"In Search of Deer":
A historical ecological perspective on caribou in northern Manitoba in the context of Cree use

by

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A Thesis submitted to the Faculty of Graduate Studies of
The University of Manitoba
in partial fulfilment of the requirements of the degree of

MASTER OF NATURAL RESOURCES MANAGEMENT

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ABSTRACT

Caribou have a longstanding cultural and environmental role, and have interacted with human groups across time. This thesis is a consideration of these interactions, exploring prehistoric and historic patterns of caribou usage by Cree people in northern Manitoba. Through zooarchaeological analysis, an ethnohistorical review, and community workshops and interviews with York Factory First Nation, the relationship between caribou populations and Cree use is illustrated, providing insight into abundance, movements, and the socio-cultural value of caribou over time. In doing so, context is provided for the present-day situation: connections between historical and modern herds are drawn, population and migration changes are highlighted, and the impact of hunting pressures, climatic variation, habitat changes, and food availability on caribou populations are contemplated. Caribou have long been central to the seasonal economy in northern Manitoba, and the use of these animals reflects their abundance and value.

ACKNOWLEDGEMENTS

First and foremost, I would like to thank my advisors, Iain Davidson-Hunt and Micheline Manseau. Their advice and patience through this entire process have been invaluable. From the very start, they offered guidance, and have continued to support me throughout. My committee members, Brooke Milne and Michael O'Flaherty, also offered valuable feedback at each stage and ensured I considered various issues and kept on track. Thank you all!

I would also like to express my sincere gratitude to the people of York Factory First Nation: thank you for your support and for your interest. I appreciate all I learned from everyone who participated. Thank you to Wayne, Georgina, Roy, Marie, Amelia, Nellie, and everyone at Future Development for helping with the organization of this project and for taking me under your wing. I would also like to thank Flora for her support during my project.

Jim Thomas, Elly Bonny, and Ryan Pengelly of HTFC were instrumental in connecting me with YFFN, and helped me with my various trips up north. Thank you for all of your advice and for taking a genuine interest in me and my work. I'm truly grateful for all you've done.

I am also indebted to the Manitoba Museum and Parks Canada for making the archaeological collections available for study. Sharon Thomson (Parks Canada) helped me with the York Factory collection, and offered advice and knowledge throughout the process. Brian Smith (Historic Resources Branch) helped me to get started selecting sites elsewhere in Manitoba, and I'm grateful for him taking the time to share his knowledge. Kevin Brownlee (Archaeology Curator, Manitoba Museum) was incredibly helpful and open, and his assistance in selecting sites and finding the collections was invaluable, as were his insights into the archaeological remains and the provision of examples for my workshops. Betty-Ann Penner (Database Administrator, Manitoba Museum) retrieved and extracted information from the database, making this analysis possible. Kevin, Betty-Ann, and Leigh Syms, thank you for your warmth, your advice, and your support. Amelia Fay (HBC Curator, Manitoba Museum) helped me prepare for the workshops by finding examples of items made from caribou, and for this I am grateful. I would also like to thank the staff at the Manitoba Archives for showing me the ropes.

I especially would like to thank my friends and family for their support. My parents, Richard and Brenda, have always encouraged, supported, and inspired me, and offered advice along the way. My sister Elizabeth has been through this all before, and offered encouragement. The support of my partner Nathan has been vital, and I appreciate his genuine interest in my work. My dearest friend Kristyn is always there for me, and this endeavour was no different.

I must also thank my fellow students at the NRI, for the advice, the chats, and the hang-outs. You've made my time at the NRI all the more fun!

Finally, I am fortunate to have received generous financial support. Funding from SSHRC, the University of Manitoba, Northern Scientific Training Program, Canadian Northern Studies Trust (Caribou Research and Management Award), Manitoba Hydro (Graduate Fellowship), the province of Manitoba (Provincial Grant), and support from my advisors all made this project and my time at the NRI possible.

GLOSSARY

General terms

Chief Factor. The highest ranking commissioned officer at a fur trade fort.

Ethnohistory. The study of a culture through the use of historical and archaeological records, as well as oral history and similar sources; history from the perspective of a particular group.

Green meat. A term used to refer to fresh meat.

Hedge. A technique used for hunting caribou. A fence or drive constructed from logs and branches with gaps at various distances through which the caribou could move. Snares were placed in these gaps in order to catch the caribou.

Historical ecology. An interdisciplinary research approach that focuses on the relationship between humans and the environment across time.

Pemmican. Ruhiggan mixed with fat and berries.

Ruhiggan. Dried meat pounded into a powder.

Terms in archaeology and faunal analysis

***Artiodactyla* / Artiodactyl.** An order of mammals that are hoofed and even-toed, including pigs, cows, and deer.

BP. 'Before present', used in identifying dates.

***Canidae* / Canid.** A family of dog-like carnivores, including domestic dogs, wolves, and foxes.

***Cervidae* / Cervid.** The deer family of mammals, including caribou, elk, and moose.

Diaphysis. The shaft of a long bone.

Distal. "The end of the bone furthest away from the point of attachment of the limb to the [midline of the] skeleton" (Hillson 1996:4).

Epiphysis. The end of a long bone.

MNE. Minimum number of elements; the number of elements necessary to account for the diagnostic bone fragments present.

MNI. Minimum number of individuals; the number of individual animals that could be represented by the identified elements.

***Mustelidae* / Mustelid.** A family of weasel-like carnivores that vary greatly in size, including wolverines, otters, minks, and martens.

NISP. Number of identified specimens; a count of the identified (i.e., a taxonomic designation, whether of basic class or more specific) bone fragments present.

NSP. Number of specimens; a raw count of the bone fragments present.

Proximal. "The end of the bone closest to the point of attachment of the limb to the [midline of the] skeleton" (Hillson 1996:4).

Stratigraphy. The geological layers of an archaeological site and the study of these layers.

Taphonomy. "The study of the changes that influence [an archaeological] deposit" (Reitz and Wing 2008:117). E.g., initial deposit after death of animal, decomposition, geological processes, cultural activities, etc.

Zooarchaeology. The study of animal remains from archaeological sites.

Bones

Cranium. The head of an animal. Together with the mandible, composes the skull.

Carpal. A wrist bone.

Femur. The thigh bone.

Innominate. Pelvic bone.

Humerus. The bone in the upper forelimb that articulates with the shoulder.

Lateral Malleolus. Generally the distal portion of a fibula (calf bone). In cervid species, however, this exists as a separate leg/ankle bone similar to a tarsal.

Mandible. The jaw bone. Together with the cranium, composes the skull.

Metacarpus. Bones in the forelimb. In humans, these are the hands. In cervid species, these are the lower forelimb, with the animals walking on their toes.

Metapodium. Generic term for metacarpus or metatarsus.

Metatarsus. Bones in the hindlimb. In humans, these are the feet. In cervid species, these are the lower hindlimb, with the animals walking on their toes.

Phalanx. A toe bone.

Radius and ulna. Two bones in the forelimb, between the humerus and the metacarpal bones.

Scapula. A flat bone, connecting the forelimb to the back; the shoulder blade.

Sesamoid. Small compact bone such as the patella (kneecap).

Tarsal. An ankle bone.

Tibia. A long bone in the hindlimb between the femur and the metatarsal bones.

Vertebrae. The bones that comprise the spine.

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CHAPTER I:
INTRODUCTION

Caribou (*Rangifer tarandus*) have long played important cultural, economic, and ecological roles in northern Canada. The relationship between humans and caribou in the north has been one of mutual influence: humans have had both positive and negative impacts on caribou populations, while caribou and the northern environment have influenced the activities and beliefs of various human groups. It is useful to explore this relationship when attempting to understand the current situation of caribou in Canada, given the extensive knowledge base held by First Nations and Inuit groups as well as the influence caribou and humans may have upon each other.

In ecological studies, temporal depth has often been neglected or overlooked. History cannot be ignored, however, and the exploration of a species' previous migration patterns, ranges, and population trends can help us to better understand their current situation. Through the exploration of historical data, we can expand the depth of our knowledge and determine long-term population and migration patterns, previous impacts or responses to change, and sustainable patterns of use. In addition, when making management decisions, the socio-cultural value of a species must be taken into account, and this value is often steeped in a historical relationship. This is certainly the case for caribou. Evidence of past use and historical descriptions of caribou can provide insight into population fluctuations, migration patterns, and the socio-cultural value of caribou. Valuable information regarding caribou may lie in the archaeological record, ethnohistorical documents, and historical memory.

The current study aims to explore past patterns of caribou use and abundance, particularly in the context of the experience of Cree people in northern Manitoba. The understanding of

caribou that will be gained through this research will ensure that the historical behaviours and roles of caribou in the province are not forgotten in modern conservation and management decisions.

1.1 Background

In Manitoba, barren-ground, boreal woodland, and eastern migratory caribou are present (COSEWIC 2011). The barren-ground animals are migratory, with a large range through a number of provinces and territories. The Qamanirjuaq herd of barren-ground caribou winters in northern Manitoba. Boreal woodland caribou are found through central and north-central Manitoba, and are more sedentary in nature (COSEWIC 2011). These caribou are listed as threatened federally and provincially (Canada 2002). The coastal herds are classified as eastern migratory, and are composed of migratory woodland caribou that move across a larger range than boreal woodland caribou (COSEWIC 2011). Overall, a large number of caribou are found in the province, and these animals have long played an important role in the lives of many First Nations people. Caribou have been used for meat, clothing, shelter, and tools, as well as having an immaterial importance in terms of spirituality and social cohesion.

The human presence in Manitoba began with the retreat of the ice sheets, and the expansion of human groups continued as glacial Lake Agassiz drained (Buchner et al. 1983). It is likely that people occupying the southern region of the province would have focused on bison hunting, while those who migrated northwards to the forests and beyond would have adapted to the prey available there: caribou and small game animals (Buchner et al. 1983). The adaptation of people to the northern boreal environment is demonstrated through their tool kit (Buchner et al. 1983). Prehistory in northern Manitoba is revealed through archaeological material culture,

particularly stone tools and pottery, and through ethnographic or ethnohistoric comparisons and analogies. Ethnographic analogy relies on information from current groups, while ethnohistoric analogy draws from oral history or written records. These sources have been used by researchers in the interpretation of archaeological remains in the province. Archaeological evidence reveals different cultures present in the region, discussed further in Chapter II, and it seems that caribou generally played a large role in the hunting practices of many of these groups (Buchner et al. 1983; Malasiuk 1999).

In historical times, with the arrival of Europeans and the advent of the fur trade, caribou -- referred to as 'deer' in many historical accounts -- remained an important resource. Although Henry Hudson and his crew arrived in Hudson Bay in 1610, it was not until the latter half of the 17th century that Europeans returned to the area and fur trade posts were established (Lytwyn 1993). Of particular, but not singular, importance in northern Manitoba was York Factory. York Factory was first known as York Fort, and then Fort Bourbon when it was under French control (Lytwyn 1993; Simpson 1972). While both inland and coastal Cree people participated in the fur trade, it was the Homeguard Cree -- those who resided permanently along the coast -- who were involved in provisioning for European traders at York Factory (Lytwyn 1993, 2002). To allow for more trade, the Hudson's Bay Company (HBC) established inland trading posts in the late 1700s, once the French had withdrawn from the region (Lytwyn 1993, 2002; Payne 1984; Simpson 1972). Because of the provisioning trade, species of waterfowl and caribou took on commercial value during this time (Lytwyn 1993, 2002). By the 1800s, however, it seems that caribou populations were declining, potentially influenced by a variety of factors including hunting pressures, habitat changes, and population cycles. Eventually this decline, as well as the drop in beaver populations, limited Cree involvement in the fur trade (Lytwyn 1993).

Much of our understanding about the past has been gained through archaeological endeavours, in addition to written accounts after the arrival of European explorers and traders. These records hold information about the history of caribou in the province as well, and exploring them in detail will provide context for the species in the present day. In conservation and management, it is important to recognize that a species or an ecosystem are not static entities, but are constantly in flux (Alagona et al. 2012; Lauwerier and Plug 2002; Lyman and Cannon 2004). In order to understand this, we can explore the history of that species or ecosystem through various means, including zooarchaeology, palaeoecology, historical documents, and geology, among other things (Crumley 1994; Hayashida 2005). Attempting to explore the human-environment relationship across time is known as historical ecology, and it is through this approach that the current study is undertaken.

1.2 Purpose and Objectives

The purpose of the this research is to explore prehistoric and historic patterns of caribou usage in northern Manitoba, which will provide insight into population changes, herd dynamics and migration patterns, and the social value of the species across time. The Cree people in the region, rather than European fur traders, are focused upon to the extent made possible by the available data. The temporal focus ranges from the late pre-contact period until the end of the fur trade era, during the early 20th century.

Overall, a historical ecological account of caribou in northern Manitoba has been created, with a focus on the relationship between caribou and Cree people. This research is guided by the following objectives:

1) Document the role of caribou in pre-contact subsistence;
2) Document the role of caribou during the fur trade, particularly in relation to Cree use; and
3) Determine the relationship between caribou use and caribou populations over time.

1.3 Study Area

This project focuses on northern Manitoba, spanning from the York Factory region on the Hudson Bay coast to Southern Indian Lake in the west of the province (Figure 1.1). This range includes both barren-ground and woodland caribou subspecies, and has long been home to various human groups.

Southern Indian Lake is located in the Boreal Shield, specifically the Churchill River Uplands (Smith et al. 1998). Characterized by mixed stands of black spruce and jack pine as well as peatlands throughout, the Boreal Shield ecozone is home to moose, barren-ground and woodland caribou, black bears, and various furbearers (Bellhouse 1971; Smith et al. 1998). Geese and other birds also use the area (Smith et al. 1998). During the 1960s and 1970s, many archaeological investigations took place in the Southern Indian Lake area in order to recover any artifacts and relevant data prior to the Churchill River Diversion project. Both pre-contact and historic sites were uncovered, and these sites provide much information on the occupation of the area. It is clear that the Southern Indian Lake region has been occupied for centuries, with a 'significant population' being attained during the Late Woodland period (1300-350 years ago; see Table 2.1) (Wright 1971). Importantly, the archaeology of this area provides insights into the ancestors of Cree people that occupied the region from at least 900 BP (before present) (Wright 1971). It should be noted, however, that the area was at different times occupied by the Cree and the Dene (Chipewyan) people (Bellhouse 1971). The boundaries between these groups were in

flux, likely during the pre-contact period as well as the historic period (Bellhouse 1971). Cree activity in the area continued through the historic period (Bellhouse 1971; Wright 1971). Several sites from Southern Indian Lake were considered in this study, as were journals from a post located there in the early 1800s, as detailed in Chapter III.

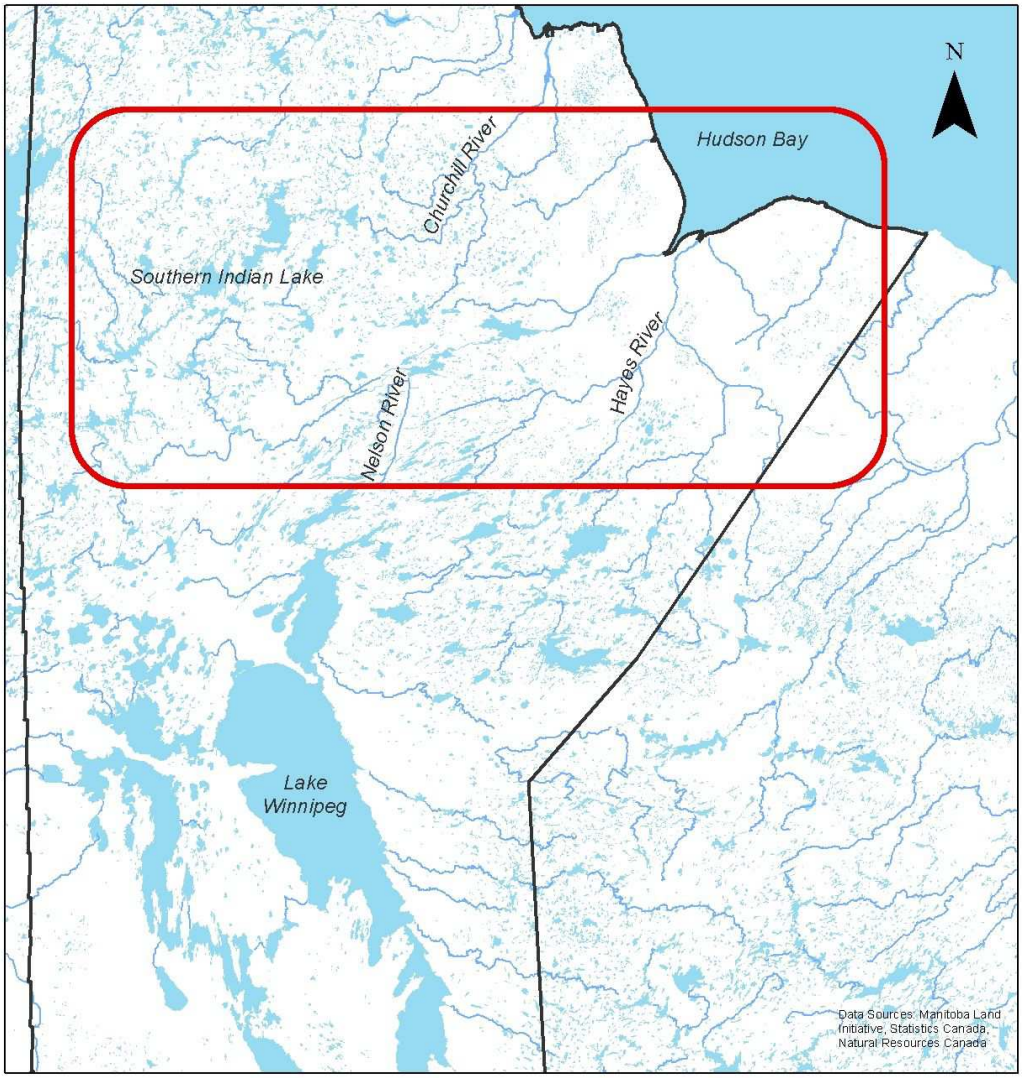

Figure 1.1 Map of general study area

The York Factory region is also considered in this research, specifically the archaeological site of York Factory. York Factory is situated in the Hudson Bay coastal lowlands, characterized by tidal mudflats and wetlands, with stands of spruce further inland (Smith et al. 1998). Polar bear, black bear, moose, and woodland caribou are found in this area, as well as furbearers like marten, fisher, and arctic fox (Smith et al. 1998). The Hudson Bay coast is also host to significant numbers of geese during their migrations, as well as other birds like ptarmigan (Smith et al. 1998). This region has a long history of human use and occupation. The Hudson Bay coast was long thought to have been visited seasonally by Aboriginal people; more recent research supports a more permanent occupation of the Hudson Bay lowlands (Lytwyn 1993, 2002; Pilon 1987, 2006). With the establishment of the York Factory, Fort Severn, and Fort Albany posts, however, activities and use of resources in the area -- including caribou -- intensified. The post that eventually came to be known as York Factory was first built in 1684; later iterations of the fort from the 1700s and 1800s have been excavated, and it is the faunal remains from these later occupations that are considered in this thesis.

1.4 General Methods

This thesis was carried out with historical ecology in mind, grounded in an understanding of the importance of traditional and experiential knowledge and the value of decolonized research. Decolonizing methodologies recognize the issues and biases that may be associated with historical and anthropological research, and aim to give the relevant communities a voice in the research. This theoretical background is elaborated upon in Chapter III. Three distinct, complementary methods were used: zooarchaeological analysis, a review of archival and ethnohistorical literature, and a participatory component with York Factory First Nation (YFFN).

These three methods ensured that the above-noted objectives were met. Much of the research was qualitative in nature. Certain features of this study, specifically aspects of the zooarchaeological research, involved quantitative methods. Therefore, this thesis relies on mixed methods.

1.4.1 Archaeological analysis

Zooarchaeology is the study of animal remains found in an archaeological context (O'Connor 2004; Reitz and Wing 2008). Studying archaeological faunal remains can provide insight into how humans have used animals in the past, including types of animals, amounts of each species, seasonality, among other information (O'Connor 2004; Reitz and Wing 2008). For my research, I studied faunal remains from several sites in northern Manitoba, namely York Factory and seven sites in the Southern Indian Lake area. Through the identification of caribou remains, I determined how caribou were used, their abundance, and how this varied across time and the region. These remains also provide information on the seasons in which the sites were occupied, based on the seasonal availability of different animals. In general, the faunal remains from each site show what types of fauna were used and in what ways caribou contributed to subsistence and other activities. Through archaeological analysis, I have met the first two objectives, and contribute to the third.

1.4.2 Ethnohistorical review

Through the review of ethnohistorical sources in the Manitoba Archives, I was able to supplement and complement the information gathered from the archaeological record. Using fur trade post journals, account books, and explorer and trader accounts and observations, I collected

data about when and where caribou were observed, how they were used, and how much was traded. This was accomplished through key word searches and reading through relevant documents available in the Manitoba Archives. Extant literature (e.g., Lytwyn 1993, 2002) assisted in guiding and focusing this archival research. For obvious reasons, this ethnohistorical research was limited to the fur trade era, thus addressing the second objective and contributing to the third.

1.4.3 Community workshops and interviews

Community workshops and interviews with YFFN members in York Landing, Manitoba, allowed for an open flow of knowledge. Research intents, methods, and findings were presented to community members in order to gain their insights and perspectives, and to ensure that they were made aware of research and materials related to their cultural heritage. Through interviews and workshops, community knowledge about caribou movements, subspecies, and current and past uses were shared, thus better informing research questions and conclusions. This project was also beneficial to the community, through the generation of information that may be used to inform caribou and land use management, provide a basis for further research, and offer insight into the community's history and related materials. In total, three meetings and workshops were held, and six interviews with Elders and current resource users were conducted over the course of this thesis.

1.5 Contribution to Knowledge

This thesis has resulted in the formulation of a historical ecology of caribou in northern Manitoba. The detailed examination of how caribou in the region have been used in the past has

demonstrated some migration patterns, abundance changes, and the overall social value of these animals over time. While the faunal analysis is limited due to the nature of preservation and the compression of stratigraphy in the region, it nevertheless provides insight into the use of caribou across time. Similarly, the ethnohistorical review has illuminated the historical patterns of caribou use, movements, and abundance, and brought this historical information into the caribou management context. Finally, the inclusion of community insights has enriched the interpretation of the information gained through other methods and has given me a deeper understanding of caribou in a Cree context. Overall, the exploration of the significance of this animal to Cree people, the continuity of this value, and the migration and population patterns of caribou in northern Manitoba illuminates the complexity of this human-environment relationship. These insights can help with the understanding of caribou today, and this project further demonstrates the value of archaeological and historical research for environmental management and conservation.

This thesis serves as the basis for further research in archaeology and in caribou genetics. Importantly, the archaeological analysis contributes to the body of literature focused on the occupation of northern Manitoba. The archaeological remains studied in this project may also further work being conducted on caribou diversity by Dr. Micheline Manseau, Dr. Paul Wilson, and their respective labs. These remains may be sampled for DNA to explore caribou subspecies. In the context of their research, my project brings a historical and cultural perspective and provides an understanding of how humans and caribou in northern Manitoba have interacted and how caribou diversity has changed and been perceived by humans in the region.

1.6 Thesis Organization

This thesis contains seven chapters. This introductory chapter serves as an overview of the research, including an explanation of objectives and methods. The second chapter contains both technical and theoretical background information, including an archaeological and historical overview, an explanation of relevant theories, and a description of caribou in Manitoba. The third chapter outlines in detail the three methods of data collection and analysis used for this thesis. The fourth and fifth chapters illustrate the findings from each method, with the ethnohistorical data and information from YFFN considered together. The sixth chapter synthesizes these findings and discusses the use of caribou and patterns over time. The final chapter provides a summary, an explanation of the implications for caribou conservation and management, and general concluding remarks.

CHAPTER II:
RESEARCH CONTEXT AND THEORETICAL BACKGROUND

In order to investigate past patterns of caribou use in Manitoba, it is first necessary to understand the modern situation of caribou and the historical and archaeological record of the province. In addition, the theoretical groundings of this project -- namely historical ecology and community archaeology -- need to be explained. Optimal foraging theory and its place in zooarchaeological analysis is also briefly outlined, providing context for later interpretations. Through the process of summarizing the history of the region and exploring the theoretical background, this research is contextualized and the overall value in conservation and management is made clear.

2.1 Caribou

Caribou are an important part of both the environmental and cultural landscape of the circumpolar north. Caribou and reindeer, the European equivalent, are found throughout the north, and in Canada have been an important part of the lives of Aboriginal peoples. These animals vary in behaviour and appearance, with several subspecies found in Canada. These include barren-ground, Peary, and several types of woodland caribou.

Unfortunately, as large game animals requiring extensive habitats, caribou are particularly vulnerable to human expansion and development projects as well as climatic variation. The ecological and cultural significance of these animals is clear, and this, in addition to their current standing in Manitoba, must be recognized in order to conduct further research.

2.1.1 Caribou in Manitoba

In Manitoba, there are three officially recognized types of caribou: barren-ground, boreal woodland, and eastern migratory (COSEWIC 2011). Barren-ground caribou (*Rangifer tarandus groenlandicus*) occur in northern Manitoba (COSEWIC 2011). They are migratory caribou, part of the Qamanirjuaq herd (Figure 2.1). These caribou come from Nunavut in the autumn and winter in northern Manitoba (Keeyask 2012). The eastern migratory caribou (*Rangifer tarandus caribou*) are a type of migratory woodland caribou, and include the Pen Island herd and the Cape Churchill herd (Abraham and Thompson 1996; COSEWIC 2011). These caribou are also migratory, moving inland in the Nelson River and Hayes River region for the winter (Keeyask 2012). Boreal woodland caribou (*Rangifer tarandus caribou*) occur in a broad range in central Manitoba, and are relatively sedentary, not migrating to the same extent as the barren-ground or eastern migratory caribou (COSEWIC 2011).

2.1.2 Conservation Status in Manitoba

Many reindeer and caribou herds are experiencing population declines (Bastille-Rouseau et al. 2013; Gunn et al. 2009; Vors and Boyce 2009). There have been fluctuations throughout history, but current variations appear to be related to climate change and anthropogenic effects (Gunn et al. 2011; Vors and Boyce 2009). The status of different caribou populations varies across Canada, with a number of herds in decline and others remaining stable or increasing (Gunn et al. 2011). In Canada, some types of caribou are listed federally as threatened or endangered. Of the subspecies in Manitoba, it is the boreal woodland caribou that are currently listed as threatened under the federal Species at Risk Act and the provincial Endangered Species and Ecosystems Act (Canada 2002; Manitoba 2006).

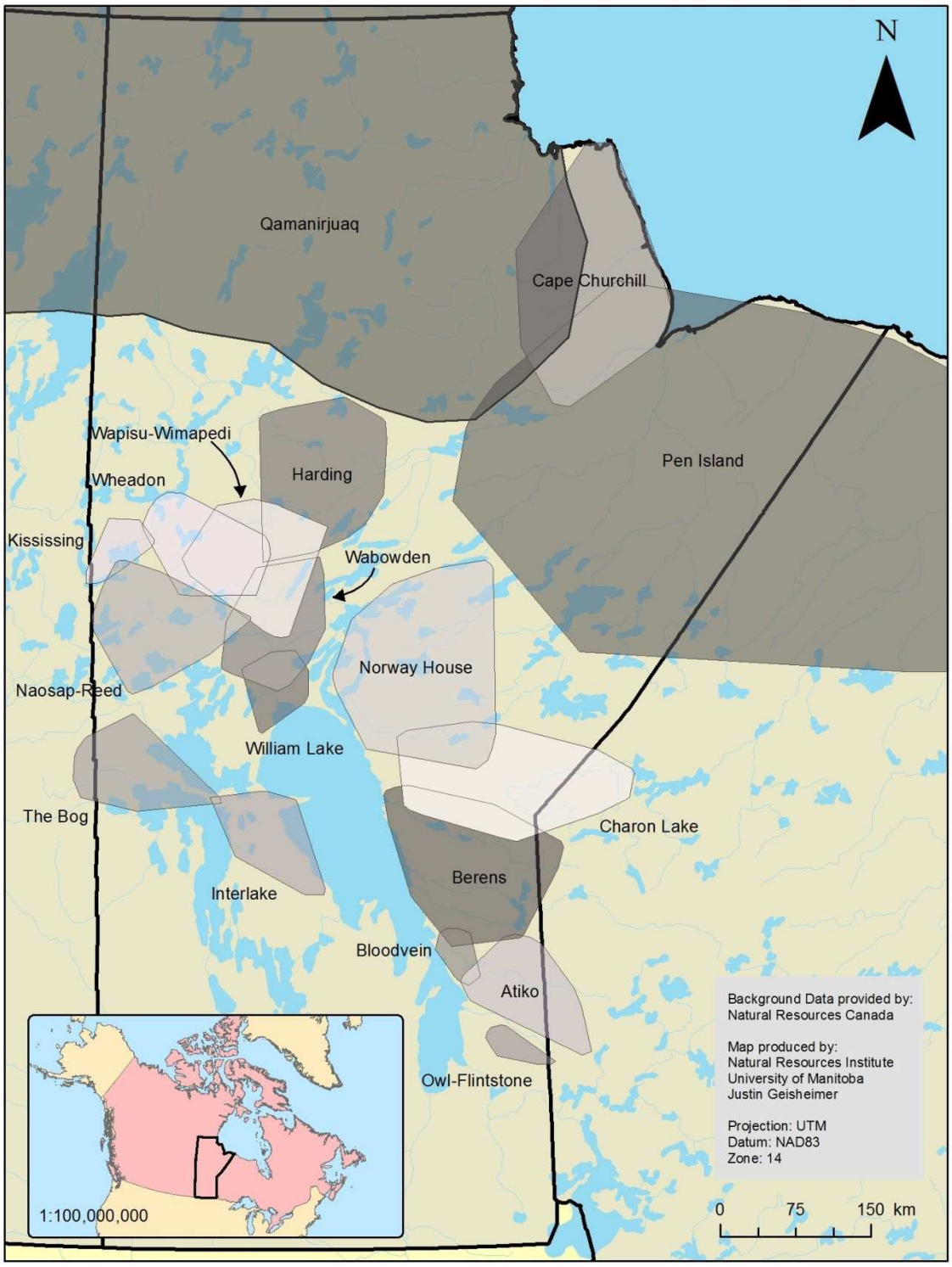

Figure 2.1 Caribou herds in Manitoba

A key concern in Manitoba at present is defining the caribou found in the northeastern part of the province near the Hudson Bay coast. In this area, barren-ground and migratory woodland caribou are found, but an additional type, referred to as 'summer resident caribou' in the recent Keeyask Environmental Assessment, has been noted as well (Keeyask 2012). Summer resident caribou do not migrate with the migratory woodland caribou, but instead remain in the general vicinity for most of the year (Keeyask 2012). This has raised questions as to whether these animals are in fact boreal woodland caribou.

2.1.3 Socio-cultural Significance to First Nations People

Throughout the world, caribou and reindeer have a long-standing cultural importance (Burch 1972; Gordon 2003). This is demonstrated archaeologically and through oral history. Continued modern importance is evinced through community interviews and observations. In North America, caribou are particularly important in northern Aboriginal cultures. Caribou provide meat, skins for clothing and shelter, and bone for tools and ornamentation (Hummel and Ray 2008). Beyond this, the animals also have a spiritual and cultural value (Hummel and Ray 2008). While the level of importance today may vary from historical memory and tradition, caribou continue to play a role in the present day (Hummel and Ray 2008). Although the focus of this thesis is Cree people, examples from other First Nations groups are included below to demonstrate the importance of caribou. For the sake of brevity, however, the Inuit relationship with caribou is not elaborated upon.

The Dene people are one of many groups that have ancient ties to caribou herds. Modern Dene people rely on caribou as did their ancestors. Gordon (2005) outlines millennia of use of the Beverly herd in northern Canada by various cultures represented archaeologically by lithic

tools and pottery. Site distribution, tool types, and faunal remains demonstrate this relationship (Gordon 2005). Today, caribou represent economic interests, tradition, and social cohesion for various communities, including the Dene people of Lutsel K'e in the Northwest Territories (Hummel and Ray 2008). As Griffith notes, the Lutsel K'e Dene use caribou for meat and materials, and hunting, butchering, and preparing hides are social activities (see Hummel and Ray 2008).

The Anishinaabe people in Pikangikum, Ontario traditionally used caribou for meat, clothing, tools, and items such as rattles (WFMC 2006). Although they no longer hunt caribou very often, the traditional importance of the animal is not forgotten (WFMC 2006). Beyond material goods, caribou can represent clans and totems for the Anishinaabeg (WFMC 2006). The Innu people of Labrador maintain a similar connection to caribou in their modern lives. Although they no longer follow the caribou herds, Innes states that the Innu still have a connection with the animals and the places they travel (see Hummel and Ray 2008). Innu people continue to travel to crossing sites and similar locations in order to feel more connected to their traditions and culture (Hummel and Ray 2008).

Caribou also have significance for Cree communities. As demonstrated in the historical summary below, caribou were both a subsistence resource and a trade commodity for Cree people in the past. Today, caribou are still hunted and valued as a traditional resource. Thus it is clear that for many communities, caribou have a cultural significance. These animals continue to play a role in modern cultures, and the traditional and historical value of caribou is not forgotten.

2.1.4 Drivers of change in caribou

Various factors impact or have impacted caribou. Food availability, fires, snow cover, hunting pressures, and natural cycles have all influenced caribou movements and abundance at various points in time. In addition, human expansion and development projects have greatly impacted the habitat of caribou.

Studies of past caribou populations indicate that, following the settlement of North America, caribou populations generally declined (Bergerud 1974). Various factors have been suggested, including destruction of food sources (i.e., lichen), increased hunting pressures, and movements to other habitats (Bergerud 1974). More recently, studies of caribou population cycles have indicated that natural cycles play a role in caribou abundance and scarcity (Gunn 2003; Gunn et al. 2009). Climate changes may influence these cycles as well as impact food sources and increase insect harassment (Gunn et al. 2009; Zalatan 2006). Industrial development and human expansion are also significant concerns, with varied impacts including habitat destruction, range disruption, and increased harvests through new access, demand for meat, and improved hunting methods (Gunn et al. 2009). These drivers of change in caribou abundance and movements are considered in relation to the data gathered for this thesis.

2.2 History and Archaeology in Northern Manitoba

As the current study aims to explore caribou in the context of Manitoba history and prehistory, it is important to consider what research has been done in the area. This includes both archaeological and historical investigations.

2.2.1 Archaeological Investigations in Northern Manitoba

Archaeological research in northern Manitoba has generally been carried out as part of hydroelectric developments and Parks Canada mandates. Archaeology in the area has various limitations, including preservation issues due to the nature of the northern boreal forest, subarctic, or riverbank/shoreline sites in general (e.g., Holly 2002). Nevertheless, an array of sites ranging from pre-contact to late historical time periods has been uncovered.

Archaeology in the region began with the discovery of pre-contact pottery sherds in 1878 (Kroker 1990; Lytwyn 1993; Malasiuk 1999; Pilon 2006). While there were further investigations in the early 20th century in the boreal forest and the north, particularly in the 1950s, providing evidence for early human occupation of the region, more extensive investigations did not occur until the 1960s (Malasiuk 1999; Pilon 2006; see also Kroker 1990). These activities included surveys of the Churchill River and Southern Indian Lake by J. V. Wright, as well as an unsuccessful attempt by Ken Dawson to find evidence of pre-contact occupation along the Hayes and Albany Rivers (Malasiuk 1999; Pilon 2006). Wright identified 36 sites in the Southern Indian Lake region, and hypothesized that the archaeological materials represented the prehistoric ancestors of the Cree people from 1000 years previous (Kroker 1990; Malasiuk 1999; Wright 1971). In the Ontario portion of the Hudson Bay Lowlands, several pre-contact sites were discovered by John Pollock and William Noble in the 1970s, providing evidence for pre-contact occupation of the area by southern cultures (as opposed to Palaeoeskimo groups) (Lytwyn 1993; Pilon 2006).

Archaeological research by Parks Canada in northern Manitoba has generally focused on major fur trade posts. This includes sites such as York Factory and Prince of Wales Fort along the Hudson Bay coast (Adams 1985b; Lunn 1985; Parks Canada 2009). These places have

provided substantial amounts of cultural material and information about European and First Nations activities during the fur trade. The fur trade is not the sole focus, however. Sites like Seahorse Gully (see Anderson and Hodgetts 2007; Hodgetts 2007; Meyer 1970; Nash 1972) have also provided important insights into pre-contact activities in the region, and other archaeological finds provide information on First Nation and Inuit ways of life during the historic period (see Adams 1985a).

In terms of inland archaeology, we can look at the Churchill River Diversion Archaeological Project (CDAP). It was due to hydroelectric development that CDAP, "the largest archaeological project in north-central Manitoba" (Malasiuk 1999:11), was carried out. Begun in 1969, CDAP was meant to account for archaeological sites that may have been impacted by Manitoba Hydro's proposal to divert part of the Churchill River (Kroker 1990; Malasiuk 1999). The studied sites were limited to those of high priority along shorelines, ignoring potential inland sites beyond the anticipated inundation (Kroker 1990; Malasiuk 1999). Overall, 315 sites were assessed through this project (Malasiuk 1999). Aside from this large investigation, smaller assessments and surveys were carried out throughout the 1970s and 1980s. These were done along South Indian Lake and the Nelson River, and near Thompson (Kroker 1990; Malasiuk 1999).

In the 1990s, sites surveyed during the initial CDAP were revisited through a new CDAP initiated by the Historic Resources Branch of Manitoba, and new sites were also investigated. This ensured that archaeological materials and burials could be uncovered and rescued from erosion along shorelines (Malasiuk 1999). In total, the new project discovered 54 burial sites and 413 archaeological sites, a significant contribution to the archaeological understanding of the region (Malasiuk 1999).

Through these archaeological investigations, it has been shown that northern Manitoba has a significant history of human use and occupation, and that archaeological cultures in the area are "far more complex than previously realized" (Malasiuk 1999:17). A variety of tool types and pottery styles have been recovered, and it has become clear that pre-contact occupation of the area was more substantial than first hypothesized (Malasiuk 1999). It is also clear that Aboriginal culture was not abandoned with the arrival of Europeans, with lifeways and material culture remaining relatively consistent: "the Cree were no more reliant on European trade at this time (direct or indirect) than they had been on the traditional Aboriginal trade which had provided them with higher quality stone materials and prestige items from far away" (Malasiuk 1999:19; see also Lytwyn 1993).

2.2.2 Northern Manitoba, Pre-Contact

Table 2.1 Manitoba, Pre-contact (adapted from Malasiuk 1999, 2001; Buchner et al. 1983)

Period	Subdivisions	Date Range (approximate)	Culture Complexes / Tool and Pottery Types
Early Pre-contact	-	12,000 – 8000 years ago	Palaeo-Indian, Clovis, Lindenmeier
Middle Pre-contact (Intensive Diversification)	Early	8000 – 5500 years ago	Plano, Palaeo-Indian
	Late	5500 – 2000 years ago	Shield Archaic, Pre-Dorset, Talthelei
Late Pre-contact	Middle Woodland	2000 – 1300 years ago	Laurel, Pre-Dorset, Talthelei
	Late Woodland	1300 – 350 years ago	Blackduck, Selkirk (Kame Hills, Clearwater Lake, Pehonan), Dorset, Talthelei

Our understanding of prehistory in northern Manitoba is based on ethnographic or ethnohistoric analogies and archaeological investigations (Holly 2002; Malasiuk 1999). Humans

have been present in Manitoba since the ice sheets began to retreat approximately 12,000 years ago (Buchner et al. 1983; Hlady et al. 1970; Malasiuk 2001). These people slowly made their way north.

The earliest cultural materials in Manitoba are projectile points associated with the Clovis Culture, from approximately 10,000 to 9000 BCE ('Before the Common Era', equivalent to B.C.) (Buchner et al. 1983). However, these tools are rare in the province, given the position of the ice sheet and the extent of glacial Lake Agassiz (Buchner et al. 1983). From 9000 to 8000 BCE, Folsom points are found, associated with the Lindenmeier Culture and the replacement of mammoths with bison as the primary prey (Buchner et al. 1983). Like the Clovis culture, this culture is relatively rare in Manitoba due to the environmental conditions at the time (Buchner et al. 1983). By 8000 BCE, as the ice sheet retreated and Lake Agassiz drained, we find evidence of the Plano peoples (Buchner et al. 1983; Malasiuk 1999, 2001). Based on evidence from Canada and the United States, these people were also focused on hunting bison (Buchner et al. 1983; Malasiuk 1999). There is evidence of 'Northern Plano' peoples as well, groups who "left the plains for the fringe of coniferous forest to the north" (Malasiuk 1999:86). Here, they most likely focused upon migratory caribou and other forest resources (Buchner et al. 1983; Malasiuk 1999). There are signs of adaptation to the new environment through their tool kit, which includes items such as picks and adzes (Buchner et al. 1983).

By 5000 BCE, the cultures of Manitoba would have varied, in part based upon the region in which they were located. The focus here shall be upon part of the central and the northern sections of the province. The Shield Archaic Complex, a group of cultures found in north-central Manitoba, appears to have emerged from the Plano peoples who adapted to the boreal forest (Buchner et al. 1983; Malasiuk 1999, 2001; see also Kroker 1990). These people would have had

a generalized economy, focusing on both large and small game, as well as plant collecting (Buchner et al. 1983; Malasiuk 1999). They most likely would have used the rivers and waterways for travel, with birch bark canoes as well as snowshoes and toboggans, as such adaptations would be necessary for year-round occupation (Buchner et al. 1983; Malasiuk 1999).

Further north, along the coast, are a number of sites representing the Pre-Dorset Culture. These include Thyazzi, the Twin Lakes Site, and Seahorse Gully (Buchner et al. 1983; see also Kroker 1990). Based on stone tool types, site locations, and limited faunal remains, it appears that Pre-Dorset peoples moved seasonally from the coast to the interior, relying on marine mammals -- particularly ringed seals -- as well as fish, birds, and caribou (Anderson and Hodgetts 2007; Meyer 1970). The characteristic stone tools of this culture have been found near Thompson, Southern Indian Lake, and Shamattawa, dating between 1500 and 500 BCE (Buchner et al. 1983; Malasiuk 2001). Later, the Dorset Culture appears to "[represent] a continued adaptation of the Pre-Dorset peoples to the Arctic" (Buchner et al. 1983:93). They too relied on marine mammals such as seals, walruses, and whales, as well as fishing and caribou hunting (Buchner et al. 1983; Nash 1972). Evidence of the Dorset Culture is found at Seahorse Gully, not far from the Pre-Dorset occupation of the same locale (Buchner et al. 1983; Nash 1972).

Later cultures are recognizable primarily through their pottery types. The Laurel Complex marks the beginning of the Late Prehistoric Period (Buchner et al. 1983; Malasiuk 2001). This culture is distributed through the central portion of the province, as well as parts of the south and into the northern boreal forest (Buchner et al. 1983). The Clearwater Lake Complex, from 1300 to 1700 CE ('Common Era', equivalent to A.D.), extends through north-central Manitoba (Buchner et al. 1983). The Kame Hills Complex, from 850 to 1750 CE, is found around Southern Indian Lake (Buchner et al. 1983; Malasiuk 1999). The latter two

complexes appear to be the ancestors of the Woodland Cree (Buchner et al. 1983; Malasiuk 1999, 2001). Finally, in the north, we find the Taltheilei Tradition (Buchner et al. 1983). This culture, the predecessors of the Dene people, was relatively stable (Malasiuk 1999). It appears that fishing and caribou hunting were the basis of their economy (Malasiuk 1999).

Overall, prehistory in Manitoba involved the expansion of southern peoples to the north, and northern peoples southwards. In the north and in the northern boreal forest, it seems likely that caribou were a main part of the subsistence strategies, along with marine resources and other forest game. Archaeologically we find evidence of distinct groups, including the ancestral Cree people of the region.

2.2.3 Northern Manitoba, Post-Contact

In northern Manitoba, European exploration began with Henry Hudson's expedition into Hudson Bay in 1610. This mission ended with a mutiny, but an account by Abacuck Pricket indicates an encounter with a First Nations person (Lytwyn 1993). In 1612, Thomas Button and two ships were sent to search for Henry Hudson (Lytwyn 1993; Simpson 1972). They wintered at the mouth of the Nelson River, surviving on game and fish, but the accounts of this journey do not provide information about any encounters with indigenous people (Lytwyn 1993). Luke Fox, in 1631, saw evidence of recent camps, as did Thomas James (Lytwyn 1993).

Further exploration and First Nation-European interactions occurred elsewhere in Canada, to the south of James Bay. In 1668, English fur traders returned to Hudson Bay (Lytwyn 1993; see also Payne 1996). In 1670, the Hudson's Bay Company received a royal charter and exclusive trading rights for the region (Fast 1996; Lytwyn 1993; Simpson 1972). A number of posts along James Bay were established around this time (Lytwyn 1993). The fort that would

eventually become York Factory was built later, in 1682 near the Hayes River (Fast 1996; Lytwyn 1993). Other forts in Manitoba, such as Prince of Wales Fort and Oxford House, were established as well.

In northern Manitoba, Cree involvement in the fur trade was based around York Factory. In 1682, a French fort and two English forts were built at the mouths of the Hayes and the Nelson Rivers (Lytwyn 1993). Contact with the Lowland Cree occurred, and some trading was carried out (Lytwyn 1993). Two French traders spent the winter with the Cree in 1682-83, and it was clear that these Cree had previous contact with Europeans at James Bay (Lytwyn 1993). There was tension with one group of Lowland Cree from the Severn River due to the inconsistent valuation of goods, as HBC traders offered a better price, while the Hayes River Lowland Cree offered support to the French (Lytwyn 1993). Tensions such as these continued over the years amongst the Cree, the French, and the English, with competition between the French and the English encouraging competition amongst groups of Cree (Lytwyn 1993; see also Ray 1974). York Fort changed hands to the French, and was renamed Fort Bourbon in 1694 (Payne 1996; Simpson 1972). York Factory was reclaimed by the English and HBC under the Treaty of Utrecht in 1713, and the French withdrew from the region (Payne 1996; Ray 1974; Simpson 1972).

Between 1713 and 1782, the number of inland (or 'Upland') Natives coming to the bay to trade furs was decreasing (Lytwyn 1993; Simpson 1972). HBC began establishing inland fur trade posts to ensure that trade could occur without lengthy journeys for those involved, which began to change the role of York Factory to more of a depot (Lytwyn 1993; Simpson 1972; see also Payne 1996). The Lowland Cree, however, did more than providing furs: they acted as provisioners for the European traders (Lytwyn 1993; Fast 1996). These hunters, generally

Homeguard Cree (permanent coastal Lowland Cree, as opposed to the seasonal Lowland Cree), provided waterfowl as well as game such as caribou (Lytwyn 1993; Fast 1996). This role developed over time: in the earlier years, only a few Cree people were employed as hunters for the HBC forts, but towards the end of the 18th century, the numbers increased (Lytwyn 1993). The HBC provided the Homeguard Cree hunters with emergency food supplies, feasts, and gifts, as well as with guns, gunpowder, and shots (Lytwyn 1993).

From this, a commercial trade in waterfowl and caribou developed. Caribou were generally hunted using hedges -- fences of wood through which caribou were directed into snares -- during the spring migration and at river crossings during the fall migration (Lytwyn 1993, 2002). Caribou trade involved tongues, dried meat, fat, and skins, but it began with the tongues because it was easier to bring numerous tongues to a post than an entire caribou (Lytwyn 1993, 2002). This started in the 1740s, increasing through to the end of the 18th century (Lytwyn 1993). The HBC, in the 1760s, specifically aimed to procure caribou meat from the Cree, and made several attempts at trade (Lytwyn 1993). According to Lytwyn (1993), they were eventually successful, and caribou trade grew at York Factory: "annually, upwards of 300 whole caribou, 1300 tongues, and quantities of other products such as sides, briskets, rumps, heads, hearts, ruhiggan, and pemmican were purchased by the Company" (Lytwyn 1993:339). At Albany Fort, the European traders also struggled to develop a caribou trade (Lytwyn 1993). However, they were not as successful, and "the caribou trade did not become a major enterprise for the Albany Fort traders" (Lytwyn 1993:342). Lytwyn's (1993) research also indicated that the trade of caribou skin increased towards the end of the 18th century, primarily at York Factory. Other animals, including fish and whales, were also traded (Lytwyn 1993).

Due to a significant smallpox epidemic in 1782 and 1783, trade in furs declined (Lytwyn 1993). Nevertheless, the inland trading posts expanded, and so few Upland Natives went to York Factory or other coastal posts after 1782 (Lytwyn 1993). At this time, however, increased competition in the area between the HBC and the North West Company (NWC) meant that Cree traders ran into problems: groups heading to trade at York Factory were intercepted and traded with NWC men instead, and would arrive at York Factory with little to offer (Lytwyn 1993). This led to more intensive hunting, encouraged by both the HBC and the NWC, and stress on fur-bearing animals such as beavers and martens (Lytwyn 1993; Ray 1975). Paired with climatic variation, beavers became scarcer (Lytwyn 1993). Caribou herds suffered similarly; provisioning increased, but with increased hunting the population decreased and movements became less predictable (Lytwyn 1993). By 1815, Native hunters began having difficulties providing for themselves, much less for the European traders (Lytwyn 1993; see also Ray 1975). After 1829, the caribou hunts were less successful, and the caribou population in the region had dropped significantly (Lytwyn 1993). Thus, in the 1800s, geese became even more important (Lytwyn 1993).

In 1821, the HBC and NWC merged (Lytwyn 1993; Simpson 1972). The Company also implemented conservation measures for the beaver populations around Hudson Bay (Ray 1975). The trade of geese continued to rise, both in meat and feathers (Lytwyn 1993). Aside from geese, however, Cree participation in the fur trade was limited once beaver and caribou populations declined (Lytwyn 1993). The Cree were able to live without European goods, and they had limited time for trade, as “the decline in traditionally important resources...meant that more effort needed to be spent on subsistence activities” (Lytwyn 1993:439). Through the late 1800s, the limited trade opportunities, changing trapping dynamics and employment opportunities, and the

depletion of traditional resources eventually led to the migration of the some Lowland Cree away from York Factory and the surrounding area (Lytwyn 1993, 2002).

2.3 Historical Ecology

Historical ecology is an interdisciplinary research approach that considers the interrelationship and interactions between humans and the environment across time (Balée 1998; Crumley 1994; Rick and Lockwood 2013). Using disciplines such as ecology, archaeology, ethnohistory, and palaeoecology, this approach allows for the exploration of the human-environment relationship and the consequences of this interrelationship on both cultural development and the environmental landscape. In essence, historical ecology is an approach that recognizes the impacts, both positive and negative, that humans have had on the environment, as well the influence the environment has had on societies.

2.3.1 Premises and Postulates

As proposed by William Balée, historical ecology has four central postulates. These postulates are implicit in many historical ecological studies, and so understanding them is vital. Firstly, Balée (1998:14) challenges the pristine myth: “much, if not all, of the nonhuman biosphere has been affected by human activity.” He highlights some of the direct impacts modern Western society has had on the environment, such as deforestation, but also mentions broader, wide-ranging but indirect effects, such as ozone depletion and global warming (Balée 1998). The impacts of prehistoric groups are clear as well, generally via anthropogenic fire and agriculture (Balée 1998). Thus, environments around the world have been directly and indirectly affected by human actions.

The second postulate of historical ecology notes that these human effects are not necessarily positive or negative: “Human activity does not necessarily lead to degradation of the nonhuman biosphere and the extinction of species, nor does it necessarily create a more habitable biosphere for humans and other life forms and increase the abundance and speciosity of these” (Balée 1998:19). It is through this postulate that historical ecology challenges the stereotypical notion of *Homo devastans*, the destructive human nature ordinarily highlighted by environmental activists (Balée 1998). It is possible for human effects on the environment to be ‘good’, ‘bad’, or ‘neutral’. For instance, anthropogenic fires used by indigenous peoples in the grasslands encouraged the growth of new plants to attract game species and increase their abundance (Balée 1998). Thus, anthropogenic fires are not simply destructive actions, but allow for the creation of a new habitat and may decrease the number of wildfires (Balée 1998).

The third postulate states that different societies have different impacts on the environment and on subsequent societies (Balée 1998). Essentially, Balée is highlighting the importance of cultural relativism as well as arguing against environmental determinism. While in general state level societies, both past and present, have had negative impacts on the biosphere and nonhuman life forms, the effects of a particular society type (e.g., hunter-gatherers) cannot be generalized: there are groups that have caused extinctions without being state level (Balée 1998). Nevertheless, he argues that different types of societies have quantitatively different impacts on the environment (Balée 1998). Thus, the socio-political context must be understood.

Finally, the fourth postulate of historical ecology states that culture and the environment must be looked at as a totality (Balée 1998). Culture cannot be separated from the environment, and the environment cannot be fully divorced from culture, and so the two should be considered a single phenomenon (Balée 1998). In this way, historical ecology is not fully anthropocentric,

acknowledging that while “humans have conditioned the biosphere through their activities in regions and on landscapes, these same activities have constrained other potential developments” (Balée 1998). To an extent, cultural development is influenced and limited by the (human-altered) environment surrounding it.

In addition to these postulates, there are a number of features central to historical ecology. Firstly, the time scale at which historical ecology operates is key. Rather than considering the environment or culture as static, as many other approaches inevitably do, historical ecology examines cultures and environments in a diachronic sense (Balée 2006). Indeed, the emphasis of historical ecology is upon exploring the relationship between humans and the environment over *long periods of time* to understand how these interactions “contribute to...the heterogeneity of landscapes across world regions” (Balée and Erickson 2006:6). Secondly, the mechanisms for change within historical ecology are human actions and reactions. Balée (1998:13) states that historical ecology is based upon the idea that “historical, not evolutionary, events are responsible for the principal changes in relationships between human societies and their immediate environment.” Thirdly, in historical ecology the landscape is generally the unit of analysis. A landscape is defined as “the material manifestation of the relation between humans and the environment” (Crumley 1994:6). Essentially, this is the manifestation of the ongoing dialogue between humans and nature -- the level at which human-environment interactions take place, “with a temporal dimension that is as historical and cultural as it is evolutionary” (Balée 2006:77). However, Crumley (1994:9) points out that, “as abstractions whose components vary between individuals and among groups, landscapes cannot be studied in their totalities.” This means that while researchers need to consider both humans and nature holistically, the landscape itself needs to be examined at a particular scale. In this

way, we can examine different effects and factors at different temporal and spatial scales, in specific environmental and cultural contexts (Crumley 1994).

2.3.2 Historical ecology and archaeology

A number of different techniques and types of material evidence can be used for historical ecology. Humans have left marks on the landscape in various ways through their exploitation of plant, animal, and mineral resources. Evidence of these impacts can be accessed through a number of sources: "environmental archaeology, paleoecology, history, geography, geology, and cultural anthropology" (Hayashida 2005:46). Sources of data include botanical remains, faunal remains, geological and sedimentary evidence, and site distribution, as well as current vegetation patterns and written/oral records (Hayashida 2005; O'Brien 2005; Swetnam et al. 1999).

Historical ecology has been used in archaeology for a wide array of projects. For instance, studies of Amazonian dark earth deposits have demonstrated that even the Amazon rainforest has been altered by human use (Hayashida 2005). Amazonian dark earth deposits, rich in charcoal, are associated with archaeological sites, generally between 500 and 2500 years old (Hayashida 2005). This dark earth is particularly fertile, much more so than the natural upland (*terra firme*) soils (Hayashida 2005). Amazonian dark earth is of two varieties: *terra preta* and *terra mulata* (Hayashida 2005). The former is darker and filled with artifacts and other debris, while the latter is lighter, more widespread, and empty of artifacts, but nevertheless fertile (Hayashida 2005). *Terra preta* is associated with settlements, while *terra mulata* is most likely due to agriculture (Hayashida 2005).

Another project, the Cannon Reservoir Human Ecology Project, used a historical ecological approach to study the ways in which indigenous peoples in the Salt River valley of northeastern Missouri responded to changes in their environment during the Holocene (O'Brien 2005). The researchers looked at the distribution of sites on the landscape, which indicated that resource availability affected the location of a site, and downstream locations were more desirable (O'Brien 2005). In order to evaluate climatic variability and how this might have affected site location without regard for the two geographic dimensions, soil data and floral communities were examined (O'Brien 2005). During the 'Little Ice Age' (1550-1850 CE), forests expanded into the prairies; these data were used as a baseline for analysing these sites (O'Brien 2005). Interestingly, 73 per cent of the sites were bottomland, but only after the Early Archaic Period (O'Brien 2005). In addition, by the Late Archaic Period, there were 6 different contexts in which sites occurred, compared to 2 in the Palaeoindian Period (O'Brien 2005). Land use patterns appeared to change as population density increased (O'Brien 2005). While there were continuities across the time periods, there were significant differences as well: for instance, there was a reduction in the number of upland sites during the Middle Archaic Period (O'Brien 2005). This focus on lowland sites indicates shifts in resource distribution or resource focus (O'Brien 2005). The results from the Late Archaic Period contrasted the modern distribution of forest, indicating that forests had reclaimed some of the prairie areas (O'Brien 2005).

As a final example, I will use the research by Erlandson et al. (2008), which explored 10,000 years of human use of shellfish on San Miguel Island in California in order to discuss issues surrounding fisheries and aquatic ecosystems. San Miguel Island has a long occupation history, and given its limited terrestrial flora and fauna, marine ecosystems were heavily exploited (Erlandson et al. 2008). By the time Europeans arrived in the area, the native Island

Chumash had a high population density living in sedentary villages, were heavily exploiting the aquatic resources, and engaged in trade with communities on the mainland (Erlandson et al. 2008). After contact, the population rapidly declined, and by 1820 CE the Spanish had relocated the remaining Chumash mainland communities (Erlandson et al. 2008). After this, sea otters, pinnipeds, whales, and abalones were heavily exploited by various non-native regimes and inhabitants, drastically altering the marine ecosystem (Erlandson et al. 2008). Mussels and abalones are common in the area, and are generally vulnerable to human exploitation (Erlandson et al. 2008). Importantly, sea otters also prey upon these shellfish (Erlandson et al. 2008). The researchers found that mussels are ubiquitous across time, though there were some middens – particularly the historic Chinese occupation – in which black abalones were more abundant (Erlandson et al. 2008). In terms of size, there was a decrease in shell size over time (Erlandson et al. 2008). Interestingly, during the historic period, abalones increased in size, indicating that after the Chumash moved and the sea otters were hunted, the abalones were able to rebound (Erlandson et al. 2008). Over time, the human population in the area grew and resource exploitation was done more intensely, and the smaller sizes in shellfish reflect this (Erlandson et al. 2008). Despite the fact that the Native exploitation patterns did have a clear impact on the shellfish, they were nevertheless sustainable, particularly in comparison to the rapid decline of the last few centuries (Erlandson et al. 2008).

2.3.3 Applications for environmental management and conservation

The above case studies provide examples of how, through historical ecology, archaeology can contribute to environmental management, planning, and conservation. We can gain insight into the history of a species, and observe human impacts on the environment. These case studies

indicate the ways in which human actions can result in the long-term alteration of the landscape and its composition. Tropical forests, for instance, have been significantly altered due to human use. Studies such as these can provide managers with information vital to the creation of predictive models and insight into what practices may be sustainable in the long-term. The 10,000-year study on shellfish exploitation provided similar information, relevant to sustainable fisheries and marine exploitation practices. Finally, the Cannon Reservoir Human Ecology Project demonstrated the ways in which humans may respond to climatic variation and environmental change. Studies such as this are particularly useful, as they indicate how humans, plants, and animals are affected by climatic changes. This can have applications in responses to climatic and environmental variation and stressors in the present.

It is through historical ecology that archaeology is able to contribute to our understanding of environmental issues. Studies such as these can provide information on a wide variety of environmental questions. Using this approach, archaeologists can provide a better understanding of current processes and states of nature, thus allowing for more informed policy and management decisions.

2.4 Decolonizing Methodologies and Community Archaeology

Community-based research helps to ensure that the researcher is engaged and reflexive, and that community members can share their thoughts, knowledge, and concerns. This style of research allows for a more nuanced understanding of a specific community, sensitive to their history and culture. Community-based research is especially important for issues relating to natural resource and environmental management, where decisions about development and legislation need to be made. In Canada, First Nations people are often affected by or concerned

with mining, hydroelectric development, road construction, and wildlife protection legislation. Thus research related to these areas, whether into the potential effects or into the cultural values of certain resources, should involve the affected communities.

Research by an outsider into the heritage of First Nations communities inevitably raises questions surrounding the ownership of history, multivocality, and colonial biases. Given the nature of my research, which in part explores First Nations heritage and practices, these issues must be considered. Thus, a decolonizing methodology along with a community archaeology-style approach to heritage guided my research design.

2.4.1 The problem of colonization in research

Although not often explicitly acknowledged, in academia 'Western' knowledge is generally seen as 'truth'. This bias has its roots in colonialism (Kovach 2009; Tuhiwai Smith 1999). The imperialistic ideals of various European countries led to the colonization of the 'New World' and other areas. The perceived superiority of Western ways of knowing -- with their universal science, objectivity, and categorization -- is the implicit philosophy of many academic disciplines (Tuhiwai Smith 1999:65). Thus, other worldviews conflict with much of academic discourse.

The issue of colonization is particularly relevant to anthropology, as "of all the disciplines, anthropology is the one most closely associated with the study of the Other and with the defining of primitivism." (Tuhiwai Smith 1999:66; see also Atalay 2006). Anthropologists and archaeologists began by studying 'primitive' cultures; the discipline has a strong colonial history (Atalay 2006; Colwell-Chanthaphonh and Ferguson 2008). This colonial archaeology separated indigenous people from their culture and heritage and weakened traditional land claims

(Colwell-Chanthaphon and Ferguson 2008:4). Also problematic was the concept of cultural evolution -- a natural progression from savagery to civilization -- which influenced research done by Europeans (Atalay 2006:285). The idea of European intellectual, biological, and cultural superiority, although no longer thought to be true, has nonetheless permeated academia, and has significantly impacted our epistemological approaches to research.

2.4.2 Community archaeology

The goals of decolonization can be achieved through an approach known as community archaeology. There is some debate surrounding the terminology, but simply put, community archaeology is an approach that involves local peoples and/or groups with cultural or historical ties to the archaeological site throughout the research process (Marshall 2002; Tully 2007). It is a methodology that values reflexivity, democracy and equality in decision-making, and subjectivity and multivocality in interpretation. Colwell-Chanthaphonh and Ferguson (2008:11) describe collaborative work as falling somewhere on a collaboration continuum, ranging from resistance to participation to full collaboration. It seems that community archaeology projects can range between participation and collaboration (e.g., Tully 2007), and this indicates how flexible this approach may be.

As a strategy of inquiry, community archaeology is in many ways similar to participatory action research (see Colwell-Chanthaphonh and Ferguson 2008; Creswell 2009). Emerging from the postprocessualist (interpretivist) tradition, community archaeology has many benefits, particularly when indigenous interests are considered. Perhaps most importantly, community archaeology can ensure that voices are heard in regards to research design, execution, and dissemination, and that local understandings and interpretations are seen as valid (Atalay 2006;

Chirikure and Pwiti 2008; Gadsby and Chidester 2005; Tully 2007). There are also some benefits in terms of economic empowerment (e.g., through more control over tourism to a site) and education (for both the community and outsiders) (Chirikure and Pwiti 2008; Nicholas et al. 2011). Because of this, community archaeology is excellent for fostering cross-cultural respect and understanding, as well as connecting a group to their past (Chirikure and Pwiti 2008; Tully 2007).

There are some potential drawbacks to this strategy, however. Firstly, there may be issues in determining what constitutes a 'community' and which groups should be involved (Chirikure and Pwiti 2008; Hodder 2002). Pleasing each stakeholder may also be problematic (Chirikure and Pwiti 2008; Hodder 2002). Unfortunately, the power dynamics are not completely removed, and "a top-down approach of some kind is unavoidable, for there must be a regulating body or authority" (Chirikure and Pwiti 2008:475). In addition, there can be resistance from archaeologists, reluctant to give power to locals (Atalay 2006; Chirikure and Pwiti 2008). Arguably the most complex part of community archaeology is balancing community desires with the discipline's obligation to the material record: what should be done when community views are in conflict with what the archaeology reveals (see Atalay 2006; Chirikure and Pwiti 2008)?

Nevertheless, despite these potential difficulties, community archaeology is a valuable approach to archaeological research. It recognizes that archaeologists are not the arbiters of the past, and their interpretations are not the sole way to understand the material culture of past groups. Community archaeology ensures that all groups (indigenous or otherwise) have a right to and an active role in the interpretation and stewardship of their heritage.

2.4 A Comment on Zooarchaeology and Optimal Foraging Theory

Optimal Foraging Theory (OFT) is one approach used by archaeologists in the study of faunal remains. Originally conceptualized in evolutionary ecology, OFT was applied to anthropological studies in the 1960s. In anthropology, the goal of OFT is to create generalized economic models that account for specific behaviours among hunter-gatherers and foraging societies (Smith 1983). It assumes that foraging behaviours can be explained through biological terms, focusing on natural selection, fitness, and reproductive success. OFT has been used with varying degrees of success in archaeological contexts to explain prey choice, particularly in prehistoric studies (e.g., Bird et al. 2009). This approach assumes that humans make rational hunting decisions to maximize their efficiency while minimizing costs in time and energy (Smith 1983).

Environmental determinism and the implication of cultural evolution are obvious concerns in the application of OFT. However, some scholars acknowledge these problems and apply OFT regardless. For instance, Winterhalder (1978:11) utilized a more 'heuristic' interpretation of foraging models, recognizing "that humans must adapt to the same aspects of environment as other organisms, but [making] no assumptions about the mechanisms by which behaviours arise and are spread (evolve) in a population." In this case, foraging models were used to create a framework for analysis. Similarly, Smith (1983) argued that the value of OFT and foraging models is being able to frame hypotheses and generate broad insights into behaviours. Nevertheless, the over-simplification of human choices and behaviours is problematic and heavily critiqued by some scholars (Smith 1983). Certainly, OFT should not be used as a sole interpretative method, but rather in tandem with other understandings of hunting choices. In particular, these hunting choices must be considered in the broader cultural context.

The creation of mathematic models to interpret faunal remains has its uses. While the variation in and the complexities of human behaviour and culture must not be forgotten, OFT models can provide some insight into why foraging is done in particular ways. However, in this particular study, quantitative modelling is not used. Rather, the theoretical concepts behind OFT as well as its critiques are contemplated in the interpretation of faunal remains. While studying the faunal remains from each site, factors in prey choice such as seasonal availability, population abundance, and quality of meat and skins were considered. In this way, tenets from OFT -- specifically the concepts of efficiency and energy costs -- become involved. In general, however, it is assumed that choices can be explained by various factors, including availability, efficiency, and cultural values.

2.5 Summary

In order to explore the historical ecology of caribou in Manitoba, it is necessary to understand the archaeology and history of the province as well as several theoretical concepts. This chapter reviewed these topics and demonstrated the value of history in environmental and social research. Historical ecology is a research approach that allows for a deeper understanding of the environment, including wildlife, and ensures that the human-environment relationship is explored and explained. Caribou, as animals with a long-standing relationship with human groups, can be better understood through their historical and cultural role.

The theoretical background reviewed above provides context for the methods outlined in the next chapter. Historical ecology allows for the integration of the chosen data sources -- archaeological data, ethnohistorical commentary, and community knowledge -- in order to generate a more complete understanding of caribou in the past and address the objectives of this

thesis. The concepts considered in decolonization promote an awareness of potential issues in the interpretations of historical and archaeological data, as well as the value of community-based approaches. The relevant methods are described in Chapter III.

CHAPTER III:
METHODOLOGY AND METHODS

The overall goal of this project is to outline a history of caribou use in northern Manitoba, particularly as it relates to Cree people, and through doing so, developing an understanding of caribou movements and populations in the past. Given the aim of focusing upon interactions with a First Nations group, my research needed to be sensitive to indigenous concerns, in addition to considering the potential problems with archaeological interpretation and biases in historical documentation. My research approach, strategy of inquiry, and data collection methods ensured an awareness of potential issues while conducting this historical study of caribou.

3.1 Worldview and Strategy of Inquiry

All research is influenced by the philosophical worldview of the researcher (Creswell 2009). As such, it is important to be aware of and transparent with one's approach. I subscribe to a pragmatist worldview, in that I feel that different methods and philosophies are appropriate in different situations (Creswell 2009). Researchers should be flexible, and aware of the various contexts in which the research is being conducted, be it social, historical, political, or other (Creswell 2009). However, I am also influenced by social constructivism, particularly in the context of this research. Social constructivists are aware of the interpretive quality of social research, and the importance of cultural and historical perspectives and individual experience (Creswell 2009).

For my research, I have deemed qualitative methods to be appropriate. Qualitative research, which allows for an interpretive and participatory approach, ensured I could explore the historical relationship between caribou and First Nations people with sensitivity, flexibility, and

awareness of community understandings. My strategy of inquiry was thus two-fold: I have drawn upon a historical ecology framework and was guided by a decolonizing methodology in my thought process. As outlined in the previous chapter, a historical ecology approach focuses upon the interrelationship between humans and the environment over time. This concept provides the framework for my project. A decolonizing methodology acknowledges the complications involved in an outsider researching First Nations heritage. Questions surrounding the ownership of history, multivocality, and colonial biases are inevitable. Decolonized research requires that I consider what it means to be an outsider of European descent studying indigenous heritage, and so I have chosen a community archaeology-style method of conducting my research, outlined below.

3.2 Research Methods: Collection and Analysis

The methods used to conduct this study correspond with my research approach and strategy of inquiry. Information was gathered and analysed through zooarchaeological research, an ethnohistorical review, and a participatory component entailing workshops and interviews.

3.2.1 Archaeological Analysis

Archaeological data can provide new insights into past environments, including information about wildlife and their relationship with humans. Through the examination of archaeological faunal remains and the interpretation of the related data, past uses of caribou have been explored. This method provides both pre-contact and historical data, and is necessary for all three objectives.

3.2.1.1 Selection of sites

For this study, sites (Table 3.1; Figure 3.1) were selected through a review of archaeological site reports from northern Manitoba. Factors in site selection included:

1) Faunal remains: Sites needed to have associated faunal remains, particularly caribou bones;
2) Location: Within northern Manitoba, both in the coastal region and the northern boreal forest; and
3) Accessibility: Faunal collections needed to be accessible for analysis.

If possible, some form of association with Cree people -- whether through pre-contact connections or fur trade activity -- was desired.

Table 3.1 Archaeological site details

Site Name	Borden Number	Location	Time Period
Isthmus	HiLp-3	Northwest shore of Southern Indian Lake	Pre-contact
Rusty River	HdLw-7	Leaf Rapids, Southern Indian Lake	Pre-contact (Woodland period: 2000 BP – 250 BP)
Kame Hills	HiLp-1	Muskwesi River, northwest shore of Southern Indian Lake	Pre-contact
Poplar Point	HeLu-2	Western locality, Southern Indian Lake	Early fur trade (early 1800s)
Late Historic Cabin	HdLx-1	Island River, Leaf Rapids locality, Southern Indian Lake	Late fur trade (1890s-1900s)
Can of Birds	HfLp-6	Sandhill Bay, Southern Indian Lake	Fur trade, recent (1950s)
Flicker	HeLw-20	MacBride River, Southern Indian Lake	Pre-contact, fur trade, recent
York Factory	--	Hayes River, Hudson Bay coast	Fur trade (1684-1900s)

York Factory, a key fur trade post in northern Manitoba, was immediately confirmed as a study site. Sharon Thomson (Parks Canada) made this collection available to me. Seven more sites were chosen for review with assistance from Kevin Brownlee (Manitoba Museum) and Brian Smith (Historic Resources Branch). These seven sites are located in the Southern Indian Lake region, and were initially investigated through the Churchill River Diversion project. These collections were stored at the Manitoba Museum.

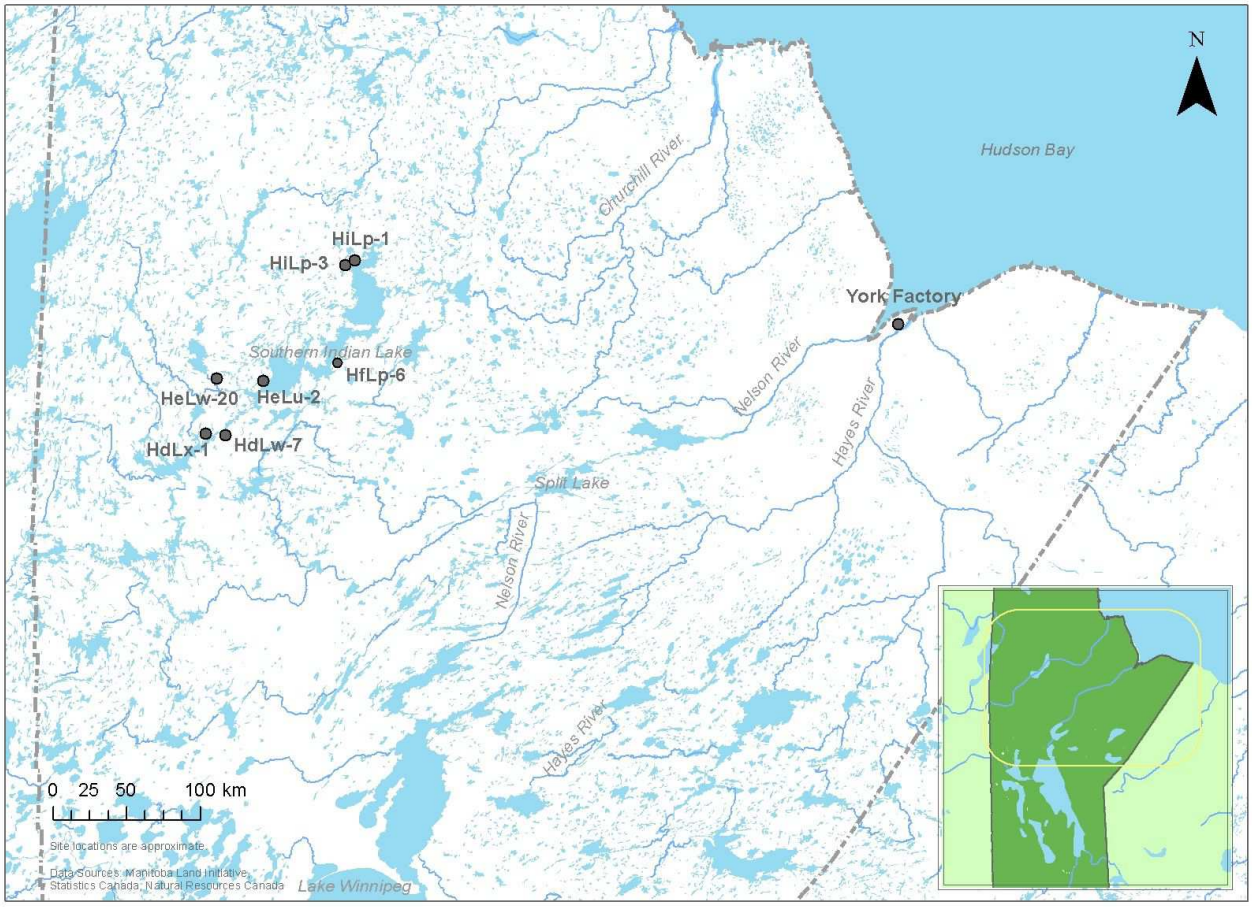

Figure 3.1 Archaeological site locations

3.2.1.2 Identification and quantification of faunal remains

These pre-existing faunal collections were revisited for analysis. Only bones previously identified as *Artiodactyla* (hoofed, even-toed mammals, including deer species) were examined for this thesis, in order to confirm the initial identification and to gather descriptive data. However, given the level of unidentified specimens from the York Factory site, several previously unidentified groups of bones were analysed in addition to artiodactyl species.

Elements and species were determined through the use of comparative texts and specimens. Comparative specimens were available from the Manitoba Museum. Various manuals (France 2009; Hillson 1992) were also used in the identification process. Particularly valuable, however, were two digital collections: 3D comparative animal skeletons from the Max Planck Institute (Max Planck 2014) and the reference collection available through the Virtual Zooarchaeology of the Arctic Project (VZAP 2014).

Previous identifications were relied upon for non-artiodactyl specimens. Some were previously identified to the species level, but many fragments were only identifiable to class (i.e., mammal, bird, fish). At times, the latter bones were identified as a particular size of animal by past researchers. For mammals, these generally included small (e.g., mouse, rabbit), small/medium (e.g., muskrat, beaver), medium (e.g., beaver, dog), medium/large (e.g., deer, wolf), and large (e.g., caribou, moose, bear). For birds, these categories included small (e.g., songbird), medium (e.g., duck), and large (e.g., Canada goose).

In faunal analysis, bone fragments can be quantified in various ways, each with their own advantages and disadvantages. Depending on the researcher, the terms and abbreviations are used in different ways, so they will be clarified and defined here. For the overall assemblages, the analysis is limited to NSP (Number of Specimens) and NISP (Number of Identified

Specimens). NSP refers to the total number of fragments; it is a raw count of the fragments collected, whether identified or unidentified. NISP is the number of *identified* specimens; in this case, *identified* indicates that some level of taxonomic designation was assigned. These counts do not account for fragmentation, taphonomy, or differential preservation, which must be kept in mind. Different types of animals may be used in different ways and thus some may be more fragmented than others (Lyman 2008). Similarly, different types of animals may have more fragile remains or may be discarded differently, which may affect fragment counts (Lyman 2008). Nevertheless, NSP and NISP give a general indication of the abundance of each taxa.

For the *artiodactyla* bones, it was possible to determine the MNE (Minimum Number of Elements). In the following study, MNE is only listed for *cervidae* species, as this is most relevant. MNE refers to the number of elements that would be needed to account for the various articular ends and shaft specimens (Lyman 2008). Thus, this unit accounts for fragmentation. In this study, I took into account fragment refits, landmarks (e.g., articular ends, distinctive muscle attachments, etc.), and size of the fragment (e.g., a nearly complete diaphysis/shaft was counted separately from a distal epiphysis with half of a shaft). Side, animal size, and age were also considered in the determination of MNE. MNE can be problematic depending upon the accuracy and precision of the researcher. Consistency is key. In addition, different species can have different numbers of each element (Lyman 2008); however, this is not an issue in this study as MNE was only considered for cervid species.

In addition, through the MNE it was possible to determine the MNI (Minimum Number of Individuals). This is the number of individuals that could be represented by the elements present. While this was determined for each site, in this case MNI is limited in what it can add to this analysis, and thus is not included in the primary analysis.

In some faunal analyses, researchers determine the biomass and the 'meat weight' of an animal in order to account for different sizes and more accurately quantify what a species contributed to diet (Lyman 2008; Reitz and Wing 2008). Indeed, when comparing the fragment, element, and species frequencies and interpreting the composition of the assemblage, it is important to remember the relative weights and sizes of each species. For instance, while beaver fragments may account for a higher percentage of the overall assemblage than caribou fragments, caribou are larger animals and would still contribute a greater quantity of meat to the diet than a small mammal like a beaver. This can be accounted for through meat weight. Meat weight is determined through establishing the MNI, multiplying by the average light weight, and determining the percentage of the meat that would be edible (Lyman 2008). While useful, this conversion was determined to be unnecessary and limited with the available data. Thus, the following analysis proceeds with the simple acknowledgement that even if small mammal, avian, and fish bones account for a larger number of fragments than those of caribou, moose, or other large mammals, this does not indicate that the small species were of higher importance or contributed more to diet. The size of the species is a relevant consideration when determining overall use and value in the context of the faunal assemblage, and is kept in mind throughout this analysis.

3.2.1.3 Ageing remains

Whenever possible, age at death was determined for caribou and moose remains. Age estimation was done through the examination of various features, including long bone fusion, cranial sutures, and tooth wear. Level of fusion was used to estimate general categories, based on

Hufthammer (1995). This source looked at reindeer in Norway, and generated the following ageing table:

Table 3.2 Age determination through fusion (adapted from Hufthammer 1995)

Element	Age at fusion (months)
Scapula	2 to 6
Radius (proximal)	4 to 10
Humerus (distal)	6 to 15
First and second phalanges	6 to 18
Tibia (distal)	18 to 30
Metacarpus (distal)	18 to 30
Metatarsus (distal)	18 to 30
Calcaneus	18 to 42
Radius (distal)	36 to 48
Femur (proximal)	36 to 48
Femur (distal)	36 to 48
Tibia (proximal)	36 to 48
Ulna (proximal)	42 to 48
Humerus (proximal)	42 to 54

Spiess (1979) suggests that fusion times in *Rangifer* species and *Odocoileus* (deer) are similar, indicating that data from white-tailed deer could be used also (see also Reitz and Wing 2008). Detailed information for moose fusion times was not available, and thus generalized mammal age patterns were used. In addition to looking at the fusion of long bones, crania sutures were considered. In general, the appearance of cranial sutures on a mammal's skull can indicate the maturity of the animal, as the cranial bones fuse through adulthood (Lyman 2008; Reitz and Wing 2008).

Age was also estimated based on tooth eruption and wear patterns. Tooth eruption is useful for young animals (Miller 1974; Spiess 1979). For examining tooth wear, Miller (1974)

was relied upon, as his work provided photographic examples of varying levels of tooth wear at each age. A consideration of tooth wear can place the animals within an age range (Spiess 1979).

For the purposes of this research, any age estimates were placed within a general age class, based on the level of certainty of the estimate and to account for variation in different caribou and reindeer populations. These classes were foetal, juvenile, juvenile/subadult, subadult/adult, or adult.

3.2.1.4 Sexing remains

Similarly, when possible, sex was determined. Caribou are sexually dimorphic -- that is, males are generally larger than females. However, this is difficult to assess archaeologically, given the possible presence of both woodland and barren-ground caribou, and the presence of juvenile, subadult, and adult animals. In this study, sexing was attempted when looking at innominate (pelvic) bones and, for caribou, complete or nearly complete mandibles.

Innominate bones (consisting of the ilium, ischium, and pubis) are the most reliable and commonly used element for estimating the sex of an animal. For this research, methods suggested in Greenfield (2006) were used. These methods are used for sexing fragmentary innominates of ungulate species, and therefore were used for both caribou and moose remains in this study. The innominate in general does not survive well archaeologically, but the acetabulum (the cavity of the hip joint) and the surrounding sections are fairly common as it is a compact bone (Greenfield 2006). Several features of this section can be associated with sex. Specifically, the height of the acetabular wall and the sharpness of the ilio-pubic ridge are considered (Greenfield 2006). However, there is overlap between the sexes of cervid species, and so this identification method is tentative (Greenfield 2006).

For caribou, mandibles were also considered. In particular, length of the diastema (the section between the incisors and premolars) can be indicative of sex (Miller 1974; Morrison and Whitridge 1997; Spiess 1979). Other statistically useful measurements include the maximum height and the distance from the third molar to the mental foramen (Morrison and Whitridge 1997). However, because the mandible is not often preserved in whole, these measurements are often unavailable.

3.2.1.5 Modifications and breakage

In addition to identifying and quantifying bones, it is important to consider how the bones were modified. Butchery marks, signs of burning, and evidence of carnivore or rodent gnawing can indicate use and disposal patterns. Fracturing and breakage can also suggest use and disposal.

Bones were examined for signs of butchery. The number and location of cuts, chops, and scrapes, as well as any signs of sawing, were noted. These marks were described as well, noting the general depth and any overlap. Cuts and other marks can indicate skinning, disarticulation and dismemberment, removal of meat, and subdivision of meat into smaller sections (Reitz and Wing 2008). It should also be recognized that such activities do not always leave behind marks.

Burning and gnawing were also noted and described. The degree of burning was classified as charred, blackened, or calcined. This was simplified to a general 'yes or no' for analysis purposes, but the degree of burning was considered in the overall interpretation. Gnawing was similarly simplified to 'yes or no', though heavily gnawed specimens are noted.

Finally, fracturing and breakage was considered. However, a detailed analysis of fracture patterns was beyond the scope of this analysis. Nevertheless, breakage in general was considered

in the analysis. In particular, broken phalanges and long bones can indicate usage patterns. Marrow extraction may be represented by broken or split phalanges and long bones (Jin and Mills 2011), and tool manufacturing is suggested by the particular pieces of long bones that remain. For instance, the presence of distal tibia may indicate the manufacture of tools like fleshers. However, breakage can simply be due to discard or soil conditions. Fracturing was described where possible, and the present portion of the bone was analysed to note any patterns.

3.2.1.6 Summary

An analysis of faunal remains can provide insight into the use of caribou in the past. Through this method, it was possible to compare caribou with other species present on the site in order to determine the subsistence pattern. Any insights into age and sex can indicate hunting preferences and seasonality. Modifications, including butchery marks and burning, show how the animals were used and discarded. Overall, archaeological remains assist in the understanding of caribou use.

3.2.2 Ethnohistorical Review

Studying ethnohistorical documents allows for detailed insight into trade use, subsistence use, migration patterns, and hunting practices. This method provides information on caribou during the fur trade, ensuring a detailed response to the second objective.

3.2.2.1 Selection of documents

The ethnohistorical review was conducted using documents from the Manitoba Archives as well as published first-hand accounts of life during the fur trade.

At the Manitoba HBC Archives, I looked at journals and account books from York Factory and Indian Lake post. For the York Factory journals, I generally looked at years in 10-20 year intervals, depending on what was available and practical, to get a broad sense of caribou across time in the area. Years chosen were also guided by the initial literature review (e.g., Lytwyn 1993, 2002; Pilon 1987, 1990, 2006; Ray 1974; Tough 2011). For the post at Indian Lake, such a broad time span was not covered. Journals were available between 1805 and 1823, and so it was decided to look at examples from the initial years (1805-1806), middle years (1809-1811), and later years (1819-1820) of occupation.

Several first-person accounts were selected as well (Table 3.4). These were published documents, written by explorers and traders between the late 18th and the early 20th centuries.

Table 3.3 Archival records considered

Location	Year	Type of record	Bibliographic Reference
York Factory	1690	Account book	HBCA B.239/d/2-3
	1719-1720	Post journal	HBCA B.239/a/5-6
		Account book	HBCA B.239/d/10-11
	1750	Post journal	HBCA B.239/a/33-34
		Account book	HBCA B.239/d/40-41
	1770	Post journal	HBCA B.239/a/62-65
		Account book	HBCA B.239/d/60
	1785	Post journal	HBCA B.239/a/84-86
		Account book	HBCA B/239/d/75-77
	1800	Post journal	HBCA B.239/a/104-105
		Account book	HBCA B.239/d/122
	1815	Post journal	HBCA B.239/a/121-124
	1824-1826	Post journal	HBCA B.239/a/133-134
	1834-1835	Post journal	HBCA B.239/a/148-149
		Account book	HBCA B.239/d/491
	1849-1850	Post journal	HBCA B.239/a/173, 176
	1880	Post journal	HBCA B.239/a/183
	1889-1890	Post journal	HBCA B.239/a/184
Indian Lake	1805-1806	Post journal	HBCA B.91/a/1
	1809-1810	Post journal	HBCA B.91/a/3-4

Table 3.3 Archival records considered (continued)

Location	Year	Type of record	Bibliographic Reference
Indian Lake	1819-1820	Post journal	HBCA B.91/a/5-6
	1820-1823	Account book	HBCA B.91/d/1-4, 7
York Factory District	1815	District report	HBCA B.239/e/1
	1873-1874	Post report	HBCA B.239/e/7-8
	1889-1890	Post report	HBCA B.239/e/13
Indian Lake District	1820-1821	District report	HBCA B.91/e/1-2

Table 3.4 Explorer/trader accounts considered

Name	Role	Time Period	Primary Location(s)	Bibliographic Reference
George Simpson McTavish	Chief Trader at York Factory	1870-1905	York Factory; Fort Churchill	McTavish 1963
James Isham	Chief Factor at York Factory and writer for HBC	1743-1749	York Factory	Isham 1949
Andrew Graham	Naturalist and writer for HBC	1767-1791	York Factory; Prince of Wales Fort	Graham 1969
Samuel Hearne	Explorer and fur trader for HBC	1769-1772	Churchill; Prince of Wales Fort; Hudson Bay coast; Northwest Territories/Nunavut	Hearne 1795
Nicolas Jérémie	Clerk, interpreter, and Governor of Fort Bourbon	1694-1714	York Factory (Fort Bourbon)	Jérémie 1926
Joseph Burr Tyrrell	Geologist, cartographer, explorer	1912	Hudson Bay coast, Nelson River	Tyrrell 1913
John Richardson	Naturalist and explorer	1825-1826	Northern parts of Canada, including northern Manitoba	Richardson 1829
David Thompson	Fur trader for HBC, cartographer, and explorer	1784-1812	York Factory; Fort Churchill; Cumberland House	Thompson 1916
Edward Preble	Biologist	1890s/1900s	Hudson Bay region	Preble 1902

3.2.2.2 Review of documents and organization of data

All of these documents were read, and specific key words were noted. Key words included caribou, deer, reindeer/rein deer, moose, and Cree/Indian. References to or descriptions of hunting, trade, migrations, and general use were also noted from each source. These quotes and references were then organized into topics using Nvivo software. This was purely for organizational purposes; no quantitative analyses were done. Topics included hunting (locations, times, practices), types of caribou (descriptions), migrations (times, locations, descriptions), numbers/population (descriptions, mentions of scarcity), uses (food, bone, hides, preferences), and trade and provisioning. Mentions of other animals, specifically moose, were also noted and organized.

Quantitative trade data were collected from account books and considered, but a fuller picture was gained from data previously collected by Lytwyn (1993). These data provided information on more years, and were generally more complete. Quantitative trade data was organized and graphed in Excel.

In addition, recent literature related to the topic was reviewed. This included research related to traditional knowledge, ecological studies, and caribou management and policy documents. Exploring this literature meant that the broader context of this thesis was understood, ensuring relevant interpretations and application.

3.2.2.3 Summary

Archival and ethnohistorical research provides complementary information with which to interpret archaeological remains. It also provided information not available through the archaeological analysis in this thesis, such as population data and caribou movements. For this

project, a review of how and when caribou appeared in historical documents provided insight into fur trade uses and perceptions of the animals. In addition, commentary on caribou movements was useful and trade records illuminated the availability of caribou in the study area.

3.2.3 Community Workshops and Interviews

A participatory component ensured that I could better understand caribou in the context of a Cree community. This method was also important for information sharing.

		J	F	M	A	M	J	J	A	S	O	N	D
2013	***Meeting with Chief and Council***												
	Community workshop												
2014	***Community workshop***												
	Interviews												

Figure 3.2 Timeline of community work

3.2.3.1 York Factory First Nation: Ethics and Consent

York Factory First Nation (YFFN) is one of several communities with historical and cultural ties to York Factory. While their traditional territory is the coastal region around York Factory, YFFN relocated inland to York Landing in 1957. This community was chosen for this project given its connections to York Factory, one of the key archaeological sites for this research.

I initially met with YFFN Chief and Council in May 2013 to discuss the project. With their approval, I travelled to York Landing in July 2013 to present the project to community

members. At this initial meeting, I presented my project idea and discussed how YFFN would be involved.

Ethics approval for this project was received in January 2014 (Appendix A). For the presentation and the first workshop, no information was gathered. The first workshop presented the initial insights the archaeological and archival research, and any questions were answered. Comments were used to inform future interviews and the final workshop. The final workshop involved oral consent, with an explanation that any suggestions or comments may be used to inform this research. Interviews used written consent forms.

3.2.3.2 Workshops

A community workshop is an interactive participatory process, which provides a medium for sharing opinions, experiences, and knowledge, and a forum for raising issues and questions. There are many reasons for carrying out community workshops -- to verify and evaluate researcher interpretations, to share information, to raise community awareness and concerns, to incite discussion and create action plans, and so forth. As such, they are flexible, providing a method for planning, data collection, analysis, and dissemination, should the researcher choose.

For this project, workshops were used to share findings during the research process and at its conclusion. The workshops were also a venue for discussion and helped in the planning of interviews. The goals of these workshops were as follows:

1) To learn about community members' knowledge of their historical relationship with caribou and relate this to data I gather, strengthening and adding depth to my research;

2) To share information with the community about their material heritage and history, and where this data is housed, be it archaeological or archival; and
3) To facilitate communication between York Factory First Nation and the Natural Resources Institute, University of Manitoba, in regards to caribou, material culture and social history, and potential future academic research.

After the initial meeting in July 2013, two workshops were held. A translator was present at each workshop to ensure everyone present could understand and participate. In May 2014, I travelled to York Landing to present my initial findings and interpretations of the archaeological data. Some archival information was included at that point as well. In October 2014, the concluding workshop was held, in which more detailed findings and project conclusions were shared. Each workshop involved the presentation of information and the use of visual aids (e.g., maps, photos). Replicas of bone tools were also brought to the May workshop. These aids were used to stimulate discussion.

3.2.3.3 Interviews

A total of six interviews were conducted in June 2014, after the May workshop. With assistance from staff at York Factory Future Development, three Elders and three resource users were contacted, and they agreed to participate. An interview guide based on relevant findings was created and used (Appendix B). Topics such as hunting methods and locations, current uses of caribou, life at York Factory, and the overall importance of caribou were discussed. Two interviews had a translator present, and information shared by one of the translators was also included in this study with his consent.

After the interviews were completed, audio files were transcribed. The transcriptions were individually analysed, and quotes and statements were organized and categorized. As with the ethnohistorical information, this was done through the use of NVivo software. Categories included hunting, migrations, social value/importance, caribou types, food uses, bone uses, and hide uses. Comments were primarily modern, but any historic commentary was noted as well. Quotes included in this thesis are in English. Any statements originally in Cree were translated during the interview, and those translations are treated as direct quotes where applicable, with the permission of the participants.

3.2.3.4 Summary

One critical reason for choosing to conduct workshops and interviews was to adequately account for the issue of colonization in Western research. A decolonizing methodology influenced this research. Paired with the first two methods, archaeological and historical research, it is perhaps most accurate to say that this project was 'community archaeology *style*' in its approach. As the archaeological collections central to this project have already been excavated and curated, the community could not be involved retroactively in this process. However, through the workshops, I was able to connect community members with this information. Through the interviews, I was able to better understand the role of caribou in the lives of YFFN members, currently and in the past. This community work assisted in meeting the aims of community archaeology and decolonized research: voices were heard, questions were answered, and learning occurred on both sides. Thus, there was mutual benefit in the community component of this project.

3.3. Methods Summary

Table 3.5 Methods Summary

Objective	Method	Example of relevant data
1. Determine the role of caribou in pre-contact subsistence.	Archaeological analysis	- Taxonomic abundances show which species were prioritized at a given site. - Examination of caribou bones for signs of butchery, tool use, etc. demonstrate how the animals were being used.
2. Document the role of caribou during the fur trade.	Archaeological analysis	- Taxonomic abundances show which species were prioritized at a given site. - Examination of caribou bones for signs of butchery, tool use, etc. demonstrate how the animals were being used.
	Ethnohistorical review	- Post journals indicate hunting locations and times, as well as trade patterns. - Explorer/trader accounts describe uses and migrations.
3. Determine the relationship between caribou use by Cree people and caribou populations over time.	Archaeological analysis	- Taxonomic abundances demonstrate which species were focused on.
	Ethnohistorical review	- Trade patterns show changes in amount of caribou being use. - Journals and trader accounts highlight changes in the number of caribou available.
	Community workshops/interviews	- YFFN members explain the traditional importance of caribou and how caribou are used today.

3.4 Limitations and Data Reliability

Each method has its limitations, which must be kept in mind in order to properly analyze the available data. In the archaeological analysis, the influence of fragmentation and preservation on the findings cannot be disregarded, as noted above. Fragmentation and preservation limits the

accuracy of the data in representing the true spectrum of faunal resource exploitation. In addition, limited certainty in dating the remains means that broader time periods are considered, particularly in the pre-contact context. Lack of specificity in dating necessitates greater generalization. These limitations are acknowledged in the analysis and interpretation of the faunal remains, and generalized conclusions are made to ensure findings are not overstated.

In the ethnohistorical data, it must be remembered that a limited perspective is recorded. The accounts are subjective, and are limited to men of European ancestry. The issue of racism, of course, must be considered. This limited perspective is acknowledged throughout the interpretations, particularly through the theoretical consideration of decolonization. Nevertheless, the historical sources have value and provide some insight into past practices and patterns.

Finally, it must be acknowledged that this project only involved working with one Cree community. Several other Cree communities in the region have ties to York Factory, and others are representative of the region as a whole. Additionally, only six community members were interviewed. However, I was not attempting to develop a comprehensive overview of Cree values in the north, but rather develop a general understanding of the role of caribou. The other purpose of the community work was to ensure the information found was shared in a more direct manner with a Cree community, and in this respect, this has been accomplished.

3.5 Dissemination

A central tenet of this thesis is the concept of decolonization and the value of community research. Thus, appropriate dissemination and information sharing is one of the goals. Through the community workshop process, my research was shared with York Factory First Nation. A summary booklet for distribution to the community members is planned to ensure the

information from this thesis remains available. Information is also disseminated through this thesis and any future presentations or publications.

CHAPTER IV:
ZOOARCHAEOLOGICAL FINDINGS

The following chapter contains the results from the faunal analyses. Each archaeological site is discussed individually, with geographic and temporal comparisons to follow in Chapter VI. Data on taxonomic abundances, detailed findings on caribou remains, and commentaries on seasonality and usage practices represented by the faunal remains are included below for each site. Overall, this archaeological information provides insights into the use of caribou in the context of the broader subsistence patterns during the pre-contact and post-contact periods. For examples of the faunal remains examined in this study, see Appendix C.

4.1 Isthmus (HiLp-3)

The Isthmus site is located on the northwest shore of South Indian Lake near the Muskwesi River, 1.5 kilometres southeast of the Kame Hills site (HiLp-1, see below) (Dickson 1983). It was surveyed and excavated during the Churchill River Diversion Archaeological Project. While some historic remains were collected, the site primarily consisted of pre-contact artifacts, including 113 lithic tools, 9 hearths, and many ceramic sherds (Dickson 1983).

4.1.1 Overall faunal assemblage

4.1.1.1 Taxon Abundances

In total, 2214 fragments of animal bones were collected. Based on association with ceramics, all have been considered as representative of a pre-contact time period. Mammals make up the majority of the remains, followed by fish (Table 4.1). Bird bones are fairly uncommon in this assemblage.

Table 4.1 Classes in HiLp-3 Assemblage

Class	NSP	Percentage of Assemblage
Bird	7	0.32%
Mammal	1856	83.83%
Fish	348	15.72%
Mollusc (Bivalve)	2	0.09%
Unidentifiable	1	0.05%
Total	2214	100.01%

(Due to rounding, percentages may not total precisely 100%)

Table 4.2 Identified Fragments in HiLp-3 Assemblage

Identification	NISP	Percentage of Assemblage
Bird (unknown)	3	0.14%
Medium/large bird	1	0.05%
Medium bird	1	0.05%
Sharp-tailed grouse	1	0.05%
Thrush	1	0.05%
Mammal (unknown)	1551	70.09%
Large mammal	2	0.09%
Medium/large mammal	254	11.48%
Medium mammal	1	0.05%
Cervid species (unknown)	5	0.23%
Moose	6	0.27%
Caribou	29	1.31%
Hare/Rabbit	3	0.14%
Beaver	2	0.09%
Black bear	3	0.14%
Fish (unknown)	324	14.65%
Jackfish	2	0.09%
Sucker	22	0.99%
Mollusc (Bivalve)	2	0.09%
Total	2213	100.05%

Of the bones that could be identified beyond class to size or to species, medium/large mammal specimens are the most common (Table 4.2). Caribou bones are prominent amongst

identified species. A few small mammal (i.e., hare or rabbit) bones could be identified, but otherwise bones identified to species or size were primarily from larger mammal species.

4.1.1.2 Bone Tools and Other Alterations

One bone tool was recovered from at HiLp-3: a flesher made from a caribou tibia. The age of this tool is unclear; it was collected outside of the limits of pre-contact ceramic finds, indicating that this tool is possibly from a later time period (Dickson 1983).

4.1.2 Caribou and other cervidae remains

4.1.2.1 Frequencies

A total of 40 fragments or 31 elements were identified as caribou, moose, or unknown cervid (Table 4.3). Unknown cervid remains are likely attributable to caribou, given the size of the bones and the lack of white-tailed deer in the region during the time. However, this cannot be said with complete certainty, and so they are classified as *cervidae*. Caribou bones make up the majority of all cervid remains. Moose is present but not very common. Of the identified caribou elements, phalanges are most abundant (Table 4.4). This is possibly suggestive of butchery patterns, but it should be noted that phalanges can be overrepresented due to the number of these elements in a single skeleton. This may account for its prevalence in the assemblage.

Table 4.3 Identified Cervid Remains at HiLp-3

Species	**NISP**	**%NISP**	**MNE**	**%MNE**
Cervid species (unknown)	5	12.50%	4	12.90%
Moose	6	15.00%	5	16.13%
Caribou	29	72.50%	22	70.97%
Total	40	100.00%	31	100.00%

Table 4.4 Identified Cervid Elements at HiLp-3

Element	**Caribou**		**Moose**		**Cervid species (unknown)**	
	MNE	***%***	***MNE***	***%***	***MNE***	***%***
Vertebra	1	4.55%	-	-	-	-
Scapula	2	9.09%	-	-	1	25.00%
Humerus	1	4.55%	1	20.00%	-	-
Radius	2	9.09%	-	-	1	25.00%
Ulna	1	4.55%	-	-	1	25.00%
Tibia	1	4.55%	1	20.00%	-	-
Metacarpus	2	9.09%	-	-	-	-
Metatarsus	1	4.55%	-	-	-	-
Metapodium	1	4.55%	1	20.00%	-	-
Phalanx	10	45.45%	-	-	1	25.00%
Sesamoid	-	-	2	40.00%	-	-
Total	22	100.02%	5	100.00%	4	100.00%

4.1.2.2 Modifications

Several types of modification were noted, and burning was particularly prominent: 67.74% of all cervid species elements were burnt. A greater percentage of moose elements exhibited signs of burning (80.00%) while 59.09% of caribou elements were burnt (Table 4.5). Given the high frequency of burning, it was an intentional activity. Bones could have been burnt for disposal purposes (i.e., site cleaning, sanitation, etc.) or as a fuel source (Reitz and Wing 2008; see also Costamagno et al. 2002; Théry-Parisot 2002; Théry-Parisot et al. 2005). Another possibility is using the smoke to drive away insects (e.g., see McAvoy 2014).

Carnivore gnawing was minimal. Two caribou elements and two moose elements had evidence of carnivore gnawing, perhaps suggestive of carnivore scavenging. Rodent gnawing on a single caribou element suggests some site disturbance.

No butchery marks were present on caribou remains. Two cutmarks were noted on moose remains: 1 on the distal end of the metapodium and 1 on the distal end of the tibia. No particular

insights into butchery practices can be stated, other than these marks being general evidence of butchery, possibly of initial disarticulation or skinning.

Fragmentation and breakage should also be noted. In particular, 60% of caribou phalanges were broken. This is likely indicative of marrow extraction practices, and highlights to importance of bone marrow.

Table 4.5 Modified Caribou and Moose Bones at HiLp-3

Modification type	**Caribou**		**Moose**	
	MNE	***%MNE***	***MNE***	***%MNE***
Burning	13	59.09%	4	80.00%
Gnawing (carnivore)	2	9.09%	2	40.00%
Gnawing (rodent)	1	4.55%	-	-
Cutmarks	-	-	2	40.00%

4.1.2.3 Age and sex

Sex could not be determined among specimens in this assemblage. Similarly, no meaningful age classes could be determined beyond subadult/adult.

4.1.3 Summary

The overall faunal assemblage indicates a mixed subsistence and highlights the importance of caribou. While fragmentation should be kept in mind, the number of fish remains is suggestive of a relative importance of fish as well. Bird use is comparatively rare or underrepresented. Likely the focus at HiLp-3 was on caribou and fish, supplemented by other game.

As for the season of occupation, nothing conclusive can be said. Fish are available year-round, as are moose, hare/rabbit, and beaver. It should be noted that moose meat was best in the late summer and fall period, and moose were harder to reach in the winter (Malasiuk 1999). Furbearers were often taken in the winter months (Malasiuk 1999). The few black bear bones may suggest a spring/summer/fall time period. Caribou were likely hunted during the spring and winter migrations, so the site would have been occupied during these times. It is clear that the site was occupied at least during the fall and winter. In all likelihood, this site was utilized throughout the year, with different species sought out during the optimal seasons.

While no butchery marks were noted on caribou bones, the burning and breakage is evidence of food use. In particular, the broken phalanges indicate marrow extraction. The purposeful breaking of phalanges is at times interpreted as resource depletion, as minimal marrow is available from phalanges in comparison to other bones. Indeed, the extraction of marrow here could suggest an occupation during a year or season of hardship. However, it has recently been shown that the extraction of marrow from phalanges can simply be due to the quality of marrow it provides, rather than desperation (Jin and Mills 2011). The same can apply below, to other sites with signs of marrow extraction from phalanges.

4.2 Rusty River (HdLw-7)

HdLw-7 is one of the archaeological sites located on the Rusty River. It has been tested and excavated several times, yielding both pre-contact and historic remains (Smith 1995, 1997b). The 1997 excavation was focused on the pre-contact portion of the site. Thus, while it is clear that the site has been occupied across time, because the majority of remains considered here are from the 1997 excavation, the bones are considered pre-contact. The condition of the bones

suggests the bones are from the later Woodland period, possibly early historic (Smith 1997b). A small percentage of bones in the collection were not included in this analysis due to a possible association with later periods.

4.2.1 Overall faunal assemblage

4.2.1.1 Taxon Abundances

In the pre-contact faunal assemblage, a total of 3532 fragments were collected. The majority of these fragments were identifiable to the class level (i.e., bird, mammal, fish), but 10.31% remained unidentified (Table 4.6). Mammal bones make up the majority of the assemblage, followed by bird and a small number of fish. Fish remains are fragile and thus not always preserved. The NISP should not be taken as a precise count of how many fish were used. However, it is interesting that fewer fish than bird remains are present, particularly in comparison with the other sites in the region.

Table 4.6 Classes in HdLw-7 Assemblage

Class	NSP	Percentage of Assemblage
Bird	203	5.75%
Mammal	2878	81.48%
Fish	87	2.46%
Unidentifiable	364	10.31%
Total	3532	100.00%

Identified mammal species are a mix of large mammals such as moose and caribou and small or medium mammals such as beaver and muskrat (Table 4.7). While the majority of bird species are unidentified, those that were identified are primarily waterfowl. Like mammal and

bird, fish bones remained generally unidentified beyond class, but some could be attributed to jackfish and walleye.

Table 4.7 Identified Fragments in HdLw-7 Assemblage

Identification	NISP	Percentage of Assemblage
Bird (unknown)	184	5.81%
Canada Goose	11	0.35%
Mallard	2	0.06%
Duck species (unknown)	3	0.09%
Spruce Grouse	1	0.03%
Loon	2	0.06%
Mammal (unknown)	2483	78.37%
Large mammal	19	0.60%
Medium/large mammal	43	1.36%
Medium mammal	19	0.60%
Small/medium mammal	15	0.47%
Small mammal	7	0.22%
Cervid species (unknown)	27	0.85%
Moose	25	0.79%
Caribou	31	0.98%
Canid species (unknown)	2	0.06%
Bear species (unknown)	1	0.03%
Black bear	4	0.13%
Beaver	163	5.15%
Muskrat	23	0.73%
Hare/rabbit	16	0.50%
Fish (unknown)	52	1.64%
Jackfish	33	1.04%
Walleye	2	0.06%
Total	3168	99.98%

4.2.1.2 Bone Tools and Other Alterations

No tools were specifically made of caribou or other cervid bone. Included in this assemblage is 1 awl made from an unidentified bone, 1 flaker made from a mammal bone, and 1

whistle made from a bird bone. In addition, another flaker made from a mammal bone was uncovered, and classified as post-contact.

4.2.2 Caribou and other cervidae remains

4.2.2.1 Frequencies

As previously mentioned, the category of *cervidae (unknown)* is retained and considered separately due to a lack of certainty for bone identification, but most of these bones are likely caribou. Caribou bones are more common than moose, particularly once fragmentation is accounted for through the MNE count (Table 4.8). The most common element for caribou and for unknown cervid is phalanx (Table 4.9). As with the assemblage at HiLp-3, this prevalence could be related to the overrepresentation of phalanges. The most common moose element is a carpal, which may be due to similar reasons.

Table 4.8 Identified Cervid Remains at HdLw-7

Species	NISP	%NISP	MNE	%MNE
Cervid species (unknown)	27	32.53%	21	38.89%
Moose	25	30.12%	12	22.22%
Caribou	31	37.35%	21	38.89%
Total	83	100.00%	54	100.00%

Table 4.9 Identified Cervid Elements at HdLw-7

Element	Caribou		Moose		Cervid species (uknown)	
	MNE	***%***	***MNE***	***%***	***MNE***	***%***
Vertebra	3	14.29%	-	-	-	-
Radius	-	-	1	8.33%	-	-
Ulna	-	-	-	-	1	4.76%
Metacarpus	-	-	1	8.33%	-	-
Carpal	-	-	4	33.33%	-	-
Tarsal	2	9.52%	1	8.33%	-	-
Sesamoid	3	14.29%	-	-	1	4.76%
Phalanx	13	61.90%	-	-	17	80.95%
Rib	-	-	2	16.67%	1	4.76%
Teeth	-	-	3	25.00%	1	4.76%
Total	21	100.00%	12	99.99%	21	99.99%

4.2.2.2 Modifications

Both caribou and moose bones showed evidence of burning (Table 4.10). All caribou bones were burnt to some degree, while half of moose bones were burnt. Some of these bones were likely minimally charred during the cooking process, but the amount of burning suggests some intentional burning as well. This again was likely for disposal and/or fuel.

Evidence of gnawing and butchery was rare. One moose bone, a rib, has a deep puncture mark from a carnivore canine tooth. This is suggestive of some scavenging. Butchery marks are found on two caribou elements, a phalanx and a vertebra. These are likely signs of secondary butchery, as opposed to disarticulation of the skeleton. Marks on phalanges can be evidence of skinning (Reitz and Wing 2008). Another modification to be noted is that the majority of the caribou phalanges were broken in such a way that suggests marrow extraction.

Table 4.10 Modified Caribou and Moose Bones at HdLw-7

Modification type	**Caribou**		**Moose**	
	MNE	***%MNE***	***MNE***	***%MNE***
Burning	21	100.00%	6	50.00%
Gnawing (carnivore)	-	-	1	8.33%
Cutmarks	2	9.52%	-	-

4.2.2.3 Age and sex

The remains could not be attributed a specific sex. Similarly, the majority of remains could only be categorized as subadult/adult or adult, based on fusion patterns. One *cervidae* element was tentatively classified as infant/juvenile, but this identification was uncertain due to the general degradation of the bone.

4.2.3 Summary

Overall, this faunal assemblage represents a broad range of species. Mammalian species make up the majority of the remains, with a mix of species and sizes. Beaver bone is common, and muskrat and hare/rabbit are present as well. It must be noted that though there are fewer caribou bones, caribou would contribute a greater percentage of food through size and numbers. Nevertheless, beaver and similar species would have been used for food and for furs. Caribou and moose would have contributed meat and skins as well, with caribou being particularly important during migration times. Fish and bird were both used, and are represented in smaller numbers by the faunal remains.

HdLw-7 could have been occupied year-round as a campsite or general habitation area. Moose, hare/rabbit, and fish could have been taken throughout the year. As noted previously, fall was the best season for moose. The waterfowl identified would have been available from spring

through to fall. Caribou would be available in the winter and spring, when the animals were moving through and around the area.

Evidence of specific caribou use comes from the comparison of species abundances and through the consideration of bone modifications. No tools were made from caribou bones here, but cutmarks and breakage are indicative of butchery, skinning, and possibly marrow extraction.

4.3 Kame Hills (HiLp-1)

Excavated in the 1970s, the Kame Hills site is located on the northwestern shore of Southern Indian Lake. It consists of a sand beach between two kames, or hills formed by glacial deposits, with two terraces and a hill extended inland beyond the beach (Dickson 1975, 1983). The site represents many pre-contact cultures, most notably the Kame Hills complex of pottery. The remains from this site are intermixed and thus the bones cannot be accurately dated to particular pre-contact time periods. A sample of burnt bone was dated to 975 BP +/- 140, but this cannot be applied to all bones on the site (Dickson 1975). Samples of charcoal yielded dates of approximately 2000 or 3000 years ago (Dickson 1975). Thus, the precise dates are uncertain, but the site has a long history of occupation.

4.3.1 Overall faunal assemblage

4.3.1.1 Taxon Abundances

Approximately 44,843 bone fragments were categorized as pre-contact. A small number of fragments are not considered below, due to lack of association with human activity and/or unclear context. Overall, most of the fragments are mammal remains (Table 4.11). Fish are present with several hundred remains, while bird bones are scarce.

Of the identified birds, the majority are waterfowl or shorebirds (Table 4.12). Jackfish are the most common identified amongst the fish class. The mammalian class has a range of species and sizes, with beaver bones being the most common identified species, followed by caribou. Based on size, large and medium/large mammals dominate the assemblage.

Table 4.11 Classes in HiLp-1 Assemblage

Class	NSP	Percentage of Assemblage
Bird	68	0.15%
Mammal	43798	97.67%
Fish	932	2.08%
Mollusc (Bivalve)	7	0.02%
Unidentifiable	38	0.08%
Total	44843	100.00%

Table 4.12 Identified Fragments in HiLp-1 Assemblage

Identification	NISP	Percentage of Assemblage
Bird (unknown)	18	0.14%
Large bird	7	0.02%
Medium/large bird	1	0.00%
Medium bird	27	0.06%
Duck/goose species (unknown)	6	0.01%
Canada Goose	1	0.00%
Mallard	1	0.00%
Mute Swan	1	0.00%
Scoter	1	0.00%
Northern Shoveler	2	0.00%
Crow	1	0.00%
Hawk/Kite/Harrier (unknown)	2	0.00%
Mammal (unknown)	39622	88.43%
Large mammal	854	1.91%
Medium/large mammal	993	2.22%
Medium mammal	247	0.55%
Small/medium mammal	766	1.71%
Small mammal	61	0.14%
Artiodactyl species (unknown)	39	0.09%

Table 4.12 Identified Fragments in HiLp-1 Assemblage (continued)

Cervid species (unknown)	196	0.44%
Moose	43	0.10%
Caribou	288	0.64%
Bison	15	0.03%
Carnivore species (unknown)	12	0.03%
Canid species (unknown)	19	0.04%
Marten	5	0.01%
Wolverine	1	0.00%
Mustelid species (unknown)	1	0.00%
Bear species (unknown)	7	0.02%
Black bear	34	0.08%
Rodent species (unknown)	8	0.02%
Beaver	471	1.05%
Muskrat	93	0.21%
Porcupine	14	0.03%
Red squirrel	3	0.01%
Mouse species (unknown)	1	0.00%
Snowshoe hare	5	0.01%
Fish (unknown)	787	1.76%
Jackfish	109	0.24%
Sucker	25	0.06%
Whitefish	6	0.01%
Walleye	5	0.01%
Mollusc (Bivalve)	7	0.02%
Total	44805	100.1%

4.3.1.2 Bone Tools and Other Alterations

Two tools are associated with Kame Hills. One is an awl made from an unidentified mammal bone. The other is a fragmentary antler tool, possibly a wedge for splitting wood (pers. comm. K. Brownlee 2014). The antler could not be identified beyond *cervidae*; it could be from a large caribou or from a moose.

4.3.2 Caribou and other cervidae remains

4.3.2.1 Frequencies

Caribou are undeniably the most common cervid, with moose accounting for little of the identified cervid remains (Table 4.13). This is especially true if we consider the unknown *cervidae* to be caribou. Phalanges, tarsal bones, and sesamoids are the most common elements for both caribou and unknown *cervidae*, presumably because of the prevalence of these bones within the skeleton and their durability (Table 4.14). Long bones in this assemblage are fragmentary and thus not necessarily identifiable as a particular species.

Table 4.13 Identified Cervid Remains at HiLp-1

Species	**NISP**	**%NISP**	**MNE**	**%MNE**
Cervid species (unknown)	196	37.19%	102	31.00%
Moose	43	8.16%	17	5.17%
Caribou	288	54.65%	210	63.83%
Total	527	100.00%	329	100.00%

Table 4.14 Identified Cervid Elements at HiLp-1

Element	**Caribou**		**Moose**		**Cervid species (uknown)**	
	MNE	***%MNE***	***MNE***	***%MNE***	***MNE***	***%MNE***
Cranium	2	0.95%	-	-	1	0.98%
Mandible	2	0.95%	2	11.76%	1	0.98%
Tooth	2	0.95%	-	-	3	2.94%
Antler	1	0.48%	1	5.88%	3	2.94%
Vertebra	4	1.90%	-	-	3	2.94%
Rib	-	-	-	-	5	4.90%
Sternum	-	-	-	-	1	0.98%
Innominate	2	0.95%	-	-	-	-
Scapula	7	3.33%	-	-	1	0.98%
Humerus	5	2.38%	2	11.76%	1	0.98%
Radius	7	3.33%	-	-	2	1.96%
Ulna	3	1.43%	-	-	-	-

Femur	-	-	-	-	1	0.98%
Tibia	11	5.24%	1	5.88%	4	3.92%
Metacarpus	6	2.86%	1	5.88%	1	0.98%
Metatarsus	15	7.14%	-	-	5	4.90%
Metapodium	3	1.43%	-	-	4	3.92%
Lateral malleolus	6	2.86%	1	5.88%	1	0.98%
Carpal	10	4.76%	5	29.41%	2	1.96%
Tarsal	43	20.48%	2	11.76%	8	7.84%
Sesamoid	18	8.57%	-	-	10	9.80%
Phalanx	63	30.00%	2	11.76%	45	44.12%
Total	210	99.99%	17	99.97%	102	99.98%

4.3.2.2 Modifications

More moose bones exhibit signs of burning than caribou bones (Table 4.15). As with sites discussed above, this is likely related to cooking and, for the more heavily burnt bones, disposal and other utilitarian causes. There is less burning of the cervid remains here than at the other pre-contact sites.

Very little gnawing and few butchery marks were noted. Light carnivore gnawing is present on 4 caribou elements and 1 moose element, again indicative of scavenging or presence of canid species. As for cutmarks, several things can be said. For caribou, one metatarsus was cut and split, while several other elements have cutmarks typical of general butchery. Two caribou antler tines and an antler base are scored and sawn, indicating removing of antlers and likely the alteration of antlers into tools or other items. An unknown cervid antler also demonstrates alteration: it is cut in half. In addition, other cervid elements, namely a calcaneus and a vertebra, have several small cut marks, possibly signs of skinning or butchering. Finally, a moose humerus has shallow cuts on the shaft, likely from meat removal.

Finally, fragmentation and breakage must be noted. As mentioned above, a metatarsus was split for marrow extraction or tool production. It is likely that many of the fragmentary long bones are in that condition due to marrow extraction as well, but may be in part related to preservation factors such as trampling and stratigraphic compression. Similar to previously discussed sites, the phalanges at HiLp-1 are mainly broken in a transverse pattern suggestive of marrow extraction. Tibias are primarily represented by distal ends, which can be a possible indicator of tool manufacturing (pers. comm. K. Brownlee 2014). Part of the procedure of making fleshers and other tools is the removal of epiphyses (e.g., Bird 2011; Brownlee 2005), and so a predominance of discarded epiphyses may represent this practice.

Table 4.15 Modified Caribou and Moose Bones at HiLp-1

Modification type	**Caribou**		**Moose**	
	MNE	***%MNE***	***MNE***	***%MNE***
Burning	56	26.67%	7	41.18%
Gnawing (carnivore)	4	1.90%	1	5.88%
Gnawing (rodent)	-	-	1	5.88%
Cutmarks	7	3.33%	1	5.88%

4.3.2.3 Age and sex

With three exceptions, sex could not be determined for any cervid remains. Two antler specimens, one from a moose and one from an unknown cervid were identified as male, based on size and thickness for the latter. One caribou cranium fragment is possibly male, again based on size and robustness, but this is uncertain. Nothing meaningful can be said regarding sex.

Ageing was based on level of fusion and tooth eruption/wear. One unknown *cervidae* distal tibia was identified as a possible juvenile/subadult. One proximal humerus from a moose

was identified as juvenile, as it was partially fused. As for caribou, one unfused proximal humerus epiphysis was identified as juvenile, while an innominate, distal radius, and proximal phalanx were determined to be juvenile/subadult based on level of fusion. A caribou cranial fragment was labelled young adult based on the cranial sutures, and teeth were tentatively aged as 3 to 4 years. Otherwise, the remainder of *cervidae* elements were subadult/adult or indeterminate. Several fragments from un-erupted artiodactyl teeth were also found.

4.3.3 Summary

The faunal assemblage at Kame Hills represents a broad exploitation pattern of available species, with a mixture of smaller mammals such as beaver and larger mammals like caribou. Though fish remains are not present in great numbers, this is likely in part due to lack of preservation; given the location, fish were likely an important part of subsistence. The bison remains, though minimal, are highly unusual and indicative of some form of trade with or travel to the south of the province. Overall, many species were used at HiLp-1, with caribou and various furbearers playing a key role in subsistence.

The site was occupied across time, and very little can be separated into individual time frames. Likely the area was occupied in most or all seasons. Moose and fish were available year-round, as were most furbearers such as beaver. The fall would have been the optimal season for moose, and the winter months for furbearers. Caribou would be prevalent during the winter and early spring months, and waterfowl were present during the spring through to the fall. The presence of young caribou also suggests a time of year: juveniles were present during the winter migration. However, as the ages are uncertain, and the animals may be subadult, they could also be present in the spring migration.

While moose are present, it is clear that a larger number of caribou were used. In this assemblage, the cutmarks demonstrate skinning and butchery, and broken phalanges and other bones suggest possible marrow extraction. Importantly, there are also signs of tool manufacturing, with scored and cut antlers and the prevalence of distal tibias.

4.4 Poplar Point (HeLu-2)

The Poplar Point site, HeLu-2, consists of three fur trade buildings dating to the early 1800s (Smith 1997a). It was first recorded and tested in 1969 and again in 1974. It was revisited in 1994, during which time two fur trade establishments were excavated. The faunal remains considered here come from the 1994 excavations. Although initially thought to be a North West Company post from the mid-1800s, later excavations noted two separate fur trade posts with artifacts possibly from the late 1700s to early 1800s (Smith 1997a). It is likely that one post was HBC and the other was NWC, set up in competition with each other (Smith 1997a). Smith (1997a) postulates that the HBC building at HeLu-2 was occupied during two winter seasons in 1806 and 1807, with the NWC building being occupied during this time as well. Due to limitations in available data, the following analysis considers the two sections of HeLu-2 as a whole.

4.4.1 Overall faunal assemblage

4.4.1.1 Taxon Abundances

The faunal remains at HeLu-2 are a fairly equitable balance of fish and mammal (Table 4.16). A small percentage (2.06%) is composed of bird fragments. A total of 4124 fragments were recovered.

Of the mammal remains, small and medium species are best represented: beaver, muskrat, and hare/rabbit bones are common (Table 4.17). Caribou and moose are comparatively uncommon here, though there are several large mammal bones that could potentially be from these species. Fish are a large proportion of the assemblage, with pike and walleye being the most common fish species. The few identified bird bones are a mix of waterfowl and birds like ptarmigan and grouse.

Table 4.16 Classes in HeLu-2 Assemblage

Class	NSP	Percentage of Assemblage
Bird	85	2.06%
Mammal	2096	50.82%
Fish	1918	46.51%
Unidentifiable	25	0.61%
Total	4124	100.00%

Table 4.17 Identified Fragments in HeLu-2 Assemblage

Identification	NISP	Percentage of Assemblage
Bird (unknown)	25	0.61%
Large bird	13	0.32%
Medium bird	29	0.71%
Wood duck	3	0.07%
Loon	6	0.15%
Swan	1	0.02%
Pelican	1	0.02%
Raven	4	0.10%
Willow ptarmigan	2	0.05%
Spruce grouse	1	0.02%
Mammal (unknown)	1865	45.50%
Large mammal	10	0.24%
Medium/large mammal	9	0.22%
Medium mammal	12	0.29%
Small mammal	4	0.10%
Artiodactyl species (unknown)	2	0.05%
Moose	8	0.20%

Table 4.17 Identified Fragments in HeLu-2 Assemblage (continued)

Caribou	5	0.12%
Marten	2	0.05%
Beaver	66	1.61%
Muskrat	53	1.29%
Hare/rabbit	59	1.44%
Canid species (unknown)	1	0.02%
Fish (unknown)	1852	45.18%
Pike	42	1.02%
Sucker	2	0.05%
Whitefish	4	0.10%
Walleye	18	0.44%
Total	4099	99.99%

4.4.1.2 Bone Tools and Other Alterations

No bone tools are present in this assemblage.

4.4.2 Caribou and other cervidae remains

4.4.2.1 Frequencies

While looking at the total number of fragments, moose bones appear to be more common (Table 4.18). When fragmentation is accounted for through MNE, however, caribou elements are slightly more common. Overall, though, it is a balance of moose and caribou, and it cannot be said for certain that one is more prevalent than the other. It should be noted that it seems that the most durable elements (i.e., phalanges, teeth, tarsal bones) are accounted for here, rather than more fragile elements (Table 4.19).

Table 4.18 Identified Cervid Remains at HeLu-2

Species	**NISP**	**%NISP**	**MNE**	**%MNE**
Caribou	5	38.46%	5	55.56%
Moose	8	61.54%	4	44.44%
Total	13	100.00%	9	100.00%

Table 4.19 Identified Cervid Elements at HeLu-2

Element	Caribou		Moose	
	MNE	***%MNE***	***MNE***	***%MNE***
Vertebra	1	20.00%	-	-
Tooth	1	20.00%	-	-
Rib	-	-	1	25.00%
Tarsal	3	60.00%	-	-
Sesamoid	-	-	1	25.00%
Phalanx	-	-	2	50.00%
Total	5	100.00%	4	100.00%

4.4.2.2 Modifications

Most of the caribou elements are burnt, though none of the moose bones are (Table 4.20). The burning is light, perhaps indicating cooking or unintentional exposure to flame.

Several cutmarks are present on the caribou tarsal bones. Light cuts on these elements may be suggestive of skinning. There are also deep cuts on the moose rib, indicating removal of meat. Light carnivore gnawing is present on the moose phalanx, but on no other elements.

Table 4.20 Modified Caribou and Moose Bones at HeLu-2

Modification type	Caribou		Moose	
	MNE	***%MNE***	***MNE***	***%MNE***
Burning	4	80%	-	-
Gnawing (carnivore)	-	-	1	25%
Cutmarks	2	40%	1	25%

4.4.2.3 Age and sex

No cervid remains could be identified as male or female. Similarly, no meaningful age classes could be distinguished beyond subadult/adult.

4.4.3 Summary

The faunal assemblage at HeLu-2 clearly demonstrates its function as a fur trade post, with many bones from furbearer species. The prevalence of fish bones suggests that fish were a key resource for the traders occupying these posts. Caribou and moose were present, but perhaps not as central to subsistence during the two seasons the area was apparently occupied.

The season of occupation is thought to be primarily winter, based on research done by Smith (1997). The remains themselves do not definitively demonstrate this, but lend support. Most of the identified species are available year-round, but caribou and furbearers would have been sought out in the winter months, as during this time caribou were available and animals like beaver had good quality fur and were in a predictable location (Malasiuk 1999). The lack of waterfowl may support the idea of a primarily winter occupation as well.

Caribou and moose were clearly hunted, but are not the most abundant species in this assemblage, based on fragments. This may simply reflect fur trade practices and perhaps season or overall availability, rather than any particular preferences.

4.5 Late Historic Cabin (HdLx-1)

HdLx-1 is a historic cabin located on the Churchill River near Island River (Smith 2001). It was first recorded in 1969 as a prehistoric campsite; these pre-contact remains were excavated as part of the first archaeological investigations for the CRD (Smith 1994, 2001). Identified in 1994 as a high priority for further mitigation and recovery, the historic part of the site was excavated in 2000. The remains found during this later excavation are considered here. Artifacts at HdLx-1 date the site to the late 1800s or early 1900s, and it was likely inhabited for several decades (Smith 2001).

4.5.1 Overall faunal assemblage

4.5.1.1 Taxon Abundances

A total of 3588 post-contact faunal fragments were collected. Several other fragments were catalogued as pre-contact or undetermined due to their context and associated artifacts, and these are not included here. The overwhelming majority of fragments are identified as mammal, with minimal bird and fish remains (Table 4.21).

Table 4.21 Classes in HdLx-1 Assemblage

Class	NSP	Percentage of Assemblage
Bird	4	0.11%
Mammal	3557	99.14%
Fish	21	0.59%
Mollusc	2	0.06%
Unidentifiable	4	0.11%
Total	3588	100.01%

Table 4.22 Identified Fragments in HdLx-1 Assemblage

Identification	NISP	Percentage of Assemblage
Bird (unknown)	4	0.11%
Mammal	402	11.22%
Large mammal	885	24.69%
Medium/large mammal	1970	54.97%
Medium mammal	66	1.84%
Small/medium mammal	27	0.75%
Small mammal	11	0.31%
Artiodactyl species (unknown)	5	0.14%
Cervid species (unknown)	2	0.06%
Moose	74	2.06%
Caribou	72	2.01%
Beaver	14	0.39%
Snowshoe hare	29	0.81%
Fish (unknown)	21	0.59%
Mollusc (unknown)	2	0.06%
Total	3584	100.01%

The majority of the mammal remains are from medium/large and large animals (Table 4.22). However, some smaller mammal species, such as beaver and hare, were identified. Caribou and moose bones are prevalent, and it is likely that the undetermined medium/large and large mammals are also *cervidae*. A lack of fish and bird should be noted; this may reflect subsistence practices or season, but it is likely also related to preservation and collection.

4.5.1.2 Bone Tools and Other Alterations

Several bone tools were identified: 2 needles from unidentified animals and 1 moose flesher. The flesher is shattered but reconstructed, and is the handle of the tool. Two mollusc buttons were also noted. In addition, amongst the possible pre-contact remains was 1 broken unidentified tool. Its use was unclear, but it was modified in some way.

4.5.2 Caribou and other cervidae remains

4.5.2.1 Frequencies

Prior to accounting for fragmentation, moose and caribou remains are essentially equal (Table 4.23). However, using MNE, it is clear that caribou bones are more abundant. As with most of the other sites discussed in this chapter, phalanges are the most common element (Table 4.24).

Table 4.23 Identified Cervid Remains at HdLx-1

Species	NISP	%NISP	MNE	%MNE
Cervid species (unknown)	2	1.35%	2	3.77%
Moose	74	50.00%	12	22.64%
Caribou	72	48.65%	39	73.58%
Total	148	100.00%	53	99.99%

Table 4.24 Identified Cervid Elements at HdLx-1

Element	**Caribou**		**Moose**		**Cervid species (uknown)**	
	MNE	***%MNE***	***MNE***	***%MNE***	***MNE***	***%MNE***
Mandible	2	5.13%	-	-	-	-
Vertebra	-	-	2	16.67%	1	50.00%
Sacrum	-	-	-	-	1	50.00%
Rib	2	5.13%	5	41.67%	-	-
Scapula	1	2.56%	-	-	-	-
Long bone*	-	-	1	8.33%	-	-
Radius	3	7.69%	-	-	-	-
Ulna	2	5.13%	-	-	-	-
Femur	-	-	1	8.33%	-	-
Tibia	1	2.56%	-	-	-	-
Metatarsus	1	2.56%	1	8.33%	-	-
Metapodium	1	2.56%	-	-	-	-
Carpal	1	2.56%	-	-	-	-
Tarsal	2	5.13%	1	8.33%	-	-
Lateral malleolus	1	2.56%	1	8.33%	-	-
Sesamoid	2	5.13%	-	-	-	-
Phalanx	20	51.28%	-	-	-	-
Total	39	99.98%	12	99.99%	2	100.00%

4.5.2.2 Modifications

Half of the moose bones and a little over half of the caribou bones exhibit signs of burning (Table 4.25). Most of these burnt bones are charred or blackened. While not fully calcined, the bones are still fairly burnt, suggesting intentional burning.

Two moose ribs have cuts on the shaft, and one is sawn. These marks suggest butchery and disarticulation. Several light cuts are noted on the moose femur shaft as well, perhaps related to skinning or to general butchery. Many caribou elements have cuts and chops, demonstrative of butchering. Of particular interest are the cutmarks on the posterior section of the mandible, which may suggest skinning or the removal of the jaw. One caribou and two moose bones have

light carnivore gnawing. As with previous sites, a consideration of fragmentation and breakage suggests marrow extraction.

Table 4.25 Modified Caribou and Moose Bones at HdLx-1

Modification type	**Caribou**		**Moose**	
	MNE	***%MNE***	***MNE***	***%MNE***
Burning	24	61.54%	6	50.00%
Gnawing (carnivore)	1	2.56%	1	8.33%
Cutmarks	13	25.00%	3	33.33%

4.5.2.3 Age and sex

No elements indicated sex. The majority of moose and caribou bones could not be aged beyond subadult/adult. There is one possible juvenile caribou phalanx, but this identification is uncertain.

4.5.3 Summary

This late 1800s cabin provides insight into the subsistence patterns of its occupants. The majority of remains come from larger animals, likely caribou and moose, which suggests a focus on large game hunting here. Smaller mammals such as beaver and hare were also identified, though to a lesser extent. It is nevertheless likely that trapping was a relatively important activity for the inhabitants.

While moose would have been available year-round, caribou would be more prevalent during the winter months in this area. Given the lack of bird remains, it may be that this cabin was occupied primarily during the winter. In general, the lack of variety in species and sizes may indicate brief winter occupations with limited access to certain species.

Overall, caribou appear to have been a key species at this site, along with other large mammals like moose. There is much evidence of butchery and marrow extraction from caribou.

4.6 Can of Birds (HfLp-6)

HfLp-6, named 'Can of Birds' by the field crew, was excavated in 1974 and 1975 (Kelly 1982; Kroker 1990). Due to the distance to York Factory, fur trade posts were established in this area in the 1700s to accommodate Cree people from the region (Kroker 1990). There are two components to this site considered here: a historic hearth with minimal pre-contact material intermixed and an accumulation of debris from a more recent (1950s) occupation (Kelly 1982).

4.6.1 Overall HfLp-6 Fur Trade faunal assemblage

4.6.1.1 Taxon Abundances

In the hearth, a mixture of mammal and fish bones was found (Table 4.26). Mammal bones are the most common, though it must be remembered that fish remains are more fragile and thus less likely to be recovered.

Amongst the mammal remains, no small mammals were identified (Table 4.27). The only species identified was caribou. Most fish bones were unidentified, save for one pike bone.

Table 4.26 Classes in HfLp-6 Fur Trade Assemblage

Class	NSP	Percentage of Assemblage
Mammal	65	82.28%
Fish	14	17.72%
Total	79	100.00%

Table 4.27 Identified Fragments in HfLp-6 Fur Trade Assemblage

Identification	NISP	Percentage of Assemblage
Mammal (unknown)	42	53.16%
Large mammal	12	15.19%
Medium/large mammal	2	2.53%
Medium mammal	1	1.27%
Cervid species (unknown)	1	1.27%
Caribou	7	8.86%
Fish (unknown)	13	16.46%
Pike	1	1.27%
Total	79	100.01%

4.6.1.2 Bone Tools and Other Alterations

No bone tools or otherwise altered bones were found with this hearth.

4.6.2 HfLp-6 Fur Trade caribou and other cervidae remains

4.6.2.1 Frequencies

As only caribou remains could be identified, there is not much to be said regarding the frequency of this species (Tables 4.28, 4.29).

Table 4.28 Identified Cervid Remains at HfLp-6 (Fur Trade)

Species	NISP	%NISP	MNE	%MNE
Cervid species (unknown)	1	12.50%	1	14.29%
Caribou	7	87.50%	6	85.71%
Total	8	100.00%	7	100.00%

Table 4.29 Identified Cervid Elements at HfLp-6 (Fur Trade)

Element	**Caribou**		**Cervid species (uknown)**	
	MNE	***%MNE***	***MNE***	***%MNE***
Rib	1	16.67%	-	-
Ulna	1	16.67%	-	-
Tibia	-	-	1	100.00%
Tarsal	3	50.00%	-	-
Phalanx	1	16.67%	-	-
Total	6	100.01%	1	100.00%

4.6.2.2 Modifications

Interestingly, no burning was noted on these remains, despite their location (Table 4.30). The bones were in poor condition, presumably due to soil conditions and weathering.

One caribou element, an ulna, was gnawed by a carnivore. Another, a tarsal, had light carnivore and rodent gnawing. Butchery marks suggest disarticulation; two elements appear to have been cut or sawn. One rib also has a cutmark, probably indicating the removal of meat or organs. As for fragmentation, it is likely that these bones were broken for marrow, or broken through disposal.

Table 4.30 Modified Caribou and Moose Bones at HfLp-6 (Fur Trade)

Modification type	**Caribou**	
	MNE	***%MNE***
Gnawing (carnivore)	1	16.67%
Gnawing (carnivore and rodent)	1	16.67%
Cutmarks	3	50%

4.6.2.3Age and sex

Age and sex could not be determined based on these remains.

4.6.3 HfLp-6 Fur Trade Summary

Because there was a lack of identified species and a limited context, few conclusions can be made. Both mammal and fish were used. No small mammal or bird remains were present, which may suggest a choice based on need or season, or possibly a short occupation of the campsite. However, this may be a preservation issue, particularly given that the remains were found in a hearth. More fragile bones may not have survived, or may be scattered elsewhere.

4.6.4 Overall HfLp-6 Recent faunal assemblage

4.6.4.1 Taxon Abundances

A total of 2907 fragments were collected from the recent occupation areas of the site, which allows for a more detailed interpretation. The remains are primarily mammal, with some fish and minimal bird bones (Table 4.31).

Table 4.31 Classes in HfLp-6 Recent Assemblage

Class	NSP	Percentage of Assemblage
Bird	28	0.96%
Mammal	2700	92.88%
Fish	176	6.05%
Mollusc	3	0.10%
Total	2907	99.99%

Larger mammal species, including caribou, are the most common, but smaller mammal species, including beaver, were also found (Table 4.32). Fish bones were collected as well, and it is clear that they were also an important resource. Bird bones were comparatively rare.

Table 4.32 Identified Fragments in HfLp-6 Recent Assemblage

Identification	NISP	Percentage of Assemblage
Bird (unknown)	6	0.21%
Large bird	9	0.31%
Medium/large bird	1	0.03%
Medium bird	12	0.41%
Mammal (unknown)	2049	70.49%
Large mammal	273	9.39%
Medium/large mammal	132	4.54%
Medium mammal	20	0.69%
Cervid species (unknown)	9	0.31%
Caribou	159	5.47%
Canid species (unknown)	6	0.20%
Mustelid species (unknown)	1	0.03%
Beaver	43	1.48%
Muskrat	8	0.28%
Fish (unknown)	169	5.81%
Pike	5	0.17%
Sucker	2	0.07%
Mollusc (Bivalve)	1	0.03%
Snail	2	0.07%
Total	2907	99.99%

4.6.4.2 Bone Tools and Other Alterations

No bone tools or otherwise modified bones were recovered.

4.6.5 HfLp-6 Recent caribou and other cervidae remains

4.6.5.1 Frequencies

With no moose identified, caribou were the primary large mammal (Table 4.33). Phalanges were the most common element, in part due to overrepresentation, but also suggestive of butchery and use (Table 4.34). Tibiae, scapulae, and vertebrae were also common recoveries.

Table 4.33 Identified Cervid Remains at HfLp-6 (Recent)

Species	**NISP**	**%NISP**	**MNE**	**%MNE**
Cervid species (unknown)	9	5.36%	3	2.91%
Caribou	159	94.64%	100	97.09%
Total	168	100.00%	103	100.00%

Table 4.34 Identified Cervid Elements at HfLp-6 (Recent)

Element	**Caribou**		**Cervid species (uknown)**	
	MNE	***%MNE***	***MNE***	***%MNE***
Cranium	2	2.00%	-	-
Mandible	5	5.00%	-	-
Tooth	2	2.00%	-	-
Vertebra	9	9.00%	-	-
Innominate	2	2.00%	-	-
Scapula	10	10.00%	1	33.33%
Humerus	2	2.00%	1	33.33%
Radius	7	7.00%	-	-
Ulna	6	6.00%	-	-
Femur	4	4.00%	1	33.33%
Tibia	10	10.00%	-	-
Metacarpus	1	1.00%	-	-
Metatarsus	8	8.00%	-	-
Metapodium	5	5.00%	-	-
Carpal	1	1.00%	-	-
Tarsal	6	6.00%	-	-
Lateral malleolus	1	1.00%	-	-
Phalanx	19	19.00%	-	-
Total	100	100.00%	3	99.99%

4.6.5.2 Modifications

Over a third of caribou bones are burnt to some degree (Table 4.35). These are mainly blackened and calcined, suggesting intentional burning. Carnivore gnawing on several elements may indicate scavenging or the presence of dogs with the occupants of the site. Butchery marks in this assemblage indicate several practices: skinning, disarticulation, and the intentional splitting of bones to access marrow.

Phalanges are more complete in comparison to those identified at other sites, which may indicate marrow extraction from these bones may not have been as important an activity. Interestingly, all tibiae are represented by distal ends. The prevalence of distal ends may suggest tool-making; perhaps fleshers were being made to process furs.

Table 4.35 Modified Caribou and Moose Bones at HfLp-6 (Recent)

Modification type	**Caribou**	
	MNE	***%MNE***
Burning	38	38.00%
Gnawing (carnivore)	11	11.00%
Gnawing (rodent)	1	1.00%
Cutmarks	12	12.00%

4.6.5.3 Age and sex

In general sex could not be determined, though two possible female and two possible male caribou were identified based on pelvic bones and on mandible size/length. This tells us little of the sex structure, however.

As for age, the majority were identified as subadult/adult or adult. Several were indeterminate. Three bones were identified as juvenile and one as juvenile/subadult based on degree of fusion of long bones and vertebrae.

4.6.6 HfLp-6 Recent Summary

This recent debris comes from hunting cabins, and represents the activities of the occupants. They hunted caribou during the winter. The remains show that furbearers were also used. Trappers occupied these cabins during the winter. Fish were an additional food source.

Male and female caribou were both hunted, and no particular preference is suggested by these bones. Caribou served as a food source and provided materials for clothing and for tools.

4.7 Flicker (HeLw-20)

HeLw-20, the Flicker site, is located on the left bank of the MacBride River (Hanna 1975). It was found and excavated in 1973. The site has been continuously occupied to some degree over time, and these cultural components are not stratified (Hanna 1975). Thus, the faunal remains cannot be accurately separated into time periods. With this in mind, HeLw-20 is considered as a whole, more representative of the area than of any individual time period.

4.7.1 Overall faunal assemblage

4.7.1.1 Taxon Abundances

A total of 1131 bone fragments are considered below. The majority of the remains could be identified as mammal (Table 4.36). Fish is also a prominent class. More mollusc fragments were found than bird.

Table 4.36 Classes in HeLw-20 Assemblage

Class	NSP	Percentage of Assemblage
Bird	30	2.65%
Mammal	880	77.81%
Fish	165	14.59%
Mollusc	56	4.95%
Total	1131	100.00%

Table 4.37 Identified Fragments in HeLw-20 Assemblage

Identification	NISP	Percentage of Assemblage
Bird (unknown)	9	0.80%
Large bird	7	0.62%
Medium/large bird	5	0.44%
Medium bird	5	0.44%
Canada Goose	3	0.27%
Hawk/Eagle/Kite (unknown)	1	0.09%
Mammal	546	48.28%
Large mammal	115	10.17%
Medium/large mammal	2	0.18%
Medium mammal	35	3.09%
Small/medium mammal	5	0.44%
Cervid species (unknown)	2	0.18%
Moose	14	1.24%
Caribou	75	6.63%
Carnivore species (unknown)	1	0.09%
Fox (arctic or red)	10	0.89%
Weasel species (unknown)	1	0.09%
Beaver	31	2.74%
Muskrat	39	3.45%
Red squirrel	1	0.09%
Hare/rabbit	3	0.27%
Fish (unknown)	128	11.32%
Jackfish	37	3.27%
Mollusc (unknown)	3	0.27%
Mollusc (Bivalve)	36	3.18%
Mollusc (Snail)	17	1.50%
Total	1131	100.03%

Of the mammal remains identified to size or species, large mammal bones are the most abundant (Table 4.37). Bones specifically identified as caribou account for 6.65% of the assemblage. A wide variety of species were identified, including a number of furbearers. Of these, muskrat and beaver are particularly numerous. Various bivalves and snails are also included here.

4.7.1.2 Bone Tools and Other Alterations

Recovered bone tools include 1 broken harpoon head from a mammal bone and 1 awl made from a caribou metatarsal. The latter is a shaft fragment that appears utilized and was likely an expedient tool -- a fragment that was used as a make-shift tool immediately and possibly abandoned soon afterward.

4.7.2 Caribou and other cervidae remains

4.7.2.1 Frequencies

Caribou remains account for the majority of identified cervid remains and are more numerous than moose (Table 4.38). The most common caribou elements are tarsal bones (Table 4.39), most likely due to the durability and number of these within an individual skeleton. Metatarsal bones were also relatively common. These bones may indicate discard practices, with lower limb bones being discarded in a different area than more central bones.

Table 4.38 Identified Cervid Remains at HeLw-20

Species	NISP	%NISP	MNE	%MNE
Cervid species (unknown)	2	2.20%	2	3.13%
Moose	14	15.38%	9	14.06%
Caribou	75	82.42%	53	82.81%
Total	91	100.00%	64	100.00%

Table 4.39 Identified Cervid Elements at HeLw-20

Element	Caribou		Moose		Cervid species (uknown)	
	MNE	***%MNE***	***MNE***	***%MNE***	***MNE***	***%MNE***
Antler	1	1.89%	-	-	-	-
Vertebra	-	-	2	22.22%	-	-
Rib	-	-	3	33.33%	-	-
Scapula	2	3.77%	-	-	-	-
Radius	1	1.89%	-	-	-	-
Ulna	2	3.77%	-	-	-	-
Femur	-	-	1	11.11%	-	-
Tibia	1	1.89%	-	-	-	-
Metacarpus	2	3.77%	-	-	-	-
Metatarsus	9	16.98%	1	11.11%	-	-
Metapodium	-	-	-	-	1	50.00%
Carpal	5	9.43%	-	-	-	-
Tarsal	22	41.51%	-	-	-	-
Phalanx	8	15.09%	2	22.22%	1	50.00%
Total	53	99.99%	9	99.9(%	2	100.00%

4.7.2.2 Modifications

Over a quarter of caribou bones are burnt, along with 1 moose bone (Table 4.40). The majority are lightly charred or affected by fire, suggesting perhaps unintentional burning through cooking or other activities. Several are calcined, however, possibly for disposal or fuel use.

Carnivore gnawing is minimal and light. Rodent gnawing is only present on one element: a moose vertebra. Signs of butchery are a mix of light cutmarks, deep gouges, and light chop

marks. Important, caribou antler fragments are scored and appear to be the remnants of tool production. Other cutmarks are signs of disarticulation and removal of meat. In addition, a moose metatarsal appears to have been cut and split, likely for marrow extraction. Marrow extraction is also suggested by the fractures observed on many phalanges and the fragmentary long bones only identifiable as large mammal.

Table 4.40 Modified Caribou and Moose Bone at HeLw-20

Modification type	**Caribou**		**Moose**	
	MNE	***%MNE***	***MNE***	***%MNE***
Burning	15	28.30%	1	11.11%
Gnawing (carnivore)	2	3.77%	3	33.33%
Gnawing (rodent)	-	-	1	11.11%
Cutmarks	9	16.98%	1	11.11%

4.7.2.3 Age and sex

No *cervidae* bones could be sexed at HeLw-20. Moose bones could not be aged beyond subadult/adult. The majority of caribou bones are subadult/adult or of indeterminate age. However, one caribou element, an unfused distal metatarsal epiphysis, is from a juvenile animal.

4.7.3 Summary

The overall faunal assemblage from HeLw-20 indicates a broad exploitation pattern, presumably maintained across time. It consists mainly of mammal, with fish also being a key class. Large mammal and caribou are more abundant than others, but beaver and muskrat are prominent as well.

Other than the migratory species identified, namely caribou and Canada Goose, most of the animals in this assemblage are available year-round. It is likely that HeLw-20 was occupied throughout the year at various points during its use.

Caribou were more prevalent than moose, indicating that this animal was used more, either due to abundance or preference. Modifications to the bones demonstrate that caribou were used for food, skins, and tool manufacture.

4.8 York Factory

York Factory was a key centre of the fur trade in Canada. It was first built in 1684, changed hands multiple times between 1685 and 1714, and rebuilt several times after that slightly upriver (Lytwyn 1993; Payne 1996; Simpson 1972). After it was returned to the British in 1714, "York Factory quickly became the single most important trading post in the Hudson's Bay Company's territories" (Payne 1996:15). Once trading posts were established inland, trade at York Factory began to decline. Nevertheless, it remained an important location for the HBC until the 20th century. As its function became more of a warehouse and administration location over the years, new buildings were constructed. The Old Octagon was the main building at York Factory initially, but it was replaced by the Depot building in the 1830s (Payne 1996). Due to construction and other disturbances over the years, the faunal assemblage is highly disturbed and difficult to differentiate. As described below, a consideration of individual strata, buildings, and areas was attempted, but found to offer few additional insights at this time due to this high level of disturbance. Therefore, the following analysis looks at the fauna from York Factory and vicinity as a whole.

4.8.1 Overall faunal assemblage

4.8.1.1 Taxon Abundances

A total of 82137 faunal fragments have been collected from York Factory and related sites. A large proportion of these remain unidentified (Table 4.41). Of the identified classes, mammal remains are the most abundant, closely followed by bird bones. Fish bones, though much less numerous, are still a prominent class.

Table 4.41 Classes in York Factory Assemblage

Class	NSP	Percentage of Assemblage
Bird	12543	15.27%
Mammal	15615	19.01%
Fish	4606	5.61%
Mollusc	355	0.43%
Reptile	5	0.01%
Unidentified	49013	59.67%
Total	82137	100.00%

A wide variety of species were exploited at York Factory (Table 4.42). Many different types of waterfowl and birds were used. In particular, geese were important. The mammal bones represent both wild and domestic species, and both food sources and furbearing animals. Cow and pig, for instance, were raised at York Factory for consumption. Domestic dogs were used for sled teams and hunting, and the remains of these animals are numerous. Caribou and general large mammal bones are abundant as well, indicating that they were a key species amongst others. Beaver, hare, and other small and medium mammals are noted, though are interestingly not as common as one might expect. This is likely because furbearers would be trapped and processed elsewhere, with only furs brought to the post itself. Whales and other marine mammals

were also used, though again not as prominent as other mammals. No specific fish species were identified, but fish in general appear to have been another key resource.

Table 4.42 Identified Fragments in York Factory Assemblage

Identification	NISP	Percentage of Assemblage
Bird (unknown)	10899	32.90%
Large bird	132	0.40%
Medium/large bird	209	0.63%
Medium bird	187	0.56%
Small/medium bird	364	1.10%
Small bird	128	0.39%
Duck/goose species (unknown)	13	0.04%
Duck species (unknown)	25	0.08%
Goose species (unknown)	70	0.21%
Canada Goose	95	0.29%
Snow Goose	19	0.06%
Mallard	9	0.03%
Swan	7	0.02%
Grey Partridge	2	0.01%
Ptarmigan	9	0.03%
Grouse	1	0.00%
Wren	6	0.02%
Crow/raven (unknown)	1	0.00%
Killdeer	367	1.11%
Mammal (unknown)	12725	38.42%
Large mammal	610	1.84%
Medium/large mammal	697	2.10%
Medium mammal	214	0.65%
Small/medium mammal	162	0.49%
Small mammal	86	0.26%
Artiodactyl species (unknown)	4	0.01%
Cervidae	108	0.32%
Moose	23	0.07%
Caribou	424	1.28%
Sheep/goat (unknown)	1	0.00%
Cow	3	0.01%
Pronghorn	1	0.00%
Pig	7	0.02%
Canid species (unknown)	10	0.03%
Wolf/dog (unknown)	209	0.63%

Table 4.42 Identified Fragments in York Factory Assemblage (continued)

Identification	NISP	Percentage of Assemblage
Fox	32	0.09%
Domestic dog	87	0.26%
Wolf	2	0.01%
Mustelid species (unknown)	1	0.00%
Black bear/polar bear	15	0.04%
Rodent species (unknown)	50	0.15%
Shrew	12	0.04%
Beaver	22	0.07%
Ground squirrel	1	0.00%
Porcupine	1	0.00%
Hare/rabbit	42	0.12%
Marten	1	0.00%
Wolverine	1	0.00%
Whale	19	0.06%
Beluga whale/narwhal (unknown)	11	0.03%
Beluga	27	0.08%
Seal (Common/Spotted/Bearded)	7	0.03%
Fish (unknown)	4606	13.91%
Mollusc (unknown)	282	0.85%
Mollusc (Bivalve)	57	0.17%
Snail	16	0.05%
Reptile (unknown)	4	0.01%
Turtle	1	0.00%
Total	33124	99.98%

4.8.1.2 Bone Tools and Other Alterations

Many tools and altered bones were collected from York Factory. Bone and shell buttons are the most common of these, with over 100 buttons and button blanks recovered. Two caribou scapulae with holes from producing button were also collected. Other pieces include combs made from shell, tortoise, and unidentified bones; 8 bone awls; several gaming pieces; and a bone pipe. Harpoons, knives, and several tool or utensil handles made from unidentified mammal bones were also recovered. Importantly, four scraping and fleshing tools were identified, two made from caribou and two made from moose.

4.8.2 Caribou and other cervidae remains

4.8.2.1 Frequencies

Caribou bones are much more abundant than moose (Table 4.43). This suggests that moose were not widely available in this area. The number of caribou bones also indicates that caribou were an important species at York Factory in general. Phalanges were by far the most common caribou element (Table 4.44). Tarsal bones and vertebra were also numerous. There are a variety of long bones that were identified as well. The variety of elements may indicate that this site had more of each stage of butchery than previous sites.

Table 4.43 Identified Cervid Remains at York Factory

Species	**NISP**	**%NISP**	**MNE**	**%MNE**
Cervid species (unknown)	108	19.46%	84	17.91%
Moose	23	4.14%	19	4.05%
Caribou	424	76.40%	366	78.04%
Total	555	100.00%	469	100.00%

Table 4.44 Identified Cervid Elements at York Factory

Element	**Caribou**		**Moose**		**Cervid species (uknown)**	
	MNE	***%MNE***	***MNE***	***%MNE***	***MNE***	***%MNE***
Antler	-	-	-	-	1	1.19%
Cranium	3	0.82%	1	5.26%	3	3.57%
Mandible	15	4.10%	1	5.26%	4	4.76%
Tooth	8	2.19%	2	10.53%	12	14.28%
Vertebra	33	9.02%	1	5.26%	8	9.52%
Rib	17	4.64%	4	21.05%	13	15.48%
Sacrum	2	0.55%	-	-	-	-
Innominate	11	3.01%	1	5.26%	2	2.38%
Scapula	9	2.46%	1	5.26%	1	1.19%
Long Bone	-	-	-	-	1	1.19%
Humerus	19	5.19%	-	-	-	-
Radius	26	7.10%	1	5.26%	3	3.57%

Table 4.44 Identified Cervid Elements at York Factory (continued)

Element	**Caribou**		**Moose**		**Cervid species (uknown)**	
	MNE	***%MNE***	***MNE***	***%MNE***	***MNE***	***%MNE***
Ulna	11	3.01%	-	-	2	2.38%
Femur	13	3.55%	3	15.79%	5	5.95%
Tibia	21	5.74%	1	5.26%	3	3.57%
Metacarpus	10	2.73%	1	5.26%	-	-
Metatarsus	16	4.37%	-	-	8	9.52%
Metapodium	8	2.19%	-	-	2	2.38%
Carpal	10	2.73%	-	-	2	2.38%
Tarsal	24	6.56%	-	-	4	4.76%
Carpal/tarsal (unknown)	-	-	-	-	1	1.19%
Lateral Malleolus	12	3.28%	-	-	-	-
Sesamoid	6	1.64%	-	-	3	3.57%
Phalanx	92	25.14%	2	10.53%	6	7.14%
Total	366	100.02%	19	99.98%	84	99.97%

4.8.2.2 Modifications

A relatively small number of caribou and moose bones are burnt (Table 4.45). Burning was likely accidental in many cases, given the condition of the bones and the small degree of burning and heat exposure. Bones that were burnt heavily were likely for fuel or disposal.

Carnivore gnawing is simple to explain at York Factory: bones were given to the dogs onsite, and this is why nearly a quarter of caribou bones and over a third of moose bones show signs of gnawing. Many of the bones are gnawed quite heavily.

Butchery marks are relatively common on these bones. Several bones have chop marks, suggesting disarticulation and dismemberment. The many scrapes and cuts on long bone shafts indicate the removal of meat, either before or after cooking. Cutmarks on the ends of bones represent disarticulation or the removal of meat. Cuts also were noted on several vertebrae, also

indicative of the removal of meat. Some of these cuts may be from skinning of the animals as well.

Breakage and fragmentation should also be noted. Phalanges are a mixture of whole, broken proximal ends, and broken distal ends. It is likely that these elements were broken for marrow extraction, though fracture types are unclear for some. Many long bone fragments are possibly from the extraction of marrow as well, but this cannot be said for certain as this analysis did not include a detailed consideration of fracture types. In addition, many of the recovered mandibles were broken in a location that allows for the extraction of marrow. Metapodia are not fragmented in a particular pattern: there is a mixture of shaft fragments, proximal ends, and distal ends. This is not suggestive of a particular use. Finally, tibia remains are also a mixture proximal and distal ends. This may still be evidence of tool manufacture, but it is uncertain.

Table 4.45 Modified Caribou and Moose Bones at York Factory

Modification type	**Caribou**		**Moose**	
	MNE	***%MNE***	***MNE***	***%MNE***
Burning	56	15.30%	2	10.53%
Gnawing (carnivore)	85	23.22%	7	36.84%
Gnawing (rodent)	7	1.91%	-	-
Gnawing (carnivore and rodent)	4	1.09%	-	-
Cutmarks	126	34.43%	5	26.32%

4.8.2.3 Age and sex

The sex of the majority of the *cervidae* remains could not be determined. Six caribou elements were identified as female, two were tentatively identified as female, and six were tentatively identified as male. These identifications were based on features of innominate bones

and lengths/sizes of mandibles. However, this does not indicate anything in particular regarding the sex structure of the assemblage.

Most of the moose remains were adult or subadult/adult, but one was identified as a juvenile. Similarly, most of the unknown *cervidae* remains were adult or subadult/adult, but 13 elements (or 15.66%) were identified as juvenile. The caribou remains are 9.02% juvenile, or 33 elements. In addition, 3 caribou elements were identified as juvenile/subadult. These identifications are based on degree of fusion, porosity, and size. When teeth were examined, tooth wear and eruption was used to determine age. The presence of juveniles suggests a summer or fall hunt.

4.8.3 Regarding Areas and Time Periods of York Factory

As part of the analysis, attempts were made at dividing the faunal assemblage based on location on the site and time period. In general, no significant differences emerged that can be commented on accurately. It appears that the overall assemblage is generally representative of the faunal exploitation patterns at York Factory over time. It is also important to recognize that due to the environment and to the activities on site (i.e., continual construction and additions of buildings during the life of the fort), many of the remains are intermixed and cannot be accurately assigned to a particular time period. For these reasons, analyses based on these divisions are not included here.

However, one interesting pattern emerged when looking at the remains from the excavation of the Native encampment at York Factory: this area exhibited a similar mixture of species to several of the sites at Southern Indian Lake. It was also lacking in domestic species such as pig and cow, save for one cow bone. However, unlike the sites at Southern Indian Lake,

bird bones were more prevalent. This area provides some insight into Cree subsistence patterns in the coastal area.

4.8.4 Summary

The overall assemblage at York Factory represents a broad use of faunal resources. Domestic and wild species are used, and both food uses and fur uses of animals are implicit in the data. Mammals and birds were key resources at this site, supplemented by fish. Preservation issues must be kept in mind, however, and it is likely that fish were more numerous than represented archaeologically.

We know that York Factory was occupied year-round, and this is also represented by the faunal remains. The variety of species in and of itself indicates hunting and resource use in each season. Caribou would have been primarily available during the late fall and spring migrations. Waterfowl would be most common in spring and fall. Fish would be available year-round, but likely stocked through the summer and fall for the winter months. Ptarmigan and partridges would be important over the winter as well.

Caribou were an important resource amongst others at York Factory. Archaeologically, it is clear that these animals made up a large proportion of the resource base, but that bird species and fish also played an important role. Caribou were used for meat, skins, and tools, demonstrated by butchery patterns and the presence of bone tools. Importantly, moose were not common at this site during the fur trade.

4.9 Summary

This zooarchaeological analysis has demonstrated the relative importance of caribou in northern Manitoba, both during the pre-contact period and during the fur trade. Similar uses are represented at each site: caribou were used for meat, marrow, skins, and tools. A consideration of the optimal seasons of use for caribou and other species aids in understanding usage patterns and interpreting the archaeological remains.

Differences in exploitation of animal resources are generally unrelated to caribou. For instance, fish use appears more common at most sites around Southern Indian Lake than bird use, whereas bird use appears more common at York Factory, though fish also account for a significant portion of the assemblage (Figure 4.1). This variation is likely explained by the differential availability of these species and by issues with archaeological preservation. Marine mammals were also available in the coastal region, and thus are found in the York Factory assemblage. In addition, some sites have a higher abundance of beaver, muskrat, and other smaller mammals, at times more so than caribou. This is likely tied to site function and length of occupation for each individual site. Another important difference is the use of moose, which is much more common at Southern Indian Lake. The reason for this is again related to the availability of the animal: moose were not common in the York Factory region historically. In general, it appears that a similar variety of species were exploited prehistorically and historically. Only the domesticated mammals from York Factory represent a significant change in the use of fauna. For instance, Kame Hills offered a variety of species that appears similar to the variety at some of the more recent sites, implying little change in the breadth of subsistence patterns.

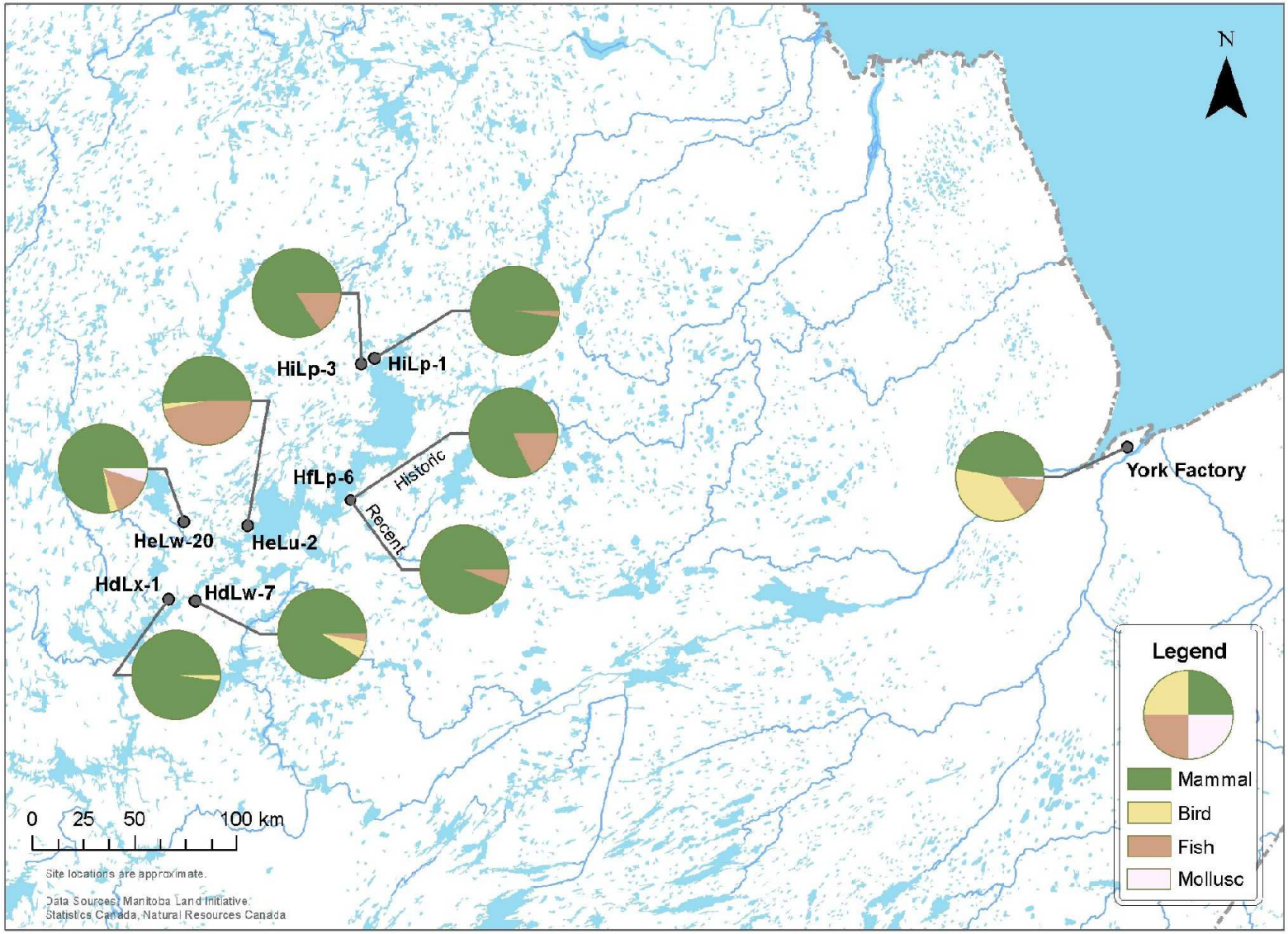

Figure 4.1 General taxonomic abundances at each site

Overall, the archaeological remains show a trend of continued use of caribou over time and across the study region. There are no signs of population declines, but populations cannot be commented on using this data, due to the broad and at times unclear time periods covered by each site. The archaeological collections also provide examples of the different ways in which caribou may be used, such as food and tool manufacture, with the use of skins implied.

This chapter has focused on the findings of the zooarchaeological analysis. Next, I explore the findings from the archival research and the work with YFFN. These sources provide insight into caribou use, value, and migration and abundance patterns.

CHAPTER V:
FINDINGS FROM ETHNOHISTORICAL REVIEW AND COMMUNITY INSIGHTS

This chapter presents the findings from the ethnohistorical research as well as the insights from interviews and workshops with YFFN. The ethnohistorical information includes trade data, hunting and migration descriptions, and evidence of caribou use from York Factory records, Indian Lake records, and first-person historical accounts. This is followed by commentary on the community workshops and a discussion of what was learned through the interviews. Together, these methods provide a detailed understanding of the use and value of caribou in the region.

5.1 Ethnohistorical Review

5.1.1 York Factory Records

The post journals, district reports, and account books associated with York Factory provided insight into caribou hunting practices, migrations, trade patterns, and general usage.

5.1.1.1 Migrations and hunting

At York Factory, several methods were used for hunting caribou. The two main practices were the use of caribou hedges and snares, and hunting using guns in the open areas. Hedges were used each year, with men staying at or periodically being sent to the hedges during the hunting seasons. Both ‘the hedge’ and ‘the upper hedge’ are referred to (e.g., HBCA B.239/a/5). Caribou were dragged back to the fort by dog sled or transferred by canoe or boat. As the trade become more established, Cree hunters were employed by the HBC and sent on hunting excursions, which is made evident by various entries in the 1800s.

Several hunting locations are mentioned, indicative of where caribou were moving during their migrations. The caribou hedges near the fort are the focus. There is a hedge at Ten Shilling Creek referred to. Hedges are described in other historical sources (e.g., HBCA B.91/a/5) as being made of branches, with entryways at various intervals lined with snares made of hide to catch the caribou. Men were often sent 'in search of deer' in other locations, including crossings at French Creek, Heal River, Steel River, Pennycuttaway River, and the Nelson River, as well as when caribou were near Port Nelson or in 'the plains'. In addition, the 1815 York Factory District Report states that caribou crossed Gull Lake through "a convenient narrow" in the lake, as well as at Split Lake, where they would cross in August, November, and April (HBCA B.239/e/1).

These crossings are mentioned outside of the context of hunting as well, and at times the writers of these journals comment on the migration or provide details. Caribou are often described crossing rivers. For instance, on August 15th, 1720, 32 caribou (referred to as 'deer') were seen crossing the river, presumably the Hayes (HBCA B.239/a/5). At other times, 'large numbers' are seen crossing or calving (e.g., May 1815, B.239/a/121). Crossings and migrations are generally mentioned in April or May and September. Hunting and trade occurs throughout the year, but were most commonly mentioned in May or June and September, October, or November. In earlier years (i.e., 1720-1800), hunts and trade were mostly mentioned in the late spring, summer, and early fall. This appears to shift more to spring and winter months after 1815.

5.1.1.2 Scarcity

Hunting success varies, and at various times hunts fail with hunters returning empty-handed. This happens in many years, and does not appear to indicate any particular pattern. At

various points in time, it is commented that “there is no Deer to be seen” (e.g., September 6, 1750, HBCA B239/a/62). However, in some years, great scarcity and starvation is commented upon, and this suggests a decline in caribou populations or availability. In 1800, many entries indicate that game animals were particularly scarce on the coast. For instance, it is said that game are becoming more and more scarce:

> It is truly pitiful to hear the complaints of Indians that visit the Factory from whatsomever quarter they come from. No Deer, Partridges, Rabbits or Fish to be got nor anything for them to make a sorry subsistence on, but what they chiefly receive from the Factory. I cannot help remarking that every species of Game proves scarcer and scarcer every Season.
>
> February 12, 1800
> [HBCA B.239/a/104]

This is said to be true in all regions, not solely around the fort. Some Native families claimed that they had subsisted on fish for most of the year, having not seen caribou since the previous fall (HBCA B.239/a/104). Indeed, in this year, several times they said “Pray God send either Deer or Geese about soon or else both English and Natives will have occasion to remember the year 1800” (April 26, 1800; HBCA B.239/a/104).

Caribou were said to make a late appearance in 1825, in low numbers. Scarcity appears to continue or recur in the 1830s. Families from the east, presumably around Fort Severn, “report[ed] favorably of the Partridge Hunt, but complain[ed] of the entire disappearance of the Rein Deer” (November 3, 1835; HBCA B.239/a/149). Similar experiences were shared by other families during this time as well. For example, one Native man told traders at York Factory that many people around ‘North River’ (Nelson River) were struggling, “in consequence of the want of deer. He himself has not killed one this Season, and many of those in that quarter have been alike unfortunate.” (February 24, 1835; HBCA B.239/a/148). Similar comments occur again in 1850, with Natives stating no deer are to be found on the coast or in the east (e.g., January 27,

1850; HBCA B.239/a/173). There were occasionally comments referring to difficulties reaching the caribou, saying they were “unable to approach deer, through want of snow” (January 12, 1850; HBCA B.239/a/173) or “the snow is too shallow and crusted to admit of their approaching the Deer” (April 19, 1850; HBCA B.239/a/173). This suggests that one issue is lack of access, not solely low numbers.

The 1889-1890 Post Report for York Factory comments on scarcity, explaining that “the continued scarcity of food and Fur animals has kept our Returns much lower than they used to be some years ago” and that the lack of food has made it impossible for Natives to hunt (HBCA B.239/e/13). However, in the journals during this time, both successful and unsuccessful hunts are mentioned, and in April 1890 caribou are said to be around the fort in great numbers (HBCA B.239/a/184). No specific number is mentioned, and this may be relative to a general scarcity, or it may suggest a recovery in numbers.

5.1.1.3 Uses and Trade

Caribou are noted as used by both York Factory traders and by Cree people. In particular, the instances of apparent starvation of Cree people and other Native groups are noted in the journals, indicating the reliance on caribou as a key food source. In general, however, caribou use is primarily referred to in the context of trade.

Caribou were brought to the fort in various forms: fresh meat, dried meat, ‘green’ meat, pemmican, bladders of fat, skins, tongues, heads, and so on. At York Factory, the meat was salted and stored in casks (e.g., 1785, HBCA B.239/a/85). Meat was also stored in the Ice House, and counted based on the cut of meat (rump, shoulder, etc.) (e.g., 1835, HBCA B.239/a/148). This meat was supplied by Cree hunters working for the HBC, as well as by Cree people who

came to the fort to trade. The Chief Factors periodically sent men on hunts and to the deer hedges to check and see what could be brought back for storage. Skins were also traded and collected for use. Skins were said to be used for snowshoes and snares, but otherwise these accounts are fairly vague.

Data collected for this project from the journals and account books were compiled and examined. However, the information put together by Lytwyn (1993) offers a more complete pattern. Lytwyn (1993) compiled data on the trade of whole caribou, tongues, and skins, as well as their use as provisions. These data demonstrate some trends in caribou trade at York Factory, and are visualized in the graphs below.

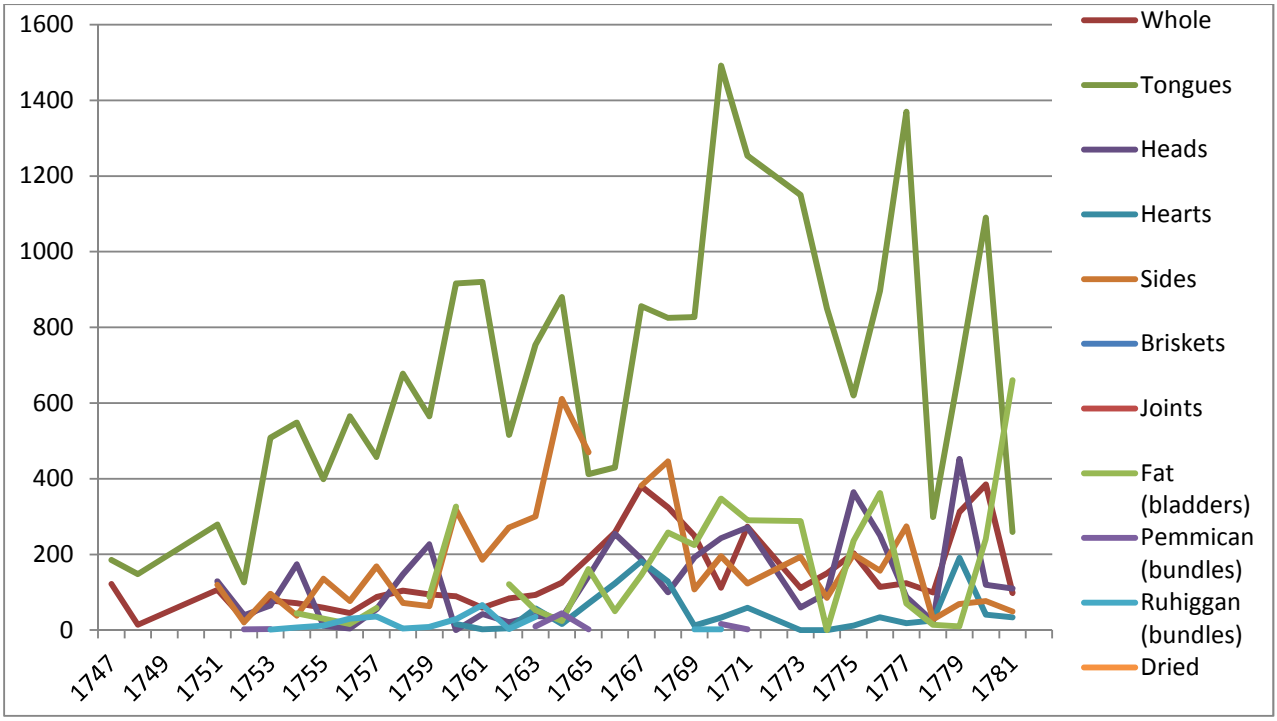

Figure 5.1 Trade of Caribou at York Factory 1747-1782 (adapted from Lytwyn 1993)

This trade data (Figure 5.1) demonstrates the overall growth of caribou trade, and various low points and possible declines. The trade of whole caribou (Figure 5.2) and the trade of tongues (Figure 5.3) in particular appear to suggest the beginnings of decline. However, it is likely related to the smallpox epidemic experienced at this time (see Lytwyn 1993). From 1747, trade generally increased, but with variation from year to year. It should be noted that for most, except perhaps the trade in fat (Figure 5.4), there is a decrease in the final year of this available data. However, this is not definitively indicative of overall decline in availability of caribou. Rather, this data demonstrates the fluctuations in trade. In the years after this, between 1787 and 1809, data from the caribou provisioning trade show a general decline (Figure 5.5).

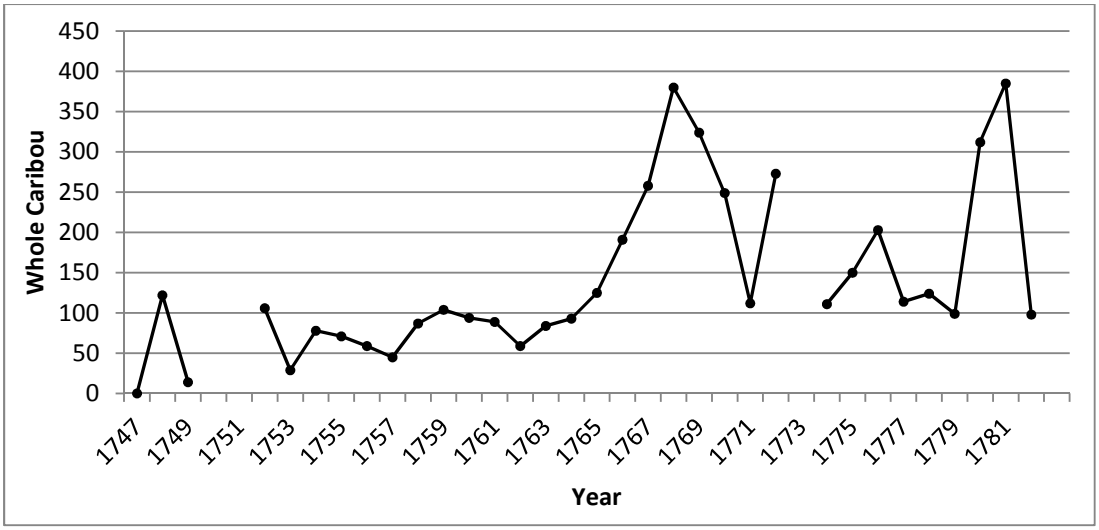

Figure 5.2 Whole caribou traded between 1747 and 1782 (adapted from Lytwyn 1993)

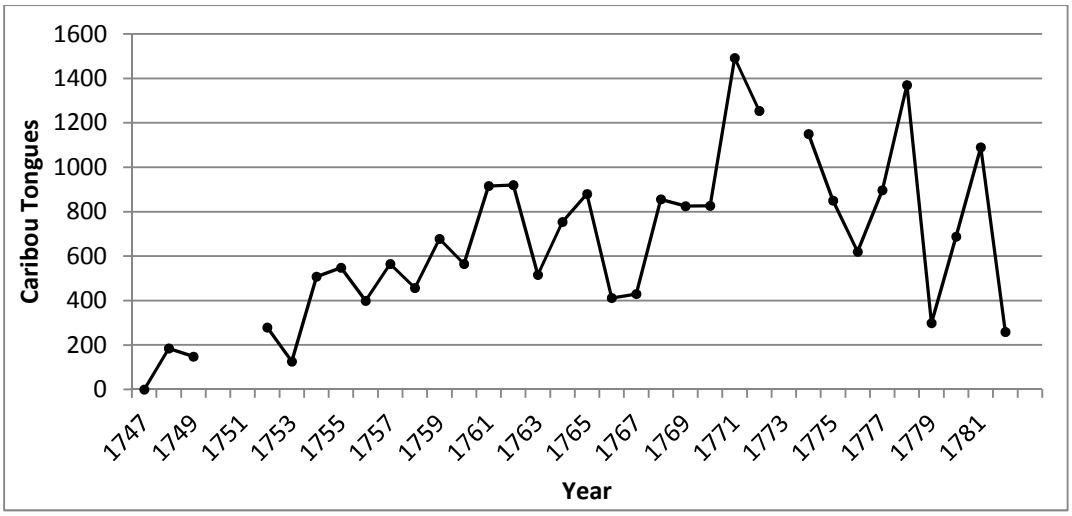

Figure 5.3 Caribou tongues traded between 1747 and 1782 (adapted from Lytwyn 1993)

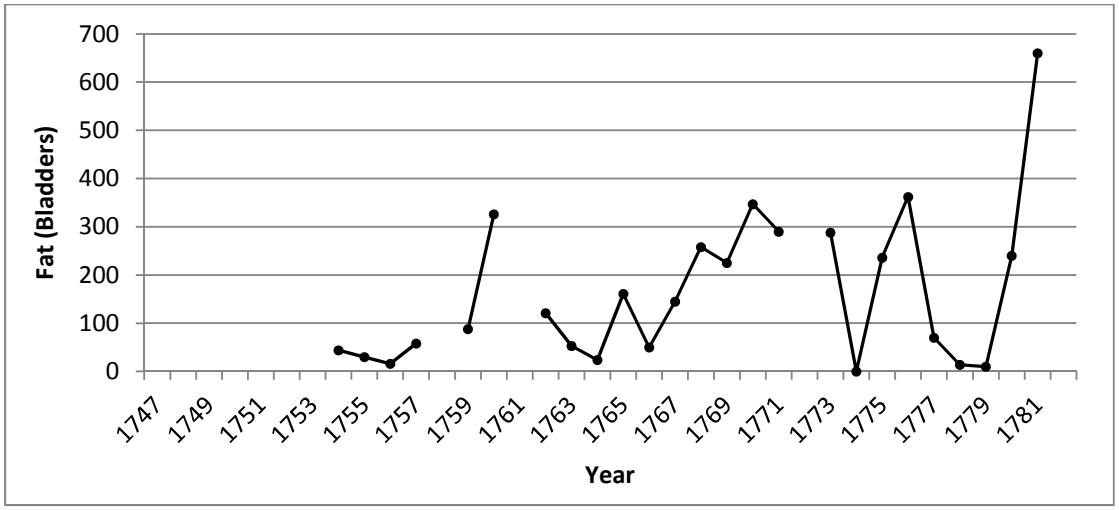

Figure 5.4 Caribou fat traded between 1747 and 1782 (adapted from Lytwyn 1993)

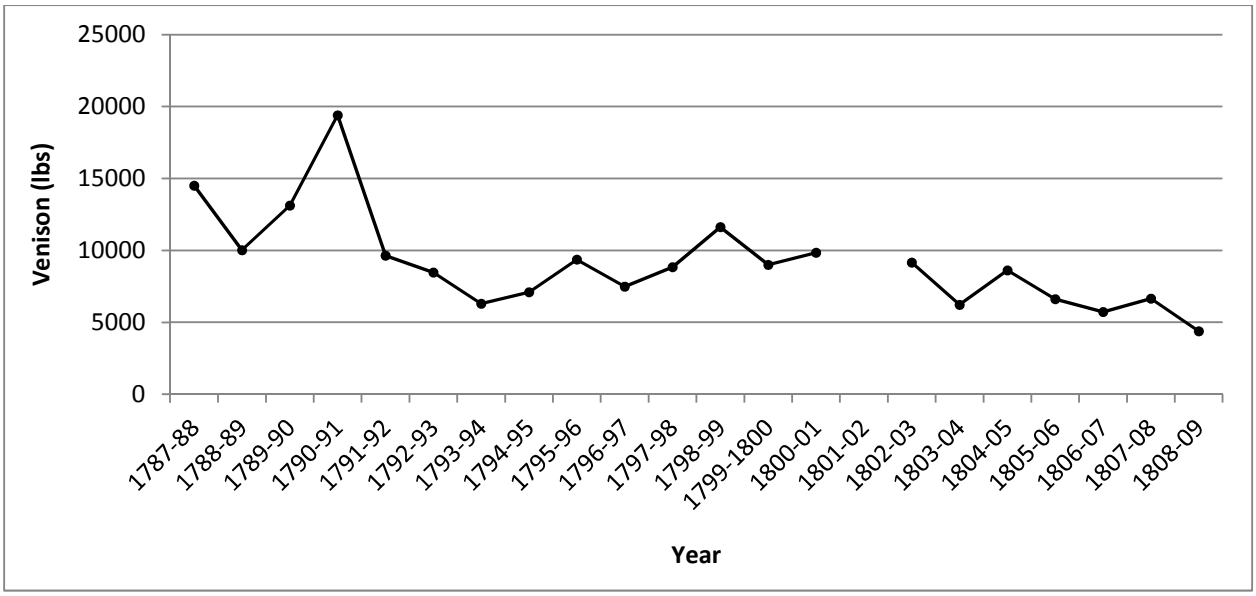

Figure 5.5 Caribou provisioning trade: York Factory, 1787-1809 (adapted from Lytwyn 1993)

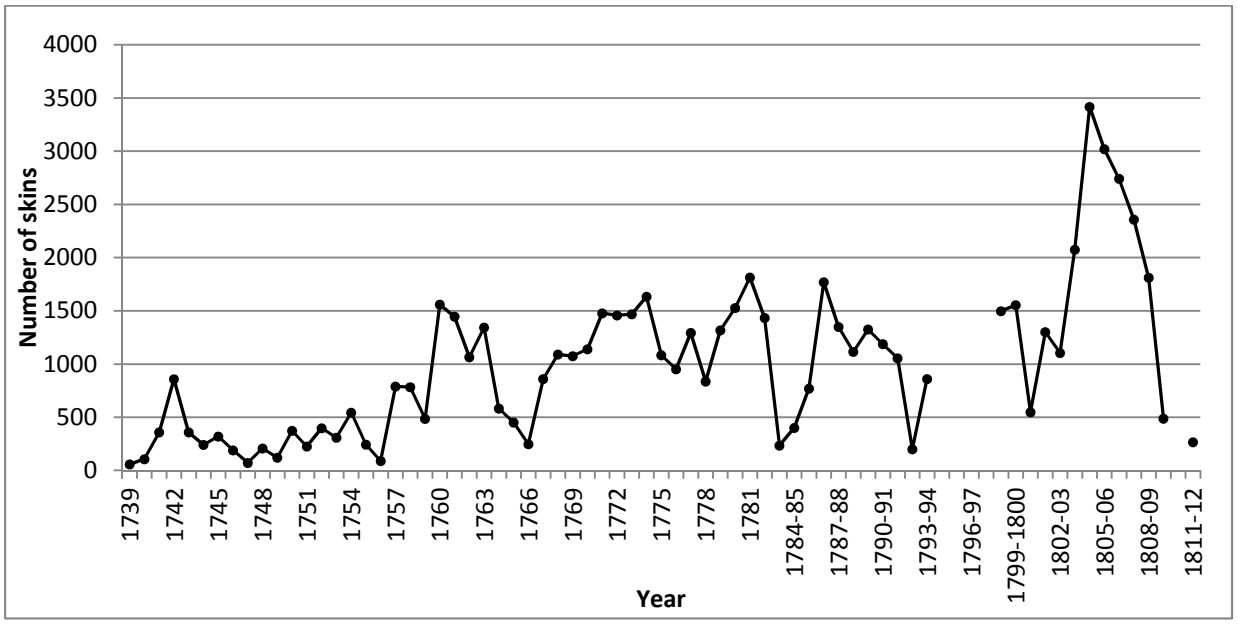

Figure 5.6 Caribou skin trade: York Factory, 1739-1812 (adapted from Lytwyn 1993)

The caribou skin trade (Figure 5.6), represented with data from 1739 to 1812, suggests a gradual growth and sudden decrease in skin trade. These changes in trade may indicate a change in caribou abundance and availability at this time.

5.1.1.4 A note on moose

Moose is occasionally mentioned, and is noted in the account books. However, these comments are vague and infrequent, and mainly referring to skins or meat received from Native traders, rather than specific mentions of hunting moose. They are more common earlier on in the journals, in the early to mid-1700s. Moose are also mentioned in journals documenting the journey inland from York Factory. These records make it clear, then, that caribou were the primary commodity.

5.1.2 Indian Lake Records

The Indian Lake post is located on Southern Indian Lake. It was operated for several years, inconsistently from 1805 to 1824. The few journals associated with this post provide some insight into the activities and trade in the area. Construction of the post is described, as are activities such as fishing, partridge hunting, trade with Dene and Cree people, and moose and caribou hunting.

5.1.2.1 Mentions of caribou

Movements of caribou are only briefly and occasionally mentioned. Several times, caribou are seen crossing the lake or passing through nearby areas. Caribou are seen passing to the south in the late winter and early spring (i.e., February and March). In 1820, they are also

described as passing in August and again in December in great numbers. It appears that caribou came by this post during the winter months, but other times are unclear. The exact paths and timing of migrations of caribou through the region remain unclear, however, as there is little commentary on this.

When these movements are mentioned, hunting also occurs. The use of snares and hedges is described:

> For several Days past there has been small herds of Deer of 4 & 5 & sometimes more passing to the South, but seldom more than once a day, and as I could make nothing out of them with the Guns, I sett a parcel of Snares on the 19th to try what fortune would attend them, for this purpose we selected a deep Bay, where they generally walked and at the Bottom of the Bay we made an inclosure with Sticks...
>
> March 18 to 19, 1820
> [HBCA B.91/a/5]

The entry continues and describes this as the 'Northern Indian', or Dene, way of hunting.

Once caught, caribou were used as provisions at the fort, in addition to the fish, rabbits, partridges, and moose. One entry mentions caribou meat being pounded into pemmican for use during the summer. The skins were used as clothing and as a trade good, and were mentioned as being sent to York Factory.

5.1.2.2 Prevalence of moose

Moose are often mentioned in these entries, both in terms of trade and hunting, particularly in the earlier years of operation. Native people in the area often bring moose meat and skin for trade. Moose noses, dried meat, and skins were brought to Indian House. It seems that moose were primarily hunted using guns. However, one entry in April of 1806 says that "the Snow is so deep that the Indians kill the Moose with their Knives" (HBCA B.91/a/1).

5.1.3 Additional Historical Accounts

In addition to the official records of the fur trade posts, several men recorded their experiences and observations at York Factory and the broader region. These accounts range from the late 18th century to the early 20th century. They are more descriptive in nature and complement the post records.

5.1.3.1 Types of caribou and their migrations

In general, caribou are described as having good meat, being strong swimmers, and incautious when in herds (Hearne 1795; Thompson 1916). Two types of caribou, the barren-ground and the woodland, are described in these documents. While often simply referred to as 'caribou', it should be noted that the caribou that came to York Factory were labelled barren-ground by some and woodland by others. This appears to be due to confusion from their migration habits. For instance, Tyrrell (1913) states that barren-ground caribou move from the coast near Goose River (Ontario) inland to Split Lake and back again in the spring. Others, including those cited below, considered these animals to be woodland caribou. Below, for clarity, the York Factory caribou are referred to as migratory woodland.

The range of the barren-ground caribou is said to be limited by the Churchill River (Hearne 1795; Preble 1902; Richardson 1829). They are frequently referred to as the 'northern' deer (Hearne 1795). The meat of the barren-ground is said to be better (Hearne 1795). The woodland caribou is generally described as large and limited to forested regions (Hearne 1795; McTavish 1963; Thompson 1916). James Isham, for instance, describes three types of deer:

> ...the smallest deer, are of the size of our forrest Deer, in England, But not so finely for shape and make, another sort their is something Larger, Both these are very Numerious, in most parts of the Country, and Very fatt at Seasons of the year's, being in august and sept. four inches fatt on

> the Rump part of the best,--their is another sort of Deer, which is Large as a horse of 8 or 9 hands high, they are not so Numerious, as the aforemention'd Deer...
>
> [Isham 1949:151]

He is referring to barren-ground caribou, woodland caribou, and moose. David Thompson (1916:102) describes a type of caribou, presumably woodland, as 'the ugly moose', calling it "a link between the moose and the rein deer" due to its solitary habits and middling size. Samuel Hearne (1795:224) describes these animals as being "so much larger than those which frequent the barren grounds to the North of Churchill River, that a small doe is equal in size to a Northern buck."

The migration patterns are also commented on (Figure 5.7). Migratory woodland caribou are said to move along the coast near York Factory, south in the spring and north in the fall. Andrew Graham (1969) notes this as occurring in the months of May and September, with mosquitoes and flies driving the animals to the coast in the summer. In 1744, Dobbs indicated that caribou passed York Factory to the south in March and April and to the north in July and August (Harper 1955). April and May, and July and August, were the months indicated by Jérémie (1926) as the migration times for caribou around York Factory. Later in time, Preble (1902) states that caribou cross the Hayes 40 miles from York Factory, sometimes closer, during October and November, and again in the spring. McTavish (1963) and Jérémie (1926) mentioned caribou being found between Cape Churchill and York Factory, particularly in the summer, driven out of the bush by mosquitoes and horseflies.

On the other hand, barren-ground caribou apparently moved east to west and west to east, with the bucks moving west in October and the females remaining on the barren grounds (Hearne 1795). When the males returned east in May, the females moved west to meet them (Hearne 1795). Richardson (1829) indicated that the migration of woodland caribou was contrary

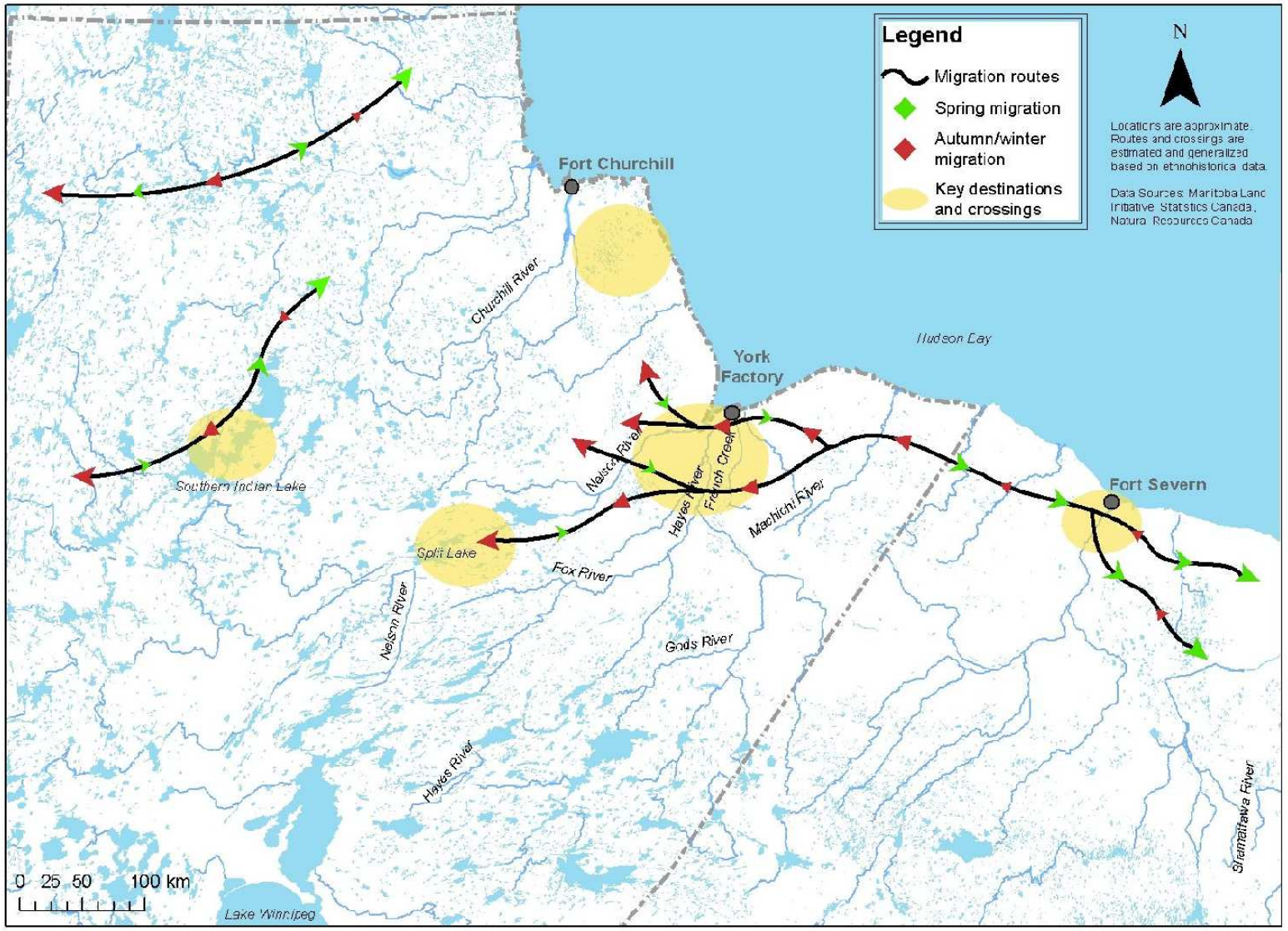

Figure 5.7 Map of historical migrations and locations described in journals and explorer/trader accounts

to that of the barren-ground caribou, suggesting that barren-ground caribou moved north in the spring and south in the fall.

Thompson (1916) described a migration he witnessed in May of 1792 twenty miles upriver of York Factory, giving a sense of the immensity:

> ...we heard a noise as of distant thunder...About forty yards below us, a vast herd of Rein Deer, of about one hundred yards of front, rushing through the woods, headlong descended the steep bank and swam across the river; in the same manner ascended the opposite bank, and continued full speed through the woods...in this manner the herd continued to pass the whole day to near sunset, when a cessation took place. ... The next day, a while after sun rise, the same sound and rushing noise was heard, and a deer herd of the same front, with the same headlong haste came down the bank and cross the river, and continued to about two in the afternoon, attended by small herds on either side, after which small herds passed, but not with the same speed, and by sun set finally ceased.
>
> [Thompson 1916:101-102]

5.1.3.2 Hunting practices

Caribou were hunted in various manners. One prominent method at York Factory was the use of deer hedges (Graham 1969; Isham 1949; Thompson 1916). Thompson (1916) described these being used during the early spring when the water opened:

> ...commencing about four miles above the Factory, strong hedges of small pine trees, clear of their branches, are made, near to, and running parallel with, the bank of the River, at intervals of about fifteen yards door ways are made in which is placed a snare of strong line, in which, the Deer attempting to pass, entangles itself...
>
> [Thompson 1916:98-99]

The caribou caught in the snares either strangle themselves or are found by the hunters and killed with spears. Hearne (1795) also described the use of hedges, but specifically referred to 'Northern Indians' using these. He observed this when he travelled northward, and commented that "this method of hunting, if it deserves the name, is sometimes so successful, that many

families subsist by it without having occasion to move their tents above once or twice during the course of the whole winter" (Hearne 1795:80).

During the spring months, Hearne said the 'Northern Indians' would hunt caribou on the barrens. They would pay attention to the direction of the wind, conceal themselves, and have women and children go around to the other side of the herd (Hearne 1795). It seems Cree people would hunt in this manner as well, and Hearne (1795) complimented their skill with the bow and arrow. Graham also mentions the Natives at York Factory hunting on the plains. On the plains, the flat lands between the coast and forests, caribou were killed with guns (Graham 1969). At river crossings, they were hunted in the water. Graham (1969) explains that women and children were involved in ensuring the caribou did not turn back, while men hunted from the canoes using spears, bayonets, and arrows.

5.1.3.3 Uses

These documents also contain descriptions of how caribou were used by both Native people and Europeans. First and foremost, caribou served as a food supply. In butchering caribou, Native people would separate the joints, strip the meat, and dry and smoke it (Graham 1969;Thompson 1916). Meat could be dried by the sun or by fire (Hearne 1795). Isham (1949) describes this process:

> If only one Indian is by himself when Kill'd a Quantity of Deer, he first Strips the skin of then cut Each Joint of heaving nothing away. Even the pouch they Eat, turning the Extrements out and filling it with fatt and blood and Reckon itt good food; they also take all the bones out of the side and Rump's and Cutt the meat thin,-- they then take some poles, on which they hang the meat, making a good fire under, which is Kept turning, tell itt's thoroughly Dryd. which will be about 4 Day's they then tie itt in Bundles and will Keep for years...
>
> [Isham 1949:55]

Heads, tongues, and feet were also dried in this way (Isham 1949). Meat from legs would also be dried, and sometimes pounded in ruhiggan or pemmican (Isham 1949). Dried meat was an important provision for hunting and travelling (McTavish 1963). Fat was collected and stored in bladders for use and trade (Graham 1969). Natives used caribou for broth and stew as well, with fat, blood, and scraps of meat (Hearne 1795; McTavish 1963; Richardson 1829). All parts were used: hearts, stomachs, tongues, kidneys, haunches, and so forth. Meat and organs were boiled, roasted, smoked, dried, or prepared in a myriad of different ways. At York Factory, and presumably other locations, meat was also kept fresh by frost for several months of the year (Isham 1949). Other food uses included the extraction of marrow and grease from bones and eating the stomach contents (Isham 1949; McTavish 1963; Richardson 1829; Thompson 1916).

Bone was also used for tools, as were antlers. Richardson (1829), while describing caribou use by Dene and other groups, explained that antlers were made into fish-spears and hooks, chisels, and other items, while the 'shin-bone' was split to make a knife for hide-preparation. The use of bones was not mentioned by other authors.

Graham (1969) explains that skins are an article of trade, and are used for clothing by both Europeans and Indians. Jackets, britches, and boots were made (Graham 1969; Isham 1949). Cree people are said to wear shoes made of moose or caribou skins (Thompson 1916). Hearne (1795:196) stated that eight to ten deer skins were needed for "a complete suit of warm clothing for a grown person during the Winter." The skins were best in the late summer months, as the hair was the proper length and during the winter it was too thin and full of holes from insect bites (Hearne 1795; Isham 1949; Jérémie 1926). In addition to clothing, caribou skins were made into snares and tents (Graham 1969; Hearne 1795). McTavish (1963) states that caribou skin or moose skin was used for making whips. In commentary on overseas uses, Isham

(1949) notes that caribou skins did not sell well due to lack of quality, while Graham (1969:16) mentions that “the skins sell in London for seven shillings each.” Clearly some skins were sold in Britain.

5.1.3.4 Changes in abundance

Descriptions of caribou herds paint a picture of how numerous these animals were perceived to be. The migration described by Thompson (1916) quoted above, is an example of this. Similarly, Jérémie (1926:22, 38) states that in the summer when the caribou moved to the coast, “bands containing over ten thousand may be seen, and this continually for forty or fifty leagues” and “the roads they make in the snow as they pass form a closer network than the streets of Paris.” Richardson (1829) claims that a herd could take several hours to cross the river at York Factory. It is, however, important to keep in mind that abundance and scarcity can be exaggerated. Thompson (1916:126-127) comments on this, saying that “if the country contained but half the Deer and other animals some writers speak of, the Natives would not suffer as they do.”

Times of scarcity are also spoken about by these writers. In particular, overhunting is named as an influencing factor. Graham (1969), for instance, speaks of Natives hunting caribou for provisions and trade with York Factory to the point when European traders turn away the meat:

> I have seen at York Fort eighty carcasses in one day, and in some seasons they have crossed the river in such numbers that many have been refused by us, having salted a sufficient stock of that kind of provisions. The natives even then keep slaying, only to get the skins to barter with us for necessaries.
>
> [Graham 1969:15-16]

He states that they took only skins for trade, and other choice parts such as tongues, heads, hearts, and feet, otherwise "letting the carcasses go adrift in the river" (Graham 1969:154). Such claims are relatively common in the historical documents (e.g., Isham 1949; Richardson 1829). According to these writers, Native people would justify such massive hunts with the cultural belief that "the more they destroy the more plentiful they grow" (Graham 1969:154). Similarly, Hearne (1795:118) claimed that he was told by Dene Elders that "killing plenty of deer and other game in one part of the country, could never make them scarcer in another." Indeed, they explained that:

> the deer are as plentiful now as they have ever been; and though they are remarkably scarce some years near Churchill river, yet it is said , and with great probability of truth, that they are more plentiful in other parts of the country than they were formerly.
>
> [Hearne 1795:196]

Overhunting was not the only explanation for changes in numbers, however. Other comments in these documents hint at some sense of a natural cycle in numbers. McTavish (1963), for example, poetically referred to equilibrium:

> After years of plenty, Nature adjusted her balance by disease, starvation, migration (just as recorded in the Bible of ancient fluctuations of plagues), famine and wars to retain her equilibrium.
>
> [McTavish 1963:215]

Comments such as this demonstrate the fluctuations. At times, caribou simply were not available in the same numbers, and this led to uncertainty.

> It's a Very uncertain place for the English mens Living in these parts, we Living sometimes Like princes, and other times Like beggars, not a morcel of fresh provisions to put in our mouth's by which itt may be sayd itt's Either a feast or a famine, -- for I have Knowne so much Deer's flesh for a fortnight or 3 week's, that we cou'd not Eat itt while good, but has spoild upon our hands...& in a month afterwards shall not Gett a Deer

> for Love or money...
>
> [Isham 1949:116]

In addition, some suggest that the availability of caribou was influenced by changes in movements rather than numbers. Hearne (1795:196) said that the abundance of caribou in particular places was determined by the wind, "for the deer are supposed by the natives to walk always in the direction from which the wind blows." Interestingly, after Thompson (1916:102) provided the above-quoted description of a herd of caribou passing, he was told by the Natives he asked at York Factory that "large herds do sometimes pass in the spring, they [had] often seen their roads, but seldom the herds." This suggests that caribou, in changing their paths, were oftentimes missed. Perhaps some of the times of starvation and decline could be explained by this.

> ...in some years, hundreds of deer may easily be killed within a mile of York Fort; and in others, there is not one to be seen within twenty or thirty miles. ... In fact, after twenty years of residence in this country, I am persuaded that whoever relies much on the produce of the different seasons, will be frequently deceived, and occasionally expose himself and men to great want."
>
> [Hearne 1795:396]

In the end, it is clear that caribou were not always available in great numbers, and that this was relatively unpredictable. Great scarcity occurred, and may have been influenced by migration changes or overhunting.

5.1.4 Ethnohistorical Summary

Each of these historical sources provides insight into the past uses, movements, and populations of caribou. York Factory records detail the trade in caribou meat and skins, providing both quantitative data and commentary on availability and usage. The information

from York Factory suggests a gradual increase in caribou trade and provisioning followed by a relatively sudden decline in the early 1800s. Scarcity appears to become a problem around this time. However, it should be kept in mind that unsuccessful hunts and searches are mentioned through the years, and other factors such as weather and changes in migration routes may be relevant. Migrations are also mentioned, and these records provide the names and general times of caribou crossings.

Indian Lake records focus more upon moose, indicating the importance and abundance of moose in this region. However, caribou are still used and referred to. A migration path through Southern Indian Lake is mentioned as well. In comparison to York Factory, little specific documentation refers to this area. In general, it can be said that barren-ground caribou moved through this region yearly but in less predictable patterns and numbers. With the prevalence of moose, this was not a great concern.

The primary accounts from explorers and traders provide detailed information on types of caribou, migrations, and usage. These descriptions are invaluable to understanding the movements and numbers of caribou during the fur trade. Importantly, caribou use by Cree people and other Native groups is detailed as well, providing insight into use of caribou outside of the fur trade context.

Overall, these records explain that caribou were used for food, clothing, tools, and trade. Caribou became scarce in the early 1800s, and this appears to have continued to be an issue throughout this century. Explorer and trader accounts imply hunting pressures as well as changing migration routes and possibly natural cycles as the causes. Trade records simply state that caribou were scarce and the consequence was starvation. Migration timing and routes were also described, explaining the movements of caribou from Fort Severn, along the coast to York

Factory, and inland in the spring, and moving back towards Ontario in the fall. Caribou around Southern Indian Lake were moving through the area in the late winter and summer months. With these documents, it is possible to understand the use, abundance, and movements of caribou during this time.

5.2 Community Workshops and Interviews

In order to gain some insight into modern-day caribou use, the value of caribou to Cree people, and the use of caribou at York Factory, I spoke with members of YFFN. Through interviews, I was able to get a sense of the role of caribou in the lives of Cree people, traditionally and at present. This information adds clarity to the ethnohistorical data and aided in the overall interpretation process.

5.2.1 Community Workshops

An introductory meeting was held in July 2013 in order to introduce the project to community members. The next workshop was in May 2014. This event consisted of a presentation followed by a question-and-answer period. Participants included community Elders and YFFD staff. Results of initial analyses were shared. Photos of archaeological artifacts and ethnohistorical items such as moccasins and parkas (Appendix D) were included in the presentation to stimulate discussion and provide examples of the items being studied. In addition, replicas of bone and antler artifacts from various locations in northern Manitoba were passed around, also to provide examples and encourage discussion. Informal commentary and questions during this workshop helped in the planning of interviews and in overall interpretations.

The final workshop was held in October 2014. Project conclusions were shared at this time. Participants asked questions on the materials and shared their own thoughts regarding certain aspects of the project. In particular, the following points were made:

1) Caribou were and are an important part of the seasonal cycle.
2) People should show respect to caribou and only take what they need. Participants had not heard of any belief such as that indicated in a few historical documents, the idea that 'the more they kill, the more they flourish.' This historical claim does not fit with what YFFN members believe today.
3) Food, fire, and other similar factors impact where caribou go.
4) Hedges and snares were not used when the current Elders lived at York Factory (i.e., in the 1940s/1950s).

These insights provide a perspective that complements some ethnohistorical accounts and conflict with others, namely, the claim of a cultural belief behind overhunting. In general, though, participants agreed with historical descriptions of how caribou were used.

Overall, these workshops provided a forum for dissemination and discussion, and the insights from participants deepened my understanding of caribou in a Cree context. The workshops were important for general communication and dissemination, as well as ensuring interviews could be conducted.

5.2.2 Community Interviews

While workshops were primarily focused on sharing findings and receiving informal feedback, interviews with community members – both Elders and resource users – provided more detailed accounts of caribou in the present day around York Landing and historically around York Factory. Several key points were common across these interviews, namely:

1) Caribou are an expected and vital part of the seasonal cycle. They are one of several important species, including moose, fish, and geese.
2) Caribou are still used today, primarily for food. Hides are used for various purposes, though not often made into clothing. Long bones are still made into scraping tools.
3) All parts of the caribou are and were used. Overhunting and wastage are of concern.

5.2.2.1 Historical Commentary

Commentary on the historical use caribou at York Factory came primarily from Elders, who confirmed the use of caribou for food, clothing, and tools. Various uses were described. Meat, obviously, was a primary use of caribou. Blood was used for flavouring soup and other foods. Marrow would be eaten as well. Tongues and heads were delicacies. Both Flora Beardy and Isaac Beardy mentioned that the stomach would be used as a container. Bones would be made into scrapers and fleshers, as well as other tools like needles. Caribou hides were used for clothing, boots, and blankets.

The Elders I spoke to explained that caribou were not hunted directly at York Factory when they lived there (i.e., in the early to mid-1900s), but rather inland and north. For example, Obediah Wastesicoot described how his father would go hunt caribou across from Port Nelson,

north of York Factory. The men would stay out hunting for several days, and Obediah's father would bring home a maximum of five caribou, which would be shared.

Caribou migrations in the region were sometimes talked about as well. Isaac Beardy said that he had heard of caribou crossing the Nelson River, which are locations also mentioned in the historical record. He specifically named Jackfish Island and Deer Island as places where caribou crossed, and noted that caribou could be found scattered in small numbers near Deer Island year-round. Importantly, the caribou were not entirely predictable in their movements:

> Sometimes they [the elders] said the caribou wouldn't show up at York Factory where they used to, but they would show up somewhere else. Because the caribou have to move, like if they go to one place all the time, then they eat up all their food.
>
> [Flora Beardy, June 25, 2014]

5.2.2.2 Current Uses and Practices

Participants described specific uses of caribou as well, and these explanations help with the understanding of past uses and complement the historic accounts. As stated above, at York Factory in the past people used caribou for food, clothing, and tools. Seeing photos of archaeological examples and of clothing examples from the museum, most of the interview participants agreed that these things were made, and sometimes still are. Indeed, in many ways these practices continue today in York Landing. Hunters share their meat with family, friends, Elders, and people unable to hunt.

Most participants explained to me how caribou are hunted and butchered. YFFN community members have hunted caribou in various locations: around York Landing, at Ilford, near Churchill, and along the railway. Today, hunters often hunt caribou while out trapping: if they come across caribou, they harvest them. In general, people hunt whatever is available.

However, both Albert Saunders and Flora Beardy stated that hunters generally avoid calves or pregnant females.

> As far as I can remember from the stories I was told, you just take the biggest one and you leave the smallest ones alone.
>
> [Flora Beardy, June 25, 2014]

Once killed, some hunters butcher them right away, while others let the caribou sit for a day or two. Blaine Beardy explained that if the caribou is left to sit, it affects the taste. Scott Saunders also mentioned this:

> Just take the guts out first and then just flip them over, drain the blood out of their gut, and do the same thing. And then I usually let mine sit for a couple days. ... Let them sit, and they'll be nice and tender in a couple days, and butcher them. But some just butcher them right away when they kill them.
>
> [Scott Saunders, June 23, 2014]

Flora Beardy described the general butchering process and the removal of bones:

> When the hide is taken off, you do your meat. You cut it all up and then you debone it, everything, if you're going to debone, and package your meat the way you want to package it, and then the bones, you boil the bones. And then they used to skim all the grease off it and then you would use that fat for bannock.
>
> [Flora Beardy, June 25, 2014]

Today, people still try to use all parts of the caribou. Meat is shared with friends and family. People sometimes still use marrow and blood for food. While clothing is not commonly made from the caribou skins anymore, it is still sometimes done, and the skins can also be used as blankets, kneeling pads, and other utilitarian items. The process of preparing caribou hides is still known, though some people discard the hides.

> They used to, but I think they've lost the knowledge of how to smoke and prepare the hides. I could probably do it. I've seen them do it, like I've watched the elders do it before. It's a lot of work. It takes a while. You gotta scrape all the hair off, and soak it, and then you wring it out. That's

> the hard part, the twisting it, get all the water out. And then stretching it and smoking.
>
> [Albert Saunders, June 24, 2014]

Flora Beardy indicated that many skills, including beadwork and hide tanning, are being taught again today.

5.2.2.3 Current Migrations and Populations

When YFFN first relocated to York Landing, there were not many caribou in the area. Today, there are many caribou that come through. The Pen Island herd moves through Shamattawa first and then comes to York Landing. They come to the area in late winter, and then go back in the other direction.

> We never really get them, hardly get them good until after the new year. Say late November, December, they're further east. Then – January, February come around, they're more in our neck of the woods.
>
> [Blaine Beardy, June 24, 2014]

> Then when they've finished all of the stuff that they're doing, like feeding and all that, time to head back to where they came from. The herds seem to get bigger as they move, as they get further to where their home range is.
>
> [Albert Saunders, June 24, 2014]

Albert Saunders also mentioned that "every year is different" and the caribou go to different areas each year. This is similar to what Flora Beardy and Jimmy Beardy told me, that caribou change their paths and follow the food.

Caribou are also found on the coast today, but not in the great numbers described in the ethnohistorical documents. They are found around Pennycuttaway and other tributaries in the region.

> Around Pennycuttaway, they maybe calve. Further into the bush you can see where they've – a bunch of beddings and all that stuff. If you go further into the bush there, you'll start finding them.
>
> [Scott Saunders, June 23, 2014]

Obediah Wastesicoot described riding in a helicopter and seeing caribou cross at Pennycuttaway:

> A mile and a half wide. That's how wide those caribou are, crossing that river.
>
> [Obediah Wastesicoot, June 25, 2014]

He also noted that although thousands of caribou come through York Landing and the surrounding area, they are not clustered into one large herd. Rather, there are smaller groups of the caribou all traveling in the same direction.

5.2.2.6 Types of Caribou

Both barren-ground and woodland caribou were discussed briefly. Albert Saunders said that, to him "a caribou is a caribou" and that he does not specifically hunt for one type or another. Scott Saunders mentioned that barren-ground caribou taste better, while woodland caribou have tougher meat. When asked about the different types, Isaac Beardy explained that growing up he knew of two types, not the middle-sized caribou seen today. Jimmy Beardy elaborated on this, explaining that he has seen the different types of caribou intermix: the small barren-ground, the larger woodland, and the middle-sized Cape Churchill animals (also a type of woodland caribou). This was described by Flora Beardy as well, who indicated that she has seen barren-ground and woodland caribou group together around Churchill.

5.2.2.5 Overall Importance

Caribou are important to the people I interviewed because they are a source of food, and their skins and bones can be used for various purposes. However, it was explained that they are one of several important species, and that caribou hunting is one of several traditional seasonal activities. To Blaine Beardy, for example, caribou are important because he expects them every year and relies on caribou and other species:

> It's important to me to know that they're going to come back every year. Because I'm expecting that. It's a seasonal thing. For wintertime, we wait for the caribou. We live off whatever, trap. Springtime, we wait for the waterfall, wait for the ice to go down, fish. And moose, you hunt it all year round.
>
> [Blaine Beardy, June 24, 2014]

Flora Beardy also indicated that caribou are valued, but so are other animals:

> But you know, even a moose, all the things that you can eat, you know, that provide food, they're important. They're all important.
>
> [Flora Beardy, June 25, 2014]

Everyone that I spoke to stated that caribou are important to them because these animals provide food to people.

Importantly, everyone highlighted that people should not waste or overkill. Hunters should take what they need, and share with those who cannot hunt. Caribou, and other animals, are to be valued and respected. This is important for future generations to learn.

> There are other generations that are coming in and they have to be taught the same way as us. They're going to be taught the same thing, not to waste, not to overkill, and stuff like that.
>
> [Scott Saunders, June 23, 2014]

5.2.3 Community Involvement Summary

These workshops and interviews helped me to understand caribou in a broader sense, and contextualize my interpretations in the experiences of YFFN hunters and Elders. The community members provided insight into caribou types and movements, and explained how caribou were and are used. Importantly, they stated why they value caribou: for food and, to a lesser extent, clothing and materials. The comments on caribou being relatively scarce around York Factory while they lived there in the early 20th century could be support for the decline or absence of caribou noted in the historical record. However, this may also simply represent a different perception of the number of caribou, possibly exaggerated in historical accounts. Both workshops and interviews provided a forum in which to share information and learn about caribou, strengthening my understanding of the topic. As a whole, working with YFFN gave me a deeper appreciation of caribou and the north, and contributed greatly to my interpretations.

5.3 Summary

These two methods provide detailed insight into the use, abundance, and value of caribou. Ethnohistorical records provide quantitative and descriptive data for understanding how caribou were used during the fur trade period. These sources show the commercial value to caribou in addition to its traditional subsistence role. Importantly, the records indicate that the availability of caribou declined in the 19th century, and hint at shifting migration routes. Work with YFFN provided me with a better understanding of caribou in a Cree context, as well as giving insight into continued use into the present day.

In the next chapter, these findings and the archaeological findings from Chapter IV will be discussed as a whole, in order to describe pre-contact and fur trade use of caribou and

determine patterns of use and abundance across time. Together, the three sources of information allow for a deeper understanding of caribou in the province and the relationship between use and caribou populations.

CHAPTER VI:
SYNTHESIS AND INTERPRETATION OF FINDINGS

Each of the sources of information for this research provides insights into the use of caribou and, through this, reveals patterns of availability and socio-cultural importance. It is now possible to specifically address the objectives that have guided this thesis and in doing so develop a historical ecological understanding of caribou. In this chapter, I synthesize the findings of this research in order to explore the role of caribou in pre-contact subsistence and in the fur trade, and discuss the relationship between Cree use of caribou and patterns of caribou abundance. In addressing these objectives, population trends, migration patterns, and the socio-cultural value of caribou are discussed. Importantly, variations in caribou use and availability across the study region and over time are highlighted.

Overall, it is clear that across time and across northern Manitoba, caribou have played a key role in livelihoods. The archaeological record has provided broad insights into caribou usage, and there is a trend of continued use of caribou in the context of a wide exploitation pattern. This archaeological information, though generalized, is complemented by historical sources, which describe use and detail migration patterns and abundance. Commentary from YFFN community members aids in the overall understanding of the use and value of caribou by Cree people. Considered as a whole, these sources serve to further illuminate the history of caribou in relation to Cree people in northern Manitoba.

6.1 Pre-Contact Use of Caribou

As noted in Chapter II, there is a long history of occupation in northern Manitoba. By approximately 8000 years ago, with the retreat of the ice sheets, groups moved into the northern

forests and tundra, adapting to the resources there. These groups have been identified based on lithic tools and pottery styles. The faunal remains studied for this thesis assist in explaining pre-contact subsistence patterns.

It is the archaeological analysis that provides a glimpse into the use of caribou in northern Manitoba prior to European contact. Three sites -- HiLp-3, HiLp-1, and HdLw-7 -- serve as examples of pre-contact subsistence in the vicinity of Southern Indian Lake. Because the faunal remains could not be attributed to specific pre-contact cultures, what follows is a fairly broad description of the use of caribou prior to the fur trade. While not ideal in the level of detail available, this zooarchaeological analysis nevertheless helps to illuminate pre-contact patterns. Paired with extrapolations from early historical information and ethnographic insights, a general description of pre-contact caribou usage is outlined. Thus, this section addresses the first objective of this thesis.

6.1.1 Seasonal cycle

Cree people have long followed the seasonal cycle of their environment, relying on the species and resources made available to them during the different times of the year. This is documented in oral history and historical writings, and was emphasized by YFFN members during the interviews. The pattern of relying on seasonal resources is in all likelihood a continuation of pre-contact traditions. As noted previously, while the Dene people traditionally had a specialized subsistence pattern intimately tied to the movements of caribou, the Cree are known to have relied on a variety of resources, with caribou being one of many valued animals (Malasiuk 1999; Lytwyn 1993; Brightman 1993). While there is some overlap between ancestral Dene and ancestral Cree archaeological occupations, the faunal remains studied demonstrate a

mixed seasonal economy and, in combination with evidence from pottery styles and lithic tools, may be considered a reflection of ancestral Cree populations around Southern Indian Lake.

With this in mind, the general seasonal cycle can be detailed. The Hudson Bay Lowlands and the interior boreal forest region are both areas rich in resources. Various species of fish, furbearing mammals, large game, waterfowl, and game birds can be found throughout northern Manitoba, though the availability and quality are often determined by season. In this way, hunting decisions would have been partly based on efficiency: animals were sought out during the ideal seasons. The association of specific animals with certain times of years is likely a longstanding tradition and reflects the subsistence patterns of Cree people. Historical information from Andrew Graham (1969) shows that the Cree names for months are associated with important animals and weather changes. The association between animals and months is noted by Lytwyn (1993) and Malasiuk (1999).

Table 6.1 Historic Cree Months (adapted from Graham 1969)

Month	Cree Name (Graham)	Meaning
January	Shepowarticinum-Apeshem	Cold Moon
February	Shea-Apeshem	Old Moon
March	Mekisseu-Apeshem	Eagle Moon
April	Niscock-Apeshem	Goose Moon
May	Atheak-Apeshem	Frog Moon
June	Oupinnihou-Apeshem	Incubation Moon
July	Oupuskahou-Apeshem	Moulting Moon
August	Uppahau-Apeshem	Flying Moon
September	Wuskauhow-Apeshem	Shedding Moon
October	Wesack-Apeshem	Rutting Moon
November	Askuttatesew-Apeshem	Frost Moon
December	Powatchicanisish-Apeshem	Short day Moon

Pre-contact Cree people and their ancestors likely placed similar importance on weather changes and animal behaviours. For instance, geese and other waterfowl were expected in the spring and fall months, and caribou were observed in the spring and late fall months.

The archaeological remains studied in this thesis suggest subsistence practices that followed a seasonal cycle. HiLp-3, HdLw-7, and HiLp-1 all show a mixed seasonal economy, with the use of furbearers, caribou, fish, and some bird species. Given that caribou and waterfowl would generally be available during their yearly migrations, these animals would have been used primarily during specific times of year, namely late fall/winter and spring for caribou and spring and summer for waterfowl. Game birds would also have been sought out in the warmer months. Fish would have been used year-round, but would have been more productive and accessible during the spring and summer months (Malasiuk 1999). Moose would have been sought out year-round, but were particularly valuable in the summer season when caribou were elsewhere, as well as during the fall rut (Malasiuk 1999).

6.1.2 Subsistence and material uses

It appears clear that, as expected, caribou were a key contributor to the seasonal economy for the ancestral Cree people and other groups in northern Manitoba. In the Southern Indian Lake region, barren-ground caribou came through during the late fall and early winter, and again in the late winter and early spring months. During these times they could be harvested in great numbers. Boreal woodland caribou would have been available in the general vicinity throughout the year, and were likely hunted in a manner similar to moose (Malasiuk 1999).

Archaeological remains demonstrate that caribou were used for both food and for tools. Butchery marks were noted on bones from HdLw-7 and HiLp-1, which indicated primary and

secondary butchering (i.e., dismemberment and removal of smaller cuts of meat). Some scrapes may also indicate skinning. Indeed, it can be assumed that the skins would have been used in a similar manner to that described in historical sources, such as for clothing and tents. All three pre-contact sites also had possible signs of marrow extraction, indicating another food use of caribou. HiLp-1 provided several examples of bone and antler tools produced from caribou remains. These included an antler wedge (*cervidae*) and a predominance of distal tibia bones, suggestive of tool production. The heavy burning of many bones suggests they were possibly used for fuel as well. Clearly caribou served many important purposes during this time.

6.1.3 Pre-Contact Occupation of the Hudson Bay Lowlands

The pre-contact sites in the study were all located in the Southern Indian Lake region; no pre-contact coastal sites were considered. Thus, the data from this study cannot provide insight into the pre-contact use of caribou in the York Factory region. However, it is worth briefly outlining relevant commentary on the pre-contact use of the area and what this may suggest about the pre-contact use of caribou in the coastal region of Manitoba.

The nature of the pre-contact occupation of the coastal lowlands has been debated. Past researchers thought that year-round occupation of the region would not have been possible (Lytwyn 1993). However, research by Pilon (1987, 2006) and Lytwyn (1993, 2002) supports the idea of a year-round occupation by Cree people prior to the development of the fur trade. Pilon (1987, 2006) investigated archaeological sites in the Severn River region, comparing inland sites along rivers and sites in the coastal area. He found that Native people made use of the resources in the Hudson Bay Lowlands throughout the year, utilizing coastal resources in the warm seasons and inland resources in the cold season (Pilon 1987). Of these resources, caribou were clearly

vital to subsistence, with caribou remains found in nearly all components of the sites (Pilon 1987). The time depth of this land use, however, is uncertain. Archaeological remains studied by Pilon (1987, 2006) suggest the occupation of the lowlands for at least 2000 years. Lytwyn (1993) demonstrated that during the early historic period, groups of Cree people occupied the Lowlands, including the coastal area. He distinguished between Coastal and Inland Cree people based on the division within the Lowlands of coastal tundra and interior muskeg (Lytwyn 1993). This distinction was recognized during the fur trade, and the Homeguard Cree who lived near York Factory and provided food and supplies to the traders were primarily the Coastal Cree (Lytwyn 1993). Demonstrating that traditional subsistence patterns were maintained into the fur trade period, this research by Lytwyn (1993) suggests that Cree people have long occupied the Hudson Bay Lowlands, and that caribou have been a central part of their subsistence throughout time.

This information suggests that seasonal or year-round use of the York Factory region would have been likely during the late pre-contact period, and caribou would have been a key resource. However, as stated, no data from the present study is available to explore this in detail. The York Factory archaeological site has artifacts from the fur trade occupation rather than from any pre-contact activities.

6.2 Fur Trade Use of Caribou

Archaeological remains, ethnohistorical sources, and knowledge from YFFN participants are compiled in order to address the second objective of this thesis, namely, documenting the role of caribou during the fur trade. The fur trade went through different phases, with evolving relationships and interactions between Cree people, European traders, and the local resources. In this study, the fur trade period spans from the late 1600s until the early 1900s. Overall, during

the fur trade, caribou remained a central part of the mixed seasonal economy for Cree people, in addition to other species including waterfowl and fish. However, with the advent of the fur trade, a new commercial economy developed in the region. This was primarily focused on furbearing species such as beaver and muskrat. However, European traders required provisions, and came to rely on the same species as the Native people. Thus, in addition to being used in a similar manner to how it was during the pre-contact period, caribou became an important provisioning and trade item. This had repercussions for the species' abundance and socio-cultural value.

6.2.1 A new economy

As Brightman (1993:9) indicates, "acquisition of European goods and involvement in the trade as fur suppliers to Indian middlemen began in all probability well before the establishment of the Hudson's Bay Company's coastal establishments in the late 1600s." Indeed, these goods would have been available from trading with people from eastern Canada, where the fur trade began earlier in the 17th century. However, in Manitoba, the establishment of York Factory and other forts in the area was an influential development and spurred the direct trading of furs in the region. As such, a new dimension was added to the local economy. In addition to traditional subsistence pursuits, which appear to have remained the same (Lytwyn 1993; Pilon 1987, 1990), Cree people began trading furs with Europeans. Initially it was the people nearest York Factory who were involved. These local Cree served as middlemen for communities who lived and trapped further from the coastal forts. Sometimes the people located further inland travelled to York Factory and other forts in the area to trade directly with the European traders.

Over time, this pattern changed. By the early 1800s, Native people were less likely to travel to the forts to trade (Ray 1974). In order to encourage the continuation of the fur trade, the

HBC began to establish fur trade posts further inland, including the vicinity of Southern Indian Lake. Even prior to this development, the influence of the fur trade and the availability of European goods were far-reaching. European products such as tea, sugar, gunpowder, and cloth came to be necessities for Cree people (Carlos and Lewis 2001; Ray 1974).

In a similar way, European traders were reliant on Native hunters and trappers. Around York Factory, the local Cree provided the fort with provisions and were eventually employed by the fort directly. In the Southern Indian Lake region, the provision trade was also important for the smaller posts in the area. Provisions included caribou as well as fish and waterfowl. The importance of caribou in traditional subsistence and as a trade commodity is described in the ethnohistorical sources studied for this project and was highlighted by YFFN members.

6.2.2 Subsistence and trade

With the establishment of York Factory and other trading posts, European goods became available to Native groups. These goods included household items such as pots and cloth and food items such as sugar, tobacco, tea, and alcohol (Carlos and Lewis 2001). Items like this slowly became necessities, and people made an effort to procure furs to trade for these goods. Just how much of an impact this commercial economy had on hunting patterns and traditional subsistence is arguable (see Carlos and Lewis 2001, 2002; Lytwyn 1993, 2002; Ray 1974, 1975), but it cannot be denied that European goods were highly sought after and that this would have influenced trapping decisions and movements.

Although the fur trade altered the local economy and turned European goods into necessities, the traditional subsistence pursuits remained the same for many years. Research by Lytwyn (1993, 2002) and other scholars has demonstrated “that for many decades following

contact, the Lowland Cree continued to maintain the adherence to traditional subsistence patterns, all while participating in the fur trade" (Pilon 2006:233). Lytwyn (1993) states that the involvement of Cree people in the fur trade intensified in the late 18th century, due to the smallpox epidemic in the 1780s as well as the establishment of inland trading posts. Indeed, the continuation of traditional subsistence patterns is reflected in the ethnohistorical sources summarized in the previous chapter. Caribou were hunted in the general vicinity of York Factory, but people also travelled further inland to hunt. During interviews, Elders described hunting as taking place away from fort and going across the Nelson River to hunt. This would have been in later years of York Factory's operation, and the descriptions in earlier historical accounts indicate hunting closer to the fort as well.

Many of the explorers and traders who documented their experiences described the ways in which caribou were used by Cree and other Native groups, and YFFN members verified these uses. It is clear that the animals were used and prepared in a multitude of ways, with meat being dried, smoked, or roasted or boiled for immediate consumption, organs being consumed or used as storage containers, and fat being collected. Other uses described included the drying of feet, the extraction of marrow and grease, and the addition of blood to broth and stew. Skins were also utilized and made into clothing, tents, and snares. Many of these uses have continued to the present day, as described by YFFN participants.

The archaeological remains support many of these historic uses descriptions, with fragmentation reflecting marrow and grease extraction, cuts suggesting butchery and skinning, and some burning showing cooking. The remains demonstrate relatively consistent use of various species, including caribou. Most of the fur trade remains, however, cannot be directly associated with Cree people. At York Factory, the faunal assemblage reflects use by both Native

people and European traders. However, the similarities noted between the Native Encampment area of the York Factory site and the pre-contact sites in the Southern Indian Lake region suggest a continuation of traditional subsistence patterns.

Trade uses were added on to these traditional subsistence uses of caribou. As with the subsistence uses, the trade of caribou is described in the ethnohistorical sources. The journals and additional descriptions make it clear that Europeans residing at the forts and trading posts were reliant on various animals, including caribou, moose, geese, ptarmigan, and fish. Cree and other Native people would bring these provisions to the forts, including York Factory and Indian Lake, to trade and sell. Cree people who lived directly around York Factory were the Homeguard Cree and were employed as goose and caribou hunters by the HBC. Interviews included references to a continuation of trapping and hunting to sell and trade, as well as employment with the HBC, when YFFN members were resident at York Factory in the 20th century.

6.2.3 Scarcity, starvation, and declining trade

In addition to impacting the structure of the Cree economy, the fur trade had an influence on local wildlife populations. With increased pressure placed on both furbearer and game populations, many species experienced a decline in abundance. The furs of beavers, foxes, lynx, and muskrats, among other species, were in high demand, and Cree trappers were encouraged to trap as many as possible. With European goods becoming more important, trapping and hunting for trade purposes increased. Likely, caribou hunting intensified in order to provide enough food to allow for time spent trapping non-food species, as caribou would have provided more meat than other game animals for arguably less time spent hunting (Pilon 2006). In this way, it seems the OFT concept of efficiency -- through focusing on a species that could provide a large amount

of food in a single hunt -- is part of the reason for over-exploitation. Caribou hunting also intensified in order to support the provisioning trade. It appears that hunting caribou year-round was encouraged to some degree (Hummel and Ray 2008; Lytwyn 1993). The York Factory journals and trade records suggest that hunting began to occur throughout the year, as caribou meat was noted as being brought to the fort in nearly all months. This may have been accomplished through hunting caribou that remained scattered through the region in the summer months, and through travelling greater distances in pursuit of the animals.

There is commentary in the historical record referring to these declines and to the disappearance of caribou and other game around York Factory. There are many instances in the York Factory journals that indicate an apparent lack of caribou, beginning around 1800. Many Natives are said to have come to the fort complaining of scarcity and starvation. Black-Rogers (1986) highlights that the use of the word 'starve' in fur trade journals must be understood in context, and that 'starve' may indicate a variety of situations: literal starvation, focusing on subsistence rather than trade, or use of the word in a metaphorical or ambiguous sense. In general, however, these accounts indicate some degree of want. Trade records collected for this thesis and by Lytwyn (1993) outlined in the previous chapter also demonstrate a decline in caribou meat and skin trade at the beginning of the 19th century, suggesting a lack of availability.

Caribou scarcity was not commented upon in the historical records studied relating to Southern Indian Lake. The decline discussed in this thesis is restricted to the caribou that were found around York Factory. However, Ray (1975) noted that the depletion of large game was widespread and by the 1830s it was an issue in other regions of the north, including Mackenzie River and Peace River. He goes on to explain that "by the 1840s the barren ground caribou area of the northern Churchill and eastern Great Slave Districts and the bison ranges of the grassland

portions of the Saskatchewan and Swan River Districts were the only sections of the Northern Department which had surplus game" (Ray 1975:62). The decline of caribou populations occurred in many areas during this time period (Bergerud 1974; Ray 1975), but not necessarily around Southern Indian Lake.

Indeed, it seems that during the 1800s, many species including caribou went through population declines. Caribou were still hunted but many complaints of starvation and failed hunts occurred in the decades following the initial decline. Occasionally caribou were still found in large numbers, but this became much more unpredictable and undependable. One of the reasons given for these declines is the impact of increased hunting pressures and overhunting on the part of Native groups in order to meet trade and subsistence demands. While overhunting is the cause implied by the historical documentation studied for this thesis, other factors to keep in mind include population cycles, weather and climatic variation, and other habitat changes. These various factors are discussed briefly below.

It should be noted that in response to these declines, the HBC implemented several conservation measures during the 19th century (Ray 1975). However, the HBC's conservation programs were focused on furbearers, primarily beavers, and did not address the decline of large game. These changes were implemented beginning in 1821 by George Simpson, when he noted that Natives in the region were leaving due to lack of food and resources and those who remained focused on food procurement rather than trapping and trading fur (Ray 1975). Focusing on the beaver, Simpson's conservation program included the restriction of trapping in overhunted areas as well as shifting trapping areas through the establishment of new trade posts and the closure of others (Ray 1975). The latter strategy was an attempt to move Native trappers away from depleted areas. In addition, trappers were encouraged to target other furbearers such

as muskrat and discouraged from trapping beaver during warm seasons when the pelts were of poorer quality, in order to give beaver populations a chance to recover (Ray 1975). Finally, the use of steel traps was also banned, as they were thought to have contributed to the over-trapping issue (Ray 1975). Trappers generally opposed these restrictions, and success was also hindered by the accessibility of other fur markets through independent traders (Ray 1975). After 1841, stricter rules were enacted using a quota system and the trapping of other furs was encouraged through trade premiums (Ray 1975).

The changes in caribou availability impacted life in the 20th century as well. The YFFN Elders to whom I spoke indicated that caribou were not available directly around York Factory when they lived there in the mid-1900s, and that the caribou were generally not plentiful. Hunters had to travel inland or north to find caribou. For instance, Obediah Wastesicoot mentioned that his father would hunt caribou north of Port Nelson, across the Nelson River. This indicates that caribou hunting patterns and availability were different than those in the 1700s and early 1800s, when caribou were hunted closer to York Factory. While caribou hunting remained a part of life for people at York Factory in the 1900s, the population declines experienced in the 1800s appear to have had a continued impact, and lifeways in the region continued to be altered in response to changes in trapping dynamics, the HBC, and the overall economy of northern Manitoba.

6.3 General Trends

From examining the use of caribou in the past, there are several trends that become evident. These reflect the regional and temporal availability of caribou and its abundance in

comparison with other species. Patterns and variations such as those addressed below demonstrate the value of a historical ecological understanding of caribou.

6.3.1 Geographic variation

Looking at both the York Factory and the Southern Indian Lake regions, it is clear that caribou were generally used in the same fashion: in both areas, caribou were used for food, clothing, shelter, and tools, in the context of a broader seasonal subsistence pattern. It should be remembered that different herds of caribou visited these two regions. People around York Factory primarily used caribou that migrated from Ontario. Caribou possibly came to the area from Cape Churchill as well (see McTavish 1963, e.g.). The movements of caribou in the York Factory region are described in several historic sources (i.e., Graham 1969; Hearne 1795; Jérémie 1926; McTavish 1963). The caribou at Southern Indian Lake, on the other hand, mainly would have been the barren-ground caribou moving down from the north, though boreal woodland caribou were likely scattered through the region as well. The barren-ground caribou at Southern Indian Lake appear to have been more unpredictable and broad-ranging in their movements. It should be remembered that the starvation comments and abundance changes described previously were from sources referring to the York Factory area.

Other geographic variations are in relation to other species, specifically fish, waterfowl, and moose. All of these animals were used in both regions. However, at most Southern Indian Lake sites, fish account for a larger percentage of the faunal assemblage than birds, whereas at York Factory, bird species played a larger role. While taphonomic processes and preservation issues should be kept in mind, it seems clear that fish were a more prominent resource around Southern Indian Lake and waterfowl were generally more important at York Factory. This is

likely a reflective of the availability of waterfowl on the Hudson Bay coast, due to their migration and nesting habits. This difference between inland posts and the coastal York Factory post is noted in the 1815 District report: “The food procured at the inland posts is principally Fish of which there is a great abundance at Gods Lake, Oxford, & Nelson River. York is supported by Geese, Partridges, and Venison...” (HBCA B.239/e/1).

A regional variation in the availability of moose is reflected archaeologically and ethnohistorically. While caribou elements outnumber moose bones at each site, it must be noted that moose remains were more common at Southern Indian Lake sites. Similarly, moose are rarely mentioned in the York Factory journals and other records, whereas the Indian Lake post journals commonly note the presence and trade of moose. This, again, is a reflection of the historic availability and range of moose, and is discussed in more detail below.

A similar pattern of caribou use was noted in the Hudson Bay Lowlands of Ontario as well. Pilon (1987) demonstrated seasonal exploitation patterns with caribou, beaver, and fish as key resources. Caribou appeared to take primacy, given their prevalence in the archaeological assemblages studied. Pilon (1987) described a seasonal economy in the Severn River region similar to that observed in this thesis.

6.3.2 Caribou and moose

As noted above, moose were more commonly used at Southern Indian Lake rather than at York Factory, likely due to differences in their range. However, interviews indicate that presently moose are very common in the York Factory region. Moose were relatively widespread in the late 1700s in northern Ontario, and declined in the early 1800s (Fritz et al. 1993; Winterhalder 1978). This corresponds with the decline observed in caribou, and adds an

interesting dimension to the consideration of caribou abundance. A scarcity of both moose and caribou is noted in the 1815 District report in reference to the region between York Factory and Gods Lake (HBCA B.239/e/1). The range of moose expanded northward during the 1890s, moving up to the Hudson Bay coast (Winterhalder 1978). On the other hand, in the Southern Indian Lake region, it is clear that moose were a key resource. Moose were available to and highly valued by the Cree in the area (Brightman 2003; Malasiuk 1999).

Fritz et al. (1993) state that the decline of woodland caribou and moose in northwestern Ontario was due to both hunting pressures and habitat disturbance via wildfire. In Ontario, the fur trade resulted in increased pressure on moose and caribou (Fritz et al. 1993). Fire outbreaks prior to 1805 created habitat for moose. However, later fires in the 1820s impacted moose winter habitat and caused a population decline (Fritz et al. 1993). Caribou were subjected to increased hunting pressures and their habitat was negatively impacted by the fires (Fritz et al. 1993). Thus, caribou and moose populations were both affected by hunting pressures and habitat alterations from fires. Fritz et al. (1993) explain that caribou returned as the habitat became mature, but declined again after a further outbreak of fires towards the end of the 19th century, and moose returned as the bush habitat grew back. Commentary from Winterhalder (1978) supports the idea that a reduction in habitat quality and a subsequent re-growth could have contributed to the decline and return of moose. These studies help to explain the differences in archaeological faunal assemblages and provide key insights into caribou changes over time in Ontario and Manitoba.

6.3.3 Changes in caribou over time

Overall, the information gathered through the three individual methods indicates that caribou have been continuously and consistently used across time. Caribou bones have been found at many sites in northern Manitoba, and the sites examined in this project demonstrate that caribou have been used in addition to other species over centuries. Previous studies, such as that by Pilon (1987, 2006), have also demonstrated the continued use of caribou: "Faunal data indicate that a constant element in the diet throughout the annual cycle was caribou. In fact, it has been proposed that caribou was a focal resources, central to the successful exploitation of the Hudson Bay Lowlands" (Pilon 2006:242). This comment, focused on the Severn River region in Ontario, can be expanded to include the study area of this project. The ethnohistorical information complements the archaeological data, highlighting the importance of caribou to Cree subsistence and fur trade pursuits, as well as the value of caribou to other groups in the north (e.g., Dene people). Through the interviews, it was made clear that caribou have remained an important part of life for Cree people in the north today. The traditional seasonal cycle was highlighted by YFFN, demonstrating its persistence through time.

However, changes have also occurred. In the study region, changes in abundance occurred in the York Factory area. The addition of the fur trade to the economy in the region had significant impacts on the pursuits of hunters. As mentioned previously, it is likely that hunting pressures on caribou increased, both in response to the provisioning trade and to compensate for the increased trapping of non-food species. Clearly there was a significant change in abundance or availability in the York Factory region. The factors that caused this are important to understand. These were briefly touched upon in the previous chapter, but shall be detailed here. The historical research generally highlights hunting pressures and overhunting as the cause of

caribou decline at York Factory. However, other factors -- including habitat variation, food availability, and population cycles -- should be acknowledged as possible contributors to the observed scarcity in the 19th century. Indeed, the research described previously on moose and caribou in northern Ontario during this period is highly relevant, and indicates that various factors likely played a role in the scarcity noted in the York Factory area.

6.3.3.1 Hunting pressures

Many researchers have put forth hunting pressure as a cause of the caribou decline in various areas, including Manitoba (Banfield 1951; Bergerud 1974; Courtois et al. 2003; Kelsall 1968; Lytwyn 1993, 2002). This conclusion is generally based upon the ethnohistorical accounts describing overhunting issues, as well as the general economics and demands of the fur trade. The historical research conducted as part of this thesis does indeed indicate that the decline experienced at York Factory and the general region was related to hunting pressures. As noted in the previous chapter, Graham (1969) and Isham (1949), along with other writers, documented massive hunts by Cree people, apparently with the intention of trading the caribou meat, tongues, and skins. Wastage aside, the economic demands and incentives of the provisioning trade as well as the combined needs of European traders and Native groups for food would have increased pressures on local resources. Further complicating this was the issue of additional time spent on trapping non-food animals, meaning that large game -- i.e., caribou -- would have been more desirable as they would provide a greater amount of food for time spent hunting. This too would have increased pressure on caribou.

Interestingly, a cultural belief regarding hunting has been described both in the ethnohistorical record and in research done by Brightman (2003) and other researchers (e.g.,

Lytwyn 2002; Ray 1975). This belief states that the more caribou that are killed, the more they flourish. Brightman (2003) argued that it is unlikely that desire for European goods alone would cause overhunting to such a degree of scarcity; rather, he stated that traditional cultural beliefs contributed to this issue. During this time, "Crees conceived the moose, caribou, and beaver as infinitely renewable resources whose numbers could neither be reduced by overkilling nor managed by selective hunting" (Brightman 2003:280). This belief is reflected in the explanations provided by Graham (1969) and Hearne (1795). A conception of game as an abundant, limitless resource unaffected by human interference could indeed have contributed to the depletion of caribou in the new economic context of the fur trade. It is important to recognize that this belief is not held by YFFN community members today, and was not something of which the Elders or others I spoke to had heard. Today overhunting and wastage is of great concern to community members. It must also be remembered that the commentary on wasteful behaviour was from an outsider's perspective. As Dean (2008) indicates, there may have been practical reasons for not using the entire caribou during particular seasons, based on the best times of year for hides and meat. August was best for quality hides (Dean 2008; Malasiuk 1999). Meat was best harvested at the end of summer and during fall, as prior to this time, the meat was too lean (Malasiuk 1999).

Nevertheless, we cannot deny that the various demands of the fur trade resulted in increased pressure on caribou. As increased demand resulted in larger harvests and year-round hunting, it is understandable that hunting pressures contributed to the decline of caribou in the York Factory region, particularly if it was combined with a worldview in which overhunting would not significantly impact the animals. However, other factors likely influenced the decline as well, and these require further research.

6.3.3.2 Climate, food, and habitat changes

Caribou populations and migration routes are also greatly influenced by food and habitat availability, which in turn are often impacted by climatic variability and human activities. Shifting ranges and variations in abundance could have impacted the availability of caribou to hunters in the York Factory region. Ethnohistorical sources indicated the unpredictability of caribou movements and hunting success was likely influenced by these factors.

Snowfall influenced the accessibility of caribou to hunters. This was indicated in the York Factory journals several times, with comments indicating that lack of snow made it difficult to approach deer. When hunting caribou in winter, deep snow was important as it hindered the movement of the animals thus increasing accessibility for hunters (Lytwyn 1993; Rogers and Black 1976). Snow depth varied from year to year, which meant that hunting success varied as well (Rogers and Black 1976). Similarly, wind has also been said to influence the movements of caribou, both in interviews and in the historical record. For instance, Isaac Beardy stated that caribou do not like moving against the wind. Hearne (1795) indicated similar observations. Another factor was fires, which Fritz et al. (1993) argue impacted the habitat available to caribou in the Hudson Bay Lowlands. They specifically refer to Ontario and the Ojibwa people, but the discussion is relevant to the Cree of York Factory as well. Forest fire outbreaks in Ontario prior to 1805 negatively impacted caribou habitat in the area (Fritz et al. 1993). With reduced habitat, caribou were then affected by increased hunting pressures (Fritz et al. 1993). The impact of fires on caribou movements was also mentioned during workshops with YFFN. Weather and habitat variation impacts food availability as well, which will influence where the caribou move. The significance of food was highlighted in interviews with YFFN members, who stated that the caribou will follow their food and will not necessarily use the same

paths every year. They highlighted the changing movements of caribou based on food, and indicated that every year can be different.

Changes in weather and habitat would have influenced the migration paths that the caribou could follow. These shifts would also impact the availability of food and suitable habitat for caribou, which would have led to reduced numbers and increased vulnerability to hunting pressures.

6.3.3.3 Population cycles

A final factor to consider is the population cycle of caribou. While not explicitly recognized historically, several writers hinted at these natural fluctuations. Recent studies have addressed caribou population cycles, and it is possible that the historical decline of caribou at York Factory was at least in part influenced by a natural cycle.

Many mammals have population cycles. Snowshoe hares, lemmings, lynx, and other animals appear to follow abundance patterns over time (Bulmer 1974; Gunn 2003; Krebs et al. 2001; Winterhalder 1980; Yan et al. 2013; Zalatan 2006). Through studies of caribou herds throughout North America, it has become clear that caribou populations fluctuate over the course of decades (Gunn 2003). These cycles are determined by some of the above-listed factors, including climatic variation and food availability. In particular, the Arctic Oscillation, which explains many temperature variations in the Arctic, impacts the population dynamics of several species including caribou (Zalatan 2006).

In general, a natural cycle of abundance was not referred to in the ethnohistorical record. As noted in the previous chapter, McTavish (1963) referred to the equilibrium of nature in relation to caribou and other game, but otherwise specific factors like overhunting were

attributed to changes in caribou. Regardless, the population cycle of caribou should not be forgotten when considering the decline in caribou observed during the 19th century, as it was likely a great contributor to this change.

6.3.4 In relation to modern herds

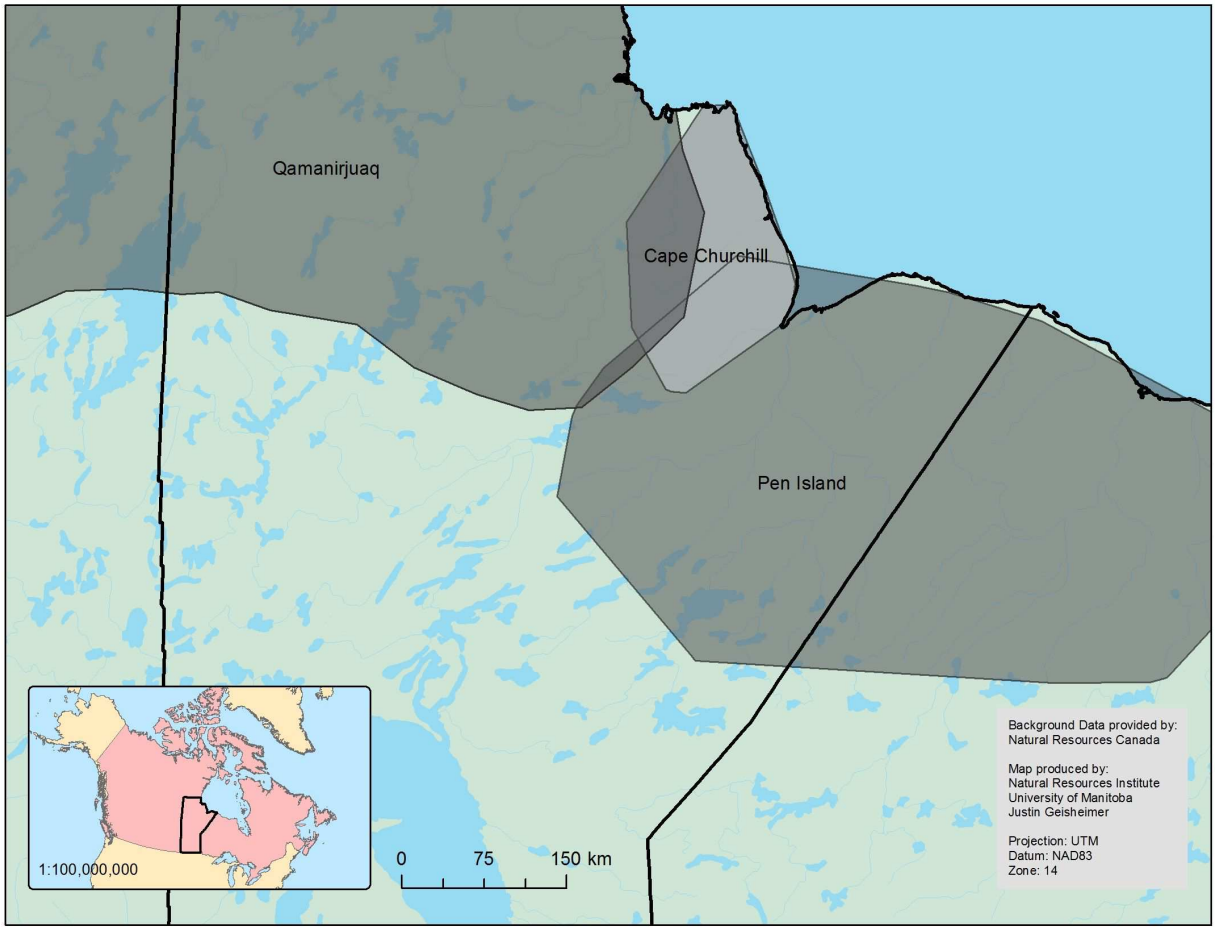

Figure 6.1 Present ranges of the Qamanirjuaq, Cape Churchill, and Pen Island herds

Barren-ground and migratory woodland caribou still migrate through and reside in Manitoba today (Figure 6.1). The caribou described in the historical records and represented by the archaeological remains are most likely the ancestors of these herds. The Southern Indian

Lake region is primarily occupied by the barren-ground Qamanirjuaq herd that migrates from Nunavut south in the winter. These are likely the caribou described in records referring to that area and represented by the faunal bones. In the York Factory region, the story is murkier. Previous scholars have associated the historical caribou at York Factory with barren-ground animals, while others describe them as woodland. This disagreement is primarily due to the inconsistencies in the historical documents, the large numbers of caribou described, and the migratory behaviours of the historical animals. In all likelihood, however, the caribou that visited York Factory during the fur trade and prior were the predecessors to the Pen Island and Cape Churchill herds of migratory woodland caribou, as described below. Boreal woodland caribou also played a role historically, but historical documents from the study area often focused on migratory caribou, and so connections between past and present are clearer for the barren-ground and migratory woodland caribou herds.

6.3.4.1 Barren-ground caribou: The Qamanirjuaq Herd

In the present day, barren-ground caribou -- specifically the Qamanirjuaq herd -- continue to migrate into northern Manitoba in the winter months. Their winter range includes the northern section of Southern Indian Lake, and in some years the caribou are further south along the lake (Keeyask 2012). At the Manitoba-Saskatchewan border, this herd travels approximately halfway down Reindeer Lake (Keeyask 2012). To the east, these animals sometimes cross the Churchill River, and occasionally reach Split Lake.

Archaeological remains suggest that this range was similar in the past, but perhaps extended further south more frequently, given the locations of HdLx-1, HdLw-7, HeLw-20, and HeLu-2. While it is likely that both barren-ground and woodland caribou were available in these

locations, the focus of Cree harvests was doubtless on the large herd of barren-ground caribou, due to their large numbers. Ethnohistorical sources indicate that caribou crossed Southern Indian Lake in the late winter months. In general barren-ground caribou are described as moving north in the spring and south in the fall. Some sources also indicate the Churchill River as the edge of the barren-ground range, which is generally consistent with movements today, though of course barren-ground caribou are sometimes found to cross the river. These descriptions appear to correspond with the modern behaviours of the Qamanirjuaq herd. Based on modern range maps (e.g., BQCMB 2014; Keeyask 2012), the range appears to be similar to that described historically and suggested archaeologically. It is possible that they previously ranged a short distance further south, as Preble (1902) noted that the barren-ground caribou reached the southern end of Reindeer Lake.

6.3.4.2 Migratory woodland caribou: The Pen Island and Cape Churchill Herds

In the 1950s and 1960s, small herds of caribou were noted inland from Hudson Bay in the Lowland forests of Ontario during the winter (Abraham and Thompson 1996). In the 1980s, hunters from Shamattawa noted migrating caribou in their vicinity as well (Abraham and Thompson 1996). The YFFN members interviewed for this project also indicated that caribou did not come to the Split Lake region until more recent years. This suggests an increasing population or a shift in range. Indeed, the population rose steadily during the 1980s and 1990s (Abraham and Thompson 1996). However, changes in range and numbers were noted again in the 2000s (Abraham et al. 2012). Today, the Pen Island caribou herd migrates from Ontario to the Nelson River, passing Shamattawa and coming near York Landing (Keeyask 2012). They occasionally cross the Nelson River as well (Keeyask 2012). The Cape Churchill herd migrates

to the Nelson River and crosses as well (Keeyask 2012). These general movements were described and verified during interviews with YFFN members.

While the large numbers and migratory movements of the caribou around York Factory caused confusion regarding their classification, it appears likely that the historical caribou were in fact the predecessors to the Pen Island herd. Historical sources note a range similar to that occupied by Pen Island caribou today, though the historic coastal migration path differs from the modern route. During the later years of the fur trade, the caribou around York Factory declined significantly. Groups of caribou remained in the region but in insignificant numbers. Indeed, as mentioned previously, YFFN Elders I spoke to indicated that caribou were not plentiful around York Factory when they lived there in the early 20th century, and it was mentioned that when people hunted caribou they went inland and north across the Nelson River. Without the hunting pressures of the fur trade, it seems that the populations rebounded, allowing for the greater numbers observed in subsequent decades of the 20th century. As for the Cape Churchill animals, their history is not as detailed. McTavish (1963) noted the presence of scattered herds of woodland caribou in the area between Cape Churchill and York Factory, suggesting the presence of these caribou during the late 1800s, though these are not necessarily the ancestors of the modern Cape Churchill herd. In addition, an account from Jérémie (1926) suggests the presence of caribou in the area while he was there, in the late 17th and early 18th centuries. He stated that in the region between "Fort Bourbon" (York Factory) and "Danish River" (Churchill River), the only thing of note was the herds of caribou seen in the summer months (Jérémie 1926). In addition, as stated above, one participant noted that YFFN members resident at York Factory in the early 1900s hunted caribou north of Port Nelson. These points suggest that predecessors to the Cape Churchill animals may have continuously used this region over centuries.

6.4 Use and Caribou Populations

The final objective of this research focuses upon the relationship between use and populations over time. In general, the relationship between caribou abundance and the Cree use of caribou during prehistoric and historic times is straightforward. Caribou were important across time, with a central role in the seasonal subsistence; this is clear through the continued reliance on caribou in the changing economy of the north through the fur trade and into the present day. When caribou were available, they were hunted and used. In the context of traditional Cree subsistence, caribou were generally sought out during specific times of year, that is, during their annual migrations when they were available in large numbers. This was indicated in a variety of sources. In particular, YFFN Elders and hunters described the seasonal cycle followed by Cree people, explaining that caribou are hunted during their seasonal migration.

In their discussion of Ojibwa subsistence strategies, Rogers and Black (1976) outline several principles, including the idea that specific food resources were sought out when they were most abundant and readily available (i.e., during particular seasons). This concept is seen here as well, and ties into the concepts found in OFT. In this way, prey choice can be explained by the seasonal availability of different species. As caribou were most abundant and accessible during migrations, focusing on caribou during these times would maximize hunting efficiency.

With the advent of the fur trade and the increasing involvement of Cree people in provisioning, hunting pressures on caribou increased, and the animals were assigned an additional value through this economic context. As a large mammal that congregates in large groups, caribou are an ideal subsistence resource, providing an opportunity to access a great amount of food in a single hunting excursion. In addition, during the fur trade, year-round hunting of caribou was also encouraged, a shift away from strictly following the seasonal cycle.

The increased use of caribou correlates with and influenced their decline in the 1800s. It seems that this use of caribou impacted their abundance, just as abundance encouraged use (Figure 6.2).

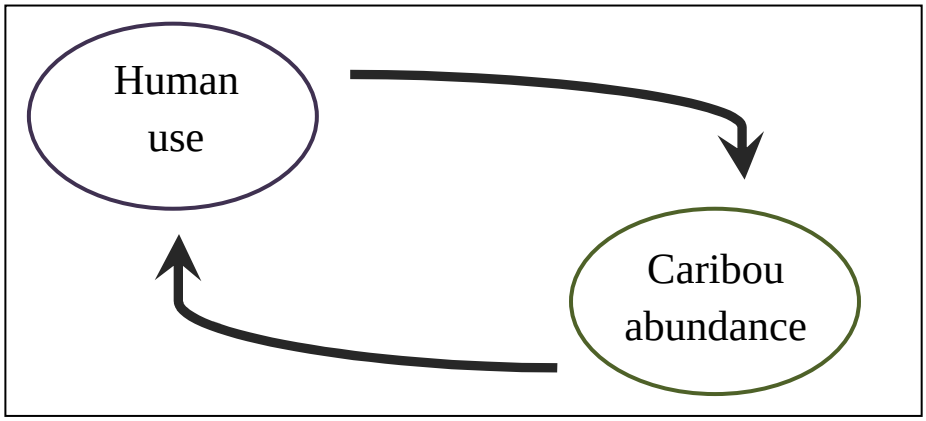

Figure 6.2 Basic relationship between use and population abundance

However, the reduction in caribou populations is not as straightforward as over-use: as discussed above, other factors such as fires, weather patterns, and habitat changes may have also played a role in the caribou decline (Figure 6.3).

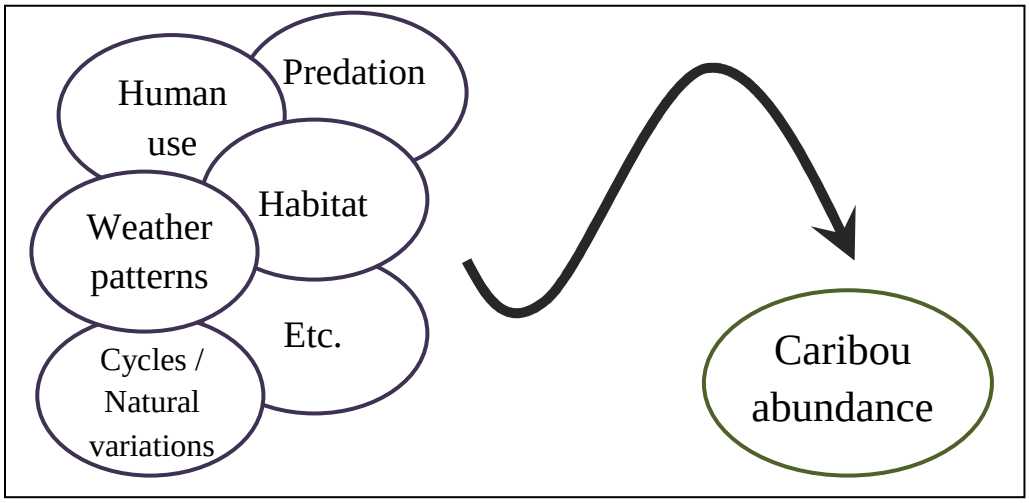

Figure 6.3 Complex factors involved in caribou abundance

Hunting patterns during the fur trade -- with hunting eventually being carried out year-round, more mouths to feed due to European occupation, and economic incentives for trading -- clearly indicate the influence of use on caribou populations. Caribou abundance also influenced use; these animals were used whenever available, both in the traditional seasonal subsistence pattern and in fur trade usage. We cannot deny the influence of seasonal patterns on hunting activities and caribou use. However, it is important to remember that when caribou were scarce, their absence was sorely felt. Caribou remained an important part of life, even when they were not available in great numbers, and so use is not the sole indicator of value. While caribou are not as central to subsistence as they once were, these animals are still highly regarded and valued by people today. The role of caribou in the traditional seasonal economy of Cree people remains important, just as moose hunting, goose hunting, fishing, and trapping continue to be valued activities.

6.5 Summary

The above discussion demonstrates the continued use of caribou over time in northern Manitoba, changing abundance and migration patterns, and the connections of this historical information to modern caribou herds in Manitoba today. During the pre-contact period, caribou were a key part of the Cree seasonal economy, with these animals primarily being hunted during the migrations and other species such as moose, beaver, waterfowl, and fish being exploited at various times throughout the year. This pattern continued into the fur trade period. However, with an increased demand for caribou in the form of skins and provisions for European traders, caribou experienced increased hunting pressures. These hunting pressures appear to have contributed to the decline of caribou populations in the York Factory region, possibly in

conjunction with habitat alterations and weather factors. The historic patterns of factors such as these require further research and consideration to better understand the causes of the caribou decline around York Factory. Nevertheless, it appears that increased hunting was influential in the scarcity observed in the 19th century.

The caribou that were exploited in the past appear to correspond with modern populations of caribou. As such, this analysis provides further detail regarding these herds. Ranges and migration routes have altered, more so in the Hudson Bay Lowlands. These changes provide further evidence for the influence of hunting pressures, as well as possible habitat alterations and weather variations, on caribou populations. In particular, this demonstrates the way in which pressures from human activities can compound with environmental factors to profoundly alter caribou populations. However, in the case of the caribou around York Factory, we see signs of resilience in response to hunting pressures, as the population rebounded fairly quickly.

Overall, it is important to recognize the continued socio-cultural value of caribou over time. These animals were vital to prehistoric and historic Cree subsistence, and contributed to the fur trade economy in Manitoba. Caribou have retained their importance for present-day communities, both as a food source and as a valued aspect of Cree tradition.

The final chapter reviews the findings of this thesis, and discusses the relevance of this information for caribou conservation and management. A historical ecological understanding of caribou is outlined, demonstrating the value of studying past patterns of use, movement, and abundance.

CHAPTER VII:
CONCLUSIONS

The overall aim of this thesis was to develop a historical ecological understanding of caribou in northern Manitoba, situating the history of caribou within the context of human use. Through exploring this history, it has been possible to demonstrate the long-standing relationship between Cree people and caribou within the region and to outline past patterns of caribou abundance and migrations.

A considerable amount of the data used in this research was pre-existing and, in the case of much of the ethnohistorical information, has been considered by previous researchers in various fields. Past research in history and caribou biology have included commentary on the historical patterns of caribou in the York Factory region. This body of research includes a consideration of caribou in the context of a broader study of Cree subsistence patterns during the fur trade (Lytwyn 1993), studies on the Pen Island herd of caribou in Manitoba and Ontario (e.g., Abraham et al. 2012; Abraham and Thompson 1996), and general considerations of caribou such as those by Kelsall (1968), Harper (1955), and Banfield (1951). This thesis revisits and adds to these past studies, spotlighting the history of caribou in northern Manitoba and its relevance for modern conservation and management. While similar ethnohistorical sources are relied upon, including the York Factory journals and works by Graham (1969), Isham (1949), McTavish (1963), and Hearne (1795), this data has been considered in the context of the objectives of this research. In addition, archaeological information from northern Manitoba previously unused in caribou research -- and under-utilized in general -- is combined with these sources, lending further support to the findings of past considerations of caribou use (e.g., Lytwyn 1993). Contextualized through discussions with YFFN community members, this research has

consolidated and enriched the historical understanding of caribou in the region, and laid the groundwork for future investigations and modern applications.

7.1 Summary: A Historical Ecology of Caribou

The information collected through this research demonstrates the use of caribou across time. During both the pre-contact period and the fur trade period, and in both areas of northern Manitoba considered in this thesis, caribou were used by Cree people for food, clothing, shelter, and tools. They were an important part of the seasonal economy, and were primarily hunted during the annual migrations.

In the pre-contact period, Cree people relied on several different species, one of which being caribou. Different animals were available during different times of the year: geese and ducks were primarily hunted in the spring and fall when they migrated to nesting and wintering grounds; caribou migrated in the spring and fall; moose and fish were used year-round but especially during the warm season; and furbearers were hunted year-round as well but particularly during the late fall and winter months. A consideration of OFT and the relevant concepts aids in understanding this seasonal cycle. Caribou were a key source of food, and played a role in the seasonal movements and activities of people, with caribou hunting being an important aspect of the annual cycle. The exact ranges of caribou during this time are not firmly established. However, given the site locations it appears that caribou in the Southern Indian Lake region travelled a similar range to that which the Qamanirjuaq herd occupies today.

With the establishment of the fur trade, caribou also began to play a role in the fur trade economy. An important provision for the traders, Cree hunters began bringing caribou meat and skins to the forts and worked as provisioners as well as trappers. Caribou remained an important

source of food and materials for Cree people, and the overall seasonal cycle still influenced hunting patterns. However, as more time was spent trapping furbearers with little food value, caribou were hunted more frequently to compensate. As large mammals, the time spent hunting caribou ensured a greater amount of food than if that time was spent hunting smaller mammals for food. In the early 1800s, caribou, moose, and beaver populations declined, and issues with scarcity occurred throughout the century, with Native hunters and European traders struggling to successfully locate and harvest these animals.

The previous chapter detailed the human use of caribou over time, and the implications for abundance and social value. Below, the relevance for caribou conservation and management is contemplated.

7.2 Conservation and Management Implications

This historical ecological study of caribou is valuable to conservation and management efforts in the province, as it provides a more detailed understanding of the changes experienced by caribou in the past and the connections of historical caribou to modern herds. It also provides further evidence of the long-standing socio-cultural value of caribou to Cree people, supporting the importance of consultation and collaboration with First Nations communities in caribou management decision-making.

7.2.1 Modern connections

Both barren-ground and migratory woodland caribou were considered in this thesis, as the study region includes parts of the ranges of both of these subspecies. The ranges and migration routes described in the historical record demonstrate the connections between

historical herds and modern herds. Archaeological remains also suggest the continuity of these herds. As indicated previously, the Qamanirjuaq herd of barren-ground caribou would have been the caribou available around Southern Indian Lake. Today, their range is much the same. As for the caribou in the York Factory region, these appear to correspond with the Pen Island and Cape Churchill herds today. The migration route typically followed by the Pen Island herd differs from the path followed historically: during the fur trade, the caribou generally moved along the coast from around Fort Severn to York Factory, whereas today these caribou move inland towards Shamattawa.

These ties to present-day herds indicate the longevity of caribou in the region, and the relative stability of the ranges over time. The coastal caribou have experienced greater change, and this is perhaps an important consideration in modern studies. The historical records suggest that significant human use has impacted the movements and numbers of these animals. The Pen Island animals were 'recently' discovered in the region and the population and range expanded in 1980s and 1990s, which, assuming these are indeed the caribou historically hunted at York Factory, is indicative of a rebound in population and recovery from these historical effects (Abraham and Thompson 1996). These caribou are an example of the various ways in which caribou can be negatively impacted by human activities, and this is an important consideration in future operations that may impact the area. However, their relatively quick recovery also suggests the resilience these caribou have in the face of hunting pressures, in comparison to other more long-term issues such as habitat destruction.

7.2.2 Changes and causes

As detailed in the previous chapter, the causes of the population decline experienced by caribou in the 19th century were likely multi-faceted and complex. Both environmental and human factors were most likely at play, and influenced caribou abundance and movements. Population cycles, climatic variation, habitat alteration, and food availability all possibly impacted the availability of caribou and resulted in a shift in ranges around York Factory. Habitat and climate, as well as general seasonal variation, could have influenced any shifts in southward range of the barren-ground caribou as well. Based on the historical information gathered for this study, it appears that increased hunting pressures due to fur trade demands for provisions and the necessity of European trade goods played a central role in driving down caribou numbers in the York Factory region. This historical ecological study serves as yet another example of the various factors that influence caribou populations, and demonstrates the impacts these caribou experienced in the past.

In the consideration of the various factors that impacted caribou populations in the past, the importance of understanding issues from a Native perspective is also highlighted. The issue of overhunting and severe wastage by Native people was described by many historical sources. Complex factors explain this issue, including economic demands of the fur trade and practical reasons based on seasonal usability of meat and fur, and yet the idea of overhunting has nevertheless resulted in various caribou conservation measures and restrictions being put in place in northern Canada which negatively impacted the lifeways of Dene and other people (Dean 2008; Kulchyski and Tester 2007; Sandlos 2007). While of course hunting pressures should not be disregarded in this context, the complexity of these issues must be considered, historical biases must be acknowledged, and Aboriginal perspectives and practices must be understood.

7.2.3 Socio-cultural value

Zooarchaeological analysis suggests the continued use of caribou in a similar seasonal pattern, likely over thousands of years ranging from the late pre-contact period to the fur trade. Even more recent information from later archaeological sites (i.e., HfLp-6) and from interviews with YFFN participants demonstrates the continuation of caribou use in a changing economic context. The seasonal subsistence traditions of the Cree include caribou as a key resource during seasonal migrations. This use is demonstrated through ethnohistorical data and through discussions with YFFN as well. While the fur trade changed the usage of caribou in some ways, namely amount hunted and hunting practices, caribou were still central to Cree subsistence. The YFFN members who spoke with me explained that caribou are valued as a food source and as an expected part of the seasonal cycle and of the landscape. The importance of caribou lies in their use but also in their overall presence in the environment.

Overall, this thesis provides further support for and information regarding the socio-cultural value of caribou and the long-standing relationship between Cree people and caribou. This value is important to recognize in conservation and management efforts, as it indicates an importance beyond the ecological. Because of this, First Nations communities must be included in caribou conservation and management decisions.

7.2.3 Historical ecology and management

Finally, this thesis serves as another example of the value and utility of historical ecology in conservation and management studies. Historical ecology, which as described considers the interrelationships between humans and the environment over time, provides a depth of

understanding that may otherwise be overlooked. In doing so, historical ecology provides researchers and managers with a deeper understanding of the issues at hand.

The value of interdisciplinary studies, particularly the combination of the anthropological, the historical, and the ecological, has been made clear through an ever-growing body of literature. As pointed out by many researchers (e.g., Balée 1998, 2006; Crumley 1994; Fritz et al. 1993; etc.), it can be all too easy to separate humans from environment, considering ecological processes in isolation from human action and influence, and vice versa. These things do not exist in isolation, however, and so researchers must consider these various factors and fields.

Historical ecology brings time depth and insights into patterns, impacts, responses to change, and sustainable practices. It can also be used to explore hypotheses formulated through other approaches. In this case, a historical ecological approach has ensured that long-term patterns of caribou movements and numbers are considered, as well as ensuring that the complexity and influence of human needs and economic demands are acknowledged. Through the combination of historical, archaeological, and ecological understandings of caribou, it has been possible to more fully consider patterns, changes, and their causes, both environmental and anthropogenic.

7.3 Future Research

Research concerning the history of caribou has been conducted in various regions (e.g., Gordon 2003, 2005; Santomauro et al. 2012). This thesis focuses specifically on caribou in Manitoba, and could be used as the basis for various future projects focused on either the relationship between caribou and people or caribou biology.

As this thesis in part demonstrates the relationship between caribou and Cree people in northern Manitoba, future research into similar subject matter may draw from this project. General subsistence practices, the socio-cultural value of caribou, and historical understandings of caribou subspecies are a few topics that may be useful to explore in further detail in the future.

The archaeological specimens studied as part of this project could be used to explore the genetic history of caribou in the region. This would be particularly useful in the York Factory region, where researchers could explore the intermingling of different caribou subspecies and better understand the genetic make-up of the Pen Island herd. Faunal remains from the Southern Indian Lake sites may provide insights into the distribution of caribou subspecies in that region as well, particularly if pre-contact remains are considered.

As discussed, other factors in addition to hunting pressures could have been at play and should be considered in more detail in the future. The historical information studied in this thesis provides a limited account of these factors. Thus, a detailed history of fire outbreaks, climatic variation, and other factors would provide a deeper understanding of these issues. Further research would aid in understanding long-term impacts and responses to factors other than overhunting.

Overall, this thesis can serve as the basis for various future explorations into caribou in the past, and may also be drawn upon for studies on various archaeological and historical topics.

7.4 Reflection and Concluding Remarks

The role of caribou in the ecosystem, in economics, and in culture has a long history. The overall status of caribou is deeply intertwined with and reflective of the relationship of this animal with human activities and culture. Through this thesis, I have explored the history of

caribou in northern Manitoba and their interactions with Cree people. In doing so, I have developed an understanding of caribou use across time, changes in caribou migrations and abundance, and the overall importance of caribou for Cree communities. The continuity of this relationship and value is impressive, and through speaking with YFFN Elders and hunters I was able to learn about the continued use of caribou today and their importance in a modern context. This understanding was incredibly valuable when considering the use of caribou in the past.

In exploring the prehistoric and historic use of caribou, it became clear that caribou have long been an important species in this region. Though at times unpredictable, these animals were depended upon for food and materials for clothing and tools. They were one of several key species in a mixed seasonal economy, and this demonstrates the broad nature of subsistence in the study area: people adapted to the local environment and relied upon many different species at different times of the year. This pattern of use continued into the fur trade period, but gradually shifted to heavier exploitation of caribou and other game for provisions and furbearers for trading. Increased hunting pressures, paired with various environmental factors, resulted in scarcity in several species including caribou in the 1800s. While still available, caribou were nowhere near as plentiful as they had been previously, and people began to focus on other species (e.g., hare, fish, geese, etc.) and increasingly came to rely on and value European supplies.

The decline experienced by caribou in the York Factory region was, it seems, temporary, as the Pen Island herd increased in population and range over a century and a half later. The range of the Qamanirjuaq herd appears to have retracted slightly northward, though otherwise is quite similar to that noted historically. Understanding the development of these herds, past changes they experienced, and their overall importance to people in the region can assist in

making better management decisions today. This history demonstrates the ways in which caribou can be influenced by human use and environmental changes, and also enforces the importance of caribou to Cree communities.

In this way, this thesis shows the utility of historical ecology to conservation and management studies as well as the importance and value of including First Nations communities in research. The archaeological and ethnohistorical data are invaluable in demonstrating past patterns of use and abundance of caribou, which contributes to the modern understanding of caribou. Working with YFFN and considering the Cree relationship with caribou helped me to better understand the information I was interpreting, lent focus to the project objectives, and ensured that the research was reaching a community with modern and historical ties to the study area and to caribou in general. Overall, this thesis has resulted in a truly historical ecological understanding of caribou in northern Manitoba, and highlights the value and potential of archaeological, historical, and community-based research in caribou conservation and management.

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APPENDIX A:
ETHICS APPROVAL AND SAMPLE CONSENT FORM

UNIVERSITY OF MANITOBA | Research Ethics and Compliance
Office of the Vice-President (Research and International)

Human Ethics
208-194 Dafoe Road
Winnipeg, MB
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APPROVAL CERTIFICATE

January 17, 2014

TO: **Laura Hebert** (Advisors Davidson-Hunt/Manseau)
Principal Investigator

FROM: **Susan Frohlick, Chair**
Joint-Faculty Research Ethics Board (JFREB)

Re: **Protocol #J2013:151**
"A Historical Ecological Study of Caribou in Northern Manitoba"

Please be advised that your above-referenced protocol has received human ethics approval by the **Joint-Faculty Research Ethics Board**, which is organized and operates according to the Tri-Council Policy Statement (2). **This approval is valid for one year only**.

Any significant changes of the protocol and/or informed consent form should be reported to the Human Ethics Secretariat in advance of implementation of such changes.

Please note:

- **If you have funds pending human ethics approval, please mail/e-mail/fax (261-0325) a copy of this Approval (identifying the related UM Project Number) to the Research Grants Officer in ORS in order to initiate fund setup. (How to find your UM Project Number: http://umanitoba.ca/research/ors/mrt-faq.html#pr0)**

- **if you have received multi-year funding for this research, responsibility lies with you to apply for and obtain Renewal Approval at the expiry of the initial one-year approval; otherwise the account will be locked.**

The Research Quality Management Office may request to review research documentation from this project to demonstrate compliance with this approved protocol and the University of Manitoba *Ethics of Research Involving Humans*.

The Research Ethics Board requests a final report for your study (available at: http://umanitoba.ca/research/orec/ethics/human_ethics_REB_forms_guidelines.html**) in order to be in compliance with Tri-Council Guidelines.**

PROJECT CONSENT FORM

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way. This research has been approved by the Joint-Faculty Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Coordinator (HEC) at 474-7122 or Margaret.Bowman@umanitoba.ca. A copy of this consent form has been given to you to keep for your records and reference.

If you have any questions, feel free to contact:
Laura Hebert (Researcher) – laura.hebert5@gmail.com or umhebe29@myumanitoba.ca
Iain Davidson-Hunt (Supervisor) – Iain.Davidson-Hunt@umanitoba.ca
Micheline Manseau (Supervisor) – micheline.manseau@pc.gc.ca

Please indicate whether you agree to the following:

	YES	NO
1. I am 18 years of age or older.		
2. I agree to participate in this project.		
3. I agree that the researcher may take notes during this interview.		
4. I agree that the researcher may use a recording device during this interview.		
5. I agree that the researcher may take photographs of me for use in publications connected to this research.		
6. I agree that the researcher may cite my name and directly quote me in publications.		
7. I agree that the research may directly quote me using a pseudonym rather than my name.		

Participant's Signature: _____ Date: _____

Researcher's Signature: _____ Date:_____

Participant Contact Information:
Name: _____
Mailing Address: _____
_____
Phone Number: _____
E-mail Address: _____

APPENDIX B:
INTERVIEW GUIDE

1) About the participant

- What is your name?
- When and where were you born?
    - When did you move to York Landing?
- Can you tell me about your experiences with caribou? Do you hunt, for instance?

2) Research Questions

I am going to ask you a few questions about what my research is showing so far. This can be based on your own experiences/knowledge, or perhaps stories you've heard from your parents/grandparents/Elders at the time.

a) <u>Population/Migration</u>

- My research has found that caribou populations declined in the early 1800s, and some authors have noted scarcity throughout this time as well.
    - Did anyone ever talk about caribou becoming scarce in the past?
    - Have you noticed fewer caribou at any point in time?
- The historical documents talk about caribou calving at and migrating past Ten Shilling Creek, Pennycutaway River, and other locations along the Hayes.
    - Have caribou always calved there?
    - Do they still go there?
    - *Where did people hunt caribou?*
- The historical documents seem to mention the migrations and hunting mainly in the months of May and June (sometimes earlier, in April), and September and October (sometimes into November).
    - Is that where they pass through today?
    - Is that when they migrate? Has this changed?
    - Do they come through York Landing?
    - Did they come here when you first moved here?
    - *When did people hunt caribou?*

b) <u>Hunting and Uses</u>

- How do you hunt caribou?
    - When living at York Factory, how did people hunt caribou? Did you ever see/hear about using caribou fences or snares for caribou?
    - The archaeological information I have found seems to show that both adults and calves were hunted, but primarily adults. Is this true? Are/were there preferences for adults or calves? Males or females?

- When a caribou is killed, is it butchered immediately? Are there certain parts that are preferred or left behind?

- What do you use caribou for?
    - Do you or does anyone in York Landing still tan hides? Make bone tools? Make other things out of bone or antler? Did you see/hear about anyone making these things at York Factory?
    - Most of the items that I have found were made of caribou, though certainly some bone tools were moose. Is caribou hide/bone better to use for certain things than moose hide/bone?
- What were caribou used for at York Factory? The historical documents say caribou were used for food/provisioning (dried meat, tongues, etc.) and skins (for clothing).
    - Did you hear any stories about trading caribou there?
- There are many more caribou bones than moose bones in the archaeological collections, and moose were rarely mentioned in the historical documents at York Factory.
    - Were moose found around York Factory? Were they ever hunted?
    - Were moose important? Are moose important today?
    - What other animals were hunted then?

c) <u>Other</u>

- How do Cree people treat caribou? Can you describe the importance of caribou?
- Do you have any stories about caribou you'd like to share?
    - At York Factory, in the past?
    - Any traditional stories you'd like to share?

APPENDIX C:
EXAMPLES OF FAUNAL REMAINS

Examples of tools

Caribou flesher (HiLp-3)

Caribou scraper (York Factory)

Antler wedge (HiLp-1)

Example of butchery

Calcaneus with cutmarks (HeLu-2)

Example of gnawing

Metatarsus, carnivore gnawing (York Factory)

Other examples

Phalanges (HdLw-7)

Scapula, demonstrative of bone condition at Kame Hills (HiLp-1)

APPENDIX D:
EXAMPLES OF ETHNOHISTORICAL PHOTOS FOR WORKSHOPS

The following photos are examples of items made of caribou hide from the Manitoba Museum. These are some of the photos that were shared at workshops with YFFN.

Dog whip: Caribou hide and yarn.

Belt: Caribou hide and plastic beads.

Parka: Caribou skin, cotton, and sinew.