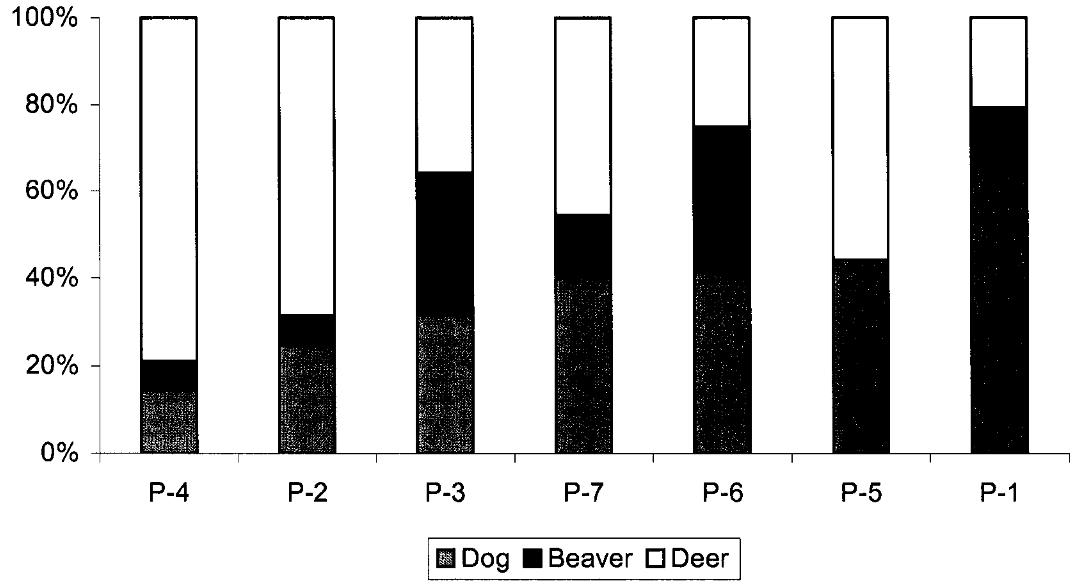



***Figure 5.13***
*Relative Frequencies of Dog, Beaver and Deer in Benson Palisade Deposits, Expressed by Percent NISP*

The palisade sections of the Benson village do not appear to have any obvious faunal patterning (see Figure 5.13). However, it is apparent that the majority of palisade deposits show a concentration on dog or deer remains. This pattern may reflect the fact that more deer and dog remains were onsite and would have been disposed of in refuse piles, especially since the majority of beaver remains were used as expedient tools.

The middens are dominated by dog remains (see Figure 5.14). Few beaver remains were recovered from the midden deposits. This may reflect the use of beaver bones as expedient scrappers and knives. This point is further strengthened by the fact that beaver bones occur most frequently within the houses (see Figure 5.15). Houses are likely places to manufacture, lose and dispose of tools. It would have also been a likely place for the processing of the beaver skins once they were returned to the village.

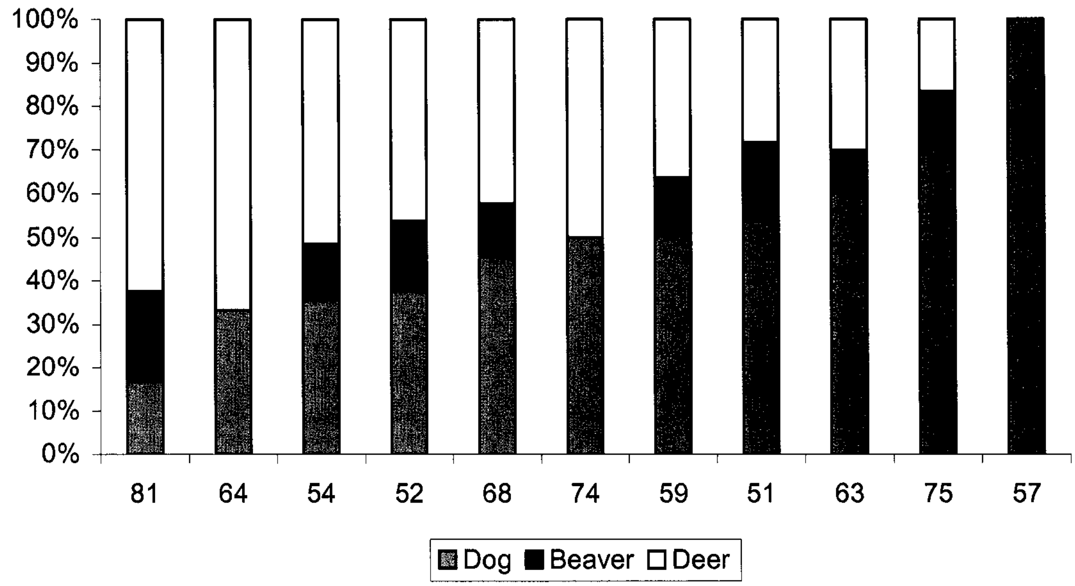



***Figure 5.14***
*Relative Frequencies of Dog, Beaver and Deer in Benson Midden Deposits, Expressed by Percent NISP*

In general, dog, beaver and deer remains are found in the middens (see Figure 5.15). This is not surprising since these are the locations for refuse disposal. Second to midden deposits most remains were deposited next to the palisades. Again, this is an expected trend since palisade deposits functioned almost identically to midden deposits. Beaver and deer remains are more plentiful in houses than dog. This likely relates to the fact that elements from these animals were often modified and used as tools, where as dog remains do not appear to have such a high incidence of modification.


***Figure 5.15***
*Relative Distribution of Dog, Beaver and Deer Remains Between Houses, Middens and Palisades at Benson*

The homogeneity of the faunal distribution suggests a village wide subsistence and economic strategy. The lack of any distinct patterning in the animals exploited between the two groups of differently oriented houses suggests that these people had the same economic and subsistence strategies, and that they were likely of the same cultural association

Birds:

The bird remains from the site are dominated by passenger pigeon, grouse, grouse family and goose (see Table 5.23). The pigeon remains are found scattered throughout the sites middens. It is likely that these birds were taken opportunistically when their seasonal migration would bring them near to the village. Though not large birds, they would have aided to the sometimes-limited diet of the Huron as well as provided raw material, bones and feathers, for use in the manufacture of beads and for the decoration of clothing and other goods. This use of feathers and bone by the Huron for decorative purposes likely explains the presence of low valued subsistence animals such as blue jay, robin, crane, heron, loon, and the yellowbellied sapsucker.

Grouse would have supplied a reasonable amount of meat. They are ground birds that could have been easily caught in nets. The geese on the other hand would have provided much more meat but might have been more difficult to hunt. They are large birds that may have been more highly valued for their bones for beadwork and their feathers for decoration. The eagle and owl remains may represent a more ritualistic capture. The owl was often depicted on ceramic smoking pipes. This indicates that the owl may have held some kind of ritual significance, or that it may have been associated with members of certain family groups (Pendergast 1992).

***Table 5.23***

*NISP Values for Benson Birds*

| | NISP |
|---|---|
| Blue jay | 2 |
| Crane | 6 |
| Eagle | 4 |
| Goose | 13 |
| Grouse | 23 |
| Grouse Family | 19 |
| Hawk | 1 |
| Heron | 1 |
| Loon | 6 |
| Owl | 2 |
| Pigeon | 101 |
| Robin | 1 |
| Turkey | 6 |
| Yellowbellied Sapsucker | 5 |

Fish:

Sucker, catfish and perch dominate the fish remains at the Benson site (see Table 5.24). The unidentified fish category does not reflect the actual identifiable nature of the collection. Since the fish remains from the site were so numerous it was decided within the time restraints of this project not to identify the entire collection. As a result, a randomly selected sample was taken to the Canadian Museum of Nature and was roughly analyzed by Steve Cumbaa. It was possible through this cursory analysis to determine that the majority of the fish remains are from bottom feeding species. Discussion of the seasonal cycle of these fishes can be found in Appendix A. The fish remains suggest a dominance of net, weir, or hand fishing. We know from the ethno-historic record that weirs, nets and hooks were used to catch fish (Tooker 1964:62-63 and Trigger 1969:30). Few fishing tools, fishhooks, net sinkers or weights, were found on the site. The fish remains are in excellent condition and would easily facilitate another researcher interested in addressing their specific exploitation at this site.

***Table 5.24***
*NISP Values for Benson Fish*

| | NISP |
|---|---|
| Eel | 8 |
| Sucker | 154 |
| Pike/Muskellunge | 5 |
| Catfish | 86 |
| Perch | 41 |
| Fish | 2729 |
| Minnow | 2 |
| Walleye | 19 |

In addition to the fish remains there were several specimens identified as eel, bullfrog, and turtle (see Table 5.25). The eel remains have evidence of butchery on their vertebra. It is possible that in addition to subsistence these animals were used in curing rituals and in general medicinal practices (Tooker 1964). The bullfrog would have been significantly large to have provided some meat, and may have been opportunistically captured. Their low incidence on site suggests that they played an insignificant role in village subsistence. The turtle remains are largely shell fragments some of which have signs of polish while others have been burned. Turtle shells were used in the historic period to make rattles, and the polished specimens may represent this use. The enthohistoric record also records that turtles were often put on the fire live and cooked (Tooker 1964:64). It is possible that the burnt shell fragments can be attributed to this. It is difficult know how many turtles are actually represented on the site. The proximity of the site to water sources suggests that turtles would have been easy to acquire. The problem lies in the fact that the turtle's shell is made up of many components and when these break apart it is difficult to reconstruct how many turtles these remains represent. It is likely that several species are represented in the turtle assemblage and it may be insightful in the future to return to this data set to further analyze the potential subsistence and ritual uses of these animals as suggested by their remains.

***Table 5.25***
*NISP Values for Benson Amphibians*

| | NISP |
|---|---|
| Eel | 8 |
| Bull Frog | 9 |
| Turtle | 263 |

It is important to note that there is no apparent spatial patterning in the distribution of specific avian or aquatic species (see Figure 5.16). It appears that access to these resources was equal across the site. Again, the majority of these remains are located within the midden and palisade deposits. This is not surprising since these are obviously the areas were excess waste material was discarded. In addition, not all house interiors were completely excavated. As a result, it is possible that some of the faunal remains from these houses were not recovered.

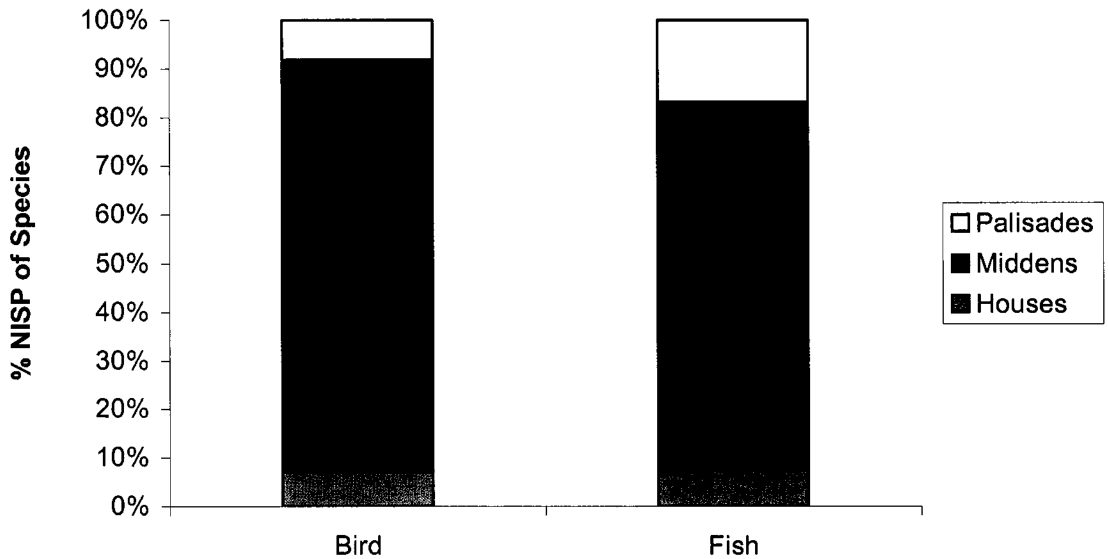



***Figure 5.16***
*Relative Distribution of Bird and Fish Remains Between Houses, Middens and Palisades at Benson*

Exotic Remains/Trade:

Only the Benson site contained exotic remains. These remains are not included in the mammal species list (Table 5.22). I have excluded this category because it likely did not contribute to the exploitation activities undertaken by the people of the village. Exotic materials can, however, suggest possible trade routes and exchange patterns that may be important to our understanding of shifting exploitation patterns in light of increased fur trade concentrations. The exotic remains from the Benson site include the presence of a single walrus bone. This specimen comes in the form of an awl. The most likely source for this piece would be the St. Lawrence River. This exotic material could have either been acquired through trade networks established with the St. Lawrence Iroquois or by the direct movement of St. Lawrence Iroquois people onto the site.

The faunal data is available for review in Appendix E.

<u>Evidence of Interaction:</u>

It is important to look at the distribution of St. Lawrence Iroquois materials as well as European goods within this village in order to determine to what extent the people of the village had access to, and were interacting with, these peoples.

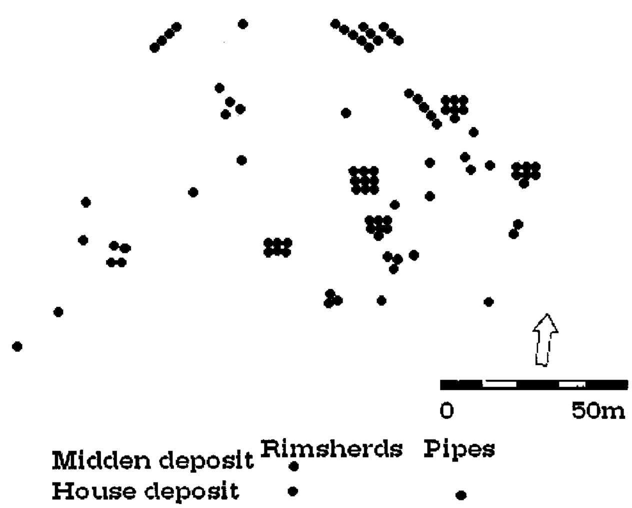



***Figure 5.17***
*Distribution of St. Lawrence Iroquois Rimsherds and Pipes at Benson (adapted from Ramsden 1977a:80)*

It has been determined that the St. Lawrence Iroquois pottery at the Benson site was made of the same clay as the Huron pots (Trigger et al. 1980). This suggests that these pots were made on the site and not traded in from the St. Lawrence and supports the hypothesis that St. Lawrence Iroquois people were living at this village site.

As can be seen from Figure 5.17 the distribution of the St. Lawrence Iroquois pipes seems to be concentrated on the houses and middens associated with the northeast occupation of the village. This could relate to the presence of St. Lawrence men in this area of the village and not in the other areas. The wide distribution of the rimsherds suggests that women may have been occupying more areas of the village.

European goods were discovered in many areas of the Benson site. The pieces include an iron awl, tubular brass/copper beads, an iron disc, and various pieces of metal. The pieces of metal were generally found in midden deposits (Ramsden 1977a:89). European goods were likely coming to the Benson site from the St. Lawrence River area. These goods were either obtained on Huron journeys to this region, by intermediary trading, or by the arrival of St. Lawrence Iroquois refugees to the village (Ramsden 1977a:96). The latter seems the most likely given the evidence for the presence of both St. Lawrence Iroquois men and women at the Benson site. As Ramsden has stated, "it is a reasonable inference that the Benson men were devoting a considerable amount of time to trapping beaver for furs, which were traded to the St. Lawrence River [the St. Lawrence Iroquois] in exchange for metal goods" (1977a:97). It is also likely that the St. Lawrence Iroquois were living at the village and as such were solidifying a direct link to the St. Lawrence and to European materials.

The Wet Back Site (BeGr-1):

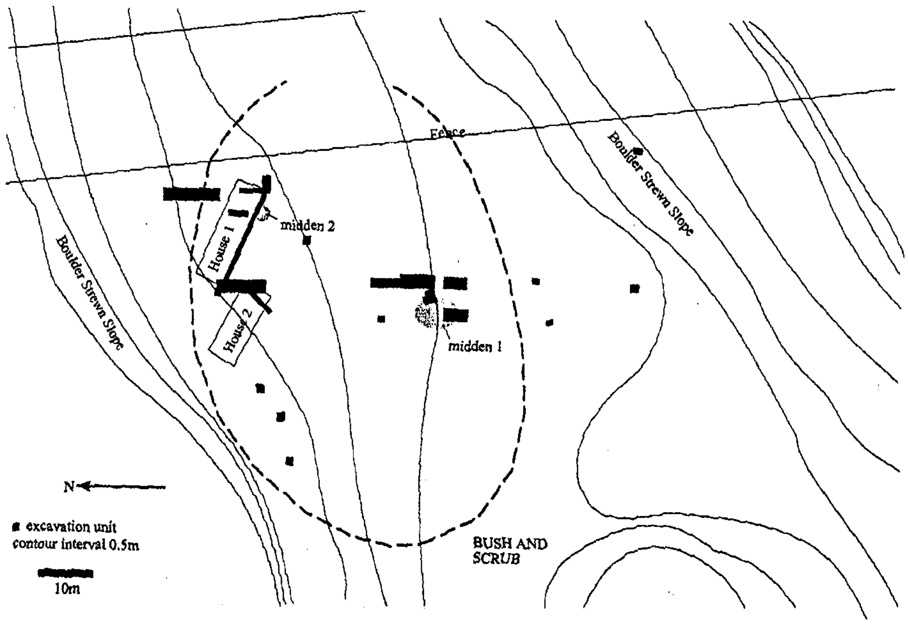



***Figure 5.18***
*Map of the Wet Back Site (adapted from Ramsden 1978a)*

The Wet Back site is located five miles northeast of the Benson site and two miles northwest of Balsam Lake (Figure 5.18) (Ramsden 1978a:27). It dates to the protohistoric period and was likely occupied at nearly the same time as the Benson village (Ramsden 1978a:27). The site was tested in 1976 and 1977 and only two small longhouses and two small middens were revealed. The site covers approximately one acre on a level terrace above a marsh that is fed by a spring (Ramsden 1977a:107). There was no evidence of a palisade. It is likely that this site was occupied for a brief period of time as a resource exploitation camp, as a satellite village, or an intermittent stopover on a migration to another village. There was a rolled tubular brass/copper bead recovered from the site that is evidence of access to European goods (Ramsden 1977a:110). The ceramics found at Wet Back can be associated stylistically with the ceramics at the Benson site (Ramsden 1978a:27). In addition to the Huron ceramics a quantity of St. Lawrence Iroquois pottery was also collected, showing that the people who occupied this location were in contact with the St. Lawrence Iroquois. It is likely through them that the Wet Back population acquired European trade goods.

Faunal Analysis:

Dr. David Black of the Department of Anthropology at McMaster University originally completed the faunal analysis for the Wet Back in July of 1987. Dr. Black made the results of his faunal analysis available to me for the purpose of this study. It is important to note that the Wetback site was a small-unpalisaded site and therefore has a much smaller collection of faunal remains then the village sites already discussed. All of the bones that were excavated were collected. This is not say that the collection is as comprehensive as those taken from Coulter, Kirche and Benson. The collection from Wet Back has no stratigraphic information associated with it. Therefore, I was unable to determine if there were any spatial patterns in the distribution of the faunal remains. Black's (1987) report on the faunal remains calculated MNI values for each species (see Tables 5.26 and 5.27). As discussed earlier, with a small collection the MNI values approach the NISP values. This results in species that are represented by only one bone being calculated as one animal despite the fact that another species represented by 20 bones might also calculate into one animal (see methodology discussion for further information about MNI calculations).

***Table 5.26***
*MNI Values for Wet Back*

| | MNI | %MNI |
|---|---|---|
| Fish | 22 | 56 |
| Mammals | 11 | 28 |
| Birds | 6 | 15 |
| Total MNI | 39 | 100 |

***Table 5.27***
*MNI Values for Wet Back Mammals*

| | MNI | %MNI |
|---|---|---|
| Bear | 1 | 9 |
| Beaver | 1 | 9 |
| Dog | 1 | 9 |
| Fur Bearers | 6 | 55 |
| Deer | 2 | 18 |
| Total MNI | 11 | 100 |

Black (1987) did not complete the analysis of the entire faunal collection. The faunal remains were available to me and as a result I was able to examine the collection to create NISP values. The Wet Back faunal collection consists of 1045 bone fragments of which 11.5% were identifiable to species. Of the mammal remains collected 26% were identifiable. I separated the remains into the following main categories: fish, mammal, bird, turtle, dog, beaver, and deer. This involved sorting the remains and calculating the NISP values for each category. By returning to the NISP values it is possible to avoid the issues of aggregation and inflation caused by MNI calculations. The general trend for fish, mammal and bird is presented in Table 5.28.

*Table 5.28*
*NISP Values for Wet Back*

| | NISP | %NISP |
|---|---|---|
| Fish | 550 | 52.6 |
| Mammal | 459 | 43.9 |
| Bird | 36 | 3.4 |

It is apparent from this analysis that fish were an important species on the site, followed closely by mammals. In terms of the meat return for each species it is obvious that mammals were providing the largest source of meat at this site. The faunal remains on the whole seem consistent with the remains that would be found at a briefly occupied location, but less consistent with the remains expected from a resource exploitation camp. We would expect a resource exploitation camp to be focused on a certain species or range of species. The Wet Back site displays the variety that is typically found in the village sites.

The identified mammal species can be seen in Table 5.29 and represents a pattern we would expect from a protohistoric Huron site in the Trent River Valley. Dog is the dominant mammal. Deer are second. Beaver are third. The implications of this pattern in relation to other sites in this study will be discussed in the following section on intersite analysis.

The faunal data used in this analysis has been made available for review in Appendix F.

***Table 5.29***
*NISP Values for Wet Back Mammals*

| | NISP |
|---|---|
| Dog | 45 |
| Deer | 42 |
| Beaver | 8 |
| Bear | 7 |
| Chipmunk | 6 |
| Hare | 5 |
| Marten | 4 |
| Squirrel | 1 |
| Mouse | 1 |

Evidence of Interaction:

Of the ceramic material recovered from the Wet Back site 9% of the analyzable pieces displayed St. Lawrence Iroquois motifs (Ramsden 1977a: 108). Provenience information is not available for this material but due to the small size of the site it is unlikely that there is specific spatial patterning of remains. One European tubular brass/copper bead was recovered from a midden deposit (Ramsden 1977a: 110). The presence of St. Lawrence Iroquois and European materials on the site suggests that the people occupying this location had relationships with these people and access to goods through them. Because the occupation appears to have been brief at this location, it is important to remember that the presence of even one piece of St. Lawrence Iroquois or European material could indicate a much more intense trade or interaction relationship on the whole.

Inter-site Variability of Subsistence Patterns:

In order to determine the changing dog, beaver and deer exploitation trends in the Upper Trent River Valley throughout the pre and proto historic periods it is important to compare the faunal patterns displayed for these species from each of the sites in question. This will highlight the shifting species specialization by the Huron in the Trent River Valley. First the trends for the resource exploitation camps/hamlets will be examined and then the village occupations will be addressed.

Rumney Bay and Wet Back:

Rumney Bay and Wet Back are both considered to be small, briefly occupied hamlets. The Rumney Bay site is associated with the traditional Hardrock grouping of Huron as defined by Ramsden (1977a) and interpreted as being an indigenous Huron group in the Trent River Valley. Wet Back is associated with the Benson grouping of sites and as such represents a later occupation with a mixture of traditional Hardrock and progressive peoples (Ramsden et al. 1981). These two sites are the most temporally distant from each other in this study. The faunal trends displayed at each are representative of a brief occupation. Because there are only two such sites available for comparison the conclusions drawn from their analysis are speculative, and may represent only one possible interpretation of the trends observed.

When the relative percent NISP values for each of the sites, in terms of their dog, beaver and deer exploitation, are compared (see Figure 5.19) it appears that the Rumney Bay people placed greater emphasis on the exploitation of beaver than the people at the

Wet Back site. Furthermore, dog exploitation is greater and deer is reduced at the Rumney Bay site as compared to the Wet Back site. Given the dates of these sites this trend seems opposite to what we would expect. However, if we compare the dog, beaver, and deer exploitation to other mammal, bird and fish exploitation on the sites we can begin to see that the shift in exploitation patterns is not out of line with exploitation changes seen in association with the increasing beaver fur trade of the Wet Back period (see Figure 5.20).

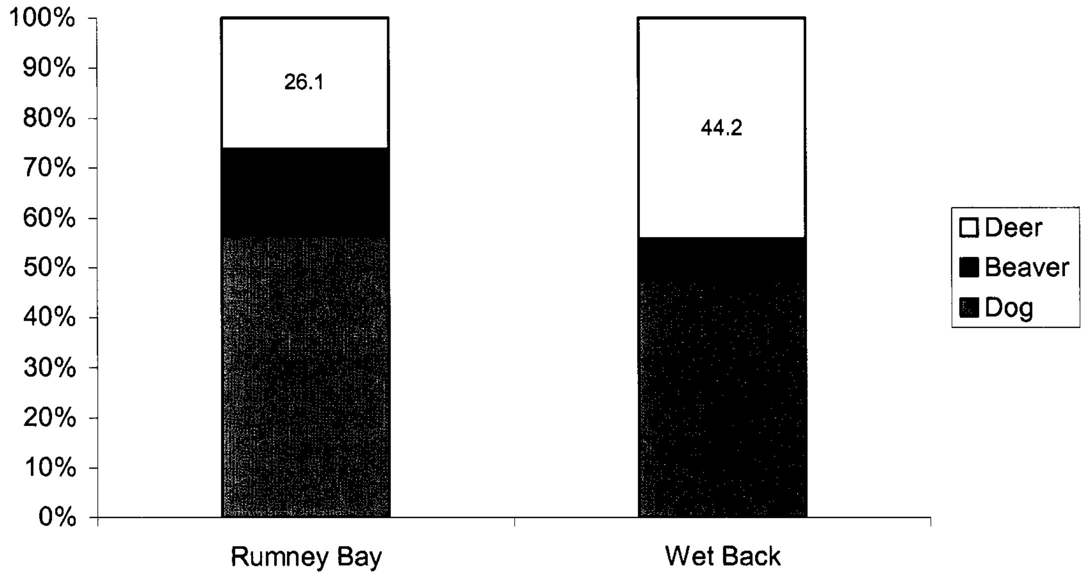



***Figure 5.19***
*Relative Frequency of Dog, Beaver and Deer Remains at Rumney Bay and Wet Back as Expressed by Percent NISP*

The Rumney Bay site appears to have been a fish exploitation camp with minimal exploitation of birds and mammals. Relative to the other species the role of dog, beaver, and deer is minimal (see Figure 5.20). At the Wet Back site the exploitation of mammals has increased and we see a relative decrease in fish exploitation. The people at the Wet

Back site are exploiting more beaver, dog and deer. It is important to note that the amount of dog represented at the Wet Back site is slightly greater than the amount of deer. An overall increase in the amount of beaver being exploited is seen from the Rumney Bay to the Wet Back occupation. It is probable that the people at the Wet Back site were adjusting their exploitation patterns in order to exchange beaver furs for trade items. It is also likely that if these people had grown accustomed to using dog as a food resource then they would have continued to do this even at their resource exploitation camps or hamlets.

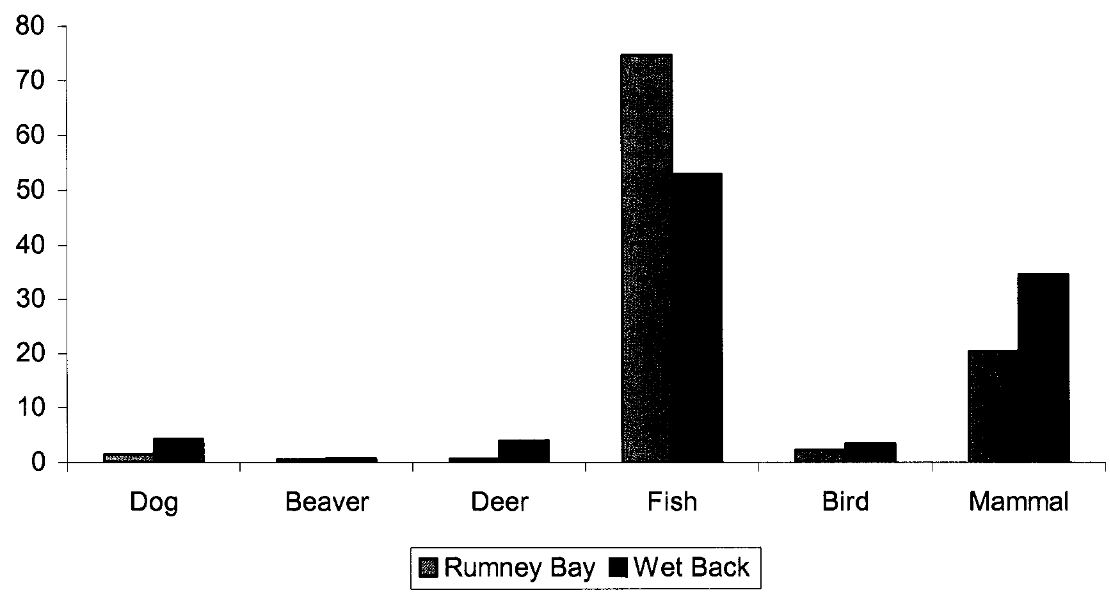



***Figure 5.20***
*Relative Frequency of Faunal Remains at Rumney Bay and Wet Back as Expressed by Percent NISP*

These interpretations are tentative, and more exploitation camps need to be examined in order to create a comprehensive picture of species exploitation at short-term occupations. The small sample sizes associated with these sites, introduces a potential error into the faunal analysis. However, the analysis of additional sites could solve this problem.

Kirche, Coulter and Benson:

The shifting faunal trends in dog, beaver and deer exploitation are much more apparent for the village sites. Since the sample sizes of these collections were quite large it is likely that the trends observed accurately reflect the exploitation practices exercised by the people at these villages.

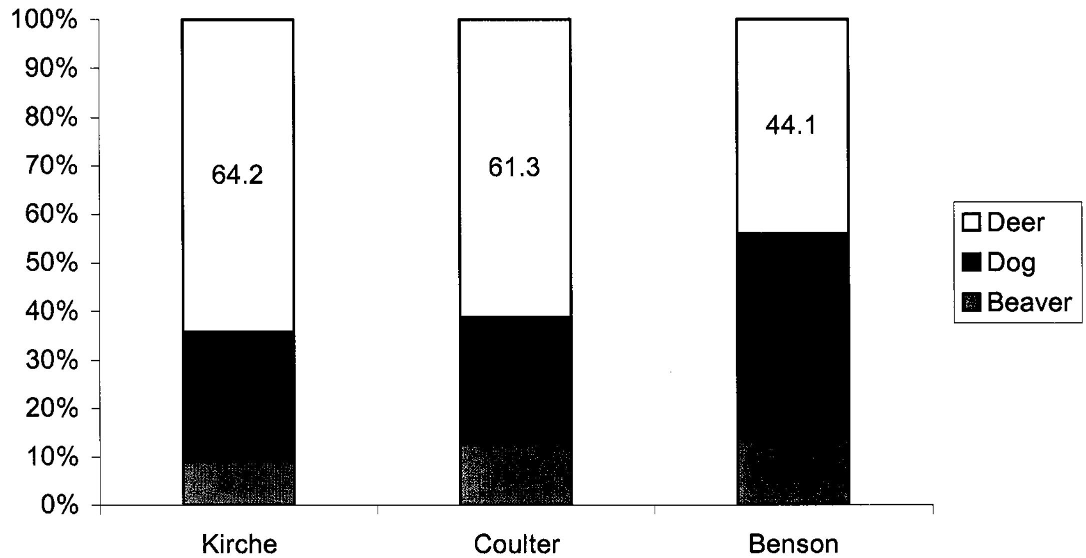



***Figure 5.21***
*Relative Frequency of Dog, Beaver and Deer Remains at Kirche, Coulter and Benson as Expressed by Percent NISP*

When the sites are placed in order from earliest to latest it can be seen that beaver exploitation increases over time (see Figure 5.21). Further, there is an increase in the relative exploitation of dog and a decrease in the relative exploitation of deer over time.

This is exactly the pattern that one would expect if there were an economic realignment focused on the exchange of beaver pelts with the St. Lawrence Iroquois for the purpose of acquiring European trade goods.

When we compare the element representation graphs for the mammal remains from the Kirche and Benson sites it is apparent that beaver and other mammals were being treated in the same way at both villages (see Figure 5.22). This suggests that the beaver exploitation was similarly motivated at each site. Further, the manner in which beaver remains were treated did not change, but the intensity of their exploitation did.

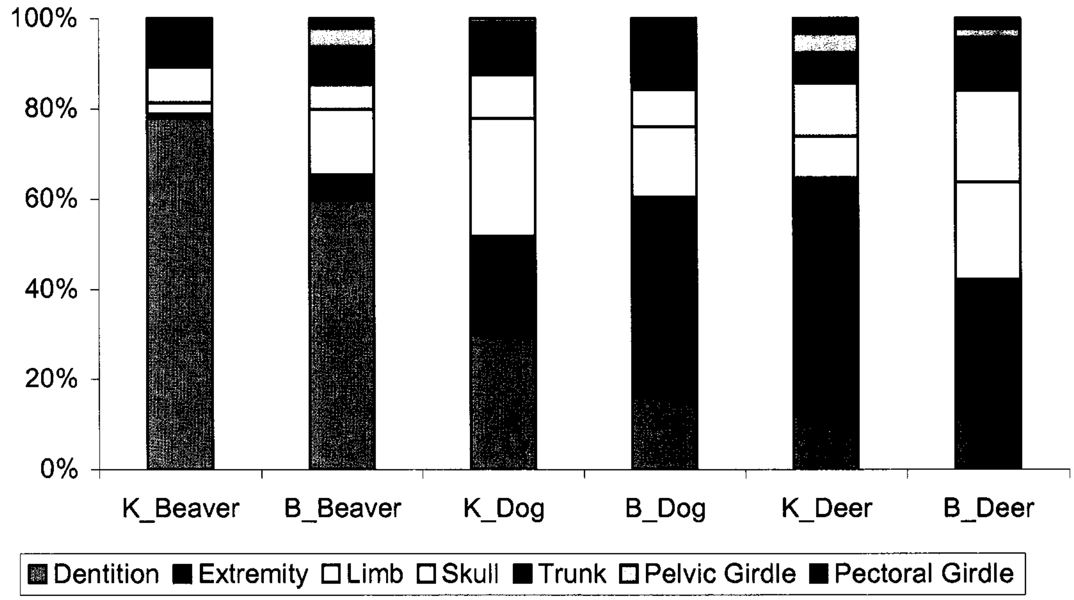



***Figure 5.22***
*Relative Frequency of Elements for Selected Kirche and Benson Mammals*

In order to understand beaver exploitation and its intensification through time, it is necessary to comprehend the economic atmosphere and political situation between the Huron in the Upper Trent River Valley and the St. Lawrence Iroquois. This will help to explain the manner of contact with, and presence of, European goods at the sites in question. These relationships and their implications will be explored in Chapter Six and Seven.

Conclusion:

This chapter has outlined the faunal exploitation patterns for each of the five sites examined in this research. The relationship between the faunal distribution and the distribution of St. Lawrence Iroquois and European goods at each of the sites was also addressed. The chapter concluded by comparing the dog, beaver and deer faunal patterns for each of the sites, this allowed the shift toward increased beaver exploitation to be highlighted. The analysis of these sites has revealed that throughout the $16^{th}$ century faunal exploitation was shifting away from a deer dominated system to a specialized beaver system. This change in subsistence and exploitation strategies was no doubt motivated by the political and economic situation of the Huron in the $16^{th}$ century and will be discussed at length in Chapter Seven.

## St. Lawrence Iroquois: Cultural Contact
## Chapter Six

> …multiple standpoints do not simply create multiple, incompatible archaeologies. They challenge all archaeologists, wherever possible, to use this multiplicity to create more holistic and objective syntheses. Their goal should be an archaeology that is more complete and less biased because it is informed by an ever-increasing number of viewpoints and constrained by more data (Trigger 1998:23).

### Introduction:

The Huron of the Upper Trent River Valley during the 16$^{th}$ century were going through a period of economic realignment. This research has demonstrated that the exploitation trends for dog, beaver and deer were shifting during this period and I have proposed that this is occurring to facilitate increased and intensive cultural contact with the St. Lawrence Iroquois allowing the Huron to secure access to European trade goods. This period of economic realignment coincides with the archaeological and historical disappearance of the St. Lawrence Iroquois from their homeland. I suggest that it is possible to demonstrate through varying lines of evidence that the St. Lawrence Iroquois were adopted into Huron villages and that the St. Lawrence Iroquois continued as a people but ceased to exist as a culturally defined unit. In this chapter I look at the role that the St. Lawrence Iroquois played in motivating and facilitating this realignment.

### St. Lawrence Iroquois Cultural History:

The St. Lawrence Iroquois belong to the Iroquoian language family and are related to the Nations in the present day Iroquoian Confederacy. They existed in the region centered along the Saint Lawrence Seaway extending from the mouth of the St. Lawrence to west of present day Montreal. Though scattered over a large geographic area encompassing many environmental regions, there is relatively little regional difference in their material culture. We know that these people existed from historic accounts of their villages and archaeological evidence.

St. Lawrence Iroquois Dispersal:

The question most often raised about the St. Lawrence Iroquois is when and why they disappeared as a culturally distinct and identifiable group? Cartier records the presence of the St. Lawrence Iroquois at Hochelaga and Stadacona in 1534 (Pendergast 1991:47). By the time Champlain visited the area in 1603 he could find no remains of these people in this area. "The sites noted by Cartier in AD 1535 and AD 1541 during his travels on the St. Lawrence River had disappeared when Champlain visited the area in AD 1603" (Pendergast 1975:49). What had happened to the St. Lawrence in the time between Cartier and Champlain's visits?

Phases of Extinction:

One of the most dynamic and adaptable suggestions for the disappearance of the St. Lawrence Iroquois is Pendergast's (1993) explanation of phases of extinction. This proposal suggests that the St. Lawrence Iroquois underwent phases of extinction prior to the arrival of Champlain to the New World. These phases are related to endemic warfare within Iroquoian culture, pressure from competition over European trade and the affects of European diseases. "Several scholars have adopted the concept of a phased destruction of the St. Lawrence Iroquoians on a regional basis as the basic premise for the several hypothesis which seek to explain the disappearance of these people" (Pendergast 1991:59).

Jamieson (1990) has proposed that the St. Lawrence Iroquois were allied with the Huron and were coming under attack from the Five Nations members. He believes that the St. Lawrence Iroquois were relocating along the St. Lawrence River by AD 1535, after which they continued to be attacked. By AD 1600 they had succumbed to European disease and attacks by the Iroquois and Micmac (Jamieson 1990). Survivors would then have moved west and lived with their Huron and Algonkian allies. This hypothesis may help to explain the situation in the Trent River Valley.

Refugee Hypothesis:

The refugee hypothesis attempts to explain the Huron-St. Lawrence Iroquois relationship in terms of refugee movements to escape persecution by other Native groups.

Excavations in the Trent River Valley in south central Ontario, have explored protohistoric Huron development in the region during the period when the St. Lawrence Iroquois are known to have disappeared (Damkjar 1990, Nasmith 1989, Ramsden 1990a, 1988a, 1978, 1977a, 1977b, Ramsden et al 1981). This research has revealed evidence that Huron populations may have been accepting refugee groups of St. Lawrence Iroquois, an idea first suggested by Laidlaw in 1891. Laidlaw (1891:76-77) and Boyle (1891:24) had noted the similarity of the ceramics from Victoria County on the Trent River Valley, south central Ontario, to the ceramics found at the Dawson site (Hochelaga?) in modern day Montreal. This lead them both to consider the idea that the

St. Lawrence Iroquois may have moved as refugee groups into the Trent River Valley. Though there is no mention of this in the historic record of the Huron's oral history, the archaeological evidence suggests that refugee groups may have moved into the area. Sites in the region show increasing signs of contact with the St. Lawrence groups throughout the pre- and proto-historic periods. This is seen via an increase in pots and pipes from the St. Lawrence region. On the sites in the Upper Trent River Valley which date to the time of the St. Lawrence Iroquois disappearance there is a dramatic increase in the percent of St. Lawrence style pottery (Ramsden 1990a:90). My research demonstrates that beaver exploitation increases alongside the increased presence of St. Lawrence Iroquois styled artifacts. This suggests that the arrival of St. Lawrence Iroquois peoples from the east may have intensified the Huron desire to amass beaver pelts for trade.

In the past it has been suggested that women make pottery, and men make smoking pipes (Tooker 1964:59; Trigger 1969:35). Based on this assumption, it has been said that the sites in the Trent River Valley only show that St. Lawrence Iroquois women were on these sites as represented by their pottery. The few St. Lawrence Iroquois pipes found have been explained as goods acquired through warfare and trade and not as indications of St. Lawrence men moving into the area. This interpretation warrants further investigation. The ethnohistoric record supports the suggestion that women made the pottery in Iroquoian populations (Tooker 1964:59). The record, however, does not suggest that men were the only people smoking. Women would have had equal access to tobacco and as such would have had equal opportunity to smoke (Tooker 1964). It is plausible to suggest that the making of smoking pipes might have been attributed to men, but beyond these basic statements implications become more difficult. Ramsden (1990a) has suggested that both women and men came to the Trent River Valley and that we only see evidence of this through pot making because it would have been a safe way of expressing cultural affiliation (Ramsden 1990a:94). Women and pottery are associated with domestic production, and within the household it may have been acceptable to display your own style and cultural affiliation. Men, however, are involved in the more public sphere, hunting, fishing, and warring in village based units. In this political arena it might have been inappropriate to display cultural independence especially in light of the fact that you are with the people who have adopted you into their community (Ramsden 1990a:94). As such, St. Lawrence men might use Huron style pipes, while St. Lawrence women may have continued to make traditional pottery. The assumption that men were captured and killed in war, but women were not is not borne out by the ethnohistoric record. Elizabeth Tooker (1964) stated that there was no ethnohistoric support for this assumption. Rather, the Huron are recorded as capturing, adopting, and torturing both men and women. This evidence refutes the belief that only women could be on Huron sites as captive brides, since the men would have been tortured and killed.

Other support for the refugee theory includes evidence of Huron-St. Lawrence Iroquois hybrid pottery. This hybrid pottery has been found on the Benson, Kirche and Coulter sites within the Trent River Valley (Ramsden 1990a:90). This pottery has stylistic characteristics from each group, the Huron and the St. Lawrence Iroquois, and may represent the merging of one group into another, as well as, the influence that the two groups were having on each other.

We also see evidence on these Huron sites of the expansion of palisades to incorporate longhouses, and longhouse extensions. These expansions may be related to the arrival of refugee groups to the area and the need to create housing for them. The Kirche site, located in the Upper Trent River Valley, shows differential spatial patterning between Huron and St. Lawrence Iroquois materials. The houses located outside of the palisade and those immediately inside of it have the highest concentrations of St. Lawrence Iroquois materials. This pattern suggests that these houses represent a group of St. Lawrence Iroquois people who were first living outside of, and then adopted into, the Huron community (Ramsden 1990a:93).

It has also been suggested that the presence of St. Lawrence style pottery and pipes on sites in the Trent River Valley may represent trade between the two populations and may not be related to the incorporation of refugees. However, this is refuted by trace element analysis of ceramics from the Benson and Coulter sites. This analysis revealed that the ceramics were made in south central Ontario and not in the traditional homeland of the St. Lawrence Iroquois (Trigger et al.1980, and Ramsden 1990a:92). This places a greater emphasis on population movement or refugee adoption than on the suggestion that these goods were the products of trade. The faunal analysis completed has now revealed another line of evidence that further strengthens the argument for the incorporation of the St. Lawrence Iroquois into Huron society.

Warfare and Iroquoians:

The refugee theory does serve one purpose very well; it suggests a move away from the concept of endemic war. In the historic period, the Iroquois became known for their efficient warfare, through which, they decimated several populations. The Five Nations manage to conquer the Huron, the Erie, the Petun, the Neutral and the Susquehanna after they adopt European style warfare in the $17^{th}$ century (Fenton 1971). Traditionally, however, warfare was quite a different matter. It is seen as having been ritualistic. The purpose was the capture of a few members of the raided group as a means of replenishing one's own population and avenging past injuries. There was no attempt to kill as many people as possible or to take over land. This ritualistic nature does not encourage the kind of decimation seen in the proto and historic periods and does not lead to the extinction of a group. Periods of respite occur and groups involve themselves in amicable and reciprocal trade. The fact that war was not an intensive, decimating and enduring phenomena supports the suggestion that no single group is responsible for the decimation of the St. Lawrence Iroquois, but rather, that they were slowly phased out through changes in trade relations, disease, warfare, and political realignment in advance of intense European contact.

J.V. Wright (1966) has looked at the destruction of Native groups at the hands of the League Iroquois and he has suggested that the pattern established was not so much the destruction of people but of a cultural association. "The late Ontario Iroquois stage is terminated with the destruction of the Huron, Petun, Neutral, and the Erie between 1649 and 1654 by the League. Although destroyed as independent tribes their close kinsmen in the Five Nations adopted the majority of the defeated peoples. In this sense, a cultural development was destroyed and not a people" (Wright 1966:93). It is not inconceivable then to suggest that the practice of adoption was in existence before the great decimations of the historic period. The St. Lawrence Iroquois could have been adopted into neighboring groups just as the later groups were. Although phases of attack and decimation occurred historically we must consider other factors that played a role in the destruction of the St. Lawrence Iroquois.

Economic Realignment:

Researchers have for too long considered the Huron of the Historic period to be a static society existing with out any notion or influence as yet felt by the arrival of Europeans to their world. This has been refuted by Ramsden (1988a) who has argued that the Huron were a society transformed and as such the recorded information about these people does not reflect a group of unaware innocent savages. Instead it reflects the Huron after almost one hundred years of economic and political realignment motivated by indirect access to European trade goods beginning in the early 1500's. Ramsden has stated, "it appears that Huron society had been undergoing a marked reorganization as a result of indirect European influence for at least fifty years before a European saw a Huron community" (1988a:46). Trigger has said of the Huron concentration in historic Huronia, "this final concentration of population was the culmination of a process that had begun long before the arrival of the Europeans" (1969:25).

In the historic period, during their final occupation period in Huronia, the Huron had refined their role as middlemen in the intensive beaver fur trade that was solidifying. By the time the Europeans arrived in Huronia they discovered that beaver no longer plentiful in this portion of the country (Tooker 1964:25). The Huron were by then acting as trade facilitators between the French and various other tribes. It has been suggested through the enthohistoric record that this position may have been awarded to the Huron for two reasons. First, they originally established intense trade with the French and as such "owned" this trade route (Trigger 1969:37-38), and second, they were building off of their position in the prehistoric times as being a trade oriented people. Trigger has written, "it is clear that the key role that the Huron played in the French fur trade was an extension of their role as traders in prehistoric times" (1969:36).

The extent of the Huron economic realignment is highlighted by the archaeological evidence that suggests an increased desire for European goods was coupled with an intensified relationship with the St. Lawrence Iroquois. In Chapter Seven I focus mainly on the village sites researched in this study as they offer the most complex mix of evidence suggesting a realignment period (Ramsden 1990b:383). The hamlets reviewed in this research, though limited in their settlement development and material culture remains are best used to highlight the sweeping nature of change seen during this period.

Conclusion:

This chapter has addressed the St. Lawrence Iroquois and their relationship with the Huron of the Upper Trent River Valley. The evidence from the Huron sites in the Upper Trent River Valley has lent support to the refugee hypothesis that explains what may have happened to the St. Lawrence Iroquois. This, however, is only one of the many contributing factors to the St. Lawrence Iroquois dispersal and disappearance. The St. Lawrence Iroquois were undoubtedly affected by a number of diverse pressures that resulted in many coping strategies being implemented and many varying paths chosen. The movement into Huron villages was but one of these paths, others remain to be explored.

# Interpretations and Conclusions
## Chapter Seven

> …the best hope of unraveling their [the Huron] prehistoric development seems to lie in the detailed study and comparison of individual villages and local clusters of villages as they formed in prehistoric times and then to trace the complex movements and regroupings by which they came together to form the historic Huron confederacy (Trigger 1979:210).

In this chapter I summarize the evidence presented in previous chapters and suggest that for the Huron of south central Ontario the 16th century was marked by economic realignment and dramatic change followed by a period of resettling.

It is apparent when we look at the overall trends throughout the 16th century that the Huron of the Upper Trent River Valley were going through a period of dramatic change. Table 7.1 summarizes the shifts seen in several categories for the three village sites explored in this research. Several of these shifts have already been addressed in the preceding discussion of the refugee theory, however, they will be reviewed here in order to highlight their support for the economic realignment of the Huron. These shifts when reviewed in relation to each other present a picture of change represented by the Kirche and Coulter sites with a succeeding period of resettlement occurring at the Benson site. The faunal data for these sites emphasizes the increasing beaver specialization evident throughout this period. I believe that this specialization is directly related to the increasing interaction with the St. Lawrence Iroquois that most likely occurred in order to the accommodate these peoples after their diaspora from their homeland along the St. Lawrence. I examine each of the shifts detailed in Table 7.1 and discuss the possible implication of these shifts in terms of the Huron economic realignment.

***Table 7.1***
*Comparison of Kirche, Coulter and Benson Village Occupations, (adapted from Nasmith 1989:62)*

| | Kirche | Coulter | Benson |
|---|---|---|---|
| House Orientation | Irregular | Irregular | Regular |
| Palisade Expansion | At least 1 | Several | None |
| Human remains | Scattered | Scattered | Uncommon |
| European Goods | 2 beads | 2 beads, 28 frags. | Varied iron/copper |
| S.L.I Pottery | Some | Some | Most |
| Other S.L.I objects | Pipes | Pipes | Pipes |
| Deer/beaver/dog relative contributions | Deer dominates, then dog, then beaver | Deer decreases, dog/beaver increase | Deer=Dog, increase in Beaver |
| | PERIOD OF CHANGE | | RESETTLING |

The orientation of houses at the village sites examined in this study seem to move from an irregular pattern to a more homogenous pattern through time. As has been discussed in Chapter Five, the houses at the Kirche and Coulter site do not appear to be governed by a single plan of orientation, instead they appear to represent the addition of houses either during an intense period of village growth or by people who had little interest in aligning themselves within the village in a regular fashion (Ramsden et al. 1981:263). It has been suggested that heterogeneous house organization could be a defensive mechanism since invading people would find it difficult to navigate their way through the village. At the Benson site there are two obvious trends in houses orientation and it has been successfully argued that this difference likely reflects a shift in occupations by the people already at the village and not by the addition of new peoples as is likely for the Kirche and Coulter sites (Fogt and Ramsden 1996).

Palisade expansions are also apparent at the Kirche and Coulter villages and absent at the Benson village. These expansions appear to have been made in order to accommodate the additions of new people into the villages. Kirche has only one expansion, but Coulter has at least five phases of expansion which almost doubled the size of the village. The final expansion phase at Coulter was the largest and it is likely that such a large expansion was made in advance of the expected arrival of a great number of people. It appears, however, that these people either never arrived or that the village was abandoned prior to their house construction. Ramsden (1988a:47) has suggested that the Coulter site represents a coalescence of people, who were likely coming together for protection, and access to trade routes. It would have been profitable for the Huron to band together to exploit trade routes since the Huron, historically at least, strongly protected their trade routes and a large village functioning as a trade body would have been more successful then small villages competing against each other to gain access to the same trade resources (Trigger 1969:39). The Benson site has no signs of palisade expansion suggesting that the influx of people to the region or the movement of Huron people within the region had slowed during its occupation.

The presence of scattered human bone is a common feature of all Iroquoian villages. The Iroquoian peoples were participants in ritualistic warfare that resulted in the torture of war captives (Tooker 1964 and Trigger 1969). The Kirche and Coulter site have evidence of human bone that has been burned, cut, and in some cases modified. This treatment of human remains is most often attributed to warfare. At the Benson site human remains are quite rare (Ramsden 1977a:96). It is likely that during the period of realignment illustrated by the Kirche and Coulter sites that hostilities would have been high, and as a result more human bone would be expected at these sites. The Benson site, reflects a more peaceful period of occupation. It is important to remember that there is no evidence on these sites that warfare was preceding at a large scale with any intense motivation other than ritualistic and general hostility. A period of realignment in any culture is typically marked by increased warfare and hostility.

The presence of European goods on each of the village sites increases through the 16th century. This reflects two things. First, increased contact between more easterly groups with Europeans was allowing more goods to enter trade networks. Second, the Huron appear to have been aligning themselves so that they could better control and access these intensifying trade routes. The Kirche and Coulter site have evidence of rolled tubular copper beads, a fairly common modification of European metal likely acquired by the fragmentation of copper pots. The Benson site has an iron awl that has been hafted into a bone handle. New European trade items were becoming available and these items were being used in a more traditional fashion. The rolled beads are decorative items, but the iron awl is a tool, and represents a more complex integration of European goods into a changing Huron lifestyle.

As has been discussed previously the presence of St. Lawrence Iroquois ceramics increases on Huron sites throughout the pre and proto-historic periods. The pots, at least at the Coulter and Benson sites, are all made of similar clays suggesting that they were all made locally and were not traded in from the St. Lawrence River. Instead, it is proposed that the St. Lawrence Iroquois were present on these sites and participating in the daily activities of the village. The increase in St. Lawrence Iroquois ceramics through time suggests that either more people of this cultural association were arriving in the Trent

River Valley or that those people already living at these villages became more comfortable expressing their cultural motifs. The presence of hybrid pots at the Kirche, Coulter and Benson sites, displaying both St. Lawrence Iroquois and Huron motifs and made on local clays solidifies the presence of St. Lawrence Iroquois peoples in the area. This is further supported by evidence from the Coulter site of juvenile St. Lawrence Iroquois ceramics (Damkjar 1982:138). The presence of juvenile ceramics suggests that a second generation was being taught to make pots that had cultural motifs different from those of the surrounding village population. The St. Lawrence Iroquois are living in these villages, and are involved in the daily activities. They are even merging their culture with that of the people who have adopted them.

Pipes that show St. Lawrence Iroquois motifs are also present at all of the village sites in this study. Though less common than ceramics, they do exist. It is difficult to fully understand the implication of their presence. Pipes, are most often associated with men, and would suggest the presence of men on the sites. They might have been acquired through trade. However, at the late date of the Benson occupation the St. Lawrence Iroquois are believed to have been on the verge of distinct cultural extinction, making it difficult to suggest that they were occupied in any intense pipe trade. I propose that trade is an unlikely explanation. The phased destruction of the St. Lawrence Iroquois suggests that it is more likely that these pipes represent the addition of St. Lawrence Iroquois people to Huron communities. Men as well as women were being incorporated into Huron villages.

The final line of evidence indicative of Huron economic realignment comes from an analysis of the faunal remains. As I have demonstrated, there is an undoubted shift in the dog, beaver and deer exploitation strategies. By the mid 1500's beaver was already being exploited to supply trade fur for exchange for European goods. As has been discussed previously, beaver element representations suggest that beaver were being skinned off site with only select elements returning to the village. This differential treatment was afforded only to the beaver remains, highlighting their specialized exploitation. As a corollary to this specialization I have argued that dog became a domesticated food source and was used to supplement the diet while deer hunting was being minimized in order to concentrate hunting efforts on the more economically valuable beaver. This action demonstrates that the Huron were becoming involved in a new economically motivated hunting strategy. I suggest that they were aware that they were on the verge of intense change, and that they actively and consciously decided to involve themselves in this burgeoning trade network. Ramsden (1978b:104) has surmised,

> The significant expansion of village size by additions of large population segments to certain villages; the movement of peoples over long distance to join expanding villages; the establishment or intensification of an east-west trade network; the intensification of warfare; and the acquisition of European goods ... all of the above developments are interrelated, and ... the introduction of European goods in the trade network is the pivotal point around which they revolve.

With St. Lawrence Iroquois peoples being adopted onto their sites, the Huron would have heard first hand accounts of the Europeans and what a trade relation with them had to offer. They would have likely been informed of the Five Nations' competition for access to these peoples and their goods. If it is true that those who first establish a trade route continue to own it, then the acceptance of the dispersed St. Lawrence Iroquois into their villages would have been more than just an act of altruism but also a strategic incorporation of those people who effectively had the right to trade routes with the Europeans. The movement of the Huron into Huronia in the historic period suggests that while the Algonquians and Five Nations were fighting over the St. Lawrence River the Huron were attempting to situate themselves closer to the Ottawa River in a pivotal location for access to trade routes. The concentration of Huron people into Huronia has often been argued to be the result of retreat from hostile forces. I propose that greater than the need to retreat from attacking Iroquoian tribes, was the need for the Huron to put themselves in the best position economically to control and benefit from European trade.

The Huron of the Upper Trent River Valley were going through a series of complex and interrelated changes during the 16$^{th}$ century. These changes are indicated in various ways archaeologically. As outlined in this research changes in village formation/composition, an increasing presence of European goods, an increasing presence of St. Lawrence Iroquois ceramics, and a shift in faunal exploitation patterns in favor of increasing beaver specialization can be identified. I have argued that the interplay of all of these changes came as result of an intensified relationship with the St. Lawrence Iroquois coupled with an economic realignment aimed at better exploiting the burgeoning European driven fur trade.

## Bibliography


Amorosi, T., J. Wollett, S. Perdikaris and T. McGovern
1996 Regional Zooarchaeology and Global Change: Problems and Potentials. *World Archaeology* 28(1):126-157.

Bailey, A.G.
1933 The Significance of the Identity and Disappearance of the Laurentian Iroquois. *Transactions of the Royal Society of Canada*. 3rd Series. Vol. 27, 2:97-108.

Behrensmeyer A.K. and A.P. Hill editors
1980 *Fossils in the Making: Vertebrate Taphonomy and Palececology*. The University of Chicago Press, Chicago.

Binford, L.R.
1987 Researching Ambiguity: Frames of Reference and Site Structure. In *Method and Theory for Area Research: An Ethnoarchaeological Approach*, edited by S. Kent, pp. 449-512. Columbia University Press, New York.

Black, D.
1987 *BeGq-2 and BeGr-1 Faunal Identifications*. Ms. In Possession of Author.

Boyle, D.
1891 Pottery. *Fourth Annual Report of the Canadian Institute*. An Appendix to the Report of the Minister of Education, Ontario.

Bradley, J.
1987 Native Exchange and European Trade: Cross-Cultural Dynamics in the Sixteenth Century. *Man in the Northeast* 33:31-46.

Cadman, M.D., F.J. Eagles and F.M. Helleiner
1987 *Atlas of the Breeding Birds of Ontario*. Federation of Naturalists and the Long Point Bird Observatory. University of Waterloo Press, Waterloo.

Campbell, C. and I.D. Campbell
1989 The Little Ice Age and Neutral Faunal Assemblages. *Ontario Archaeology* 49:13-33

Chapman, F.M.
1966 *Handbook of Birds of Eastern North America*. Dover Publications Inc., New York.

Crabtree, P.
1990 Zooarchaeology and Complex Societies: Some Uses of Faunal Analysis for the Study of Trade, Social Status, and Ethnicity. In *Archaeological Method and Theory*, vol 2, edited by, M.B. Schiffer, pp. 155-205. University of Arizona Press, Tucson.

Damkjar, E.
1982 *The Coulter Site and Late Iroquoian Migrations to the Upper Trent Valley.* Master's thesis, Simon Fraser University, Burnaby.

1990 The Coulter Site and Late Iroquoian Coalescence in the Upper Trent Valley. *Occasional Papers in Northeastern Archaeology No. 2*. Copetown Press. Dundas, Ontario.

Douglas, J.
1897 The Consolidation of the Iroquois Confederacy; or, What Happened on the St. Lawrence Between the Times of Cartier and Champlain. *Bulletin of the American Geographical Society* 29(1):41-54.

Driver, J.
1982 Medullary Bone as an Indicator of Sex in Bird Bones from Archaeological Sites. In *Aging and Sexing Animal Bones from Archaeological Sites*. British Archaeological Reports British, Series 109, Oxford, pp. 251-254.

Eiseley, L.
1971 *The Night Country*. Scribner, New York.

Elliot, V.
1983 Notes on the Coulter Site (BdGr-6). Unpublished Notes of the Zooarchaeological Identification Center, Ottawa.

Emerson, J.N.
1954 *The Archaeology of Ontario Iroquois*. Unpublished Ph.D. Dissertation, University of Chicago.

Erlandson, J.M.
1994 *Early Hunter-Gatherers of the California Coast*. Plenum Press, New York.

Feder, K.L
1990 *Frauds, Myths, and Mysteries*. Mayfield Publishing Company, Mayfield.

Fenton, W.N.
1971 The Iroquois in History. In *North American Indians in Historical Perspective*, edited by Eleanor Burke Leacock and Nancy Oestreich Lurie, pp. 129-168. Random House, New York.

Fitzgerald, W.R.
2001 Contact, Neutral Iroquoian Transformation and the Little Ice Age. In *Societies in Eclipse: Archaeology of the Eastern Woodlands Indians, AD. 1400-1700*, edited by David S. Brose, C. Wesley Cowan, and Robert C. Mainfort Jr, pp. 37-47. Smithsonian Institution Press, Washington.

Fogt, L. and P.G. Ramsden
1996 From Timepiece to Time Machine: Scale and Complexity in Iroquoian Archaeology. In *Debating Complexity: Preceedings of the 26th Annual Chacmoal Conference*, edited by D.A. Meyer, P.C. Dawson and D.T. Hanna, pp. 39-45 Archaeological Association of the University of Calgary, Calgary.

Gifford-Gonzalez, D.
1990 Bones are not Enough: Analogues, Knowledge, and Interpretive Strategies in Zooarchaeology. *Journal of Anthropological Archaeology* 10:215-254.

Gobalet, K.W.
2001 A Critique of Faunal Analysis; Inconsistency among Experts in Blind Tests. *Journal of Archaeological Science* 28:377-386.

Grayson, D.K.
1984 *Quantitative Zooarchaeology: Topics in the Analysis of Archaeological Faunas*. Academic Press, New York.

Griffin, J. B.
1961 Some Correlations of Climatic and Cultural Change in Eastern North American Prehistory. *New York Academy of Science, Annals* 95:710-717.

Klein, R.G. and K. Cruz-Uribe.
1984 *The Analysis of Animal Bones from Archaeological Sites*. University of Chicago Press, Chicago.

Hayden, B.
1977 Corporate Groups and the Late Ontario Iroquoian Long-house. *Ontario Archaeology* 28:3-16.

Heidenreich, C.
1971 *Huronia: History and Geography of the Huron Indians 1600-1650.* McClelland and Stewart Limited, Ontario.

Hodder, I.
1986 *Reading the Past: Current Approaches to Interpretation in Archaeology*. Cambridge University Press, Cambridge.

Hunt, G.T.
1940 *The Wars of the Iroquois: A Study in Intertribal Trade Relations*. Madison,

James, S.R.
1997 Methodological Issues Concerning Screen Size Recovery Rates and Their Effects on Archaeofaunal Interpretations. *Journal of Archaeological Science* 24:385-397.

Jamieson, J.B.
1990 Trade and Warfare: The Disappearance of the St. Lawrence Iroquoians. *Man in the Northeast* 39:1-8.
Wisconsin.

*(The) Jesuit Relations and Allied Documents; Travels and Explorations of the Jesuit Missionaries in New France 1610-1791: The Original French, Latin and Italian Texts with English Translations and Notes*. Edited by R.G. Thwaites, 73 Vols. Cleveland, 1896-1901. Facsimile reproduction, 73 vols., New York 1959.

Johnson, B.
1989 *Familiar Amphibians & Reptiles of Ontario*. Natural Heritage/Natural History Inc., Toronto.

Laidlaw, G.
1891 Balsam Lake. *Fourth Annual Report Canadian Institute,* (Session 1890-91) An Appendix to the Report of the Ministry of Education, Ontario. Toronto.

1900 North Victoria County New Sites. *Annual Archaeological Report, Ontario, 1900*. Toronto.

1917 Indian Sites in Victoria County and Vicinity. *Annual Archaeological Report, Ontario, 1917*. Toronto.

Legge, A.J. and P.A. Rowley-Conwy.
1991 "...Art Made Strong with Bones": A Review of some Approaches to Osteoarchaeology. *International Journal of Osteoarchaeology* 1:3-15.

Lyman, R.L.
1993 *Vertebrate Taphonomy*. Cambridge University Press, London.

McAndrews, J.
1994 Pollen Diagrams for Southern Ontario Applied to Archaeology. In *Great Lakes Archaeology and Paleoecology: Exploring Interdisciplinary Initiatives for the Nineties*. The Quaternary Sciences Institute, University of Waterloo, London, Ontario.

McCullough, K.M.
1978 Modified Deer Phalanges at the Draper Site. *Museum of Indian Archaeology, Research Report 5*. London.

Munro, N.
1999 Small Game as Indicators of Sedentization during the Natufian Period at Hayonim Cave in Israel. In *Zooarchaeology of the Pleistocene/Holocene Boundary*, edited by J.C. Driver, pp. 37-45. Bar International Series 800.

Nasmith, C.
1989 The Kirche Site a 16th Century Huron Village in the Upper Trent Valley. *Occasional Papers in Northeastern Archaeology No. 1*. Copetown Press. Dundas, Ontario.

O'Conner, T.
2000 *The Archaeology of Animal Bones*. Texas A&M University Press, College Station.

O'Shea, J.M.
1989 The Role of Wild Resources in Small Scale Agricultural Systems: Tales from the Lakes and the Plains. In *Bad Year Economics: Cultural Responses to Risk and Uncertainty*, edited by Paul Halstead and John O'Shea, pp. 57-67. Cambridge University Press, Cambridge.

Payne, S.
1972 Practical Recovery and Sample Bias: The Results of some Sieving Experiments. In *Papers in Economic Prehistory*, edited by E.S. Higgs, pp. 49-64. Cambridge University Press, London.

Pendergast, J.F.
1975 An In-Situ hypothesis to Explain the Origin of the St. Lawrence Iroquoians. *Ontario Archaeology* 25:47-55.

1985 Huron-St. Lawrence Iroquois Relations in the Terminal Prehistoric Period. *Ontario Archaeology* 44:23-39.

1991 The St. Lawrence Iroquoians: Their Past, Present, and Immediate Future. *The Bulletin* 102:47-74.

1992 Some Notes on Ceramic Smoking Pipes from St. Lawrence Iroquois Archaeological Sites. In *Proceedings of the 1989 Smoking Pipe Conference: Some Selected Papers*, edited by Charles F. Hayes III, Connie Cox Bodner and Martha L. Sempowski, pp. 51-70. Rochester Museum & Science Center, Research Records No. 22.

1993 More on When and Why the St. Lawrence Iroquoians Disappeared. In *Essays In St. Lawrence Iroquoian Archaeology*, edited by James F. Pendergast and Claude Chapdelaine, pp. 9-47. Occasional Papers in Northeastern Archaeology No. 8, Copetown Press, Ontario.

1998 The Confusing Identities Attributed to Stadacona and Hochelaga. *Journal of Canadian Studies* 32(4):149-167.

Peterson, R.L.

1966 *The Mammals of Eastern Canada*. Oxford University Press, Toronto.

Ramsden, P.G.

1977a *Late Iroquoian Occupations of South Central Ontario: A Report on the 1976 Investigations*. Ms., submitted to Canada Council.

1977b *A Refinement of Some Aspects of Huron Ceramic Analysis*. National Museum of Man Mercury Series, Archaeological Survey of Canada Paper 63.

1978a *Late Iroquoian Occupations of South Central Ontario: A Preliminary Report on the 1977 Field Season.* Report on File, Ministry of Citizenship, Culture and Recreation, Toronto.

1978b An Hypothesis Concerning the Effects of Early European Trade Among Some Ontario Iroquois. *Canadian Journal of Archaeology* 2:101-106.

1988a A Society Transformed. *Rotunda* Spring:45-48.

1988b Palisade Extensions, Village Expansion and Immigration in the Trent Valley Huron Villages. *Canadian Journal of Archaeology, Brief Commmunications/Notes*, 12:177-183.

1990a Saint Lawrence Iroquoians in the Upper Trent River Valley. *Man in the Northeast* 39:87-95.

1990b The Hurons: Archaeology and Culture history. In *The Archaeology of Southern Ontario to A.D. 1650*, edited by Chris J. Ellis and Neal Ferris, pp. 361-384. London Chapter, Ontario Archaeological Society, Occasional Publication Number 5.

Ramsden, P.G., E. Damkjar, B. Jamieson and C. Nasmith.
1981 *Late Iroquoian Occupations of South Central Ontario: An Initial Report on the 1978 Field Work in Victoria County.* Report on File, Ministry of Citizenship, Culture, and Recreation, Toronto.

Ramsden, P.G. and V. Volterra
1995 Thermoluminescence Dating of Late Iroquoian Sites near Balsam Lake, South-Central Ontario. A report on OHF grant # ARG-614.

Rankin, L.
1999 *Upper Trent Valley Research Plan*. SSHRC Post Doctoral Fellow. Unpublished Document Available from the Author.

Rankin, L., J. Tuck and P.G. Ramsden
2003 *The Hurons of Balsam Lake: A Laboratory Manual for Anthropology 4190 Winter 2003*. Copetown Press Inc.

Reitz, E.J. and E.S. Wing
1999 *Zooarchaeology*. Cambridge University Press, London.

Ringrose, T.J.
1993 Bones Counts and Statistics: A Critique. *Journal of Archaeological Science* 20:121-157.

Scott, W.B.
1967 *Freshwater Fishes of Eastern Canada*. University of Toronto Press, Toronto.

Tooker, E.
1964 *An Ethnology of the Huron Indians*. American Bureau of Ethnology, Bulletin 190. Washington.

Trigger, B.G.
1969 *The Huron Farmers of the North*. Hult, Rinehart and Winston, Montreal.

1972 Hochelaga: History and Ethnohistory. In *Cartier's Hochelaga and the Dawson Site*, by James F, Pendergast and Bruce G. Trigger. 1-92. McGill-Queens University Press, Montreal.

1976 *The Children of Aataentsic* (2 vols.). McGill-Queen's University Press, Montreal.

1979 Sixteenth Century Ontario: History, Ethnohistory and Archaeology. *Ontario History* 71(4):205-223.

1998. Archaeology and Epistemology: Dialoguing Across the Darwinian Chasm. *American Journal of Archaeology* 102:23.

Trigger, B.G., L. Yaffe, M. Diksic, J. L. Galinier, H. Marshall, and J. F. Pendergast
1980 *Trace Element Analysis of Iroquoian Pottery*. Canadian Journal of Archaeology 4:119-145.

Warrick, G.A.
1984 Reconstructing Ontario Iroquoian Village Organization. *National Museum of Man Mercury Series, Archaeology Survey of Canada*, Paper 124:1-180.

Wright, J.V.
1966 *The Ontario Iroquois Tradition*. National Museum of Canada, Bulletin 210. Ottawa.

## Appendix A

Profiles of species identified at the sites discussed within the text

**Moose (Peterson 1966:326-330):**

The moose is the largest living form of deer. Males possess large antlers, which Native populations used as tools. Moose have a short, smooth coat in the spring that is dark brown to black in color. The coat develops a light brown color in the fall and becomes much longer. In late winter to early spring the coat may again change in color taking on a grayish hue. Males can weigh from 725 to 1400 lbs. and females can weigh between 500 and 900 lbs. Moose are typically circumpolar in distribution, and as such are typically absent in Ontario south of the Precambrian shield. This modern range reflects the push of the animals northward after the arrival of the 'white man' to Eastern Canada. Moose inhabit secondary growth areas of boreal forests near rivers and lakes. Moose feed on aquatic vegetation in the summer months and this is when they are most likely to be seen, feeding at the edges of bodies of water. Moose are solitary animals though they may be encountered in groups at ideal feeding locations. When in groups however, each moose will move about independently breaking from the group at will.

**Deer (Peterson 1966:322-326):**

The white tailed deer is one of the most common animals in southern Ontario. Male deer develop antlers with un-branched spikes projecting upward off a forward tilted main beam. In the summer their pelage is bright reddish that changes to grayish as winter draws near. Underneath the tail the fur is white. This becomes apparent when the deer is startled and bounds away with its tail upright. Male deer weigh between 199 and 475 lbs.

while females fall in the range of 75 to 250 lbs. The white tailed deer is a New World species and inhabits areas of second growth and the intermediate stages of forest succession. Land settlement has actually helped to improve habitat conditions leading to population growth. In southern Ontario agricultural clearing both today and as far back as the 15$^{th}$ century has created ideal habitats for white tailed deer populations. In the winter and early spring deer prefer feeding in cedar swamps and several deer may gather together in what is called a yard. Deer are alert and cautious and are always ready to flee from their primary predator, the wolf. The white tailed deer is also an excellent jumper and can clear heights of seven to eight feet. New antlers grow in rapidly beginning in the spring and are a shed after the rutting season that begins in October and is completed by late November. Typically one to two fawns are born in May or June.

**<u>Domestic Dog (Peterson 1966:203-204):</u>**

Domestic dogs, while typically not listed in mammal faunas, were important contributors to the subsistence strategies of the 15$^{th}$ and 16$^{th}$ century Huron populations. Domestics can be difficult to distinguish from wild canids; a point further complicated by the relatively common occurrence of wolf-dog and coyote-dog hybrids. Domestic dogs, however, do have distinguishable cranial elements, tooth shape, and general size differences from wolves and coyotes. These are especially identifiable in fetal form. Due to their domesticity these animals can breed and birth throughout the year. They remain carnivores and will eat most food given to them by man. If left to their own devices they are capable hunters of small game and efficient scavengers of human middens and carrion.

**<u>Coyote (Peterson 1966:197):</u>**

Prior to 1900 the coyote had a limited range in Ontario extending northwest from Lake Nipigon. Since this time the range of the coyote has expanded rapidly. Hybridization with domestic dogs can be considerable and has been especially noted in the more agricultural regions of southern Ontario. Coyotes normally roam open country. Breeding occurs in February and births follow approximately two months later. Normally five to six pups are born at a time. Coyotes live in dens and participate in cooperative hunts, banding together in packs of twelve animals on average. As carnivores, coyotes eat small mammals, deer, fish, and birds. Coyote are most commonly known for, and recognized by their howling abilities.

**<u>Wolf (Peterson 1966):</u>**

The wolf is another carnivore belonging to the canidae family containing dogs, coyotes and foxes. Wolves are approximately the size of large German Shepard dogs. They most commonly have grey coats though white and black variations do occur. Wolves also mate with domestic dogs producing hybrid forms. These crosses can again be difficult to distinguish especially from fragmented archaeological collections. Wolves weigh between 60 and 100 lbs. and are found throughout southern Ontario. In this region wolves prefer more wooded areas than coyotes. They will venture into the open to chase prey. The wolf is an elusive nocturnal animal and as such is rarely seen by humans. Wolves band together to hunt in packs in the fall and winter. Hunting mostly the white tailed deer. Wolves live in dens and mate in January and February with four to seven pups born two months later.

**Red Fox (Peterson 1966:210-213):**

The red fox can be found throughout southern Ontario. Their pelt can vary from red to brownish with less common variants of silver or black. Red foxes weigh on average between six and sixteen lbs. They can inhabit a wide range of environments and thrive in proximity to human habitations. The red fox can be readily observed in the wild. They are active during the day often sunning themselves in family units. They live in dens and breeding begins in January or February with four to five kits being born two months later. They most often feed on mice and rabbits but their diets can include insects, birds, frogs, snakes, and vegetation. They may also scavenge carrion when the need and opportunity arises.

**Grey Fox (Peterson 1966:215-217):**

The grey fox is similar in size and behavior to the red fox though they generally weigh slightly more at six to 28 lbs. Their pelt is a combination of colors that give an overall appearance of grey. Though generally a southern species remains of grey fox in Native middens have pushed their presence in southern Ontario into pre-Columbian times. As compared to the red fox the grey fox prefers more wooded and less open regions. The grey fox is unique among the canids for its ability to climb trees. Though a nocturnal species it is often active during the day. Breeding occurs in February and March and on average four pups are born two months later.

**Black Bears (Peterson 1966:219-222):**

Black bears in Ontario typically have a coat with a black body, brown nose, and spots of white on the chest. Black bears can weigh between 200 to 600 lbs with females being about ten percent smaller than males. These bears occupy substantially wooded areas and have an omnivorous diet. They will eat carrion, berries, grass, other vegetation, fish, small mammals, birds, frog, and insects. They may occasionally take down large game such as deer and moose. Mating beings in June and July and young are born in January or February, typically with one to three cubs per female. The young are born during the period of hibernation and will not leave the den until late March or April. Hibernation begins when the weather becomes sufficiently cold. Black bears are solitary and stay in well-defined areas demarcated by claw marks on trees. Black bears can be baited using decaying meat and are often seen scavenging in dumps near human habitations. The Black bear has been responsible for more human injury and death than any other North American predator.

**Raccoon (Peterson 1966:226-229):**

The raccoon is most easily recognized by its black eye mask and ringed tail. Its fur is long and typically grey in color. Being a largely southern species the raccoon is prevalent in southern Ontario. Raccoons are normally found in hardwood areas located near bodies of water. Breeding takes place between January and early March and after a two-month gestation period approximately four young are born. Family groups break up in the fall when the young become independent. Raccoons are nocturnal animals that hunt for fish and frogs along shorelines. They will also travel inland for ripe corn. They supplement their diet with fruit, nuts, insects, crawfish, small mammals and birds. Though active throughout the year raccoons may den for several days if the weather becomes cold enough.

**Weasel (Peterson 1966:233-236):**

The common or short tailed weasel has a dark brown summer pelage that changes to complete white in the winter. Weasels thrive in southern Ontario. They prefer to live in woodlands though they will expand this habit if need arises. Males can weigh between 80 to 182 gr. While females fall into the 45 to 75 gr. range. Mating beings in early summer and after an eight to nine month gestation period four to seven young are born in early spring. Weasels feed upon mice, rabbits, birds, amphibians and invertebrates. They are mainly nocturnal though they can be seen during the day. They are agile and will often elude onlookers by rapid retreat and use of cover. They remain coveted for their pelts, which have long been associated with European nobility.

**Mink (Peterson 1966:245-248):**

The mink is a large dark furred weasel. The pelage of the mink, unlike that of the weasel, does not change color in the winter. Males weigh between 565 and 1250 gr. while females range between 500 and 950 gr. The mink's habitat covers all of southern Ontario and is centered on areas near bodies of water. The mink, as a weasel, is adapted for aquatic living. They are excellent swimmers and can hunt on land and in water. They feed on small mammals, frogs, fish, snakes and birds. They are most often nocturnal though they can be seen during the day. They are solitary mammals hardly ever seen in the company of more than their family group. They breed in February and March with their young born in April or May. Typically litters are of three to six young. Mink have durable pelts with glossy softness and a rich deep brown color. Mink are the most valuable of ranch-raised furbearers and were valued in pre-Columbian times for the same qualities.

**Marten (Peterson 1966):**

The marten has been extirpated from the modern agricultural regions of southern Ontario. However, it would have been present in the region during the 15th and 16th centuries. Their coat varies in color from a yellowish buff, to deep reddish brown, to almost black. Male martens weigh between one and three lbs. while females weigh between one and two lbs. The marten typically occupies the boreal coniferous forest. They are extremely agile in tress, which is useful since it primarily hunts the red squirrel. They will also hunt on the ground taking mice, shrews, chipmunks, rabbits, birds, amphibians, reptiles, nuts, and insects. The mating season begins in July and lasts through August with a gestation period of nine to ten months. The litter, consisting of three to four offspring, is born in March or April. The fur of the marten has brought high prices on international markets often being referred to as the sable of the New World. This suggests that they may have been an important furbearer to the Native populations of the 15th and 16th centuries.

**Striped Skunk (Peterson 1966267-269):**

The striped skunk is most easily recognized by its coal black fur and distinctive white stripping down its back. Adult skunks will weigh between three and 14 lbs. Skunks prefer semi open areas of mixed forest and grassland, they are however, extremely tolerant and can be found in any number of environments. The skunk is common throughout eastern Canada and is abundant in southern Ontario. The stripped skunk is an omnivore with a high dependence on insects. Skunks breed in February and March with an average litter of six born in May. Skunks are primarily nocturnal. They retreat into their dens by late December and remain there until late February. They may reemerge briefly during this period should need arise.

**Otter (Peterson 1966:271-273):**

The river otter, though a terrestrial carnivore, is more highly adapted for an aquatic existence. Its body is long, slender and stream lined and its fur is dark brown, short, and dense. The otter is found in southern Ontario and is one of the most widely distributed mammals in eastern Canada. Adult river otters weigh between ten and 30 lbs. Their habitat includes lakes, marshes, streams and seashores. In this aquatic habitat otters feed on fish, amphibians, turtles, snakes, water foul, muskrats, and small rodents. The river otter is swift and graceful in water while clumsy and unsure on land. In the winter otters are easily tracked by the ploughed ditch they leave in the snow due to their short legs. An average of two to three young are born between March and April. Otter pelts are durable and have been highly sought after by trappers. Their populations, though never dense, have been able to maintain relative stability despite intensive exploitation by trappers.

**Lynx (Peterson 1966:280-282):**

The lynx, though common in most of eastern Canada, has become scarce in the agricultural regions of southern Ontario. This change has come as a result of intensified farming and human population expansion. Lynx would have been found in the region during the 15$^{th}$ and 16$^{th}$ centuries prior to the industrialization of the 19$^{th}$ and 20$^{th}$ centuries. The average weight of an adult lynx ranges between 11 and 35 lbs. The lynx's habitat includes wooded and swampy areas were snowshoe hare are common as a prey species. Lynx primarily hunt hare and will in times of need also hunt small mammals, ground birds, frogs and invertebrates. The population growth of lynx is linked to the population growth of hare. When hare populations decrease the lynx population will typically decrease in the following year. Mating takes place from January to March with one to four kittens born two months later. The pelt of the lynx is long-haired, soft, and delicately shaded and has experienced periods of popularity with hunters when long haired fur has been favored.

**Snowshoe Hare (Peterson 1966:87-89):**

The snowshoe hare is the most common lagomorph in eastern Canada. It is common to southern Ontario. The pelt of the snowshoe hare changes in color from dirty brown in the summer to white in the winter. The hare's large feet are well adapted to the deep snow of its boreal forest habitat. Adult snowshoe hares weigh between three and five lbs. Though its main habitat is the boreal forest it will expand into cedar and spruce swamps at the more southerly extent of its range. The snowshoe hare remains largely inactive during the day hiding in the forest cover. They become most active in the evening when they seek food, which consists of vegetable matter. Breeding begins in March and two to four young are born about a month later. Births peak in May. Two litters can be born to a female in one season. The snowshoe hare experiences regular cycles of population growth and decline with a complete cycle happening every nine to ten years. Since the snowshoe hare is an important prey species to many boreal furbearers its periods of abundance and scarcity may also have an effect on these populations.

**Cottontail Rabbit (Peterson 1966):**

The cottontail is also common in southern Ontario. Its pelage is dark brown and grey in the summer changing to slightly paler hues in the winter. There are also white spots and distinctive reddish-brown patches on its body. Adult cottontails weigh between two and four lbs. Cottontails live in hedgerows, woodlots, and ravines in agricultural areas. They require their habitat to have escape cover such as tall grass and shrubbery. Breeding begins in February and a litter of four to seven is born approximately one month later. Females may produce two to three litters before the end of the breeding season and the commencement of winter. Cottontails have a vegetable based diet tending toward buds and twigs with the addition of bark in the winter. Cottontails are most active at daybreak and dusk. They are solitary creatures, and outside of family units, are rarely seen in groups. The cottontail provides meat both to humans and to carnivores. Similar to the snowshoe hare, cottontail populations are cyclic and fluctuate on nine to ten year intervals.

**Red Squirrel (Peterson 1966:112-114):**

The red squirrel is common to southern Ontario. Their pelage can range in color from rusty red to brown, black, grey, and any combination of these. Adult red squirrels range in weight from 140 to 250 gr. Their habitat is limited to boreal coniferous forests. In this habitat red squirrels feed on nuts, seeds, berries, buds, fungi, sap, and occasionally bird's eggs. They have two distinct breeding periods the first from February to March and the second from June to July. Approximately four young are born after a gestation period of

38 days. Red squirrels are diurnal and are active throughout the year. They will, however, remain in their nests during periods of extreme cold.

**Woodchuck (Peterson 1966:115-118):**

The woodchuck is a heavyset rodent and is commonly referred to as the ground hog. Woodchucks are common in southern Ontario where their habitat is quite large. They prefer areas of fields, pastures, ravines, woodlots, semi-open forests, and rock slop features that are prevalent in an agricultural area where land clearing and field abandonment occurs. The woodchuck has a brownish pelage with a lightening of fur on the under parts and legs. An adult woodchuck weighs between four and 12 lbs. Woodchucks are active during the day and enter into a period of hibernation in the winter. Hibernation can begin as early as late September and continues until March. The hibernation is not continuous and woodchucks can become active again for brief periods in mid-winter. Breeding follows hibernation typically beginning in March. The gestation period lasts approximately one month with two to six young born in April or May. The fur of the woodchuck is not considered of commercial quality by 20$^{th}$ century standards.

**Eastern Chipmunk (Peterson 1966:121-123):**

The eastern chipmunk can also be found in southern Ontario. The main body fur of the chipmunk is reddish brown with characteristic dark brown and buff median stripes running down each side. The eastern chipmunk makes its habitat in hardwood forests and well-drained areas. They will use brush piles, rock piles and even dumps as den sites. An adult can weigh between 75 and 115gr. Though able to climb chipmunks prefer to remain on the ground. Breeding begins in March and April with two to seven young born one month later. A second breeding may occur in June and July. During the coldest months of the year chipmunks hibernate. Chipmunks eat a variety of things including nuts, seeds, berries, insects, small birds, and eggs.

**Beaver (Peterson 1966:133-136):**

The beaver has played a pivotal role in the development of Canada and the northeastern United States. It is the largest and most distinctive rodent in Canada. The beaver is found throughout eastern Canada and has long been admired for its industrious dam building as well as its thick rich brown coat. Beaver, though once common in southern Ontario, have been extirpated along the agricultural regions largely due to the destruction of their natural habitat. Beavers inhabit wooded waterways including lakes and streams. An adult beaver weighs between 30 and 80 lbs. Beaver live in lodges generally constructed at the edge of waterways or on islands in waterways. Beaver feed on bark and twigs and other vegetable matter. Beaver are vulnerable to animal predators when forced to travel long distances over land. Beaver breed during the winter and kits are born three months later usually in April, May, or June. The beaver leaves obvious signs of its presence on the landscape in the form of lodges and dams and this contributes to its easy exploitation by hunters.

**Deer Mice (Peterson 1966:140-144):**

The range of deer mice includes all of southern Ontario. They typically weigh between 12 and 31 gr. They can be found in almost any environment though they prefer forested areas. The deer mouse will also enter into human habitations and infestation can occur quickly. Deer mice are primarily nocturnal with activity beginning during early twilight.

They breed in early spring with two to eight young born in early march. Breeding continues until October with several litters being born each year. Deer mice feed on vegetable matter, insects and other invertebrates.

**White-footed Mouse (Peterson 1966:144-147):**

The white-footed mouse closely resembles the deer mouse and is also quite common in southern Ontario. An adult white-footed mouse weighs between 12 and 31gr. Their preferred habitat is forested and well covered areas though they will expand into more open regions along the edges of wooded areas. The breeding patterns of the white-footed mouse are identical to those of the deer mouse. The white-footed mouse feeds on deciduous vegetation. They are more nervous and fearful of humans than the deer mouse.

**Vole (Peterson 1966:161-164):**

The vole is present in south central Ontario as their habitat includes grassy areas, preferably that are moist and upland. The agricultural region of southern Ontario, with fields and secondary forest growth, provides an ideal habitat for the vole. Voles commonly experience extreme population fluctuations that seem loosely based on a four-year cycle. Several litters of up to nine young are produced each year. Voles feed on grasses and often develop runways under grass and snow to maintain access to food while covered from predators. The vole is an important prey species for a number of mammals such as hawks, owls, foxes, and weasels.

**Muskrat (Peterson 1966:169-171):**

The muskrat is the largest member of the family Cricetidae. Muskrats are found in southern Ontario in their preferred habitat of marshes, ponds, lakes and streams. They feed on aquatic vegetation. An adult muskrat can weigh between 810 and 1580 gr. Muskrats build dens into the banks of waterways with entrances that lay below the water. Breeding begins in April with a gestation period of one month. It is common for a muskrat to have three litters in a single season. Though their primary food is vegetable matter they also feed on clams and mussels. Muskrats are diurnal though most activities are carried out at night. Muskrat pelts, though not the finest of North American furs, have been a staple in the commercial fur trade in the New World. Both Europeans and Native groups used the muskrat as a food and fur source.

**Porcupine (Peterson 1966:188-191):**

The porcupine is well known for its mix of fur and sharp quills, which it will release on contact with a predator. The porcupine can be found in southern Ontario in woodland areas. Adult porcupines weigh between ten and 30 lbs. They feed on bark, buds, pine needles and leaves of hemlock, aspen and sugar maples. They are proficient climbers and do so to reach these food sources. Breeding occurs in the fall and involves elaborate courtship. Gestation lasts seven months and one kit is usually born between April and June. Porcupines are solitary animals that are active in all seasons. Porcupine meat is edible, though often heavily parasitized. Their quills have been used by Native cultures for ornamentation.

**American Eel (Scott 1967:77):**

The american eel is easily distinguished by its long, slim almost snake like appearance. Eels have strong jaws and sharp teeth. They are olive green to brown in color and can be over one m. in length. The american eel can be found in Lake Ontario and has spread into

Lake Huron via river systems and canals. Spawning occurs in the Atlantic Ocean with young eels making their way inland through river systems. They live in mud bottomed lakes and rivers and as adults they will return to the ocean to spawn and die. Eels mainly subsist on other fish though they will eat most aquatic creatures. The flesh of the eel is rich and oily. They are perceived as edible with those of a meter in length providing a considerable amount of meat. Eels spawn in large groups and are easily caught at fish weirs set up across streams and rivers.

**Freshwater Drum (Scott 1967:115):**

The freshwater drum has a compressed body that is relatively thin laterally. The drum averages between one to two lbs. in weight but specimens from the Great Lakes have weighed as much as ten lbs. The freshwater drum is a bottom feeding fish staying in the mud or sandy bottom of lakes and rivers. It feeds mainly on snails, mollusks and crayfish that it crushes with its powerful jaws. The flesh of the freshwater drum is white, flaky and quite edible. They are caught as a bi-catch of fish netting.

**Sucker Family (Scott 1967:42-44):**

Fish of the sucker family are found in the freshwaters of North America, and are closely related to minnows. Suckers are forage fish and bottom feeders. The white sucker averages in weight from one to two lbs. In the spring the white sucker moves from lakes to streams to spawn. There they deposit over 50,000 eggs leaving them unattended on the gravelly bottom. The white sucker feeds on bottom dwelling creatures such as aquatic insects, snails, mollusks, worms and plant material. White suckers are easy to catch in the spring when they are spawning. Dip nets can be used to scoop them from the water. They are a prey species for pike and walleye and make excellent live bait.

**Pike (Scott 1967):**

The pike averages a weight of two to four lbs. in southern Ontario. One weighing 42 lbs was once caught in Lake Simcoe showing that a wide variation in size is possible. In the summer pike frequent the weedy shallows of lakes and as the waters cool they move into the deeper areas. Spawning takes place in the early spring once the ice has gone. Eggs are scattered in marshy areas and then abandoned. Pike feed on other fish, including suckers, perch, and minnows. They are not selective and will also consume leeches, crayfish, frogs, snakes, mice, small muskrats and small ducks. The pike is one of the most popular game fish. Their flesh is white and flaky.

**Muskellunge (Scott 1967:39-41):**

The muskellunge is pike like in appearance but has an average weight of over 20 lbs. The muskellunge prefers medium sized bodies of water and is usually absent from the small lakes frequently inhabited by pike. They spawn in the spring, one to two weeks after the pike have spawned. Opposite to the habits of the pike the muskellunge prefer deep waters in the summer and shallower waters as the temperature drops. The muskellunge is a predatory fish feeding mainly on other fish. They are also popular games fish and have white, flaky, and flavorful flesh.

**Catfish (Scott 1967:71-73):**

All catfish are members of the Ictaluridae family. They are nocturnal fish active during the hours of darkness. The channel catfish is the largest of Canadian catfish and can weigh 30 lbs. or more though they average between two and four lbs. The channel catfish prefers cool, clear waters for the majority of the year. Spawning takes place in the spring and during this period the channel catfish will ascend rivers. Catfish in general are bottom feeders and feed on vegetation, insects, crayfish, mollusks and smaller fish such as minnows and yellow perch. Their flesh is white and flaky and highly valued by fisherman.

**Pumpkinseed (Scott 1967:94):**

The pumpkinseed is a member of the sunfish family. Its body is laterally compressed and almost round in outline. They provide little in the way of meat measuring only four to five inches in length. The meat that they do offer is sweet and of excellent flavor. The pumpkinseed frequents weedy ponds, lakes and slow flowing rivers. Spawning begins in the spring with males guarding the fertilized eggs. The pumpkinseed feed mainly on aquatic insects, snails and occasionally other small fish.

**Burbot (Scott 1967:80):**

The burbot is a long, thin fish. They are light brown in color becoming dark brown to black in the northern extremes of their range. The average burbot weighs between one and three lbs. Their preferred habit is deep inland lakes and large rivers. The burbot spawn from January to March in rivers or on rocky lake bottoms. Burbot are carnivorous feeding primarily on other fish. They supplement this diet with aquatic insects, crayfish and plankton. The flesh of the burbot is white, firm and has a subtle flavor. It has a large liver, which can yield good quality oil comparable to cod liver oil.

**Yellow Perch (Scott 1967:102):**

The yellow perch, as its name suggests, is yellow to yellow-green in color. The yellow perch weighs between four and ten oz. and as such is one of the smaller fish exploited in the region. The yellow perch spawns in shallow water in the spring of the year. No parental care is given to either the eggs or the young. Adult yellow perch typically move about in schools. These schools leave the lakes in the spring of the year and ascend tributary streams to spawn. The yellow perch is primarily a lake fish where they feed on animal plankton, aquatic insects and smaller fish. The yellow perch are themselves a major prey species for larger game fish. Among fisherman their flesh is highly praised for its flavor.

**Bass (Scott 1967:89-90):**

Bass are present in many of the lakes of southern Ontario. Bass weigh between one and two lbs. Though common in most of present-day southern Ontario they were once confined to the St. Lawrence River and the Great Lakes drainage system. They prefer rocky lakes and rivers. Spawning in southern Ontario typically takes place in June. The males build nests in the gravel, which the females will deposit their eggs into. The males then chase the females away so that other females can come and add their eggs to the nest. When the young hatch the males guard them for one to two weeks. Male bass can be easily caught during the spawning period, as they will attack anything that comes near their eggs or young. Bass are carnivorous and feed mainly on other fish, especially yellow perch and various species of minnows. Bass are praised by fisherman for their preference of shallow waters and their readiness to strike at bait.

**Lake Trout (Scott 1967:23-24):**

The lake trout is one of the largest freshwater fish in southern Ontario. They average in size from three to five lbs. with occasional reports of fish of 60 to 100 lbs. The lake trout prefers deep lakes and though once common in the Great Lakes and their drainage system they are now on the verge of extinction in these waters due to predation by lampreys. The lake trout spawn from October through November in the shallow waters of lakes or rivers. The young are unguarded as the adults immediately return to deeper waters. The lake trout is carnivorous. They feed on other fish and in times of need on plankton and aquatic insects. During these lean times the growth of the lake trout will be sufficiently retarded. The lake trout is praised as a game fish with excellent flesh. It is most easily caught in gill nets, which allow many fish to be taken at once. They will respond to bait casting, especially in the spring of the year when the temperature forces them into more shallow waters.

**Walleye (Scott 1967:100):**

The walleye is common to lakes and large rivers in southern Ontario. They range in size from three to five lbs. The largest fish on record weighed 23lbs and was caught in southern Ontario. Spawning begins in the spring after the ice breaks up. The eggs, once laid, are abandoned by the walleye. The walleye stays in shallow waters on lakeshores, proceeding to gravelly rivers and streambeds to spawn. They are carnivorous and feed primarily on yellow perch and minnows. In the summer large numbers of mayflies are also eaten. The white flesh of the walleye is highly esteemed and it is viewed as one of the most important commercial species of Canada's fresh waters.

**Fallfish (Scott 1967:54):**

The fallfish is a robust minnow. They play an important role as a forage fish for other species. The fallfish is the largest native member of the minnow family in eastern North America, averaging from five to eight inches in length. The fall fish can be found in lakes though it prefers eddies at the foot of falls and rapids. Spawning begins in the spring. The male makes a nest into which the female deposits the eggs. The male then fertilizes the eggs and covers them with stones. Fallfish feed on insects, plankton and other small fish. The fallfish will strike at lures and its flesh is firm, white and sweet tasting.

**Snapping Turtle (Johnson 1989:77-81):**

The snapping turtle is the largest of its species found in Ontario. Its carapace ranges in color from dark brown to black. The snapping turtle prefers slow moving water with muddy bottoms. Snapping turtles are quite aggressive on land and will snap and hiss, however, when approached in water it will dive to the bottom and stay there to avoid danger. Despite their ominous name these turtles are quite vulnerable as the plastron is reduced and does little to protect their limbs and flanks, which cannot be tucked in. Most snapping turtles are 40 cm. or smaller from nose to tail. Larger snappers do exist and are occasionally caught by fisherman. Snapping turtles are opportunistic feeders. They will scavenge carrion or crawl about the lake bottom consuming dead fish or small easy to catch prey. They have been known to occasionally eat small ducklings. Snapping turtles can be caught with a baited hook as they perceive this as another dead thing to eat. They hibernate on pond bottoms or in riverbanks. Breeding occurs when they emerge in the spring. They lay their eggs in well-drained soils in nests that they dig and then abandon.

Predators often feed on these unguarded nests and anywhere from 50 percent to 90 percent of the nests may be destroyed. Since the number of turtle eggs that survive to maturity is so low intensive hunting and predation of these animals can devastate the snapping turtle population.

**Painted Turtle (Johnson 1989:85-88):**

The painted turtle is a medium sized turtle in the range of ten to 25 cm. It is aptly named since it has an olive green upper shell with red lines around the outer edge. Its head, neck and tail are stripped with yellow. The painted turtle's habitat includes slow moving rivers, ponds, lakes and marshes. These typically have mud bottoms suitable for hibernating and submerged vegetation for subsistence. Painted turtles are basking turtles and are most often encountered when sunning. They are omnivorous feeding on snails, tadpoles, fish, aquatic insects, crayfish, carrion, algae and submerged plants. Painted turtles may not breed every year since so much energy is required for egg production. When they do breed five to ten eggs are laid in June and hatch in September.

**Bullfrog (Johnson 1989:72-74):**

The bullfrog is Ontario's largest frog measuring on average from ten to 15 cm in length. Bullfrogs inhabit the shorelines of lakes, ponds and slow moving rivers. Deep, permanent bodies of water are a necessity since the tadpoles spend their winter in water. Bullfrogs are an important prey species for snapping turtles, herons and water snakes. The bullfrog breeds in late June through July. They are territorial during this period and may breed more than once. The eggs form large floating rafts of up to 8,000 and are left unattended. Tadpoles spend the winter under the ice and transform the following summer. Adult bullfrogs hibernate in the muddy bottoms of the waterways they inhabit. Bullfrogs will eat anything smaller then themselves including frogs, turtles, snakes, small birds, fish and dragonflies.

**Hawks/Eagles (Chapman 1966:213-234):**

Hawks and eagles belong to the family Accipitridae and are present in southern Ontario especially during the migratory seasons. These birds are generally perceived as inedible. They are solitary throughout the year banding in flocks only to migrate. They feed primarily on small rodents and are of value in agricultural areas for their control of these populations. These birds of prey attack with their feet and use their strong bill to tear their prey into manageable fragments. They construct large and obvious nests usually on elevated places providing points of look out. These birds weigh in the area of 12 lbs. They are usually found near water where they supplement their diet by preying on fish.

**Scaup (Cadman, Eagles, and Helleiner 1987:92):**

The scaup is known as a diving duck. They are open water ducks frequent in lakes and bays. They feed mainly on mollusks and aquatic plants that they acquire by diving. They feed during the day and nest near grassy sloughs and in marshy lakesides. Though not plentiful, the scaup does frequent southern Ontario. They begin nesting later then most ducks beginning in early June. The greater scaup extends its breeding range into the sub-artic and artic regions of North America. In southern Ontario they occupy lake and pond shores were the land is open and more like the tundra.

**Ruffed Grouse (Cadman, Eagles, and Helleiner 1987:138):**

The ruffed grouse has an established reputation in Ontario as a game bird. Its range in south central Ontario includes coniferous and deciduous forests. Most important to its habit is the presence of poplar and birch trees. The ruffed grouse's population density has been historically known to fluctuate on ten-year cycles. These cycles are more intense in northern Ontario and at times seem absent in the agricultural south. The ruffed grouse has a secretive nature and can be difficult to locate. Breeding begins in late march. The male attracts a female and she then builds a well-concealed nest where a large clutch of up to 11 eggs is laid. The young hatch in 23 days and can fly ten days later. The female will remain with them until they are 12 weeks old. The male plays no role in their care. The ruffed grouse does not thrive near centers of intense human occupation. Since they are unable to fly for prolonged or continuous flights that are relatively sedentary in terms of habitat.

**Canada Goose (Cadman, Eagles and Helleiner 1987:64):**

The Canada goose is common to southern Ontario where it breeds in marshes, wooded swamps and on the shores of ponds, lakes and rivers. The population of these birds declined in southern Ontario shortly after the arrival of European farmers. Their numbers have rebounded since they were reintroduced to the area throughout the 1960's, 70's and 80's. Canada geese are easy to see in the wild since they are diurnal feeders. Loud and aggressive honking can often reveal the boundaries of their various territories. Mates usually return to the same nest site if the previous nesting season was successful. If it was not they will move to a new location. Both males and females guard the nest and broods when hatched are frequently seen grazing on farmland or swimming along the shores of lakes or ponds.

**Blue Jay (Cadman, Eagles and Helleiner 1987:286):**

The blue jay is one of the most recognized birds of southern Ontario. The blue jay will make its home in coniferous, deciduous and mixed forest environments. This especially adapts it to the forests of south central Ontario. The blue jay, during most of the year, is loud and rowdy. However, it is secretive and solitary when it comes to breeding time and nesting behaviors. Nesting begins in mid April, with nests in white pines, hemlocks or other evergreen trees.

**Common Loon (Cadman Eagles, and Helleiner 1987:36):**

The common loon can often be seen on Ontario's lakes. It is easily recognized by its white and black plumage and distinctive calls. This species is most commonly found in northern Ontario and on the lakes of the Canadian Shield and northward. Though less common, they can be found in southern Ontario. Most loons spend the winter on the Pacific, Atlantic and Gulf coasts. Nesting occurs on large lakes with the nest located on small islands or promontories close to the waters edge. Loon numbers have been reduced in areas of high human population. Breeding begins in mid to late summer. Breeding pairs return to the same lakes year after year. The data for southern Ontario indicates that the Trent River Valley may be the southern limit of the common loons breeding habitat.

**Great Blue Heron (Cadman, Eagles, and Helleiner 1987:50):**

The great blue heron is common in south central Ontario. Its numbers drop in regions of intensive agriculture. Though some move further south in the winter they can be found in areas of open water in southern Ontario. The great blue heron feed on fish, amphibians and invertebrates. They hunt in shallow water in streams and lakes. They prefer a wetland environment associated with relatively isolated woodlots appropriate for nesting. Large stick nests are built high in trees with deciduous trees favored in southern Ontario. Several nests can be found in a single tree or in several trees next to each other. This makes colony detection fairly obvious. Herons are especially common along the southern boarder of the Canadian Shield. The present agricultural practices in southern Ontario have removed woodlots and as a result restricted the range of the great blue heron. The extent and nature of agriculture in the $15^{th}$ and $16^{th}$ centuries would not have impeded on their habitat in this way.

**Passenger Pigeon (Cadman, Eagles, and Helleiner 1987:565):**

The passenger pigeon was once common in inconceivable numbers in southern Ontario. They are now extinct. Records indicate "flocks of migrants that darkened the sun like clouds passed uninterrupted from sunrise to sunset" (Cadman, Eagles, and Helleiner 1987:565). Flocks such as these would have contained millions of birds. Nesting colonies were reported as covering areas as large as 350 $km^2$ with tree branches breaking under the weight of so many birds and the roar of wings compared to a gale at sea. Colonies were centered on hardwood bush or swamps but would rapidly expand into the surrounding forest due to sheer volume. They were hunted with intensity. Often taken while in colonies or while at winter roosting sites. By 1900 the species had all but disappeared with the last reliable sighting made in Simcoe County in 1902.

**Sandhill Crane (Cadman, Eagles, and Helleiner 1987:160):**

The Sandhill crane is uncommon in south central Ontario. Though present on the Bruce Peninsula they are generally absent from the remainder of southern Ontario. Sandhill cranes in this region breed in low shrub bog and peaty wetlands with abundances of sphagnum, cattail, leather leaf, sweet gale and sedges. Nests are built within two m. of water and are surrounded by tall grass that obscures them from view. Sandhill cranes were much more common in southern Ontario before the $20^{th}$ century. In the $17^{th}$ century sandhill cranes stopped in south central Ontario en route to and from their wintering grounds in New England. The sandhill crane returns to its nesting grounds in early April and is very secretive while nesting.

**Wild Turkey (Cadman, Eagles and Helleiner 1987:142):**

The wild turkey has been reintroduced in southern Ontario as it had been extirpated from its historical habitat by the late $19^{th}$ century. Their decline is attributed to the loss of their hardwood habitat. Wild turkey feed on agricultural bi-products such as waste corn and grains. They are normally found near a year round supply of water. They are wary birds. It is likely that over hunting aided in their decline. Wild turkey traditionally populated the southernmost of Ontario, extending east of Toronto and North of Barrie. The wild turkey spends much of its time in wooded cover and can be difficult to locate. Males gobble in the spring to attract females though this can also attract predators. The birds form flocks in the late fall and these can often be seen feeding in fields.

**Yellow-bellied Sapsucker (Cadman, Eagles and Helleiner 1987:236):**

The yellow-bellied sapsucker is common to south central Ontario. Its habitat includes the dry second growth forests that abound there. They prefer to nest in the dead heart of living poplar trees and aspen. Birch trees provide sap that is the staple of the sapsuckers diet. They obtain this sap by drilling distinctive holes into and around the trunk and large limbs of trees. They remain in the same nesting location for several years. These birds are quite small and provide small meat yields.

**Robin (Cadman, Eagles and Helleiner 1987:330):**

Robins, though largely absent from southern Ontario in the winter, return to the region in the spring. The range of the robin covers almost all of North America. They have adapted to a variety of habitats. In forested areas they prefer forest edges, burned or cutover areas, fens and bogs, as well as lake and river shores. Human activities tend to alter the environment favorably for the robin.

**Snowy Owl (Cadman, Eagles, and Helleiner 1987:541):**

The snowy owl is uncommon to present day south central Ontario. It is an arctic bird and occasional winter visitor to southern Canada. The species is circumpolar and breeds on the arctic tundra. It may move south in the winter to the northern United States. Due to the almost continuous daylight in the north during the summer the snowy owl has adapted to being active both during the day and the night. Though camouflaged in the winter, the snowy owl stands out starkly against a summer brown and green background. Even on winter visits to southern Ontario it would be quite obvious in the coniferous forests.

When in Ontario these owls frequent open fields and shorelines that most closely resemble their favored northern tundra.

Appendix B

Preliminary MNI values for the Rumney Bay faunal collection adapted from the calculations of Dr. David Black (1987).

| Class/Order | Genus/Species | Common Name | MNI | Element (side) |
|---|---|---|---|---|
| Mammalia: | | | | |
| Rodentia | Tamia striatus | Eastern chipmunk | 1 | Mandible L |
| | Tamiasciurus hudsonicus | Red squirrel | 1 | Humerus (L) |
| | Erethizon dorsatum | Porcupine | 1 | $I^1$ (R) |
| | Castor canadensis | Beaver | 1 | $I^1$ (R) |
| | Ondatra zibethicus | Muskrat | 1 | Femur (L) |
| Carnivora | Canis (familiaris) | (domestic) dog | 1 | Astragalus (L) |
| Artiodactyla | Odocoileus virginianus | White-tailed deer | 1 | Parietal (R |
| Aves: | | | | |
| Strigiformes | | Owls | | |
| | Strix varia | Barred owl | 1 | Tarsometa. (R) |
| Passeriforms | | Perching birds | | |
| | Corvus brachyrhynchos | Common crow | 1 | Synsacrum |
| | Small UI passeriform | | 1 | Humerus (R) |
| Anseriformes | Branta canadensis | Canada Goose | 1 | Femus (R) |
| Reptilia: | | | | |
| Testudines | | Turtles | | |
| | Malachemys geographica | Map turtle | 1 | Carapace |
| Amphibia: | | | | |
| Anura | | Frogs, toads | | |
| | Rana sp. | Frog | 1 | Humerus (R) |
| Osteichthyes: | | Bony fish | | |
| Perciformes | | Perch like fish | 8 | Operculum (L) |
| | Micropterus salmoides | Large mouth bass | 2 | Post-temp. (L) |
| | Micropterus dolomieu | Small mouth bass | 1 | Angular (R) |
| | Perca flavescens | Yellow perch | 2 | Dentary (L) |
| | Stizostedion sp. | Walleye | 1 | Post-temp. (R) |
| Catostomidae | | Suckers | 6 | Pharang. (L) |
| Ictaluridae | | Catfish | 3 | Cleithrum (R) |
| | Ictalurus punctatus | Channel catfish | 1 | Operculum (R) |
| | Ictalurus nebulosus | Brown bullhead | 2 | Pectoral Spine |
| Mollusca: | | | | |
| Pelecypoda | Elliptio complanata | Filter clam | 11 | Valve (L) |

Preliminary NISP values for the Rumney Bay faunal collection, focused on the identification of dog, beaver and deer.

| Class/Order | Genus/Species | Common Name | NISP |
|---|---|---|---|
| Mammalia: | | | |
| | | UI mammal | 167 |
| Rodentia | Tamia striatus | Eastern chipmunk | 4 |
| | Tamiasciurus hudsonicus | Red squirrel | 1 |
| | Erethizon dorsatum | Porcupine | 3 |
| | Castor canadensis | Beaver | 4 |
| | Ondatra zibethicus | Muskrat | 1 |
| Carnivora | Canis (familiaris) | (domestic) dog | 13 |
| Artiodactyla | Odocoileus virginianus | White-tailed deer | 6 |
| Reptilia: | | | |
| Testudines | | Turtles | 22 |
| Amphibia: | | | |
| Anura | | Frogs, toads | |
| | Rana sp. | Frog | 2 |
| Aves: | | Misc. bird | 20 |
| Osteichthyes: | | Bony fish | 620 |

## Appendix C

Mammal NISP values for the Kirche faunal collection, adapted from the analysis by Steve Cumbaa of the Canadian Museum of Nature (Nasmith 1989).

| Scientific Name | Common Name | NISP |
|---|---|---|
| Homo sapiens | Human | 31 |
| Lepus americanus | Snowshoe hare | 8 |
| Leporidae | Rabbit Family | 6 |
| Marmota monax | Woodchuck | 39 |
| Tamias striatus | Eastern chipmunk | 9 |
| Tamiasciutus hudsonieus | Red squirrel | 4 |
| Peromyscus sp. | Mouse | 5 |
| Microtinae | Vole | 2 |
| Cricetidae sp. | Small rodent | 3 |
| Ondatra zibethicus | Muskrat | 19 |
| Castor canadensis | Beaver | 26 |
| Erethizon dorsatum | Porcupine | 1 |
| Canis familiaris | Domestic dog | 190 |
| Canis lupus | Wolf | 2 |
| Canis sp. | Dog family | 71 |
| Urocyon cinereoargeuteus | Gray fox | 1 |
| Vulpes vulpes | Red fox | 4 |
| | Fox | 4 |
| Ursus americanus | Black Bear | 41 |
| Procyon lotor | Raccoon | 7 |
| Lutra Canadensis | River otter | 8 |
| Martes americana | Marten | 5 |
| Mustela sp. | Mink/weasel | 1 |
| Mephitis mephitis | Striped skunk | 2 |
| | Carnivore | 3 |
| Alces alces | Moose | 12 |
| Odocoileus virginianus | White tailed deer | 477 |
| | Deer/Caribou | 5 |
| Cervidae | Deer family | 19 |
| Artiodactyl | | 1 |
| Artiodactyl | Large | 1 |
| | UI small mammal | 25 |
| | UI medium mammal | 122 |
| | UI Large mammal | 764 |
| | UI Mammal | 2857 |

Avian NISP values for the Kirche faunal collection, adapted from the analysis by Steve Cumbaa of the Canadian Museum of Nature (Nasmith 1989).

| Scientific Name | Common Name | NISP |
|---|---|---|
| Branta canadensis | Canada goose | 5 |
| Anserinae | Goose | 1 |
| Aytha affinis or A. marlia | Scaup | 1 |
| Accipitridae | Hawk | 1 |
| Haliaeetus | Eagle | 1 |
| Meleagris gallopavo | Turkey | 8 |
| Bonasa umbellus | Ruffed grouse | 7 |
| Tetraonidae | Grouse family | 12 |
| Grus canadensis | Sandhill crane | 3 |
| Grus sp. | Sandhill crane/whooping crane | 1 |
| Ectopistes migratorius | Passenger pigeon | 10 |
| Sphyrapicus varius | Yellow-bellied sapsucker | 4 |
| Cyanocitta cristata | Blue jay | 1 |
| Turdus migratorius | Robin | 1 |
| | UI medium bird | 2 |
| | UI large bird | 33 |
| | UI small bird | 1 |
| | UI bird | 61 |

Reptile and Amphibian NISP values for the Kirche faunal collection, adapted from the analysis by Steve Cumbaa of the Canadian Museum of Nature (Nasmith 1989).

| Scientific Name | Common Name | NISP |
|---|---|---|
| Chelydra serpentina | Snapping turtle | 2 |
| Chrysemys picta | Painted turtle | 34 |
| Emydidae | Pond turtle family | 10 |
| | UI Turtle | 8 |
| Rana catesbeiana | Bullfrog | 3 |
| Rana sp. | UI frog | 3 |

Fish NISP values for the Kirche faunal collection, adapted from the analysis by Steve Cumbaa of the Canadian Museum of Nature (Nasmith 1989).

| Scientific Name | Common Name | NISP |
|---|---|---|
| Anguilla rostrata | American eel | 16 |
| Salvelinus sp. | Trout | 24 |
| Coregonus sp. | Whitefish or cisco | 29 |
| Esox sp. | Pike/Muskellunge | 22 |
| Catostomus commersoni | White sucker | 168 |
| Catostomus sp. | Sucker | 133 |
| Catostomidae | Sucker family | 557 |
| Ictalurus nebulosus | Brown bullhead | 373 |
| Ictalurus natalis | Yellow bullhead | 4 |
| Ictalurus sp. | Bullhead | 2 |
| Ictaluridae | Freshwater catfish family | 64 |
| Lota lota | Burbot | 4 |
| Lepomis gibbosus | Pumpkinseed | 6 |
| Lepomis sp. | Sunfish | 19 |
| Lepomis or Ambloplites | Sunfish | 1 |
| Micropterus dolomieui | Smallmouth bass | 20 |
| Micropterus sp. | Bass | 155 |
| Centrarchidae | Sunfish family | 1 |
| Perca flavesceus | Yellow perch | 228 |
| Stizostedion vitreum | Walleye | 6 |
| Stizostedion sp. | Walleye or sauger | 3 |
| Percidae | Perch family | 4 |
| Aplodinotus grunniens | Freshwater drum | 1 |
| | UI fish | 1356 |

## Appendix D

Mammal NISP values for the Coulter faunal collection, adapted from the analysis by Virginia Elliott (1983) of the Canadian Museum of Nature.

| | | Middens | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Scientific Name | Common Name | 51 | 57 | 61 | 63 | 70 | 71 | 72 | 75 |
| Homo sapiens | Human | | | | | | | | 1 |
| Lepus americanus | Snowshoe hare | | 1 | | 5 | | | 1 | 1 |
| Leporidae | Rabbit Family | | 1 | | 3 | | | 4 | 6 |
| Marmota monax | Woodchuck | | | 11 | 4 | | | 3 | 1 |
| Tamias striatus | Eastern chipmunk | | 14 | 2 | 19 | | | 19 | 6 |
| Tamiasciutus hudsonieus | Red squirrel | | 1 | 1 | 7 | | | 2 | 7 |
| Sciuridae | Squirrel family | | 1 | 1 | 2 | | | 1 | 1 |
| Peromyscus sp. | Mouse | | 3 | 16 | 62 | | | 88 | 14 |
| Cricetidae sp. | Small rodent | | | | 4 | | | | |
| Ondatra zibethicus | Muskrat | | | 2 | 4 | | | 8 | 1 |
| Castor canadensis | Beaver | | 7 | 1 | 20 | | | 3 | 5 |
| Erethizon dorsatum | Porcupine | | | | | | | | 1 |
| Canis familiaris | Domestic dog | | 10 | 6 | 29 | | | 17 | |
| Canis sp. | Dog family | | 1 | 1 | | | | 3 | 7 |
| Ursus americanus | Black Bear | 3 | | 3 | 3 | | | | |
| Procyon lotor | Raccoon | | | | 1 | | | | |
| Lutra Canadensis | River otter | | | | 1 | | | | |
| Martes americana | Marten | | | | | | | 3 | 2 |
| Mustela sp. | Mink/weasel | | | | | | | | 2 |
| Alces alces | Moose | | | 1 | 2 | | | | |
| Odocoileus virginianus | White tailed deer | | 24 | 25 | 57 | | | 30 | 9 |
| | Deer/Caribou | | | | | | | | 1 |
| Cervidae | Deer family | | | | 21 | | | 4 | 4 |

Avian NISP values for the Coulter faunal collection, adapted from the analysis by Virginia Elliott (1983) of the Canadian Museum of Nature.

| | | Middens | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Scientific Name | Common Name | 51 | 57 | 61 | 63 | 70 | 71 | 72 | 75 |
| Branta canadensis | Canada goose | | 1 | 1 | | 1 | | 1 | |
| Accipitridae | Hawk | | | | 1 | 1 | | | |
| Haliaeetus leucocephalus | Bald eagle | | | | | 1 | | | |
| Meleagris gallopavo | Turkey | | | | | 3 | | | |
| Bonasa umbellus | Ruffed grouse | | 1 | 1 | | 5 | | 1 | 1 |
| Tetraonidae | Grouse family | | | | | 2 | | | 1 |
| Grus canadensis | Sandhill crane | | | | | | | | 2 |
| Ectopistes migratorius | Passenger pigeon | | | | 12 | 108 | | 191 | |
| Sphyrapicus varius | Yellow-bellied sapsucker | | | | | | | 1 | |
| Seiurus aurocapillus | Oven bird | | | 1 | | | | | |
| Icteridae | Blackbird family | | | | 1 | | | | |
| Pinicola enucleator | Pine grosbeak | | | | | | | | 1 |
| Passeriformes | Perching birds | | | | | 3 | | | 1 |
| Turdidae | Thrush family | | | | | 3 | | 1 | |
| Olor sp. | Swan | | | | | | | 1 | |
| Gavia immer | Common loon | | | 1 | | | | 1 | |
| Turdus migratorius | Robin | | | | | 1 | | | |

Reptile and Amphibian NISP values for the Coulter faunal collection, adapted from the analysis by Virginia Elliott (1983) of the Canadian Museum of Nature.

| | | Middens | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Scientific Name | Common Name | 51 | 57 | 61 | 63 | 70 | 71 | 72 | 75 |
| Chelydra serpentina | Snapping turtle | | | | | 1 | | 2 | |
| Chrysemys picta | Painted turtle | | 3 | 1 | 5 | 3 | | 2 | |
| Emydidae | Pond turtle family | | 1 | 4 | 4 | 11 | | 5 | 4 |
| Rana catesbeiana | Bullfrog | | | | 1 | | | 5 | |
| Rana sp. | UI frog | | | | | 3 | | 2 | |
| Bufo americanus | | | | | | 1 | | | |
| Anura | Toads and frogs | | | | | | | 7 | 3 |

Fish NISP values for the Coulter faunal collection, adapted from the analysis by Virginia Elliott (1983) of the Canadian Museum of Nature.

| | | Middens | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Scientific Name | Common Name | 51 | 57 | 61 | 63 | 70 | 71 | 72 | 75 |
| Anguilla rostrata | American eel | | 1 | 1 | 4 | | | 2 | 2 |
| Salvelinus sp. | Trout | | | | 1 | | | | |
| Coregonus sp. | Whitefish or cisco | | 1 | | | | 1 | 1 | 1 |
| Esox sp. | Pike/Muskellunge | | 2 | 1 | 7 | | | 20 | 1 |
| Catostomus commersoni | White sucker | | 71 | 52 | 161 | | 3 | 159 | 135 |
| Catostomus sp. | Sucker | | 21 | 36 | 17 | | 1 | 98 | 31 |
| Catostomidae | Sucker family | | 115 | 164 | 172 | 1 | 8 | 310 | 169 |
| Ictalurus nebulosus | Brown bullhead | | 24 | 93 | 46 | 1 | 1 | 147 | 88 |
| Ictalurus punctatus | Channel catfish | | 2 | 3 | | | | 3 | |
| Ictalurus sp. | Bullhead | | | 8 | 10 | | | 31 | 9 |
| Ictaluridae | Freshwater catfish family | | 3 | 6 | 18 | | 1 | 53 | 6 |
| Lota lota | Burbot | | 1 | 1 | | | | 3 | 3 |
| Lepomis gibbosus | Pumpkinseed | | | | 33 | | | 38 | 19 |
| Lepomis sp. | Sunfish | | 7 | 6 | 18 | | | 82 | 26 |
| Micropterus dolomieui | Smallmouth bass | | 22 | 36 | 33 | | | 24 | 17 |
| Micropterus sp. | Bass | | 12 | 12 | 10 | | | 24 | 7 |
| Centrarchidae | Sunfish family | | 5 | 2 | 13 | 1 | | 22 | 11 |
| Perca flavesceus | Yellow perch | | 88 | 78 | 148 | | 13 | 716 | 229 |
| Stizostedion vitreum | Walleye | | | 6 | | | | 3 | |
| Stizostedion sp. | Walleye or sauger | | 3 | 2 | | | | 2 | 1 |
| Percidae | Perch family | | 12 | 7 | 36 | 1 | 12 | 81 | 21 |
| Perciformes | Perch-like fish | | 13 | 5 | 28 | | 1 | 63 | 44 |
| Percopsis omiscomaycus | Trout-perch | | | | 1 | | | | |
| Lepomis macrochirus | Bluegill | | | | 6 | | 1 | 7 | 4 |
| Lepisosteus osseus | | | | | | | | | 3 |
| Notropis sp. | | | | | | | | 1 | 1 |
| Semotilus atromaculatus | Creek chub | | | | | | | 1 | |
| Semotilus corporalis | Fallfish | | | | | | | 3 | 4 |
| Semotilus margarita | | | | | | | 1 | 1 | |
| Semotilus sp. | Chub/fallfish | | | | | | | 1 | 3 |
| Cyprinidae | Minnow family | | | | 7 | | | 6 | 7 |
| Moxostoma sp. | Redhorse | | 3 | | 2 | | | 3 | |

Appendix E

Trent River Valley Animal Bone Database Recording Codes

## Specimen #
A number that identifies each unique specimen. Assigned sequentially, starting from 1 as they are examined. Several unidentifiable fragments can be listed together under on specimen number.

## Catalogue #
The catalogue number is recorded as the one assigned to the specimen or group of specimens after being removed from the field.

## Square
The unit of excavation out of which the specimen(s) was/were taken.

## Quad
The quadrant, when identified, within the excavation unit from where the specimen(s) was/were found.

## Level
The level or excavation, i.e. depth and cultural relation from which the specimen(s) was/were removed.

## Stratigraphy
The stratigraphic layer from which the specimen(s) was/were taken.

## Feature
A feature number, recording the context in relation to the specimen(s). 100=houses, 200=middens, and 300=palisades.

## NISP
Number of identified specimens.

## Taxon
Most Precise taxonomic category to which the specimen(s) can be identified

| Code | Latin Name | Common Name |
|---|---|---|
| UIB | | UI bone |
| ART | | Artiodactyl |
| LMA | | Large Mammal |

| | | |
|---|---|---|
| MMA | | Medium-sized Mammal |
| SMA | | Small Mammal |
| STM | | Small Terrestrial Mammal |
| MTM | | Medium-sized Terrestrial Mammal |
| LTM | | Large Terrestrial Mammal |
| MM | | Marine Mammal |
| ALA | Alces alces | Moose |
| CAN | Canidae | Dog Family |
| CAF | Canis familiaris | Domestic Dog |
| CLT | Canis latraus | Coyote |
| CLU | Canis lupus | Wolf |
| CNS | Canis sp. (lupus/familiaris) | Dog/Wolf |
| CRN | Carnivora | Carnivore |
| CAD | Castor canadensis | Beaver |
| CER | Cervidae | Deer Family |
| ERD | Erethizon dorsatum | Porcupine |
| HSP | Homo sapiens | Human |
| LEP | Leporidae | Rabbit family |
| LPA | Lepus americanus | Snowshoe Hare |
| LOC | Lutra canadensis | River Otter |
| MAM | Mammalia | Unidentified Mammal |
| MAR | Marmota monax | Woodchuck |
| MAA | Martes americanus | Marten |
| SKU | Mephitis mephitis | Striped Skunk |
| MIC | Microtinae | Vole |
| MST | Mustela sp. | Mink or Weasel |
| ODV | Odocoileus virginianus | White-tailed Deer |
| ONZ | Ondatra zibethicus | Muskrat |
| PER | Peromyscus sp. | Mouse |
| PCY | Procyon lotor | Raccoon |
| ROD | Rodentia | Rodent Family |
| TAH | Tamiasciurus hudsonieus | Red Squirrel |
| TAS | Tamius striatus | Eastern Chipmunk |
| URC | Urocvon cinereoargenteus | Grey Fox |
| URS | Ursidae | Bears |
| URA | Ursus americanus | Black Bear |
| URH | Ursus horribilis | Grizzly Bear |
| VVU | Vulpes vulpes | Red Fox |
| PEM | Peromyscus maiculates | Deer Mouse |
| PEL | Peromyscus leucopus | White Footed Mouse |
| MSE | Mustela erminea | Weasel |
| MSV | Mustela vison | American Mink |
| SYF | Sylvilagus floridanus | Conttontail |
| LYN | Lynx lynx | Lynx |

| | | |
|---|---|---|
| SBI | | Small Bird |
| MBI | | Medium-sized Bird |
| LBI | | Large Bird |
| ACC | Accipitridae | Hawk |
| ANS | Anserinae | Goose |
| HAL | Aquila or Haliaetus | Eagle |
| AVE | Aves | Unidentified Bird |
| AYF | Aytha affinis or A. marila | Scaup |
| BOU | Bonasa umbellus | Ruffed Grouse |
| BRC | Branta canadensis | Canada Goose |
| CYC | Cyanocitta cristata | cf. Blue Jay |
| ECM | Ectopistes migratorius | Passenger Pigeon |
| GRC | Grus canadensis | Sandhill Crane |
| GRU | Grus sp. | Sandhill or Whooping Crane |
| MEG | Meleagris gallopavo | Turkey |
| SVA | Sphyrapicus | Yellow-bellied Sapsucker |
| TET | Tetraonidae | Grouse Family |
| TUM | Turdus migratorius | Robin |
| GRI | Gravia immer | Common Loon |
| ARH | Ardea herodias | Great Blue Heron |
| NYS | Nyctea scandiaca | Snowy Owl |
| | | |
| PIS | Pisces | Unidentified Fish |
| ANR | Angiulla rostrata | American Eel |
| APG | Aplodinotus grunnieus | Freshwater drum |
| CAT | Catostomidae | Sucker Family |
| CAC | Catostomus commersoni | White Sucker |
| CAS | Catostomus sp. | Sucker |
| CEN | Centrarchidae | Sunfish Family |
| COR | Coregonus sp. | Whitefish or Cisco |
| ESO | Esov sp. | Pike or Muskellunge |
| ICT | Ictaluridae | Freshwater Catfish Family |
| ICA | Ictalurus natalis | cf. Yellow Bullhead |
| ICE | Ictalurus nebulosus | Brown Bullhead |
| ICS | Ictalurus sp. | Bullhead |
| LEG | Lepomis gibbosus | Pumpkinseed |
| LEA | Lepomis or Ambloplites | Sunfish |
| LES | Lepomis sp. | Sunfish |
| LOL | Lota lota | Burbot |
| MID | Micropterus dolomieui | Smallmouth Bass |
| MIS | Micropterus sp. | Bass |
| PEF | Perca flavesceus | Yellow Perch |
| PEC | Percidae | Perch Family |

| | | |
|---|---|---|
| SAL | Salvelinus sp. | Trout |
| STS | Stizostedion sp. | Walleye or Sauger |
| STV | Stizostedion vitreum | Walleye |
| ICP | Ictalurus punctatus | Channel Catfish |
| SEM | Semotilus corporalis | Fallfish, minnow |
| | | |
| UNT | | Unidentified Turtle |
| RAN | cf. Ranna sp. | Unidentified Frog |
| CHS | Chelydra serpentina | Snapping Turtle |
| CHP | Chrysemys picta | Painted Turtle |
| EMY | Emydidae | Pond Turtle Family |
| RAC | Rana catesbeiana | Bullfrog |

## Element

UN unknown
VE unknown vertebra
LB unknown longbone
SH shell (Turtle)

**Mammals**

| | | | | | |
|---|---|---|---|---|---|
| **AT** | Atlas | **SC** | Scapula | **IN** | Innominate |
| **AX** | Axis | **HU** | Humerus | **FE** | Femur |
| **CR** | Cranium | **RA** | Radius | **TI** | Tibia |
| **MN** | Mandible | **UL** | Ulna | **FI** | Fibula |
| **CE** | Cervical | **MC** | Metacarpal | **MT** | Metatarsal |
| **TH** | Thoracic | **CP** | Carpals | **TA** | Tarsal |
| **LU** | Lumber | **CU** | Cuneiforme (ulnar carpal) | **AS** | Astragalus Z-1/2 |
| **CD** | Caudal | **NC** | Naviculocuboid | **CA** | Calcaneous |
| **RI** | Rib | **SE** | Sesamoid | **CC** | Costal Cartilage |
| **AN** | Antler | **MX** | Maxilla | **VE** | Vertebra |
| **SA** | Sacral | **CL** | Clavicle | **BA** | Baculum |
| **AB** | Auditory bulla | **CT** | Centrotarsal | **PA** | Patella (zone 1) |
| | | | | | |
| **PH** | Unknown Phalanx | **FP** | Front Phalanx | **HP** | Hind Phalanx |
| **PH1** | Phalanx I | **FP1** | Front Phalanx I | **HP1** | Hind Phalanx I |
| **PH2** | Phalanx II | **FP2** | Front Phalanx II | **HP2** | Hind Phalanx II |
| **PH3** | Phalanx III | **FP3** | Front Phalanx III | **HP3** | Hind Phalanx III |

-See specific details for dog phalanges, LFII-LFIV for example

-Accessory metacarpal 1 articulates with a smaller piece called accessory metacarpal 2.

**Teeth**

| | |
|---|---|
| **TO** | Unknown Tooth |

Multiple letter code e.g. UdP3; LM2

| | | | |
|---|---|---|---|
| **U/L** upper/lower | **(d)** deciduous | **C** Canine | |
| | (p) permanent | **I** incisor | 1 |
| | | **P** premolar | 2 |
| | | **M** molar | 3 |
| | | | 4 |

**Fish**

| | | | | | |
|---|---|---|---|---|---|
| **MX** | Maxilla | **OP** | Opercular | **HB** | Hypobranchial |
| **PMX** | Premaxilla | **PO** | Preopercular | **CB** | Ceratobranchial |
| **DE** | Dentary | **PL** | Palatine | **EB** | Epibranchial |
| **AR** | Articular | **QU** | Quadrate | **PP** | Pharyngeal plate |
| **PS** | Parasphenoid | **HM** | Hyomandibular | **PT** | Posttemporal |
| **VO** | Vomer | **CH** | Ceratohyal | **CL** | Cleithrum |
| **BO** | Basioccipital | **IH** | Interhyal | **SCL** | Supracleithrum |
| **SO** | Suborbital | | | **BT** | Basipterygium |

| | | | | | |
|---|---|---|---|---|---|
| **RAY** | Ray | **SP** | Spine | **TH** | Thoracic |
| **BSR** | Branchiostegal | **IHS** | Interhaemal spine | **PC** | Precaudal |
| **SC** | Scale | | | **CD** | Caudal |

**Bird**

Mostly the same codes as mammals with the following additions and changes. Remember the anterior caudal's are fused to form the synsacrum; the most posterior vertebra is the pygostyle. Pectoral girdle has the same code as the scapula, adding the coracoid and furculum. Carpometacarpus is the same as metacarpus, as in the mammals. Phalanges can be difficult to identify, if unsure use PH to define a foot phalange.

| | | | | | |
|---|---|---|---|---|---|
| **TR** | Tracheal Ring | **SS** | Synsacrum | **PY** | Pygostyle |
| **SR** | Sternal Rib | **CO** | Coracoid | **FU** | Furculum |
| **WP** | Wing Phalanx | **PH** | Foot Phalanx | **P1** | Proximal Phalanx |
| **EG** | Egg Shell | **QU** | Quadrate | **P2** | Second Phalanx |
| **ST** | Sternum | | | **P3** | Third Phalanx |
| | | | | **P4** | Terminal Phalanx |

**Amphibian and Reptile**

When possible use the same codes as for mammals and birds. Use bird phalanges to record phalanges of amphibians and reptiles. Radius/ulna and Tibia/fibula are fused in amphibians. Vertebra are not always the same as in birds and mammals for unassigned vertebra use VE. Some will have an urostyle (UR). All portions of the sternal complex are labeled ST.

| | | | | | |
|---|---|---|---|---|---|
| **PL** | Plastron | **CC** | Caprice | **SH** | Shell (Indeterminate Turtle Shell) |
| **VE** | Vertebra | **UR** | Urostyle | **RU** | Radius/Ulna |
| **ST** | Sternal Complex | | | **TF** | Tibia/Fibula |

## Zones (1-10 and un-zoned fragments)
Vary depending on element – see diagrams.

## Side
**L** left
**R** Right

## Fusion
2 letter code. 1st letter for proximal/anterior epiphysis, 2nd for distal/proximal epiphysis

**U** unfused shaft and epiphysis
**S** unused shaft
**E** unfused epiphysis
**G** fusing
**F** fused
**B** (baby) unfused shaft – size and texture indicate foetal/neonatal bone
**N** unknown/no data available

## Length (mm)
Maximum length measured to the nearest centimeter. Complete bones

## Weight (mg)
Measured to the nearest milligram.

## Weathering
**L0-5** on Behernsmeyer's (1980) scale for large mammals (also apply to medium-sized mammals)

## Modification
**P** Pathology
**A** Abrasion
**K** Cutmarks (fine marks)
**S** Saw marks
**U** Butchery marks (large deep marks)
**T** Worked
**B** Burnt Black
**W** Calcined (burnt white/bluish-white)

**E** Root etching
**C** Carnivore gnawing
**D** Digestive corrosion
**R** Rodent gnawing
**X** Excavation break

Phalanx modifications: Can be any combination of the following
PT1: cup and pin
PT2: Toggle
PT3: drilled
PT: Undefined phalanx modification

## Fracture Type (3 number code) e.g. 211

For long bones only. Almost full cylinder

| | | |
|---|---|---|
| **1** Stepped-columnar | **1** Smooth fracture surface | **0** Impact scar and flaking absent |
| **2** Sawtoothed | **2** Rough fracture surface | **1** Impact scar present |
| **3** V-shaped | | **2** Flaking present |
| **4** Flaking | | **4** Both present |
| **5** Perpendicular | | |
| **6** Irregular | | |
| **7** Spiral | | |
| **8** Longitudinal | | |

## Bone Type (mammals only)

**C** Cortical – classic thick cortical bone or thin cortical with no trabecular bone attached
**T** Trabecular – any trabecular bone – even if it has a thin cortex attached.
**B** Both (thick cortical with trabecular)
**X** Exfoliated outer cortex (very thin)
**J** Spongy foetal/neonatal bone
**O** Tooth (cementum plus dentine)
**M** Tooth cementum
**D** Tooth dentine

## Measurements

As appropriate for particular element and species – see diagrams

**Cranium**
Basal horncore max diameter
Basal horncore min diameter

**Mandible**
Cheek tooth row length

**M1 (mandibular)**
f
l

**M3 (mandibular)**
h
d

**Scapula**
SLC
GLP

**Humerus**
SD
HTC
BT

**Radius**
SD
BpP
Bd

**Ulna**
DPA
BPC

**Pelvis**
LAR
LA

**Femur**
DCp
Bp
Bd
Sd

**Tibia**
Bp
Dp
Bd
Dd
SD
GL

**Calcaneum**
GL

**Astragalus**
GLI

**PH1, PH2**
DLS

**PH3**
DLS

**MC/MT**
GL
SD
Bp
Dp
Bd

## Comments

Any other remarks such as articulations, location of pathologies etc.

**NISP values for the Benson faunal collection:**

| Code | Latin Name | Common Name | NISP Values |
|---|---|---|---|
| Mammals | | | |
| UIB | | UI bone | 431 |
| ART | | Artiodactyl | 40 |
| LMA | | Large Mammal | 314 |
| MMA | | Medium-sized Mammal | 839 |
| SMA | | Small Mammal | 206 |
| LTM | | Large Terrestrial Mammal | 4 |
| ALA | Alces alces | Moose | 8 |
| CAN | Canidae | Dog Family | 20 |
| CAF | Canis familiaris | Domestic Dog | 854 |
| CNS | Canis sp. (lupus/familiaris) | Dog/Wolf | 2 |
| CRN | Carnivora | Carnivore | 2 |
| CAD | Castor canadensis | Beaver | 288 |
| ERD | Erethizon dorsatum | Porcupine | 2 |
| HSP | Homo sapiens | Human | 1 |
| LPA | Lepus americanus | Snowshoe Hare | 8 |
| LOC | Lutra canadensis | River Otter | 9 |
| MAM | Mammalia | Unidentified Mammal | 4517 |
| MAR | Marmota monax | Woodchuck | 29 |
| MAA | Martes americanus | Marten | 4 |
| SKU | Mephitis mephitis | Striped Skunk | 5 |
| MIC | Microtinae | Vole | 2 |
| MST | Mustela sp. | Mink or Weasel | 1 |
| ODV | Odocoileus virginianus | White-tailed Deer | 917 |
| ONZ | Ondatra zibethicus | Muskrat | 14 |
| PER | Peromyscus sp. | Mouse | 14 |
| PCY | Procyon lotor | Raccoon | 9 |
| ROD | Rodentia | Rodent Family | 13 |
| TAH | Tamiasciurus hudsonieus | Red Squirrel | 26 |
| TAS | Tamius striatus | Eastern Chipmunk | 20 |
| URC | Urocvon cinereoargenteus | Grey Fox | 3 |
| URS | Ursidae | Bears | 27 |
| URA | Ursus americanus | Black Bear | 5 |
| PEM | Peromyscus maiculates | Deer Mouse | 28 |
| PEL | Peromyscus leucopus | White Footed Mouse | 3 |
| MSV | Mustela vison | American Mink | 6 |
| SYF | Sylvilagus floridanus | Conttontail | 1 |
| LYN | Lynx lynx | | 3 |
| BIRDS | | | |
| SBI | | Small Bird | 25 |

| | | | |
|---|---|---|---|
| MBI | | Medium-sized Bird | 295 |
| LBI | | Large Bird | 186 |
| ACC | Accipitridae | Hawk | 1 |
| HAL | Aquila or Haliaetus | Eagle | 4 |
| AVE | Aves | Unidentified Bird | 181 |
| BOU | Bonasa umbellus | Ruffed Grouse | 23 |
| BRC | Branta canadensis | Canada Goose | 13 |
| CYC | Cyanocitta cristata | cf. Blue Jay | 2 |
| ECM | Ectopistes migratorius | Passenger Pigeon | 101 |
| GRC | Grus canadensis | Sandhill Crane | 4 |
| GRU | Grus sp. | Sandhill or Whooping Crane | 2 |
| MEG | Meleagris gallopavo | Turkey | 6 |
| SVA | Sphyrapicus | Yellow-bellied Sapsucker | 5 |
| TET | Tetraonidae | Grouse Family | 19 |
| TUM | Turdus migratorius | Robin | 1 |
| GRI | Gravia immer | Common Loon | 6 |
| ARH | Ardea herodias | Great Blue Heron | 1 |
| NYS | Nyctea scandiaca | Snowy Owl | 2 |
| | | | |
| FISH | | | |
| PIS | Pisces | Unidentified Fish | 2726 |
| ANR | Angiulla rostrata | American Eel | 8 |
| CAT | Catostomidae | Sucker Family | 141 |
| CAC | Catostomus commersoni | White Sucker | 21 |
| ESO | Esov sp. | Pike or Muskellunge | 7 |
| ICT | Ictaluridae | Freshwater Catfish Family | 81 |
| ICE | Ictalurus nebulosus | Brown Bullhead | 3 |
| PEC | Percidae | Perch Family | 41 |
| STV | Stizostedion vitreum | Walleye | 19 |
| ICP | Ictalurus punctatus | Channel Catfish | 2 |
| SEM | Semotilus corporalis | Fallfish, minnow | 2 |
| | | | |
| UNT | | Unidentified Turtle | 263 |
| RAC | Rana catesbeiana | Bullfrog | 9 |
| | | | |
| | | Total | 12,866 |

**Selected Benson MNI Calculations:**

| | NISP | MNI | Element |
|---|---|---|---|
| Bluejay | 2 | 1 | |
| Crane | 6 | 1 | |
| Eagle | 4 | 1 | |
| Goose | 13 | 3 | CO |
| Grouse | 23 | 2 | MC |
| Grouse Familiy | 19 | 3 | Humerus-L |
| Hawk | 1 | 1 | CO |
| Heron | 1 | 1 | |
| Loon | 6 | 2 | Sternum-L |
| Owl | 2 | 1 | |
| Pigeon | 101 | 8 | Humerus-R |
| Robin | 1 | 1 | |
| Turkey | 6 | 1 | |
| Yellowbellied Sapsucker | 5 | 1 | |
| Eel | 8 | 3 | |
| Bull Frog | 9 | 1 | |
| Turtle | 263 | 2 | CO-L |
| Artiodactyl | 35 | 1 | |
| Bear | 32 | 2 | Canine |
| Beaver | 288 | 39 | Incisor |
| Chipmunk | 20 | 4 | Mandible-L |
| Cottontail | 1 | 1 | |
| Deer | 917 | 19 | Mandible-L |
| Dog | 854 | 19 | Canine |
| Dog Family | 20 | 1 | |
| Fox | 3 | 1 | |
| Lynx | 3 | 1 | |
| Martin | 4 | 2 | Mandible-R |
| Mink | 7 | 2 | Mandible-L |
| Moose | 8 | 1 | |
| Mouse | 42 | 4 | Mandible-R |
| Muskrat | 14 | 3 | Mandible-L |
| Otter | 9 | 1 | |
| Porcupine | 2 | 1 | |
| Raccoon | 9 | 1 | |
| Rodent | 13 | 2 | Maxilla-R |
| Skunk | 5 | 1 | |
| Snowshoe hare | 8 | 1 | |
| Squirrel | 26 | 5 | Femur-R |
| Vole | 2 | 1 | |
| Woodchuck | 29 | 3 | Femur-R |

## Appendix F

Preliminary MNI values for the Wet Back faunal collection adapted from the calculations of Dr. David Black (1987).

| Class/Order | Genus/Species | Common Name | MNI | Element (side) |
|---|---|---|---|---|
| Mammalia: | | | | |
| Rodentia | Tamia striatus | Eastern chipmunk | 1 | Mandible (R) |
| | Tamiasciurus hudsonicus | Red squirrel | 1 | Mandible (R) |
| | Castor canadensis | Beaver | 1 | $I^1$ (R) |
| | Sciurus caroliniensis | Grey squirrel | 1 | Radius (L) |
| Lagomorpha | Lepus americanus | Varying hare | 2 | Mandible (R) |
| Carnivora | Canis (familiaris) | (domestic) dog | 1 | Maxilla (L) |
| | Martes americana | Marten | 1 | Mandible (R) |
| | Ursus americanus | Black bear | 1 | Phalanx |
| Artiodactyla | Odocoileus virginianus | White-tailed deer | 2 | Parietal (R) |
| | Rangifer tarandus | Caribou | 1 | $M^2$ (L) |
| Aves: | | | | |
| Columbiformes | Ectopistes migratorius | Passenger Pigeon | 1 | Tarsometa. (R) |
| Galliformes | Bonasa umbellus | Ruffed grouse | 1 | Humerus (L) |
| | Gallus gallus | Domestic chicken | 1 | Tibiotarsus (R) |
| Passeriforms | Corvus corax | Common raven | 1 | Tarsometa. (R) |
| | Corvus brachyrhynchos | Common crow | 1 | Tibiotarsus (L) |
| Other Birds | | Large UI bird | 1 | Humerus |
| Amphibia: | | | | |
| Anura | | Frogs, toads | | |
| | Rana sp. | Frog | 1 | Femur (L) |
| Osteichthyes: | | Bony fish | | |
| Perciformes | | Perch like fish | | |
| | Micropterus sp. | Bass | 2 | Dentary (L) |
| Catostomidae | | Suckers | 8 | Pharang. (L) |
| Ictaluridae | | Catfish | 10 | Cleithrum (R) |
| | Ictalurus punctatus | Channel catfish | 1 | Dentary (L) |
| | Ictalurus nebulosus | Brown bullhead | 1 | Dentary (L) |
| Mollusca: | | | | |
| Pelecypoda | Elliptio complanata | Filter clam | 43 | Valve (L) |
| Gastropoda | Anguispira alternata | Forest snail | 1 | Shell |

Preliminary NISP values for the Wet Back faunal collection, focused on the identification of dog, beaver and deer.

| Class/Order | Genus/Species | Common Name | NISP |
|---|---|---|---|
| Mammalia: | | | |
| | | UI mammal | 339 |
| Lagomorpha | Lepus americanus | Varying hare | 5 |
| Rodentia | Tamia striatus | Eastern chipmunk | 6 |
| | Tamiasciurus hudsonicus | Red squirrel | 1 |
| | Castor canadensis | Beaver | 8 |
| Carnivora | Canis (familiaris) | (domestic) dog | 45 |
| | Martes americana | Marten | 4 |
| | Ursus americanus | Black bear | 7 |
| Artiodactyla | Odocoileus virginianus | White-tailed deer | 42 |
| Amphibia: | | | |
| Anura | | Frogs, toads | |
| | Rana sp. | Frog | 2 |
| Aves: | | Misc. bird | 36 |
| Osteichthyes: | | Bony fish | 550 |