Caribou is Life: An Ethnoarchaeology of Ethen-eldèli Denesųłiné Respect for Caribou

by

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Abstract

Descendent communities request that archaeological practices in Canada change to address and incorporate their traditional values and needs. Directed by the Ethen-eldèli Denesųłinë, this study centres on their relationship to barrenland caribou. This research serves as a case study on how to close gaps between archaeological and indigenous communities by integrating community guidance and differing worldviews. This collaboration addresses how the relationship between the Ethen-eldèli Denesųłinë and the Beverly and Qamanirjuaq caribou herds helps to maintain cultural continuity. The study uses interviews of knowledge holders to understand how Denesųłinë relate to caribou. It documents variations in Denesųłinë techniques of caribou harvest, migration routes, and seasonal rounds. It provides data on how technological, social, and ecological changes affect cultural resilience. Because of the unprecedented ecological change occurring in the barrenland caribou ranges, this research has particular value for the Denesųłinë. This community-oriented study uses ethnohistorical and ethnoarchaeological methods to understand Denesųłinë rules of caribou harvest and to show how Denesųłinë embed their respect for caribou in hunting, butchery, and management practices. The Ethen-eldèli Denesųłinë believe that caribou is life. They show respect to caribou in numerous ways and believe that these attitudes and behaviours preserve and perpetuate their way of life.

Keywords: Ethen-eldèli Denesųłinë; barrenland caribou; anthropology of respect; ethnoarchaeology; cultural resilience; caribou is life
Dedication

This work is for Ethen-eldëli Denesųlinė youth. May your hunts always be successful.
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Chapter 1.  Respect for Caribou: Indigenous Heritage and an Ethnoarchaeology of Ethen-eldèli Denesųłiné

Descendant communities request that archaeological practices in Canada change to incorporate their traditional values and needs. In the Canadian Subarctic, my caribou hunting Ethen-eldèli Denesųłiné partners asked me to study how they steward their culture. Their leadership, elders, and harvesters all want to safeguard their lifeways from government intrusion; that is, they wanted this study to reveal how their pervasive relationship to caribou secures their future. In asking to do this work, the Denesųłiné are attempting to inoculate themselves from government actions that trample on their customs. This proactive approach is not incidental; rather, it is informed by the unjust historical treatment of their kin and neighbours by various governments, such as the abysmal relocation of the Sayisi Denesųłiné in the 1950s, and increasing restrictions and moratoriums on the harvest of barrenland caribou herds. As an archaeologist and academic, I provide a scientific basis to the Denesųłiné lifestyle that wildlife biologists cannot. The resulting project, as reported here, examines a central question: how does the relationship between the Ethen-eldèli Denesųłiné and the Beverly and Qamanirjuaq caribou herds maintain cultural continuity? Here I follow Metallic's (2015:37) definition of cultural continuity as “the desire for a people to maintain core elements of their culture such as stories, traditional values and language by adapting to changes over time.” Canadian indigenous communities also describe cultural continuity as “being who we are” (Oster et al. 2014:3).

Through critical use of the direct historical approach, in combination with elder and harvester interviews, ethnohistorical review, and archaeological surveys, I analyse how the Denesųłiné preserve and share their heritage. Now that significant climatic and ecological change is occurring on the barrenland caribou range, this research has attracted special interest by the Denesųłiné because they think that the respect they show caribou is the way they preserve and adjust the Denesųłiné way of life. This research assesses the influence of Denesųłiné values on the creation and maintenance of heritage and reveals how they incorporate understandings of the past, including the ethnoarchaeological information developed through this study, in their cultural narratives.
This project specifically addresses how indigenous communities apply the results of archaeological research to address questions important to the Denesųłiné. These include queries on the persistence of Denesųłiné traditions that focus on co-dependence of caribou herds. This study also helps to resolve issues about the range of data types and applications relevant to community-oriented studies. It reveals the interdependencies of context and relevance to all parties to community-oriented research.

In Canada, academically trained archaeologists are charged with managing heritage for the province, nation, and discipline. They tend to promote an archaeologist-made heritage. The project follows Laurajane Smith’s definition of “heritage” as “a process of engagement, an act of communication, and an act of making meaning in and for the present” (2006:1). Heritage is a social experience in which sharing knowledge and memories inform the present. Such a social approach to heritage involves how people identify with the past (Smith et al. 2003:66). This understanding challenges a particular use of the archaeological record in the management of heritage and suggests a community-oriented alternative. If heritage is a social engagement then a community-based project can balance the interests of scientific research and descendent communities. With this in mind, I study the historical and twenty-first century relationships of the Ethen-eldèli Denesųłiné to caribou. The community directors for the research live in Black Lake, Fond du Lac, and Wollaston Lake in Northern Saskatchewan and harvest from the Beverly and Qamanirjuaq barrenground caribou herds (Figure 1.1). In this dissertation I focus on Western and indigenous cultural and archaeological practices and aim to reveal the influence of Denesųłiné values and processes that create a distinct, Denesųłiné-authored and owned heritage.
1.1. Incorporating Indigenous Concerns in Archaeological Research

Canadian archaeological practice should narrow the gaps between the aims of archaeologists and indigenous peoples (Nicholas 2001:30-33, 38, 2008:1660, 2010:10-13). Historically, archaeological research was rooted in a colonial practice of interpreting the past because experts based in Western science evaluate and redefine local and regional histories (McNiven and Russell 2005:1-8; Nicholas 2005:89; Watkins 2012:260-262). Many northern Canadian aboriginal communities still grapple with this form of heritage-based colonialism (Kapyrka 2010:11-16). This is evident by the legal definitions of ownership contained in public laws created by provincial and territorial governments (Smith and Jackson 2007:172-173; Yellowhorn 1996:27).

Archaeological practice is clearly a socio-political action in and for the present (Tilley 1989:105; see also explicit applications of critical theory in Leone et al. 1987:283-292; Lyons 2005:1; Wylie 1985:138). Collaborative research with stakeholders may influence interpretation and results for social and political gain due to skewing results by misidentifying cultural diagnostics to assume patrimony, limiting research access to datasets, knowledge holders, and land, intentionally omitting data, falsifying oral history, and rewriting conclusions (Custer 2005:7-10; McGhee 2008:580-581; Trigger 1989:776-797).1

Shanks and Tilley (1987:7, 1988:205) and Smith (2004:1-4) suggest that archaeologists should account for the social and political milieu that surrounds their research because archaeological data can be abused and misinterpreted (Carman 2005:45; Gero 2004:287-294). However, there are many examples of community-oriented research that balance collaboration, community, and archaeological values (Atalay 2012:47-55; Nicholas et al. 2007:275-290; Smith et al. 2003:69-80). These often use ethnographic methods to include indigenous concepts in archaeology such as principles of respect and reciprocity between the living and the ancestors and their material culture of the Hul’qumi’num Treaty Group, intergenerational research conversations that are the foundation of the Moriori Cultural Database, and the collective knowledge stewardship by the Ziibiwing Cultural Society and their management of the Sanilac Petroglyphs (Hollowell and Nicholas 2009:147-152). An ethnographic form of archaeology moderated politized ethnic tensions in New Orleans (Matthews 2008:157-182) and community involvement negotiated diverse perspectives of the Sanctuary of Poseidon at Poros (Hamilakis and Anagnostoropoulus 2009:76).

A respectful archaeology is the primary goal of various archaeological associations, such as the Canadian Archaeological Association (CAA 1997:5-6) and the World Archaeological Congress (1991:22-23). This goal highlights respectful archaeological practices and advocates that researchers show due regard for indigenous traditions and local communities. Many descendent communities share concerns that most archaeological work lacks appropriate respect for their values.

1 As noted in section 1.5.3, I mitigated potentials for abuse by vetting the results of the dissertation with my Ethen-eldéli Denesųłiné partners.
Although there are exceptions, Canadian archaeological research is a colonial endeavour as most archaeological research is for cultural resource management (CRM) projects set within environmental assessment frameworks (Birch 2006:134-137; Byrne 1991:269-276; Waterton and Smith 2009:12-15). Also, community heritage is subject to provincial or territorial management (Klassen 2013:3; Waterton and Smith 2010:10; Waterton 2015:59). In many indigenous peoples’ minds, my community partners’ included, archaeologists are outsiders to communities and treated with mistrust. They are grouped with external specialists, including health care providers, social workers, educators, biologists, and accountants (Fontaine 2009:12; Widdowson and Howard 2008:19-48). Many descendent communities propose an alternative: archaeologists should show respect for communities by collaborating, deferring to, and working for them (Yellowhorn 2015:1). Archaeologists should also focus research on areas of interest and importance to descendants (Nicholas 2000:127-129; Welch et al. 2011:85). The Denesųłiné partners of this study asked to focus research on their relationship to caribou. Working in collaboration, the community partners and I collected data about modern and historical interactions with caribou. By doing so, we mobilized knowledge for mutual benefit that respects both Denesųłiné needs and my archaeological interests.

In this dissertation I explore how people identify with the past and how individual experiences contribute to group understandings and uses of places and material objects in support of local histories (see Labadi 2007:150-153; Meskell 2002:281; Nora 1989:18). Archaeological materials are not inherently meaningful. Instead, a person’s cultural values and relationship to the material inscribes their meaning (Kuutma 2006:177-178; Smith 2006:4,188). This social view of heritage challenges the misconception that only experts take proper care of heritage. Considering that descendent communities keep continuity with their pasts, they are best placed to design and conduct archaeological research to suit their twenty-first century needs and ensure that their values and understandings are part of the interpretation (Atalay 2012:4-6,85; Lyons 2013:5-13). With this in mind, this dissertation investigates the stewardship processes that create Denesųłiné heritage to understand cultural resilience.
1.2. Research Goals and Objectives

With major changes occurring on the caribou range, indigenous traditions are increasingly in conflict with policies of provincial, territorial, and federal governments.\(^2\) These traditions, including caribou harvest, are under threat by governments who interfere and limit activities by such actions as the relocation of the Sayisi Denesųliné in 1956 (Bussidor and Bilgen-Reinart 1997:xxxi), and by ongoing moratoriums for the Bathurst and George River caribou herds that curtail traditional harvests (Government of Northwest Territories 2016:1; McLean 2014:1). While northern communities are directly involved in the decision-making process through resource management boards linked to self-governance, the decisions they face can be difficult, such as self-imposing restrictions on harvesting activities. However, should current policies that restrict and criminalize caribou harvest expand to other jurisdictions in the future, this study provides information that flows back to the communities about the nature and values associated with their caribou harvests and their aspirations to maintain traditional lifeways. This investigation thus aims to understand current and past harvesting practices that inform the future of the Denesųliné. The primary research goal is to understand the social and technological processes operating to preserve and adjust the Ethen-eldëli Denesųliné way of life and heritage. This study centres on the question: how does the relationship between the Ethen-eldëli Denesųliné and the Beverly and Qamanirjuaq caribou herds maintain cultural continuity?

The aim is to document in detail how the Denesųliné relationship to caribou is adaptive and reinforces cultural resilience. To accomplish this, this study:

1. Documents the relationship between the Ethen-eldëli Denesųliné and the caribou

\(^2\) I broadly define traditions as “intangible cultural heritage” and follow UNESCO’s definition as the “means the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity”(UNESCO 2003). By “traditional,” I mean the application of traditions and intangible cultural heritage in day-to-day life.
2. Identifies social and technological mechanisms that influence the resilience of the Ethen-eldèli Denesųlínė

3. Describes the use of travel ways of the Ethen-eldèli Denesųlínė in relation to caribou

The project seeks to identify where modern Denesųlínė understandings of their relationship to caribou may be evident in the archaeological past. The study:

4. Documents the role of the ethnoarchaeological record in the construction of heritage

5. Identifies past and current seasonal rounds and use of the land by the Ethen-eldèli Denesųlínė

6. Sheds light on how Ethen-eldèli Denesųlínė establish their traditional territories and manage change

7. Seeks to benefit northern people and their discourse by engaging ethnoarchaeological data and perspectives in documenting lifeways

8. Assesses the advantages and disadvantages of the community-oriented research adopted here

1.3. The Ethen-eldèli Denesųlínė

The project involves the Ethen-eldèli Denesųlínė, ("the caribou-eaters") who harvest from the Beverly and Qamanirjuaq barrenground caribou herds (Mackay 1978:89-92). The approximately 9,000 Denesųlínė are in 2016 the most numerous and widely distributed of Northern Athapaskans (Smith 1981:271). They reside in nine communities strewn across the subarctic, which is a land of transition between the boreal forest and tundra (ESWG 1995:5, 53-62; Helm et al. 1981:146-148). They range from Hudson Bay north of the Seal River, northwest to the mouth of the Coppermine River on the Arctic Ocean. The Ethen-eldèli Denesųlínė occupy the Great Slave Lake and Lake Athabasca regions and use land as far south as Cold Lake, Alberta (Figure
Denesųłiné have a profound attachment to caribou and land (Deline Dene Band 2012:1; Gordon 2003:19; Wakelyn 1999:2). Indeed, their physical, ecological, and spiritual relationships with caribou define Denesųłiné culture (Helm 2000:63-67). These complex relationships are embedded and reflected in innumerable ways, including in how to harvest and treat caribou (Government of Northwest Territories, Department of Education, Culture and Employment 2012:1), in social rules and behavioural norms (Asch 1989:210-216), in subsistence practices (Tssessaze 1999:1), and in animistic spirituality (Birket-Smith 1930:80-82). Some Denesųłiné think that disrespect shown by aboriginal and non-aboriginal hunters to caribou is the main reason behind the precipitous declines of the barrenground herds (BQCMB 2008:27-28; Kendrick and Manseau 2010:253-254; Sarkadi 2007:56-66). If one adopts the broad Denesųłiné definition of “respect,” which combines spirituality, principles of conservation, and sustainable harvests, then this is indisputably true.
Figure 1.2. Project study area relative to the communities on the Beverly and Qamanirjuaq barrenland caribou range.

Source: After BQCMB 1994a:2.
Traditionally, Denesųłiné are hunter-fisher-gatherers with inveterate loyalty to a local band loosely affiliated with a regional organization. Each autonomous band is a microcosmic unit of social organization that is made of from two to 12 families and responsible for the “spatially compacted condition of the group” (Helm 1968:118-120). Conversely, the regional band is a macrocosmic unit of social organization with a focus on identity in a territorial range; it is composed of 12 to 50 families (Helm 1968:118-120). The size of both local and regional bands depends on the seasons, task groups, and seasonal aggregations (Smith 1970:60-66, 1976:1-5). Overall, kinship maintains and informs band dynamics (Gillespie 1976:6-11; Helm 2000:10): “[t]he unifying aspect is the bilateral primary linkage between constitute conjugal pairs, with a core sibling set as the focus of affiliation” (Helm 1968:120). Since 1990, northern communities’ populations have grown, as reflected in large family sizes, and multi-family co-habitation on designated reserves (Elias et al. 1997:32-33). To put things in perspective, a community that had 100 people in 1900 has 1,000-2,000 people in 2016 (Statistics Canada 2006:1).

Denesųłiné cultural roots lie in adaptations to their physical environment, which exhibits variable resource availability and quality, but social cohesion also plays its part in accessing them (Gordon 2005:155-157). There are strong adaptive mechanisms in the culture, ideology, and spirituality that persist in the face of change (Hodder 1987:1-8; Thomas 1996:89-95). Although most Denesųłiné are Christian, animist traditions are foundational tenets in Denesųliné spirituality, as is the case across much of indigenous North America (Goulet 1998:200; Sharp 1988:112). Shamanic practices, such as the shaking tent ceremony and scapulamancy, continue to offer spiritual sustenance in the same way that church service does (McCormack 2011:153-154). Thus, the Denesųliné relationship to the barrenground caribou anchors their way of life to their land. The distinctive set of social customs that it fosters is what makes Denesųliné unique among their neighbours. This is an important distinction because they manifest this relationship in their physical ways of doing things, their ecological adaptation, and their spiritual understandings of the land, animals, and people.

Denesųliné subsist from traditional foods harvested from the land, primarily caribou, fish, berries, and waterfowl. They also use store-bought foods that are

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3 I.e., conjugal pairs plus dependents.
extremely expensive and brought in by long-distance trucks on seasonal roads, ice roads, or by air. The Denesųłiné are hunters and fishers, and consider those who go on the land to collect resources “harvesters” in acknowledgement of these essential subsistence practices. A survey of 261 individuals from Hatchet Lake Denesųłiné First Nation in 1998 and 1999 (CanNorth 2000) showed that caribou composed over 82 percent of the diet, with all other meats (i.e., moose, beaver, and other small animals) composing less than one percent (see also Appendix A). Fish represented 16 percent of their traditional diet, with birds and berries less than a percent each. In other words, Denesųłiné eat five times as much caribou as fish and 80 times as much caribou as plants and birds. Moreover, in the 1960s, “caribou probably provided 90% or more of the diet; rarely has a society been so dependent on one species” (Smith 1971:396, emphasis added). Furthermore, when compared to 339 different hunter-gather cultures, the Denesųłiné harvest of caribou in the 1970s surpasses the diet received through hunting compiled for all other hunter-gatherers (Binford 2001). Therefore, I wanted to understand their relationship to their main prey: caribou.

1.4. Study Rationale: Will Declines in Caribou Herds Mean Loss of Denesųłiné Cultural Traditions?

The Beverly and Qamanirjuaq Caribou Management Board (BQCMB), an advisory board of indigenous organizations and governments, develops and updates management plans for caribou (BQCMB 2015:1). Its mission statement is to “safeguard the caribou of the Beverly and Qamanirjuaq herds for traditional users who wish to maintain a lifestyle that includes the use of caribou, as well as for all Canadians and people of other nations” (BQCMB 2002a:1). Indigenous peoples that rely on the herds have a strong voice on this board, thus ensuring the sustainability of their harvests (BQCMB 2014:2). Federal and provincial governments from the 1950s to the 1970s thought that barrenground caribou herds were in decline. These beliefs were based on low population estimates from biological censuses (Kelsall 1968:x), the cause of the apparent decline was uncertain. Wildlife biologists advised limits on harvest quota for
indigenous people to save the caribou. Federal agencies thought that limiting hunting activities would immediately remedy the population loss in these herds (BQCMB 2002b:10). In contrast, Denesųlinė hunters thought that forest fires had significantly disrupted caribou winter habitat, and specifically faulted the governments for not controlling the fires (AD4-7; AD4-8). Denesųlinė established the village at Wholdaia Lake during the height of the caribou crisis (see Chapters 5 and 6) and did not think that their hunting caused it (BQCMB 2002b:10). At the same time, Inuit also questioned the government response and whether a population decline was in fact underway. They thought that mining exploration and other human activities had more to do with disrupting the seasonal distribution and movement of the herds since they continued to observe large numbers of caribou (BQCMB 2002b:11). In hindsight, biologists found that the caribou decline of the 1960s and 1970s was the impression delivered by poor biological survey methods and analysis (BQCMB 2002b:11; Ruttan 2012:85-91). The reported decline was also due to the misunderstanding of the nature of traditional harvests, and the use of caches in Northern Manitoba (Ruttan 2012:92-96; Symington 1965:xvi). The federal government responded with a policy to relocate Sayisi Denesųlinė to Churchill, Manitoba, which created another social engineering disaster (Bussidor and Bilgen-Reinart 1997:xxxi).

Governments have applied moratoriums, closures, and other hunting limits to nearby caribou herds (Gunn, Russell, and Eamer 2011:15). In 2014, the Government of Northwest Territories established a moratorium for the Bathurst herd, which roams a large region west of the Beverly Herd. Bathurst caribou calve near Bathurst Inlet in summer and winter south of Great Slave Lake. People harvested between 7,000 and 23,000 caribou annually from the Bathurst herd during its high population years between

4 Throughout this dissertation, I use a broad definition of “indigenous” that is often understood through an individual’s and group’s self-identification. I follow Cobo’s working definition: “[i]ndigenous communities, peoples and nations are those which, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing in those territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal systems” (Cobo 1986:para 379). In Canada, this refers to First Nations, Inuit and Métis peoples.
1986-1993 (Gunn, Russell, and Eamer 2011:16). During its 2005 to 2006 fiscal year, the Government of Northwest Territories reported a harvest of 4,500 caribou (Gunn, Russell, and Eamer 2011:16). In 2007, the Government of Northwest Territories reduced the number of tags for registered hunters from five to two and restricted the harvest to bulls (Gunn, Russell, and Eamer 2011:16). By 2014, a moratorium on the annual harvest became public policy (Government of Northwest Territories 2015:1). This moratorium has had a drastic impact on the aboriginal people who live along the shores of Great Slave Lake. The BQCMB would like to avert a similar fate for the Beverly and Qamanirjuaq herds and sees a cautionary tale in the post-1992 history of management decisions on the Bathurst range. The failure of managing Bathurst caribou influences the BQCMB assessment of the herds and proposed management actions.

Given the focus on the Denesųłiné relationship to caribou, this study is expressly sensitive to Denesųłiné interests, needs, and present challenges. This project intends to serve their interests by gathering traditional knowledge from elders, developing educational materials for youth, and sharing information that helps them plan for ecological change. Changes in barrenground caribou populations, such as the Beverly herd affect the primary harvest of the Ethen-eldèli Denesųłiné (Boulanger et al. 2011:883; Campbell 2007:4-5). In 2010, low numbers and changes in migration made Beverly caribou inaccessible to harvesters (BQCMB 2010a:11-13; Government of Northwest Territories 2011:14-15). Considering the cultural significance of the Beverly caribou herd, it is inevitable that changes in the herd will affect northern people.

In 2008, systematic aerial surveys of the Beverly herd’s calving grounds revealed diminished populations (Johnson and Williams 2013:17). In 2010, the Beverly herd was absent from its traditional calving grounds. Satellite tracking of Beverly caribou revealed some form of amalgamation with the Ahaik caribou herd that occupied the shores of the Arctic Ocean by Queen Maud Gulf (BQCMB 2010b:5). Researchers and communities acknowledge that something significant happened on the range, but disagree on the conclusions that have been drawn (BQCMB 2011:1). Denesųłiné are also concerned about the impact of forest fires on the caribou, and health effects of increased environmental contamination by organic mercury and radioactive elements (Loberg 2010:1-7, Parson and Barsi 2001:267-269). These changes are occurring within Deninu Kue First Nation harvesting areas that extend from Great Slave Lake east to the Thelon
River and south to the Saskatchewan border. Their elders state, “to see a decline in caribou, is to see a decline in a way of life for the Dene” (Deninu Kue First Nation 2007:16). This project provides first-hand observation of the effects to the Denesųłiné from major ecological transformation (Parlee et al. 2005a:35; 2005b:173-179).

To achieve the goals expressed by the communities, I use a variation on internalist archaeology to frame the work within an indigenous worldview and to serve local community interests (Yellowhorn 2002:234-235). This study explicitly incorporates Denesųłiné understandings of caribou, which simultaneously conjoin spiritual, ecological, and physical considerations. Their ecological acumen asserts some control over knowing where the caribou are at any given time and how to harvest them, and is based on traditional knowledge of natural factors such as seasonally available forage and predator-prey relationships that influence herd migration (i.e., wolf predation). The physical sphere includes how people handle animals, that is, having requisite anatomical knowledge and butchery proficiencies and knowing how to dispose of animal remains. The study examines spiritual connections that bind this hunting culture to its primary harvest and documents animistic beliefs on hunting magic and divination. It addresses how traditional understandings of caribou influence the resilience of the Denesųłiné way of life.

1.5. Defining Denesųłiné Relationships to the Beverley and Qamanirjuaq Barrenground Caribou

This project seeks to understand the social processes that construct, reinforce, and change the age-old Denesųłiné way of life. It documents their past and present relationship to barrenground caribou because material and intangible aspects of a community’s heritage link former and ongoing experiences (Smith 2006:4). It investigates the negotiation of social meaning in the Denesųłiné relationship with caribou and extends aspects of this meaning to the Black Lake, Fond du Lac, and Hatchet Lake Denesųłiné First Nations because they too depend on the Beverly and Qamanirjuaq barrenground caribou herds. Much of their customary lifestyle persists to the present, and their knowledge holders cite years of experience and observation as their basis for knowing the land. I have worked directly with these descendent communities since 2008,
so I respect that the Denesųłiné approved, grounded, and directed the research as it aligns with my brand of community-directed study wherein “aims, methodology, and any dissemination of results have all been determined and controlled by the local community” (Smith et al. 2003:69). The project received direction and instruction from Denesųłiné chiefs and councils, as well as support from the Athabasca Denesųłiné Né Né Land Corporation, which strives to integrate Denesųłiné values into educational programs and materials. Exercising their due diligence afforded the study’s community partners a forum for influencing the nature, goals, topics, and methods of the research and resulted in the involvement of individual community members and elders.

Involvement of scholars and local populations is not just a good idea or an optimistic goal, legal frameworks, including the Nunavut Final Agreement, and various land claim agreements in the Northwest Territories and the Yukon, formalize community participation in research in Northern Canada. Overall, the northern strategy is to conduct research that serves mutual purposes that simultaneously has scientific and local benefits. In alignment with this attitude, this community-oriented study dovetails community interests with academic needs in which the community partners signed off on the blueprint for the research and made me the builder of the dissertation. My background as an archaeologist with many years of experience in Northern Canada was valuable to the Denesųłiné. I brought a suite of research tools to them, including archaeological techniques, ethnographic and participant observation skills, and an analytical approach to ethnohistorical data. The first opportunity to apply my expertise working with northern communities was in 2004 when I collaborated with Hatchet Lake Denesųłiné First Nation on a proposed all-season road to Wollaston Lake. Right from the start of this collaboration, I knew that the southern Canadian approach — featuring research isolated from community interests, needs, and involvement — would not work in the north. Until indigenous communities produce their own scholars to be their advocates, the process herein deployed emphasizes research conducted for and with, rather than on the Denesųłiné and their ancestors. Aligned with this aim, I began with the community partners choosing the research questions and advising me as I composed the project parameters.

The Denesųłiné partners asked that I highlight their current way of life, explicitly focus on caribou, go on the land with knowledgeable individuals, and share the results
with their communities. They reviewed the overall objectives and research questions that I developed and insisted that the research follow their cultural protocols and protect the confidentiality of individuals and specific sacred knowledge. They also insisted on being kept up to date on any research developments, including any proposed field trips or information vetting sessions, and asked to hold all of the field notes and related media in their oral traditions archive. Nonetheless, I have maintained my academic independence; that is, I developed the research questions, goals, and the methods of data collection. I had the freedom to review archival and historic information, to conduct archaeological research in the manner of my choosing, and to conduct interviews how and when I wished. While there was a balance of independence and interdependence, overall, this was a collaborative project. Synergies developed over time; for instance, when invited to participate in traditional activities, though I had the freedom to visit areas that I wished, the partners insisted that their knowledgeable guides be used, to our mutual benefit. Likewise, to combine resources and to make the most efficient use of each community’s time and capacity, community and school presentations were scheduled together with the activities of the Athabasca Denesułiné Né Né Land Corporation. While the community partners proposed and approved the overall outline of the research, I designed the research methods, collected, analyzed, and synthesized data, and shared, vetted, and archived the results with the Denesułiné. Thus, I am confident that the data provided here accurately describe Denesułiné relationships to caribou.

1.5.1. Research Questions

This project begins with the observation that the Ethen-eldèli Denesułiné relationship to the Beverly and Qamanirjuaq caribou herds embodies their heritage and informs their cultural continuity. In this context, the study addresses the resilience of Denesułiné traditions, with resilience defined as “the capacity of a system to experience disturbance and still maintain its ongoing functions and controls” (Holling and Gunderson 2002:50). When people enter the equation, cultural resilience explains a “culture’s capacity to maintain and develop cultural identity and critical cultural knowledge and practices” (UNESCO 2007:21). By any measure, Denesułiné possess a resilient culture that has supported social, technological, and ecological adaptations over at least 4,000 years. Contributing to their resilience, the dynamics of change and continuity pertain to
their relationship to caribou, including harvest methods, seasonal rounds, resource storage strategies, and responses to drastic ecological variation. Furthermore, cultural realignments may relate to environmental changes, such as when caribou change their migration patterns, or how Denesųłinė modify cultural practices as new technologies become available, such as the snowmobile. With such a multitude of factors and practices acting simultaneously, Table 1.1 presents the research questions, assumptions, and hypotheses that helped generate the steps used to collect data. The table lists specific questions and lines of reasoning employed to assess community perceptions and experience (Elias et al. 1997:7; Janes 1974:7-10), and outlines the general research process focusing on interviewing knowledge holders and specific ethnoarchaeological techniques.

Table 1.1. Research Questions, Assumptions, and Procedures.

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Assumptions and Theories</th>
<th>Research Procedure</th>
<th>Evidence and Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do Denesųłinė characterize their relationship to caribou?</td>
<td>The Denesųłinė relationship to caribou is ancient and central to their culture</td>
<td>Asked elders to define their relationship to caribou, and provide examples</td>
<td>The Denesųłinė</td>
</tr>
<tr>
<td>What is the social context of caribou?</td>
<td>Caribou are a critical resource</td>
<td>Asked elders why caribou are important</td>
<td>The Denesųłinė</td>
</tr>
<tr>
<td>What Denesųłinė practices show respect for caribou? Sub-questions: What are the methods of harvest? How many caribou are harvested? How do Denesųłinė butcher caribou?</td>
<td>The relationship to caribou is shown via: harvesting, butchery, and disposal of faunal remains; spiritually defined contact with caribou; and understanding land/water impacts on caribou. Expected continuity of butchery practices between modern Denesųłinė activities and ethnographic and archaeological sites</td>
<td>Researched caribou harvesting technologies. Asked elders and harvesters how they harvest and treat caribou. Participated in the hunting and butchery of caribou to see what people do, rather than what they say they do</td>
<td>Denesųłinė, participant observation</td>
</tr>
<tr>
<td>Research Question</td>
<td>Assumptions and Theories</td>
<td>Research Procedure</td>
<td>Evidence and Sources</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Where on the land do people harvest caribou? Sub-question: How do Denesųłinė transport caribou?</td>
<td>Cultural practices should change over the seasons and vary with the number and proximity of caribou Expected close correspondence of identified travel ways with caribou migration routes</td>
<td>Identified the seasonal round. Correlated traditional travel ways with caribou migration Identified and visited caribou kill sites. Recorded ethnographic sites as practical. Confirmed data with community partners</td>
<td>Spatial distributions of features and artifacts at kill sites. Found evidence of trails and travel ways, and transportation method, and sought Denesųłinė commentary on results. Reviewed traditional use and archaeological surveys</td>
</tr>
<tr>
<td>Who harvests caribou? Are there variations in how different individuals and social groups harvest and handle caribou? Sub-questions: what, if any, differences in practices are present by age and gender? How are caribou meat, fur, and bones stored? How do Denesųłinė dispose of caribou remains?</td>
<td>Caribou harvests are communal efforts; variation should be present. Expected production of dry meat and/or pemmican where time/season permits. Expected ritual handling and disposal of bone. Expected caribou meat to be protected from scavengers</td>
<td>Asked elders and harvesters if different people do different cultural practices. Looked for pemmican production sites (via faunal remains, and/or stone tool types) Located caches, assessed context and contents</td>
<td>The Denesųłinė, participant observation. Recorded the spatial distribution of discrete features, including caches of faunal remains</td>
</tr>
<tr>
<td>What is the longevity of cultural practices on caribou? Sub-questions: In what ways is this historical data similar or dissimilar to its modern context? What is the nature of sites in the region?</td>
<td>Modern culture practices should be evidenced in the past (i.e., historical accounts, ethnographic records). Expected continuity between recent Denesųłinė sites/use area and ancestral features. Assumed material culture was linked to modern Denesųłinė</td>
<td>Investigated oral traditions and historical records. Located diagnostic materials for chronological control</td>
<td>Researched oral traditions and historical documentation. Found diagnostic material culture in habitation and harvesting sites</td>
</tr>
</tbody>
</table>

The direct historical approach involves working from present certainty toward past ambiguity in a search for understanding past lifeways and traditions (McKern 1939:301-313, 1942:190-172; Steward 1942:337-343). I identify continuity through traditional Denesųłinė activities and tools that appear in historical narratives and their analogues represented in the archaeological record (i.e., traditional hunting areas, caribou lances, hide processing tools, and so forth). Spatial and temporal continuities in the material culture found in the archaeological record indicate clear connections between modern activities and the past (Matson and Magne 2007:5-8). Training in
archaeology orients my attention to time depth, but the geography of northern Saskatchewan and the Northwest Territories also demands spatial considerations. The region around northern Saskatchewan, northwestern Manitoba, southwestern Nunavut, and southeast Northwest Territories is the range where Fond du Lac, Black Lake, and Hatchet Lake Denesųłiné First Nations traditionally hunted the Beverly and Qamanirjuaq caribou herds. Within a community-oriented study, a direct-historical approach involves citizens in the research agenda through semi-structured interviews that yield commentary and insight on recent and more remote pasts. Local contacts compare extant traditions practised by knowledge holders with historical accounts from explorers, fur traders, and missionaries. It also brings in analytical methods, such as ethnographic analogy, to assess use and function of artifacts found at customary sites. Thus, I can triangulate oral history interviews with knowledge holders, archaeological data, and insights from historical sources to strengthen the links between the contemporary Denesųłiné and their ancient culture. For instance, where archaeologists see 4,000 years of antiquity in the Taltheilei tradition, the Denesųłiné see their ancestors.

1.5.2. An Ethnoarchaeology of Caribou Harvest

This study uses ethnoarchaeological techniques to understand how the Denesųłiné harvest and process caribou. Ethnoarchaeology is “the strategic gathering and studying of ethnographic data on human behavior and its ramifications by archaeologists, who train as ethnographers in order to address issues of concern to archaeological inquiry” (Gavua 2012:1). Ethnoarchaeological methods are also used to understand changing environmental and historical contexts and the variability of material culture by observing otherwise intangible behaviour (Gavua 2012:1; Politis 2015:43–44).

There are a variety ethnoarchaeological approaches, from actualistic studies that focus on the production, distribution, and discard of material culture (Yellen 1977), to the observation of site formation processes (Friesem et al. 2016:2-26), and the replication of production processes, such as stone tool manufacture (McCall 2012:157-203), amongst many others. A cornerstone of ethnoarchaeology is the use of analogical inference to connect presents and pasts. Caution is needed if direct observations of activities are applied to disparate archaeological contexts because intention and result can be different and create ethnographic anomalies (Fewster 2006:61-87; Gould and Yellen
Often analogies are limited to historical contexts with direct linear antecedents, with inferences expressed to the past of the people being observed in the present (Cunningham 2009:115-136).

Ethnoarchaeologists often study animal butchery and focus on faunal remains to strengthen analogies that compare butchery activities with the archaeological record (Lane 2014:105; Lyman 1987:252). Early ethnoarchaeology work with Nunamiut of Alaska and the Ju’hoânsi of the Kalahari to develop inferences useful to understand the archaeological record focused on carcass processing, bone grease and marrow production, food storage, and sharing (Yellen 1977, 1991:1-26; Binford 1978, 1981a). Denesułiné harvesting and butchery have also served as obvious attractants to understand the social fabric within households and its implications to understand archaeological patterning (Jarvenpa and Brumbach 1983).

Ethnoarchaeologists use diverse approaches to study animal butchery; for example, middle range theorising developed from the study of faunal collections attributed to a living people (Binford 1978:12). The aim of middle range theorising is to model dynamic living systems, often using material culture as proxies to social operations. Ethnoarchaeologists employ analogy a means of inference and interpretation and actualistic studies when they observe living communities and use their insights to guide the interpretations they make (David and Kramer 2001:117). Inferences gained from observing material culture in living contexts contribute an ethnographic analogue for archaeological interpretations about the organisational properties of cultural systems (Binford 1981b:179). Present-day contexts when compared to the spatial organization of material culture provide insights about ephemeral events, such as the identification of toss and drop zones around hearths. Alternatively, such research explores social and ideological signatures via contemporary observations, such as the study of cattle and pig butchery in Sudan that bear signatures of ideology; wherein butchery indicated that belief mediated bone distribution (Hodder 1982:151-161; Lane 2014:108). Hodder saw that hunters ritually handled skulls and mandibles and placed them on buildings for spiritual protection, which resembles the spirituality expressed in caribou skull shrines made by the Nunamiut (Binford 1978:413).
Understanding hunters also compels ethnoarchaeologists to note that animal size, the number of animals for processing, the distance from the kill site to destination sites, the number of people in the group, the condition of the carcass, and time of day influences animal butchery. The equipment available for processing, the technology at the destination site, and the ultimate form of the product all influence the dissection (Gifford-Gonzales 1993:185). Ethnoarchaeology combines a variety of data sets to bridge our understandings of presents and pasts. Most notably:

Ethnoarchaeological observations of a given society, along with other similar observations of the same kind, are compound with historical, anthropological and archaeological information in order to generate models that can be useful for archaeological interpretation. It is not that activity A correlates with derivatives B and C; it is that the record of activity A and derivatives, along with all other sources of information and inspiration, permits the generations of models that would help to understand and explain some dimensions of past society (Politis 2015:65).

Hence, reasoning by analogy is at the heart of most ethnoarchaeological approaches. However, understandings can be developed by anomaly rather than analogy (Lane 2014:104, citing Gould 1978, 1980). The idea is that variances from expected and established patterns indicate behaviours deserving special scrutiny. Many of the best ethnoarchaeological observations generate models and hypotheses testable using archaeological data and otherwise inform and expand interpretations of the past.

A more engaged form of ethnoarchaeology is ethnographic archaeology, which is a realignment and conceptual elaboration of ethnoarchaeology to focus on the legitimacy of local peoples and their ownership and control of their tangible and intangible heritage. Ethnoarchaeology should not just use ethnography to collect data to interpret the material past. Rather, it is an application of ethnography as a way to address social and political issues (Castañeda 2008a:6). Ethnographic archaeology is a “broad term to encompass an array of methods, objectives, uses and rationalities” (Castañeda 2008a:2). It involves a critical engagement with stakeholders and descendent communities in an ethnocritical form of archaeology that balances self-reflection and community engagement (Handler 2008:95-118; Zimmerman 2008:183-204). In this formulation, ethnography emerges “as a trans-disciplinary and trans-cultural space that
enables researchers and diverse publics to engage in various conversations, exchanges and interventions, and critiques” (Hamilakis and Anagnostoropoulus 2009:67).

Now, the focus is on collaborations with descendent and stakeholder communities that situate research in an ethnographic present (Hamilakis 2011:402-405). It is suggested that:

At the level of methodology and practice, archaeological ethnographies involve multi-sited, ethnographic and ethno-historical research such as formal and informal interviews, participant observation, archival research, or ethnographic site tours amongst local and trans-local communities, amongst visitors to an archaeological site, and amongst the archaeological team (including workmen and workwomen); ethnographic and other participatory and dialogic events in schools, with the active involvement of schoolchildren; and performative and art installations in various media and sites which can also generate further ethnographic research (Hamilakis and Anagnostopoulus 2009:67).

Ethnographic archeology is an “ethnographic turn” that considers how material heritage gives meaning to descendent communities (Castañeda 2008b:25).

Ethnography is often used to facilitate relationships within communities, improve archaeological interpretations, ensure research remains relevant, include a multimodality of perspectives, and to reflect on the archaeological research processes itself (Hamilakis 2011:407-408; Hollowell and Nicholas 2008:63-94; Meskell 2005:83-85). An application is the critical archaeological study of ethnic groups that directly engage with researcher and community partnerships, engaged and collaborative. Another application regards the application of ethnographic methods of community collaboration to interpreting materiality. For instance, this is seen in progressively applicable public participation and learning at the ancient sanctuary of Poseidon on Poros in Greece (Hamilakis and Anagnostoropoulus 2009:67) and the collaborations about Kruger National Park in South Africa (Meskell 2005:83).

Ethnographic archaeology is helpful to “dislodge the certainty of archaeology, the belief placed in its absolute authority, and its naturalization by its practitioners as the sole and exclusive agent for the production of discourses and practices about ancient things” (Hamilakis and Anagnostoropoulus 2009:66). Ethnological archaeology addresses issues and concepts broader than ethnoarchaeology (Hamilakis and
Anagnostoropoulus 2009:65) and show the “textures of daily life,” and “downplay... the distinctions between past and present” (Hamilakis and Anagnostoropoulus 2009:66-67, Hamilakis 2011:399). With ethnography, researchers have to understand the social context of their experiences and observations, to offer with confidence interpretations of the behaviours being observed (Hamilakis and Anagnostoropoulus 2009:75). Thus, ethnographic archaeology “is ‘felt’ rather than conceived in an abstract sense,” in that it is based on experience, observation, and interaction (Hamilakis and Anagnostoropoulus 2009:75). Ethnography, ethnohistory, and archaeology cast different light on the same phenomena, and when combined, provide a fulsome picture. This study uses integrated exchanges with residents, archaeological surveys, and an analysis of historical records to understand Denesųłiné attitudes about caribou.

1.5.3. Methods

Community involvement is common for northern research. It ensures that local voices have a say in the research cycle (Williamson 1989:36-52; Lyons 2013:6-8). The first step is to be patient in establishing trust. I collaborated with the research partners to create protocols respectful of Denesųłiné values and interests (CAA 1997:5-6; Yantz 2005:18-31, 128-133). Fundamentally, the Denesųłiné insisted the project focus upon the importance of caribou to them, and that it highlight their way of life (Smith 1978:68-70). Table 1.2 outlines the methods to collect and analyse data for the project. First, the Denesųłiné suggested that the study area should include the Beverly and Qamanirjuaq caribou range and focus within on caribou water crossings. Community partners asked that I interview elders and harvesters and that I place myself in a participant-observer role to gain a good sense of the activities I record. Semi-structured interviews involved a translator and a transcriber. Alice Kehoe (personal communication April 29, 2010) shared some good advice when she said, "meet the old people, listen to what they say, and write it down" (also see Kehoe 1993:87-105; Kehoe and Kehoe 1985:1-10). The Denesųłiné suggest that seeing people live off the land provides a full understanding of their way of life as it allows for observing practices regarding caribou in a cultural context. Denesųłiné shared stories of their former way of life. Community partners and I visited their customary areas (also known as archaeological sites) by retracing their traditional travel routes. From conversations, I garnered intangible knowledge of caribou behaviour, transhumance, and cultural adaptation that serve as social indicators for the...
study. These cultural elements are the focus for the interpretation of ethnographic sites, archaeological sites, and historical data. The field methods outlined in Table 1.2 include strategies for assessing culture histories, settlement patterns, and ethnographic and archaeological sites. Unlike other environments wherein excavations are the essential element of archaeological research, here there has been no appreciable accumulation of sediment since the last ice age. Intensive surface surveys are appropriate, as are records of placenames and ethnographic sites. To infer chronologies, I tracked historical events in oral narratives and recorded diagnostic material culture on the land. The communities deliberately requested that the investigation avoids their sacred sites, such as burials and vision quest locations. Community partners and I agreed that the research would respectfully avoid sacred sites.
Table 1.2. Research Methods.

<table>
<thead>
<tr>
<th>Research Element</th>
<th>Method</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study area</td>
<td>Study areas as defined by the Denesųłinė.</td>
<td>Preliminary research indicated that interception points along the migration routes of the Beverly herd have traditional value</td>
<td>--</td>
</tr>
<tr>
<td>Harvester and elder interviews</td>
<td>Semi-structured interviews</td>
<td>Conducted semi-directed elder interviews, focusing on research sub-questions</td>
<td>Lindsay 2011; University of Alberta 2012</td>
</tr>
<tr>
<td>Ethnographic analogy</td>
<td>Participant observation</td>
<td>Participated in and observed traditional Denesųłinė lifeways: recorded with standard ethnographic field notes, supplemented with photography, and audio/video recordings</td>
<td>Bernard 2006; Mack et al. 2005; Spradley 1980</td>
</tr>
<tr>
<td>Ethnoarchaeological and archaeological survey</td>
<td>Ethnoarchaeological recording</td>
<td>Conducted intensive surface survey for ethnographic and archaeological sites, features, and artifacts. Recorded features, including tent rings, cairns, and cabin foundations with plan-view sketch maps, feature/sediment profiling, and photography. Recorded diagnostic material culture at visited traditional sites</td>
<td>Cunningham 2009; Jarvenpa and Brumbach 2006</td>
</tr>
<tr>
<td>Spatial control</td>
<td>Toponymy</td>
<td>Integrated Denesųłinė place names to tie narratives to known places</td>
<td>Andrews et al. 1998; Hanks 1983; Legat et al. 2001</td>
</tr>
<tr>
<td>Map biographies</td>
<td></td>
<td>Transcribed land use activities on NTS topographic maps (1:250,000 and 1:50,000 scales)</td>
<td>Tobias 2000, 2009</td>
</tr>
<tr>
<td>Participant observation</td>
<td></td>
<td>Visited traditional sites, recorded with handheld GPS and ethnographic sketch maps</td>
<td></td>
</tr>
<tr>
<td>Sketch maps</td>
<td></td>
<td>Recorded sites with handheld GPS (+/- 5 m accuracy), used stadia rods and tape measures for features (+/- 1 cm accuracy)</td>
<td></td>
</tr>
<tr>
<td>Temporal control</td>
<td>Historical elements in oral narratives</td>
<td>Identified connection to known historic activities (i.e., epidemics; severe climate events, including 1816, White River eruption, smallpox, and Spanish Flu), technologies (i.e., firearms, snow machine, and charter aircraft), recalled calendar years</td>
<td>Baum 1991; Henige 1982; Ritchie 1995; Vansina 1985; Yow 1994</td>
</tr>
<tr>
<td></td>
<td>Chronometric control</td>
<td>Analyzed diagnostic artifacts and collected samples for radiocarbon assays</td>
<td></td>
</tr>
</tbody>
</table>
At the inception of the project, I signed a research agreement with the Athabasca Denesųlinė Né Né Land Corporation. Its purpose was to identify information sharing procedures. Therefore, as partial fulfillment of it, I deposited all primary research data in the oral traditions archive of the Athabasca Denesųlinė Né Né Land Corporation. This agreement ensured adherence to the prior and informed consent in advance of conducting research among Hatchet Lake, Black Lake, and Fond du Lac Denesųlinė First Nations. The ownership of the project data remains with the Athabasca Denesųlinė and all knowledge holders remain anonymous in the dissertation at their request.

The research was conducted under the terms of an application for ethical approval for research submitted to the Simon Fraser University Office of Research Ethics. This process ensures researchers place care into study design and protects both research subjects and the university from unscrupulous research practices. Both processes required me to provide detailed descriptions of how information would be collected, stored, and shared. I collected data with semi-directed interviews. The questions were open, allowing knowledge holders to share information in a manner that best suited them. I wrote responses into notes, and where consent was granted, I made audio recordings.

I conducted interviews with knowledge holders selected by the First Nations. Knowledge holders remain anonymous in this dissertation at the communities’ request. In this document, an alphanumeric system indicates knowledge holders in which “AD” stands for Athabasca Denesųlinė. A numeral is associated with each knowledge holder. An additional numeral indicates individual interviews. In this dissertation, AD0 identifies knowledge holders, and AD0-0 indicates specific interviews. Therefore, in-text references to knowledge holders appear as AD1, whereas references to interviews appear as (AD2-3), which in this case indicates the third interview with knowledge holder 2. Interview notes, recordings, and transcripts remain confidential. These are with the Athabasca Denesųlinė Né Né Land Corporation. Interviews were conducted in English and Denesųlinė, facilitated by a translator. I vetted all interview data with knowledge holders before including them in the dissertation to ensure accuracy and maintain the confidentiality of sensitive information. The vetting process included opportunities for knowledge holders to expand on interview data. I also shared project results with
communities during public meetings and one-on-one with knowledge holders. I used plain language, as well as visual aids, including photos, maps, and schematics. I used translation services when required. I use Denesųlinė terms sparingly and instead use English equivalents where practical. This approach better shares Denesųlinė understandings to English audiences. The text explains each Denesųlinė term as it appears in the dissertation.


Besides traditional land use information, source materials included a regionally rich, but obscure corpus of oral narratives such as legends, myths, and cultural and personal histories (Blondin 1990:1-2, 1997:viii). Collected works include those from Buffalo Narrows, Dillon, and Turnor Lake (Bekkatta 1999:1; Holland and Dalby 2002:7-108) and from Black Lake, Fond du Lac, and Wollaston Lake (Holland and Dalby 2001:4-45; Holland and Kkailther 2003:6-166; Lowie 1912:175-200). Additional material was recorded in La Loche (Bortolin 1998:7-141; Marnoch 1980:4-14), Cold Lake (Goddard 1912:7-63), and Fort Chipewyan (Li 1946:389-423; Mandeville 2009:1-280; Scollon 1979:1-64). These oral narratives show that the Denesųlinė language structures their ways of knowing the world (Bortolin 1998:30-33; Elias et al. 1997:34-35; Fossett 1996). For Denesųlinė, “it is difficult, perhaps impossible to separate ethnography, geography and mythology in their history” (Coutu and Hoffman-Mercredi 1999:17). Therefore, I regard oral narratives as a record of lived experience with diverse temporal and spatial contexts.
This study incorporated previous geographical studies into the research to refine understandings of the travel ways and seasonal rounds, later presented in Chapter 3. Denesųłiné cognitive geography, as expressed in oral narratives, has been mapped (Wonders 1984:1-108) to preserve contextual value for communities (Elias 2003:13-15). Source data include local histories from Stony Rapids (Harpelle 1984:23-40), Buffalo River (Kupsch 1977:23-48), Buffalo Narrows (Wuorinen 1981:1-33), Lac Brochet (Leko 2010:56-61; Rogers 1945:11-13), and northern Manitoba (Lowery 1981:1-135). Table 1.3 lists the individual map biographies. At least 203 individuals were interviewed from 1978 to 2003, with equal representation from, Fond du Lac, Black Lake, and Hatchet Lake Denesųłiné First Nations, each of which produced from 62 to 74 map biographies.

<table>
<thead>
<tr>
<th>Map Biography Study</th>
<th>Fond du Lac</th>
<th>Black Lake</th>
<th>Hatchet Lake</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hewitt (1978)</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Usher (1990)</td>
<td>39</td>
<td>31</td>
<td>21</td>
<td>91</td>
</tr>
<tr>
<td>Elias (2003)</td>
<td>30</td>
<td>31</td>
<td>31</td>
<td>92</td>
</tr>
<tr>
<td>Total</td>
<td>74</td>
<td>67</td>
<td>62</td>
<td>203</td>
</tr>
</tbody>
</table>

### 1.6. Outline of Chapters in the Dissertation

This chapter has introduced the research goals, the questions that motivated fieldwork, and the data and methods underlying interpretations. Chapter 2 provides essential background information on caribou ecology and the nature of Denesųłiné caribou harvest over time. It reviews the state of caribou, the harvest, and the historical record for the region. Data in Chapter 2 provide context for information presented throughout this volume. Chapter 3 outlines caribou migration and Denesųłinė mobility as key elements of the seasonal round. Chapter 4 shares observations as a participant in caribou hunting parties and the butchery that followed. Chapter 5 presents a synthesis of recoveries from an ethnographic and archaeological survey of the caribou crossing at Wholdaia Lake in the Northwest Territories. Chapter 6 links the archaeological data of the Wholdaia Lake caribou crossing to the historical record and notes continuity and consistency in observations of caribou harvesting by Samuel Hearne in 1771 and J.B. Tyrrell in 1893. Chapter 7 identifies the importance of caribou for the cultural resilience...
of the Denesųliné. It discusses ways of producing material culture, caching techniques, transportation methods, and the roles ethnicity plays in defining frontiers. Chapter 8 examines Denesųliné resilience and the temporal and spatial continuity of caribou handling, the behavioural rules relating to subsistence harvesting, and animistic spirituality. Chapter 9 discusses caribou co-management through a focus on the roles of the BQCMB, habitat change from wildfire, and methods to teach how to respect caribou. The chapter presents the results of the study, the advantages, and challenges of conducting a community-oriented study, and suggests future directions for research.
Chapter 2. Barrenland Caribou and Ethen-eldëli Denesųłiné History

Caribou are a Canadian icon, their character symbolizes the north, and their pursuit by the Denesųłiné embodies humanity’s gift for existence in precarious ecologies. In this chapter, I introduce the physical and ecological attributes of caribou and then explore Denesųłiné history and harvests of the Beverly and Qamanirjuaq caribou herds. The first section of the chapter introduces the species and summarizes their natural history, phylogeny, physical attributes, and behaviour. This is followed by a description of the use of caribou that charts its temporal depth and spatial extent based on aboriginal harvest levels. The third section is a historical overview of the study area that describes Denesųłiné contact with Europeans, their involvement in the fur trade, mineral exploration, the church, treaty-making, and co-management of land and resources. This foundation provides context for Denesųłiné mobility and caribou hunting practices discussed in later chapters.

2.1. Characteristics of Barrenland Caribou

Long before caribou became iconic of the Canadian north because of its placement obverse the Queen on our 25¢ piece in 1937, the species had unique anatomical and physical characteristics naturally selected for a subarctic environment (Baker 1997:70,125; Haxby 1986:149-150). Of course hunters such as the Denesųłiné found many useful features in this mammal, including the characteristics of fur used for clothing and shelter. Their knowledge of caribou behaviour provided a variety of habits they could exploit. Thus, knowledge of caribou habitat and ecology gave them some control over their food source as they learned to align efforts to the seasonal migration. The following data on the population levels and the fidelity of individual herds to calving areas set the stage for a discussion of human interventions.

2.1.1. Natural History and Phylogeny of Caribou

Barrenland caribou have a deep antiquity in North America. The earliest known caribou fossil is a 1.6 million-year-old tooth from Fort Selkirk Yukon (Gordon 2003:15).
Additional items include a fragment of a 45,500-year-old skull from Sixty Mile, Yukon and a 40,600-year-old piece of antler collected near Rivière-du-Loup in Quebec (Gordon 2003:15). In northern North America, the continental glaciers separated two groups of caribou separated at the sub-species level (Wilson and Reeder 2006:652-660). A southern group developed into woodland caribou (Rangifer tarandus caribou). Caribou in the northern Beringian refugium evolved into four subspecies of tundra caribou: barrenland caribou (Rangifer tarandus groenlandicus), Grant’s caribou (Rangifer tarandus granti), Peary’s caribou (Rangifer tarandus pearyi), and the extinct Dawson’s caribou (Rangifer tarandus dawsoni). Over time, caribou subpopulations overlapped (Dueck 1998:31-44), which may explain the distinct behaviour observed in woodland and barrenland caribou (Thompson 1916:148). Bergerud (2007:31-34) separates caribou into sedentary and migratory caribou. Sedentary caribou undertake short migrations, whereas migratory caribou migrate long distances (Hummel and Ray 2007:42). Woodland and barrenland caribou also exhibit distinct mitochondrial genetic lineages (Cronin et al. 2005:503).

Today, seven major barrenland caribou herds migrate between the tundra and taiga: Western Arctic, Porcupine, Bluenose, Bathurst, Beverly, Qamanirjuaq, and George River herds (Gunn, Russel and Eamer 2011:5; Kendrick 2003:166). Biologists well understand caribou ecology even though their range extends for thousands of kilometres across the barrenlands and northern boreal forest and onto the island of Newfoundland (BQCMB 1999:1-35). Their extensive migration routes are recorded (Parker 1972:24-53). Nonetheless, with the available collected scientific knowledge, caribou are unpredictable partly due to seasonal variations in weather, perceived impacts to calving grounds (BQCMB 2004:5), and the chaos fomented by the forest fire season, which together conspire to confound management plans of caribou population and migration (BQCMB 1994a:2-4, 1994b:14-19).

2.1.2. Physical Characteristics of Caribou

Caribou size varies by sex and herd. However, in general they are a medium-sized animal, though males are larger than females (Hummel and Ray 2007:32). Typically barren-ground males weigh in at 108 kg, and females at 77.5 kg. Woodland caribou males weight on average around 179 kg and females 132 kg (Kelsall 1968:29).
Caribou have moderately long legs with exceptionally large hooves (Kelsall 1968:32-33). Their hooves are adapted to the northern environment where snow accumulation is high. They provide support on soft ground, snow, and muskeg. Their outer edges curve abruptly to their tip. Dewclaws are large (Hummel and Ray 2007:34-35). In the winter, their worn pads have sharp edges, making them non-skid. Hair between the hoofs is long, covers the pads, and is advantageous for walking on snow and ice (Kelsall 1968:34).

Caribou fur is heaviest in winter and shed in the spring and summer. Breeding females shed last (Harper 1955:109-112). The fur is ragged in late May during the moult. A complete new coat appears by June or July. Caribou tend to be dark on their backs and lighter on their bellies (Harper 1955:109). Beverly caribou have a whitish pelage on their sides and heads and are shorter and stockier than Bathurst caribou (Kendrick 2003:172). Winter fur is four to five centimetres long, coarse, brittle, and provides excellent insulation from the cold. Kelsall (1968:35) has recognized that "native people have taken advantage of this feature since time immemorial in making their winter clothing of caribou or reindeer skin." Caribou hair is hollow and buoyant, so they swim high in the water, and when dead they float (Harper 1955:90; Hummel and Ray 2007:33).


Caribou have extensive fat deposits (Kelsall 1968:41), which northern peoples use to supplement their diet and use as fuel (AD1-9; Franklin 1923:240; Holland and Kkailther 2003:115; Jenness 1922:48,101, Stefánsson 1921:231-234, 246-247, 252). Males have little to none on their bodies by the time the rut ends in November. During the winter, if conditions are right, fat accumulates, but it is lost quickly in the spring migration. Much fat develops over the rump and saddle, sometimes extending to the
back of the neck and on the upper ribs, and back fat is usually 7.5 cm thick and can weigh up to 18 to 22 kg. Fat also concentrates on the kidneys, ribs, around the pelvis, behind the eyes, over the ears, and on the sternum. It is about 20 percent of the total weight of a healthy bull (Kelsall 1968:41). Cows and young do not get as fat and are fattest when bulls are skinny at the end of the rut (Couturier et al. 2008:370). The fat of cows and young accumulates throughout the winter (Taillon et al. 2011:300-301). It too is lost in the spring migration. Non-breeding cows are fatter than pregnant ones (Kelsall 1968:41). The quantity of summer fat decreases during the fly season, which ends around August, after which fatty tissue increases rapidly (Pachkowski et al. 2013:476). In poor years, animals get skinny because black flies and mosquitoes harass them, causing them to get less feed and rest (Birket-Smith 1929a:56,133; Harper 1955:70; Hearne 1795:197; Seton 1929:109-111).

2.1.3. Caribou Behaviour

Caribou move quickly and often. Their gaits include a walk, a pace, a trot, and a gallop (Harper 1955:87-88). On average, they travel 7 km/h on ice and hard packed snow, but move slower on land and soft snow (Kelsall 1968:43). They are strong swimmers. Their buoyant fur and large hooves and dew claws propel them through the water. They usually swim 3 km/h, but can go from 6.5 km/h, and up to 7.5 to 11 km/h when harassed. Animals choose narrow crossings of water. They will swim distances up to at least 6.5 km, such as across the north end of Artillery Lake (Kelsall 1968:43).

Caribou are largely indifferent to humans (Banfield 1951:22; Harper 1955:84; Pike 1896:51-52, 90). Their senses vary, but they have an acute sense of smell, evidenced by their ability to smell food under snow (Miller 2003:975; Reimers and Colman 2006:57). Their eyesight is poor, as is their hearing. Animals are known to ignore loud sounds and will not turn their heads to a gunshot at 50 m (Harper 1955:85; Kelsall 1968:45). Moving animals will detour closely around bodies at rest (Harper 1955:84), and they are remarkably aware of movement up to a distance of 1.5 km (Kelsall 1968:45).

Overall, caribou are silent, except during the rut (Harper 1955:101). In big herds, one usually only hears the clicking of their hooves. Caribou are silent under stress, even
when mortally shot or hunted by wolves. Very rarely caribou release a short involuntary snort when they are startled and then leap before a run (Seton 1911:210). After calving, cows and calves communicate by short grunts, especially in June and early July. This grunting is diminished and infrequent by late July and August (Harper 1955:101). Loudest are rutting bulls with their “snorting-bellowing” in the end of September and early October (Kelsall 1968:42).

2.1.4. Ecology of Caribou

Caribou range over tundra and taiga. Tundra represents the treeless lands with (formerly) continuous permafrost. Taiga is forest and forest-tundra transitional areas. Most caribou live between 55° N to 70° N latitude, except the 52° N southern boundary of the George River herd in Labrador. They range the full breadth of northern Canada, from 56° W to 141° W longitude. Throughout their range, the climate is moderately warm, sunny and dry in summer, and long and cold with little precipitation in winter. Snow depth affects caribou forage and travel. Overall, the topography in the range is often rugged and complex, with bedrock commonly exposed (Bostock 1967:29). A variety of glacial debris is often present, including till, eskers, and kames (Taylor 1959:1; Taylor et al. 1970:1). Areas of floodplains, alluvium, and deep till deposits are unsuitable for caribou as these forested areas provide little forage (Kelsall 1968:50). Caribou avoid severe forest fire burns (Julig 2002:344; Munsterhjelm 1953:97).

Caribou reside in a food web comprised of predators, competitors, and scavengers. Major predators are humans and wolves, while bears (grizzly and polar), coyote, wolverine, lynx, golden eagle, and ravens are known to feast on caribou carrion (Awan et al. 2010:7-9; Fleck and Gunn 1982:96-107). Main competitors for forage include arctic and snowshoe hare, ground squirrels, lemmings and voles, woodland caribou and muskox (Miller 2003:974), while large and small mammals and birds scavenge caribou carcasses.

Large lakes and fast-flowing rivers are easy routes of travel when frozen, but are barriers to caribou when they are ice-free (BQCMB 1999:12). Small streams and water bodies pose no obstacle as caribou can easily cross them or detour around them. Large lakes and rivers create bottlenecks that cause bunching of the herd and lines of
movement to crossing points (Williams and Gunn 1982:1-49). In the tundra, caribou find it easy to move and will use the most rugged land summer and winter (BQCMB 1999:11). Eskers, drumlinoid ridges, and moraines are seasonally important to caribou. Eskers, which are landscape features that result from the melting of continental glaciers, are widespread and can be over 35-m-high and extend from 160 to 320 km. Eskers run nearly east-to-west by Great Slave Lake, whereas they orient along a northeast to southwest axis in northeastern Saskatchewan (Taylor 1959:1; Taylor et al. 1970:1). In summer, caribou use them as windswept refugia devoid of flies. Eskers provide easy travelling in spring and winter when nearby lowlands have deeper soft snow (Kelsall 1968:58).

Mainland tundra suits its description as an arctic prairie (Seton 1911): where one observer sees a friendly arctic (Stefánsson 1921) another gazes upon barrenlands (Kelsall 1968:59). The taiga transition is the “land of little sticks,” which are mostly diminutive black spruce, some tamarack and jack pine, with stands of birch, poplar, and willow shrubs (Pelly 2008:112). The treeline is not sharp, but consists of patchy areas of open pasture where caribou can graze interspersed with small stands of forests depending on terrain and drainage. Caribou prefer lowland vegetation. Their primary foods are lichens, berry plants, including the leaves and stems of blueberries, bilberry, bearberry, cranberry, crowberries, and birch, sedges, Labrador tea, and willows (Fleck and Gunn 1982:69-95). Lichens (*Cladonia* sp. and *Cetraria* sp.) are highly important to caribou and are a staple of their diet (Barrier and Johnson 2012:180-182). Caribou will eat willows and birch less than 30 cm in height, but avoid taller plants. Under snow-free conditions, caribou are almost in constant motion, and may pause only briefly to graze at a patch of lichen before resuming the march. Their dedication to their peregrinations is "like a commuter eating breakfast on the run" (Murie 1935:245). Caribou have an adaptive extensive grazing pattern rather than an intensive one (Bergerud 2007:523-529). Caribou crater in winter, digging through the snow to access forage. They dig with their front limbs and feed on exposed ground cover. Their concave hooves scoop snow; caribou do not dig with their antlers (Pruitt 1960:18; Thomas and Hervieux 1986:305-306). Snowpack depth and density are important. Icy crusts after early thaws, freezing rains, and deep snow are problematic for caribou (Fleck and Gunn 1982:109-111). Caribou prefer to feed in shallow rather than deep snow, favour soft to hard snow, and choose exposed ground to snow covered (Harper 1955:86-89; Bergerud 2007:523-529).
They eat sedges at the edge of rivers and lichens throughout their range. Caribou get moisture from the foods they eat and from snow and do not appear to drink much water (Harper 1955:99).

Caribou migrate in the spring and autumn every year. They “make directionally oriented, purposeful and uninterrupted movements twice annually between far summer and winter ranges” (Kelsall 1968:106). They winter in forests (BQCMB 1999:8-10), in late winter and spring they begin to congregate in larger herds and move en masse to calving grounds (CARMA 2015a:1), and then summer on the tundra (Gunn, Russell, and Eamer 2011:3). Caribou are gregarious and nomadic in July and August (CARMA 2015b:1). The constant presence of biting insects influences their movement (Pruitt 1960:24-25). Insects proliferate in their summer range (Bergerud 2007:366-369). As the days grow shorter, there is a southward shift to the winter ranges. Aggregations occur at large water crossings (Miller and Gunn 1986:85-88). In late August and September, caribou reach the forest edge and gather into herds. They rut by the end of October and reach their main wintering areas by early December, and often earlier (Bergerud 2007:212; BQCMB 1999:8-10). Snow cover and adequate food supply influence movements until spring (BQCMB 1999:8-10). Caribou migration guides Denesųliné hunting practices, as documented in Chapter 3.

2.1.5. Caribou Population and Fidelity to Calving Grounds

Caribou populations vary from a few thousand to hundreds of thousands of animals in each herd. The size and extent of ancient caribou populations in North America are unknowable. Estimates vary from around 2,000,000 animals to the impossible 30,000,000 proposed by Seton (1911:22, 258-260; 1929:131-134). Other writers proffer figures such as 2,500,000 to 3,000,000 (Anderson 1924:329; 1938:400), and some prefer models based on a carrying capacity of 9.8 ha per caribou (Cranston-Smith 1995:91). Such an exercise yielded an estimate of 1,750,000 by using an average of five animals per 2.6 km² and a winter range of 900,000 km² (Banfield 1954:10).

Debate continues on the nature of the population variation of barrenland caribou. Modern methods such as aerial surveys convinced some wildlife biologists that in 1949 caribou populations were in decline (Banfield 1954:3). Figures 2.1 and 2.2 present the
results of aerial surveys of Beverley and Qamanirjuaq herds. Appendix B (Tables B.1 and B.2) includes the source data for the figures. The Beverley herd had an average population of 154,200 animals based on data from 1967 to 2015. Moreover, it produced a record high of 300,000 animals in 1994 (Williams 1995:1-36) and dipped as low as approximately 105,000 animals in 1980 (Gunn and Decker 1982:16-17). The Qamanirjuaq herd has an average population of 172,000 animals based on data from 1950 to 2015, though it produced a record 496,000 animals in 1994 (Campbell et al. 2010:10, 63) and a low of approximately 39,000 animals in 1980 (Heard and Calef 1986:159-166). Caribou populations exhibit great variation. Indigenous traditions suggest a 30-year cycle of large numbers followed by low numbers (Beaulieu 2012:66; Nesbitt and Adamczewski 2013:11).
Figure 2.1. Population of the Beverly herd, including linear regression.

Figure 2.2. Population of the Qamanirjuaq herd, including linear regression.
The names of the caribou herds relate to their fidelity to specific calving grounds visited during their annual migration (Skoog 1968:214,543; Miller 1982:523-534). Bulls and cows travel at different times, especially during calving and the rut (Miller 2003:973). Calving occurs in the last few days of May and throughout June. Most births happen in the second week of June (BQCMB 1999:8-10). There are four main calving areas west of Hudson's Bay: Kaminuriak Lake, Beverly Lake, Bathurst Inlet, and Darnley Bay (Wakelyn 1999:1). Calving occurs at the highest available elevations in relatively rugged, windswept, and poorly vegetated areas (BQCMB 1999:11). At Beverly Lake, caribou calve in elevated areas on the north and south sides of the lake, between 150 to 330 metres above sea level (m ASL) (Fleck and Gunn 1982:48, 53). Caribou use these areas because they have fewer predators and biting insects (Gunn and Sutherland 1997:26).

2.2. Denesųlinė Use of Caribou Herds

The following discussion foregrounds the current harvest of caribou by Denesųlinė. When using the direct historical approach, conventional wisdom holds that all discussions begin with the present. Denesųlinė traditional knowledge exhibits a mature understanding of caribou behaviour, which they express in their oral narratives. It contains customs and activities associated with harvesting that persist as historical and archaeological data. Denesųlinė acuity of caribou emerges from their observations of the calving, rutting, grazing, seasonal migration, aggregation, and dispersion behaviours since ancient times.

Caribou are a keystone resource for indigenous communities in northern Canada. A total of 20 indigenous communities reside in the range of the Beverly and Qamanirjuaq herds (Table 2.1; BQCMB 2002b:28). Food security in these communities requires an allegiance to traditional foods, especially caribou.
Table 2.1. Communities on the Beverly and Qamanirjuaq Caribou Range.

<table>
<thead>
<tr>
<th>Saskatchewan</th>
<th>Manitoba</th>
<th>Northwest Territories</th>
<th>Nunavut</th>
<th>Alberta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camsell Portage</td>
<td>Brochet</td>
<td>Fort Smith</td>
<td>Baker Lake</td>
<td>Fort Chipewyan</td>
</tr>
<tr>
<td>Uranium City</td>
<td>Lac Brochet</td>
<td>Fort Resolution</td>
<td>Chesterfield Inlet</td>
<td></td>
</tr>
<tr>
<td>Black Lake</td>
<td>Tadoule Lake</td>
<td>Łútsël K'é</td>
<td>Rankin Inlet</td>
<td></td>
</tr>
<tr>
<td>Stony Rapids</td>
<td>South Indian Lake</td>
<td>Whale Cove</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fond du Lac</td>
<td>Churchill</td>
<td></td>
<td>Whale Cove</td>
<td></td>
</tr>
<tr>
<td>Wollaston Lake</td>
<td></td>
<td></td>
<td>Arviat</td>
<td></td>
</tr>
</tbody>
</table>

Because harvest data are viewed as proprietary by many communities and harvesters (AD4-6; AD5-7), this discussion relies on published data from the BQCMB (1994a:4, 2014:18). Table 2.2 presents an estimate of the annual harvest of caribou by community. These data are from harvests between 1982 and 1991. They indicate that on average in a northern community every couple requires three caribou from the harvests each year, so a family of four would expect six animals. These same data indicate a maximum annual harvest per person of three caribou, as presented in the adjusted grand total of caribou harvest in Table 2.2. Each year the BQCMB (2014:18) estimates that aboriginal communities harvest around 14,000 animals from both the Beverly and Qamanirjuaq herds. An annual harvesting pressure of roughly three percent of the herd takes into account yearly fluctuations of caribou populations. Table 2.3 presents an estimate of the 2005-2006 harvest from Beverly and Qamanirjuaq caribou herds using data from the BQCMB (2014:18). Based on these data, people harvested about three percent of the herd in 2005-2006, with 2.5 times more caribou harvested from the Qamanirjuaq herd than the Beverly herd. Between both herds, communities harvested 14,100 caribou from 2005-2006. This is in general agreement with the average harvest of 14,127 caribou in 1994.
## Table 2.2. Community Harvests of Caribou in 1994.

<table>
<thead>
<tr>
<th>Community</th>
<th>Approximate Population</th>
<th>Average Harvest</th>
<th>Maximum Harvest</th>
<th>Average Caribou/Person</th>
<th>Maximum Caribou/Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camsell Portage</td>
<td>61</td>
<td>68</td>
<td>205</td>
<td>1.1</td>
<td>3.4</td>
</tr>
<tr>
<td>Uranium City</td>
<td>209</td>
<td>94</td>
<td>600</td>
<td>.4</td>
<td>2.9</td>
</tr>
<tr>
<td>Black Lake</td>
<td>1,400</td>
<td>807</td>
<td>2,300</td>
<td>.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Stony Rapids</td>
<td>276</td>
<td>117</td>
<td>244</td>
<td>.4</td>
<td>.9</td>
</tr>
<tr>
<td>Fond du Lac</td>
<td>1,026</td>
<td>1,061</td>
<td>1,761</td>
<td>1.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Wollaston Lake</td>
<td>900</td>
<td>694</td>
<td>2,300</td>
<td>.8</td>
<td>2.6</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>resident harvesters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brochet</td>
<td>650</td>
<td>647</td>
<td>1,475</td>
<td>1.0</td>
<td>2.3</td>
</tr>
<tr>
<td>Lac Brochet</td>
<td>695</td>
<td>1,031</td>
<td>2,758</td>
<td>1.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Tadoule Lake</td>
<td>450</td>
<td>425</td>
<td>1,125</td>
<td>.9</td>
<td>2.5</td>
</tr>
<tr>
<td>South Indian Lake</td>
<td>1,000</td>
<td>89</td>
<td>800</td>
<td>1</td>
<td>.8</td>
</tr>
<tr>
<td>Manitoba resident harvest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Smith*</td>
<td>2,512</td>
<td>400*</td>
<td>500*</td>
<td>.2</td>
<td>.2</td>
</tr>
<tr>
<td>Fort Resolution*</td>
<td>515</td>
<td>200*</td>
<td>500*</td>
<td>.4</td>
<td>1.0</td>
</tr>
<tr>
<td>Lutsel Ké*</td>
<td>286</td>
<td>1,000*</td>
<td>1,200*</td>
<td>3.5</td>
<td>4.2</td>
</tr>
<tr>
<td>Fort Reliance</td>
<td>11</td>
<td>50*</td>
<td>100*</td>
<td>4.5</td>
<td>7.1</td>
</tr>
<tr>
<td>Baker Lake</td>
<td>1,186 (854)</td>
<td>2,816*</td>
<td>3,379</td>
<td>2.4</td>
<td>2.8</td>
</tr>
<tr>
<td>Chesterfield Inlet</td>
<td>3,16 (79)</td>
<td>100*</td>
<td>300*</td>
<td>.3</td>
<td>.9</td>
</tr>
<tr>
<td>Rankin Inlet</td>
<td>1,706</td>
<td>1,524</td>
<td>2,737</td>
<td>.9</td>
<td>1.6</td>
</tr>
<tr>
<td>Whale Cove</td>
<td>235</td>
<td>545</td>
<td>704</td>
<td>2.3</td>
<td>3.0</td>
</tr>
<tr>
<td>Arviat</td>
<td>1,323</td>
<td>2,223</td>
<td>2,765</td>
<td>1.7</td>
<td>2.1</td>
</tr>
<tr>
<td>All jurisdictions total</td>
<td>14,757</td>
<td>14,127</td>
<td>26,738</td>
<td>1.0</td>
<td>1.9</td>
</tr>
<tr>
<td>Adjusted grand total</td>
<td>11,673</td>
<td>17,660</td>
<td>33,423</td>
<td>1.5</td>
<td>2.9</td>
</tr>
<tr>
<td>Double adjusted grand total</td>
<td>22,075</td>
<td>41,779</td>
<td>3.0</td>
<td>5.8</td>
<td></td>
</tr>
</tbody>
</table>

*Estimated harvest value

Source: Data from BQCMB 1994a:4.

## Table 2.3. Harvest Estimate for the Beverly and Qamanirjuaq Caribou Herds in 2005-2006.

<table>
<thead>
<tr>
<th>Herd</th>
<th>Caribou Population</th>
<th>Harvest Estimate</th>
<th>Harvest Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beverly</td>
<td>124,000 (2011 survey)</td>
<td>3,800 (2005-2006)</td>
<td>3.1%</td>
</tr>
<tr>
<td>Qamanirjuaq</td>
<td>349,000 (2008 survey)</td>
<td>10,300 (2005-2006)</td>
<td>3.0%</td>
</tr>
</tbody>
</table>
2.3. Archaeological Longevity of Caribou Use in the Beverly and Qamanirjuaq Range.

Archaeological components in the study region indicate a longevity of caribou harvest in the Beverly and Qamanirjuaq caribou range since 9400 B.C., with considerable evidence of Cody complex, Late Plano complex, Shield Archaic tradition, Arctic Small Tool tradition (ASTt), and the Taltheilei tradition (see Appendix C) (Clark and Morlan 1982:82-88; Ives 1993:5-31; Wright 1999:725). The oldest sites include Cody Complex materials (9400 B.C. – 5900 B.C.) which are found on the southern fringe of the range of the Beverly and Qamanirjuaq range and along the former shore of Glacial Lake McConnell (Saxberg and Reeves 2003:305). Cody complex materials include Cody knives, Alberta, and Scottsbluff projectile points ubiquitously of Beaver River silicified sandstone quarried from the Fort McMurray region (Martindale 2014:25-28, 181-192; Saxberg and Reeves 2003:311-314). Variation within the Cody complex near Fort McMurray, Alberta, has been split by Saxberg and Reeves (2003:308-310) into the Fort Creek Fen complex (ca. 9400 B.C. to 8700 B.C.), Nezu complex (ca. 8700 B.C. to 7500 B.C.), Cree Burn Lake complex (ca. 8700 B.C. to 6600 B.C.), and Early Beaver River complex (ca. 6600 B.C. to 5900 B.C.). Blood residue analysis of Cody complex materials indicates the use of caribou, bison, moose, beaver, and rabbit (Saxberg 2005: 687-690; Saxberg and Reeves 2003: 309-310).

Northern Plano complex (6900 B.C. to 4900 B.C.) and Shield Archaic tradition (4900 B.C. to 1800 B.C.) materials follow the Cody Complex. Northern Plano components were identified at the Grant Lake and Migod sites in the Northwest Territories; both are hunting camps (Stewart 1991:179-184). Additional Northern Plano components are at the Aberdeen Site (Wright 1972b:54-55), on Lake Athabasca (Wilson 1981:294; Wright 1975:123), the Thelon River (Harp 1961:18,33) and Acasta Lake (Noble 1971:104-105), and in collections from Peter Pond Lake, Saskatchewan (Millar and Ross 1982: Plate 1a, Plate 3a-e, as identified by Meyer 1995:54). The transition from Northern Plano to Shield Archaic remains poorly understood. The Shield Archaic

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5 Dated to 8189-8111 cal B.C. (p=0.009), 8090-8074 cal B.C. (p=0.002), 8064-8040 cal B.C. (p=0.003) and 8001-5844 cal B.C. (p=0.986). Calibrated at 2σ with the program CALIB 7.04 [Stuiver and Reiner 1993, Stuiver et al. 1998]). Original dates from Rutherford et al. 1979:64-65.
persists to be regionally enigmatic as recoveries are uncommon (Wright 1972a:69). The Shield Archaic tradition, as identified by J. V. Wright (1972a:69), spans from 4900 B.C. to 1800 B.C. and includes a complex of projectile points, scraper forms, and bifacial knives (Wright 1981:86-87). Shield Archaic tradition sites are found near treeline on the barrenlands, and at the Aberdeen site in the Thelon River drainage (Wright 1972b:31; Gordon 1996:201).

Following the Shield Archaic tradition, Arctic Small Tool tradition materials associated with climatic warming and inland caribou hunting appear circa 3,000 B.C, and are regionally associated with Pre-Dorset materials. Arctic Small Tool tradition materials are occasionally recovered from sites in the Kivalliq, northern Saskatchewan, and Manitoba (Gordon 1975:94-95; Gordon 1996:147-197; Nash 1969:48). Pre-Dorset materials have been found below Elizabeth Falls in Saskatchewan near the community of Black Lake (Minni 1976, Plate 1, Specimen 5), along the margins of Lake Athabasca (Wright 1975: Plate XIX, Fig 2), and on Fox Island on the south end of Reindeer Lake (Meyer and Frey 1995:81). In northeastern Alberta, the Bezya site contains an assemblage of Pre-Dorset materials (Leblanc and Ives 1986:65-81). The nearby Little Pond site contains microblades typical of ASTt. There is solid evidence of Pre-Dorset caribou harvesting, with sites found at known caribou crossings. In the region, the Arctic Small Tool tradition is followed by the Taltheilei tradition (Nash 1975:166-179).

The Taltheilei tradition (2200 B.C. to 1900 A.D.) is directly associated with caribou harvesting in near-normal climate conditions after the climate had cooled, and the forest pulled southward to its current extent (Meyer 1999:23). Sites include drivelines, water-crossing ambushes, and caches (Clark 1991:104-110; Morrison 1981:171-180; Spiess 1979:106-118). The range of the Beverly and Qamanirjuaq herds closely parallels that of the Taltheilei tradition, both in spatial location and in seasonal variation (Gordon 1996:11-15,237-246). Seasonal differences are apparent in the material culture of the Taltheilei tradition with differences between forest-winter and barrenland-summer tool kits. For example, winter sites in the taiga contain smaller stone tools, often with extensive retouching. Quartz and siliceous shale are common in winter

6 Early Dorset (900 B.C. to 0 A.D.), Middle Dorset (0 A.D. to 900 A.D.) and Late Dorset (900 A.D. to 1100 A.D.) components are more common along the western coast of Hudson Bay and near Baker Lake, followed by Thule (1100 A.D. to 1900 A.D.) occupations (Raghavan et al. 2014:2).
taiga sites. Quartzite and basalt are common on summer tundra sites. Adzes found in the taiga are ground and exhibit regular striae usewear. Tundra adze’s are flaked and exhibit cross-striae. This indicates soft wood such as birch were worked in the taiga, whereas bone and antler were worked on the tundra (Gordon 1996:83).

Noble (1971:115-116) posits that the Taltheilei tradition represents ancestral Denesųłiné. The type-sites for the Taltheilei tradition include the Taltheilei Narrows Site (KdNw-2), the Waldron River site (KfNt-1), the Frank Channel site (KePl-1), and Acasta Lake site (LiPk-1) (Forbis 1961:112-113). The tradition is defined by a continuum of projectile point styles, often long stemmed lanceolates made of grey siliceous shale, that are separated into early, middle, and late phases (MacNeish 1951:38; Nobel 1971:110-116). Broad, generally lanceolate projectile points with poorly defined stems characterize the early phase of the Taltheilei tradition, followed by middle phase lanceolate forms, and late phase small corner and side-notched projectile points (Gordon 1996:57,85,116).

Early Taltheilei materials (2200 B.C. to 230 B.C.) are found throughout Northwest Territories, Nunavut, and Northern Saskatchewan. Key early Taltheilei sites include the Whitefish Lake Site (KeNi-4), and the Migod site (KkLn-4) (Gordon 1996:117-128). Middle Taltheilei materials (230 B.C. to 730 A.D.) are scattered throughout Nunavut and Northwest Territories. Materials have also been recovered from Athabasca, Black, and Cree Lake in Saskatchewan. Key Middle Taltheilei sites include the Junction Site (KjNb-6) and the Mountain Lake Site (JgLp-1) (Gordon 1996:86). Late Taltheilei tradition materials (730 A.D. to 1900 A.D.) are present east of Great Slave Lake (Ives 1977:40-44; Pollock 1977:13-15; McCullough 1982:105-108,158-159). Key Late Taltheilei sites include the Martin Chartier Site (JIOc-20), the Shethanei Narrows Site (leLk-4), and the Frank Channel Site (KePl-1) (Gordon 1996:56). Late Taltheilei materials have been recovered from sites at Rennie, Lynx, Firedrake, Mantic, Sid, and Mary Lakes in Northwest Territories, as well as at Artillery, Clinton, Colden, Grant, Barlow, Boyd, and Nonacho Lake. In Saskatchewan, Late Taltheilei materials occur at Black, Cree, Saleski Lakes and Haultain, Mudjatik and Churchill Rivers and Buffalo Narrows and Athabasca Lake. Late Taltheilei materials extend to Northern Manitoba, including finds at Little Duck, Shetanei, Caribou, Egenolf, and South Indian Lakes (Gordon 1996:55-63). The spatial extent of Taltheilei tradition materials overlaps with modern Denesųliné and
Tatsanotinne (Yellowknives) territories. The Taltheilei tradition represents Denesųlinė due to a continuity of material culture established with the direct historical approach and spatial overlap with ethnohistoric Denesųlinė populations. The Churchill River system marks the southernmost limit of Taltheilei occupation and corresponds with the extreme southern migration limit of barrenground caribou upon which the Taltheilei peoples subsisted.


2.4. Ethen Eldèli Denesųliné Caribou Harvesting in the Historical Record

Historical accounts document Denesųliné caribou harvests throughout the Beverly and Qamanirjuaq caribou range. The very first chronicles composed by fur traders, and all subsequent reportage, depict change in Denesųliné cultural practices wrought by outside influences. European navigators, such as Martin Frobisher in 1576, 1577 and 1578 (Best 1578:1-150) and Henry Hudson in 1610 (Pricket 1625a:374-377,1625b:377-379), began sailing into arctic waters in the late sixteenth and early seventeenth centuries in search of a Northwest Passage around North America (Gosch
When the company of adventurers of England trading into Hudson Bay received their charter in 1670, it marked the moment when the world began to intrude on the Denesųłiné reality. Denesųłiné initially avoided Europeans and did not fully participate in the fur trade. Instead, they preferred their custom of following the caribou herds. However, by 1714, there was chronic interaction, and they were active trading partners with the Hudson’s Bay Company.  

In the mid-nineteenth century, Roman Catholic missionaries reached their homeland to proselytize among the Denesųłiné and draw them to the church. The twentieth century coincided with the signing of Treaties 8 (1899) and 10 (1906), which was then followed by a regional boom in mineral exploration, especially for gold and uranium. The intent of Treaties 8 and 10 was to relieve the burden of indigenous title, which required the signatories to surrender their rights and title to the land to the Crown (Indian Claim Commission 1993a:17-25). It includes the standard phrase that signatories “shall have right to pursue their usual vocation of hunting, trapping and fishing throughout the tract surrendered” (Government of Canada 1899:12). However, there are opposing views of the making of treaties regarding what indigenous peoples surrendered and what they gained (Allooloo et al. 2014:140-141). Regardless, treaties facilitated mineral exploration. The treaties were not to disrupt traditional caribou harvests (Indian Claim Commission 1993a:iii-v). As Canada became a modern, industrial nation, the fur trade faded from the national scene, but it enjoyed a resurgence in the early twentieth century. The trade peaked in the Depression era when many unemployed men and women went back to the bush economy (Petch 1998:68). The regional histories show the flexibility and cultural adjustments Denesųłiné made as the world system engulfed their caribou range. Figure 2.3 presents a general timeline for the expansion of externally defined trade and economy.

7 A peace forged between the Denesųłiné and Cree facilitated this increased interaction.
Figure 2.3. Timeline of Euro-Canadian expansion in the Beverly and Qamanirjuaq caribou range.

Source data: See Appendix D (Tables D.1 and D.2) for the complete set of material used to develop the timeline.

Note: Stars represent sudden changes and disruptions in the region west of Hudson Bay.
2.4.1. Contact and the Early Fur Trade

Ongoing Denesųłinę social realities are influenced by their account of interaction with Europeans. Historical records identify the longevity of cultural practices on caribou, show how and where the Denesųłinę lived at the time of contact, and provide a timeline for cultural, economic, and technological transformations that influenced their lifeway. Denesųłinę contact with Europeans and their world began in the early seventeenth century. What was vicarious became direct when English navigators sailed more frequently into Hudson's Bay. Chronicles about the region came from the pen of Captain Thomas Button, who made the initial visit by an Englishman to the margin of the Qamanirjuaq caribou range (Rundall 1849:68-97). Button disembarked from his ship in Hudson Bay in 1612 (Knight 1932:5), and although he was surveying the coast he did not examine it in detail (Knight 1932:6), nor did he encounter local peoples. The next visitor was Jens Munk, who failed an explicit attempt to transit the Northwest Passage on behalf of Denmark from 1619-1620 (Knight 1932:8; Tyrrell 1931:371-411). He sailed two ships, the Unicorn (Enhiörningen) and the Lamprey (Lamprenen) into Hudson's Bay in 1619 (Gosch 1897:486), where he with 64 men wintered where the Churchill River, as it became known, drains into the bay (Gosch 1897:523-538). That winter they met disaster, and all but three of his crew died from scurvy (Knight 1932:10). Munk abandoned the larger Unicorn at the mouth of the Churchill (Gosch 1897:538), and he and the remaining two survivors sailed back to Denmark in 1620 in the Lamprey (Knight 1932:10). During his winter in the bay he did not meet any inhabitants, but noted the presence of habitations and an abandoned dog (Gosch 1897:28-29).

The next visitors were Luke Foxe and Thomas James of England. Foxe and James separately sailed along the west side of Hudson's Bay from 1631 to 1632 (James 1633:29; Knight 1932:13). Foxe sailed the Charles in search of a Northwest Passage, while Thomas James sailed the Henrietta Maria. A group of London merchants funded Foxe, whereas The Bristol Society of Merchant Venturers funded James (James 1633:5). Charles I of England sanctioned both ventures. Thomas James gave his name to the bay where he wintered, hence James Bay (James 1633:47-50; Knight 1932:14). Foxe sailed past Churchill Harbour, being fearful of its shoals. Foxe mistakenly thought
he was at "Sir Thomas Rowe's Welcome," instead he went to Silmuit, now known as Chesterfield Inlet, where he observed Inuit graves and winter houses (KkJg-1). His captain’s log has a clear description of graves and houses in which he found goods manufactured from iron and copper (Foxe 1894:310-321). He thought they were likely salvaged from Munk’s shipwreck at the mouth of the Churchill River (Merbs 1971:16-24, 1997:249). Foxe describes finding parts of a canoe on Sentry Island, 58 km from Marble Island, and based on its description it was a Denesųłiné birch canoe (Foxe 1894:332). Luke Foxe did not winter in Hudson Bay, and instead returned to England in 1631. Neither Foxe nor James encountered Denesųłiné.

There is a wealth of information relating to the fur trade of northern Canada. Historians such as Harold Innis (1956), E. E. Rich (1959), and Arthur Morton (1973) are among the notable authors who have written about the history of the fur trade. Most archival materials reside solely in the Hudson’s Bay Company (HBC) Archives in Winnipeg, and only fragments of other companies and activities remain. The Hudson’s Bay Company established a post at the mouth of the Churchill River in 1687. Henry Kelsey (1929:26), who worked the post, reported that he observed Athabasca (Denesųłiné) objects, namely, an old canoe, and “targets” (which were shields), when he trekked 13 km inland from the Churchill River post. He worked for the Hudson’s Bay Company from 1684 to 1722. In 1689, he walked 200 km of the coast north of Churchill in search of Denesųłiné, but did not meet any on that journey (Kelsey 1929:xxiv, 25-32; Knight 1932:22), or comment on their camps (Meyer 1976:41-58). From 1690 to 1692, Kelsey travelled inland looking for anybody with whom to trade. He did double duty for the Hudson’s Bay Company on these trips. He first reconnoitred for them, then had the task of trying to entice aboriginal groups he met to trade at the Bay. He likely travelled up the Hayes River to the Saskatchewan River meeting Cree and Nakoda Sioux (Meyer and Russell 2007a:182-186).

As word spread about the traders who only wanted furs, the Denesųłiné increased their participation in the early fur trade from 1714 to 1774. This was specifically due to the initiative of James Knight who desired to draw Denesųłiné to the coast of Hudson’s Bay. Knight worked for the HBC from 1676 until his death in 1720. He
worked in the HBC posts along the southern margin of Hudson's Bay, and in 1714, accepted the French surrender of York Fort from Nicolas Jérémie (Knight 1932:47-48). Knight re-established a post at the mouth of the Churchill River, calling it Fort Prince of Wales in 1717 (Knight 1932:20), and reported that Inuit wintered at the mouth of the Churchill River, at Eskimo Point from 1716 to 1717. He also observed Denesųłiné scavenge Danish iron from Jens Munk’s shipwreck. Knight notes the recovery of “cast iron bars 3 or 4 feet long, 4 inches thick, found by digging” (Knight 1932:121). Knight also relates Jérémie’s account of the incident when the Denesųłiné accidentally exploded Munk’s *Unicorn* in 1620 after they ignited the powder magazine. No one was killed, but the Denesųłiné collected iron fragments such as nails from the wreck, and later in 1717, Knight himself recovered a cannon from the *Unicorn* (Knight 1932:133-134).

The most significant figure in the recent history of the Denesųłiné is Thanadelthur (Brandson 1998:1-45). Thanadelthur was a Denesųłiné woman who brought her people into the fur trade by forging a peace between the Cree, Inuit, and Dene (J. Smith 1984:296-297; Van Kirk 1974:40-45). She appears in many oral narratives and historical accounts. On November 24, 1714, she arrived at York Factory after escaping from her Cree captors and failing in her attempt to return to her homeland (HBCA B.239/a/1, November 24, 1714). In the summer of 1715, Knight sent Thanadelthur in the company of William Stewart of the HBC to arrange a peace (HBCA B.239/a/1, 27 June 1715; Knight 1932:53). William Stewart and Thanadelthur returned to York Factory in May 1716 with a concluded peace agreement between the Cree and Denesųłiné (HBCA B.239/a/2, May 7, 1716). Knight noted that Thanadelthur was the “chief promoter and actor in it whch[sic] has caus’d[sic] respect to her & Carry’d Allso a Great Sway among the Indians” (HBCA B.239/a/3, February 5, 1717). There are many different accounts of how this peace came about (Coutu and Hoffman 1999:126; McCormack 2003:329-364), as well as the nature of peacemaking (Johnson 1952:42-45; Merritt 1993:23), and her importance for the Dene as a whole (Petitot 1883:650-651). Thanadelthur’s activities caused transformative change for local indigenous peoples because she was able to bring the Denesųłiné into the trade and prevent conflict. Her efforts were not without
consequences; she died from an illness on February 5, 1717 (HBCA B.239/a/3, February 5, 1717; Knight 1932:62).

Denesųłiné told HBC Factors of metal far to the north (Tyrrell 1911:4). Nicholas Jérémie knew of copper in 1714. Jérémie explains:

They have in their country a mine of red copper, so abundant and so pure that without putting it through the forge, just as they obtain it at the mine, they pound it between two stones and make anything that they wish with it. I have often seen it, since our Indian's constantly bring it from there when they go in war parties (Tyrrell 1911:5).

Richard Norton searched for this “copper mine” in 1717 for the HBC (Knight 1932:141), travelling two seasons with the Denesųłiné from July 18, 1717 to December 25, 1717 (Knight 1932:122,141,153). Though no extant documents detail his trip in 1717, Tyrell calculates that a journey to the copper mines should take two years. Although Tyrrell (1911:7) doubted that Norton got there or if he related stories he heard from the Denesųłiné, Tyrell concluded that Norton travelled north of 67° to 68° based on a description of the sun not setting in summer, and affirmed Norton’s statement that “[h]e met no salt river, no scrub, no tree, and he starved” (Great Britain 1749:231). Norton’s trip inland provided the HBC with first-hand observations on Denesųłiné seasonal movements on the caribou range.

In May 1719, Knight convinced the HBC to sponsor a voyage in search of copper, whales, and the Northwest Passage (Geiser and Beattie 1993:1-10). Knight took the frigate *Albany* and the sloop *Discovery* into Hudson’s Bay in 1719 (Mills 2003:356), where he disappeared like Henry Hudson. 50 years later, the HBC again searched for copper to the north, when Moses Norton sent Samuel Hearne overland with Denesųłiné from 1769 to 1773 (Hearne 1795) to investigate reports of metals far north. During his travels, he came across Denesųłiné hunting near the treeline and in the barrenlands and encountered an isolated extended family group of Denesųłiné on the Thelon River above its junction with the Dubawnt (Hearne 1911:272). They had wintered at a wooded oasis along the Beverly caribou migration route.
After Hearne’s journey, the HBC shifted their policy of remaining bound to coastal posts and from 1774 onward began to establish an inland network of fur trade posts. Cumberland House in central Saskatchewan was the first such post though many more would follow (Froehlich 2001:5-21, 31-42). In part, this was from competition between the HBC and the Northwest Company (NWC) and the French merchants who travelled to the most remote regions to trade, and from 1774 to 1821 formed the main period of trade. During this time, the smallpox epidemic of 1786 had a drastic effect on Denesųłiné populations. After the 1821 amalgamation with the NWC, the HBC held a monopoly in the region until 1870. The main fur traders of this era were Samuel Hearne (1795), Peter Fiddler, Philip Turnor (Tyrrell 1934), Peter Pond (Innes 1930), Sir Alexander Mackenzie (1966, 1970), and David Thompson (1916, 1962). The most remarkable event was the defection of David Thompson from the HBC to the NWC in 1797 on Reindeer Lake. Figure 2.4 presents the locations of fur trade posts on the Beverly and Qamanirjuaq caribou range. Denesųłiné actively engaged in the trade, focused on arctic fox, and bartered with caribou hides and pemmican.
Figure 2.4. Fur trade posts on the Beverly and Qamanirjuaq caribou range.

Source: Data from BQCM 1999:25-34; NRCan 2012:1 and 2015:1.
2.4.2. Mineral Exploration, Missionaries and the Twentieth Century Fur Trade


In 1929, Stony Rapids in Saskatchewan was the take-off point for prospectors on the caribou range (Zaslow 1988:181). This included prospecting for gold, pitchblende, and nickel-copper in 1934. Mineral exploration culminated in the establishment of the Consolidated Mining and Smelting gold mine at Goldfields in 1935 (Zaslow 1998:114). In 1936, Goldfields had a population of over 1,000 people, yet few northerners benefitted from this venture (Julig 2002:337). Similar prospecting occurred along the Thelon-Hanbury route between Baker Lake and Great Slave Lake in the Northwest Territories (Zaslow 1998:180). Another mining corporation called Eldorado operated the Lorado uranium and Gunnar gold mines on Lake Athabasca from 1945 to 1953. Full production occurred in 1953, the same year it ceased operation. Eldorado built the mining town of Uranium City to support its business (Zaslow 1998:241). Prospectors found uranium on Black Lake in 1949 (Marles 1984:22). At that time, provincial, territorial, and federal governments understood that mineral exploration and development affected local peoples, yet they did little to mitigate anything. Denesųłiné are still living with that legacy, which began with the destruction of wildlife habitat (Zaslow 1998:271). Large wildfires invariably accompanied the prospectors (Julig 2002:338). In the 1920s and 1930s, the southern edge of the winter range was set on fire to assess mineral potential, specifically to expose bedrock outcrops and made travel easier. Prospectors set fires at regular

1 Beginning in 1870 international whaling activities increased in Hudson Bay. Inuit and First Nations participated directly in whaling and hunted caribou to exchange with the whalers (Eber 1989:21-160).
intervals along well-known travel routes (Julig 2002:338). These impacts led to governmental intrusions into the lives of northern people, which resulted in deleterious consequences (Zaslow 1998:271). The Northern Saskatchewan Fur Marketing Service, which formed in 1945, established an encumbrance system in which trappers would buy supplies on credit and pay off debts with fur. This arrangement ensured a trapper harvested fur and sold them to the specific fur buyer who held their account (Zaslow 1998:276-277).

Moving to the present, the continued exploration for uranium remains a concern to the Denesųłiné. One environmental critic pointed out that:

Exploration for and mining of uranium has been the greatest concern in the past among communities that harvest Beverly caribou. Uranium exploration and development has occurred for decades on the Beverly winter range in Saskatchewan. Mineral exploration has increased over the past 10 years on the ranges of both the Beverly and Qamanirjuaq herds in the Northwest Territories and in Nunavut (BQCMB:2010b). As of May 2010, there were many active prospecting permits, mineral claims and mineral leases on the Beverly and Qamanirjuaq traditional calving grounds (Gunn, Russell, and Eamer 2011:17-18).

As of 2016, northern developments have a significantly reduced physical footprint in the caribou country but not for lack of mining operations. Rather, as Denesųłiné hunter George Mercredi explained, caribou avoid mining areas because the noise of heavy equipment from mining scares them away (Holland and Kkailther 2003:113).

Roman Catholic missionaries brought their faith to the Denesųłiné and converted them to the ways of the church and over the years this has influenced local cultural formations (McCarthy 1990:3-4, 23; 1995:110-111; Tucker 1851:177-191). Missionaries transformed and strengthened the faith of the Denesųłiné principally by living with the faithful and their caribou harvests. Later, these churches became the nuclei for the communities that grew up around them. The missionary order called the Oblates of Mary Immaculate (O.M.I.) established the first missions in the region; these were Our Lady of Seven Sorrows (1846-1853) at Fond du Lac and Saint Peter's (1847-1860) at Lac du Brochet. These missions were to impress Catholicism as the faith of choice for all Denesųłiné and to forestall Protestant denominations from proselytizing in the north.
(Holland and Kkailther 2003:3). Father Alphonse Gasté travelled from Brochet on full seasonal rounds and held service at Aberdeen Lake and Beverly Lake, near the calving areas in summer in the 1870s (Gasté 1870:346-347,353-355; Turquetil 1912:278). Missionaries such as Father Duchaussois, who lived with the Denesųłiné on Kazan Lake (Duchaussois 1923:167-168,308), Father Darveau in northern Manitoba (Darveau 1999:15-36), and Father Gamache at Fond du Lac (Holland and Kkailther 2003:113-114), all accompanied bands of hunters as they traversed the caribou country. Father Turquetil lived with Denesųłiné and Inuit at Lac du Brochet and on the Kazan River (Turquetil 1904:51-59; 1907:330-333,338; 1912:288-291). Father Mégret lived at Wollaston Lake (Mégret 1996:23) and Fond du Lac (AD5-7). The missionaries’ letters and diaries consistently describe the careers of caribou harvesters, including the use of water crossings. The priests also document changes in the seasonal round to include church services such as Easter and Yule.

After the Hudson’s Bay Company sold its interest in Rupert’s Land to Canada in 1869, many smaller fur-trading companies set up operation in the Northwest Territories and Keewatin. From 1870-1950, outfits such as the Lamson and Hubbard Canadian Company Ltd, the Northern Trading (Transportation) Company and Revillon Frères all promoted trapping as a way of life for the Denesųłiné (Cockburn 1990:17-19; Hunter 1983:83-89; Sexé 1923:47-84). Generally, the Denesųłiné took part in the trade to satisfy their limited needs for goods. When caribou were present, Denesųłiné invested their time on subsistence harvesting and ignored the fur-bearing animals they trapped. When the caribou were scarce, there was a greater incentive to trap for trade (Smith 1988:135). The twentieth century opened with the signing of Treaty 8 in 1899 and Treaty 10 in 1906. The federal government amended the British North America Act to pass the Natural Resources Transfer Act (1930) through parliament to create parity between the charter provinces and the newer provinces of Alberta and Saskatchewan it formed in 1905, and to establish the Natural Resources Intelligence Service. The Depression era cast doubt on the viability of fur trading companies and created the economic conditions for the Hudson’s Bay Company to buy Revillon Frères in 1936, thus re-establishing a monopoly it had abandoned in 1869 (Ray 1990:160). Then in the 1960s, the Department
of Indian Affairs started to pressure the Denesųļinė to come in off the land and live in permanent settlements (Elias et al. 1997:100).

The Government of Canada established a treaty commission from 1899 to 1910 in the region west of Hudson’s Bay that had a mandate to conclude agreements with the indigenous populations (Bussidor and Bilgen-Reinart 1997:23). Thus, the signing of Treaty 8 and Treaty 10 removed the burden of indigenous title from the land and cleared the way for government plans (Fumoleau 2004:46-100). The establishment of reserves by treaty inflicted consequences on Denesųļinė lifeways that were exacerbated by the National Resources Transfer Act of 1930 because it shifted the ownership of resources, including wildlife, from federal to provincial jurisdictions (Government of Canada 1930a:1, 1930b:1, 1930c:1; Tough 1995:121-122). North of 60o, the control of natural resources remained with the federal government.

In the mid-twentieth century, the socialist governments of Saskatchewan created a series of cooperatives. Five of these had mandates to extract natural resources, including the Fish Marketing Service, Saskatchewan Timber Board, Fur Marketing Service, Government Trading, and Government Airways (Elias et al. 1997:14; Quiring 2004:167-205). The Northern Resources Transfer Act essentially criminalized the Denesųļinė custom of caribou harvesting and initiated direct policing of caribou harvests by RCMP. It also generated challenges for Métis hunters who had no treaty rights to shield them from provincial hunting laws. The Saskatchewan government also had difficulties providing health care and education services for the Métis of northern Saskatchewan (Dobbin 1985:8-15; Fuchs 2000:213,225-235; Macdougall 2005:33-38; Raymond 2013:29-78; Smillie 2007:72-91; Valentine 1955:33).

The federal government had relocated the Sayisi Denesųļinė from Duck Lake to Churchill in 1956 (Bussidor and Bilgen-Reinart 1997:43-54; Petch 1998:84-150). The plight of the Sayisi provides a classic example of anomie, the condition that people experience from the discontinuity of cultural traditions due to cultural fragmentation and stress. The state-sponsored cultural fragmentation and dislocation inflicted on the Sayisi Denesųļinė by Canada was another of the failed experiments in social engineering that
passed for public policy at the federal level. The rationale for the move was to save the caribou herds from their purported wanton slaughter by Denesųlinė; the direct consequences were starvation and death that led to cultural discontinuity of caribou harvests due to its cessation by the Sayisi.

2.4.3. Co-Management of Caribou by the Beverly and Qamanirjuaq Caribou Management Board

The Beverly and Qamanirjuaq Caribou Management Board (BQCMB) was formed in 1982 by government action in response to perceived declines of the caribou herds (BQCMB 2014:1). The board was a way to integrate and focus multiple cultures and jurisdictions on caribou. It includes members from five jurisdictions (Canada, Northwest Territories, Nunavut, Saskatchewan, and Manitoba). Members are selected to represent five main groups: Inuit, Denesųlinė, Cree, Métis, and non-aboriginal (Figure 2.5); however the “Board’s mandate remains with Governments” (BQCMB 2014:2). During the tenure of the BQCMB, profound changes have occurred in the communities. These involve political, economic, and social transformations, including the transfer of federal authority to territorial governments, and the growing self-governance capacity of indigenous people. Social shifts also relate to the increasingly challenging economic development from mineral exploration (BQCMB 2014:5).

Figure 2.5. Seats of the Beverly and Qamanirjuaq Caribou Management Board.
Source: BQCMB 2014:2.
The BQCMB annually conducts a vulnerability assessment for each herd, which is a measurement tool that monitors the status of the herd. It bases its assessment on baseline information, which takes into account any increases or decreases of the herd and their stressors (BQCMB 2014:25-26). It uses a series of nine ranked indicators: seasonal distribution and range use; population size and trend of the herds; herd productivity; herd health; range quality, quantity, and availability; amounts of predators and insects; human-caused disturbances; and changes in weather and climate (BQCMB 2014:25-26). The results of each fragility index are to guide scientific research and influence the application of conservation strategies. When herds are threatened, the BQCMB recommends increased scientific monitoring (i.e., more aerial surveys) and implements conservative harvest options to protect caribou populations. The BQCMB can recommend other actions if caribou herds are robust, and it continually undertakes public education activities that promote herd conservation, especially when herds are vulnerable (BQCMB 2014:1).

Managing these caribou herds is not just a matter of numbers in a harvest. People must also show respect to the caribou herds, so the BQCMB defines the benefits of respectful hunting practices. Respectful hunting generally means hunters harvest fewer caribou because they take no more caribou than they need. Respectful hunting also means all caribou shot are retrieved, wounding losses are minimized by good marksmanship, and all meat from harvested caribou is used (BQCMB 2014:34). The BQCMB also suggests that when caribou populations are low, hunters should reduce their harvests and take bulls rather than cows. Harvesters sometimes kill more caribou due to poor handling and storage, and these concerns are the main justification used to educate hunters about respectful harvesting (BQCMB 2014:34).

The effects of climate change on the herds are cumulative and involve the stresses from environmental and cultural changes in caribou habitat and mortality, including habitat fragmentation, degradation and loss, parasites, predation, disturbance, hunting, and weather (BQCMB 2014:37, COSEWIC 2002:43-56). Table 2.4 outlines the twenty-first century environmental and cultural impacts to caribou: climate change, mineral exploration, and linear developments such as roads and power lines. Over the
past 60 years, caribou habitat has decreased because of forest fires, and since 1985, greater summer aridity has increased the size and number of fires (Kochtubajda et al. 2006:218-219). Insect harassment has begun earlier in the summer since the mid-1990s (Toupin et al. 1996:376; Witter et al. 2012:1838). The northwards shift of the calving areas of the Beverly herd in 2008-2009 is an example of the effects of climate change on caribou.

Table 2.4. Environmental and Cultural Impacts to Caribou.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Impact</th>
<th>Effects</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate change</td>
<td>Fire</td>
<td>Fire causes habitat loss because the lichens burn. Regeneration of lichens takes more than 60 years</td>
<td>Flannigan et al. 2008:8-9; Kochtubajda et al. 2006:218-219; Marles 1984:115; Nesbit and Adamczewski 2013:23</td>
</tr>
<tr>
<td>Insects</td>
<td></td>
<td>Warble (<em>Hypoderma tarandi</em>) and oestrid flies (<em>Cepehenemyia trope</em>) are parasitic to caribou. Their presence influences caribou movement. Mosquitoes (Culicidae) and blackflies (Simuliidae) also harass caribou. Climate change has modified the timing and intensity of insect harassment on the range.</td>
<td>Toupin et al. 1996:376; Witter et al. 2012:1838</td>
</tr>
<tr>
<td>Mineral exploration</td>
<td>Mines</td>
<td>Mining influences caribou presence. The sound of heavy equipment and blasting disturb caribou. Regional mines are for gold and uranium. Before 1995, mineral prospecting and mines focused on the winter range. Now mineral exploration is focused on other parts of the range, including calving and post-calving areas.</td>
<td>BQCMB 2014:7</td>
</tr>
<tr>
<td>Roads / linear developments</td>
<td>Winter roads</td>
<td>There are increasing effects on caribou by the roads, including the distance of caribou movements, and increased predation, and harvest. Winter roads are present on the winter range, and usually most active when caribou are nearby.</td>
<td>Nesbitt and Adamczewski 2013:11</td>
</tr>
<tr>
<td>All season roads</td>
<td></td>
<td>All season roads allow permanent access for traffic and harvesters</td>
<td>Nesbitt and Adamczewski 2013:11</td>
</tr>
<tr>
<td>Lateral connectors</td>
<td></td>
<td>Such shortcuts change access patterns. A proposed connector from the Key Lake Mine to Cigar Lake would allow southern hunters easier access to caribou herds.</td>
<td>BQCMB 2014:7</td>
</tr>
</tbody>
</table>

60
The Beverly and Qamanirjuaq Caribou Management Act recently redefined the Beverly herd; it is now “a complex of Barren-Ground Caribou that gives birth to its young near Beverly Lake and the Queen Maud Gulf Area in Nunavut” (BQCMB 2014:14). The BQCMB made this change because the Beverly herd has abandoned its traditional calving grounds by Beverly and Aberdeen Lakes. Environment change now compels the cows to migrate to the edge of the Arctic Ocean on Queen Maud Gulf to deliver their calves. Since 2009, Beverly caribou no longer enter Ethen-eldêli Denesųłiné country, so they have lost their harvest. Climate change limits the distance south the caribou will travel because the local ecosystems that used to benefit them no longer exist. However, climate change did benefit the range of the Porcupine Herd because the spring begins earlier and is significantly warmer in most years since 1985. During late spring, after calving, this has resulted in early snowmelt and more food available for nursing mothers. Consequently, early calf survival has improved for the Porcupine herd because of increased food availability and use of insect relief habitat in July (Gunn, Russell and Eamer 2011:23-24).

The BQCMB has established four management goals for caribou:

1. Protect and ban all development in very important areas, especially calving grounds.
2. Protect caribou from disturbance and habitat loss from mineral exploration and development.
3. Hunters should take only what they need. Hunters should help by preventing wastage.

It also outlined 12 conservation priorities that articulate their objectives for protecting caribou habitat and minimizing commercial disturbances (Table 2.5). Many of their priorities highlight communication and coordination between provincial, territorial, and aboriginal governments (BQCMB 2014:21).
<table>
<thead>
<tr>
<th>Priority</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) To acknowledge that communities have aboriginal and treaty rights</td>
<td>Aboriginal and treaty rights are protected under Constitutional Acts 1867-1982 and the Nunavut Land Claim Agreement Act</td>
</tr>
<tr>
<td>2) To cooperate</td>
<td>This includes cooperation concerning community and government participation and communication</td>
</tr>
<tr>
<td>3) To use the precautionary principle</td>
<td>A lack of detailed information should not be a reason to postpone reasonable mitigation measures. The BQCMB assumes a threat exists if there is a lack of information</td>
</tr>
<tr>
<td>4) To use principles of sustainable development</td>
<td>Sustainability ensures that modern day needs are met without limiting the opportunities for future generations</td>
</tr>
<tr>
<td>5) To use best scientific, local and traditional knowledge available</td>
<td>Management actions will be made on the best data</td>
</tr>
<tr>
<td>6) To recognize and encourage local perspectives</td>
<td>Place high value on Hunter-Trapper Organizations (HTOs), band councils, and wildlife organizations. Seek individual and local perspectives</td>
</tr>
<tr>
<td>7) To ensure decisions should take into account cultural, economic and social benefits of caribou beyond subsistence/food</td>
<td>Management decisions should take the cultural importance of caribou into consideration</td>
</tr>
<tr>
<td>8) To acknowledge that conservation initiatives should recognize environmental complexities</td>
<td>These include understanding of the interplay of insects, disease, fire, weather, predators and human activities have on the herds</td>
</tr>
<tr>
<td>9) To protect habitat and enable free movement in the range</td>
<td>Do not limit caribou movement or remove habitat from caribou use. The BQCMB (2014:7) consistently recommend that no developments occur on calving and post-calving areas and migration routes. Development continues at these locations (BQCMB 2014:7)</td>
</tr>
<tr>
<td>10) To limit the effects of commercial land use</td>
<td>Limit significant effects on caribou and their habitat</td>
</tr>
<tr>
<td>11) To educate of sustainable caribou harvesting</td>
<td>Teach respectful harvesting practices to youth</td>
</tr>
<tr>
<td>12) To ensure a free flow of information</td>
<td>Share information widely, and seek advice from individuals and organizations</td>
</tr>
</tbody>
</table>

Source: *Priorities from BQCMB 2014:21.*
2.4.4. Ecological Changes in the Beverly and Qamanirjuaq Caribou Range

Climate change has increased the size and intensity of wildfires in the north (Morita and Kinney 2014:19-20). Wildfires have major impacts on forage availability for caribou. Biologists estimate that unburned forests have a carrying capacity of one to two caribou per square kilometre and note that caribou specifically avoid burned forests until the lichens grow back. July is the peak month of wildfires, which means that while fires are burning the forest, most caribou are in calving or post-calving areas on the barrenlands (Barrier and Johnson 2012:184). Community consultant AD4 states that for this reason, “habitat loss for caribou is a large concern” (AD4-7). He feels that a warmer climate dries out the forest and fires increase in frequency. As a result, the caribou populations are “currently low due to the less food in their fall and winter ranges” (AD4-7). He points out “the lack of forest fire fighting in the land of little sticks” as the cause (AD4-8). Forestry operations have not extended on the range. He thinks that governments do not fight fires in the region because the land does not have valuable timber, and once said out loud, “governments don’t fight the fires because there are no large mines or communities in the area” (AD4-8). Scientists do verify his impression that climate change has increased the extent and severity of wildfires (Flannigan et al. 2008:8-9; Kochtubajda et al. 2006:218-219). At the BQCMB meeting in May 2016, Alicia Kelly, the representative for the Government of Northwest Territories, noted that the Government of Northwest Territories does not have a “let-it-burn” policy. While the Government of Northwest Territories focusses on human populations first, it also considers fighting fires based on wildlife value too, if funding and resources are available in the territory. The Government of Saskatchewan has a “let-it-burn” policy.

The effects of climate change on barrenland caribou populations are a large-scale ecological issue. If a warmer climate does indeed foment conflagrations, a quick look at the records that governments have kept since they started tracking forest fires in the 1940s reveals a trend. Caribou lichens remain in unburned forested areas but require at least 50-60 years to regenerate after a wildfire (Marles 1984:115; Nesbit and Adamczewski 2013:23). Overall, many forest fires have burned in the north. Figure 2.6 is a cartographic illustration of the spatial extent of forest fires on the Beverly and
Qamanirjuaq range and Table 2.6 presents the amount of surface area burned by forest fires on the caribou range, and calculates burned area for the calving, post calving, late summer, fall, and winter ranges of each herd. Interpreting Table 2.6 reveals a drastic habitat loss in the forest cover that served as winter range for caribou over the past 65 years. Forest areas make up 54 percent of the winter range, with 40 percent un-forested, and six percent waterbodies. Figure 2.7 presents the yearly surface area burned by wildfire in the Beverly and Qamanirjuaq winter ranges and shows a shift to larger areas burned annually since 1979. Figure 2.8 presents the ratio of the relative amounts of intact to burned forest areas and shows that 85 percent of forests in Beverly and Qamanirjuaq Winter Range have burned. Additionally, a total of 50 percent of Beverly fall range and 15 percent of Qamanirjuaq fall range have burned. More fires have burned on the western side in the Beverly area than in the Qamanirjuaq area on the eastern side. This means that in winter, Beverly and Qamanirjuaq caribou have only 15 percent of available forage area. The identified effect of the habitat loss on caribou is dramatic (Figure 2.9). In response to this extreme level of habitat loss, the BQCMB has asked governments to “maintain corridors of unburned forest to connect areas of productive caribou habitat” (BQCMB 2014:8). Such a plan may be stillborn given that only 15 percent of the forest habitat remains.

Table 2.6. Extent of Forest Fires on the Caribou Range.

<table>
<thead>
<tr>
<th>Herd</th>
<th>Seasonal Range</th>
<th>Range Area (ha)</th>
<th>Forested Area (ha)</th>
<th>Water (ha)</th>
<th>Burned Areas (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beverly</td>
<td>Calving</td>
<td>3,766,901</td>
<td>0</td>
<td>50,624</td>
<td>0</td>
</tr>
<tr>
<td>Beverly</td>
<td>Post calving</td>
<td>10,497,248</td>
<td>85,789</td>
<td>2,091,476</td>
<td>0</td>
</tr>
<tr>
<td>Beverly</td>
<td>Late summer</td>
<td>23,289,223</td>
<td>3,463,530</td>
<td>5,760,812</td>
<td>267,014</td>
</tr>
<tr>
<td>Beverly</td>
<td>Fall</td>
<td>22,646,407</td>
<td>9,372,588</td>
<td>3,169,022</td>
<td>4,936,921</td>
</tr>
<tr>
<td>Qamanirjuaq</td>
<td>Calving</td>
<td>2,935,993</td>
<td>0</td>
<td>672,823</td>
<td>0</td>
</tr>
<tr>
<td>Qamanirjuaq</td>
<td>Post calving</td>
<td>17,865,859</td>
<td>4,409,730</td>
<td>2,944,434</td>
<td>706,871</td>
</tr>
<tr>
<td>Qamanirjuaq</td>
<td>Late summer</td>
<td>9,973,975</td>
<td>502,848</td>
<td>2,041,555</td>
<td>18,210</td>
</tr>
<tr>
<td>Qamanirjuaq</td>
<td>Fall</td>
<td>2,916,000</td>
<td>327,621</td>
<td>617,474</td>
<td>21,861</td>
</tr>
<tr>
<td>Beverly and</td>
<td>Winter</td>
<td>62,409,754</td>
<td>33,767,838</td>
<td>3,577,657</td>
<td>28,562,756</td>
</tr>
</tbody>
</table>

Source: Data based on Canadian Interagency Forest Fire Centre 2015:3; National Forest Centre 2015:1; and NRCan 2012:1 and 2015:1.
Figure 2.6. Burned area in Beverly and Qamanirjuaq winter range.
Source: Canadian Forest Fire Database, and near-real-time FIRMS MODIS data from Canadian Interagency Forest Fire Centre 2015:3; National Forest Centre 2015:1; and NRCan 2012:1 and 2015:1.
Obviously, there is an enormous problem for Beverly and Qamanirjuaq caribou if only 15 percent of the winter habitat remains. The extent of the burns is a likely warning sign of current and future declines and changes in caribou migration. Denesųłinė harvesters have been asking the provincial and territorial governments to put out more forest fires to save limited caribou habitat. Each fire decreases winter range habitat. The various governments appear to have ignored the clear Denesųłinė request for increased fire suppression. In contrast, the Government of Saskatchewan has a 'let-it-burn' policy (Government of Saskatchewan 2015:4). Therefore, governments will only intervene if a fire affects residences or commercial values; that is, firefighters attack fires directly affecting communities and stand back and let the rest of the fires outside of community protection zones burn. While the "let-it-burn" policy is good social policy that saves homes, it does not protect caribou habitat. Denesųlinė feel doubly disrespected: governments neither act on their requests nor protect caribou habitat from the fires.
Figure 2.7. Annual burned area in Beverly and Qamanirjuaq winter range 1948-2013.
Source: Data from Canadian Interagency Forest Fire Centre 2015:3; and National Forest Centre 2015:1.

Figure 2.8. Intact to burned forest ratio 1948-2013 for the Beverly and Qamanirjuaq winter range.
Source: Data from National Forest Centre 2015:1.
The extent of the recent wildfires led me to calculate the carrying capacity for caribou for 2015 using Barrier and Johnson’s (2012:184) equation. The Beverly and Qamanirjuaq winter range includes 337,678 km² of forest. A total of 285,627 km² of this forest has burned since 1948 leaving a total unburned area of 52,051 km². Therefore, the forested area in the Beverly and Qamanirjuaq winter range had a carrying capacity for 50,000 to 100,000 animals in 2015. In 1995, the unburned forested area was 168,339 km² and had a carrying capacity of 170,000 to
335,000 animals. In 1982, the unburned area was 253,259 km² and had a carrying capacity of 250,000 to 500,000 animals.

2.5. Chapter Summary

Archaeological evidence shows that the people who colonized the study area around 10,000 years ago harvested caribou and occupied camps in the barrenlands and the taiga. The Taltheilei tradition appears around 2200 B.C. and represents people who followed the caribou herds from their wintering areas in the forests of the south to their calving grounds in the barrenlands of the north. The Denesųłiné, direct descendants of the Taltheilei tradition, targeted caribou as their preferred and primary food and as the main source for material necessities, including shelter, and clothing. Persistence of caribou harvest by the Denesųłiné is evident in the ethnohistorical record. Ever since 1620 when the Denesųłiné discovered the shipwreck of Munk’s Unicorn at the mouth of the Churchill River on Hudson’s Bay, they have had to adjust to and accommodate outsiders’ intrusions into the caribou range. Denesųłiné were initially reluctant to join the fur trade, but from 1714 onward they were active participants in the trade. The later part of the twentieth century saw Denesųłiné adjust to treaties, game laws and mineral exploration, and development. Even though drastic change occurred, Denesųłiné maintained a continuity of caribou harvest. They are also involved in the BQCMB’s efforts to support conservation and sustainable harvest of barrenland caribou. The future of the Beverly and Qamanirjuaq herds is uncertain, in part due to significant regional ecological change related to a changing climate.
Chapter 3. Ethen-eldèli Denesųłiné Pursuit of Caribou through the Seasons

Since ancient times the Ethen-eldèli Denesųłiné pursuit of caribou was their purpose for travel. Intercepting this gregarious species required planning, cooperation, and any spare good fortune. However, they devised strategies to gain some control over chasing an unpredictable quarry. In this chapter, I therefore introduce their mode of journeying as it pertains to their former and current seasonal rounds and their presence on the land.

In this chapter I demonstrate how the Denesųłiné and caribou migrate together through the year. First, I describe Denesųłiné travel ways relative to the seasonal variability and range use of the Beverly and Qamanirjuaq caribou herd. Second, I show how Denesųłiné cognitive geography, navigational skills, and wayfinding influence mobility. Third, I describe the Denesųłiné seasonal round, as organized by a lunar calendar that divided their year by specified moons in reference to activities and caribou harvests. Later, I provide an estimate of the number of caribou needed to sustain a family for their year’s journey. I use satellite collar data on caribou migration to establish the distance of daily and annual movement of the herds, and then calculate the caloric and food equivalent requirements, i.e., number of caribou consumed, to follow the herds. Overall, with this chapter I explore the links between caribou migration and Denesųłiné trails, the nature of wayfinding, the seasonal round, and the level of harvest required to follow the herds.

3.1. Caribou Herds in the Seasonal Round

The following discussion addresses the objectives of the study to describe the Denesųłiné use of travel ways in relation to caribou, and to identify their past and current seasonal rounds. Ethen-eldèli Denesųłiné live in and travel throughout the boreal forest and barrenlands. Common to both is the rugged Canadian Shield (Pehrsson et al. 2014:1-2), a rough and rocky land, with large lakes, tributary streams, well-developed fens, bogs, marshes, and floating muskeg. Large river corridors, including the Athabasca, Thelon, Cochrane, Churchill, and Kazan Rivers, generally flow from the south to the north and drain into the Arctic Ocean (AANDC 2011:1). The region has massive lakes such as Great Slave Lake and Lake
Athabasca, as well as sizeable and significant lakes, such as Wollaston, Reindeer, and Nueltin Lakes. In the south, white and black spruce, and tamarack grow in boggy lowlands, while jack pine prefer well-drained uplands such as sandy ridges, relict shorelines, and eskers. Large sandy eskers, remnants of the melting of Laurentian glaciers, have a northeast to southwest or east-to-west character. These are often more than 100 km long and can rise 30 m to 50 m above the surrounding lands (Schreiner 1984:18).

In the north, the trees are smaller in size and grade from medium-sized mature stands to dwarf stands of black spruce, tamarack, and birch. In both the forests and on the barrenlands, the predominant understory is lichen, particularly reindeer lichen: the food that caribou eat (Brodo and Ahti 1996:1151; Scotter 1964:87). Farther north, the forest gives way to the barrenlands. The treeline is a large area of transition from stunted conifer forests to open plains where small groves are conspicuous within open terrain. Forested refugia are occasionally found in broad river valleys surrounded by barren upland plains (Pelly 1996:1-6). Summers are short and mild; winters are long, cold, and snowy (Gough and Wolfe 2001:142-143; Ivy et al. 2014: 2794-2795). Winds are predominantly from the west, while easterlies often bring flurries and cyclonic low-pressure storms from Hudson Bay (Peralta-Ferriz et al. 2014:1464; Rouse 1991:25-27). Overall, lakes and rivers cover between six and 20 percent of the range. South of the treeline, forests cover 48 to 53 percent of the land, and 85 percent of the forest has burned since 1948 (Appendix E, Table E.1).

3.1.1. Ethen-eldèlí Denesųliné Travel ways

Denesųliné travel between the winter and summer ranges of the caribou herds a yearly (Burch and Blehr 1991:440) over long distances of challenging terrain (Gillespie 1976:6; Smith 1981:272). How Denesųliné follow the caribou herds has attracted significant anthropological interest; some thought humans incapable of following caribou herds, suggesting they simply could not keep up with the herds (Burch 1972:345). Instead, anthropologists thought that Denesųliné lived mainly in the transition region between summer and winter ranges of the barrenland caribou herds and intercepted them at customary gathering places. Lewis Binford joined this discussion and added veracity to the assumption that keeping up with migrating
caribou would defy pedestrians (Binford 1991, cited in Burch and Blehr 1991:439). The long distance mobility that keeps Ethen-eldèli Denesųłiné families proximate to the moving herds convinced other researchers that rapid movement across enormous tracks of the country was possible and facilitated by a network of travel ways. Regional archaeological record point to assemblages consistently associated with specific caribou herd ranges (Gordon 1996:11-15). The seasonality identified in ancient sites found across the entire caribou range aligns to the observation of Denesųłiné moving with the herd from wintering areas to summer calving grounds.

As more observations accrued, the suggestion that humans could not keep up with the caribou during major migrations was amended to admit that people “come amazingly close to it” (Burch and Blehr 1991:440), especially the Ethen-eldèli Denesųłiné. It is reported that “[t]he most extreme case of following the herds in all of North America, and probably in the entire ethnographic record was the Chipewyan” (Burch and Blehr 1991:440). For Denesųłiné, keeping up with the herd in winter is not so demanding, as the animals move slower and graze relatively gregariously (Nagy and Campbell 2012:145-149). In summer, they can be difficult to follow, so people establish camps at strategic areas to intercept groups of caribou. The greatest concentration of caribou occurs in the summer calving areas. For those hunting caribou in the summer, this means they “either wallow in enormous abundance or do without” (Burch and Blehr 1991:440). There are historical reports of Denesųłiné harvesting caribou in the summer at the northern edge of the traditional caribou range in the calving and post-calving areas near Baker Lake (Burch and Blehr: 1991:441). One elderly resident, Boniface Mercredi, recalled:

One old man, he was 99 years old when he died, he told me about the days when you used flint to start a fire, and used to have powder and shot to shot caribou. He was there himself. And he said that when the caribou go south the people would follow the caribou. In the wintertime, they stay with the caribou all winter and trap there. When the caribou start to move north, they follow them right to where the muskox are (Holland and Kkailther 2003:130).

Traditional travel corridors facilitated mobility. People need detailed knowledge of the regional landscape to follow caribou herds. They have to organize in their minds an

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9 Some bias in favor of written texts may be evident. For example, neither the mechanization of travel since the 1950s nor the cultural transformations that accompanied permanent settlements on the southern caribou range were anticipated (Gordon 1990:400).
understanding of the regional topography, and the loci within the landscape of the lakes, rivers, hills, and eskers. With their mental maps, they can evaluate routes to anticipated places of caribou congregation related to seasonal changes in the herd (Bussidor and Bilgen-Reinart 1997:22-23; Birket-Smith 1930:14). The sense of journeying is one element of this. Journeying involves going long distances in small groups, often to target specific resources or areas (AD3-2). Conversations with AD5 elicited this explanation: “[i]ndividuals gain respect by undertaking great journeys” (AD5-6). Dangers associated with being on the land are part of the day-to-day experiences and collective memories of the communities. Denesųłiné assiduously avoid dangers, and acknowledge travel hazards, because experience helps to mitigate such risks as the use of boats in the stormy fall season on Athabasca, Wollaston, and Reindeer Lakes, and during times of freeze-up and break-up (Elias et al. 1997:48).

Denesųłiné emphasize their preference of being mobile. Fur trade accounts express the importance of travel over settlements: The Denesųłiné “range over, rather than inhabit, the large track of land which lies to the North of Churchill River” (Hearne 1795:xxiii). One essential element of sustained travel is the ability to cross water bodies. Hearne (1795:xxiii) stated, “[t]hey could by no means think that any set of people, however wandering their manner of life might be, could ever traverse so large a track of country as to pass the Northern boundary of that Bay, and particularly without the assistance of water-carriage.” This implies that travel that covered the vast geography of their country was the normal condition for Denesųłiné, but for travel on foot, they still needed watercraft to cross open waters such as creeks and rivers. Far from simply wandering, their movements, before 1800 and in 2016, follow caribou.

Traditional travel corridors that originated in antiquity, descriptions of which appear in historical literature, remain in use. Over time the Ethen-eldèli Denesųliné found many travel ways within the caribou range (Figure 3.1). They used that vast network to good effect when hunting (Usher 1990:2-3; Elias 2003:15-16), and kept an active cognitive map later recorded in map biographies by Larry Hewitt (Holland and Kkailther 2003:10). Overall, Denesųliné identified these trails from oral history interviews. During the interviews they directly recorded on topographic maps their location of their (Freeman 1976:167-168; Tobias 2009:37-50; Usher et al. 2002:124-125). These maps represent graphically the memories of 203 individuals, 74 from Fond du Lac, 67 from Black Lake, and 62 from Hatchet Lake, as recorded by Hewitt (1978), Usher (1990), and Elias (2003). They spoke about their cabins and habitation sites (Figure 3.1)
and in conversations with AD1, AD2, AD3, and AD6, they confirmed the long-term continuity of the travel network. During one interview, AD1 described a journey to treeline using the Chipman River travel way from Black Lake:

People would come all the way around here with a paddle from Black Lake. 16-foot canoe, with the gear, six to seven days. Dog couldn’t come in canoe; they would go overland. Dogs would follow the boat all the way. Lots of bays around here the dogs can go further and go across them, even the seven to ten portages, the dogs come around at the same time as we were paddling. There are lots of portages. One, two, three, four, five, six, seven, eight, nine, ten, 11, 12 portages. Those were used all the time for travel. That is where they would go. Because it is close to treeline, we’d use the river, all by paddling (AD1-1).

The travel data from 1950 to 2003 are consistent with the ethnohistorical record from 1770 to 1895 (Back 1836:83-183; Hearne 1795:60-159; Tyrrell 1897:49-127). There are no discrepancies between oral testimony and written narratives about caribou migration routes and watercourse crossings included in Figure 3.1. Denesųłiné harvesters explained that “hunters used their knowledge of migration routes and water crossings that caribou used to access wintering grounds, to focus their hunting efforts and position themselves on the caribou range” (Kendrick 2003:166). Furthermore, AD2 said that junctions between two or more trails tend to be associated with habitation sites (AD2-2). The interviews there clearly indicate that these travel corridors formed an effective communication network. The travel routes on this map align to the north-to-south caribou migration routes. The route from Fond du Lac north to the barrenlands follows the Grease River through Scott, Ivanhoe, and Labyrinth Lakes. It connects to the Taltson River and from there the route goes northeast to Rennie Lake.
Figure 3.1. Map of Ethen-eldêli Denesuline travel ways relative to caribou migrations.

There the route passes the treeline, which is 315 km north of Fond du Lac. From Rennie Lake, travellers continue north through Jarvis, Damant, Sid, and Mary Lakes. The north end of this travel way is at Mosquito Lake, 494 km from Fond du Lac.

Travellers from Black Lake go north to the barrenlands via the Chipman River, and traverse Cross, Square, May, Chipman, Rasmussen, and Bompass Lakes. Leaving Bompass Lake, the route crosses Selwyn, Flett, and Wholdaia Lakes where it then follows the Dubawnt River to Boyd Lake. This path reaches the treeline 349 km north of Black Lake. From treeline, the route goes to Barlow, Carey, and Nicholson Lakes. The north end of the travel way is at Dubawnt Lake, 535 km north of Black Lake.

Starting from Wollaston Lake, travellers reach the barrenlands by way of Cochrane River to the shores of Bannock and Synder Lakes. Then they follow along the Thelwaize River to Kasmere Lake, and then from there northwest to Kasba Lake to reach the Kazan River that empties into Ennadai Lake. The route crosses treeline at Ennadai Lake 410 km north of Wollaston Lake. The route crosses Ennadai Lake and follows the Kazan River to its terminus at the north end of Nowleye Lake 653 km north of Wollaston Lake.

All three routes orient to a south to north trend and crisscross with known caribou migration routes. The three named Denesųłiné bands maintain their own network of trails. Based on data in Figure 3.1, there is little overlap of the trail network between bands. Fond du Lac and Black Lake Denesųłiné First Nations’ trail networks follow the Beverly Herd. Hatchet Lake Denesųłiné First Nation’s trail network aligns with migration routes of the Qamanirjuaq Herd.

3.1.2. Wayfinding

Cognitive geography is the broad term that encompasses the mental mapping exercises the people customarily used to position themselves in space. “Wayfinding” relates to the mode of travel as people find their way across the land. It includes the skills they possessed in navigating across the land and the geographic knowledge manifested in mental maps. In Interviews with AD2 and AD3, I asked how Denesųłiné
wayfind on the land and I later saw this technique in action through the observations during journeys I undertook (AD2-3, AD3-3). In summer, people travel major water bodies by boat. In winter, snowmobiles allow people to travel farther by crossing lakes, frozen rivers, and portages over land and wetlands. People travel between known places following existing routes. Getting lost is not an option, so the hunters see no point in relying on compasses and GPS units. People orient themselves almost entirely by using landmarks. Denesųlinė know cardinal directions from where the sun is in the sky and by the time of day, and to a lesser extent by the wind. Denesųlinė measure distance by time, such as the number of days required to reach a destination. The modern equivalent measures the fuel consumption of outboard motors and snowmobiles. In winter, the portages are essential landscape features; other landmarks include hills, eskers, camps, bays of lakes, and creeks. Tracks of past travel guide their routes. Using shortcuts only leads to trouble and is strongly discouraged because individuals can get lost or become obliged to cross thin ice or floating muskeg. Denesųlinė frown upon travel during times of poor visibility, such as thick fog or white-out snow conditions.

Denesųlinė often travel at night and navigate by the stars. In winter, because days are short and nights long, journeys initiated in daylight often end at night depending on weather, time spent searching for game, and harvest success. Wayfinding at night is risky, but the stars provide direction. Polaris and the Big Dipper are the most prominent stars for wayfinding because they are always visible. Orion is also of use though it moves across the “celestial sphere” through the night in the wintertime (AD1-1). Astronomical observations, such as the azimuth and zenith of the sun, moon, and stars, are also used. The Big Dipper and the Milky Way figure prominently in the elderly resident Michael Benjamin’s accounts of looking at the stars for wayfinding (Holland and Kkailther 2003:96). Polaris, the pole star, never moves so it can orient travellers in any season. The simple rule to stay on established trails helps at night. Following a trail to known landmarks affirms the navigator’s location. Passing landmarks confirm distance and bearing. For example, during a caribou hunt along the Cochrane River (explained in detail in Chapter 4), one hunting party decided to head back at twilight to basecamp. So rather than staying put, they were had to travel through the night. They followed the main trail south along the Cochrane River for over 100 km to basecamp without a map. They occasionally confirmed their direction by checking the stars during pauses to ensure they were on track. While most travel ways have a main trail, the travel ways have many
branches and forks, that usually, but not always, lead back to the main path. At night, it is hard to determine which trail is the main travel way and which is a branch or a fork. In this situation, following the trail south with occasional astronomical checks was sufficient. Weather that produces overcast skies disrupts wayfinding by stars. Limited visibility from cloud, wildfire smoke, and blizzards also impede celestial navigation. In response to these conditions, travellers use other methods such as landmarking. When storms arise, travellers halt for safety. Landmarking is a means of navigation where a traveler’s position is determined solely based off of known topographic features reinforced by toponyms. Denesųlinė commonly use landmarking techniques when they break new trails or have to re-establish a trail after a significant snowfall obscured the former tracks.

Landmarks can be very subtle for the uninitiated (Figure 3.2). I used to think that the taiga consisted of a homogenous rugged landscape. After travelling with Denesųlinė, I observed how they “map” their landscape. Mapping onto the land refers to the cultural tools that travelers use, such as navigational aids, weather prediction, and risk assessment based on experience. In winter, travellers place small spruce branches 10 to 40 m on the lake away from shore. These branches stand in dark contrast to the ice viewed at distances under 3 km. At distances greater than 3 km, the branches create a subtle distortion on the homogenous white shade of the lake, but the cause of the distortion is uncertain until observed at closer distances. At portages, the routes through forests are not marked with blazes. Instead, travellers remove branches 0 to 2 m in height on the trees facing the trail. This creates a narrow passage about 90 cm wide, coincidentally the width of a snowmobile. A view where expected features should be present, but instead are missing, often termed “negative space,” is an all-weather indicator of a trail through the forest; for example, the way that snow drifts on and obscures the leeward side of a trail indicates its presence. Visibility of trails under drifts is especially important during winter conditions, such as blizzards.
One mechanism to reinforce landmarking is that offerings are left on the trail whenever a major landscape feature is first encountered (AD2-4; AD1-5; AD3-4; AD5-4 AD6-1). Denesųliné leave offerings such as tobacco and spruce boughs out of respect for the landform itself and to a lesser degree, to the stories and legends associated with them. In 1795, when David Thompson visited waterfalls, his guides left offerings at landmarks between Hatchet and Black Lakes (Thompson 1916:144) and at Elizabeth Falls (Thompson 1916:145). I observed similar actions by AD2 and AD6, who also insisted I leave offerings upon the first visit to Wholdaia Lake, the Cochrane River, Selwyn Lake, and other important landmarks. I have seen tobacco, cloth, spruce boughs, and feathers left as offerings. Sayisi Denesųliné in Manitoba also observed the custom of making offerings. "When we came to a place where there was a lake and animals, we would put a rock in the water in thanks" (Bussidor and Bilgen-Reinart 1997:34).

Figure 3.2. A snowmobile portage over a peninsula north of Cochrane River, Saskatchewan.

Place names connect oral traditions to physical places and act as an orthography for reading the landscape (Boas 1934:2-21; Kroeber 1916:31-33). They guide travel and reinforce how people know where they are in the landscape (Whaèhdǫò Nàowoò Kǫ
Toponyms are essential indications of geographical knowledge (Aurora Research Institute 2015:1; Savoie 2001:1-25), and are land tenure systems (Elias 2003:14). Hence, Denesųliénė use a variety of place names and a “subtle range of topographic terms” (Holden 2011:262). In Denesųliénė linguistic style, few descriptive words are used. Instead, the actions of characters imply emotions and thoughts. This holds true for place names (Holden 2011:316). AD2 told me that place names connect people to legends and oral histories. The stories “They were Young Again” and “They put Them in Water,” told by Bart Dzeylion, name Kasba Lake (Holland and Kkailther 2003:30). Kasba Lake means White Partridge Lake (Thieelzoa 1892:1; Sikstrom 2012:436). The main route from Black Lake to the barrenlands follows the Chipman River through a number of lakes, crosses a height of land, and enters the Dubawnt and Thelon River system that flows through the barrenlands and the calving grounds of the Beverly herd. Selwyn Lake is on this travel route. Father Gamache recorded Selwyn Lake’s traditional name as “Now you throw a rock” (Holland and Kkailther 2003:130). Campet Medal described a special place at Goo Tué (Bug Lake): “this lake is on the portage between Selwyn and Flett Lake north of Black Lake. People who visit this lake throw an article of clothing in the water. If the clothing floats to the middle of the lake and begins to move in circles, like a whirlpool, before it sinks under the water, the person will be healed” (Holland and Kkailther 2003:86). AD2 asserts that Denesųliénė leave offerings when they first enter significant lakes or landscape features (AD2-3). Wayfinding on travel ways relate to methods of travel. Generally, people follow known routes. They leave offerings at landmarks along the way, and use place names to reinforce their position in the landscape.

3.1.3. Ethen-eldėli Denesųliénė Seasonal Activities

Northern winters are long and cold, but this does not dissuade extensive travel in winter. Snowshoe and dog sled facilitated winter travel in the old days, whereas now snowmobiles, all-terrain vehicles, 4 x 4 trucks, and scheduled and chartered aircraft are preferred. Ecological variation greatly influences the seasonal round; the migration of barrenground caribou dramatically expresses this. Intensive use of the extant trails in the fall and winter caribou ranges is normal (Figure 3.1). Although Denesųliénė have vast knowledge of caribou and their habits, the migration of the herds is often unpredictable with minor and major variations every year. Forest fires, insect harassment, and weather
are the confounding variables they must consider (Government of Northwest Territories 2011:13). A 1915 population of 1,500 Harvaqtuurmiut (Caribou Inuit) who lived on the Kazan and Thelon Rivers was reduced to 74 individuals by 1922 (Burch 1988:90). The “Great Famine” was caused by a failure to intercept the migrating herd compounded by poor harvests related to a low ebb in the Qamanirjuaq caribou population cycle, and past overhunting of muskox (Keith 2004:42).

Before 1960, Denesųliné patterned their travel between the barrenlands and the taiga forest as dictated by the caribou year (Wakelyn 1999:2-3). AD1 explained:

Caribou. Always on the move, all the time. Only stay long enough if caribou are round. If the caribou move, people move. People move away, if they have enough caribou. Whenever the caribou move, people go there too. Woman gave birth today. They would go tomorrow. When they move, they had to go (AD1-3).

Importantly, only some families travelled north to the barrenlands in summer; others stayed year round south of treeline and caught fish, and hunted small game and waterfowl (Wakelyn 1999:3). An elder recalled that “[t]wo to three families would go to the barrenlands, another eight or nine would stay near treeline” (AD1-11). The Ethen-eldèli Denesųliné followed caribou to the northern calving grounds in summer and wintered together in the southern forests.

Herds such as the Beverly or Qamanirjuaq do not move as a “herd.” Instead, they move as a series of small groups which are sometimes concentrated together and are sometimes far apart. Denesųliné hunters share knowledge of observed and anticipated caribou movements between different communities and functional hunting groups. Harvesters spread in a broad front so that individual hunting groups will either intersect a herd or if they miss it, they accordingly adjust their subsistence strategy. Since the advent of the BQCMB in 1982, wildlife biologists have provided indispensable measures for understanding the barrenground caribou herds. They are highly regarded by the Denesųliné (BQCMB 2002b:16, 2010a:11).

Perhaps the most important aspects of the seasonal round are risk-minimizing behaviours associated with subsistence practices. Places known for their abundance and availability of traditional foods beyond caribou, such as annually reliable fisheries and berry patches, are highly prized. Within these areas, the collection and immediate
distribution of resources occur. Denesųlinė developed some food storage techniques to plan for times of shortage. An anecdote told during one interview reminded me that the main on-going question for the Denesųlinė is “where are the caribou?” (AD2-1). The challenge that faces hunters is that caribou are quirky because the natural seasonal variation of weather and vegetation strongly influences their presence and movement (Parlee et al. 2005a:31). Hatchet Lake Denesųlinė First Nation’s seasonal round directly links to caribou (Elias et al. 1997:35). Louie Benoanie, a local elder, shared this observation: “[t]he caribou, if one went in one direction they would follow. The caribou travel as one. Just like us. When we say that we are going to go somewhere and then we take off, the caribou are the same way. The elders in the past had a saying. A herd of caribou is like one caribou with one mind. We think alike” (Elias et al. 1997:35).

While caribou attract a good deal of attention, Denesųlinė customs reveal an annual cycle that is not directly associated with caribou. The names of the moons in their lunar calendar expressed ecological knowledge that looked beyond ungulates and incorporated spiritual and social impressions. This reinforced people’s seasonal expectations of animals and weather (Birket-Smith 1930:78; Holland and Kkailther 2003:18). A reconstruction of the seasonal round shows the series of named full moons that marked the passage of time and the influence that the modern Gregorian calendar has on their idea of time-keeping (Figure 3.3).
Figure 3.3. The Ethen-eldëli Denesųliné seasonal round based on a lunar cycle 1900-1960.


Note: Annual events are indicated as nodes on the outer ring.

Each moon image represents a full 29.5-day cycle, through all waxing to waning phases. This figure presents English rather than Denesųliné terms for clarity. The outer ring indicates specific gathering events. Inner rings depict the location of caribou relative to taiga and barrenlands. In the centre, a burning hearth is symbolic of sustained fire. The round follows a clockwise rotation because it follows the morning sun in the east, and sunset in the west. Subsequent sections provide more detail on seasonal activities.
in six seasons: winter, break up, spring, summer, fall, and freeze-up. Denesųlinė recognize five seasons based on activities associated with autumn, early winter, late winter, break-up/spring and summer (Irimoto 1981:48). Annual gatherings occur in the main village that celebrate Christmas, New Year’s Eve, Easter, and Halloween are the legacy of missionaries who arrived in 1846 (Irimoto 1981:6). Treaty day (in June) commemorates the signing of Treaty 8 or 10, depending on the particular area.

3.1.5.1 Winter

Winter is a busy time of annual gatherings, extensive travel, short days, and long nights. However, keeping count of the lunar cycles gives people some measure of situating themselves in time. Calibrating the number of moons in a solar year is the whole purpose of calendars. Traditional time-keeping has to take into account the intercalary moon, and this is done by adding a thirteenth moon in the year. Six moons span summer while winter counts seven moons. Denesųlinė custom included a lunar calendar, which they amended to align with the Gregorian calendar introduced by the missionaries. Thus, winter includes Nighttime Praying Moon/Midnight Mass Moon in December, New Year’s Moon in January, Short Moon in February, and Big Windy Moon in March (AD1-11; Holland and Kkailther 2003:18). Caribou hunting in forested areas is the primary winter activity, though everyone connects with ice fishing, trapping, and harvesting small game (Irimoto 1981:48). Historically, winter travel was by dog-team and snowshoe, and after the 1960s by snowmobile (Jarvenpa and Brumbach 1988:599). In the recent past, around 1900-1980, many families were widely distributed in the north and came together during the Christmas interlude and to a lesser extent at the fall caribou migration crossings (Irimoto 1979:74,109, 213). People met for Yule and Advent, and at other times to arrange and celebrate marriages. The early settlements were established as Roman Catholic missions and were specifically set in areas Denesųlinė frequented in winter so that families could celebrate high holy days (Picard 1971:19). These same communities morphed first into reserves and then first nations. While the missions were central places, some Denesųlinė had shifted their residential focus to the fur trade posts as early as 1797, such as in Bedford House on Reindeer Lake (Thompson 1916:161).
Increasingly since 1900, populations grew larger at permanent settlements established in the taiga at the southern edge of the range of Denesųłiné and Qamanirjuaq and Beverly caribou. For residents of these settlements, caribou were only available in winter (Wakelyn 1999:2-3). There was hardship when caribou did not travel near these settlements. To reduce this risk, many Black Lake Denesųłiné families used to winter at Selwyn Lake to hunt caribou and would cache caribou meat and fish for later consumption (Bone et al. 1973:64; Picard 1971:21-22, 27-29). Caches kept caribou harvested in winter frozen (Thompson 1916:157). From spring to fall, families ate caribou fresh or dried, although families also made dry meat in winter for their food stores (Irimoto 1981:50; see Chapter 4). For fish, wintering caches of whole fish were common, whereas in summer, Denesųliné eviscerated and dried fish for later use (Wakelyn 1999:2-3).

At Yule gatherings, extended families shared their knowledge and observations of game. This information provided an update on where to expect the caribou and helped them plan their trapping, and each household’s harvest through the year. When families hosted and organized such a rendezvous, they had to collect and/or cache supplies for more people than usual. Information sharing at these gatherings was a way for families to ensure their safety and survival. This worked because of the security in knowing where other families are, or at least where they should be. Neighbouring family groups share information on the state of the caribou during visits. In difficult times, families can send for assistance with a reasonable expectation of help. There are exceptions as a few families wintered in the barrenlands. Samuel Hearne wrote an account of a family he encountered who overwintered in 1771 in forested refugia within the barrenlands along the upper Thelon River:

Matonabbee assured me, that for more than a generation past one family only, as it may be called … have taken up their Winter abode in those woods, which are situated so far on the barrenground as to be quite out of the track of any other Indians … From my own experience I can affirm, that it is some hundreds of miles both from the sea-side and the main woods to the Westward. Few of the trading Northern Indians have visited this place; but those who have, give a pleasing description of it, all agreeing it is situated on the banks of a river which has communication with several fine lakes (Hearne 1795:275).
Outlanders who were unfamiliar with the country and who attempted to overwinter on the Thelon River did not fare so well. In one noteworthy case, John Hornby, Edgar Christian, and Harold Adlard missed the caribou migration and starved to death on the Thelon River in 1926 (Pelly 1996:53; Waldron 1997:43).

3.1.3.2 Break-up

The break-up of the rotting ice announces the Rising Moon, or April (AD1-11; Holland and Kkailther 2003:18). It is short for Jesus-Rising Moon and recalls the resurrection of the Christ and the reason to celebrate Easter. Freeze-up and break-up are critical times of the year as they limit travel for humans. Break-up poses a great hardship, as travel becomes increasingly difficult, then dangerous, then impossible. At this time, Denesųłiné cannot move, and food insecurity was a chronic condition. Families either stay in the permanent settlements, or if they are on the land, are immobile until break-up is complete. Break-up does not occur evenly. Generally, rivers and small tributary streams melt first, while lake-ice takes many months to melt (Thompson 1916:155). During break-up snowmobile travel and to an extent snowshoe travel becomes dangerous, so modes of travel change to foot, all-terrain vehicles, 4 x 4 trucks, and to a lesser degree motor boats and canoes. People mainly subsist on stored foods, most often frozen or dried caribou meat, at this time (Irimoto 1979:266-279).

Before break-up, families on the land gather resources, including cached caribou, and situate themselves in strategic areas. Denesųłiné used the pause in travel caused by break-up to prepare for spring and summer activities. They wove fishnets, tanned hides, and produced spring and summer garments. If locally available, they harvested beaver and muskrat. Because of reduced mobility, less information sharing occurred, if at all, between distributed families, which led to greater insecurity and overall risk.

3.1.3.3 Spring

Spring begins in the north when fair weather arrives during the Virgin Mary Moon, or May (Holland and Kkailther 2003:18), and continues through Egg Moon, also known as We-are-Treaty Moon, or June, references the annual treaty day on June 6 (AD1-11). Everybody who could move is mobile and on the water fishing in small creeks and bays
of lakes. Families harvest small game, collected newly sprouting vegetation and made dry meat (Irimoto 1981:45). In the spring, Denesųlinė harvest birch wood, which they use and repurpose as necessary. Samuel Hearne related in his journal their many uses for birch:

[They] were employed at all convenient times in procuring birch-rind and making wood work ready for building canoes; also in preparing small staffs of birch wood, to take with them on the barren ground to serve as tent-poles all Summer; and which, as hath been already observed, they convert into snowshoe frames when the Winter sets in (Hearne 1795:280).

March and April, the moons of early spring, account for 80 percent of human births, based on baptismal records on file with the Oblate Missionaries of the Roman Catholic Church (Gordon 1996:15-16,245-246). Thus, summer is the season for conception!

Spring was a significant time to harvest caribou. Families positioned themselves at strategic water crossings along the northern caribou migration routes. For those who were successful in their hunts, their caribou meat was cached in snow, but as the snow melted, lake ice was piled on the meat, and once that ice melted any remaining meat was dried (Irimoto 1979:307). While in pursuit of caribou, families would camp at places where geese and ducks would return and harvest birds. In spring, travel was safest by foot. In the spring of 1976, an extended Denesųlinė family with an anthropologist in tow travelled by canoe and dog team, they used the canoe to cross open water and areas of bad ice, but over good ice, dog teams hauled the canoe (Irimoto 1979:242). More than any other season, people travelled long distances north to intercept the herds, and fished, hunted, and gathered plants along the way.

3.1.3.4 Summer

Summer days are warmest and longest during the moon of Baby Ducks, or July, and by the Flying Moon, or August, they are noticeably shorter and cooler, with fewer insects. As the Mating Moon (for moose and caribou), or September, rolls around the frost forms at night and all the insects have fled for the year (Holland and Kkailther 2003:18). Mating Moon, also known by some as the Frog Moon (AD1-11), is the last for the summer season. Since the relative abandonment of calving areas by the Denesųlinė around the 1940s, the essential summer activities include open water fisheries on lakes
and major rivers, and sporadic moose hunting in wetlands and willow thickets south of treeline (Irimoto 1981:48). Before mechanization revolutionized mobility, they were full-time pedestrians who made canoes to facilitate longer trips. In the 1930s, motorized canoes, fishing boats, and runabouts replaced the customary modes of travel (Jarvenpa and Brumbach 1988:599; Lund 1964:1-12; Picard 1971:9,15). Denesųlinė participated in the fur trade and soon started to depend on using canoes in the summer (Thompson 1916:185).

Summers are short. Weather directly influences and limits travel. Travel on rivers in late spring and early summer is dangerous due to freshets. On the lakes, volatile weather is a serious challenge; often community members become storm-stayed due to significant winds, thunderstorms and, with increasing frequency since the 1990s, large forest fires (Canadian Interagency Forest Fire Centre 2015:3; National Forest Centre 2015:1). Denesųlinė fish year round and regularly use nets to haul lake trout and whitefish out of the waters. Hatchet Lake Denesųlinė First Nation conduct their fishery mainly at the mouth of Wollaston Lake, and on the Cochrane River at fish camps (AD1-1 and AD6-1). Only during break-up and freeze-up when ice conditions are uncertain do fishers become inactive. Middle Lake, Black Lake, and the Saskatchewan side of Lake Athabasca are some of the waters where they regularly cast their nets because as Father Mégret recalled, “In the camps they could always rely on fish” (Holland and Kkailther 2003:60). David Thompson observed in 1797 that “when the deer fail they readily take to angling, altho’ it affords them no clothing” (Thompson 1916:165). Historically Denesųlinė caught fish with bow and arrow, fish spear and canoe, weirs, and nets (AD2-6; Birket-Smith 1930:29). However, Samuel Hearne (1795:74) reported that Denesųlinė did not wholly commit to fishing:

> It is true, that few rivers or lakes in those parts are entirely destitute of fish; but the uncertainty of meeting a sufficient supply for any considerable time together, makes the natives very cautious how they put their whole dependence on that article, as it has too frequently been the means of many hundreds being starved to death.

He also gave a detailed description of their fishing nets and offered comments on the inconveniences of Denesųlinė fishing nets:

> The Northern Indians make their fishing-nets with small thongs cut from raw deer-skins; which when dry appear very good, but after being soaked
in water some time, grow so soft and slippery, that when large fish strike the net, the hitches are very apt to slip and let them escape. Besides the inconvenience, they are very liable to rot, unless they are frequently taken out of the water and dried (Hearne 1795:264).

Hearne noted a ritualized observance of respect, a practice for the first fish from a net.

A net thus accoutred is fit for setting whenever occasion requires, and opportunity offers; but the first fish of whatever species caught in it, are not to be sodden in the water, but broiled whole on the fire, and the flesh carefully taken from the bones without dislocating one joint; after which the bones are laid on the fire at full length and burnt. A strict observance of these rules is supposed to be of the utmost importance in promoting the future success of the new net; and a neglect of them would render it not worth a farthing (Hearne 1795:329).

Before 1970, Denesųłiné had the best nutrition in July and August due to the abundance of food from intercepting the herds (Gordon 1996:245). Late summer gatherings once occurred in the Thelon and Dubawnt areas (Gordon 1996:246). Leon Medal, a local elder, recalled that “[i]n the barrenlands, there is nothing. If there’s no caribou it is a very hard life. There are no chickens, no ptarmigan, or rabbits. The ice is very thick. It’s very hard up there” (Holland and Kkailther 2003:100). He talked of risk minimization when he stated, “If there was no caribou, if the caribou don’t come, boy, you gotta get south or by golly you’ll hunt for moose. You’ve got to hunt for moose. You have got to snare rabbit. And you set a net for fish to feed the dogs. Now is an easy life compared to then” (Holland and Kkailther 2003:103). Overall, however, annual visits to the barrenlands and the operation of summer interception harvest of caribou have stopped.

3.1.3.5 Autumn

Autumn started with Reciting Rosary Moon, or October, and the Ghost Moon, or November, began with the Catholic holiday of All Saints’ Day. Autumn was a period of social renewal when bands got together one more time at primary caribou harvesting sites and associated fisheries, and usually stayed through to freeze-up (AD2-1; AD1-2;

10 Reciting Rosary Moon used to be called the Fishing Moon (AD1-11). Ghost Moon is also called Crazy Day Moon, and was known as Walking-with-Snowshoes Moon in the old days (Holland and Kkailther 2003:18).
AD3-1). In the late summer and fall harvesters intercepted caribou at water crossings at or just south of treeline (Kendrick et al. 2005:177). In the fall, caribou would enter the taiga, but predicting when the caribou would penetrate treeline was difficult (Irimoto 1979:71). Well-known crossings for spearing caribou were at Anaunethad Lake, Firedrake Lake, Jarvis Lake, Kasba Lake, Latimer Lake, Phelps Lake, Rennie Lake, Snowbird Lake, Wholdaia Lake, and the Cochrane River (AD1-1; AD2-2; AD3-1; Irimoto 1979:72). These areas are all at the northern edge of the taiga. For those families that were further south of the treeline, moose were also hunted (Irimoto 1979:76).

Autumn usually has poor weather with many storms that foreshadowed winter (AD 1-10, Petch 1998:126). People prepared for winter by drying caribou and fish, making hides, and winter clothes (Petch 1998:29). Simultaneously, Denesųlinė picked berries and trapped furbearers near the fall caribou and fish camps (Sharp 1977:37). Autumn fisheries were an important alternate food source, especially if the ambushes at water-crossings failed (Irimoto 1979:129; Petch 1998:29). Denesųlinė fished specific reaches of waterbodies such as shallow sandy-bottomed spawning area for whitefish and trout, and dried their catch (Irimoto 1979:131). These fisheries helped build a supply of food needed in freeze-up (Irimoto 1979: 266). Similarly, if caribou were unavailable, migratory waterfowl were harvested (Smith 1976:13; Jarvenpa 1976:47). Cranberries, blueberries, and raspberries were important sources of nutrients harvested in summer and autumn near basecamps (AD2-3; Irimoto 1979:118). Since the late 1970s, Denesųlinė do not regularly pursue caribou in the autumn anymore, preferring winter hunting expeditions (Irimoto 1979:123). Therefore, the main autumn water crossings are now infrequently used.

3.1.3.6 Changes in the Seasonal Round

Since the mid-1980s, Denesųlinė punctuate the seasonal round with shorter trips from the settlements onto the land to harvest for immediate needs. Supplies for such trips, though basic, involve large quantities of fuel, ammunition, shelter (i.e., canvas and nylon tents), and to a lesser extent, store bought food. The smallest hunting unit consists of a pair of individuals, the largest 15. Hunting parties are composed of men who go out on the land for day to multi-day trips. A more typical hunting group includes three to five men who use well-established base camps or stay in wall tents set in the general
hunting areas. With the establishment of permanent settlements in the 1940s and 1950s, familial ties to the hunt were lost.

The settlements were situated so that Denesųłiné could harvest the herds of caribou that wintered south in the forest. In northern Saskatchewan, the settlements are set in the migration corridor between the summer calving areas and wintering areas. Seasonal gatherings and dispersals relate to social activities and resource harvesting. Fish camps in summer and occasional hunting trips for caribou occur all within the range of easy mobility. Travel in summer is by boat or charter plane, winter by snowmobile.

3.2. Requirements for Herd Following

To follow the caribou herds people needed to have a supply of sufficient food and materials. A calculation of caribou per person per year follows a use-model of caloric requirements. This is similar to cultural-ecological analyses that use calories to analyse energy transfer through cultural systems (Perlman 1980:273-289; Rappaport 1971:73-76; White 1959:33-57). My analysis addresses the argument that no one can keep up with the herds (Burch 1972:345; Burch and Blehr 1991:439; Gordon 1990:400, 1996:11-15). To do this, I evaluated how far each caribou herd travels every year, and then calculated how much food would be required to travel that distance. I initiated this exercise by determining how far a caribou herd travels each day because they cover about 3,000 km a year (Figure 3.4 and Table 3.2). However, those distances are spread between two intensive migrations mixed with longer sedentary periods. Data gained from satellite collar measurements indicate an average movement of 8 to 10 km a day (Nagy and Campbell 2012:145-152). A complete dataset is included as Appendix F. Historical accounts provide no answers because they range between 16 to 32 km/day according to Samuel Hearne (1795:47-189) and the 6 to 12 km a day that George Back (1836:150) observed with the Denesųłiné. There is general agreement with the travel distances, especially when George Back’s distances that are more conservative are used. Walking distances for a mixed group of men, women, and children of 6 to 12 km per day is typical for Denesųłiné and easily overlaps with the 8 to 10 km of daily caribou movement. Therefore, people could follow caribou. The only exception would be during the post-calving period in July when caribou reach their peak travel rate of 17 to 26 km per day.
At this time of year, harvesters would need to use an interception strategy to offset the pace of the caribou.

![Caribou Daily Movement Graph](image)

**Table 3.2. Daily and Annual Distance Travelled.**

<table>
<thead>
<tr>
<th>Herd</th>
<th>Daily Travel</th>
<th>Annual Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beverly</td>
<td>8.9 km/day</td>
<td>3,234 km</td>
</tr>
<tr>
<td>Qamanirjuaq</td>
<td>9.7 km/day</td>
<td>3,552 km</td>
</tr>
<tr>
<td>Queen Maud Gulf</td>
<td>8.5 km/day</td>
<td>3,091 km</td>
</tr>
</tbody>
</table>

I made a series of conservative assumptions about caloric requirements to estimate the amount of food needed to achieve this travel. For every kilogram of body weight and cargo, the estimate assumed an individual uses 9.9 calories for each hour of travel (Kenney et al. 2011:119). This analysis used the value of 9.9 calories every hour per kilogram in summer to be conservatively high and to account for the hardship of travelling over the rugged rocky terrain of the Canadian Shield in summer, and walking on snowshoes in winter. The estimate assumes 69 kg as the average female weight, and 82.5 kg as the average weight of males (Statistics Canada 2007:1). Three different
estimates were calculated for men and women: the first assumes an individual travels with no cargo, the second is they travel with cargo that is half of an individual’s weight, and the third is that a person carries cargo that matches the bodyweight to accounts for such things as packs and pulling sledges. Drudgery was a way of life back in the old days, so packs were heavy, and canoes, birch wood, dry meat, cooking stones, hide tent covers, and tent poles were hauled (Back 1836:55-56; Hearne 1795:87). The sleds pulled by women weighed 160 pounds, or about 72.5 kg (Thompson 1916:161).

The caloric requirements for men, women, and children differed. I compared these to caloric equivalents of raw and dried caribou meat and bone marrow (Appendix G, Tables G.1 to G.6) using nutritional data from the USDA (2014:1, Appendix H, Table H.1). Arriving at the number of caribou meant using the value of raw meat and fat, as well as an average weight of 109 kg for male and 85 kg for female caribou (BQCMB 2015:1). For distance travelled, the analysis uses two paces: a slow pace of 1 km/h and a moderate pace of 2 km/h and includes supplementary estimates based on variations of cargo and pace (Appendix I, Tables I.1 to I.6). The calculations indicate that the number of caribou required by an individual to follow a caribou herd over a year varies. A series of ranges in Figure 3.6 indicates the variation. This assumed that one-third of the group travels light, one-third of the group travels with a moderate cargo, and one-third of the group carries the heavy packs. These calculations assume that a travelling group would include members travelling at pace one and pace two. If 50 percent travel at pace one and 50 percent travel at pace two, then, an individual requires a minimum of 6.6 caribou, if they travel fast and light. On average, 12.4 caribou are needed if a moderate pace and cargo are used, and up to 23.2 caribou are required if individuals travel heavy and slow. While this analysis presents a conservative estimate, this simulation is consistent with historical descriptions of travel of 6 to 12 km per day with cargo (Back 1836:55-56; Hearne 1795:87; Thompson 1916:161). It requires between 6.6 and 23.2 caribou per individual per year. Detailed calculations were not made for children due to their variable weights during growth stages. Instead, a reasonable approach considers that if on average they weigh half as much as their parents, then they would require half as many calories to move across the land. This caloric requirement, therefore, equates to 3.3 to 11.6 caribou per child. These data show that herd following was indeed possible.
3.2.1. Minimizing Risk in the Seasonal Round by Following the Caribou Herds

The Ethen-eldèli Denesųłiné seasonal round directly links to mobility. Redundancies in the movement of people across the landscape include a mechanism to share information between families strewn across the boreal forest. The trail network has two main purposes. The first is to move people along caribou migration routes; the second is to move information through the network to minimize risk (Figure 3.6). Figure 3.6 presents a heuristic of the trail network that shows how people travel along caribou migration routes and camp at nodes (i.e., intersections of two trails) that intersect secondary travel ways that link nearby communities. If groups follow caribou north in

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**Figure 3.5.** Box plots of the number of caribou required per adult per year to follow the Beverly, Qamanirjuaq, and Queen Maud Gulf caribou herds at various paces.
summer using largely parallel routes, then they can communicate, by visiting with each other. These visits require east-to-west oriented travel ways that act as information pathways and provide a reasonable expectation of locating neighbouring families and sharing understandings of where to find caribou. Ethen-eldéli Denesųliné devised their travel ways to minimize risk and maximize caribou encounters.

**Figure 3.6. Schematic of migration and information pathways in the taiga and barrenlands.**

AD1 explained how people moved across the land in the 1950s through to the 1980s (AD1-3). The men and the women and children travelled separately from a morning camp to a new evening camp. The men would leave early in the morning an hour after daybreak and travel for two-thirds of the day, following a caribou migration route. They would select a suitable camping site and mark it with a stick. Experience compelled them to choose a campsite based on that day’s wind direction, local sources of firewood, and view of the surrounding land (Figure 3.7). Once the men have departed in the morning, the women and children packed camp and followed the men’s trail. In
winter, the men broke a path through the snow. The path hardened after about 20 minutes, making it easier for the women and children.

While the women and children moved from morning to evening camps, the men would split into smaller groups and travel in different directions to harvest resources. Group size fluctuated anywhere from four to 600 people (Hearne 1795:90). The smallest harvest group is two people. One party would continue on the migration pathway for one-sixth of the day’s travel time and allow for a team to both harvest and scout ahead for the next day’s travel. In winter, continued travel on the migration pathway created a trail through the snow. The strategy of splitting into smaller groups and travelling in loose association helped to cover more area. If they targeted a specific resource, splitting into smaller groups increased the odds of an encounter.

Figure 3.7. Initial stage of travel along a migration pathway from the morning camp by men (purple arrow).

While the women and children moved from morning to evening camps, the men would split into smaller groups and travel in different directions to harvest resources. Group size fluctuated anywhere from four to 600 people (Hearne 1795:90). The smallest harvest group is two people. One party would continue on the migration pathway for one-sixth of the day’s travel time and allow for a team to both harvest and scout ahead for the next day’s travel. In winter, continued travel on the migration pathway created a trail through the snow. The strategy of splitting into smaller groups and travelling in loose association helped to cover more area. If they targeted a specific resource, splitting into smaller groups increased the odds of an encounter.
With the evening camp established, the women and children would have searched near the camp for resources to harvest. Toward evening, the women and children would return to the base camp. For the small hunting parties, once their day’s travel time was exhausted, they would return to the spot where they marked evening camp to be set (Figures 3.8 and 3.9). During evening women, children and men would be together. Families would then share information gained from the various groups’ travels and make plans for the next day. In winter, an additional benefit of the men splitting into smaller teams was that their trails through the snow would harden in the night, which made travel easier the next day. This approach to travel as outlined by AD1 minimized risk by maximizing opportunities for encountering country foods and gaining information on areas near the camps.

Figure 3.8. Travel by women and children from morning to evening camp (pink arrow), and travel by men in many directions to harvest resources (purple arrow).
3.3. Chapter Summary

This chapter identified past and current seasonal rounds and use of the land by Ethen-eldèli Denesųliné is directly linked to movement caribou. While on their annual journey, Denesųliné follow known trails and use topographic landmarks associated with place names. Modern methods of wayfinding (i.e., using compasses and GPS) are not relied on. Instead, travellers navigate by sun and stars and use ritualised behaviours to minimize risk. They leave leaving offerings when groups meet new landscape features. The Denesųliné use a lunar calendar to encoded expectations of the seasonal changes in the land. In order to follow caribou at least 6.6 to 23.2 caribou are annually required per individual, depending on their pace and cargo. Repeated sequences of engendered
movement also facilitated travel. This involved men travelling before women and children, and establishing the location for each evening’s basecamp, while the women later moved and set up the lodges. This system helped move families across vast distances while they followed the caribou herds. Insights from this chapter inform later discussion of the seasonal round to assess the Denesųliné adaptive cycle and understand their cultural resilience.
Chapter 4. Caribou Hunting at Cochrane River and Selwyn Lake

Harvesting and processing caribou are identity-defining experiences for many Denesųłiné. Participation in two caribou hunts allowed me to observe Denesųłiné hunting and processing techniques, and the traces they leave behind. The first caribou hunting trip was along the Cochrane River northeast of Wollaston Lake (Figure 4.1). The second was to Selwyn Lake in the Northwest Territories from Black Lake in Saskatchewan. Since these trips occurred in late winter and early spring, we used snowmobiles and traditional camps both times. At Cochrane River, harvesters and I stayed in log cabins at a semi-permanent village. At Selwyn Lake, we stayed in canvas wall tents at a temporary camp. My intention was to learn how to harvest in the traditional way, as a participant-observer would expect.

This chapter first documents how Denesųłiné hunt caribou and the activities that occur during the hunt, delving into details about where people harvest, what methods they use, the division of labour, and variation among harvests. It then assesses the nature of ethnographic sites associated with caribou hunting via intensive surface surveys of the sites during use and after abandonment. These data focus on the use and disposal of caribou and illustrate spatial organization. The final section describes how Denesųłiné butcher and processes caribou at kill sites and base camps. It also provides data on transporting harvested caribou, on storage of caribou meat, bone, and fur, and on those parts they dispose of.
4.1. Caribou Hunting at Cochrane River and Selwyn Lake

The Athabasca Denesųłiné Né Né Land Corporation invited me to attend two caribou culture camps in 2014 and 2015 wherein elder hunters had the opportunity to teach young harvesters. They taught the youth how to “treat the caribou right” (AD5-7). This involved staying in camps on the land where elders share their teachings with young hunters (AD5-6). The first location was 64 km northeast of Wollaston Lake on the
Cochrane River and was the same area visited by Takashi Irimoto during his 1979 Ph.D. research on the Denesųłiné (Irimoto 1979:182-192, 413, 444). The second location was on Selwyn Lake in the Northwest Territories 149 km north of Black Lake.

The first culture camp was near Usam Island in the Cochrane River; the second culture camp was on the northeastern edge of Selwyn Lake. Notably, for the first culture camp, we travelled north from Wollaston Post to the Cochrane River following a traditional travel way. Takashi Irimoto took this same route, as it is the main path of egress from Wollaston Post (Irimoto 1979:411). The travel way consists of two trails. A fork to the east goes to Lac Brochet and a trail to the north goes to Usam Island at the northeast end and passes the outlet of Wollaston Lake. Cognitive geography informed this trip to the camp, so no one had to look at a map. Hunters used their experience when they selected this culture camp, and took into account the season and weather, and targeted accessible areas where they expected to find caribou.

Once at base camp, spotters went to a variety of areas to search for caribou. Two groups of paired hunters went north to look for caribou on 83-105 km-long trips on snowmobile in a single day. One pair went 105 km northeast to the East Porcupine River crossing near Phelps and Franklin Lakes, for a round trip of 210 km. The other pair went 83 km to the northeast of Charcoal Lake, crossing Bannock Lake, and travelling 166 km for the day. Once the scouts saw signs of caribou, a larger group attempted a harvest the next day, but had to trek there first.

Neophytes learning how to hunt caribou, myself included, benefit from expert teachers (AD6-2). North of Cochrane Lake, my instructions were to follow, observe, and listen. I went with my teacher to an area he expected to find caribou. We travelled a traditional trail for 40 km through a chain of unnamed lakes with the occasional portage. My teacher pointed out areas of bad ice, as well as where he carved into a rock face in 1976. We continued north across small lakes, small streams, muskegs, and eskers. After 2.5 hours, my teacher found what he was looking for: fresh caribou tracks. We saw tracks of three or four caribou that had passed through that morning. We tracked them for 11 km and ended up at the edge of a forest where there were no more tracks. My

11 Ethnographer Takashi Irimoto observed the Hatchet Lake Denesųliné seasonal round in 1975-1976.
teacher then used my snowmobile and travelled through the bush to break trail and find caribou, only to return 45 minutes later reporting no caribou. After realizing it was late afternoon, we turned back, following our track. AD6 was in the lead snowmobile and was far ahead when I saw very fresh caribou tracks. The snow from where it pulled its hoof out was on the surface. I scanned the horizon right to left and saw three blurry grey figures at treeline at the far end of a bay. I was not sure what they were. I thought maybe caribou. I had to make a decision: keep following AD6, or wait with the caribou. I decided to catch up to him and report what I saw, which was easier said because he did not stop for twenty minutes. I told him the news, but just then he found more caribou tracks. Instead of turning back, we followed these new tracks 9 km into a muskeg. We followed them to an esker, but we turned back because of the late time of day, and we would have to break trail if we continued to track caribou. I followed AD6 back to camp after a total journey of 103 km. Later, at base camp, I told the story of the day. The assembled hunters looked at my boots and because there was not any blood on them, knew I had a poor day hunting. While I followed the rules of northern teaching (i.e., follow the teacher, observe and listen), in hindsight I should have broken protocol. I should either have waited where I was or entered the bay and approached the animals on my own.

At camp following the luckless hunt, a harvester discussed an elder's successful hunt (AD9-1). He explained how a nearby hunt was a success. On a lake near where I received the first lessons as a huntsman, another hunting party of an elder, AD11, and young hunter was successful. AD11 was a great shot. He could “manage” a small herd of caribou. AD9 said of him:

> [h]e shot the lead animal, by the stomach below the front leg, which dropped the animal. This stopped the rest of the caribou from moving by causing confusion. Then a number of caribou in the centre of the group were shot. When a new leader appeared and tried to move in a new direction, it was shot. Then the caribou in the middle were shot (AD9-1).

Another harvester, AD10, joined the conversation and said, “[i]t takes a true expert to take a group of caribou that way” (AD10-1). Meanwhile, AD9 added, “[t]he two men took three hours to butcher 16 caribou. They returned to camp after dusk” (AD9-1).

On two occasions by Cochrane River, harvesters improvised and attempted to encircle caribou or flush them out to a waiting group of hunters. Both efforts were
unsuccessful. On the same day, at a nearby lake, a harvester, AD5, explained how a similar attempt led to success:

[s]even animals were hunted by three people in this manner. Two hunters were trying to move caribou toward a third. The third hunter heard shots as the first two hunters took animals instead. Afterwards, the three men were able to butcher five caribou in 25 minutes. During the trip back to camp, two of the hunters were slightly overdue at a break area. When they showed up 15 minutes later, they had shot, butchered, and packed two more caribou (AD5-6).

Evidently, while harvesters apply specific harvest strategies for local conditions, hunters are flexible and take the initiative as opportunities present themselves.

During the second culture camp at Selwyn Lake, harvester AD10 invited me on a hunting trip to a nearby Lake (AD10-2). We shared transportation. He rode a snowmobile while I stood on the back of a toboggan. We initially searched for caribou signs near camp for two hours. Unsuccessful, we travelled west across Selwyn Lake, where we met a group of hunters operating an ambush around a rocky island. This group thought that a small herd of caribou were on a hillcrest. As instructed, I snowshoed to the top of the hill. I was told to try to push the caribou off the hilltop, driving them to the hunters’ ambush. I snowshoed to the top of the hill and saw ample evidence of caribou: cratering and relatively fresh tracks that were a few hours old. However, there were no caribou on the hill. The planned ambush failed. After the attempt to trigger an ambush, my hunting partner brought me to a nearby island where he and two other men were shooting caribou. A small herd of caribou came out on the lake from a forested island. The hunters shot 16. We hauled caribou to a sheltered area near the shore, and then butchered and packed them in the toboggans, which took four men three hours. Based on observations outlined in Table 4.1, skilled hunters took 15 to 30 minutes to butcher a caribou. At Cochrane River, one group took 15 minutes to process each caribou. A second group of three hunters butchered five caribou in 25 minutes. Another group took 30 minutes for each caribou. Two hunters processed 16 caribou in three hours. While weather influenced the time it took to butcher caribou, the differentiating factor was that one group kept the fur on quartered limbs, which decreased butchery time. At Selwyn Lake, our group took between 18 to 30 minutes to process each caribou. A group of four men processed 16 caribou in two hours. While the weather was colder than at Cochrane River, differentiating factors exist between
harvesters. One factor was a minor cut on a harvester’s hand that increased processing
time. The other factor was leaving the fur on quartered limbs to decrease butchery time.

Table 4.1. Duration of Caribou Butchery relative to Number of Caribou, Time of
Day, and Weather.

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of Caribou</th>
<th>Number of Hunters</th>
<th>Minutes</th>
<th>Butchery Time per Caribou (Minutes)</th>
<th>Time of Day</th>
<th>Weather</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cochrane River</td>
<td>2</td>
<td>2</td>
<td>15</td>
<td>15</td>
<td>Dusk</td>
<td>-15 °C, Clear</td>
<td>Fur on quarters</td>
</tr>
<tr>
<td>Cochrane River</td>
<td>5</td>
<td>3</td>
<td>25</td>
<td>15</td>
<td>Afternoon</td>
<td>-8 °C, Clear</td>
<td>Fur on quarters</td>
</tr>
<tr>
<td>Cochrane River</td>
<td>16</td>
<td>2</td>
<td>240</td>
<td>30</td>
<td>Afternoon</td>
<td>-8 °C, Snow</td>
<td>Fur off quarters</td>
</tr>
<tr>
<td>Selwyn Lake</td>
<td>4</td>
<td>1</td>
<td>120</td>
<td>30</td>
<td>Afternoon</td>
<td>-25 °C, Clear, Windy</td>
<td>Fur off quarters, hunter injured</td>
</tr>
<tr>
<td>Selwyn Lake</td>
<td>4</td>
<td>1</td>
<td>120</td>
<td>30</td>
<td>Afternoon</td>
<td>-25 °C, Clear, Windy</td>
<td>Fur off quarters</td>
</tr>
<tr>
<td>Selwyn Lake</td>
<td>5</td>
<td>1</td>
<td>90</td>
<td>18</td>
<td>Afternoon</td>
<td>-32 °C Clear, Windy</td>
<td>Fur on quarters</td>
</tr>
<tr>
<td>Selwyn Lake</td>
<td>3</td>
<td>1</td>
<td>60</td>
<td>20</td>
<td>Dusk</td>
<td>-35 °C, Clear, Windy</td>
<td>Fur on quarters</td>
</tr>
<tr>
<td>Selwyn Lake</td>
<td>4</td>
<td>1</td>
<td>300</td>
<td>75</td>
<td>Morning</td>
<td>-20 °C, Clear, Calm</td>
<td>Hunter enjoyed butchery. Fur off quarters</td>
</tr>
</tbody>
</table>

Butchery time varies due to the time of day. Harvester AD10 explained, “[i]f
caribou are shot in the morning, hunters will take their time cutting them up. If they are
shot near dusk, then it’s quicker” (AD10-2). Presumably, this related to the opportunities
to plan the remainder of a day if caribou are harvested in the morning. If animals are
killed late in the day, a decision needs to be made about setting up a camp near the kill
site or travelling at dusk and night. The decision to stay or go depends on the nature of
the immediate caribou processing, prevailing and anticipated weather conditions, and
local resources suitable for camping, such as shelter and firewood. There is an
exception: I observed a Denesųłiné hunter butcher four caribou in five hours. In this
case, the hunter took over four times the length of time his peers took for the same
activity. Given the opportunity, this hunter enjoyed butchery and liked to take his time.
Overall, between the participant observation and interviews, Denesųłiné limit butchery
time to increase mobility. Hunters did not waste time, nor did they wait for stragglers. If
there were delays, latecomers were out of luck.
4.2. Ethnographic Sites associated with Caribou Harvesting at Cochrane River and Selwyn Lake

During the hunting trips, I visited Denesųłiné campsites. While there, I documented the sites, noting the presence of features and associated material culture. At each site, I produced a sketch map and took notes and photos of each feature. Where possible, I interviewed knowledgeable individuals on the nature and history of the sites. I sought tangible and intangible evidence of caribou use and discard. Important sites include Hungry Island on Wollaston Lake, the Cochrane River Camp, the Sandy Island Church, and the Selwyn Lake Camp. For this study, ethnographic sites are defined as any site that evidences cultural modification within the past 50 years (i.e., after 1966). Typical sites are habitation areas (i.e., cabin and tent loci), harvesting and processing areas, and trails and travel ways.

4.2.1. Wollaston Lake Camp: Hungry Island IaMu-E1

Ethnographic site IaMu-E1 is a Denesųłiné campsite on an island in Wollaston Lake, adjacent to the ice road that connects Wollaston Post with Wollaston Landing (Figure 4.2). Denesųłiné used this site as a culture camp in 2006 (AD4-8). The remains of a store from the 1950s were at the site. It consisted of a 5 m by 4 m cultural depression that is 1.2-m-deep. The wooden frames of two 4 m by 6 m wall tents were also at the site. These were made of locally available spruce poles tied together to support large canvas tents. I observed a rock pile that appeared to be a cache for caribou meat. The cache was made of large locally available stones, between 9 and 18 kg, and piled 0.75-m-high (Figure 4.3).
Figure 4.2. Camp at Hungry Island on Wollaston Lake, laMu-E1.
4.2.2. Cochrane River Camp: IdMr-E1

The Cochrane River Camp is an old village with a former school and church on the banks of the Cochrane River (Figure 4.4). The site is in an open spruce and birch forest with a caribou lichen and feather moss understory. AD2 and AD6 revealed that a few Denesųłiné families lived here in the 1950s and 1960s. Families first used canvas wall tents with wood stoves at the site. Later, the families built a school and a semi-permanent settlement of log cabins. The campsite is now a staging area for caribou harvests in winter and fisheries in summer. Hunters make daily return trips from the camp to hunting areas. Often, hunters departed between 1 to 2 hours after sunrise and returned between late afternoon and twilight. The terrain at the camp is low rolling to rugged bedrock controlled knolls covered by black spruce. Extensive wetlands are present in places near the camp. These often have small scrubby willows on their edge. Occasional eskers are present nearby, often with stands of jack pine on them. Site IdMr-
E1 is a series of cabins near Usam Island in the Cochrane River. The site measures 180 m on a north-to-south axis and 120 m east-to-west, and is 20 m from the bank of the Cochrane River at 2 to 4 m in elevation above the river. The site consists of 10 standing cabins (Table 4.2, Figures 4.5, and 4.6).

Figure 4.4. Cabins at the Cochrane River Camp, IdMr-E1.
<table>
<thead>
<tr>
<th>Feature ID</th>
<th>Feature Type</th>
<th>Size</th>
<th>Surface Area (m²)</th>
<th>Description</th>
<th>Associated Artifacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cabin</td>
<td>5 m x 5 m, 3 m x 3 m, 3 m x 3 m</td>
<td>43</td>
<td>3 structures forming a cabin, all 3 structures have balloon frames covered by plywood. Roofed by balloon frame rafters and plywood and asphalt</td>
<td>Light fixtures, power cables, fibreglass insulation and plastic vapour barriers, covered in mould</td>
</tr>
<tr>
<td>2</td>
<td>Cabin</td>
<td>10 m x 6 m, 3 m x 6 m</td>
<td>90</td>
<td>Old school house, balloon frame with plywood and a stove with 8&quot; stovepipe. The front entrance is of a balloon frame and plywood,</td>
<td>Glass windows, chalkboards, school textbooks, and shelves</td>
</tr>
<tr>
<td>3</td>
<td>Cabin</td>
<td>5 m x 5 m, 4 m x 4 m, 3 m x 3 m</td>
<td>50</td>
<td>Cabin made of three structures. The main building is 5 m x 5 m in size, made of at least 11 courses of spruce logs set into vertical corner posts. The rear structure is 4 m x 4 m in size and is made of at least 10 courses of spruce logs, set in vertical corner posts, the front of the building is 3 m x 3 m in size and is made of at least 16 courses of spruce logs set into vertical upright posts. All have gable roofs with balloon-framed rafters covered with plywood and asphalt</td>
<td>Jerry cans (2), wooden table, firewood, rifle, white, orange and blue polyethylene tarps sheeting the north side of the cabin</td>
</tr>
<tr>
<td>4</td>
<td>Cabin</td>
<td>5 m x 5 m, 3 m x 3 m</td>
<td>34</td>
<td>Cabin made of 14 courses of spruce logs set into vertical corner posts, gable roof with plywood and asphalt, additional structure of 12 courses of logs on the west side set into a vertical corner post</td>
<td>Plywood piles</td>
</tr>
<tr>
<td>5</td>
<td>Cabin</td>
<td>6 m x 6 m; 3 m x 3 m</td>
<td>45</td>
<td>Cabin composed of many structures. The main structure is 6 m x 6 m in size, made of at least 10 courses of spruce logs in saddle notched corners, a 3 m x 3 m balloon frame, and plywood structure is on the front, chinked with fibreglass, and covered with orange polyethylene tarps. Gable roof with balloon frame rafters covered with plywood and asphalt</td>
<td>Conical meat rack (5 poles, with 4 cross-members, surrounded by a canvas tarp windbreak, surrounding a 45 gal drum that has been cut in half, a second 45 gal. drum is nearby. Spruce bows cached to the immediate south, extra firewood, 45 gal. drum, and a Yamaha snowmobile are present. A square tin stove is set against the main building</td>
</tr>
<tr>
<td>6</td>
<td>Cabin</td>
<td>4 m x 3 m</td>
<td>12</td>
<td>Small cabin (now outbuilding) made of at least eight courses of spruce logs set into vertical corner posts, with a plywood roof, chinked with fibreglass</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.2. Cultural Features at IdMr-E1.
<table>
<thead>
<tr>
<th>Feature ID</th>
<th>Feature Type</th>
<th>Size</th>
<th>Surface Area (m²)</th>
<th>Description</th>
<th>Associated Artifacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Cabin</td>
<td>6 m x 6 m; 5 m x 4 m; 3 m x 3 m</td>
<td>65</td>
<td>The cabin is composed of three combined structures. The primary structure is a 6 m x 6 m building made of at least 12 courses of spruce logs, set into vertical corner posts. The second building is 5 m x 4 m in size, is attached to the north, and is made of plywood on a balloon frame. A small 3 m x 3 m building on the north is made of at least 15 courses of spruce logs set into a vertical corner post. All have balloon frame rafters and gable roofs covered with plywood and asphalt.</td>
<td>Wheelbarrow, blue polyethylene tarps and fibreglass chinking, extension cords for lights, stove with 8&quot; stovepipe, large plastic tubs on roof, glass windows, and a large birch pole for power cable on the south side</td>
</tr>
<tr>
<td>8</td>
<td>Cabin</td>
<td>5 m x 5 m; 4 m x 4 m; 3 m x 3 m</td>
<td>54</td>
<td>The cabin is composed of three combined structures. The primary structure is a 5 m x 5 m building made of at least 13 courses of spruce logs, set into vertical corner posts. The second building is 4 m x 4 m in size, is attached to the north, and is made of plywood on a balloon frame. A third building is attached to the west side and is a 3 m x 3 m structure of at least 15 courses of spruce logs set in a vertical corner post. All 3 structures have a balloon frame gable roof with plywood and asphalt cover.</td>
<td>Stove and stovepipe (8&quot; diameter), plywood, polyethylene tarps, and fibreglass chinking. An extension cord rests on the roof. A 3 m x 3 m plywood building with a balloon frame is 6 m west of the main house and has a gable roof with a log roof with a plywood cover, and a 45 gal. drum is to the north of the outbuilding</td>
</tr>
<tr>
<td>9</td>
<td>Cabin</td>
<td>3 m x 5 m; 6 m x 5 m; 4 m x 4 m</td>
<td>61</td>
<td>The cabin is composed of three combined buildings. The rear building (3 m x 5 m in size) is of at least 11 courses of spruce logs, with a vertical corner post, a glass window is on the western side. The second building is a 6 m x 5 m building, made of at least 13 courses of spruce logs set into vertical corner posts; 2 large glass windows are on the west side. The third building (4 m x 4 m) is a balloon frame plywood structure; all buildings have a balloon frame gable roof with plywood and asphalt tile cover.</td>
<td>Electric wiring, and light sockets, round nails, glass, and two tin square stoves on the south edge of the structure; Occupied</td>
</tr>
<tr>
<td>10</td>
<td>Cabin</td>
<td>6 m x 5 m; 3 m x 3 m</td>
<td>39</td>
<td>AD2’s cabin is composed of the main building and a front stoop. The main building is a 6 m x 5 m size building made of at least 12 courses of spruce logs, set into vertical corner posts. A large window is present on the south side (adjacent to the central kitchen), and a 3 m x 3 m balloon frame square building is attached on the west side of the building and serves as a storage area for firewood. Both have balloon frame gable roofs, with plywood and asphalt covers.</td>
<td>Portion of a blue polyethylene tarp was placed on the south-facing side, presumably to block the wind</td>
</tr>
</tbody>
</table>
Since the late-1980s, alternating families occupied the site year-round. It continues to serve as a base-camp for travel farther north. Takashi Irimoto (1978:182-192, 413, 444) visited the site in 1975, and observed improvised housing, and caribou harvesting and processing activities. My observations are largely consistent with his, with one exception. While dog teams were present in 1975, none were present during my visit. The cabins were semi-subterranean, their foundations were dug into the ground, and families piled 1 m of snow around them. A large wood stove with a 20.3 cm (8”) diameter stovepipe provided heat. Interiors are fitted with plywood walls and floors, glass windows, and insulation. In the cabins, there were no drafts whatsoever. The roofs have balloon frame rafters topped with plywood secured with wire drawn nails. These cabins often have a small front porch with a store of firewood, and a ramp made by packing down the snow.
Figure 4.5. Cochrane River Camp, IdMr-E1, view to the northwest.

Figure 4.6. Cochrane River Camp, IdMr-E1, view to the east.
At the Cochrane River camp, I saw how Denesųlinė treat caribou heads differently from the rest of the body. A group of harvesters had gathered around a toboggan that contained caribou wrapped in polyethylene tarps. They had uncovered at least six caribou heads stacked on each other and separated from other skeletal elements by a fold of tarp (Figure 4.7). I interviewed two harvesters at the site (AD10 and AD11). AD10 pointed out various delicacies that were on the head, such as the cheeks, the eyebrow, the bit behind the eye, and most especially the cartilaginous antler stub (AD10-1). Throughout the whole interview, he touched and prodded the heads and shared that when the heads are cooked, the eyes are perforated because otherwise they can burst hot liquid, and demonstrated how to perforate them with a finger (AD10-1). Another harvester I asked about the spiritual relationship Denesųlinė have with caribou initially explained that there was no spirituality at all, that nothing special was done with caribou carcasses. Then the same harvester spoke of how the beating of a caribou hide drum directly connects the drummer to caribou (AD11-1). Elder AD2 observed “[w]hat people say they do, and what they do can be different” (AD2-4). Heads of caribou receive treatment different from the rest of the body, as described in section 8.3.

Figure 4.7. Caribou heads in a toboggan separated with a tarp from caribou meat.
4.2.3. Sandy Island Church: IeMs-E1

Site IeMs-E1 is on an island covered with black spruce on the Cochrane River. The island itself is a large esker with two branches, one on the east side of the island, the other on the west. This island is on a known caribou crossing of the Cochrane River because the esker provides landing and take-off opportunities for them. While the site is associated with caribou, elder AD16 explained, “[t]his is where you pray” (AD16-1). The centre of the site is a large open church made of wooden posts covered with a balloon frame roof. Denesųliné built the church in the 1990s. Surrounding the church are at least two dry meat racks, caches of tent poles, and two rectangular tent frames are at the site (Figure 4.8, Table 4.3). The church itself is immediately west of a small lake in the center of the island reported to have sacred waters with special healing properties (AD16-1). A gazebo to assist people who want to swim in the sacred waters is on the west side of the shore of the lake.
Figure 4.8. Features at Sandy Island Church on the Cochrane River, LeMs-E1.
<table>
<thead>
<tr>
<th>Feature ID</th>
<th>Feature Type</th>
<th>Size</th>
<th>Surface Area (m²)</th>
<th>Description</th>
<th>Associated Artifacts within the Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Church</td>
<td>10 m x 12 m</td>
<td>120</td>
<td>20 upright posts, gabled balloon frame rafters, plywood roof, low upright</td>
<td>Church pews, altar, and pennant flags</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>fence along external walls</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Wall tent frame</td>
<td>6 m x 6 m, +3 m x 3 m</td>
<td>45</td>
<td>9 upright posts, 9 cross members, with an extension of a 2-pole A-frame and</td>
<td>Tied with blue polyethylene rope</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a cross member</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Outbuilding</td>
<td>3 m x 3 m</td>
<td>9</td>
<td>Balloon-framed outbuilding sheeted with plywood</td>
<td>Wire-drawn nails</td>
</tr>
<tr>
<td>4</td>
<td>Drying rack</td>
<td>3 m x 2 m</td>
<td>6</td>
<td>4-pole frame with three cross members</td>
<td>Tied with blue polyethylene rope</td>
</tr>
<tr>
<td>5</td>
<td>Spare tent poles</td>
<td>4 m x 1 m</td>
<td>4</td>
<td>Bundle of 6 spruce poles</td>
<td>Tied with blue polyethylene rope</td>
</tr>
<tr>
<td>6</td>
<td>Outbuilding</td>
<td>4 m x 3 m</td>
<td>12</td>
<td>Balloon-framed outbuilding, sheeted with plywood, weathered</td>
<td>Wire-drawn nails</td>
</tr>
<tr>
<td>7</td>
<td>Outbuilding</td>
<td>4 m x 3 m</td>
<td>12</td>
<td>Balloon-framed outbuilding, sheeted with plywood, 4 glass windows</td>
<td>Wire-drawn nails</td>
</tr>
<tr>
<td>8</td>
<td>Gazebo</td>
<td>4 m x 4 m</td>
<td>16</td>
<td>6 vertical posts with a balloon frame roof. Open structure with outside</td>
<td>Pennant flags</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>fence, no wall</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Dock</td>
<td>2 m x 3 m</td>
<td>6</td>
<td>6 vertical poles, balloon frame floor, fences, all made with milled lumber</td>
<td>Wire-drawn nails</td>
</tr>
<tr>
<td>10</td>
<td>Sacred waters</td>
<td>50 m x 100 m</td>
<td>5,000</td>
<td>Sacred waters are from a small lake within the island</td>
<td>N/a</td>
</tr>
<tr>
<td>11</td>
<td>Cross</td>
<td>3 m x 1 m</td>
<td>3</td>
<td>Large cross set on esker top made of two large spruce logs</td>
<td>Set on the pilgrimage trail on esker top</td>
</tr>
<tr>
<td>12</td>
<td>Tent frame</td>
<td>6 m x 3 m</td>
<td>18</td>
<td>3 A-frames (6 poles) supporting three cross member</td>
<td>Tied with blue polyethylene rope</td>
</tr>
<tr>
<td>13</td>
<td>Drying rack</td>
<td>1 m x 3 m</td>
<td>3</td>
<td>1 cross-member nailed to two living spruce trees</td>
<td>Wire-drawn nails</td>
</tr>
<tr>
<td>14</td>
<td>Tent frame</td>
<td>6 m x 4 m</td>
<td>24</td>
<td>6 vertical posts, 6 cross-members</td>
<td>Tied with blue polyethylene rope and surrounded by torn blue</td>
</tr>
</tbody>
</table>
Elder AD16 explained, that annually and as recently as the previous summer, “[a] spiritual walk occurs along the margins of the esker, and that the lake on the island is held sacred” by the Denesųłiné (Figures 4.9 to 4.12) (AD16-1). Most often, people visit the church in the summer, accessing it by boat. People come from Lac Brochet, Wollaston Post, and Black Lake. A priest comes in the summer. AD16 intimated that an apparition of the Virgin Mary appeared on this site and that the lake contains healing waters (AD16-1). During the interview, she requested that we clear snow off the lake, and collect ice for its healing properties for use at Wollaston Lake. In a ceremony, we removed ice with an axe. While knowledge holders did not discuss caribou on the site, we visited it during such a hunt.

Figure 4.9. Sandy Island Church on the Cochrane River, IeMs-E1.
Figure 4.10. Panorama of the Sandy Island Church and sacred waters, leMs-E1. View to the east.

Figure 4.11. Panorama of camping area adjacent to the Sandy Island Church, leMs-E1. View to the north.

Figure 4.12. Panorama of dry meat racks, tent poles, and tent frame adjacent to Sandy Island Church, leMs-E1. View to the west.
The annual pilgrimage occurs at Sandy Island Church in the first week of August. On August 3, 2014, the GeoEye-1 satellite captured a high-resolution image of the Sandy Island Church during the pilgrimage. The image depicts over 99 features at the site (Figures 4.13 to 4.14). These include the features observed in winter, also depicted are an additional 40 tenting areas indicated by blue polyethylene tarps, and over 40 moored boats. Later that winter I was only able to observe 14 features because families removed tents and tarps once the pilgrimage concluded and snow covered the area.

Figure 4.13. Satellite image of the Sandy Island Church on the Cochrane River, leMs-E1, in Saskatchewan during the Annual Pilgrimage on August 3, 2014.

Source: Imagery from GeoEye-1 2014:1.
4.2.4. Selwyn Lake Camp: JbNb-E1

During the second caribou camp and hunt, the north end of Selwyn Lake was the location of our base camp (JbNb-E1). The site is on a relatively level peninsula overlooking the lake to the south (Figure 4.14). The site is in a mixed forest of black spruce and paper birch, with an understory of bearberry and caribou lichen. AD1 explained that they used this camp because “it is on a well-travelled route in the middle of the caribou wintering here” (AD1-7). The site is relatively accessible by Black Lake by snowmobile and charter aircraft with skis. A total of 24 features are at the camp (Table 4.4), including tents, caches, an emergency shelter, and a flagpole. The tents were made of canvas or polyethylene tarps.

Figure 4.14. Selwyn Lake Camp in the Northwest Territories, JbNb-E1.
Table 4.4. Cultural Features at the Selwyn Lake Camp.

<table>
<thead>
<tr>
<th>Feature ID</th>
<th>Feature Type</th>
<th>Size</th>
<th>Surface Area (m²)</th>
<th>Description</th>
<th>Associated Artifacts within the Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tent</td>
<td>4 m x 4.5 m</td>
<td>18</td>
<td>Canvas tent, floor dug to moss, covered with spruce boughs</td>
<td>5 poles, leftover firewood/split, bags of Quaker oats (x 2)</td>
</tr>
<tr>
<td>2</td>
<td>Maurice Piche gravesite Tent</td>
<td>1 m x 2 m</td>
<td>2</td>
<td>Metal frame fence, steel pipes joined to make cross</td>
<td>Maurice Piche signed Treaty 8 for Fond du Lac</td>
</tr>
<tr>
<td>3</td>
<td>Tent</td>
<td>4 m x 5 m</td>
<td>20</td>
<td>Canvas tent, floor dug to moss, covered with spruce boughs</td>
<td>7 poles, firewood, caribou head at door left, firewood on right, chainsaw, and snowshoes</td>
</tr>
<tr>
<td>4</td>
<td>Tent</td>
<td>3.5 m x 4 m</td>
<td>14</td>
<td>Canvas tent, floor dug to moss, covered with spruce boughs</td>
<td>25 poles, stove, northern grocery bag, tarp with stove, part of caribou head and ribs outside of door, and leftover firewood</td>
</tr>
<tr>
<td>5</td>
<td>Tent</td>
<td>3.5 m x 4 m</td>
<td>14.0</td>
<td>Canvas tent, floor dug to moss, covered with spruce boughs</td>
<td>7 poles, stove, jerry cans, large pile of un-chopped firewood, small toboggan and cache by door</td>
</tr>
<tr>
<td>6</td>
<td>Tent</td>
<td>5 m x 7 m</td>
<td>25.0</td>
<td>Canvas tent, floor dug to moss, covered with spruce boughs</td>
<td>12 poles, stove, firewood, and axe</td>
</tr>
<tr>
<td>7</td>
<td>Smoke-house</td>
<td>2.5 m x 3.5 m</td>
<td>8.8</td>
<td>Wood poles tie to tree, blue tarp, hearth in middle</td>
<td>8 poles, and used haywire (mine)</td>
</tr>
<tr>
<td>8</td>
<td>Cache (meat)</td>
<td>2 m x 1.2 m</td>
<td>2.4</td>
<td>Snow cache, 0.6 m deep, 0.6 m of snow on top</td>
<td>24 poles, 2 oil drum stoves, 1 propane stove, 1 generator, pots/pans and supplies, bedding for 4 in south tent, stove pipe and propane tank on the eastern side.</td>
</tr>
<tr>
<td>9</td>
<td>Kitchen tent</td>
<td>12 m x 5 m</td>
<td>60.0</td>
<td>2 orange tarp tents combined by a blue tarp. Spruce boughs on southern tent, dirt floor on north tent</td>
<td>3 poles and 18 poles as cross members, chainsaw, stove, uncut firewood, and a jerry can</td>
</tr>
<tr>
<td>10</td>
<td>Hearth</td>
<td>3 m x 3 m</td>
<td>9.0</td>
<td>Bonfire</td>
<td>Hearth filled with cans, and 2 benches made from a chain-sawn tree (lengthwise).</td>
</tr>
<tr>
<td>11</td>
<td>Tent</td>
<td>4 m x 5 m</td>
<td>20.0</td>
<td>Canvas tent, floor dug to moss, covered with spruce boughs</td>
<td>South of cabin 1 m from trail, beside gas cache</td>
</tr>
<tr>
<td>12</td>
<td>Cache (meat, opened)</td>
<td>1.5 m x 1.5 m</td>
<td>2.3</td>
<td>Snow cache, six caribou legs, tin shovel, snow slabs to the south</td>
<td>15 poles, chainsaw, gun case, fish on sticks, and firewood Flag</td>
</tr>
<tr>
<td>13</td>
<td>Tent</td>
<td>4 m x 5 m</td>
<td>20.0</td>
<td>Canvas tent, floor dug to moss, covered with spruce boughs</td>
<td>South of cabin 1 m from trail, beside gas cache</td>
</tr>
<tr>
<td>14</td>
<td>Flagpole</td>
<td>0.1 m x 0.1 m</td>
<td>.1</td>
<td>4 m tall flagpole from spruce tree</td>
<td>Flag</td>
</tr>
<tr>
<td>Feature ID</td>
<td>Feature Type</td>
<td>Size</td>
<td>Surface Area (m²)</td>
<td>Description</td>
<td>Associated Artifacts within the Features</td>
</tr>
<tr>
<td>------------</td>
<td>--------------</td>
<td>------------</td>
<td>-------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>15</td>
<td>Tent</td>
<td>3.5 m x 4 m</td>
<td>14.0</td>
<td>Canvas tent, floor dug to moss, covered with spruce boughs</td>
<td>9 poles, gas cache and 45 gal oil drum, firewood, caribou head on the north side by the front door, and tarp windbreak on the north side</td>
</tr>
<tr>
<td>16</td>
<td>Tent</td>
<td>3.5 m x 4 m</td>
<td>14.0</td>
<td>Canvas tent, floor dug to moss, covered with spruce boughs</td>
<td>10 poles, stove, firewood, and jerry can</td>
</tr>
<tr>
<td>17</td>
<td>Privy</td>
<td>1 m x 1 m</td>
<td>1.0</td>
<td>Blue tarp</td>
<td>4 support posts and seat</td>
</tr>
<tr>
<td>18</td>
<td>Tent</td>
<td>3.5 m x 4 m</td>
<td>14.0</td>
<td>Canvas tent, floor dug to moss, covered with spruce boughs</td>
<td>5 poles, stove, firewood, and two caribou legs by front door on the right</td>
</tr>
<tr>
<td>19</td>
<td>Emergency shelter</td>
<td>2 m x 2 m</td>
<td>4.0</td>
<td>Emergency shelter made of spruce boughs</td>
<td>3 spruce poles</td>
</tr>
<tr>
<td>20</td>
<td>Tent</td>
<td>5 m x 5 m</td>
<td>25.0</td>
<td>Canvas tent, floor dug to moss, covered with spruce boughs</td>
<td>10 poles, stove, caribou skins, caribou ribs on door left, and cache</td>
</tr>
<tr>
<td>21</td>
<td>Tent</td>
<td>3.5 m x 4 m</td>
<td>14.0</td>
<td>Canvas tent, floor dug to moss, covered with spruce boughs</td>
<td>Windbreak of spruce trees, chainsaw, rifle, snowshoes, and firewood</td>
</tr>
<tr>
<td>22</td>
<td>Cache</td>
<td>2.5 m x 1 m</td>
<td>2.5</td>
<td>Snow cache, 0.6 m deep, 0.6 m of snow on top</td>
<td>1 m from a trail</td>
</tr>
<tr>
<td>23</td>
<td>Privy</td>
<td>1 m x 1 m</td>
<td>1.0</td>
<td>Blue tarp</td>
<td>Made of four poles and plywood</td>
</tr>
<tr>
<td>24</td>
<td>Tent</td>
<td>6-m-diameter</td>
<td>113.0</td>
<td>Canvas tent, floor dug to moss, covered with spruce boughs</td>
<td>2 poles, stove, chainsaw and a sled</td>
</tr>
</tbody>
</table>

Elder AD1 shared his memories and oral traditions relating to events caused by non-human beings at the site (AD1-8). Selwyn Lake’s traditional name is Ho-cha’twa. This name is from a story of two giant creatures who fought each other. This battle caused earthquakes, rockfalls, and tidal waves on the lake. AD1 recalls:

Overnight at the portage, a woman told a story to my dad. He used to tell a story about it. My dad told why Ho-cha’twa, “My boy, because I call it Ho-cha’twa, big lake, by portage. A mom and a boy and a grandmother stay overnight here [at the Selwyn Lake camp], and hear a loud noise rumbling, brawling, land shaking, they start fighting each other”. It is here, the north end of Selwyn Lake. The portage to Selwyn Lake, little lake on the west side of the big hill, on the portage. One went into ground in the mountain. That made the rumbling hills, and rock falling, and then one of them went into Selwyn Lake, and splash and made things rattle, and then things were quiet. Next morning, people woke up, mom, young boy and grand mom, “[o]h kids, maybe something had fight.” Ho-Cha’ means the big thing went into the mountain, big thing went into the lake. This is the story behind the traditional name of Selwyn Lake (AD1-8).
The campsite is associated with the gravesite of Maurice Piche, a signatory of Treaty 8 for Fond du Lac First Nation in 1899 (Fumoleau 2004:82-80,133). As such, this site holds special significance for Fond du Lac Denesųłiné First Nation. Individuals provided offerings of spruce, tobacco, and snow at the gravesite.

During the end of the hunting trip, an elder AD1, and harvesters AD12 and AD13 related their stories about caribou. In doing so, they borrowed a caribou-hide drum and told a series of traditional stories to an audience of youth, hunters, and elders. AD1 sang a caribou song and explained how the beating of the drum made a connection between hunter and prey (AD1-9). He explained, “[i]t was a very old song. That it was about hardship and difficulty and full of strong emotion” (AD1-9). He clarified the explanation when he said, “[c]aribou felt this song, and would respond.” Afterwards, he and other elders and harvesters said, “[t]he caribou were happy with the song” (AD1-9). They said, “[w]e would see caribou tomorrow” (AD1-9). The next afternoon, after most of the hunters departed south from camp, a herd of over 500 caribou passed a few kilometres north of camp.

4.3. Chaînes Opératoires of Caribou Butchery

As a result of my participation in the caribou hunts, I describe butchery processes in both kill sites and in camp. I do this by presenting the chaînes opératoire (Leroi-Gourhan 1964:164). This technique reveals the stages from kill to meal. Flowcharts diagram the organization and sequence of activities and help reveal why different decisions are made. Traditionally, chaînes opératoires reconstruct techniques to produce lithic artifacts and their residues following a logical order from sourcing raw materials and then tracking manufacture stages to their eventual discard. Application to animal butchery illustrates decisions and actions about caribou grounded in cultural values (see also Lane 2014:129).

Denesųłiné split caribou butchery into three stages. First, initial processing that occurs near the kill site. Second, processing takes place in campsites. Third, production of bone grease and pemmican, and the discard of residual caribou bones into lakes or hearths. Primary caribou butchery involves the skinning and dismemberment of the animal, as outlined in Table 4.5. The actions done to butcher caribou in the primary processing areas is illustrated as a chaînes opératoire in Figure 4.15. Figures 4.16 to 4.19 provide a
visual record of this sequence. Section 4.3.1 compares these butchery processes with Nunamiut processing of caribou observed by Louis Binford (1978) to highlight similarities and differences between different cultures. In response to my queries about how to treat dispatched caribou, harvesters AD5, AD7, and AD10 described the initial butchery of caribou near the kill site (AD5-6, AD7-1, and AD10-2). That day three men were fortunate enough to kill seven caribou, which they butchered in less than 30 minutes. Harvester AD6 reasoned that the “butchery is quick, as the meat will freeze” (AD6-1). AD5 related the following order of activities:

The head is removed first. This because rumen comes up the esophagus and can contaminate the head. Then either the animal is skinned, or the legs are cut off with fur on. About half of the hunters keep the fur on certain meat cuts because they do not freeze together like skinned meat does. Leaving the fur on also avoids freezer burn. Then the backstrap is removed. The ribs are next cut out of near the spine, by one cut if possible. Then internal organs are removed. The lining of the intestine is cleaned. The heart is removed, and blood is drained from it. A small piece of the heart is cut, but not used. Then kidneys and liver are removed. The spine is cut. Then meat is packed. Only two tools are used, a sharp knife and an axe. The axe is used sparingly (AD5-6).12

“Hundreds or thousands” was the answer AD7 gave in response to the question, “[h]ow many caribou have you butchered in your lifetime?” (AD7-1).

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Details</th>
<th>Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove head</td>
<td>First slice throat. Then slice between atlas and skull. If difficult, twist neck to break axis. Then slice between the atlas and base of the skull. Remove head and pile with other heads</td>
<td>Skull, mandible, atlas and axis vertebrae</td>
</tr>
<tr>
<td>2</td>
<td>Slice down body</td>
<td>From the neck, slice along the centre of the body passing the sternum. Take care not to slice inner organs</td>
<td>Body (ribs, sternum, and pelvis)</td>
</tr>
<tr>
<td>3</td>
<td>Cut ankles at metatarsals</td>
<td>Slice on the dorsal side of metatarsal/tibia articulation. Slice on the ventral side of metatarsal/tibia articulation. Remove ankle, and discard nearby</td>
<td>Tibia, metatarsal, tarsals, and phalanges</td>
</tr>
<tr>
<td>4</td>
<td>Remove hind quarter</td>
<td>Slice across the muscle between pelvis and upper leg</td>
<td>Pelvis, femur</td>
</tr>
</tbody>
</table>

12 This description has implications for past caribou hide uses for clothing and tents. Denesųliné harvesters take more liberties collecting late winter hides because they are of a poor quality (i.e., removing the hide in many pieces versus one piece). Fall harvests provided optimal hides for clothing and tents due to their quality and required number. For instance, 29-30 caribou hides were need to make Tiłčǫ tent coverings (Andrews 2011:196-201).
<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Details</th>
<th>Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Cut along articular surface</td>
<td>Slice along the articular surface between the head of the femur and the acetabulum. Stack hindquarters together</td>
<td>Pelvis, femur</td>
</tr>
<tr>
<td>6</td>
<td>Remove front quarter</td>
<td>Follow the same process as hindquarter. Slice along muscle between torso and humerus. Then slice between the head of humerus and scapula. Stack front quarters together, usually near the hindquarters.</td>
<td>Scapula, ribs, and humerus</td>
</tr>
<tr>
<td>7</td>
<td>Skin torso, from the belly</td>
<td>Remove skin from the torso. Remove skin with a knife from 1/4 to 1/3 of the animal. Cut from the centre of the chest to the opposing side. Reach over, and grab the removed skin/fur with both hands. Lift animal up quickly, and remove the hide with force</td>
<td>Ribs, vertebrae, pelvis, and scapula</td>
</tr>
<tr>
<td>8</td>
<td>Skin limbs</td>
<td>Remove skin from the front and hindquarters, a slice is made along the inside of the leg, and then the skin is sliced away from the inside, working around. Where possible, the skin is pulled off. I often observed cross-hand cuts, where the knife hand crosses over the hand holding the skin/animal</td>
<td>Femur, tibia, humerus, radius and ulna</td>
</tr>
<tr>
<td>9</td>
<td>Remove backstrap</td>
<td>Cut lengthwise vertically along the edge of the spinal column. Then cut horizontally along the ribs to the dorsal articulation with the spine. Remove the backstrap muscle and fat. Repeat on opposite side of the spine</td>
<td>Vertebrae and ribs</td>
</tr>
<tr>
<td>10</td>
<td>Remove rumen and intestine</td>
<td>Slice centre of the torso from the pelvis to the sternum, pulling tissue upwards. Let rumen and intestine slide out. Take care not to cut intestine or rumen. If fetal calf present, remove the amniotic sac and fetus</td>
<td>Pelvis, ribs, and sternum</td>
</tr>
<tr>
<td>11</td>
<td>Remove Stomach and intestines</td>
<td>Cut the intestines lengthwise: clean out with a knife, scraping off inner contents. Place the intestines nearby. Collect or discard the rumen</td>
<td>Stomach and intestines</td>
</tr>
<tr>
<td>12</td>
<td>Cut hand-holds in torso</td>
<td>Make slice between the ribs near the neck</td>
<td>Ribs</td>
</tr>
<tr>
<td>13</td>
<td>Remove ribs</td>
<td>Place opposing hand through the cut in the ribcage. Pull the rib cage and slice the articular ends of ribs at the spine. Usually, two slices are enough to remove the ribs, while some individuals slice each rib articulation. Others use an axe to chop through articulations. Repeat on the opposing side of the torso</td>
<td>Ribs</td>
</tr>
<tr>
<td>14</td>
<td>Remove heart</td>
<td>Remove the heart; make three slices in top of heart. Make one horizontal and two vertical cuts. Drain blood</td>
<td>Heart</td>
</tr>
<tr>
<td>15</td>
<td>Remove kidneys</td>
<td>Remove the kidneys from the torso. Slice along inner tissue</td>
<td>Kidneys</td>
</tr>
<tr>
<td>16</td>
<td>Clean spine</td>
<td>Remove the pelvis, and cut then spine in half using an axe</td>
<td>Pelvis and spine</td>
</tr>
<tr>
<td>17</td>
<td>Remove liver</td>
<td>Remove the liver, pile near organs</td>
<td>Liver</td>
</tr>
<tr>
<td>18</td>
<td>Remove antlers</td>
<td>Gently chop the inside of antler articulation with the skull with an axe. Strongly chop outside of antler</td>
<td>Skull and antlers</td>
</tr>
</tbody>
</table>
19. Pack for transport

Pack meat for transportation. Pile front and hindquarters in the bottom of the toboggan. Add spine, pelvis, and organs. Cover with the ribs. Lastly, pile heads; keep them separate from other meat. Cover with a tarp.

All elements, except for tarsal, carpals, and phalanges.

Figure 4.15. Chaînes opératoire for preparation for butchery.
Figure 4.16. Caribou butchery, minutes one to four.
Figure 4.17. Caribou butchery, minutes four to seven.

1. Remove skin from the belly.
2. Skin front limb (note cross-hand cut).
3. Fifth minute: remove backstrap.
4. Remove stomach and intestines.
5. Sixth minute: remove rumen and intestines.
Figure 4.18. Caribou butchery, minutes eight to 11.

Eighth minute: remove ribs.

Cut and pull ribs.

Cut articular surface of vertebrae.

Tenth minute: remove heart.

Slice and handle heart.

Eleventh minute: remove kidneys.
Harvesters bring meat collected from the primary butchery site near the kill into a base camp for secondary processing, as summarized in Table 4.6, while Figure 4.20 depicts a chaînes opératoire of these activities. At Selwyn Lake, hunters brought quartered caribou meat into a kitchen tent wherein four women made dry meat (AD16-2). They dexterously cut thin strips of meat with very sharp knives. An assembly line was set up with the eldest quickly removing muscles and fat. The second person thinned the cut muscles, and the last two made thinner strips by slicing the meat down the centre, cutting with the grain of the tissue. Then they sliced it lengthwise along the muscle, but not all the way through, after which they opened the piece up like a book, and sliced along the middle of the opposing pages. It was as if the muscle tissue kept folding out. Once they thinned the muscle, they placed it on racks. They dried it with heat from a smoky hearth in an oval pit.
measuring about 60 cm by 30 cm and 20 cm deep. The smoke emanated from rotten birch and aspen wood, which they left smouldering for 24 to 56 hours. Both women and men checked the moisture content of the meat every hour in the day, but they did not check it at night. If deemed adequate, they removed dry individual strips. They rearranged moist portions of meat toward the heat to improve drying.

Table 4.6. Steps of Secondary Caribou Butchery at Camp.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thaw meat pieces, place by stove</td>
<td>Move animal from kill site to butchery site (usually near a lakeshore)</td>
</tr>
<tr>
<td>2</td>
<td>Each meat piece: remove any hide</td>
<td>Remove any skin/fur from large meat chunk (e.g., front and hind quarters)</td>
</tr>
<tr>
<td>3</td>
<td>Disarticulate along articular surfaces</td>
<td>Each element is disarticulated, cut along articular surfaces</td>
</tr>
<tr>
<td>4</td>
<td>Remove muscles</td>
<td>Cut along the fat between muscle tissues. Remove each muscle group</td>
</tr>
<tr>
<td>5</td>
<td>Remove fat and tendons</td>
<td>For each piece of meat, remove fat and tendons. Do this when the muscle is removed from the element, and when each muscle group is removed. Store sinew for later use.</td>
</tr>
<tr>
<td>6</td>
<td>Split muscle</td>
<td>Cut each muscle in the centre like a book. Open into two attached halves</td>
</tr>
<tr>
<td>7</td>
<td>Slice muscle in half</td>
<td>Split each half of the muscle from the inside, making it thinner. Cut inside ‘pages’ in half</td>
</tr>
<tr>
<td>8</td>
<td>Split muscle again in half</td>
<td>Split each muscle again in half from the inside. Repeat this step until the muscle is appropriately thin.</td>
</tr>
<tr>
<td>9</td>
<td>Place bones aside</td>
<td>Place bones aside after all the muscles have been removed and store for later use</td>
</tr>
<tr>
<td>10</td>
<td>Move fat and tendons into waste containers</td>
<td>Move fat and tendons into waste containers (plastic bags, pails, and so forth), or otherwise use</td>
</tr>
<tr>
<td>11</td>
<td>Sharpen knives</td>
<td>Sharpen knives every 15 minutes</td>
</tr>
<tr>
<td>12</td>
<td>Hang meat on racks</td>
<td>Hang sliced muscles and other tissues on racks. Generally, place centre of the book on rack with the cut sides facing the heat</td>
</tr>
<tr>
<td>13</td>
<td>Dry</td>
<td>Keep hearth warm and smoky. Monitor meat until adequately dry</td>
</tr>
<tr>
<td>14</td>
<td>Pound dry meat</td>
<td>Collect dry meat, where required, pound dry meat with an axe head and hammerstone. Meat is pounded on back of a large bone, stone or the back of a knife</td>
</tr>
</tbody>
</table>
The final stage of caribou handling and discard involves the making of pemmican, as outlined in Figure 4.21. The essential ingredients for pemmican are bone grease, pounded dry meat, and dried blueberries or dried cranberries. Men and women make bone grease by pulverising bones into pieces. They boil these bones and extract grease. They discard bone fragments into lakes and hearths. They mix bone grease with pounded meat and berries. They either consume pemmican fresh or store it for later use. At Cochrane River, an elder used a makeshift rack to dry meat (AD16-1). She had set up a tripod directly in front of her cabin’s door and surrounded most of the tripod with canvas.

13 This is similar to customs of Mistissini Cree and Innu of northern Quebec and Labrador (Tanner 1979:160-161).
She had dug a central hearth about one metre into the snowpack and set strips of meat dying on the rack. She utilized the combination of snow and canvas to keep the wind away from the strips of muscle tissue (Figures 4.22 and 4.23). It was very similar to the way Denesųliné used snow and hides for winter skin lodges (see Chapter 5). In this process, they either discard caribou bone off-site in a lake or burn it.

Figure 4.21. Chaînes opératoire for bone grease and pemmican production.
Figure 4.22. Dry meat structure at the Cochrane River Camp, view south.

Figure 4.23. Dry meat structure at the Cochrane River Camp, view east.
4.3.1. Ethnoarchaeological and Ethnohistorical Comparisons of Denesųļiné Butchery.

Comparing different butchery can highlight the spectrum of activities and the underlying rationale that accounts for differences. The Evenki butchery of Siberian reindeer (*Caribou tarandus sibiricus*) was documented in detail to understand archaeological faunal assemblages better, (Abe 2995:23-25). For Evenki, all primary butchery involved two individuals, and the processing was markedly different from Denesųļiné, in that, skinning occurring first, then removal of the rumen and intestines, then removal of the head and lower limbs with the body kept whole, including organs, and femurs and humeri. During secondary butchery at basecamp, the forelimbs, ribs, spine, heart, lungs are removed from the body, and then the lower limbs are processed (Abe 2995:123-155). Personal preference, strength, and experience also influence butchery. For instance, at Selwyn Lake, an individual butchered four caribou in five hours, taking over four times the length of time of his peers for the same activity. In this case, this was because he enjoyed butchery and liked to take his time.

Parallels exist between what I observed, and the Nunamiut caribou handling that Louis Binford observed (Binford 1978), and Netsilik Inuit processing filmed by Quentin Brown (Brown 1967a:1, 1967b:1). While I reference Nunamiut data, I must acknowledge that animal butchery varies for a myriad of factors, including season, location, animal health, and local hunting rationales (Lane 2014:126; Lupo 2006; Lupo and Schmitt 2006). In order to understand Denesųļiné practices better, I compare Nunamiut and Denesųļiné butchering techniques in Table 4.7. In particular, anomalies between butchery practices may indicate different mindsets and rationalities. For example, Nunamiut do not consistently remove the head. They often cache whole animals before disarticulating them and remove the organs before removing limbs. While Nunamiut and Denesųļiné share the goal of bringing processed meat back to camp, their process of doing this is remarkably different. Denesųļiné bring nearly all of the elements back to camp, except the antlers, metatarsals, and metacarpals that they intentionally leave at butchery sites in honour to the spirits of the animals killed. While slight personal variations in how harvesters butcher the animals exist, overall they cut up each caribou in the same way. The order of steps and specific slices and removals remain consistent. Denesųļiné seem to follow explicit rules for the butchery of caribou.
### Table 4.7. Similarities and Differences of Denesųļiné and Nunamiut Butchery.

<table>
<thead>
<tr>
<th>Similarities</th>
<th>Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Primary butchery occurs near but not at kill site (Binford 1978:48)</td>
<td>• The head is not removed first by Nunamiut. Denesųļiné always remove the head first</td>
</tr>
<tr>
<td>• Secondary butchery takes place in base camp (Binford 1978:48)</td>
<td>• Nunamiut eviscerate caribou early in the processes</td>
</tr>
<tr>
<td>• Caribou meat is cached, stone caches are occasionally used (Binford 2978:50, 58, 241)</td>
<td>• Denesųļiné slice the dry meat very thin. Nunamiut dry much larger meat chunks</td>
</tr>
<tr>
<td>• Where possible, caribou are butchered before the meat freezes (Binford 1978:49)</td>
<td>• Nunamiut often cache butchered animals at the primary processing site. Denesųļiné cache at base camp</td>
</tr>
<tr>
<td>• Dry meat is pounded with a hammer (Binford 1978:158)</td>
<td>• Nunamiut use rock hunting stands partly because they have few available trees (Binford 1978:48)</td>
</tr>
<tr>
<td>• Cuts are made between articular ends of bone and leave similar cut-marks on bone (Binford 1978:48)</td>
<td>• Nunamiut separate bone grease into white and yellow types (Binford 1978:32)</td>
</tr>
<tr>
<td></td>
<td>• Nunamiut often cache whole animals (Binford 1978:50). Denesųļiné rarely cache whole animals. Instead, they cache primary butchered caribou meat (see Chapter 7 for additional details on Denesųļiné caching techniques)</td>
</tr>
</tbody>
</table>

In his landmark study on caribou butchery, Binford focused on caribou bones rather than the meat itself. He used data from a single caribou to determine the average amounts (weights) of meat based on individual elements (single bones) (Binford 1978:17). This approach discounts the significant variation in caribou size, health, and fatness based on season, gender, and age. Binford notes, “Nunamiut butchery is not a single act but a series of acts beginning when the animal is killed and continuing at various junctures until the animal is totally consumed or discarded” (Binford 1978:48). He disagreed with anthropologists who argue that “[b]utchering and dismemberment has frequently been treated as the dynamic expression of a cultural set of rules” (Binford 1978:47). Thus, he seemed to ignore his informants, preferring instead to produce abstract and hypothetical cases in which hunters chose those elements they brought from a kill site back to camp (Binford 1978:40). While there are similarities to Nunamiut butchery, there are also major differences in Denesųļiné processes.
Similar to ethnoarchaeological approaches, ethnohistorical methods provide for similar comparisons between cultures. Hearne (1795) presented detailed accounts of caribou handling by Denesųłiné that he observed over the many seasons he worked in their country in the late eighteenth century. His accounts flavour the past and include detailed explanations of cooking methods and recipes, and help to explain how Denesųłiné make a meal from organs, stomach, and fat:

But of all the dishes cooked by those people, a ‘beatee’ as it is called in their language, is certainly the most delicious, at least for a change, that can be prepared from a deer only, without any other ingredient. It is a kind of haggis, made with the blood, a good quantity of fat sliced small, some of the tendered of the flesh, together with the heart and lungs cut, or more commonly torn into small slivers; all which is put into the stomach, and roasted, by being suspended before the fire by a string. Care must be taken that it does not get too much heat at first, as the bag would thereby be liable to be burnt, and the contents be let out. When it is sufficiently done, it will emit steam, in the same manner as a fowl or a joint of meat which is as much as to say. Come, eat me now: and if it be taken in time, before the blood and other contents are too much done, it is certainly a most delicious morsel, even without pepper, salt, or any other seasoning (Hearne 1795:114).

He also noted there are cultural rules about cooking certain dishes, such as those associated with a meal of caribou blood cooked in a stomach:

… tender flesh are also shred small and boiled with it. To render this dish more palatable, they have a method of mixing the blood with the contents of the stomach in the paunch itself, and hanging it up in the heat and smoke of the fire for several days; which puts the whole mass into a state of fermentation, and gives it such an agreeable acid taste, that were it not for prejudice, it might be eaten by those who have the nicest palates. It is true, some people with delicate stomachs would not be easily persuaded to partake of this dish, especially if they saw it dressed, for most of the fat which is boiled in it is first chewed by the men and boys, in order to break the globules that contain the fat; by which means it all boils out, and mixes with the broth: whereas, if it were permitted to remain as it came from the knife, it would still be in lumps, like suet. To do justice, however, to their cleanliness in this particular, I must observe, that they are very careful that neither old people with bad teeth, nor young children have any hand in preparing this dish. At first, I must acknowledge that I was rather shy in partaking of this mess, but when I was sufficiently convinced of the truth of the above remark, I no longer made any scruple, but always thought it exceedingly good. The stomach of no other large animal beside the deer is eaten by any of the Indians that border on Hudson's Bay. In Winter, when the deer feed on fine white moss, the contents of the stomach is so much esteemed by them (Hearne 1795:317).
Finally, Hearne commented on the historic Denesųlinė preferences and cultural rules for eating the reproductive organs and the fetus. Such rules appear to relate to preference, taste, and gender, and have potential implications for hunting success. They also hint at additional cultural understandings associated with butchery.

I have often seen them sit round a deer where it was killed, and eat it warm out of the paunch. In Summer the deer feed more coarsely, and therefore this dish, if it deserves that appellation, is then not so much in favour. The young calves, fawns, beaver, etc. taken out of the bellies of their mothers, are reckoned most delicate food; and I am not the only European who heartily joins in pronouncing them the greatest dainties that can be eaten. Many gentlemen who have served with me at Churchill, as well as at York Fort, and the inland settlements, will readily agree with me in asserting, that no one who ever got the better of prejudice so far as to taste of those young animals, but has immediately become excessively fond of them; and the same may be said of young geese, ducks, &c. in the shell. In fact, it is almost become a proverb in the Northern settlements, that whoever wishes to know what is good, must live with the Indians.

The parts of generation belonging to any beast they kill, both male and female, are always eaten by the men and boys; and though those parts, particularly in the males, are generally very tough, they are not, on any account, to be cut with an edge-tool, but torn to pieces with the teeth; and when any part of them proves too tough to be masticated, it is thrown into the fire and burnt. For the Indians believe firmly, that if a dog should eat any part of them, it would have the same effect on their success in hunting, that a woman crossing their hunting track, at an improper period would have. The same ill success is supposed also to attend them if a woman eat any of those parts.

They are also remarkably fond of the womb of the buffalo, elk, deer, etc. which they eagerly devour without washing, or any other process but barely stroking out the contents. This, in some of the larger animals, and especially when they are some time gone with young, needs no description to make it sufficiently disgusting; and yet I have known some in the Company's service remarkably fond of the dish, though I am not one of the number. The womb of the beaver and deer is well enough, but that of the moose and buffalo is very rank, and truly disgusting.

The Indian method of preparing this unaccountable dish: is by throwing the filthy bag across a pole directly over the fire, the smoke of which, they say, much improves it, by taking off the original flavour: and when any of it is to be cooked, a large flake, like as much tripe, is cut off and boiled for a few minutes; but the many large nodes with which the inside of the womb is studded, make it abominable. These nodes are as incapable of being divested of moisture as the skin of a live eel; but when boiled, much resemble, both in shape and colour, the yolk of an egg, and are so-called by the natives, and as eagerly devoured by them. The tripe of the buffalo is exceedingly good, and the Indian method of cooking it infinitely superior to
that practised in Europe. When opportunity will permit, they wash it tolerably clean in cold water, strip off all the honeycomb, and only boil it about half, or three-quarters of an hour (Hearne 1795:318-319).

In sum, ethnoarchaeological anomalies highlight cultural practices. Denesųłinė first remove the head. They cache butchered caribou meat and produce extra thin dry meat. Many practices are similar between Denesųłinė and Nunamiut. They butcher animals before their carcasses freeze. Primary butchery occurs at kill sites. Secondary butchery occurs at base camps. Harvesters cache caribou. Overall, Denesųłinė handle caribou heads because of the respect they show caribou. Hearne provided an authentic flavour of caribou processing and cooking. Throughout his narrative, he notes Denesųlinė followed cultural rules for handling, cooking and eating caribou. Rules are present for the eating of a caribou blood haggis, fetus, and reproductive organs. In this case, ethnoarchaeology and ethnohistorical methods complement each other. When combined, the data on butchery practices highlight the continuity of traditions and marked cultural differences over several hundred years.

4.4. Chapter Summary

This chapter described how Denesųlinė hunt and butcher caribou, how they transport and store caribou meat, fur, and bones, and the nature of ethnographic and archaeological sites in the region. Over the course of two hunting forays, I observed Denesųlinė harvest caribou. The planning for the hunt itself included a stage of information gathering on weather, snow depth and condition, and expected caribou presence, movement, and abundance. Their selection of a harvesting area was based on known travel routes and good habitation areas with essential resources such as available firewood, water, and fisheries. Once hunters selected the location they want to harvest, a scout group searched for caribou signs (i.e., tracks and cratering) before they committed to a larger hunt. Regardless, small groups of two to three hunters investigated likely areas and harvested. The hunting forays included opportunistic interceptions, stalk and ambushes, and attempts to direct caribou to ambushes. Overall, the aim was to take enough caribou for each hunter, although harvests of entire small herds (i.e., 15 to 25 animals) were attempted.
If hunters were successful, they processed caribou with a well-defined culture-bound system of butchery. Above all, Denesųlinė emphasized travel and mobility and used a quicker primary butchery method than their neighbours. Harvesters structured initial butchery to maximize disarticulation in the shortest time possible. With the physical handling of animals, harvesters treated caribou heads differently than other parts of the caribou and packed heads separately on top of loads. They cooked and consumed them separately, and they disposed of them near the entrance of habitations. I have observed great skill in caribou butchery, both in the primary processing areas and in camp during dry meat production. While very little of the animal was left behind at the primary butchery sites, they produced some waste at camp during dry meat production. This included bits of fur, bone, fat, and tendons that they burned in hearths or disposed of in a lake.

During the hunting trips, I observed four large habitation sites and found multiple features at each site. Most often habitation structures were present, including relatively permanent log cabins, temporary canvas wall tents and their frames, and smokehouses, privies, and caches. The caches included rock and snow caches. One of the trends expressed best at the Selwyn Lake camp was that harvesters burned caribou bone in hearths prior to leaving the site. Notably, harvesters did not burn caribou skulls. Instead, they left them near the front door of abandoned tent areas. This site cleanup directly relates to showing proper respect for caribou. AD10 explained their reasoning when he stated, “[c]aribou would return to an area if harvested animals were shown respect. If disrespected, caribou would not return” (AD10-2). When compared to Nunamiut, Denesųlinė butchery is distinguished by the treatment of the head, the order of the butchery processes, and the overall shorter amount of time taken to dress caribou. Denesųlinė apply a standardized process of caribou butchery, with quick primary processing near the kill sites, and significantly longer secondary processing in camp, often to make dry meat and pemmican.
Chapter 5. Ethnographic and Archaeological Survey of Wholdaia Lake

This chapter documents the role ethnoarchaeology plays in constructing the heritage of Denesųliné first nations. It presents data I collected on how caribou crossings work while conducting an ethnographic and archaeological survey. Knowledge holders requested that I visit Wholdaia Lake in the Northwest Territories in the autumn to get a deeper understanding about their traditions as keepers of the game, including the importance of season and place. They impart traditional harvest techniques at water crossings where caribou must swim obstacles as they migrate. They also wanted to show the types of cultural materials they leave behind at their sites in this area.

The first section of the chapter documents activities that occur at caribou crossings based on the eyewitness accounts of the knowledge holders. These data document how the Wholdaia Lake caribou crossing works by identifying the timing and location of activities. The next section documents ethnographic and archaeological sites and infers hunting activities and handling of caribou as they appear at the Wholdaia Lake caribou crossing based on interviews. Included in the third section is an assessment of inter-site spatial patterns evident at the Wholdaia Lake caribou crossing. Spatial data from these ethnographic and archaeological sites establish selection criteria for habitation sites.

5.1. Physical Environment at Wholdaia Lake

Wholdaia Lake is a large subarctic lake that drains into the Dubawnt River and Dubawnt Lake system. It is 60,900 ha in area and is at 361 m above sea level (Energy, Mines and Resources Canada 1990:1). The surrounding area is gently rolling Precambrian bedrock terrain with sandy eskers that run northeast to southwest (Bostock 1967:29; Taylor 1959:1; Taylor et al. 1970:1). The eskers intrude the water and form shallow reefs that extend many hundreds of metres into the lake. A veneer of till moraine overlies bedrock that is composed of deformed metavolcanic, metasedimentary, and plutonic paragneiss rocks from the Rae Domain of the Churchill Province of the Canadian Shield (Leech et al. 1963:64; Mahan et al. 2003:1086; Pessl 2014:75). A forest of moisture-tolerant trees, such as dwarf birch (*Betula glandulosa*) and small black spruce (*Picea...*)
mariana), surrounds the lake. Caribou lichen (Cladonia rangifera), Knight’s Plume feather moss (Ptilium crista-castrensis), red stemmed feather moss (Pleurozium schreberi), Hyocomium splendens (step moss), and crowberry (Empetrum nigrum) cover the ground. Wetlands are present and contain sphagnum moss (Sphagnum sp.), blueberries (Vaccinium myrtilloides), and Labrador tea (Rhododendron groenlandicum). Overall, the area has a low amount of biomass.

The northern part of Wholdaia Lake burned in 2001 (CWFIS 2014). In most areas, surface vegetation has been burned to the regolith (the C-horizon), and occasional burned trunks, usually small spruce, are present. In burned areas, the archaeological visibility is excellent. In unburned areas, the visibility is poor. There appears to be very little soil development, and most seem to be Regosols or Brunisols.

Caribou cross Wholdaia Lake along a southwest-to-northeast running gravel and sand esker that forms a peninsula on the north end. After an initial 620 m long dip in the lake and a brief trot with an island underfoot for 1,310 m, then they swim 2,375 m across open water before reaching an egress on a rocky peninsula adjacent to a hill of spiritual importance to the Denesųłiné (Figure 5.1). A shorter (870 m) “landing” slightly southward includes a pair of rocky peninsulae, which have less use by caribou (AD1-1; AD1-2; AD2-2). An established caribou trail runs along the ridge of a locally protuberant esker. The second crossing of Wholdaia Lake is 9 km to the west, which has as its take-off a large peninsula featuring a 240-m-long crossing to a small island, a 190-m-long trail across the island, and a 350-m-long lake crossing out on a rocky peninsula. This second crossing is 5 km south of a prominent esker on the west side of the lake.

Caribou cross the lake in the fall, usually around the middle of September to early October (AD1-2; AD2-1; AD3-1; AD4-2; AD5-2). They follow the general terrain to the north, often drifting along the ridges. The animals group together on promontories that extend into the lake. As is typical in the local vernacular, AD2 describes these areas as “wildlife gates,” which indicates the funnelling effect that these areas have on the herds (AD2-1).
5.2. The Caribou Crossing of Wholdaia Lake

Conversations with AD1, AD2, AD3, AD4, and AD5 revealed Wholdaia Lake to be an area of cultural importance (AD1-1, AD2-2, AD3-1, AD4-1, and AD5-1). AD1 explained that at the Wholdaia Lake caribou crossing, hunting, and processing stages within a radius of least 5 km, where the activities associated with a single harvesting event occur in a
variety of places. Some activities occur many kilometres away from earlier activities. Different camp sites are used before and after a kill. An elder shared, “at Wholdaia Lake, there is an area on the south shore where the hunters (which are all men) wait for the caribou to cross” (AD1-1). At this area, there is a rule that “a campfire cannot be used [there], so hunters wait” a number of days without the luxury of fire (AD1-1). AD1 noted the importance for a successful ambush of knowing wind direction and reducing smells at camp (AD1-1). He explained that at this area, “hunters listen for caribou splashing in the water, the occasional snort as they are swimming, and the sound of their hooves on rock. Once the hunters hear the caribou crossing the lake, they jump into their boats and intercept caribou” (AD1-2). The boats often have two people in each, “one person controls the boat while the other stabs caribou with a spear” (AD1-2). Hunters take great care spearing caribou because if they strike a “sensitive spot,” such as directly on a rib, the caribou might kick and capsize or otherwise destroy the boat. Harvesters lance caribou in the back, specifically low along the spinal column just above the pelvis. AD3 stated, “[i]f a hunter makes a good strike, the caribou’s head will lurch forward, and the caribou will immediately drown” (AD3-1). At these watercourse crossings, the intention is to “kill all the animals who are crossing at that time” (AD3-1). As if to underscore its importance, AD2 explained, “[a] single animal cannot escape because it would tell other caribou about the hunters, and the caribou will avoid the crossing in the future” (AD2-2). In comparison, Denesųliné hunters told Samuel Hearne (1795:257) in 1771 how caribou kick each other even as hunters bear down on them by canoe:

    The common deer are far more dangerous to approach in canoes, as they kick up their hind legs with such violence as to endanger any birch-rind canoe that comes within their reach; for which reason all the Indians who kill deer upon the water are provided a long stick that will reach for beyond the head of the canoe.

This historical account illustrates the danger to watercraft of a kicking caribou, a common thread linking harvest in the 2000s to those in the 1770s.

Elders and hunters described the following butchery processes at the crossing. The caribou that die are “hauled to the southeastern shore, and their bodies are initially cut up” (AD1-1). “First, the head is cut off, antlers knocked off; then the hide is taken off, and the animal is quartered” (AD2-2). “Care is taken to remove the organs, as all parts of the animal are traditionally used” (AD3-1). After initial butchery, the animals are packed and
hauled north across the lake to tent camps for secondary processing completed by women. This includes when “the meat is cut into strips and made into dry meat” (AD1-1). Afterwards, at the tent camps, the long bones are broken up, and their marrow removed. “The broken bones are boiled for grease. The grease is mixed with pounded dry meat and some dried berries to form pemmican” (AD3-1). After making bone grease, they place remaining bone fragments into a hearth (AD2-2). As long-time hunters, AD1, AD2, and AD3 said they treat the head differently out of respect for the animal, and that the head holds their favourite cuts of meat (AD1-1; AD2-2; AD3-1). AD2 relates their sequence of dismemberment:

We cut the head off first; Eskimos don’t do it like that. We start by, we cut the head off. Then cook it separately. We would cook it on the fire, there is a lot of meat in the head, some other natives don’t do it. My mother, dad, caribou head. Cut it off, boil it up. They are good when boiled them up. Always cut off, always (AD2-1).

AD3 also shared a curious custom, “caribou head, back door only, can’t go in the front door” (AD3-1). What he means is that people brought caribou heads into lodges and homes by the back door, whereas they bring the rest of a caribou carcass in through the front door. It also implies why caribou skulls are associated with the rear of houses and lodges, and why Denesųłiné often discard them towards the rear of the campsite, as later explained in a description of the internal organization of house and lodges in section 5.3.16.

The above description of the caribou crossing of Wholdaia Lake is similar to the one given by Denesųłiné from Churchill, Manitoba to Kaj Birket-Smith (1930:22), an ethnographer affixed to the Fifth Thule Expedition. Harvesters told him how they hunt caribou at their water crossings. They taught him that they kill caribou in the autumn as they swam across water bodies. When caribou were two-thirds of the way across hunters concealed on the bank (presumably the opposing bank) would come out in canoes and encircle them. Hunters would make a berm-like barrier of linked watercraft, and from the canoes would lance them to the last animal. In Fidler Bay on Wollaston Lake, a similar harvest was recorded (Holland and Kkailther 2003:35-36). There, hunters in canoes using spears fitted with iron points produced from re-heated files, dispatched 60 caribou.

A staged sequence of activity areas at the caribou crossing on Wholdaia Lake by phase are illustrated below (Figures 5.2 to 5.5). The sequence includes an ambush camp,
the kill site on the lake, primary butchery areas, a secondary butchery area at temporary
dry meat camps, and longer-term villages on Wholdaia Lake. Figure 5.2 outlines how
caribou follow an esker, peninsulae, and an island when they cross the lake. Figure 5.3
depicts where the hunters would wait in ambush for the caribou to cross and the primary
processing area. Figure 5.4 shows where the initially butchered meat was brought for
processing after successful ambushes. It also shows the placement of a pair of villages on
the north shore of the lake. Archaeological sites including caches and tent depression on
the south shore of Wholdaia Lake are indicated in Figure 5.5.

Figure 5.2. Animal movements along the Wholdaia Lake caribou crossing.
Figure 5.3. Ambush camp, caribou kill, and primary processing stages at the Wholdaia Lake caribou crossing.

Figure 5.4. Dry meat camps and winter villages at the Wholdaia Lake caribou crossing.
Figure 5.5. Archaeological and ethnographic sites at the Wholdaia Lake caribou crossing.

5.3. Archaeological and Ethnographic Sites Found at Wholdaia Lake

The following observations cast light on the objective of the study to document the role of the archaeological record in the construction of heritage. Proximal to Wholdaia Lake are 17 cultural sites that consist of 14 archaeological sites with cairns, a cultural depression, tent rings, two caches, four tent areas, three cabin sites, a lithic scatter, and an ancient pile of caribou antler. Two villages and a recent pile of caribou antlers meet the criteria for an ethnographic site. The interpretation of features and assemblages at each site indicate a degree of continuity of occupation coeval with caribou harvesting activities at Wholdaia Lake. For this study, Tom Andrews, the territorial archaeologist of the Prince of Wales Northern Heritage Centre classified each site at Wholdaia Lake as being archaeological or ethnographic. Under the Archaeological Site Regulations (Government of Northwest Territories 2014:2), “archaeological site” means “a site where an archaeological artifact is found,” and “archaeological artifact” means “any tangible evidence of human activity that is more than 50 years old, in respect of which an unbroken chain of possession cannot be demonstrated.” In practice, this means that archaeological sites have an age
greater than a 50-year moving window, currently 1966. Ethnographic sites are thus defined as being younger than 1966.

5.3.1. Archaeological Site JdNa-1: Tent Depressions

Site JdNa-1 highlights three tent depressions on the tip of a narrow promontory jutting into Wholdaia Lake (Figure 5.6). This point of land sits on a north-to-south oriented esker covered in caribou lichen, crowberry, and small birch trees. The site extends 100 m on an east-to-west axis and 50 m north-to-south. Tent Depression 1 consists of 91 stones that enclose a 4-m-diameter circle (Figures 5.7 and 5.8). Tent Depression 2 is slightly larger with a 4.5-m-diameter circle made from 68 stones (Figures 5.9 and 5.10). Tent Depression 3 is a 4.5-m-diameter circle made from 69 stones (Figures 5.11 and 5.12). An excellent panoramic view to the west of the lake and the various islands and promontories sweeps eastward to the main caribou crossing of the lake. The site is 5 m south of the lakeshore and is 1 m in elevation above the lake.

Seasonality of occupation is unknown at the site, but if local hunting custom is any indication, the site was viable during the spring and/or fall caribou migrations. Its position on the southern fringe of the lake points to a spring occupation (AD1-2; AD2-3; AD3-2). Although at that time of year ground frost would linger longer at this locale and freeze lodgestones in place. This is because the north-facing area is relatively open and exposed. The lodgestones are rocks used to secure a hide-covered tent, and at JdNa-1, were local to the esker, and likely moved a few metres from the lakeshore. The features are consistent with the shape and size of tent rings observed at the Seahorse Gully site (Meyer 1977b:54, 1979a:12) and the Burton Rock Site by Churchill, Manitoba (Nash 1969:19). Additionally, the form of tent depressions fits within the known range of Denesųłiné and Talttheilei tent camps (Pickering 2012:229-235), and are distinct from some Inuit sites (i.e., Thule) that have squared depressions with a levelled platform and a three-flat stone hearth (Dawson and Levy 2005:443-445; Schledermann 1976:37-47).
Figure 5.6. Tent rings at site JdNa-1.

Figure 5.7. Tent ring 1 at site JdNa-1.
Figure 5.8. Planview of tent ring 1 at site JdNa-1.
Figure 5.9. Planview of tent ring 2 at site JdNa-1.
Figure 5.10. Tent ring 2 at site JdNa-1.

Figure 5.11. Tent ring 3 at site JdNa-1.
Figure 5.12. Planview of tent ring 3 at site JdNa-1.
5.3.2. Archaeological Site JdNa-2: Cultural Depression

Site JdNa-2 consists of a single cultural depression on the ridge of a north-to-south running esker (Figure 5.13). The locale offers a broad view of Wholdaia Lake that includes the caribou crossing and is in an open black spruce forest with a thick caribou lichen, club moss, low bush cranberry, dwarf spruce, and dwarf birch understory. The site is 70 m southeast of Wholdaia Lake and is 5 m in elevation above the lake. The site extends approximately 5 m north-to-south, and 5 m east-to-west. The main feature is a 30-cm-deep depression measuring 60 cm east-to-west and 50 cm north-to-south, and has an adjacent pile of 32 stones piled to the east. The pile is 1.5 m north-to-south by 1 m east-to-west in size and is 0.2 m from the depression. A small spruce tree, at least 80 years old, grows within the bottom of the depression (Figure 5.14). Caribou travel along the esker that the site is on (A1-2).
Figure 5.14. View south of site JdNa-2.
5.3.3. **Archaeological Site JdNa-3: Single Opened Cairn**

Site JdNa-3 consists of a single opened stone cairn found on the ridge of a north-to-south running esker. It is set in an open black spruce forest, with an understory of thick caribou lichen and crowberry, approximately 120 m from the south shore of Wholdaia Lake, 7 m in elevation above the lake, and measures 5 m by 5 m (Figure 5.15). The main feature is a 0.8-m-deep depression, measuring 1.5 m by 1 m, with the long axis oriented east-to-west. An adjacent 0.6-m-high pile of 60 stones has a 1.5-m-diameter and is 1 m east of the depression (Figure 5.16). From the site the viewshed is expansive, taking into its vista the lake and the caribou crossing. This feature is an opened cache because stones that formerly covered items in the depression were removed and subsequently piled beside it (Figures 5.17 to 5.19). The placement of the cairn at the terminus of the caribou crossing perhaps suggests construction of this cache in the fall (AD1-1, AD3-1).

![Figure 5.15. Cairn at site JdNa-3.](image)
Figure 5.16. Planview of the cairn at site JdNa-3.

Figure 5.17. Profile of the cairn at site JdNa-3.
Figure 5.18. Cairn at site JdNa-3.

Figure 5.19. Oblique view of the cairn at Site JdNa-3.
5.3.4. **Archaeological Site JdNa-4: Cache at Caribou Crossing**

Site JdNa-4 is a stone cairn set on the rocky shore of Wholdaia Lake at the southern terminus of the fall caribou crossing (Figure 5.20). Interviews with AD1, AD2, and AD4 indicate that caribou land on this promontory after their crossing of Wholdaia Lake in the fall. Hunters hauled caribou dispatched in the centre of the lake to this portion of the eastern shore for initial butchery. The feature is 10 m east of the shoreline, is 2 m in elevation above the lake, and encloses an area of 10 m by 10 m. The cairn is piled 0.4-m-high and is situated in a shallow pit about 0.4-m-deep (Figure 5.21). It is constructed of at least 65 visible stones set in a 3 m by 2 m area (Figure 5.22). The stones were collected locally and on average measure 20 cm by 25 cm in size and estimated to weigh between 10 and 20 kg. A series of stones were placed in layers as apparent on the planview and profile drawings, with the larger stone slabs securing the edge of the cairn (Figure 5.23). The cairn’s placement directly at the location where caribou carcasses are brought to shore strongly suggests its use as a cache. The site is 10 m from the lakeshore; numerous old lichen covered caribou bones and antlers are on the nearby shore, often semi-buried in an ice-push ridge at the lakeshore. These bones and antlers are likely of significant antiquity based on the depositional environment and subsequent growth of lichens, with an age of at least 1,000 years (Marsh and Timoney 2005:495-499; Timoney and Marsh 2005:80-81).
Figure 5.20. Cache at site JdNa-4.

Figure 5.21. Planview of cache at site JdNa-4.
5.3.5. Archaeological Site JdNa-5: Cache on Island

Site JdNa-5 is a campsite on a small island in Wholdaia Lake. The island measures 60 m southwest to northeast and 25 m southeast to northwest and is covered with caribou lichen, cranberry, crowberry, and small birch trees (Figure 5.24). The site is at an elevation 4 m above Wholdaia Lake, and extends the length of the island. Because this site is directly on the southern portion caribou crossing, it was likely occupied in fall. The site contains three
features: a stone cache and two tent depressions (Table 5.1). The stone cache consists of a pile of 22 stones 5 m west of the shore of Wholdaia Lake set in a 1.3 m area. An 1-m² test unit was placed in the centre of the cache (Figure 5.29). The unit revealed five stones placed on top of an axial section of caribou ribs and vertebrae. The test unit contained a mostly articulated axial section of a caribou, including 19 ribs, 12 thoracic vertebrae, two lumbar vertebrae, and two lone vertebral epiphyses (Figures 5.30 to 5.31). The caribou was a juvenile based on unfused vertebral epiphyses. The ribs exhibit cut-marks. The cache is directly on the rocky margins of the island and is 2 m in elevation above the lake. The tent depressions are on the center of the island and are above the cache. Tent Depression 1 consists of a circle of 10 stones with a 4.5-m-diameter (Figure 5.25 to 5.26). Tent Depression 2 consists of a circle of 44 stones with a 4.5-m-diameter (Figure 5.27 to 5.28). While the site is along a caribou crossing, no evidence exists that caribou regularly cross the island because no trails were present.

Table 5.1. Cultural Features at Island Camp JdNa-5.

<table>
<thead>
<tr>
<th>Feature ID</th>
<th>Feature Type</th>
<th>Size</th>
<th>Surface Area (m²)</th>
<th>Description</th>
<th>Associated Artifacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tent depression / Stone circle 1</td>
<td>4.5-m-diameter</td>
<td>4.0</td>
<td>Ring of 12 lodgestones</td>
<td>Historic can with funnel</td>
</tr>
<tr>
<td>2</td>
<td>Tent depression / Stone circle 2</td>
<td>4.5-m-diameter</td>
<td>0.25</td>
<td>Ring of 44 lodgestones</td>
<td>--</td>
</tr>
<tr>
<td>3</td>
<td>Cache</td>
<td>4 m x 2 m</td>
<td>8.0</td>
<td>Axial portion of a caribou covered by 5 stone, Cache consists of 17 stones</td>
<td>19 ribs, 12 thoracic vertebrae, 2 lumbar vertebrae, and 2 vertebral epiphyses</td>
</tr>
</tbody>
</table>


Figure 5.24. Features at site JdNa-5.

Figure 5.25. View north of feature 1 at site JdNa-5.
Figure 5.26. Planview of feature 1 at site JdNa-5.
Figure 5.27. View south of feature 2 at site JdNa-5.
Figure 5.28. Planview of stone circle 2 at site JdNa-5.
Figure 5.29. Planview of cache at site JdNa-5.

Figure 5.30. Cache at site JdNa-5.
5.3.6. **Archaeological Site JdNa-6: Lithic Scatter**

Site JdNa-6 is a lithic scatter on the top of an esker that runs southwest from Wholdaia Lake, and the caribou crossing (Figure 5.32). A well-established caribou trail runs along the crest of the esker (Figure 5.33). The site is 450 m south of Wholdaia Lake, 550 m east of a southern bay of Wholdaia Lake, and overlooks Wholdaia Lake to the north and the east. The site is surrounded by an open spruce forest with a caribou lichen and sparse crowberry understory and has 95 percent archaeological visibility due to surface erosion and lack of vegetation. The esker is of coarse sand at the site location. The site extends 20 m northeast to southwest, and 15 m northwest to southeast and consists of a sparse lithic scatter of quartz debitage. A caribou trail that runs along the southwest trending sandy esker bisects the lithic scatter. The site is 75 percent intact and has been disturbed by
slopewash, aeolian exposure, and caribou migration via a game trail. The site is 30 m in elevation above Wholdaia Lake. Due to the expansive view and the distance from Wholdaia Lake, it is reasonable that the site was a short-term lookout for game, especially caribou, in the southern bays of Wholdaia Lake.

The scatter consists of a quartz projectile point, and 52 pieces of quartz debitage. The debitage consists of 38 secondary flakes, including shaping, bifacial reduction, unifacial reduction flakes, some removed with bipolar techniques; nine tertiary flakes (pressure thinning flakes), and five pieces of shatter. The projectile point is 18.84-mm-long, 16.61-mm-wide, 6.53-mm-thick, and weighs 2.3 g (Figure 5.34). It appears to be the broken base of a quartz Middle Taltheilei tradition projectile point (Gordon 1996:86). It exhibits basal and edge grinding, lateral pressure flaking along its margins, and an apparent impact break from the tip. A portion of a shoulder is present, although an impact break removed the opposing shoulder. This projectile point has a plano-convex cross-section.

Figure 5.32. Artifact scatter at site JdNa-6.
Figure 5.33. View west of artifact scatter at site JdNa-6.

Figure 5.34. Projectile point recovered from site JdNa-6: actual size.
5.3.7. Archaeological Site JdNa-7: Antler Pile

Site JdNa-7 is a concentration of caribou antlers set on the northeastern margins of a rocky promontory overlooking Wholdaia Lake to the east and is on the southwestern margin of the caribou crossing (Figure 5.35). On the surface of the promontory, a 20 m by 20 m area covered with caribou lichen, crowberry, and small birch trees contained 15 caribou antlers. Carnivore gnawing and movement of the antlers is apparent. Slow-growing moss has grown on this site, and lichens have colonized the surface of the antlers. A second scatter of antlers is 20 m south of the first scatter.

Figure 5.35. Antler scatters at site JdNa-7.
I found a second scatter of 17 caribou antlers in a 15 m by 20 m area submerged in the lake. The antlers rest on the level sandy sediment of the lake at a depth of 0.3 m to 0.9 m (Figure 5.36). AD1 opined, “[t]his was unusual for the location, and traditionally the antlers should not have been placed on this island as it was a camp for the hunters to ambush caribou” (AD1-2). He noted further, “[t]his location was a place where Denesųlinė hunters would wait for caribou to cross,” and that “there was a prohibition against lighting fires at the site, as the fire could spook caribou” and deter their crossing of the lake (AD1-1). He explained, “[n]o fires would have been lit” and hunters made every effort not to scare the caribou away from the crossing (AD1-1).

![Figure 5.36. Underwater antler scatter at site JdNa-7.](image)

The collection of antlers is unique and likely represents a spiritual or ceremonial placement. AD3 explained, “[w]e believe that living caribou will visit the places where they shed their antlers. The spirits of caribou connect with their antlers and skulls” (AD3-3). The elder explained that the positioning of these antlers was an action done “out of respect for the caribou” (AD1-2).
5.3.8. Archaeological Site JdNa-8: Dry Meat Island

Site JdNa-8 is a tent area on the southern promontory of an island within the Wholdaia Lake caribou crossing (Figure 5.37). The site covers 10 m by 5 m, is 20 m from the lakeshore, and is 3 m in elevation above the lake. A flat 4 m by 3 m cleared area has a pair of stones set on the northern margin. The stones are 20 cm apart, have an average diameter of 15 cm, weigh 5 kg, and were apparently gathered in the immediate area. A closed black spruce forest with a bearberry understory covers the knoll. The site is extremely clean and very little material evidence remains when compared to more recent sites JdNa-E2 and JdNa-E3 (Figure 5.38, see Sections 5.3.16 and 5.3.17). Based on an interview with AD1, a few Denesųłiné families occupied the site in the 1950s and 1960s (AD1-2). He explained that a “canvas wall tent was set here and a stove was placed on stones” (AD1-2). By his reckoning, families made dry meat here from caribou harvested at the crossing to the south.

Figure 5.37. Features at site JdNa-8.
Figure 5.38. Tent camp at site JdNa-8.
Note: The extent of bearberry understory indicates a former tent area and the two stones in the foreground were used to support a stove.

5.3.9. Archaeological Site JdNa-9: Dry Meat Camp 1

Site JdNa-9 is a series of tenting areas on the northern edge of Wholdaia Lake (Figure 5.39). This very large site measures 200 m by 120 m and is only 10 m from the lakeshore, at is 2 to 4 m above the lake. A total of 12 features were found at the site, consisting of ten tent areas, an isolated artifact, and an isolated caribou skull (Table 5.2, Figure 5.40).
Table 5.2. Cultural Features at Site JdNa-9.

<table>
<thead>
<tr>
<th>Feature ID</th>
<th>Feature Type</th>
<th>Size</th>
<th>Surface Area (m²)</th>
<th>Description</th>
<th>Associated Artifacts within the Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, 2 stones for stove</td>
<td>Caribou skull</td>
</tr>
<tr>
<td>2</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, 2 stones for stove</td>
<td>Caribou skulls (2)</td>
</tr>
<tr>
<td>3</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, 8 stones for stove</td>
<td>None</td>
</tr>
<tr>
<td>4</td>
<td>Artifact scatter</td>
<td>0.2 m x 0.2 m</td>
<td>.04</td>
<td>Net float</td>
<td>None</td>
</tr>
<tr>
<td>5</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, 3 stones for stove</td>
<td>Caribou tibia, caribou humeri (2)</td>
</tr>
<tr>
<td>6</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, tent poles (spruce)</td>
<td>Caribou antler</td>
</tr>
<tr>
<td>7</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, 8 stones for stove</td>
<td>None</td>
</tr>
<tr>
<td>8</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, 5 stones for stove, 2 tent poles</td>
<td>Caribou radius and ulna</td>
</tr>
<tr>
<td>9</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, 1 stone for stove, on the point of esker</td>
<td>None</td>
</tr>
<tr>
<td>10</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, 3 stones for stove</td>
<td>Caribou vertebrae (1)</td>
</tr>
<tr>
<td>11</td>
<td>Caribou skull</td>
<td>0.3 m x 0.3 m</td>
<td>.09</td>
<td>Cleared flat tent area, 1 nearby rock</td>
<td>Caribou skull</td>
</tr>
<tr>
<td>12</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, 4 stones for stove</td>
<td>--</td>
</tr>
</tbody>
</table>
Figure 5.39. Tent camp at site JdNa-9.

Figure 5.40. Tent camp at site JdNa-9.
The site is in an open birch forest with a caribou lichen, feather moss, and crowberry understory. During our interview, AD1 intimated that Denesųłinė families occupied the site in the 1950s and 1960s (AD1-3). They stayed in canvas wall tents with wood stoves, which were propped on two to four stones to prevent the forest floor from burning. The tent poles were de-limbed trunks of spruce trees 2 m to 3.5 m in length and up to 10 cm in diameter, though a diameter of 6 cm is common. A portion of a meat rack was standing. Weathering of the standing wood and the decomposition of the wood on the ground are consistent with the reported age of occupation. People left these short-term tenting areas relatively clean. By clean, I mean that additional durable material culture common in the 1950s and 1960s such as sanitary cans, ceramics, bottle glass, metal fragments, plastics, and faunal remains are absent. Generally, at individual tent areas only two or four stones and perhaps a skull remain, as other artifacts associated with the camp are absent. Additional caribou bones, such as split long bones and calcined bone fragments are absent. This suggests that families burned faunal remains in hearths, or otherwise disposed of them in the adjacent lake.

AD2 related how families occupied the site simultaneously with the harvest of caribou in the fall. Inhabitants “made dry meat at this location” (AD2-3). Hunters brought field-butchered caribou to the site. An elder explained that at this site, “[t]he women sliced the meat and hung it on racks to dry it” (AD2-3), and “[c]hildren gathered cranberries and blueberries from nearby berry patches on the island” (AD2-3). Several activities occurred here, typical of traditional sites (Brumbach and Jarvenpa 1997:425).

Four caribou skulls are at the site. They were set on the edge of the tents opposite the entrance. Someone cracked open the base of these skulls to remove the brain. These were broken in a manner identical to skulls at Cochrane River I observed Denesųliné extract brain from. The process involved cooking a caribou head over an open hearth, using a large stick that was set inside the foramen magnum. While cooking, this stick was used to adjust the height of the head above the fire. Later, once the head was cooked, the stick was used to pry apart the base of the skull to access the cooked brain.

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14 Sanitary cans are modern machine made cans with double locking side-seams that have been mass-produced since 1904 (Rock 1984:69).
5.3.10. Archaeological Site JdNa-10: Cabins

A cluster of cabins, JdNa-10, on the north shore of Wholdaia Lake is on a sandy bluff 4 m in elevation above the lake (Figure 5.41). The site is 45 m northeast of the lakeshore, where the elevation rises 2 to 5 m above the lake. It has an excellent view south of the caribou crossing (AD1-5). Nearby, a large esker runs north-to-south through this open black spruce forest shading an understory of caribou lichen and crowberry. The site extends 50 m by 30 m and consists of five features: three cabin foundations, a cultural depression (cellar), and a stove (Table 5.3, Figure 5.42).

Figure 5.41. Features at site JdNa-10.
Table 5.3. Cultural Features at Site JdNa-10.

<table>
<thead>
<tr>
<th>Feature ID</th>
<th>Feature Type</th>
<th>Size</th>
<th>Surface Area (m²)</th>
<th>Description</th>
<th>Associated Artifacts within the Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cellar</td>
<td>2 m x 1.5 m</td>
<td>3</td>
<td>Cellar</td>
<td>--</td>
</tr>
<tr>
<td>2</td>
<td>Cabin foundation</td>
<td>5 m x 5 m</td>
<td>25</td>
<td>Cabin foundation is 30-cm-deep, and has a 20-cm-tall exterior rim,</td>
<td>--</td>
</tr>
<tr>
<td>3</td>
<td>Cabin foundation</td>
<td>5 m x 5 m</td>
<td>25</td>
<td>Charred timbers in the middle of the foundation, direct evidence of burning</td>
<td>--</td>
</tr>
<tr>
<td>4</td>
<td>Stove</td>
<td>1 m x 1 m</td>
<td>1</td>
<td>Old stove from a 20 gal. oil drum</td>
<td>Caribou vertebrae, sanitary cans</td>
</tr>
<tr>
<td>5</td>
<td>Cabin foundation</td>
<td>3 m x 3 m</td>
<td>9</td>
<td>Axe hewn logs, 80-cm-deep foundation depression, 25-cm rim above ground surface, overlooks Wholdaia Lake to the south</td>
<td>--</td>
</tr>
</tbody>
</table>

Figure 5.42. Cabin foundation at site JdNa-10.
5.3.11. **Archaeological Site JdNa-11: Cabin on an Esker**

A cluster of cabins, JdNa-11, sits atop an esker overlooking Wholdaia Lake and the caribou crossing to the south (Figure 5.43). They are set on a sandy bluff approximately 4 m higher than the lake elevation. The site is 185 m northeast of the lakeshore, is 10 m in elevation above the lake, and is in an open black spruce forest wherein caribou lichen and crowberry form the understory. These habitations occupy a clearing measuring 65 m by 35 m in area. A total of three features are at the site: a cabin foundation, a chimney heap, and a cultural depression (Table 5.4, Figure 5.44). An elder noted, “[t]his site was on a height of land for its view of Wholdaia Lake to the south” (AD1-4).

Figure 5.43. Spatial plan of a historic cabin site: JdNa-11.
Table 5.4. Cultural Features at Site JdNa-11.

<table>
<thead>
<tr>
<th>Feature ID</th>
<th>Feature Type</th>
<th>Size</th>
<th>Surface Area (m²)</th>
<th>Description</th>
<th>Associated Artifacts within the Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cabin foundation</td>
<td>4 m x 4 m</td>
<td>16.00</td>
<td>Old house foundation on an esker. Old chimney heap 2 m east of foundation; the foundation depression is 15-cm-deep. The exterior of the foundation has a 5-cm-high rim</td>
<td>Machine cut nails</td>
</tr>
<tr>
<td>2</td>
<td>Chimney heap</td>
<td>2.5 m x 1.5 m</td>
<td>3.75</td>
<td>Chimney heap of stones 30 cm in height</td>
<td>Wooden shakes of a canoe secured with machine cut nails</td>
</tr>
<tr>
<td>3</td>
<td>Depression</td>
<td>1 m x 1 m</td>
<td>1.00</td>
<td>Depression is 0.5-m-deep and is 45 m southeast of cabin</td>
<td>Machine cut nails, and thin wooden shakes of a canoe</td>
</tr>
</tbody>
</table>

Figure 5.44. Remains of a historic cabin at site JdNa-11.
5.3.12. Archaeological Site JdNa-12: Historic Cabin

A cluster of cabin foundations, JdNa-12, are on the lower edge of an esker overlooking Wholdaia Lake and the caribou crossing to the south (Figure 5.45). They are set on a rolling sandy bench located about 4 m in elevation above the lake. The site is 110 m north of the lakeshore and is in an open spruce forest with caribou lichen and crowberry forming an understory. A large esker runs north-to-south nearby. Caribou lichen, black spruce, and crowberry cover the site, which extends 95 m by 45 m. A total of seven features are visible at the site: three cabin foundations, three artifact scatters, and an isolated faunal remain (Table 5.5, Figure 5.46). An elder explained that families harvested blueberries and cranberries in this area (AD1-4).

Table 5.5. Cultural Features at Site JdNa-12.

<table>
<thead>
<tr>
<th>Feature ID</th>
<th>Feature Type</th>
<th>Size</th>
<th>Surface Area (m²)</th>
<th>Description</th>
<th>Associated Artifacts within the Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Artifact scatter</td>
<td>2 m x 2 m</td>
<td>4.0</td>
<td>Scatter includes a historic can and caribou bone beside large rock</td>
<td>Hole-in-Top can, and a caribou metatarsal</td>
</tr>
<tr>
<td>2</td>
<td>Faunal remain</td>
<td>0.5 m x 0.5 m</td>
<td>.25</td>
<td>Caribou scapula</td>
<td>--</td>
</tr>
<tr>
<td>3</td>
<td>Artifact scatter</td>
<td>0.1 m x 0.1 m</td>
<td>.01</td>
<td>Folded top can</td>
<td>--</td>
</tr>
<tr>
<td>4</td>
<td>Cabin foundation</td>
<td>5 m x 5 m</td>
<td>25.0</td>
<td>Cabin foundation is 20-cm-deep, and has a 10-cm-high exterior rim; there is associated depression to the north that is 0.5 m x 0.7 m in size and 40-cm-deep</td>
<td>Sanitary cans and metal tin fragments</td>
</tr>
<tr>
<td>5</td>
<td>Artifact scatter</td>
<td>1 m x 1 m</td>
<td>1.0</td>
<td>Artifact scatter of historic cans, bottles, and caribou bones</td>
<td>Caribou skull (opened), Owen’s machine bottle (ghost mould: ketchup), sanitary can, and a shoe</td>
</tr>
<tr>
<td>6</td>
<td>Cabin foundation</td>
<td>5 m x 5 m</td>
<td>25.0</td>
<td>Cabin foundation is 30-cm-deep, and has a 20-cm-tall exterior rim</td>
<td>Sanitary can</td>
</tr>
<tr>
<td>7</td>
<td>Cabin foundation</td>
<td>4.5 m x 4.5 m</td>
<td>20.25</td>
<td>Cabin foundation is 25-cm-deep, and has a 20-cm-tall exterior rim</td>
<td>--</td>
</tr>
</tbody>
</table>
Figure 5.45. Spatial layout of a historic homestead: site JdNa-12.

Figure 5.46. Remains of a cabin foundation: site JdNa-12.
5.3.13. **Archaeological Site JdNa-14: South Tent Camp**

The South Tent Camp, JdNa-14, is a group of tent areas on a sandy bench overlooking Wholdaia Lake to the west (Figure 5.47). This site consists of 12 tent area (Table 5.6, Figure 5.48) that are 25 m east of Wholdaia Lake, and in an open black spruce forest with a caribou lichen, crowberry, and feather moss understory. The site is 4 m above Wholdaia Lake, and cover 150 m east-to-west and 85 m north-to-south. An interview with an elder indicated the site was repeatedly occupied from 1940 to 1955 (AD1-13).

**Table 5.6. Cultural Features at Site JdNa-14.**

<table>
<thead>
<tr>
<th>Feature ID</th>
<th>Feature Type</th>
<th>Size</th>
<th>Surface Area (m²)</th>
<th>Description</th>
<th>Associated Artifacts within the Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, 8 stones for a stove</td>
<td>--</td>
</tr>
<tr>
<td>2</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, 5 stones for a stove</td>
<td>--</td>
</tr>
<tr>
<td>3</td>
<td>Tent area</td>
<td>4 m x 4 m</td>
<td>16.0</td>
<td>Cleared flat tent area, 4 stones for a stove</td>
<td>--</td>
</tr>
<tr>
<td>4</td>
<td>Tent area</td>
<td>4 m x 3 m</td>
<td>12.0</td>
<td>Cleared flat tent area, 5 stones for a stove</td>
<td>--</td>
</tr>
<tr>
<td>5</td>
<td>Tent area</td>
<td>4 m x 3 m</td>
<td>12.0</td>
<td>Cleared flat tent area, 5 stones for a stove</td>
<td>3 tent poles</td>
</tr>
<tr>
<td>6</td>
<td>Tent area</td>
<td>3 m x 3 m</td>
<td>9.0</td>
<td>Cleared flat tent area, 3 stones for a stove</td>
<td>--</td>
</tr>
<tr>
<td>7</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, 1 stone for a stove</td>
<td>--</td>
</tr>
<tr>
<td>8</td>
<td>Tent area</td>
<td>3 m x 3 m</td>
<td>9.0</td>
<td>Cleared flat tent area, 4 stones for a stove</td>
<td>--</td>
</tr>
<tr>
<td>9</td>
<td>Tent area</td>
<td>3 m x 3 m</td>
<td>9.0</td>
<td>Cleared flat tent area, 4 stones for a stove</td>
<td>--</td>
</tr>
<tr>
<td>10</td>
<td>Tent area</td>
<td>3 m x 3 m</td>
<td>9.0</td>
<td>Cleared flat tent area, 4 stones for a stove</td>
<td>--</td>
</tr>
<tr>
<td>11</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, 4 stones for a stove</td>
<td>--</td>
</tr>
<tr>
<td>12</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared flat tent area, 4 stones for a stove</td>
<td>--</td>
</tr>
</tbody>
</table>
Figure 5.47. Features at site JdNa-14.

Figure 5.48. View north of feature 5 at JdNa-14.

Dry Meat Camp 2, JdNa-15, is on the top of a rocky peninsula overlooking Wholdaia Lake to the west (Figure 5.49). The site is in an open black spruce forest with a feather moss, crowberry, and cranberry understory, and caribou lichens in tent areas. The site covers 98 m north-to-south and 20 m east-to-west, is 10 m east of the shore of Wholdaia Lake, and is 4 m above Wholdaia Lake. This site consists of two features. Feature 1 is a 3 m by 3 m cleared tent area, with two stones to support a stove (Figure 5.50), and feature 2 is a 3 m by 3 m cleared tent area with two stones for a stove, with a large male caribou skull is adjacent to this feature. An elder suggested an age of 1940 to 1955 by people who crossed the Wholdaia to Flett Lake portage (AD 1-13).

Figure 5.49. Features at site JdNa-15.
5.3.15. **Antler Pile at Base Camp: Site JdNa-E1**

At the primary camp on the northern edge of an esker, on the south side of the lake, site JdNa-E1, guide-outfitters left an antler pile 15 m from the shore of Wholdaia Lake, and is 1 m above the lake (Figure 5.51). At least 36 caribou antlers were in the feature. A veteran hunter re-arranged the antlers to make it more appealing to future visitors (AD1-5, AD5-4). This involved placing the antlers upside down, forming an arc (Figure 5.52). They did this to clean up the campsite and to remove stray antlers and bones.
Figure 5.51. Antler pile at site JdNa-E1.

Figure 5.52. Antler pile at site JdNa-E1 in Wholdaia Lake base camp.
5.3.16. West Village: Site JdNa-E2

A large village (JdNa-E2) on the north shore of Wholdaia Lake with 16 features covers a 310 m by 130 m area (Figure 5.53). Features consist of seven cabin foundations, four depressions, two tent areas, two privies, and an isolated faunal remain (Table 5.7, Figure 5.54). The village is on a sandy bluff approximately 4 m in elevation above the lake and has an excellent view south of the caribou crossing. The site is 30 m from the lakeshore and is between 2 to 9 m above the lake. It is adjacent to a creek entering the lake from the north. A large esker runs north-to-south nearby. The site is in an open birch and black spruce forest with a crowberry, bearberry, and caribou lichen understory. Due to the open forest and presence of cut stumps, families removed most of the large trees from the site, presumably for cabin construction and firewood. AD1 recalled that “[t]his site was occupied in the 1970s” (AD1-3) by “at least eight families” (AD1-14). This site is identified as a village because many families occupied a localized area over a period of many years. Based on interviews, the village was occupied simultaneously by many households, which each family building, occupying and repairing individual cabins. This village is an archaeological equivalent of what the Cochrane River site identified in Chapter 4 would be like if it was abandoned. At Cochrane River, elders and harvesters shared similar accounts of simultaneous occupation by many families over a period of years. The floorplans of the cabins were organized in a similar manner: a barrel stove was set in the center surrounded by bedding areas along the exterior walls and a kitchen and storage space, most often to the right of the door as one enters the cabin. This pattern was repeated at the tent camps at Selwyn Lake, and in the cabins along the Cochrane River.

Table 5.7. Cultural Features at Site JdNa-E2.

<table>
<thead>
<tr>
<th>Feature ID</th>
<th>Feature Type</th>
<th>Size</th>
<th>Surface Area (m²)</th>
<th>Description</th>
<th>Associated Artifacts within the Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cabin foundation</td>
<td>6 m x 8 m</td>
<td>48.0</td>
<td>Cabin foundation is 45-cm-deep, and has a 20-cm-tall exterior rim, a log lined door is to the south, 2 courses remain in the foundation</td>
<td>Sanitary cans, and metal tin fragments</td>
</tr>
<tr>
<td>2</td>
<td>Privy</td>
<td>1 m x 1 m</td>
<td>1.0</td>
<td>Privy depression is 50-cm-deep</td>
<td>--</td>
</tr>
<tr>
<td>3</td>
<td>Cabin foundation</td>
<td>8 m x 8 m</td>
<td>64.0</td>
<td>Cabin foundation is 30-cm-deep, and has a 20-cm-tall exterior rim</td>
<td>--</td>
</tr>
<tr>
<td>Feature ID</td>
<td>Feature Type</td>
<td>Size</td>
<td>Surface Area (m²)</td>
<td>Description</td>
<td>Associated Artifacts within the Feature</td>
</tr>
<tr>
<td>------------</td>
<td>----------------------</td>
<td>---------------</td>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>4</td>
<td>Cabin foundation</td>
<td>3 m x 3 m</td>
<td>9.0</td>
<td>Cabin foundation is 15-cm-deep, and has a 20-cm-tall exterior rim</td>
<td>--</td>
</tr>
<tr>
<td>5</td>
<td>Depression</td>
<td>3 m x 3 m</td>
<td>9.0</td>
<td>Depression is 50-cm-deep</td>
<td>--</td>
</tr>
<tr>
<td>6</td>
<td>Depression</td>
<td>2 m x 2 m</td>
<td>4.0</td>
<td>Depression is 60-cm-deep</td>
<td>--</td>
</tr>
<tr>
<td>7</td>
<td>Depression</td>
<td>1 m x 1 m</td>
<td>1.0</td>
<td>Depression is 40-cm-deep</td>
<td>--</td>
</tr>
<tr>
<td>8</td>
<td>Cabin foundation</td>
<td>6 m x 6 m</td>
<td>36.0</td>
<td>Cabin foundation is 25-cm-deep, and has a 20-cm-tall exterior rim</td>
<td>--</td>
</tr>
<tr>
<td>9</td>
<td>Cabin foundation</td>
<td>6 m x 8 m</td>
<td>48.0</td>
<td>Cabin foundation is 35-cm-deep, and has a 15-cm-tall exterior rim, 2 courses of the foundation remain, collapsed milled lumber inside the foundation depression, secured with wire drawn nails</td>
<td>Rafters and tin chimney flashing have fallen into the depression</td>
</tr>
<tr>
<td>10</td>
<td>Privy</td>
<td>1 m x 1 m</td>
<td>1.0</td>
<td>Spruce log frame, 4 horizontal timbers, log seat, 4 upright posts</td>
<td>--</td>
</tr>
<tr>
<td>11</td>
<td>Cabin foundation</td>
<td>8 m x 8 m</td>
<td>64.0</td>
<td>Cabin foundation 20-cm-deep, has a 15 cm raised exterior rim, 2 courses of logs, plus long floor braces of spruce</td>
<td>45 Gal Oil drum stove (CTO 58 16-46-78, ECL makers marks), Sorel winter boot, sanitary cans, and sheet metal</td>
</tr>
<tr>
<td>12</td>
<td>Tent</td>
<td>3 m x 3 m</td>
<td>9.0</td>
<td>3 m x 3 m cleared area, 2 stones for a stove, large stove nearby</td>
<td>Spruce tent poles</td>
</tr>
<tr>
<td>13</td>
<td>Tent</td>
<td>4 m x 3 m</td>
<td>12.0</td>
<td>4 m x 3 m cleared area, 2 stones for a stove</td>
<td>2 spruce tent poles</td>
</tr>
<tr>
<td>14</td>
<td>Cabin foundation</td>
<td>6 m x 6 m</td>
<td>36.0</td>
<td>Cabin foundation is 20-cm-deep, and has a 15-cm-tall exterior rim</td>
<td>--</td>
</tr>
<tr>
<td>15</td>
<td>Cultural depression</td>
<td>2 m x 2 m</td>
<td>4.0</td>
<td>The depression is 50-cm-deep</td>
<td>--</td>
</tr>
<tr>
<td>16</td>
<td>Caribou antler</td>
<td>0.2 m x 0.2 m</td>
<td>0.04</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>
Figure 5.53. House foundation at village JdNa-E2.

Figure 5.54. Village JdNa-E2.
5.3.17. Village: Site JdNa-E3

Site JdNa-E3 represented the remains of a large village on the north shore of Wholdaia Lake (Figure 5.55). It is situated on a sandy bluff 4 m in elevation above the lake, adjacent to a creek entering the lake from the north. A large esker runs north-to-south nearby. A total of 14 features were found in a 200 m northeast to southwest and 100 m northwest to southeast area. Features at the site consist of six cabin foundations, two outbuildings, two privies, two middens of bone, a milled lumber pile, and a cultural depression (Table 5.8, Figure 5.56). The site has an excellent view south of the caribou crossing, and is 45 m west from the lakeshore. The site is in an open black spruce forest with an understory of caribou lichen and crowberry that was modified when the site occupants removed most of the large trees for cabin construction and firewood.

Table 5.8. Cultural Features at Site JdNa-E3.

<table>
<thead>
<tr>
<th>Feature ID</th>
<th>Feature Type</th>
<th>Size</th>
<th>Surface Area (m²)</th>
<th>Description</th>
<th>Associated Artifacts within the Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cabin foundation</td>
<td>5 m x 5 m</td>
<td>25</td>
<td>Cabin foundation is 25-cm-deep and has a 25-cm-high exterior rim. It has a door to the south and a 2 m x 2 m x 1.2-m-deep cellar on the north end.</td>
<td>Stove converted from a 45 gal. oil drum</td>
</tr>
<tr>
<td>2</td>
<td>Milled lumber pile</td>
<td>2.5 m x 2.5 m</td>
<td>6.25</td>
<td>Milled lumber balloon frame</td>
<td>Wire drawn nails, 2 m uprights fastened to a 1 m long cross-member and frame, and three plywood sheets</td>
</tr>
<tr>
<td>3</td>
<td>Outbuilding</td>
<td>2 m x 2 m</td>
<td>4</td>
<td>Made of milled lumber and plywood, connected to 3 m x 3 m sanitary can midden</td>
<td>Milled lumber, plywood, sanitary cans, and children's shoes</td>
</tr>
<tr>
<td>4</td>
<td>Cabin foundation</td>
<td>6 m x 6 m</td>
<td>36</td>
<td>Cabin foundation is 25-cm-deep, and has a 25-cm-high exterior rim, 3 surviving courses of logs with saddle notched courses</td>
<td>Outboard engine parts, snowmobile parts, a stove from a converted 45 gal. oil drum, and additional polyethylene plastic debris</td>
</tr>
<tr>
<td>Feature ID</td>
<td>Feature Type</td>
<td>Size</td>
<td>Surface Area (m²)</td>
<td>Description</td>
<td>Associated Artifacts within the Feature</td>
</tr>
<tr>
<td>------------</td>
<td>----------------</td>
<td>----------</td>
<td>-------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>5</td>
<td>Cabin foundation</td>
<td>5 m x 5 m</td>
<td>25</td>
<td>Cabin foundation is 30-cm-deep, and has a 30-cm-high exterior rim, frame is made of 2 courses of natural timbers (spruce), and has been burned</td>
<td>Coca-Cola crates (polyethylene plastic), plywood, gloves, old gas tanks (20 gal. drums), metal bed frame, chrome chair frame, and snowmobile parts including a Bombardier manufactured in February 1987, VIN:304502586</td>
</tr>
<tr>
<td>6</td>
<td>Outbuilding</td>
<td>2 m x 2 m</td>
<td>4.0</td>
<td>Made of plywood fragments</td>
<td>Cut 45 gal. oil drum</td>
</tr>
<tr>
<td>7</td>
<td>Privy</td>
<td>1.5 m x 1.5 m</td>
<td>2.25</td>
<td>2-m-high building, milled and axe-hewn lumber, balloon frame</td>
<td>Fastened with wire drawn nails</td>
</tr>
<tr>
<td>8</td>
<td>Bone midden</td>
<td>40 m x 40 m</td>
<td>1,600.0</td>
<td>Large scatter of caribou bone</td>
<td>The scatter includes 247 caribou bones: 9 skulls, 1 antler, 134 vertebrae including 5 atlases and one axis, 53 ribs, 1 sacrum, 16 innominates, 7 scapulae. 2 humeri, 1 ulna, 2 femurs, 3 tibiae, 1 astragalus, 2 calcanei, 1 medial cuneiform, 1 navicular-cuboid, 5 metatarsals, 5 metacarpals, 1 1st phalanx, 2 nd phalanges, and a galvanized nickel kettle</td>
</tr>
<tr>
<td>9</td>
<td>Depression</td>
<td>1 m x 1 m</td>
<td>1.0</td>
<td>4 posts, identified as a chicken coup (AD1-4)</td>
<td>Plywood fragments</td>
</tr>
<tr>
<td>10</td>
<td>Cabin foundation</td>
<td>5 m x 5 m</td>
<td>25.0</td>
<td>Cabin foundation is 40-cm-deep, and has a 25-cm-high exterior rim, the rafters have fallen into the centre of the depression on the north side</td>
<td>45 gal. oil drum in the middle of the depression</td>
</tr>
<tr>
<td>11</td>
<td>Cabin foundation</td>
<td>4.5 m x 4.5 m</td>
<td>20.25</td>
<td>Cabin foundation is 30-cm-deep and has a 15-cm-high exterior rim</td>
<td>Cut 45 gal. oil drum</td>
</tr>
<tr>
<td>12</td>
<td>Privy</td>
<td>1 m x 1 m</td>
<td>1.0</td>
<td>Upright posts</td>
<td>Dominion bottle [1972 May/June, Mould No. 6406]</td>
</tr>
<tr>
<td>Feature ID</td>
<td>Feature Type</td>
<td>Size</td>
<td>Surface Area (m²)</td>
<td>Description</td>
<td>Associated Artifacts within the Feature</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------</td>
<td>-------------</td>
<td>-------------------</td>
<td>--------------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>13</td>
<td>Bone midden</td>
<td>30 m x 30 m</td>
<td>90.0</td>
<td>Large scatter of caribou bone</td>
<td>205 caribou bones: 5 skulls, 148 vertebrae, including 1 atlas, 11 ribs, 3 sacra, 8 innominates, 5 scapulae, 5 humeri, 2 radii, 1 ulna, 1 femur, 1 tibia, 1 astragalus, 1 calcaneus, 1 medial cuneiform, 1 navicular-cuboid, 1 lateral malleolus, 1 cuboid, 1 lateral cuneiform, 1 intermediate cuneiform, 2 metatarsals, 2 metacarpals, 1 1st phalanx, and 1 2nd phalanx, and a Skidoo Rotax gear</td>
</tr>
<tr>
<td>14</td>
<td>Cabin foundation</td>
<td>5 m x 5 m</td>
<td>25.0</td>
<td>Cabin foundation is 40-cm-deep, and has a 20-cm-high exterior rim, rafters have fallen in the depression</td>
<td>Stove parts (steel and iron)</td>
</tr>
</tbody>
</table>

From interviews, families occupied the village from the late 1960s to the 1980s (AD1-4; AD5-1). The village was once a permanent settlement of six to 12 families (depending on the year). Most features had semi-subterranean house construction with from 30 to 50 cm of excavation into mineral soil. Houses were made of saddle-notched and side-notched log courses. A large amount and variety of material culture were at the site, including sanitary cans, glass bottles, 45-gallon drums, 20-gallon drums, outboard motor and snowmobile parts, milled lumber, with various polyethylene plastic items. Faunal remains are plentiful, and many whole elements and even articulated limbs found adjacent to cabins. A pair of middens containing bone are also at the site. These extend 40 m by 40 m and 30 m by 30 m in size respectively, and contain whole elements, with more axial than appendicular elements present. Skulls were present in the bone middens, and were usually, but not always set apart from the other bone elements. Small calcined bone fragments were expected, but not observed at Wholdaia Lake, including at JdNa-E3. Carnivore gnawing of bone was also expected for faunal materials from Denesųlíné sites. During the visits to Wholdaia Lake, throughout the area wolves and their gnawing of recent caribou remains were observed. I suspect that carnivores may prefer to utilize remains from more recent natural caribou kills rather than scavenge older faunal materials that lack soft tissue.
Figure 5.55. Features at site JdNa-E3.

Figure 5.56. House foundation at village JdNa-E3.
5.4. Spatial Patterning of Activity Areas at the Wholdaia Lake Caribou Crossing

In this section, I highlight the spatial patterning of activity areas and sites at the Wholdaia Lake caribou crossing. Denesųliné habitation sites are generally set in areas with access to water, firewood, fish, and other country foods. Even modern settlements are set on the shores of large lakes. They are often in forested areas and along caribou migration corridors (see Chapters 3 and 4). This is a practical arrangement as builders need timber to construct cabins, and their occupants need firewood, which is a requirement for winter sedentism (Bussidor and Bilgen-Reinart 1977:32). Pockets of vegetation in the barrenlands, such as forested refugia in valleys, near eskers, and water, are useful for makeshift occupation. Helen Joseyounen explains, “[p]eople used to live in tents made out of caribou hides. There was an open fire in the middle of the tent that was kept burning all night in the summer to keep the mosquitoes away” (Holland and Kkailther 2003:40). Moreover, Sayisi Denesųliné set summer campsites in upland areas to avoid insect harassment (Petch 1998:32).

Areas exposed to the wind were preferred in summer, including peninsulas on lakes or crests of eskers. Francois Josie affirms that the tents in winter were very cold (Holland and Kkailther 2003:46). There was a routine in the construction of tents in winter. Families selected a level dry place. Then they clear a circular area of snow right to the moss. If the family planned to camp long-term, they removed the moss. Then they raised tent poles and wrapped them with the skin cover. For temporary camps, the door was set on the leeward (downwind) side, for longer term camps, the door faced south. At the centre was the hearth, and spruce boughs lined the inner floor. Families sealed the tent from drafts by setting a layer of branches and packing snow outside on the bottom of the skin cover (Hearne 1795:19-20). Furthermore, George Mercredi explains the importance of traditional caribou fur clothing, “[i]f you had a caribou coat and caribou pants in the bush and it was thirty below, you didn’t need a blanket. You could sleep out” (Holland and Kkailther 2003:112).

There is remarkable consistency in site selection by the Denesųliné for establishing their habitations at Wholdaia Lake that extends directly from the modern times through the historic era and well into antiquity. Local associates AD1, AD2, AD3, and AD4 related that
hearth was kept burning from September to May (AD1-3, AD2-4, AD3-3, AD4-3), and fire was transported when "[s]mouldering coals were kept in moss-bags, and carried by the women as they moved camp" (AD2-4). Because of the importance to keep a hearth burning for most of the year, subarctic camps need access to firewood in the frozen months. Therefore, unless there are refugia, such as in sheltered river valleys, permanent occupation of the barrenlands is not generally possible.15

Another consideration for locating camps is access to water. Based on the observations above, proximity to a lake or a river is beneficial, as is contiguity to multiple travel routes. Campsites should be set at junctions between travel routes. When people travelled on the main north-to-south corridor, they would camp at its junction with an east-to-west trail. Denesųliné prefer to situate camps at nodes in their travel network, regardless of local conditions. In our field survey, we found that camps are always immediately adjacent to water, typically within 15 to 20 m of a lakeshore. Prolonged stays at places depend on proximity to barrenground caribou and perhaps a reliable fishing opportunity (i.e., via netting or spearing techniques) at campsites too. The cluster of habitation sites at caribou water crossings formerly described are a good example of this. AD1 explained that areas with “a view in at least two directions” were highly valued (AD1-4). Therefore, camps are still set on islands, spits, and peninsulæ based on the viewsheds, which allow people to spot game such as caribou, moose, and muskox, as well as other people, including neighbours and enemies.

Overall, there are fewer artifacts in the older sites than in the more recent sites such as the villages. Traditionally, Denesųliné did not keep many belongings. Birket-Smith (1930:47) reported, “[w]hen a stranger enters a Chipewyan tent in summer, the only furniture he notices at once is the camp stove and the mosquito nets over the sleeping places.” In the older sites, very little material culture is present. By contrast, the more recent sites are littered with all manner of material, partly due to semi-permanent settlement, and partly due to increased transportation loads by snowmobile and charter aircraft.

15 Inuit, specifically the Kivallirmiut (composed of five inland groups: Qairnirmiut, Harvaqtuurmiut, Hauniqtuurmiut, Paalirmiut, and Ahiarmiut) burned caribou fat for heat in the Kivalliq (Walls 2009:9-14; Tookoome 1999:28-29). Denesųliné rarely burned caribou fat, and when they did, it was to provide light rather than heat (AD3-2).
As to the habitation areas, most of the cabins lack surface structures such as walls and roofs. Either Denesųlinė removed courses of logs for re-use at a different location, or burned them as firewood, although, I suspect the latter. Table 5.9 presents a summary of the sites found at Wholdaia Lake outlining their spatial relationships to water, the kill site, and a sacred area. Many habitation sites are locations where families used to extract marrow and bone grease to make pemmican. Therefore at these sites, little cultural material should remain. This held true for the tent camps, but not for the village sites.
<table>
<thead>
<tr>
<th>Borden Id</th>
<th>Site Name</th>
<th>Number of Features</th>
<th>Features</th>
<th>Distance to Water</th>
<th>Distance to Kill Site</th>
<th>Distance to Sacred Site</th>
<th>Relative Age</th>
<th>Associated Activities</th>
<th>Oral Histories</th>
</tr>
</thead>
<tbody>
<tr>
<td>JdNa-1</td>
<td>Tent Depressions</td>
<td>2</td>
<td>3 tent rings</td>
<td>5</td>
<td>1,025</td>
<td>2,445</td>
<td>Ancient</td>
<td>Camp</td>
<td>AD1-2; AD2-3; AD3-2</td>
</tr>
<tr>
<td>JdNa-2</td>
<td>Cairn</td>
<td>2</td>
<td>1 depression, 1 cairn</td>
<td>120</td>
<td>890</td>
<td>2,500</td>
<td>Ancient</td>
<td>Cache</td>
<td>AD1-2</td>
</tr>
<tr>
<td>JdNa-3</td>
<td>Single Depression</td>
<td>1</td>
<td>1 cultural depression</td>
<td>70</td>
<td>920</td>
<td>2,485</td>
<td>Ancient</td>
<td>Unknown</td>
<td>AD1-1; AD3-1</td>
</tr>
<tr>
<td>JdNa-4</td>
<td>Cache</td>
<td>1</td>
<td>1 cairn</td>
<td>10</td>
<td>210</td>
<td>1,600</td>
<td>Ancient</td>
<td>Cache</td>
<td>AD1-1; AD3-1</td>
</tr>
<tr>
<td>JdNa-5</td>
<td>Cache on Island</td>
<td>3</td>
<td>2 tent depressions, 1 cache</td>
<td>5</td>
<td>750</td>
<td>2,450</td>
<td>Ancient / historic</td>
<td>Camping, cache, stone tool production</td>
<td>AD1-13</td>
</tr>
<tr>
<td>JdNa-6</td>
<td>Lithic Scatter</td>
<td>1</td>
<td>1 lithic scatter</td>
<td>450</td>
<td>800</td>
<td>2,490</td>
<td>Ancient</td>
<td>Stone tool manufacture</td>
<td>--</td>
</tr>
<tr>
<td>JdNa-7</td>
<td>Antler Pile</td>
<td>2</td>
<td>1 surface scatter, 1 underwater scatter</td>
<td>0</td>
<td>405</td>
<td>2,060</td>
<td>Ancient / modern</td>
<td>Cache / landmark</td>
<td>AD1-1; AD1-2; AD3-3</td>
</tr>
<tr>
<td>JdNa-8</td>
<td>Dry Meat Island</td>
<td>1</td>
<td>1 tent area</td>
<td>20</td>
<td>2,230</td>
<td>2,690</td>
<td>1950s–1960s</td>
<td>Dry meat production</td>
<td>AD1-2</td>
</tr>
<tr>
<td>JdNa-9</td>
<td>Tent Camp</td>
<td>12</td>
<td>10 tent areas, 1 isolated artifact, 1 faunal remain</td>
<td>10</td>
<td>4,780</td>
<td>4,700</td>
<td>1950s–1960s</td>
<td>Dry meat production</td>
<td>AD1-3</td>
</tr>
<tr>
<td>JdNa-10</td>
<td>Cabin Site</td>
<td>5</td>
<td>3 cabin foundation, 1 cellar, 1 stove</td>
<td>45</td>
<td>5,150</td>
<td>5,120</td>
<td>~1906-1970</td>
<td>Caribou consumption</td>
<td>AD1-5</td>
</tr>
<tr>
<td>JdNa-11</td>
<td>Cabin on Esker Site</td>
<td>3</td>
<td>1 cabin foundation, 1 chimney heap, 1 cultural depression</td>
<td>185</td>
<td>5,300</td>
<td>5,260</td>
<td>~1880-1920</td>
<td>Canoe</td>
<td>AD1-4</td>
</tr>
<tr>
<td>JdNa-12</td>
<td>Historic Cabin Site</td>
<td>5</td>
<td>3 cabin foundation, 3 artifact scatters, 1 isolated faunal remain</td>
<td>110</td>
<td>5,700</td>
<td>5,475</td>
<td>Historic ~1900-1950</td>
<td>Cabin, caribou consumption</td>
<td>AD1-5</td>
</tr>
<tr>
<td>Borden Id</td>
<td>Site Name</td>
<td>Number of Features</td>
<td>Features</td>
<td>Distance to Water</td>
<td>Distance to Kill Site</td>
<td>Distance to Sacred Site</td>
<td>Relative Age</td>
<td>Associated Activities</td>
<td>Oral Histories</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------------</td>
<td>--------------------</td>
<td>---------------------------------------</td>
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<td>-----------------------</td>
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<td>--------------</td>
<td>----------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>JdNa-14</td>
<td>South Tent Camp</td>
<td>12</td>
<td>12 tent areas</td>
<td>10</td>
<td>295</td>
<td>1,510</td>
<td>1950s</td>
<td>Camping dry meat production</td>
<td>AD1-13</td>
</tr>
<tr>
<td>JdNa-15</td>
<td>Dry Meat Camp 2</td>
<td>2</td>
<td>2 tent areas</td>
<td>15</td>
<td>395</td>
<td>1,552</td>
<td>1950s</td>
<td>Camping dry meat production</td>
<td>AD1-13</td>
</tr>
<tr>
<td>JdNa-E1</td>
<td>Antler Pile at Base Camp</td>
<td>1</td>
<td>1 antler pile</td>
<td>15</td>
<td>990</td>
<td>2,485</td>
<td>Modern</td>
<td>Landmark</td>
<td>AD1-5; AD5-4;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Also Tyrrell 1893 Camp</td>
<td>See Chapter 7</td>
</tr>
<tr>
<td>JdNa-E2</td>
<td>West Village</td>
<td>16</td>
<td>7 cabin foundation, 4 depressions, 2 tent areas, 2 privies, 1 isolated faunal remain</td>
<td>30</td>
<td>4,000</td>
<td>4,050</td>
<td>1970s</td>
<td>Caribou hunting, fishing</td>
<td>AD1-3</td>
</tr>
<tr>
<td>JdNa-E3</td>
<td>Village Site</td>
<td>14</td>
<td>6 cabin foundations, 2 outbuildings, 2 privies, 2 bone middens, lumber pile, 1 cultural depression</td>
<td>45</td>
<td>4,600</td>
<td>4,680</td>
<td>1970 -1985</td>
<td>Caribou hunting, fishing</td>
<td>AD1-4; AD5-1</td>
</tr>
</tbody>
</table>

Note: Relative age was determined by diagnostic material culture, interviews, vegetation growth, and depositional environment.
Most often, sites are within 5 m of the lakeshore, with outliers as far as 440 m. The mean distance is 70 m for the sites; with a standard deviation of 108 m. Sites are found well away from the kill site. Most habitation sites are 295 m to 5,700 m from the kill itself. The mean distance is 2,117 m, and the standard deviation is 2,030 m. A known sacred site figures prominently on the landscape. Sites are between 1,038 m and 5,475 m from the sacred site (see Chapter 6). The sites have a mean distance of 2,991 m with a standard deviation of 1,411 m. Table 5.10 outlines variance in spatial distribution by site type. In summary, while most sites are set close to water, people avoided sacred sites and set habitation sites 0.3 km to 5 km away from the kill site. As elders and harvesters explained, this is due to a traditional rule that women should not visit kill sites out of respect for caribou (AD1-1; AD2-2; AD3-1; AD4-2; AD5-2). Alternatively, cache sites and antler piles are near the initial processing areas and are usually close to, but not at the kill sites. The site patterning observed at the Wholdaia Lake can be compared to archaeological data from other caribou crossings and may suggest where to expect sites at caribou crossings (i.e., as outlined in Appendix J). Furthermore, longer continuities of cultural practices, including butchery and food storage strategies, could be established using archaeological methods. A detailed analysis of faunal remains from a variety of ancestral Denesųlinė caribou cache and processing sites may exhibit similar patterning, such as cut marks, intra-site distribution of elements, and bone marrow extraction to produce pemmican.

Table 5.10. Summary of Sites at Wholdaia Lake.

<table>
<thead>
<tr>
<th>Site Type</th>
<th>Distance to Water</th>
<th>Distance to Kill Site</th>
<th>Distance to Sacred Area</th>
<th>Number of Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tent camp</td>
<td>10 - 20</td>
<td>296 - 4,780</td>
<td>1,552 - 5,120</td>
<td>4</td>
</tr>
<tr>
<td>Cabin</td>
<td>30 - 40</td>
<td>5,158 - 5,700</td>
<td>5,120 - 5,475</td>
<td>3</td>
</tr>
<tr>
<td>Village</td>
<td>45 - 185</td>
<td>4,000 - 4,600</td>
<td>4,050 - 4,680</td>
<td>2</td>
</tr>
<tr>
<td>Cache</td>
<td>10 - 120</td>
<td>210 - 890</td>
<td>210 - 890</td>
<td>3</td>
</tr>
<tr>
<td>Antler pile</td>
<td>0 - 15</td>
<td>405 - 990</td>
<td>2,062 - 2,485</td>
<td>2</td>
</tr>
<tr>
<td>Tent ring</td>
<td>5</td>
<td>750 - 1,025</td>
<td>750 - 1,025</td>
<td>2</td>
</tr>
<tr>
<td>Lithic Scatter</td>
<td>450</td>
<td>800</td>
<td>2,490</td>
<td>1</td>
</tr>
</tbody>
</table>

5.5. Chapter Summary

The visit to Wholdaia Lake showed how a caribou crossing worked, and what sorts of features, material culture, and caribou bones people left behind. As described in
interviews, a sequence of widely distributed activities occurred during successful caribou harvests. This sequence involved preparing for the ambush, and conducting a water-based kill. The caribou were initially dressed at the shore near the kill site, and then brought to camps up to 5 km away to be processed into dry meat and pemmican.

Interviews, and the ethnographic and archaeological survey revealed the importance of caribou crossings and that Denesųliné practices changed over time. At Wholdaia Lake, there were inconsistencies between what the knowledge holders say they value and what remained at camp and village sites. Elders and harvesters stressed the importance of using all parts of a caribou. At campsites, such as the dry meat camps and tent areas on the north side of the Wholdaia Lake, little material culture and bone were left behind. At village sites JdNa-E2 and JdNa-E3, however, there was evidence that people abandoned good cuts of meat (i.e., 457 bones), including articulated limbs and spine. The same camp showed little evidence of marrow extraction because complete bones were present. There were no signs that canids scavenged these bones. Therefore, a change in the use and disposal of caribou bones occurred between the dry meat camps of the 1950s and 1960s and village life of the 1970s. Overall, there was scant evidence of pemmican production in both camps and villages. Bone fragments have either been disposed of in a different location, such as outside of the habitation areas, or consumed by fire.
Chapter 6. The Ethnohistorical Record of Caribou Harvesting at Wholdaia Lake

Whereas the previous chapter emphasized archaeology, here I focus on the ethnohistorical data about Wholdaia Lake to address the longevity of cultural practices relating to caribou. I also document ways in which the regional history is similar or dissimilar to any modern context. I first present the historical nature of the use of caribou at Wholdaia Lake as an example of broader Denesųłiné practices at caribou crossings. Among the objectives of this chapter is to understand the historic use of travel ways from the earliest historical account from Samuel Hearne when he followed Matonabbe to the lakeshore in 1771. Another is to document the historical Denesųłiné relationship to caribou at Wholdaia Lake by reviewing documented from J.B. Tyrrell’s exploration of the Chipman and Dubawnt Rivers in 1893. From Tyrrell’s archival material, an indigenous map made by Ithingo Campbell in 1892 presents a different perspective on regional geography and the nature of travel ways. I then outline historic data from the RCMP and the way that twentieth-century Denesųłiné used Wholdaia Lake by detailing visits to Wholdaia Lake by RCMP officer Harry Stallworthy from 1929 to 1932, the Art Moffat expedition of 1955, and Robert Bone in 1969. From a review of ethnohistorical data, I examine continuities between the ethnography, historiography, and archaeology of Wholdaia Lake.

6.1. Samuel Hearne and Matonabbee at Wholdaia Lake

Samuel Hearne was an employee of the Hudson’s Bay Company from 1766 to 1787. In 1769 at the advice of Moses Norton, Chief Factor of the HBC’s Prince of Wales Fort, and support of the HBC leadership, he joined a group of Denesųłiné in search of a fabled copper mine on the north Arctic coast. This quest for metals comes from reported travels of Moses Norton’s father with the Denesųłiné in the 1730s, and occasional reports and samples of copper provided by Denesųłiné to fur traders (Tyrrell 1911:5). Hearne made three attempts to travel to the copper mines. The first ended in failure due to a poor guide and ill-chosen route. Hearne cancelled his second journey because he broke his sextant and returned to Fort Prince of Wales for a replacement. It was the third journey with the expert guidance of Matonabbee, a well-travelled Denesųłiné leader, that was successful. Over the course of three years, Hearne travelled 3,000 km in daily company
with this band, and in the far north, with Tatsanotinne (Yellowknives). Overall, Hearne’s (1795) account written in 1790, 20 years after the events, is considered accurate, although the account’s editor, Dr. John Douglas, introduced inconsistencies (Back 1836:146). Hearne provided a detailed account of life with the Denesųłiné following their seasonal round in pursuit of caribou. He was a skilled observer and related how they regard caribou, including hunting methods, sacred and ceremonial knowledge, and the processing and storage of caribou meat.

To check for consistency and accuracy of Hearne’s account, I reviewed Sir George Back’s 1836 Narrative of the Arctic Land Expedition to the Mouth of the Great Fish River, and along the Shores of the Arctic Ocean, in the Years 1833, 1834 and 1835. George Back, a member Sir John Franklin’s first Coppermine Expedition of 1819–1822 travelled the same areas as Hearne and interviewed several senior men who had belonged to the party of Tatsanotinne that met Hearne at Congecathewachaga. George Back (1836:146) insisted that “from an attentive examination of his narrative, we are led to conclude that he visited the various places marked in his map, in the order in which they stand; that all the rivers and lakes which he names actually exist; and that he has correctly described the general physical features of the country he traversed.” He noted the significant spatial errors in the latitude and longitude of locations provided by Hearne. Back (1836:150) also related that Hearne had an inaccurate notion of the length of a mile. Therefore, researchers must reduce Hearne’s travelling distances. Also on the main published work of Hearne (1795), Back (1836:146) opined that “[h]is printed work does not, however, quote his courses and distances so fully as his original journal (a copy of which we saw at Hudson’s Bay).” So while there are inconsistencies, I concur with Back that on the whole Hearne provides a relatively accurate portrait of Denesųłiné life.

On Hearne’s third journey, he travelled across Wholdaia Lake and met resident Denesųłiné who were pounding caribou at Wholdaia Lake on March 3, 1771. He stated:

On the second of March, we lay by the side of Whooldyah’d Whoie or Pike Lake, and not far from Doo-baunt Whoie River. On the next day we began to cross the above mentioned Lake, but after walking seven miles on it to the West South West, we arrived at a large tent of Northern Indians, who had been living there from the beginning of the Winter, and had found a plentiful subsistence by catching deer in a pound (Hearne 1795:77).
The pound is at the Wholdaia Lake caribou crossing, which is 11.2 km (7 miles) west-southwest of the east margin of the lake (Figure 6.1) where it intersects with the traditional Denesųliné travel way between Wholdaia and Snowbird Lakes about 10.8 km (6.7 miles) from the caribou crossing). The trail runs east to southeast with a heading at 246°.

Figure 6.1. Samuel Hearne 1771 route at the Wholdaia Lake caribou crossing. 

Hearne (1795:77-80) provided the earliest known first-hand account of a caribou pound, which is the pound I observed at Wholdaia Lake. He observed:

When the Indians design to impound deer, they look out for one of the paths in which a number of them have trod, and which is observed to be still frequented by them. When these paths cross a lake, a wide river, or a barren plain, they are found to be much the best for the purpose; and if the path run through a cluster of woods, capable of affording materials for building the pound, it adds considerably to the commodiousness of the situation.

The pound is built by making a strong fence with brushy trees, without observing any degree of regularity, and the work is continued to any extent, according to the pleasure of the builders. I have seen some that were not less than a mile round, and am informed that there are others still more extensive. The door, or entrance of the pound, is not larger than a common gate, and the inside is so crowded with small counter-hedges as very much to resemble a maze; in every opening of which they set a share, made with thongs of parchment deer-skins well twisted together, which are amazingly strong. One end of the snare is usually made fast to a growing pole; but if no one of a sufficient size can be found near the place where the snare is set, a loose pole is substituted in its room, which is always of such size and length that a deer cannot drag it far before it gets entangled among the
other woods, which are all left standing except what is found necessary for making the fence, hedges, etc. The pound being thus prepared, a row of small brushwood is stuck up in the snow on each side the door or entrance; and these hedge-rows are continued along the open part of the lake, river, or plain, where neither stick nor stump besides is to be seen, which makes them the more distinctly observed. These poles, or brush-wood, are generally placed at the distance of fifteen or twenty yards from each other, and ranged in such a manner as to form two sides of a long acute angle, growing gradually wider in proportion to the distance they extend from the entrance of the pound, which sometimes is not less than two or three miles; while the deer's path is exactly along the middle, between the two rows of brush-wood. Indians employed on this service always pitch their tent on or near to an eminence that affords a commanding prospect of the path leading to the pound; and when they see any deer going that way, men, women, and children walk along the lake or river-side under cover of the woods, till they get behind them, then step forth to open view, and proceed towards the pound in the form of a crescent. The poor timorous deer finding themselves pursued, and at the same time taking the two rows of brushy poles to be two ranks of people stationed to prevent their passing on either side, run straight forward in the path till they get into the pound. The Indians then close in, and block up the entrance with some brushy trees, that have been cut down and lie at hand for that purpose. The deer being thus enclosed, the women and children walk round the pound, to prevent them from breaking or jumping over the fence, while the men are employed spearing such as are entangled in the snares, and shooting with bows and arrows those which remain loose in the pound.

This description indicates that caribou were near the lake in late winter where Denesųliné hunters constructed a pound 1.6 km in size on the ice of the lake. Hearne saw Denesųliné pitch their tents on prominences with a good view of the pound and the surrounding area, but were not immediately adjacent to the pound and kill. He wrote that men killed the caribou with spears and arrows and that women and children helped at the pound.

Hearne’s account provides evidence of a continuity of caribou use of the kill site at Wholdaia Lake. Importantly, it also predates the smallpox epidemic of 1786, which affected many people and transformed local lifeways (Coutu and Hoffman-Mercredi 1999:100; Krech 1978:715). He described the different activities done by men, women, and children at the crossing, and emphasized that only men killed caribou. Women and children worked the perimeter of the pound to prevent caribou from escaping. At the pound, Hearne observed that habitation sites were near, but not at, the kill sites.
6.2. Joseph Burr Tyrrell and Ithingo Campbell at Wholdaia Lake

Geologist Joseph Burr Tyrrell visited Wholdaia Lake in 1893, 122 years after Hearne, during his study of the barrenlands from 1892 to 1894 for the Geological Survey of Canada. In 1892, he used Denesųłiné guides while surveying the area between the Churchill River and Lake Athabasca when he learned from them of a water-based route to Hudson Bay from the lake. When Tyrrell reported this to the Geological Survey, his superiors asked him to travel this route. In 1893, J.B. Tyrrell, his brother James, and six local “canoe-men” journeyed from Lake Athabasca north to the Dubawnt River, and then travelled along the Thelon River to Baker Lake and Hudson Bay (Tyrrell 1894:437; J. W. Tyrrell 1897:70-210). In 1894, Tyrrell conducted a second survey through the barrenlands, spending his time on the Kazan River and Yathyked Lake, before he journeyed east to the coast of Hudson Bay (J.B. Tyrrell 1895:438; 1897:140-218).

The key to Tyrell’s success was that he sought out local guides and where possible asked them to draw maps of the lakes and portages in the region. Ithingo Campbell was Tyrell’s guide from Isle a la Crosse on an earlier 1892 expedition between the Churchill River and Lake Athabasca in Saskatchewan (Tyrrell 1896:35,79). Campbell drew a map of the Wolverine River that Tyrrell used to guide his 1893 trip north to the barrenlands. Campbell drew it on August 3, 1892 at the mouth of Black River, and J.B. Tyrrell referenced it in his journal entry for August 4, 1892. In Tyrrell’s fieldnotes (August 4, 1892), he states, “[i]n talking with Ithungo [sic] about the route from here northwards, he says he remembers long ago, going north farther then is marked on his map of yesterday… Big Lake on the map, is the same length as from here to the mouth of the Cree River. Active Man Lake, is not so large.”¹⁶ Campbell’s mapping provided an indigenous spatial perspective of the travel route between Black Lake and the Dubawnt River and included an accurate rendering of Wholdaia Lake.

Tyrrell visited Wholdaia Lake on July 19-20, 1893. Based on his fieldnotes, he evidently used Campbell’s map as his primary source for wayfinding (Tyrrell 1893a: Book 2:21). Tyrrell encountered a group of Denesųłiné on the north side of Selwyn Lake. This

¹⁶ Active Man Lake is an alternate name for Wholdaia Lake and Big Lake is an alternate name for Selwyn Lake.
group included a man named “Jim John.” This group warned Tyrrell that he would be “eaten by the Inuit” if he continued on his journey, and Jim John drew a map of the Reindeer Lake region (Fieldnotes July 17, 1893a, page 24). Tyrrell’s party then crossed the two-kilometre-long portage between Selwyn Lake and Flett Lake (Fieldnotes July 18, 1893a, Page 24). Tyrrell also spoke with a blind elder named Alexis from Reindeer Lake, who told him that the “Ten-zon-deze” discharges the lake with a wide, shallow river that flows into “To-bon-tua” (Round Lake). Tyrrell’s party crossed Flett Lake on July 19, 1893. Tyrrell measured the portage between Flett Lake and Wholdaia Lake to be 560 paces in length with 320 paces on the south-facing slope and 240 paces on the north-facing slope. Then after crossing the portage, a storm kept Tyrrell at his campsite on Wholdaia Lake on July 19-20, 1893.

6.2.1. Ithingo Campbell: Indigenous Map-maker

Ithingo Campbell described the main travel way north from Black Lake and Stony Rapids to the barrenlands and drew a map for J.B. Tyrrell in 1892 (Figure 6.2). Notably, Ithingo Campbell’s name in Denesųłiné is Etthengo, which is the traditional word for the way-finding organ in a caribou, which directs its travel. AD5 said, “[t]his traditional name likely regards his wayfinding ability to the barrenlands and forest fringe” (AD5-6). The main northern Denesųłiné travel route goes north to Selwyn Lake, Flett Lake, and then into Wholdaia Lake. From there, the trail runs north to the Dubawnt River. J.B. Tyrrell’s caption on the map reads:

Ethingo’s map of Wolverine [sic] River and the canoe route northwards from Black Lake to the Barren Grounds by Big Lake and Active Man Lake. The latter empties into a great river which flows northward into the sea. Big Lake is as long as Black Lake from Wolverene to Cree Rivers, Active Man Lake is not so long. It will take six days to go from Black Lake to the portage in Active Man Lake, and 1 day from there to the rapid at the outlet of the lake, and 1 day down the river to the end of the map. The whole course from Black Lake is true north. The river flows to a great lake called To-bont-na lying far out in the Barren grounds, with no wood at all on its shores. It has no islands and is of great extent. It would take 6 weeks to go and come. Gabriel states that on the same great river there is a still larger lake further

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17 Tyrell notes Flett Lake is called “Na-thi-kol-tua” (Fieldnotes July 18, 1893a, p. 24).
18 In his field notes, Tyrrell refers to Flett Lake as “Pelican Lake.”
north called Ta-kiata-tua or Snow Lake, which is never entirely free from ice, tho a person can travel between the ice and the shore (Tyrell 1892a:1).

On his map, Campbell placed a dot-like mark at Wholdaia Lake but did not describe what that meant. After being there, I am convinced that he indicated the caribou crossing (Figure 6.3). Campbell accurately portrays the Wholdaia Lake to Flett Lake portage. He indicated the hill on the east site. Tyrrell’s field notes from 1893 indicate a caribou crossing at the north end of Selwyn Lake, perhaps 5 km south of the carrying place.

Campbell and Tyrrell’s information provides an opportunity for archaeological investigation of these locations. As such, I reviewed Tyrrell’s original fieldnotes and surveyed the portage between Flett Lake and Wholdaia Lake. I found two sites directly related to Tyrrell’s 1893 journey. These include a Denesųłiné campsite on the Flett and Wholdaia Lake Portage, and Tyrrell’s campsite on the south shore of Wholdaia Lake on July 19-20, 1893.
Figure 6.2. Ithingo Campbell 1892 map for J.B. Tyrrell, including Wholdaia Lake.
Source: Tyrell 1892a:1. Courtesy of the Thomas Fisher Rare Book Library, J.B. Tyrrell papers, University of Toronto.

The Wholdaia to Flett Lake Portage Site, JdNa 13, is a series of tent areas on the portage between Wholdaia and Flett Lakes. The site is 195 m south of Wholdaia Lake and 315 m north of Flett Lake, and is in a closed black spruce forest, with a caribou lichen, club moss, and feather moss understory. The site is at an elevation of 373 m ASL, 9 m above Wholdaia Lake, and extends 136 m east-to-west and 75 m north-to-south. The site consists of five features: four tent depressions and an isolated artifact find (Table 6.1). This is the only dry ground on the portage between Wholdaia and Flett Lakes. An elder indicated use of this campsite in the 1950s-1960s during seasonal travels along the traditional Denesułiné migration route north to the Dubawnt River (AD1-13). J. B. Tyrell took three photographs of the site on July 19, 1893 during his crossing from Flett Lake to Wholdaia Lake. The first depicts the northern terminus of the portage and features a prominent hill in the background (Figures 6.4 and 6.5). One of his photographs shows a
view northwest to an esker and the location of his July 19-20, 1893 campsite (Figure 6.6). In his day, Tyrrell crossed this portage on foot, now Denesułiné usually pass through in winter on snowmobiles (AD2-2, Figure 6.7).


<table>
<thead>
<tr>
<th>Feature ID</th>
<th>Feature Type</th>
<th>Size</th>
<th>Surface Area (m²)</th>
<th>Description</th>
<th>Associated Artifacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared tent area, 5 stones for a stove</td>
<td>--</td>
</tr>
<tr>
<td>2</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared tent area, 5 stones for a stove</td>
<td>--</td>
</tr>
<tr>
<td>3</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared tent area, 5 stones for a stove</td>
<td>--</td>
</tr>
<tr>
<td>4</td>
<td>Tent area</td>
<td>3 m x 2 m</td>
<td>6.0</td>
<td>Cleared tent area, 2 stones for a stove</td>
<td>--</td>
</tr>
<tr>
<td>5</td>
<td>Isolated artifact</td>
<td>0.1 m x 0.1 m</td>
<td>.01</td>
<td>1 metal artifact</td>
<td>1920s square light petroleum can</td>
</tr>
</tbody>
</table>
Figure 6.4. "Loading the canoes at intermediate portage, Daly Lake."
Source: Tyrrell 1893b:1, taken June 19, 1893 at the north end of the Flett Lake Portage. Courtesy of the Thomas Fisher Rare Book Library, J.B. Tyrrell papers, University of Toronto.

Figure 6.5. Modern view of the north end of the Flett Lake Portage, near JdNa-13.
Figure 6.6. “Looking north from intermediate portage.”

Figure 6.7. Modern view of Wholdaia Lake from height of land near JdNa-13.
Tyrell also photographed an abandoned Denesųliné camp on the portage where the four tent frames with standing poles reveal recent use of the Wholdaia Lake caribou crossing (Figure 6.8). The features of archaeological site JdNa-13 are consistent with the lodges in Tyrrell’s photo (Figures 6.9 and 6.10).

Figure 6.8. Portage Camp JdNa-13. “Old camping place on intermediate portage” July 19, 1893.
Figure 6.9. Map of features at site JdNa-13.

Figure 6.10. View west of feature 1 at site JdNa-13.
6.2.3. Archaeological Site JdNa-16: J.B. Tyrrell Camp

J.B. Tyrrell's Camp at Wholdaia Lake on July 19-20, 1893 identified as site JdNa-16, is on a low bench above the southeastern edge of a sandy beach of Wholdaia Lake. Willows and northern reed grass cover the site. The site is 20 m southwest of the lakeshore and is at 365 m ASL, 1 m above Wholdaia Lake. It overlooks the caribou crossing to the northeast and extends 30 m northeast to southwest and 25 m northwest to southeast, and consists of two features. Feature 1 is a 3 m by 3 m cleared tent area, with five stones used as a stove. Feature 2 is a small 16 m by 4 m artifact scatter of two medium sanitary cans and a large folded side-solder hole-in-top can. J.B. Tyrrell camped at this location (as evident in his Fieldnotes for July 20-21, 1893) (Figures 6.11 to 6.12). Tyrrell (1893a: Book 2:27-28) described his campsite on Wholdaia as:

A sandy bay, where we are obliged by a heavy wind to stop for a while, perhaps for the night. Behind it is a very pretty open sandy ridge which extends S.10.W winding slightly, and gradually rising over some rocky hills 70 feet above the lake. In one place, on the northern slope, it is largely composed of boulders, but it is generally a fine gravel or sand. It is a good example of an Osar… Bedrock is a light grey gneiss, highly garnetiferous.

An elder shared that Denesųłiné occupied this campsite in 1957 in the fall and noted that the families produced dry meat at this location (AD1-12). Athabasca Denesųłiné also think that animals from the Qamanirjuaq herd travel through this area, even though it is on the western periphery of their range (AD1-6). Therefore, the site was occupied between 1957 and 1893, and presumably earlier. During fieldwork, the elders and harvesters decided to camp here because of the abandoned guide-outfitter’s cabins at the site, along with aluminium boats, and the proximity to the caribou crossing (AD1-2; AD2-1; AD3-1).
Figure 6.11. Field map from Tyrrell June 19-20, 1893. Camp JdNa-16 is bottom right. Source: Tyrrell 1893a:2. Courtesy of the Thomas Fisher Rare Book Library, J.B. Tyrrell papers, University of Toronto
Figure 6.12. Field map from Tyrrell June 19-20, 1893. JdNa-16 is top left.
Source: Tyrrell 1893a:1. Courtesy of the Thomas Fisher Rare Book Library, J.B. Tyrrell papers, University of Toronto.
Figure 6.13. Site JdNa-16 relative to features identified by Tyrell in 1893.
Source: Lake margins from CanVec+ (Natural Resources Canada 2015:1), imagery from WorldView-2 2011:1.
Figure 6.14. Features at site JdNa-16.

Figure 6.15. View north of feature 1 at JdNa-16.
Tyrrell's camp of July 19-20, 1893 was the location of our camp during visits to Wholdaia Lake. The large sand kame is the prominent esker that runs the length of the caribou crossing. Viewed to the east is the same panorama that Tyrrell saw from the front door of his tent (Figure 6.16). This location is where the esker enters the water and is the sand kame Tyrrell alluded to in his journal on July 20, 1893 (Tyrell 1893a: Book 2:124). In summary, J.B. Tyrrell and Ithingo Campbell visited Wholdaia Lake in 1893, and the accurate rendering of the Denesųliné mental map suggests their long association with this caribou crossing (Figures 6.17).

Figure 6.16. Location of Tyrrell’s July 19-20, 1893 camp at Wholdaia Lake.
6.3. Additional Historical Accounts of Caribou Harvests at Wholdaia Lake

Other visitors to Wholdaia Lake who left accounts for posterity include Harry Stallworthy (1928-1930), the Art Moffatt expedition (1955), and Robert Bone (1969). Harry Stallworthy was the RCMP officer who established and ran their detachment in Stony Rapids from 1928 to 1930 (Barr 2004:91-109). He went there to enforce the new Saskatchewan and Northwest Territories game acts, which were set up to help manage “wanton slaughter of caribou, forest fires, wolf bounties and dogs” (Barr 2004:93). In September 1928, Stallworthy flew from Stony Rapids to Wholdaia Lake specifically to observe migrating caribou and to see if there was any indication of the wasteful killing of caribou (Barr 2004:101). On this trip, he did not find caribou and was told that the herds were farther north by Mr. O.K. Johnson, a trader and trapper from Stony Rapids. He did find a prospector’s tent on the shore. In April 1929 and again in March 1930, while on a dogsled patrol in the Northwest Territories, Stallworthy witnessed Denesųłiné hunting caribou at Wholdaia Lake (Barr 2004:106). Likewise, Father Picard, an Oblate Missionary, visited with the Denesųliné who were harvesting caribou at Wholdaia in 1932 (Picard 1971:17).
The Art Moffatt expedition, which followed Tyrrell’s route to the barrenlands via the Dubawnt and Thelon Rivers, visited Wholdaia Lake on July 22, 1955 (Grinnell 2010:55-62; Pessl 2014:160). This journey was to explore and document the barrenlands. Moffatt’s party collected artifacts that pertain to caribou hunting, especially lanceolate points at caribou crossings (Harp 1959:412-422). When the party crossed Wholdaia Lake, they did not meet people or find artifacts (Fred Pessl, personal communication June 11, 2014), but at nearby Selwyn Lake, they found a middle Taltheilei project point at a caribou crossing (Harp 1959:413). In 1969, Robert Bone visited Wholdaia Lake, where he met a few families living in log cabins and reported on their socioeconomic status (Bone et al. 1973:90; Robert Bone, personal communication August 15, 2013). His report contains comments on the logs cabins on nearby Selwyn Lake:

> The log cabins are neat, (everything has a place, is hung-up on string, or over poles) warm and comfortable. Spruce boughs on the floors and the cabins are set into the ground. The fresh aroma of spruce mixes with the not unpleasant odor of drying caribou which hangs in strips all over the roof. Barrel heaters set in the middle of the cabin throw off a fierce heat when well stoked with spruce logs (Bone 1969:5).

His visit to Wholdaia Lake on November 18, 1969 includes this observation:

> Waldaia Lake [sic], N.W.T. We landed at the south end of the lake Gabriel Cook’s neat log cabin was perched on a high bank and we had a stiff climb up to it. Mary Madeline – Tr. No. 27 was home but her husband (65) was out trapping… Waldaia Lake – north end, another landing and I’m glad we had a skillful pilot. Disdain family – Mrs. Louis Disain who was looking after two grand-daughters Irene and Mary MacKenzie and sent them back to Black Lake with us, and two younger children I think they belonged next-door. They had not been able to get caribou so are in a worse plight than the others. Gilbert and I went next door to see Marie Marthe, wife of Boniface Disain, who has a baby 4 months old healthy as can be and she is breastfeeding the healthy child. Advised to start baby foods, etc…(Bone 1969:7-8).

Bone’s observations agreed with the organization of the villages described in Chapter 5, and their strategic position on a caribou migration corridor. Bone says that Denesųłiné lived in semi-subterranean log cabins, and converted oil drums into stoves. These were common characteristics of the features found at the villages on the north side of Wholdaia Lake.
In addition to historical accounts, a number of legends are associated with Wholdaia Lake, which invariably figures prominently in the oral traditions. The importance of the caribou crossing, a winter village on the north side of the lake, and a nearby sacred hill on the height of land are directly named and described in the narratives (Holland and Kkailther 2003:6, 85-86,154; AD1-4) (Figure 6.18 and Figure 6.19). The naming of the lake as “Active Man Lake” by Ithingo Campbell (Tyrrell Fieldnotes August 4, 1892) is also a direct reflection of these oral traditions.

**Figure 6.18. Ethnographic travel network at the Wholdaia Lake caribou crossing.**
Source: *Imagery from WorldView-2 2011:1.*

**Figure 6.19. Sacred areas at the Wholdaia Lake caribou crossing.**
Source: *Imagery from WorldView-2 2011:1.*
6.4. Chapter Summary

With this chapter, I address the longevity of cultural practices associated with caribou and the ways historical data is similar or dissimilar to modern contexts. I retraced the footprints left by Samuel Hearne and Matonabbee, J.B. Tyrrell and Ithingo Campbell, Harry Stallworthy, and Robert Bone, and visited the same localities and camps. Because Wholdaia Lake is along the north-to-south water route the Beverly caribou herd follows to and from the southern wintering area and the northern summer range, and animals from the Qamanirjuaq herd travel through this area (AD1-6), the Denesųlinė occupation and caribou harvesting at this lake have remained a constant theme in chronicles of this place.

The lake is directly associated with oral narratives, which include sacred sites for Ethen-eldēli Denesųlinė. The ethnohistorical account agrees with the ethnographic and archaeological record (Chapter 5). When data of caribou harvests from oral narratives are combined with the ethnographic, ethnohistorical, and archaeological records, a direct continuity of caribou harvesting persists to the present, including the spatial organization habitation and caribou harvesting sites in active use. Overall, the caribou crossing at Wholdaia Lake has seen consistent use from the circa 2,000-year-old Middle Taltheilei tradition component at JdNa-6 to the mid-eighteenth century Denesųlinė operation of a pound and circa 2000 camping and hunting.
Chapter 7. Resilience of the Ethen-eldèli Denesųłiné

To this point I have cited mainly ethnohistorical and archaeological data, but I do not imply that Denesųłiné are stranded in the past. So in this chapter I how they integrate technologies to maintain their lifeways. The Denesųłiné mode of life has its roots in antiquity and is a study in resilience. Therefore, I introduce a pair of culturally based philosophies that embody this quality: *inkonţe* and *besetsùdí*. *Inkonţe* means “to-know-something-a-little,” whereas *besetsùdí* means “you-look-up-to-it.” Both involve individuals interacting with their natural and spiritual worlds to survive. These attitudes balance how people respect resources around them, and the techniques and powers they deploy to manipulate these resources. Moreover, when the two are combined, the mindset that is revealed is the Denesųłiné perspective on technologies that ensure survival and maintain their cultural continuity.

In this chapter I discuss how cultural practices interact and reinforce resilience, with resilience defined as “the capacity of a system to experience disturbance and still maintain its ongoing functions and controls” (Holling and Gunderson 2002:50), and cultural resilience as a “culture’s capacity to maintain and develop cultural identity and critical cultural knowledge and practices” (UNESCO 2007:21). I begin by discussing resilience in daily life and introducing a heuristic tool — the adaptive cycle — to help map the interlinking of cultural activities and the technological means by which Denesųłiné survive. Next, I examine how Denesųłiné transform raw materials, such as birch and stone, into tools, such as spears. Then I consider how Denesųłiné express attitudes regarding *inkonţe* and *besetsùdí* during traditional spear harvests of caribou. The next section attends to food storage, centering on Denesųłiné techniques to cache caribou that simultaneously stockpile nourishment and show due appreciation to caribou. Then I discuss how Denesųłiné incorporate new technologies, by illustrating how adopting the snowshoe, dogsled and snowmobile optimized mobility and caused simultaneous realignments of other cultural practices. Subsequently, I shed light on Denesųłiné ethnic signatures in named regional bands and material culture, and how such signatures reinforce territoriality in cultural frontiers. Finally, I chart these cultural activities in an adaptive cycle to provide insights on the nature of Denesųłiné resilience.
7.1. Cultural Resilience by Caribou Harvesting

Individuals are not overtly cognizant of resilience because it is a quality of life that just is. People are resilient simply by being and persisting to be. In the process they balance individual and cultural domains by manipulating natural and social worlds (Ridington 1999:169-181). One such example is Francois Guindon’s collaborative work with Mistissini Cree of northern Quebec. The Mistissini observe animistic traditions about their “complex relationships between minds, bodies and material environments” (Guindon 2015:78) while simultaneously reacting to their increasing dependence on outside worlds. He takes a broad view of technology, defining it as, “a body of materials and embodied skills that together, materialize... and sustain worldviews, identities, social relations and life-ways” (Guindon 2015:79). He finds that “[m]aterial transformations, in this context, sustained the productive practice and resourcefulness of Mistissini men and women” (Guindon 2015:85). His position is:

The Mistassini, therefore, did not passively experience change, but actively shaped the process through their skills and values. They think that they adapted to their tastes and skills, used, reused and transformed in many outstanding ways to make them valued products of their materials culture, were all tangible manifestations of their resourcefulness (Guindon 2015:87).

An element of the Mistassini Cree healing experience could find a wider audience across indigenous and northern Canada since “communities, their institutions and their elders are conscious of these problems and have developed diverse strategies targeting the healing of the youth and of their communities as a whole” (Guindon 2015:80). In this context, health is connected to resourcefulness, and when combined both support Mistassini Cree resilience.

In northern British Columbia, Robert Ridington wrote about cultural transformations and technological change being strongly linked among the Dane-Zaa, for whom existence is predicated on an individual’s technological acumen (Ridington 1982:470-471, 1983:57- 58). The Dane-Zaa see that the time has arrived to “rethink Aboriginal technologies as sources of social agency in which a broad range of factors have participated and still participate,” and that “Aboriginal technologies are capable, like other indigenous cultural heritages... of enhancing the capabilities and well-being of these societies” (Guindon 2015:93). In the North Slope of Alaska, the Iñupiat-caribou system shows that “changing adaptive strategies helps households rebound from perturbations. Adaptive strategies that
promote the ability to rebound involve incorporating new opportunities while maintaining key cultural and social functions” (Martin 2015:8). For Iñupiat, mobile residency was critical for their survival, such as when a caribou population collapse in 1900 caused people to either die of starvation or move to more fertile environs (Martin 2015:8). Later in the 1970s, the local perturbations of the Iñupiat-caribou system precipitated a transition to wage economy and store-bought food when external forces imposed hunting restrictions. However, when the restrictions were relaxed in the 1990s, Iñupiat returned to subsistence harvesting and a per-capita annual harvest of one to two caribou was the norm.

Communities thus respond to change, especially to variation in traditional foods, and specifically caribou, with flexible resource management strategies. Hence, resilience exemplifies their ability to deal with stress and disaster (Walker and Salt 2006:85). Household resilience was therefore contingent upon the caribou harvest, which in turn promoted cultural continuity through links to subsistence fishing, plant gathering, hunting, and trapping success (Martin 2015:8).

I asked elders and harvesters how they used technology and material culture to survive. In Denesųłiné contexts, they expressed attitudes of respect, besetsūdi, as a form of agency linked to cultural practices (AD1-3). They believe that if hunters do not show the proper respect to caribou when harvesting, then they will not be available in the future; therefore, harvesters try to maintain a good relationship with their caribou friends (AD 1-1; AD 2-2, AD 3-1). Likewise, inkonǯe, “the little piece of knowledge,” exemplifies how they interact with living and spiritual worlds. They accept that Denesųłiné are part of, and never above nor in control of their neighbours, the combined natural and animistic spheres. To put it another way, personal relationships exist between individuals and caribou, markedly expressed through drum songs that call caribou to people, as I observed at Selwyn Lake (see Chapter 4). Within that symbiotic bond, survival and subsistence do not make up the whole of existence, which is more complicated than materialist and cognitivist perspectives may indicate (Ingold 2000:105. Denesųłiné from Łutsel Ke consider health to be the embodiment of the “Dene Way of Life” (Parlee et al. 2007:112), which encompasses individual and family well-being, self-governance, spiritual relations, ability to harvest, and sustainable stewardship practices (Parlee et al. 2005b:169-179). For instance, individuals balance health with traditional knowledge and social practices, such that:

   caribou population decline has negatively affected the food security of many northern communities many of whom already face many challenges around
maintaining healthy diets and ensuring the socio-cultural well-being of their communities. At the same time, individuals and households are very innovative in their ability to cope and adapt to changing environmental conditions owing to diverse ecosystems, strong social networks, rich oral histories and traditional knowledge (Parlee 2010:1).

The challenge is that Denesųlinė look at their existences as integrated wholes, rather than as elements divided by values, resources, or technologies.

7.1.1. The Denesųlinė Adaptive Cycle

The diverse data gathered in partnership with Ethen Eldēli Denesųlinė reflect their relationship to caribou. In a similar situation, Kendrick (2003:50-57) organized Łútsël K’ê data to highlight change and innovation. Likewise, Berkes and Folke (2002:122-129) used the adaptive cycle to outline changes in how Chisasibi Cree steward caribou in northern Quebec. In order to parse holistic experiences into a meaningful structure, I introduce the adaptive cycle, a heuristic model for illustrating cultural resilience, into which I can set data gained from interviews and archaeological research. The adaptive cycle is depicted as a figure eight that represents a complex system that oscillates between conservation (i.e., incremental growth and accumulation) and rapid reorganization, change, and innovation (Holling and Gunderson 2002:50).

The adaptive cycle model applies to ecosystems, societies, and cultures. It balances potential, controllability, and adaptive capacity that shape the responses of ecosystems, agencies, and people to change and crisis (Holling 1986:293, 2001:393-394). It is the means by which I present the Denesųlinė capacity of adaptation to ever-changing worlds. While other theoretical perspectives that explore human adaptation, such as cultural transmission theory, and neo-evolutionary theory (Eerkens and Lipo 2007:256-265; Jordan 2014:1-63; Perreault and Brantingham 2011:62-66), can provide additional insights on this subject, I feel these approaches are ill suited to this study. Community partners and I established cultural protocols on data collection on certain topics. Our combined focus regards Denesųlinė attitudes and practices that relate to caribou. If the community partners were interested in Denesųlinė ways of learning, knowing, and teaching, we could have approached this type of research differently. How people acquire knowledge is important but secondary to this study’s focus on the Denesųlinė relationship to caribou. Instead, applying resilience theory to the Denesųlinė experience provides perspectives on human-
environment interaction and the kinds of change in cultural attitudes and practices that transform adaptive systems (Redman 2005:71-72).

The adaptive cycle is a “tool for thought” that diagrams phases of cultural integrity by weaving together ecological concepts on the nature of exploitation and conservation resources with the consequences of environmental change and regeneration (Wuethrich 2002:35). It is a systems-based analytic plan for organizing ways-of-being, the relationships between people, animals and land, and the skills that support existence (Redman 2005:71-72). The four states of the adaptive cycle (Figure 7.1) are exploitation (r), conservation (K), release (Ω), and reorganization (α). In a Denesųłinė context, these can be defined as:

1) Exploitation phase: physical ways people capture resources from the environment (i.e., hunting activities).

2) Conservation phase: cultural means by which humans maintain stable ecosystems (i.e., stewardship practices).


4) Re-organization phase: is the adaptive capacity to reformulate cultural activities and values in response to environmental change.

These four states link to connectedness and potential for change. Connectedness “is the strength of internal connections that mediate and regulate the influences between inside process and the outside world. Essentially the degree of internal control that a system can exact over external variability” (Holling and Gunderson 2002:50). Connectedness is also the “capacity of a system to experience disturbance and still maintain its ongoing functions and controls” (Holling and Gunderson 2002:50). It can also mean “controllability” (Holling 2001:394). Potential is the latent possibility for change. The exploitation state situates people in a system of ecosystem succession and represents “the instantaneous rate of growth in a population” (Holling and Gunderson 2002:33). In ecological literature, exploitation strategies focus on the collection and utilization of resources (Mech et al. 2015:1-9; Pianka 1970:592-597; Rowley-Conwy and Layton 2011:852-853). The conservation state relates to strategies that stockpile resources. These strategies tend towards slower rates of growth and flourish in areas of constant competition in which resources become divided and sequestered to separate uses (Berkes and Folke 2002:125;
Holling and Gunderson 2002:33-34), and can be viewed as a sustained plateau (Holling and Gunderson 2002:33, citing Pearl 1927). The state of release and “creative destruction” (Gunderson et al. 2002:320) frequently occur when an increasingly fragile ecosystem gets pushed beyond its current state. Such events can be dramatic, because natural disasters that cause ecological collapse (i.e., forest fires, increased drought and aridity, and severe infestations of insect pests) can push ecosystems to collapse (Holling and Gunderson 2002:34). Occasionally cultural practices that lead to severe overharvesting may act as a disturbance with significant ecological implications (Berkes 1999:103). The re-organization state marks the beginning of a new adaptation, regards innovation, and associated restructuring of social and economic processes (Holling and Gunderson 2002:35).

**Figure 7.1. The Denesųłiné adaptive cycle.**

Resilience is the cultural response to fluidity in an ecosystem that influences the expansion and contraction of the adaptive cycle. Changes from exploitation to conservation states are slow and incremental, and rapid for states of release to re-organization. For this reason, potential for change decreases as conservation states shift to release states, and may signal an impending release event with extensive and impressive impacts (Table 7.1). As I write these observations, we are witnessing one such transformation state as wildfires consume large tracts of mature boreal forest around Fort McMurray, Alberta. Such events qualify as drastic environmental change that would challenge any community dependent on the traditional foods of that region. Living with oscillating periods of ecological stability and fragility, hunter-gatherers use communal harvests and stockpiles to manage risk (Gould 1989:130). Equally important for survival are the mechanisms to harvest and transform resources into useful products.

Table 7.1. Interconnections of Potential, Connectedness, Uncertainty, and Resilience by Phase.

<table>
<thead>
<tr>
<th>State</th>
<th>Ecological Resilience</th>
<th>Potential</th>
<th>Connectedness</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reorganization</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Exploitation</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Conservation</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Release</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

7.2. Ethen-eldèli Denesųliné Transformation and Use of Raw Materials in Archaeological and Historic Contexts.

Here, I describe how Denesųliné collect the natural world’s materials and apply their knowledge transforming them into clothing, shelter, and nourishment. The bulk of their material culture pertains to the harvest and processing of caribou. Survival through the seasons depended on having enough caribou meat, hide, and fur. Therefore, “[t]heir extremely simple material culture was due largely to their pursuit of the caribou” (Curtis 1928:xi). Denesųliné by custom had their entire year planned, so nothing was haphazard for them.

Clothing and other domestic uses, exclusive of tent cloths, bags, and many other things which it is impossible to remember, and unnecessary to enumerate. All skins for the above-mentioned purposes are, if possible, procured between the beginning of August and the middle of October; for
when the rutting season is over, and the Winter sets in, the deer-skins are not only very thin, but in general full of worms and warbles; which render them of little use, unless it be to cut into fine thongs, of which they make fishing-nets, and nets for the heels and toes of their snow-shoes (Hearne 1795:196).

Therefore, Denesųłiné knew to get sufficient quantities of hides between August and October.

Denesųłiné produced their material culture by transforming resources into tools to harvest and process caribou. As self-reliant people they manufactured what they needed from stone, metal, bark, wood, fur, antler, and bone. Special travel was required to acquire specific raw materials, particularly birch, copper, iron, and tool-stone (Table 7.2). Once they got to the source of crucial raw materials, their method of extraction and use left a clear archaeological signature. Archaeologists have found a number of raw material sources come from surficial deposits, such as quartz and slate tool stone, copper fragments from the mouth of the Coppermine River, and iron fragments from nearshore areas at the mouth of the Churchill River (Table 7.2) (Gordon 1996:57-78, 85-113, 117-144). Caribou provide Denesųłiné with fur, antler, and bone, which they acquired during primary and secondary butchery of caribou harvests. Harvesters acquired strong and flexible birch wood and sheets of birch bark from forest stands that provide the majority of wood needed for tools.

Table 7.2. Denesųłiné Raw Material Use in Archaeological and Historic Contexts.

<table>
<thead>
<tr>
<th>Material</th>
<th>Source</th>
<th>Method of Extraction</th>
<th>Use</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stone:</td>
<td></td>
<td>Stone cobbles are acquired from till deposits. Beaver River silicified siltstone was</td>
<td>Lithics materials were knapped and ground into tools, including projectile points, chithos, scrapers, bifacial knives, and adzes</td>
<td>Gordon 1996:57-78, 85-113, 117-144</td>
</tr>
<tr>
<td>quartz, slate, and Beaver River silicified sandstone</td>
<td></td>
<td>quarried from bedrock deposits on the Athabasca River near Fort McMurray. Large slabs of tool stone were dug and/or pulled out of the source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hide</td>
<td>Caribou</td>
<td>Caribou hides are removed from dispatched caribou. Hides are removed with knives and other sharp implements</td>
<td>Tanned hides were used for clothing, tents, and sacks. sinew was used as cordage, drum heads, and snowshoe babiche</td>
<td>AD1-1; AD2-2; AD3-1</td>
</tr>
<tr>
<td>Material</td>
<td>Source</td>
<td>Method of Extraction</td>
<td>Use</td>
<td>References</td>
</tr>
<tr>
<td>----------</td>
<td>----------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Antler</td>
<td>Caribou</td>
<td>Denesųłiné remove antlers from dispatched caribou with an axe. The interior portion of the antler’s pedicle is scored with an axe, then struck to knock the antler off.</td>
<td>Antlers were made into tool handles, projectile points, fish spears (leisters) and ice chisels</td>
<td>AD1-10</td>
</tr>
<tr>
<td>Bone</td>
<td>Caribou</td>
<td>Denesųłiné collect bones from dispatched caribou. Bones are collected during secondary butchery after the muscles are detached.</td>
<td>Caribou bones were made into hide fleshers, awls, and the cup-and-pin game. Bones were also used in divination rites, including scapulamancy and patellaomancy</td>
<td>AD1-10; AD3-3</td>
</tr>
<tr>
<td>Bone</td>
<td>Beaver</td>
<td>Denesųłiné remove beaver mandibles from trapped animals during primary processing.</td>
<td>Beaver mandibles were used for woodworking. They were handled like axes</td>
<td>AD1-10</td>
</tr>
<tr>
<td>Birch wood</td>
<td>Birch stands</td>
<td>Denesųłiné remove birch wood as whole trees (chopped down with axes), or as long staves and planks with an axe or adze.</td>
<td>Most wooden implements were made of birch, including spears, bows, lodge poles, snowshoe frames, canoe ribs, and dogsleds. Denesųłinė journeyed to stands of birch to collect raw material</td>
<td>AD1-1; Hearne 1795:323-325</td>
</tr>
<tr>
<td>Birch bark</td>
<td>Large birch</td>
<td>A knife is used to score the top and bottom of a mature birch trunk. A vertical cut opens the bark, which is pulled off by hand, and occasionally with the aid of a narrow stick.</td>
<td>Birch bark was used for lodge covers, canoe skin, and rind bowls.</td>
<td>Gillespie 1976:6-11; Hearne 1795:250; Marles 1984:80</td>
</tr>
<tr>
<td>Copper</td>
<td>Coppermine River, then fur traders</td>
<td>Denesųłinė collected copper fragments from surface deposits at the mouth of the Coppermine River. Copper goods acquired by trade were cut into smaller pieces and recycled into other tools.</td>
<td>Cold hammered copper was used for spear points, arrowheads, ice chisels, awls, knives and bracelets. Acquiring copper required trade or seasonal trips to quarries.</td>
<td>Gordon 1996:41; Hearne 1795:175-176; Mandeville 2009:19-31</td>
</tr>
<tr>
<td>Iron</td>
<td>Munk’s 1619 Unicorn shipwreck at Churchill River harbour, then fur traders</td>
<td>Denesųłinė collected iron fragments from the Unicorn at the mouth of the Churchill River. Since 1715, iron implements were obtained from the Fur Trade. Denesųłinė transformed iron files into other tools.</td>
<td>Iron fragments were recovered from the shipwreck at the mouth of the Churchill River. Iron fragments were made into spear points and ice chisels. Acquiring iron required seasonal movement or trade.</td>
<td>Foxe 1894:320-321; Gordon 1996:41; Knight 1932:13.121; Mandeville 2009:32-36</td>
</tr>
</tbody>
</table>
The collection and transformation of stone followed a well-established technological process, as depicted in the chaînes opératoire of Denesųłiné stone tool production (Figure 7.2). The sequence involves collecting raw material and subsequent material transformations by heating or soaking if required. Knappers reduced lithics with traditional hard hammer and bipolar techniques, formed tools with soft hammer percussion, and finished them with pressure flaking. Some tools, such as adzes, were ground. Later stages of the chaînes opératoire include tool repair and reuse. Some Denesųłiné think that a few special adepts made stone tools with their spiritual power, called *inkonǯe*, rather than by knapping, wherein the tools gained special powers that enhanced their ability to kill caribou (Holland and Kkailther 2003:53; Marles 1984:91). Section 8.3.2 discusses *inkonǯe* in detail.
Figure 7.2. Chaînes opératoire of Taltheilei tradition lithic technology: blanks to tool discard.
Denesųlinė harvests and transformations of birch begin with a trip to tree stands on the winter range of the caribou herds. Stockpiling their annual supply of birch wood occurs in the late winter and early spring when they collect bark or fell whole trees to make staves, and planks, as outlined in a chaînes opératoire (Figure 7.3). Harvesters remove birch bark by scoring the top and bottom of targeted sections of the trunk with metal knives, or in the past, with stone bifacial knives. They incised a vertical slit the length of the trunk and then peeled the bark back along the edge of the cut. Once they removed a quarter of the bark, they set a rod beneath a flap of bark then pulled it laterally to remove the bark in sheets. Using a stick prevents bark from tearing. Experts demonstrated their skills by using a hide flesher to remove the bark from the tree gently (AD1-11). To remove a stave, they took the outer bark from a side of the trunk and then scored the tree down its trunk with a knife or adze on either side of the targeted section. They worked the tool under the top section into the heartwood and worked them through until they removed the stave. Denesųlinė harvested inner bark after they removed the outer bark. They make 4 to 8 cm wide by 15 to 30 cm long thin strips with a knife, and note that the best time to harvest inner bark is in the spring when the sap flows (AD1-11). Before fur trade goods reached them, circa 1670, Denesųlinė would chop down trees using the axes from hafted beaver mandibles, where the teeth of the mandible was the cutting edge. Harvesters scored branches on two sides with a biface or knife and then snapped them off. They shaped birch with curved metal carving tools, often made from iron files.
Denesųłiné made many things from birch, such as spears, bows, snowshoe frames, and canoe frames (AD1-10; Marles 1984:83-84). They used its wood for spear shafts to which they hafted stone, antler, or iron projectile points to harvest caribou (AD1-10; AD2-2; AD3-1; AD15-1), and used birch wood for sinew-backed bows for hunting large game until the late 1970s (Curtis 1928:27). Straight birch saplings about 2 to 3 m long, and 6 to 8 cm in diameter, made excellent spear shafts. Denesųłiné made bows, which were 1.3 to 2 m long, 5 to 7 cm wide, and 3 cm thick, from a stave removed from the trunk of a mature birch. Their snowshoes also began with a frame of two long staves about 1 to 2 m in length, 4 to 6 cm wide, and 2 to 3 cm thick, lashed to a pair of short cross members that were 20 to 40 cm long, 3 to 4 cm wide, and 2 to 3 cm thick.

Denesųłiné made canoes, tent poles, and any number of small useful items from mature birch. Birch bark contains oils that make it especially flammable so that it can start a fire in the rain. Many Denesųłiné activities relate directly to the collection and
transformation of raw materials, such as tool stone and birch wood, and provided the material to continue Denesųlinė lifeways.

### 7.3. Renewal of Hunting Technologies

The following evidence pertains to the social and technological mechanisms that influence the resilience of the Ethn-eldéli Denesųlinė, starting with hunting technologies. Elderly harvesters insist that traditional caribou hunting techniques, such as spearing caribou, are the most respectful forms of harvest (AD1-10; AD2-2; AD3-1). These methods exemplify their idea of besetsūdi and involve using spears and arrows to kill caribou. In Denesųlinė oral traditions, inkonǯe was a quality of adepts who made spearheads, the manufacture of which was associated with dreaming power (Holland and Kkailther 2003:40). Denesųlinė preferred quartz projectile points as much for cosmology as for utility because the spear point retains special powers linked to their creation and serves as a conduit for the spiritual link between caribou and hunter (AD1-3).

Community partners asked me to document the use of spears because they want to share it with future generations. To do this, I researched historical accounts of their use (i.e., Sharp and Sharp 2015:257-269) and commissioned a master crafts-person to build a spear for me (Figure 7.4). The maker was an experienced spear hunter who learned his craft from his parents. I also interviewed two other elders who have speared caribou (AD2-2; AD3-1). All agree it is a faded skill, and note that the last time Ethn-eldéli Denesųlinė harvested a caribou with a spear was in the 1990s. Before that hunt, the most recent spear harvests were in 1978. Elders explain that spearing is more productive than winter interception and ambush harvests because harvesters take many caribou at a crossing. Firearm-based techniques do not have the same level of success as spearing techniques. Spears are used within 1 to 2 metres of the animal, at an angle between 35 to 45 degrees above and behind the animal. Rifles are ineffective at that distance and angle. I Instead, caribou are opportunistically shot at greater distance from lower angles in terrestrial rather than aquatic contexts. AD1 said, “[t]hat up to 40, and occasionally 100 caribou were killed” (AD1-10). Hunters estimate that families, in the late 1960s, “used c. 300 caribou from 29 July to 11 Sept; 100 to be speared by [the family] at Anauthad Lake Crossing” (Bone 1973:1). Denesųlinė speared swimming caribou from canoes. Hunters lanced animals through their exposed backs. Because dead caribou float, hunters kept lancing until they
dispatched all living animals, or until the remaining caribou left the water. This way of hunting caribou is vanishing.

Figure 7.4. Denesųłiné spear and leister (scale is 1 m, with 10 cm increments).
Source: Spear and leister commissioned from AD1.

Originally Denesųłiné spears used stone tips, but as the fur trade grew they came to rely on recycled iron files. Two iron-tipped Denesųliné spears made by Jean Baptiste and Pierre Antsanen are in the Canadian Museum of History. Community partners recalled people using fur-trade era files for spearheads (Figure 7.5). One noted that “[t]his was used by my great-great-grandfather in the 1800s to spear caribou at crossings” (AD15-1). The spear’s maker sharpened the tip of the file and re-forged the file’s long shaft into a long square stem. Gilbert Archie, a local elder, demonstrated in 1978 how to transform iron files into lance heads (Figure 7.6). The metalworking tools he used to re-forge files in open hearths were an axe, an anvil stone, and a pair of pliers.
Figure 7.5. Historic Denesųłiné lance head re-forged in the 1800s from an iron file used to harvest caribou.
Source: Lance head courtesy AD15-1.

Figure 7.6. Gilbert Archie of Turnor Lake re-forging a file with pliers, an axe, and an anvil stone in an open hearth.
Denesųlinė teachers instructed me on how to kill caribou with a spear (AD 1-10). The right-hand holds the shaft near the base of the spear. The hunter wraps a loop of leather around their wrist. A line from a boat attaches to this piece of leather. This is so that if they drop the spear, or it becomes stuck in a caribou, it is not lost. The right-hand holds the spear from the bottom, with the wrist extended as far away from the body as possible. The left-hand holds the spear mid-shaft. The fingers of the left hand roll over the top of the spear forming a c-shape. The left hand provides the aim of the spear, while the right hand provides the thrust. Because it provides less accuracy, hunters do not spear one handed. When a hunter sights an animal, with great concentration they aim the tip of the spear at the ribs of the lower back. They keep the point tip level. Then, when the aim is true, the right arm thrusts the spear into the caribou. However, the hunter does not release the shaft and instead guides it into the animal to ensure an accurate trajectory. The right hand retains a hold on the spear. If they successfully strike the animal, they quickly remove the spear. Then the hunter realigns the spear for the next caribou. In the meantime, lanced caribou dip their head into the water and drown. I was told, “[t]his was the gentlest and quickest death of the animal” (AD1-10). In quick succession, harvesters dispatched many caribou at the same time following the same process: Aim, thrust, pull. Aim, thrust, pull.

When hunters lance caribou in the water, they ensure there is an additional caribou between the target animal and the boat. This extra caribou acts as a buffer because sometimes a strike into a caribou’s back will hit a rib causing the animal to kick. Having a caribou in between ensures that the boat is not kicked, and thus not damaged or capsized. Sometimes the spear will stick in the animal and will jerk out of the hunter’s hand, if this happens hunters can quickly retrieve the spear by pulling the leather thong. Veteran hunters maintain that spearing caribou is the most respectful way to harvest them, and if done right, it is a relatively painless kill because they quickly drown (AD1-1; AD2-2; AD3-1). Because hunters kill animals in close quarters, there is a reasonable assurance that each lanced caribou would die, and there are no wounding losses. First-hand accounts from witnesses describe the hunt as similar to an ambush:

Two hunters in a small, fast canoe would lie in wait by an island or point where the caribou crossed the big lakes. When a herd had swam about halfway over the sound they overtook it and pulled up on the left side of the last animal. The man in the stern navigated the canoe while the bowman killed the caribou. He made a swift thrust; holding the blade of the spear parallel to its ribs, and quickly pulled it out again. The blade was held in that
position so that it would not stick in the ribs and give the animals a chance to upset the craft. One stab was usually enough then one could go for the next caribou (Munsterhjelm 1953:180).

The instruction I received is consistent with this and other ethnohistorical descriptions of spearing caribou (Sharp and Sharp 2015:257-269).

I also commissioned a leister (Figure 7.4), which is a tool for spearing fish. Fishers use them in a way similar to the caribou spear. The leister has a length of 208 cm, a 2.5 cm diameter, and weighs 765.3 g. This leister has a point made from caribou antler, a wire drawn steel nail, and a pair of galvanized screws. The point is bound with leather and glue, and is 24.2 cm long and 12.7 cm wide. The central spike is 10.2 cm long and 0.6 cm wide, and each screw is 2.5 cm long and 0.3 cm wide. The attached leather thong is 22.9 cm long and made of a double loop of 91 cm of leather line. Spearing fish is different from spearing caribou. The aim is different because the harvester has to adjust for the refraction of light by the water. However, fishers hold and thrust leisters the same as caribou spears.

In northern Canada, hunters also used the bow and arrow, which appeared in the Yukon circa A.D. 800 (Esdale 2008:15). There its introduction was associated with rapid environmental change, increased group size, and caribou fences and drivelines. This antiquity aligns with the Late Taltheilei tradition that dates from 661 to 1949.19 Denesųlinė consider bow hunting a respectful practice but rarely do it today (AD1-10). I was loaned a Denesųlinė bow (Figure 7.7) from AD4, which is for caribou, deer, and small game. Hunters use them parallel to the ground by hold to the centre of the bow with the left hand, nocking an arrow with four digits of the right hand holding the bowstring and arrow. The bow I observed has a pull force of 90 N, and a range of 30 to 60 m. The bow has a length of 116.7 cm, a 3.3 cm width and 1.3 cm thickness, and weighs 540 g. This bow is made from birch wood carved with a curved blade. The centre of the bow frame is wrapped 1 mm thick with sinew for a total 25.6 cm width, and has 0.9-cm-deep, and 1.2-cm-wide ends. The bowstring is of 3 mm thick twisted caribou sinew. With the bowstring attached, the bow has a recurved length of 111.2 cm and an 11.6 cm width. Three hardwood arrows were loaned by AD4. The first was 55.6 cm long, had a 0.7 cm diameter, and a 3-mm-wide and 4-mm-deep notch. The second was 58.1 cm long, had a 0.7 cm diameter, and a 3-mm-

19 The date range for the Late Taltheilei tradition is 661-1685 cal A.D. (p=0.96), 1732-1807 cal A.D. (p=0.03) and 1928-1949 cal A.D. (p=0.01). Calibrated from dates in Gordon 1996:55-63.
wide and 4-mm-deep notch. The third was 57.7 cm long, had a 0.7-cm diametre, and a 3-mm-wide and 4-mm-deep notch. All of the arrows had blunted points made of spent brass shell casings that are 3.6 cm long, 0.7 cm wide and weigh 36 g. All arrows were fletched with hawk feathers held with sinew.

Figure 7.7. Ethen-eldèli Denesųlinė caribou sinew backed bow and three arrows (scale is 1 m, with 10 cm increments).
Source: Loaned from AD4.

Denesųlinė traditions hold that harvest techniques be respectful and show besetsūdi to caribou. Equally important is the concept of inkonże that some adepts used to add special power to spears. Moreover, spearing caribou at water crossings was efficient. Although this may be true, Denesųlinė harvesting of caribou with bow and arrows was difficult and required the use of pounds.

7.4. Caching Caribou

Denesųlinė maintain a complex of harvest and resource sharing plans that ensure food security. Besetsūdi compels hunters to show respect for all animals. Harvesters cache their share of caribou meat, storing it for future use, but leave some parts for other creatures that enjoy it too. For highly mobile Denesųlinė, place-based food storage might
seem counter-intuitive. People there prefer dried meat and pemmican, though cached food was a secondary measure to minimize their risk of starvation (AD1-1; AD10-2; AD11-2). This measure was essential in times of stress, and therefore the Denesųlinė curated a number of caching strategies to provide a reasonable expectation that stored meat would not spoil and was protected from scavengers. Caches are largely set beside caribou kill sites or campsites, as were found at initial processing sites at caribou crossings (see Chapters 4 and 5). Denesųlinė apply different strategies for caching by season (Table 7.3). In winter, snow-based caches include large drift caches and small snow caches. In spring, harvesters can build muskeg caches by placing meat in a sunless north-facing wetland: harvesters must open them by mid-July before heat penetrates and spoils the meat. Denesųlinė can protect caribou meat from predators with a platform cache that keeps meat above the height of scavengers, or with a stone cache that protects meat on the ground with large stones. While platform and stone caches deter wolves, grizzly bears and wolverines can still break into them. Snow, platform, and muskeg caches are likely archaeologically invisible, but stone and drift caches have archaeological expressions (i.e., depressions and stone cairns, and antler markers and sizeable scatters of articulated caribou bone at drift caches).
<table>
<thead>
<tr>
<th>Type</th>
<th>Method</th>
<th>Description</th>
<th>Reference</th>
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<tbody>
<tr>
<td>Drift Cache</td>
<td>Harvesters pile up caribou killed at a crossing on shore in the fall.</td>
<td>Drift caches are one of the most common forms of caches. Harvesters would leave a pile of caribou on the shore of a lake and let great snowdrifts cover them. Denesųliné return to these locations. They use long poles to find the caribou in the snowdrift (Bussidor and Bilgen-Reinart 1997:37). Then they dig them out. Father Mégret described how he opened a snowdrift cache: “[a]nd two years in a row there was no caribou. It was terrible. I went with them one time, in the early morning, and we dug a hole in the snowbank on the shore looking for meat. With the wind that was thick snow. We found some rotted meat, and we found some more under the ice so cut the ice all day and at dark we came back home with some meat” (Holland and Kkailther 2003:61). Drift caches ensure that a supply of meat is available late in the winter. They also ensure that caribou meat is not wasted. Antler pile markers are used to indicate the location of caches under drifted snow.</td>
<td>Bussidor and Bilgen-Reinart 1997:37; Holland and Kkailther 2003:61</td>
</tr>
<tr>
<td>Snow Cache</td>
<td>Harvesters store caribou in a snowbank. They dig a hole in the snow.</td>
<td>Denesųliné dig holes to a depth of 1 m. They place a 40 to 60 cm cover of snow on top of the caribou meat. Caches are usually set beside a habitation site, or at the primary butchery site. On primary butchery sites, they mark caches with a pile of antlers. They leave snow caches at habitation sites unmarked. Placing the cache adjacent to the campsite prevents predation. The placement of antlers on the cache shows respect for caribou.</td>
<td>Chapter 5, AD10-2</td>
</tr>
<tr>
<td>Muskeg Cache</td>
<td>Harvesters dig a hole in muskeg. They choose a shady area, often on the north facing shadow of a hill. They cover the cache with logs and moss.</td>
<td>Harvesters make muskeg caches in the spring. It keeps the meat frozen until June or July. After mid-July, warming of the muskeg can spoil the cache. Moss insulates cache.</td>
<td>AD10-2</td>
</tr>
<tr>
<td>Rock Cache</td>
<td>Harvesters store caribou meat in a cultural depression covered by stones.</td>
<td>Stones prevent scavengers from open the cache. Grizzly bears and wolverines can open rock caches. A stone cache will deter wolves. Birket-Smith (1930:49) describes the storage of caribou meat in caribou hide bags that keep the hair on the outside. They specifically do this to waterproof the bags. A rock cache keeps scavengers away from the meat.</td>
<td>Chapter 6 AD1-1; AD2-2; AD3-1</td>
</tr>
<tr>
<td>Platform Cache</td>
<td>Harvesters store caribou meat on a raised platform. A platform is made of four log posts connected by cross-members.</td>
<td>They keep these caches high to deter scavengers. A platform cache keeps items above the snowpack. Leon Medal explains to keep caribou meat away from scavengers, “[y]ou have to put your meat up high, and always cover it” (Holland and Kkailther 2003:100).</td>
<td>Holland and Kkailther 2003:100; Tyrrell 1892b:1</td>
</tr>
</tbody>
</table>
Around freeze-up, Denesųlinė men built caches to store meat, and during spring and fall, hunters killed caribou in mild to cold temperatures to ensure the meat remained unspoiled (Bussidor and Bilgen-Reinart 1997:37). At these times of the year, days have highs of less than 10°C with frost at night. Hunters would lance the stomachs of whole caribou to allow gases to escape to prevent them from rotting by autolysis and putrefaction (AD1-1; AD2-2; AD3-1). A landmark for a drift cache was photographed in 1930 at the Kazan River (Figure 7.8). This landmark, made of caribou skulls and antlers, is taller than the snowdrifts and allowed Denesųlinė to know where to pole for caribou. At Selwyn Lake, I saw antlers left in a snow cache (Figure 7.9) and helped open a snow cache (Figure 7.10). A harvester explained that: “[t]he use of skulls and antlers to mark caches indicates respect for caribou” (AD10-2).

Figure 7.8. Caribou skull and antler landmark at Kazan River drift cache.
Source: Porsild 1930:1, Archives Canada PA-101051.
Figure 7.9. Antlers on top of a snow cache at a primary butchery site on a travel corridor.

Figure 7.10. Semi-open snow cache adjacent to a habitation site at Selwyn Lake.
Stone caches are mentioned in the Denesųlinė legend “How the Wolverine Lost his Shoes” told by Father Gamache. The story in full is below, as per traditional protocol:

The wolverine was a thief he had cached some meat all over. And the people were starving. All the animals were starving. So they got together and said, ‘We’ve got to see the wolverine and he’s got to pull out his caches or we’ll kill him’. The bear was there, and the wolf was there, and all kinds of animals. They were waiting for him. And he got scared. But he’s still the wolverine.

So he went over to where his cache was under the rocks and he would get a few little pieces of meat left on the bones that he had cached and he would just almost clean it right off. He just left the bones. And of course they suspected that’s what he was doing. So they were getting more and more angry. But if they killed him they wouldn’t get his cache.

They were getting more and more angry about him and then they came to a beaver lodge. Everyone knew that the beaver was there, in the lodge because there were traces of fresh branches above the snow. So the bear broke into the lodge. And the wolverine said, ‘I am the boss. I know it. I’ll get out the beaver now’. So he went around and broke all those breathing holes that they have on the shore of the lakes. So the beaver had to go back into his lodge, even though it was broken. And of course the wolverine was waiting. He killed the beaver and ate it.

But when all the animals were fooling around there, at the beaver lodge, they got their moccasins wet. So they set up a big fire and everybody put their shoes around the fire to dry. Of course Mr. Wolverine had a bellyful and was full of humour and joy and he was just telling stories and everyone was laughing. He took off one of his shoes and began to stretch it to smooth it. Then he ate it. And then he took another one and began to pull it and pull it, and he swallowed it. ‘Those loons. They don’t see me eating, they don’t say a word’ he thought. Well, the others did notice and they were laughing because he was eating his own shoes he thought he was fooling them, stealing their shoes. Then they noticed an enemy on the other side of the lake. A man was coming. So everyone jumped up and put on his shoes. And Mr. Wolverine … from them on he walked without his shoes” (Holland and Kkailther 2003:121-122).

The moral of the story is to share food, and not hoard it.

In another legend, “The Man who became a Wolf”, the storyteller alludes to the manner of food storage.

So they ate more. They ate up nearly all of the caribou. Finally, when there were only bones lying around, the old woman said, ‘grandson, if there aren’t many caribou, people will get hungry. We’ll cache these bones here where the game was killed. If anyone who is hungry comes along he’ll have this to
eat’. So they put all of the bones in one place, and piled snow on them and the old woman said, ‘grandson, now we’ll leave here. This probably isn’t the only caribou. There may be caribou ahead (Mandeville 2009:162).

The essential elements of this narrative are that the Denesųłiné cache caribou, bury them under the snow, and cache them where they kill animals. These stories are consistent with the oral histories and ethnographic and archaeological record at Wholdaia Lake (see Chapter 5). At Selwyn Lake (see Chapter 4) I observed several types of Denesųłiné caches, including snow and platform caches, and noted that they were associated with preferred harvest areas at water crossings (see Chapters 5 and 6). Denesųłiné maintain a number of strategies to store caribou to minimize risk. Due to their high mobility, they make caches, and often set them at caribou crossings. Likewise, harvesters build and return to drift caches in times of need. Conserving meat through caching embodies besetsúdí and shows due regard to caribou.

Stone caches encounter in regional archaeological surveys confirm that the ancestors of the Denesųłiné, the Taltheilei tradition, employed them at treeline and on the tundra. It is worth noting “[u]nless hunters cached meat as did the transient Caribou Inuit, the barrenlands were unfit for winter habitation. But there is no indication of caching or winter sites on the tundra in 8,000 years of Beverly prehistory” (Gordon 1990:400). Archaeological surveys reveal that this view is not correct. Research confirms that stone cairns are commonly found at Early to Middle Taltheilei tradition sites (Nash 1975). They likely indicate stone caches because they are set near campsites at known spring and fall water crossings. Roland Nash (1975) surveyed throughout the fall, winter, and spring range of the Qamanirjuaq caribou herds. He found caches in Windy Bay on Nueltin Lake in Nunavut associated with a number of Taltheilei tradition occupations that feature tent depressions and diagnostic materials (Nash 1975:99-136). “A Chipewyan tent depression” is indicated in his report (Nash1975:106, fig. 45). An additional five sites along Windy River also have cairns. These sites include middle Taltheilei bifaces (Nash 1975:130, Figure 48d, 137, Figure 53e).

20 Early Taltheilei tradition sites date to 2204-2026 cal B.C (p=0.02), 1610-1574 cal B.C. (p=0.01), 1565-1416 cal B.C (p=0.02), and 1122 cal B.C to 605 cal A.D. (p=0.95). Middle Taltheilei tradition sites date to 20-11 cal B.C. (p=0.01), 1 cal B.C. – 1021 A.D. (p=0.96), 1169-1178 cal A.D. (p=0.01) and 1181-1286 cal A.D. (p=0.02). Calibrated from dates in Gordon 1996:85,115 and Pickering 2012:120.
7.5. Mobility

Since ancient times, the pursuit of caribou has been essential to Denesųlinė survival. As indicated in Chapter 3, the Denesųlinė travel along migration corridors and maintain a communication network that connects neighbouring families. Mobility relies on three innovations that support movement. For Denesųlinė these are: snowshoes, dogsleds, and snowmobiles. Here I describe the nature of these tools and changes that have resulted from by their introduction. Mechanized travel has fundamentally changed Denesųlinė practices because coupled with village life; snowmobiles conspired to re-organize hunting practices in order to maintain their lifeways.

To follow the caribou herds, Denesųlinė need to travel efficiently. As Matonabbee explained to Samuel Hearne, “[w]hen all the men are heavy laden, they can neither hunt nor travel to any considerable distance; and in case they meet with success in hunting, who is to carry the fruits of their labour” (Hearne 1795:102). What Matonabbee does not mention is the weight of the loads that women bear (Thompson 1916:130). Camp materials, including a supply of food, were heavy and hauled by women whereas a hunter’s kit was light.

From what appear to be ancient oral histories it is likely that walking on snowshoes has been a popular form of travel and a welcome technological innovation. Denesųlinė invented them after watching how the feet of the grouse kept them on the surface of snow (Holland and Kkailther 2003:40, 87). Denesųlinė make snowshoes from birch wood staves, babiche, and caribou hide: and size and webbing vary for different snow conditions and use. Denesųlinė used a “2.5 m x 75 cm shoe for chasing caribou in deep soft snow and 1.2 m x 35 cm shoe for toboggan trails” (Marles 1984:84).

Historically, the dog team was the fastest means of travel: “The dog team is one of the most effective devices ever invented by man. For sustained work in the bush in winter, no machine in existence can match it for a balance of safety, payload, speed, reliability, and cost” (Sharp 1976:26). Dog teams can tolerate extremely low temperatures (i.e., below -50°C) and the sleds require few components: a birch toboggan, harnesses made of caribou hide, trained dogs, and dog food (Figure 7.11). Historical accounts suggest that Denesųlinė did not significantly use dog teams before the fur trade (Hearne 1795:208,323; MacDonnell 1760:22; Marles 1984:89). In historic times missionaries and the RCMP used
dogsleds, as indicated in reports of their patrols of Wholdaia Lake by dog team in 1930 (Barr 2004:106).

Figure 7.11. Dogsled race at Wollaston Lake in 1977.

With the introduction of snowmobiles, Denesųlinė shifted away from dogsleds. Father Darveau brought the first snowmobile to Brochet in 1949 (Mégret 1996:22-23), but they only became common in the late 1960s and early 1970s (AD1-12). Leslie Wakelyn (1999:2-3) notes that Beverly caribou were more accessible once aircraft, snowmobiles, and VHF radio arrived in the north. Although Denesųlinė incorporated these technologies into their cultural practices, they were and are not affordable for everyone. Snowmobiles are also a source of friction between those with and those without access to them. For example in the winter of 1998, caribou were relatively scarce near the southern communities (Wakelyn 1999:3). Only hunters with snowmobiles were successful, and travelled 200 km north to hunt in the Northwest Territories. Denesųlinė point out that caribou are accustomed to the sounds of snowmobiles, and that hunters had to learn to get within shooting distance of animals, but now it is easier. They think that this change is due to increased presence of hunters on the range (BQCMB 2008:24). Denesųlinė modified their hunting practices when snowmobiles appeared, which improved with experience. One hunter opined:
I think that is why caribou don’t come up in the summer. No more coming, only winter once in a while. No respecting caribou. It’s because the practices have changed. I don’t know why. When we just flew over, even from here to Flett Lake, if caribou there. Caribou already know. Too many vehicles pass there. Have good ears and smell. No more caribou coming that far. Young people now. If I kill caribou on a Skidoo, I don’t chase them. I kill one, two, three caribou at a time to fix it up. How much I had to eat. Caribou don’t like that they tie a rope to his neck, pull it to shore. ‘Why are you doing it? Don’t pull caribou by the neck anymore’. Caribou hit with a stick; they don’t like a hit with a stick. Beat caribou, they won’t come. Old days people respect that. Do not touch caribou with a paddle, when you paddle after the caribou. That is the way it was, not anymore (AD1-11).

Individuals who witnessed the changes wrought by snowmobiles state that the introduction of snowmobiles marked the end of the extensive exploitation of the taiga and tundra. When Denesųliné relied on their dog teams during the transition to the snowmobile, one observer recalled, “[i]n a real pinch, you cannot eat a snowmobile” (Sharp 1973:122). This axiom means that snowmobiles provide a different set of opportunities, limitations, and hazards than dog teams. Snowmobiles need a fuel supply, and in remote areas, fuel caches. Snowmobiles require maintenance and repair, including a supply of spare parts that can be challenging to get. In the study area, temperature matters as they are increasingly fragile below -35°C, their plastic shells become brittle, batteries freeze, and oil loses viscosity. Regardless, there has been an increase in the use of areas within easy travel distances from the main communities. Since the 1970s, Denesųliné prefer to drag dogsleds behind snowmobiles (Figure 7.12), and have upgraded their dogsleds, by making them longer, and reinforcing them with Teflon sliders to increase their efficiency and load.

Without question, in 2016 snowmobiles are essential tools for harvesting caribou in winter. However, Denesųliné feel that hunters (aboriginal and non-aboriginal alike) can use them in manners disrespectful to caribou. In this context, “hunters” primarily means Denesųliné, but extends to all hunters generally. Activities believed to be disrespectful by the Denesųliné include chasing caribou with snowmobiles, hauling caribou with rope, and harassing animals. There is apprehension that hunters sometimes kill caribou indiscriminately, with no selection of healthy animals. There are also concerns that hunters kill caribou for sport and waste meat (Nesbitt and Adamczewski 2013:19); whereas, past hunting practices were “conservation-oriented,” current hunting practices sometimes seem “indiscriminate.”
Younger harvesters are often targeted in caribou management discussions as a source of “wrong” and “wasteful” hunting practices (Nesbitt and Adamczewski 2013:16). These faults are attributed to the smaller amount of time they spend on the land and the increasing social disconnect between elders and youth. Links are thus made between youth harvesting practices and caribou population decline, which is potentially dispiriting to youth already challenged in other ways of life. This focus on youth harvesting practices as wasteful and arising from a lack of knowledge about the correct way to hunt may be demoralizing to youth and may result in a lack of interest in participating in caribou and harvest management. Are these ideas about the harvest practices of youth justified? (Wray and Parlee 2013:77).

Though this research suggests that poor hunting practices exist, hunters and elders suggest a path forward. They contend that since snowmobiles may facilitate poor behaviours, hunters must learn to use them appropriately. Denesųliné feel that if poor hunting practices are used, caribou herds will abandon people. Hence, communities should teach wise hunting practices to all harvesters, merging past and present understandings of hunting practice aligned with attitudes of besetsüdi.

Certainly the introduction of snowmobiles changed many elements of Denesųliné cultural practice. Their shifts in mobility induced a move from harvests at water crossings to winter ambushes and interceptions. Because snowmobiles operate in frozen conditions, a reduced presence in previously used spring and fall areas in season would exist due to the increased hazards posed by freeze-up and break-up. Swift mobility re-oriented Denesųliné lifeways to permanent villages that made their family traplines and the seasonal round obsolete. Furthermore, when they improved the dogsled, they changed their harvesting practices; instead of extended forays into the barrenlands, they made quick trips to intercept caribou herds (Figure 7.11). “Quick” is a relative term for Denesųliné. Hunting activities are now condensed into many multi-day harvests that each consist of a few days to a few weeks. Formerly, journeys took many months, until the 1970s. The distance travelled during the forays remain long because hunters go hundreds of kilometres in pursuit of game.
7.6. Ethnic Signatures and Territoriality

The following discussion regards the objective of the study to shed light on how Ethen-eldëli Denesųlinë establish their traditional territories and manage change. This section explores the potential correlation between ethnic signatures and territoriality as they relate to the reorganization of Denesųlinë cultural practices. Material correlates that signal identity are a form of ethnic symbolism (Jones 1998:28). Jones (1997:125) notes that “[e]thnic symbolism is generated, to varying degrees, from the existing cultural practices and modes of differentiation characterizing various social domains, such as gender and status differentiation.” From time among them, I observed that territories are functional constructs that are by-products of interactions between different culture groups. I found that ethnic signatures are cultural features that distinguish different groups. This section summarizes historical change in the practices regarding ethnicity and territory, and the fallout that caused the re-organization of cultural elements.
Territories, defined as “a specific space or spaces to which individual or groups of animals and humans are attached on a relatively exclusive and permanent basis” (Zedeño 2008:210), are social constructions that signal use, occupancy, and control of lands. Tobias (2000:3) defines “use” as activities in an area and “occupancy” as the area that a group inhabits. Territories are pragmatic representations of daily activities across the seasons, such as the seasonal rounds and trail networks. They are the antipode of fixed and often linear borders common in Euro-Canadian cadastral systems of land tenure. For the Athabasca Denesųłiné, the boundaries of two provinces and two territories bisect their territory (Indian Claim Commission 1993b:13-14). Whereas the provinces and territories arbitrarily use latitude and longitude, Athabasca Denesųłiné imagine their area as caribou range and the biennial migration (Figure 7.13).

Territories are patchworks mediated by social action. Symbolic representations of territory, such as maps and toponymy, are common, and a community’s spirituality and associated ceremonies ground these representations. For Cree, their rock art along the Churchill River and the south end of Reindeer Lake demark a frontier with the Denesųłiné (Blomquist 2011:132-133; Jones 1981:12). Their mental maps acknowledge some areas of avoidance that grow from impressions on the influence of the spirit world (Smith 1973:8-19); that is, areas of practical use are set outside cultural areas due to taboo (Rappaport 1984:209-210, 1999:205-208). Denesųłiné too avoid certain areas for similar reasons, such as the sacred site Gue Túe on the portage between Selwyn and Flett Lakes (Holland and Kkailther 2003:86). The social regulation of territories also relates to concepts of ethnicity and to community identification, which ultimately resides within the kinship system and genealogies (Ives 1990:6-7,118; Rodseth 2005:83-109).

To maintain control of territory for the semi-exclusive use of lands, waters, and associated resources, individuals need to control travel corridors and in northern Canada, this means controlling access to waterways (Speck 1931:577). If people can control a travel way, i.e., by limiting others’ access, then they can monitor access to resources, such as fisheries. This was the case when Warburton Pike negotiated access to the Lockhart River with the Tatsanotinne (Pike 1896:213-214). An early missionary, Father Pénard, from Beauval, Saskatchewan, experienced Denesųłiné fluid social and political discourses about the habitual use of areas, as well as their amicable dispute resolution mechanisms (Pénard 1929:20-24).
Throughout oral histories, there are instances of tense to aggressive conflicts between Denesųłiné and Inuit that highlight cultural frontiers (Janes 1973:39-54; 1974:7-10). Oral histories relate the fluidity of territory boundaries as neighbours compete for traditional foods and other resources (Pike 1917:186-203; Smith and Burch 1979:78-93). Instead of borders, frontiers are areas of social interaction at the meeting of two or more cultures (Barth 1969:15-37). Inuit encroached on the Denesųłiné because of a re-alignment of their seasonal rounds during the fur trade. This put them on a collision course since both were harvesting in the same areas in the same season, which sometimes led to hostile interactions (Smith and Burch 1979:78-93). “Some of the more southerly groups may have skirmished and occasionally established wary relationships of trade and mutual help with the Dene Indian people of the neighbouring forests” (McGhee 1996:92). Neither Denesųłiné nor Inuit territory expanded; rather, adaptive social changes occurred that had spatial representation at a common frontier.

Interaction between social and ethnic groups can solidify or reinforce ethnic distinctions (Hodder 1982:169-176; Jones 1997:100). Overlap areas within spatial and social frontiers are locales for ethnogenesis. Just as linguistic differences can reflect geographical boundaries (Barth 1969:10-37), so too can religious and material culture differences (Schubert 1999:201-209). Research supports the idea that relationships of land use patterns parallel social structure focusing on small family groups in the forests of northern Manitoba (Malasiuk 1999:342-363).

Ethnohistorical data identify Denesųłiné regional bands (Heber 1989:55-77), but under different monikers such as the Denesųłiné presumed to be the Ethen-eldèli, Thilanutinne (of Cold Lake and Isle a La Crosse), Kkrest'aylekkeotine, and the T'atsanotinne (Yellowknives) (Birket-Smith 1930:13; Nash 1975:3). Fidelity of regional bands to barrenland caribou herds link the main cultural divisions of the Denesųłiné (Figure 7.13).
Figure 7.13. Named Denesųlinė regional bands and associated caribou herds.
Source: Data from Nash 1975:3 and Birket-Smith 1930:18.
Ethen-eldèli Denesųšliné plan their travels around the time the caribou begin their migration. East-to-west travel runs perpendicular to caribou peregrinations because it is a feature of a communication network linking hunting groups and regional bands. Mobility for Denesųšliné is not just a case of restricted wandering (Oswalt 1966:30-32; Van Stone 1974:83). Athabasca Denesųšliné state, "our culture, history and way of life are predicated on the movements of the Beverly-Qamanirjuaq caribou herds … recent political boundaries have bisected the territory and disrupted the Denesųšliné way of life" (Prince Albert Grand Council 2009:1).

Oral histories of the Nas-nee-u exemplify the importance of named subgroups of Ethen-Elđeli Denesųšliné. John Clipping told Roland Nash (1975:70) of a lost band of Denesųšliné from northern Manitoba and Nunavut. Clipping explains:

A long time ago before the white man came a group of people called by our people the Nas-nee-u, the people who spoke like little children, lived on a big sandy island in Nejanilini Lake. They spoke poor or broken Chipewyan and the people had a difficult time understanding them. They were the people who named Nejanilini Lake as well as many of the places further north. Most of the time they lived in the north but occasionally came south into more thickly wooded regions. When they lived on the big sandy island in Nejanilini Lake they appeared to the people as friendly and intermarriage was common. However, they used to kill the best hunters of the people secretly. They would come and ask one of the best hunters to go with them on a hunting trip and then, when they were far enough away not to be found out, they would kill him and report him lost to the people. One time one of the best hunters went with them and, suspecting treachery, managed to escape. Upon returning to the people he reported the attempt on his life and the people then realized what had been happening. The people prepared themselves and subsequently attacked and killed the Nas-nee-u. Some of the people living today among the Churchill Band of the Chipewyan are descendants from the inter-marriage with the Nas-nee-u (Nash 1975:70).

Gabriel Tsannie tells of the Nas-nee-u:

There were three kinds of people who used to kill the Dene. They were the Inuit, the Cree and the Nas-nee-u. These last ones were people like us. They were Dene. They lived close to the ocean, somewhere close to Nueltin Lake, where the river flows to the ocean. There is an island there and it is on this island where every last one of the Nas-nee-u were killed.
Marise Aze also recalls the Nas-nee-u, and confirms John Clipping’s account:

All kinds of tribes used to fight the Dene. I have been at a lake where one tribe of Chipewyan Indians used to fight us too. They were named the Nas-nee-u, after their leader. He knew how to do ik’onzi. But all of his people were killed, every one of them. This place was very far from here. It was called Little Duck Lake [in northern Manitoba east of Nueltin Lake]. There is a big island in the middle of Little Duck Lake. There are no trees on this island and this is where they were killed (Holland and Kkailther 2003:11).

Symbolic expressions of ethnic difference are present in Denesųłiné material culture. Such signatures they employ on ephemeral media such as clothing design, and birch bark canoe and snowshoe forms. Traditionally, Denesųłiné stood out with their so-called “pointed skins,” which was a triangular flap of caribou skin at the base of their tunics (Curtis 1928:3; Thompson 1994:29-32). They used a birch bark boat that was 3.7 to 4.0 m long, 0.6 m wide, and could fit two people (Hearne 1795:99) (Figure 7.14) that was distinct from Cree birch bark canoes that are 5.5 m long, 0.7 m to 0.9 m wide, and fit a family and all of their materials (Gillespie 1976:8-9). These canoes were also completely different from Inuit hide-covered umiaks and kayaks. In the past, archaeological correlates of ethnic difference between Denesųłiné and Dorset and Thule material culture, include house forms, bone and antler tools such as harpoons, and stone implement such as qullik (oil lamps), and so forth (Dawson and Levy 2005:443-445; Pickering 2012:229-235).
Figure 7.14. The shape and construction of a Denesųlinė canoe.
Source: Hearne 1795:99.
People could recognize different cultural groups based on snowshoe imprints (Figure 7.15). Denesųłiné snowshoes are sided as they have asymmetrical right and left feet. Therefore, irregular tracks in the snow visibly mark ethnicity. One observer noted this trait.

Their snow-shoes differ from all others made use of in those parts; for though they are of the galley kind, that is, sharp-pointed before, yet they are always to be worn on one foot, and cannot be shifted from side to side, like other snow-shoes; for this reason the inner-side of the frames are almost straight, and the outer-side has a very large sweep. The frames are generally made of birch wood, and the netting is composed of thongs of deerskin; but their mode of filling that compartment where the foot rests, is quite different from that used among the Southern Indians (Hearne 1795:325).

On frontiers, these ethnic signatures matter because they signal at a distance if people are similar or different from one another. Oral traditions tell of conflict between Denesųłiné and their neighbours. Prior to the mid-1700s, cultural interactions were likely limited. However, the change of the Inuit seasonal round and Denesųłiné participation in the fur trade by the mid-1700s precipitated interactions on their common frontier (Keith 2004:22). At the coast, Inuit withdrew northwards from the mouth of the Churchill River about 1718 to avoid the better-armed Cree and Denesųłiné, a result of the HBC policy excluding firearms from the Inuit trade (Graham et al. 1969:236). Fur traders did not regularly trade firearms with Inuit on the western shore of Hudson’s Bay until 1795.
(Arima 1984:459). Prior to 1795, firearms were a symbol of ethnic difference because Inuit had them and Denesųlinė did not.

![Figure 7.15. Denesųlinė snowshoe, bow, and arrow. Source: Hearne 1795:457.](image)

After 1820, Inuit travelled inland, into the barrenlands (Arima 1984:459; Smith and Burch 1979:76-77), with visitors reporting camps on Dubawnt and Ennadai Lakes (Tyrrell 1987:105-107,112; Tyrrell 1897:65, 126-129). Seasonal movements of caribou influenced this frontier but also increased the potential for violence in an area. Conflict is known throughout Denesųlinė oral traditions, as in the stories about the *inkonže* of adepts *Idotliazee* and *Chennehaw* (Roberts 2010:607), and the legends “The Woman of Metals” (Goddard 1912:52-53; Petitot 1886:417-422), “One Eskimo Came Down” (Holland and Kkailther 2003:105), and “Two Brothers” (Holland and Kkailther 2003:151). Frontiers are areas where travel was generally limited to reduce potential conflict. The warning to Tyrrell about potential conflicts with Inuit along the Dubawnt River was apparently justified in 1893 (Tyrrell 1897:105-107), a local elder agreed that based on stories shared from his grandparents in the 1950s that, “[y]es, they would think that” (AD1-11). Tensions also remained between Inuit and Denesųlinė at Arviat on the coast.
of Hudson’s Bay (Roberts 2010:608). Material culture signatures and named regional bands express ethnicity. This is pertinent to frame interactions on frontiers as areas of social action, especially when people vie to harvest the same caribou.

The changing area of the frontier between Denesųłinė and Inuit in the eighteenth and nineteenth centuries was a re-organization of the seasonal use of areas. Material signs of ethnic difference inform Denesųłinė and Inuit interactions (i.e., in winter conditions, by their tracks in snow). Likewise, named subgroups of Denesųłinė indicate special relationships between populations. Some, as in the activities of the Nas-nee-u, caused intervention and subsequent re-organization by adjacent subgroups. During time in their company, I observed that the cultural practices expressed by territories and ethnic signatures relate to the social re-organization of Denesųłinė.

7.7. Variations of the Denesųłinė Adaptive Cycle

The discussion here applies the data on technological change onto diagrams of a variety of adaptive cycles. Through them, I explore different configurations of cultural practices. Three separate adaptive cycle diagrams based on different historic events illustrate how these mitigate risk and promote durable lifeways. The first centres on conventional caribou harvest and suggests a conservation state. The second regards the incorporation of new technology and linked instances of cultural transformation. The third is a diagram of Denesųłinė adjusting to a decline in caribou population.

One adaptive cycle, based on accounts from the 1900s to 1970s, outlines a conservation state in which focused caribou harvests fostered equilibrium wherein Denesųłinė attended to interception harvests at watercourse crossings and taught cultural practices to youth (Figure 7.16). Harvesters transformed food and fur into useful items. They conserved resources for later use by storing surplus meat, and they made clothing and shelter from caribou hides. Minor adjustments in the communication network maintained this conservation state and enhanced family coordination. This
conservation state was relatively stable and maintained cultural resilience by means of ecological stability.

Figure 7.16. A Denesųłiné conservation state in the adaptive cycle due to regular caribou harvests from the 1900s to 1970s.

Until circa 1965 to 1975 snowmobiles were not common for winter travel, but their arrival made accessible large caribou herds in the southern area of their winter range (Figure 7.17). Increased mechanization shifted Denesųłiné cultural practices by making possible quick trips to distant places to harvest caribou. Simultaneous to the use of snowmobiles, Denesųłiné customs with sleds and dog teams disappeared under the weight of convenience. Hunting plans shifted from fall and spring interception harvests to winter harvests, and instead of spearing caribou at water crossings, when the herd grouped together, hunting occurred in winter when caribou spread out. Hunters then
travelled farther to harvest them, but they required stockpiles of fuel and spare parts to keep the snowmobiles moving. In this stage, the catalyst that disrupted the adaptive cycle is the mechanization of hunting. Expanding their options shifted the harvester’s emphasis within the seasonal round and led to their abandonment of dog teams.

![Figure 7.17. A Denesųłiné release state related to the introduction of the snowmobile in the 1970s.](image)

Another catalyst disrupting Denesųłiné society resulted from the caribou population collapses in 1715 and from 1790 to 1792 (Figure 7.18). Historical records refer to this natural cycle and hint at examples of some of the cultural responses. In Thanadelthur’s account of 1715, the group who set out from the mouth of the Churchill were “slowed by sickness and threatened by starvation on their long trek across the Barren Ground” (Van Kirk 1980:68). This expedition had little to eat because they
missed the migration of the Qamanirjuaq caribou (Abel 2005:49). The famine from 1790 to 1792 appears in the HBC journals of Peter Fidler, Philip Turnor, and Malchom Ross, is in the archival records of early modern historians (Tyrrell 1934:190,359-360, 539; HBCA B9/a/1, pp. 16, 36), and informs more recent researchers (Yedbury 1976:248-249). In this situation, caribou were not available for harvest due to ecological change and forced Denesųliné to shift their subsistence economy to fish and small game. This required a reorganization of social structures and cultural practice. Larger groups came together at regular fisheries, and smaller groups harvested small game. This is a release state because harvesters turned their attention from caribou to other ungulates, small game, and fish (Sharp 1978:55-78). Without caribou, fur was not available for clothing and shelter. For a few years they used the hides of snowshoe hare or bear or clothing, and bark and moss for lodge covers. This state also saw an increase in the processing and storage of fish.
7.7.1. Discussion

The three adaptive states illustrated here—stable caribou harvest, change due to the diffusion of technology, and change due to a decline of caribou population—show the cultural resilience of the Denesųliné. They show the diverse ways that Denesųliné realign practices to variation in ecology and technology. Herein, I acknowledge that cultural systems are constantly changing, and respond to many pressures, with some trending towards stability, and others towards chaos. For instance, language and spirituality are less likely to change, when compared to local social and political
alignments. The adaptive cycles highlight how some of these factors simultaneously interact and create overall positive or negative trajectories for northern populations.

Cultural resilience links tool production, food storage, mobility strategies, and ethnicity; for example, access to various traditional foods was part of the menu, but only caribou provided enough hide for shelter and clothing (Wakelyn 1999:3). Modernizing forces also led to the demise of family-based nomadism when semi-sedentary village life became their reality in the 1940s (Jarvenpa 1976:68). Snowmobiles revolutionized the bush economy by mechanizing hunting and travelling (Sylanidou 2010:77). Since the mid-1980s, caribou harvesting became a winter activity with quick trips to the range. Summer, late spring and early fall harvests are infrequent. The cost of getting on the land after winter is too expensive, which produces intensive exploitation near permanent settlements. Areas assessable by boat see concentrated use. Areas only assessable by plane see less use, including aircraft on floats and skis. From 1917 to 1975, dispersed villages amalgamated into the Patuanak settlement (Jarvenpa 1980:361). This, coupled with the integration of snowmobile, decreased the size of the harvest area. Therefore, more individuals were harvesting in a smaller area, which predictably caused a decline in harvest yields and an increased reliance on store bought food. Harvesting smaller stocks of moose, fish, and furbearers than was previously available came with the loss of mobility (Jarvenpa 1980:362).

The portable lifestyle of the Denesųlinė diminished once they established their villages on the migration routes of the herds in Saskatchewan in the 1940s and 1950s. This was so they could harvest caribou in spring, fall, and winter. A year-round supply of meat was reasonably available, especially when meat was frozen in winter and dried in summer. Denesųlinė faced hardships when caribou wintered at a distance from their communities (BQCMB 2002b:26). Caches store food and reduce wastage, and offered food security in all seasons. At watercourse crossings, harvesters could only process so many caribou before they needed to move to follow the caribou. Denesųlinė maintain caches and recover the meat before it spoils. However, waiting too long to open caches is also disrespectful.
Denesųłiné recognize ethnicity by using the traditional names for regional bands, perpetuating material signatures of ethnic difference, and defining frontiers. Social elements of ethnicity influence cultural resilience as they can inform social activities on frontiers. Each regional band travelled on a series of north-to-south migration routes to follow caribou. Individual families connect using east to west trending information networks. These networks inform the social dynamics between neighbouring groups and are an essential element of how Ethen-eldèli Denesųłiné establish, maintain, and change asserted traditional territories. Applied ethnic signatures create territorial formations. Named Denesųłiné regional bands are associated with specific barrenland caribou herds.

The adaptive cycle is a useful device to frame diverse data when attempting to understand the Denesųłiné relationship to caribou. It helped reveal how cultural frameworks integrate new technologies, evident by the cultural reorganization from increased use of areas near communities after snowmobiles were introduced. Because it shows how a number of components interact, the adaptive cycle is an advantageous tool. Diagraming data in an adaptive cycle revealed cultural adjustments that maintain the cultural resilience of the Denesųłiné, such as how Denesųłiné have changed hunting practices, developed multiple strategies to cache meat, and have mechanisms to identify different ethnic groups at a distance. Central to all is the resilience of the Denesųłiné relationship to caribou.

7.8. Chapter Summary

Denesųłiné customs exemplify their lifeways and ensure their survival. This chapter examined how the philosophies of *inkonʒe* and *besetsúdi* inform social and technological processes, especially caribou harvests and the transformation of raw materials into clothing, shelter, and harvesting tools. Denesųłiné continually update their toolkits to maintain continuities with their way of life. While customary hunting practices relied on snowshoes and dogsleds, since the 1970s, snowmobiles optimized Denesųłiné mobility and caused simultaneous realignments of other cultural practices. This triggered
a shift in emphasis away from ambushes at water crossings to opportunistic hunts in winter. Simultaneously, Denesųliné preferred to stockpile nourishment as dry meat, and would store excess meat in a variety of caches. This ensured that harvesters showed due respect to caribou by preventing waste.

Denesųliné link mobility with information networks and have an excellent knowledge of their country. Identity within named regional bands, linked to caribou herd and their migration routes, and on frontiers, ethnic signatures of difference reinforced Denesųliné expressions of territory. Combined, *inkonţe* and *besetsúdî* were indicative of Denesųliné resilience and revealed how these balanced showing due regard to resources and the shifting powers and techniques that manipulate ever-changing natural and social worlds. When combined, these attitudes imbue technologies to ensure survival and maintain cultural continuity because of resilience.
Chapter 8. Ethen-eldèli Denesųliné Cultural Beliefs and Practices regarding Respect

The discussion in this chapter turns to Denesųliné practices that show respect for caribou. The previous chapter showed how various cultural activities reinforce their resilience to caribou. Here, I dig deeper and explore how Denesųliné attitudes, behaviours, and spirituality structure their relationship to caribou. The first section addresses how Denesųliné show respect to caribou and how Denesųliné characterize this reciprocal relationship. It focuses on the physical activities in relation to caribou harvesting and butchery from data drawn as a participant-observer, from interviews with knowledge holders and by reviewing ethnographic sources that describe the ways people handled caribou to show respect to their prey. The second section identifies links between cultural practices and Denesųliné spirituality based on published myths, interviews on divination, ceremonies and ritual practices, and observation of ritualised disposal of caribou remains and the general attitude cultivated by Denesųliné in all matters relating to caribou. The final section discusses how Denesųliné follow rules to avoid disrespecting caribou and reveal practices that they feel are disrespectful to caribou.

8.1. Denesųliné Dwelling in-and-of the World

Social and technological processes operate to preserve and adjust the Ethen-Eldèli Denesųliné way of life and heritage. This section explores Denesųliné practices that show respect for caribou, which sometimes seem the antipode of contemporary management plans targeting them. I begin with public policy diktats for handling caribou (Government of Northwest Territories, Department of Education, Culture and Employment 2012:1). Then I interrogate laws prescribing behaviour (Asch 1989:210-216) before examining subsistence practices (Tssessaze 1999:1) and animistic spirituality (Birket-Smith 1930:80-82). Descendent communities note that “[h]unter-gatherers in their practices, do not seek to transform the world; they seek revelation” (Ingold 2000:57). By invoking ritual and ceremonial practices, the Denesųliné allude to
their encounters in their spirit-haunted world. Thus I explore the practices that mediate and engage the natural and supernatural realms wherein human hunters meet their caribou prey on equal terms (Willerslev 2007:25-26). Only by referring to the spirits of the caribou can the term “dwelling” be seen as an “ecological approach that situates the practitioners in the context of an active engagement with the constituents of their surroundings” (Ingold 2000:55). There is then a direct line to the idea that living and observing the world forms understandings of the cosmos that make sense in this hunting culture (Ingold 2000:55). Learning concentrates on skills for “direct perceptual engagement” with its animate inhabitants (human and non-human) and inanimate surroundings. Assessing how cultural practice imparts respect identifies how Denesułiné modify caribou/hunter relationships. For Łútsël K’é elders, “some of these beliefs begin with a perspective of the caribou as spiritual beings and their migration as a spiritual journey. Some elders say that the cracks and fissures on some caribou skulls tell the migration story of each caribou” (Parlee et al. 2005a:33-34). Interviewees used a plural form for the spiritual stewards of the caribou. In my experience, the relationship is not between the Denesułiné and caribou generally, instead it is between individual hunters and individual caribou. This is more along the lines of each human equals a person, each caribou equals a caribou spirit, wherein each individual has wants, needs, and preferences. There are also a number of other non-human bosses of caribou littered throughout Denesułiné legends such as Betsóne Yeneca, “His-Grandmother Raised-Him” (Goddard 1912:14).

I propose that Denesułiné physically handle caribou, and other animals, in a deliberate way that shows respect to their prey, and in doing so preserves the harmony in their reciprocal arrangement. The previous descriptions of caribou butchery in Chapter 4 focussed on the staged process of Denesułiné processing of caribou meat, but here I emphasize how they treat the spirit of the animal as they dismember it. The ways that Denesułiné handle the carcass separates them from other predators that simply tear caribou limb from limb. Everything from transporting, processing, and transforming caribou parts into food and pelts that Denesułiné do must defer to their contract with the spirits of the caribou. Denesułiné butcher caribou in primary and secondary stages, then they cook, produce dry meat, and then dispose of any remains according to a standard
procedure (Table 8.1). They transform caribou materials to make hides and bone and antler tools. By treating caribou in these ways, George Mercredi says:

We used everything from the caribou. Nothing was wasted. The stomach was turned inside out. We then put blood in the stomach with a little bit of flour and made soup for the children. The only thing we threw away were the intestines (Holland and Kkailther 2003:111).

Caribou are the primary food of the Denesųlinė. George Mercredi credits that, “[c]aribou meat makes your belly strong you know” (Holland and Kkailther 2003:111). Łútsël K’é Elder Madeleine Drybones affirms that:

The prescribed treatment means in the past these fragments were disposed of in lakes. People mainly used caribou for everything. Now if you go out on the land you don't see any evidence of where the old people stayed. You don't see piles of hair where the women have shaved the hides or the piles of old bones. You see old sites that are very clean. It’s hard to find evidence of the old camping sites now (Kendrick 2003:185).

Therefore, how Denesųlinė touch and modify caribou is defined by their relationships with the spirits of the caribou.

Table 8.1. Activities involving Caribou.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moving caribou</td>
<td>Rope hauling</td>
<td>In winter, whole caribou can be pulled by a rope on the ice (by people and snowmobile)</td>
</tr>
<tr>
<td></td>
<td>Sledge hauling</td>
<td>In winter, caribou (whole and butchered) can be moved in a sled</td>
</tr>
<tr>
<td></td>
<td>Carrying</td>
<td>Caribou (butchered) can be carried on one’s back</td>
</tr>
<tr>
<td>Butchery</td>
<td>Skinning</td>
<td>Caribou are skinned, either at the primary kill site or in camp</td>
</tr>
<tr>
<td></td>
<td>Disarticulation</td>
<td>Caribou limbs and elements are disarticulated</td>
</tr>
<tr>
<td>Cooking</td>
<td>Grilling</td>
<td>Caribou meat is grilled over a fire</td>
</tr>
<tr>
<td></td>
<td>Drying</td>
<td>Caribou meat is dried</td>
</tr>
<tr>
<td>Disposal</td>
<td>Bones</td>
<td>Bones are disposed of in special areas (e.g., in lakes, or consumed by fire)</td>
</tr>
<tr>
<td>Hide making</td>
<td>Hide making</td>
<td>Hides are made into usable items. Standard processes are followed, including fleshing, stretching, hair removal and tanning</td>
</tr>
<tr>
<td>Tool making</td>
<td>Antler use</td>
<td>Antlers are made into tools (e.g., projectile points, handles)</td>
</tr>
<tr>
<td></td>
<td>Bone use</td>
<td>Bones are made into tools (e.g., hide fleshers, cup-and-pin toys)</td>
</tr>
</tbody>
</table>
Traditional knowledge encodes ecological information on the persistence of caribou. At Łútsël K'é, Denesųłiné elders explain:

A relationship based on respect is an especially important part of Denesųłiné-caribou beliefs. Almost all of the Łútsël K'é elders and hunters in discussions have emphasized the importance of respect and have postulated a lack of respect as a reason for changes in caribou behaviour and migration. Elders say that people need to respect the caribou so that they will continue to return. Failure to do so would result in the caribou deviating from their usual migration routes and becoming unavailable to the hunters for a number of years (cited in Kendrick 2003:183-184).

Whereas Denesųłiné rely on their thorough understanding of ecology and caribou behaviour to survive, western researchers understand caribou migration via data from population surveys, satellite collar tracking, computer-based modelling, and local experts with traditional knowledge (Berkes 2008:122). An oft-told Denesųłiné proverb along the shores of Lake Athabasca goes: “nobody knows the way of the wind and the caribou” (Munsterhjelm 1953:153). Implicit in that statement is their acknowledgement that caribou migrations are highly variable antipode to western researchers mandate to catalogue and manage caribou herds.

Denesųłiné embrace mutual reciprocities between caribou and people, which they articulate in the legend “His Grandmother Raised Him” (Lowie 1912:182-183; Goddard 1912:50; Petitot 1886:385-398). As the story unfolds:

Raised-by-his-Grandmother is a person of great power who comes to relieve the native to whom the caribou migrations have ceased. He restores the caribou on the condition of being given the tips of their tongues as tribute and when the tribute fails, he leaves them. He is ever after invoked as the deity in charge of caribou (Goddard 1912:50).

AD1 explained that “His-Grandmother-Raised-him” is a being named Betsuné-yenéca, who has the spiritual power to affect the presence of caribou and intervenes in times of hardship for Denesųłiné (AD1-2). Thus, tradition compels them to heed the reciprocal bargain negotiated between caribou and people, which grows weak if harvesters do not maintain cultural rules of use, including those later presented in Section 8.3 (Wray 2011:93).
Northern peoples insist that traditional knowledge and biological research such as wildlife surveys occupy common ground since the inductive methods deployed by scientist often parallel the hunter’s skills of observation (Fleck and Gunn 1982:48, 53; Gunn and Sutherland 1997). This common ground has a long history (Ruttan 2010:77). Historical sources present detailed information on life cycle, behaviour, migration, forage, and predator-prey dynamics about caribou gleaned from Dene who regularly crossed the barrenlands (Hearne 1795:196-201). This includes understanding the equilibrium of predation by wolves and wolverines that occupy niches at the apex of the food chain (Harper 1955:6). These historical sources served as the original biological descriptions of North American caribou.

Denesųliné knowledge accrued over generations informs on fidelity and change at the calving grounds. From 2001 to 2012, there were serious questions raised about the status of the Beverly herd (Johnson and Mulders 2009:2; Campbell et al. 2012:10-15). Biologists thought that the herd had collapsed or had disappeared based on aerial surveys of the traditional calving grounds near Beverly Lake (Adamczewski et al. 2009:15; Gunn, Poole and Wierzchowski 2011:33). Since 2008, biologists found fewer and fewer caribou on the calving ground (Campbell et al. 2012:15; Poole et al. 2014:32). In an interview in 1978, Boniface Mercredi opined, "[w]hen the caribou go to the coast to the calving ground they stay with the muskox. When the caribou go back south they follow them again" (Holland and Kkailther 2003:130). In this account, caribou calve at the coast of the Arctic Ocean, which is not consistent with the traditional calving areas near Aberdeen, Beverly and Kaminuriak Lakes for the Beverly and Qamanirjuaq herds as understood by biologists and local harvesters (Gunn and Sutherland 1997:13-28). Subsequent surveys of the Beverly herd confirmed Boniface Mercredi’s traditional knowledge and determined that Beverly caribou had shifted their calving ground 200 km north nearer the Arctic Ocean at Queen Maud Gulf (Campbell et al. 2012:17).
8.2. Spiritual Practices and Beliefs that Show Respect for Caribou

The following discussion speaks to the study’s objective to document the relationship between the Ethen-eldéli Denesųlinė and the caribou. Athabasca Denesųlinė state that their devout and symbolic attachment to the caribou is profound, strong, and elemental to their being and way of life (Athabasca Interim Advisory Panel 2004:38). Since ancient times they have observed the animism that brought them spiritual sustenance and guided their paths through this spirit-haunted world. AD1 relates that traditionally Denesųlinė “believe that animals, people, and some landforms are imbued with spirits” (AD1-9). He went on to say, “[s]pirits are constantly at work and influence the wellbeing of the people” (AD1-4). Famine and hardship result not from the unpredictable movements and distribution of caribou from year to year as Denesųlinė know (AD1-8), but from a previous slight that offended the spirits of the caribou. An explanation for scarcity is a belief that when hunters mistreat an animal, its spirit warns others to stay away (Wakelyn 1999:3). Denesųlinė specifically acknowledge that caribou are elusive, and that attempts to manipulate them can negatively influence the movements of herds (BQCMB 2001:2). Denesųlinė also believe that caribou never die unless killed (Wakelyn 1999:3); that is, caribou live until they are killed by humans, or other predators, or by unforeseen natural events, such as drowning. When applied in management contexts, Denesųlinė often do not believe biologists’ claims that caribou populations are low. Instead, they contend that caribou are difficult to find because the caribou have moved away from people. Some Denesųlinė believe that caribou are infinite in number (Hearne 1795:118-119,196-197).

Denesųlinė have faith in a metaphysical relationship between caribou and the stars. A variation of the creation myth was told to Birket-Smith (1930:86-87) at Churchill Manitoba. In the myth “The Flood,” the Creator lives in the sky and is regularly visited by animals. One day, caribou found the bag that held summer; they brought it to the Creator by ascending into the sky. The Creator opens the bag, and summer and fish

In Denesųlinė, caribou is “etthen,” and stars are “tthen.” This similarity is purposeful. The ‘e’ of etthen is a modifier of “tthen.”
fall out onto the lands below. A lesson of “The Flood” is that caribou can ascend into a spiritual realm in the sky. Ethen-eldêli Denesųliné hold that caribou relate to stars and influence the aurora borealis; for example, Wakelyn notes:

This picture is on the cover of a book on barrenland archaeology in the Northwest Territories by archaeologist Bryan Gordon and is based on a drawing by Mearle Gordon Roy. It is based on a Dene legend that caribou arose from the Milky Way, and shows caribou descending from the Milky Way in late summer before spending the winter with “the people of sunlight and starlight” (the Dene) in the forest. Another Dene legend attributes the origin of caribou to the Aurora Borealis (Wakelyn 1999:2-3).

This legend shares a link between caribou and the Milky Way or the aurora. Father Gamache notes the Denesųliné word for northern lights, “Nattla means Dancers” (Holland and Kkailther 2003:122). Hearne (1795:346) uses the term “Nant-ena” and interprets them via his English folklore as fairies. He wrote that:

The Northern Indians call the Aurora Borealis Ed-thin; that is Deer: and when that meteor is very bright they say that deer is plentiful in that part of the atmosphere; but they have never yet extended their ideas so far as to entertain hopes of tasting those celestial animals. Beside this silly notion, they are very superstitious with respect to the existence of several kinds of fairies, called by them Nant-e-na, whom they frequently say they see, and who are supposed by them to inhabit the different elements of earth, sea, and air, according to their several qualities. To one or other of those fairies they usually attribute any change in their circumstances, either for the better or worse; and as they are led into this way of thinking entirely by the art of the conjurors, there is no such thing as any general mode of belief; for those jugglers differ so much from each other in their accounts of these beings, that those who believe anything they say, have little to do but change their opinions according to the will and caprice of the conjuror, who is almost daily relating some new whim, or extraordinary event, which, he says, has been revealed to him in a dream, or by some of his favourite fairies, when on a hunting excursion (Hearne 1795:346-347).

In this account, Hearne explained that caribou are plentiful when the northern lights are present. AD15 said, “[t]he power from caribou hooves walking along on the ground creates the northern lights” (AD15-1). His friend AD1 agreed that “[w]hen there are northern lights, caribou are beneath them” (AD1-10). AD15 also related the legend of how caribou came from the stars, and said, “[c]aribou were brought down from the night
sky by a star deity" (AD15-1). This aligns with the story of caribou coming from the stars in Enzoe and Willet (2010:3). Peter Enzoe shares this:

> Our stories tell us that we Denésōliné are descendants of the caribou. We call caribou ?étthén in our languages and we also use the word ?étthén for stars. We believe caribou come from the stars. My grandfather told me the northern lights (kânaǯís, “they move in the sky”) [form because of caribou], so I know that when I see the northern lights there will be caribou in the area. This makes me happy because caribou are our main source of food (Enzoe and Willet 2010:3).

8.2.1. Personal Connections to Caribou

Denesųłiné accept that each person has a connection to caribou. A link runs from caribou to people and vice versa. Expressions of this link in oral narratives provide insight into this symbiotic relationship; for example, Kaj Birket-Smith (1930:80), the ethnographer on the Fifth Thule Expedition, wrote, "[t]he boundary between man and animal is very indefinite." One element of the symbiosis between people and caribou is evident in beliefs about blood. Nattoganeze told Father Dauvet, "[d]on't you know that our blood is just like the blood of the caribou. We have been eating it so long that our blood can never be anything else than the blood of caribou" (cited in Holland and Kkailther 2003:166). The Sayisi Denesųłiné of northern Manitoba affirms, "[i]n the eyes of the creator we are no different from the caribou ... we moved and lived with the herds, and loved the beauty of the wide-open tundra and the bounty of our land" (Bussidor and Bilgen-Reinart 1997:4). In another account, caribou come to people. Father Dauvet insists, "[t]hey weren't going to the caribou, the caribou were going to them" (Holland and Kkailther 2003:166). The story “His Grandmother Raised Him" reveals how Caribou Head Boy made caribou live with people (Mandeville 2009:74). George Mercredi said, "[t]he caribou must be very happy to have come to us as we have come to them” (Holland and Kkailther 2003:166). Physical manifestations of the symbiosis affirm:

> The strong ties between caribou and humans meant that the caribou would always return because they would get lonely for humans. Elders would also state that this was reciprocal, and they too would become 'lonely' for the caribou after a long-term absence … When an elder says

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that caribou are no longer at a certain place, it may be explained that this is so because people are no longer at that location (Kendrick 2003:189).

The essential element of these accounts is that there is a feeling of living as equals or being otherwise connected with caribou. Father Dauvet also made that observation:

They were using the same verb for a moose walking and a man who walks. So every time I see a moose I must be full of awe for something that is great. I had to carry that emotion to be close to them, and the tremendous impact every year of the coming of the caribou in the first week of November, the excitement and the tremendous activity, I must be a part of that. I must look for the caribou and speak caribou. I must be excited and joyful because that is meat. I let myself move into the season, the seasonal rhythm. This is not like day or night. This is a time for caribou, a time for fish, time for this, and so on. I must be completely balanced. I should stay in that rhythm, or I will never understand (cited in Holland and Kkailther 2003:152).

AD-1 explains how hunters personally connect to caribou by striking of the caribou skin drum. He continues:

The idea is that with the contact of the drumstick on the hide, the connection to the caribou kilometres away is intact, the caribou feel that beat, and come in rhythm to the beat. It is a direct connection, and whenever the stick hits the drum, the singer and caribou are linked together and follow the same rhythm (AD1-3).

AD2 drummed and sang a song in honour of the caribou. He stopped long enough to explain that he sings to call them in, “[d]rum to caribou to come, they come, the caribou. You hit a drum, the contact. The caribou know right away. The caribou hears us, what we are singing” (AD2-4). Similar to prayer, individuals connect to caribou when necessity compels them. Denesųliné singers dedicate their singing to aloof caribou wandering far from their camps. As reported in Chapter 4, songs can draw caribou in, bringing them in proximity for harvest.

8.2.2. Rituals and Ceremonies

Denesųliné religious thought is observed in the rituals and ceremonies associated with caribou that relate to divination, sacrifice, birth, and menses (Table 8.2).
Offerings are left at lakes and significant places to show humility to the landscape. A spiritual explanation for rituals and ceremonies is the basis for the Denesųlinė concept of *inkonže*, which means “the little piece of knowledge,” and “to-know-something-a-little” (Smith 1973:8). Denesųlinė ritually manipulate caribou bone by the way they handle skulls, scapulae, and patellae during divination rites to foretell the future with *inkonže*.

The seers that Samuel Hearne described as jugglers direct hunting location, method, and effort. As AD3 said, the most common question to ask an adept of *inkonže* is “[w]here are the caribou?” (AD3-2). Driven by the desire to intercept a herd, they deploy the only control they possess in such times. It is clear that “[d]ivination is a decision making procedure that legitimizes the basis of choice” (Nader 1996:263). It is the response to the perception of risk because the future is uncertain. It is the harnessed power of medicine. It is a belief in their place amid the “powers of creation” (Coutu and Hoffman-Mercredi 1999:65). An adept’s *inkonže* comes from their ability to commune with the spirit world, especially with animal spirits (Krech 2005:87).

### Table 8.2. Denesųlinė Rituals and Ceremonies about Caribou.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Ritual handling of heads and skulls</td>
<td>Skulls are handled differently than other caribou bones</td>
<td>Applies to bears and moose, as told in the oral tradition “The man who hibernated with a bear” (Birket-Smith 1930:32-33; Mandeville 2009:130)</td>
</tr>
<tr>
<td>Feeding the fire</td>
<td>Offerings of food (especially caribou meat and bone) are burned in hearths.</td>
<td>Jimmy Dzeylion explains, “[f]eeding the fire: bits o’ meat would be placed on the fire. This was some sort of offering. We know that down south (Europeans) made burnt offerings to God. This was an offering to the creator” (Holland and Kkailther 2003:34). Father Gamache explains, “old man of the earth, we give you this to make us live” and he threw his bit of food into the fire. Offering to “Nihónékui”: the one who made the earth. (Holland and Kkailther 2003:114)</td>
</tr>
<tr>
<td>Shaking tent</td>
<td>This ceremony involves a shaman constructing a tall, narrow tent, and a performance with an audience</td>
<td>In the ceremony, an adept collects his spiritual helpers and shares spiritual knowledge and cures with the audience</td>
</tr>
<tr>
<td>Activity</td>
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<tr>
<td>Birth</td>
<td>Birth occurred in a special lodge. Human placenta was treated carefully and buried in the ground</td>
<td>Helen Joseyounen explains childbirth, “[b]ut very, very long ago, a woman would give birth, clean up the baby, and right that instant the baby would follow the mother back to camp. It was said that Dene people were like caribou.” (Holland and Kkailther 2003:40-41)</td>
</tr>
<tr>
<td>Divination</td>
<td>Divination skills make come through ‘caribou medicine power’</td>
<td>Inkon’że is the source of medicine power for Denesųłiné</td>
</tr>
<tr>
<td>Scapulamancy</td>
<td>A caribou scapula is charred over a fire, and the markings foretell the future</td>
<td>Bart Dzeylion explains Scapulamancy, “using a caribou scapula, called be ke?ìzt, which translates as ‘marking-on-something’. This is for locating peoples. Write days of the week on the blade, X for Sunday, cook over fire/stove, marking will appear, and then it would have indicated a date of when people would arrive” (Holland and Kkailther 2003:19)</td>
</tr>
<tr>
<td>Kneecap / patellaomancy</td>
<td>A caribou patella is set on a fire, and its movements foretell the future</td>
<td>AD3 explains, “a caribou kneecap placed on a hot stove will orient itself to the direction of caribou” (AD3-3). Bart Dzeylion also explains that a bear patella bone can be used to locate caribou. “[b]ear kneecap put on a hot stove. Don’t move if there is no caribou, move when the caribou are near, it will spin and point the direction of the caribou - and give it some time” (Holland and Kkailther 2003:19). AD3 says, “[k]nee: you heat it up on the stove. It just rolls, I’ve seen it before. People dream about that; they see future about that. The knee moves because the man moves it. About dreaming, prophecies, and healing. Knee bones link the dreamer with his connection to the spirit world; it is inside them” AD3-2</td>
</tr>
<tr>
<td>Craniomancy</td>
<td>A skinned caribou skull can foretell the future</td>
<td>Madeline Catholique from Łútsël K’é explains, “[w]hen you skin out the head of the caribou you will find writing on its forehead. No one can actually read this writing. However, in the past some elderly women would say it meant, wherever the people are; that is where the caribou will go. The caribou would always migrate towards the people. That is what they said was written there” (Kendrick 2003:175-176)</td>
</tr>
<tr>
<td>Offerings at lakes</td>
<td>Offerings are provided to lakes before passing them</td>
<td>Offerings include tobacco, tea, spruce leaves. Their purpose is to show humility in a day’s travel and potential success in harvesting caribou. Sayisi Denesųłiné in Manitoba leave offerings “when we came to a place where there was a lake and animals, we would put a rock in the water in thanks” (Bussidor and Bilgen-Reinart 1997:34). Furthermore, Bussidor and Bilgen(1997:34) explain, &quot;[e]verything we did was balanced with respect&quot;</td>
</tr>
</tbody>
</table>
Ritualised behaviour during menses

Menstrual taboos and respect

Hearne (1795:314-315) explains, “[o]n those occasions a remarkable piece of superstition prevails among them; women in this situation are never permitted to walk on the ice of rivers or lakes, or near the part where the men are hunting beaver, or where a fishing-net is set, for fear of averting their success. They are also prohibited at those times from partaking of the head of any animal, and even from walking in, or crossing the track where the head of a deer, moose, beaver, and many other animals, have lately been carried, either on a sledge or on the back. To be guilty of a violation of this custom is considered as of the greatest importance; because they firmly believe that it would be a means of preventing the hunter from having an equal success in his future excursions.”

The shaking tent ceremony is an excellent example of how a dreamer works with their *inkonâge*. A tall and narrow lodge is set, covered with hide. The adept enters the lodge and calls his spiritual helpers (McCormack 2011:153). The tent sways with the arrival of the spirits. The spirits converse with each other and the adept (Brown and Brightman 1988:104). Eventually, in a trance the shaman channels the spirit that has come to the fore. Members of the audience then directly ask the spirits for information and assistance (Tanner 1979:112-113). The ritual concludes once the adept breaks their trance. Shaking tent ceremonies are means to seek knowledge, to cure illness, and to ward off sorcery (Whidden 2009:10-30). Adepts usually perform them in front of an audience as part of a public community social event (Brown and Brightman 1988:152; Henriksen 2009:63-92). Samuel Hearne recounted his experience with an ancient form of the shaking tent ritual:

On such extraordinary occasions a conjuring-house is erected, by driving the ends of four long small flicks, or poles, into the ground at right angles, so as to form a square of four, five, six, or seven feet, as may be required. The tops of the poles are tied together, and all is close covered with a tent-cloth or other skin, exactly in the shape of a small square tent, except that there is no vacancy lest at the top to admit the light. In the middle of this house, or tent, the patient is laid, and is soon followed by the conjurer, or conjurers. Sometimes five or six of them give their joint-assistance; but before they enter, they strip themselves quite naked, and as soon as they get into the house, the door being well closed, they kneel round the sick person or persons, and began to suck and blow at the parts affected, and then in a very short space of time sing and talk as if conversing with familiar spirits, which they say appear to them in the shape of different beasts and birds of prey. When they have had sufficient
conference with those necessary agents, or shadows, as they term them, they ask for the hatchet, bayonet, or the like, which is always prepared by another person, with a long string fastened to it by the haft, for the convenience of hauling it up again after they have swallowed it; for they very wisely admit this to be a very necessary precaution, as hard and compact bodies, such as iron and steel, would be very difficult to digest, even by the men who are enabled to swallow them. Besides, as those tools are in themselves very useful, and not always to be procured, it would be very ungenerous in the conjurers to digest them, when it is known that barely swallowing them and hauling them up again is fully sufficient to answer every purpose that is expected from them (Hearne 1795:191).

In the shaking tent, Denesųłiné ask the spirits, including caribou spirits and their associates such as Betsóne Yeneca, “His-Grandmother Raised-Him,” to intervene on their behalf (Goddard 1912:14; Ingold 2000:105; McCormack 2010:153). When adepts of inkonzę ask for spiritual assistance from caribou in the shaking tent, they reinforce the rapport between Denesųłiné and caribou. Rituals assist in providing a perception of possessing some control over the risk, and when the spirits grant assistance, ensure that caribou will return to the Denesųłiné.

8.3. Disrespect and Denesųłiné Rules of Behaviour

Denesųłiné, especially elders, express concern about activities disrespectful to caribou. In one case in the early 1990s, Cree hunters following the George River herd voiced anxiety about what they called a disrespectful harvest of caribou and told the story of when caribou abandoned the Cree after an ill-fated harvest in 1911 at Limestone Falls in northern Quebec (Berkes 1999:101-103). The story is both an admonition and a reminder of proper etiquette. In retelling it, the elders ensure that hunting practices are respectful to caribou (Berkes and Turner 2006:483). Conversations with AD5, AD8, and AD10 explained that animal counts, satellite collar tracking, and poor hunting practices show disrespect (AD5-6; AD8-1; AD10-2). While visiting with AD1, AD2, and AD3, they related that harvesters need to follow the cultural rules otherwise “there will be hardship” (AD1-2), “[h]unts will be unsuccessful” (AD2-1), and “[c]aribou will not return” (AD3-1). Kaj Birket-Smith heard Denesųłiné at Churchill, Manitoba say that “[i]n order not to
offend the souls of the game and thereby bring down their anger on one, special regard must be paid to them" (Birket-Smith 1930:80).

Sentiments about respect for caribou also appear in historical literature. George Blondin, a Sahtu elder, presented nine overarching Dene laws:

The laws are to: share what you have, help each other, love each other as much as possible, be respectful of elders and everything around you, sleep at night, work during the day, be polite and don't argue with anyone, young girls and boys should behave respectfully, pass on the teachings, and be happy at all times (Blondin 1997:71-72).

I learned from interviews with Athabasca Denesųliné that hunters in these communities take pride in their list of rules that govern the chase. Descriptions recorded by Larry Hewitt alluded to this list (Holland and Kkailther 2003). Data contained in interviews from Łútsël K’é (Kendrick 2003:183-185), and to a lesser degree with Sahtu (Wray 2011:101) supplement the list. These rules involve relationships to humans, to non-humans, and to the land (Table 8.3). Overall, Denesųliné are to help each other, share, respect elders and their knowledge, and follow rules that govern ways of learning and teaching. Learning is inductive and honours performance and observation, so teaching is about sharing wisdom and experiences. Denesųliné strive to use all parts of the animal, process meat as much as possible, and ensure wounded caribou die.

<table>
<thead>
<tr>
<th>Rule</th>
<th>Description</th>
<th>Comments</th>
<th>Source</th>
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<tbody>
<tr>
<td>All living things are equal</td>
<td>Equality is a basic tenet of Denesųliné worldview</td>
<td>Denesųliné are part of the natural world, not above it</td>
<td>Kendrick 2003:183</td>
</tr>
<tr>
<td>Help fellow community and family members</td>
<td>Aid family remembers in times of stress</td>
<td>Providing assistance is a reciprocal relationship that would ward off starvation</td>
<td>Kendrick 2003:183</td>
</tr>
<tr>
<td>Honour and provide for the elders and the generations to come</td>
<td>Respect should be given to elders</td>
<td>In the 1770s, a different view of elders was held (Hearne 1795:203-204)</td>
<td>Kendrick 2003:183</td>
</tr>
<tr>
<td>Do not laugh at caribou</td>
<td>Do not talk smart at caribou</td>
<td>Caribou are to be respected. Speaking poorly of them is disrespectful</td>
<td>Wray 2011:100</td>
</tr>
<tr>
<td>Rule</td>
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<td>Comments</td>
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</tr>
<tr>
<td>Share meat</td>
<td>Meat is shared</td>
<td>Father Gamache explains, &quot;[s]tealing was taboo, although meat was a common article. If there were meat, it belongs to anybody. But stealing, no I would say about thirty years ago stealing was hardly known.&quot; (Holland and Kkailther 2003:115)</td>
<td>AD1-2; AD10-2; Holland and Kkailther 2003:115; Kendrick 2003:183</td>
</tr>
<tr>
<td>Don’t waste meat</td>
<td>Leaving meat behind is disrespectful. Caching with the intention to return later is allowed. Abandonment of meat caches is discouraged</td>
<td>In the NWT wasting meat is against the law. However, ‘waste’ is a moral judgment. The beneficiaries of hunting excess meat constitute the food chain in the boreal forest. Feeding caribou meat to dogs is against the law in the Northwest Territories (Wray 2011:101)</td>
<td>AD10-2; Wray 2011:101</td>
</tr>
<tr>
<td>Split the kill between hunting partners</td>
<td>The numbers of animals are equally split between the members of a hunting party</td>
<td>The number of caribou killed by an individual does not matter. Instead, the total number of harvested caribou is shared evenly</td>
<td>AD10-2</td>
</tr>
<tr>
<td>Wait for each other when hunting</td>
<td>Do not leave people behind</td>
<td>This rule is not always followed</td>
<td>AD10-2</td>
</tr>
<tr>
<td>Learn by watching</td>
<td>Traditional practices are taught through observation and apprenticeship</td>
<td>Usually, one-on-one instruction is done</td>
<td>AD6-2; AD10-2</td>
</tr>
<tr>
<td>Use all parts of the animal</td>
<td>All parts of caribou can be utilized, including stomach, rumen, intestines, hooves</td>
<td>These items (rumen, hooves) are commonly left behind at kill sites</td>
<td>AD1-1; AD2-2; AD3-1</td>
</tr>
<tr>
<td>Leave antlers at the kill site</td>
<td>If antlers are not needed, leave antlers at the kill site</td>
<td>Antlers can be collected to make tools</td>
<td>AD10-2</td>
</tr>
<tr>
<td>Do not shoot caribou for fun</td>
<td>Take caribou only in need. Excess caribou should not be harvested</td>
<td>Hunting for sport is disrespectful</td>
<td>AD1-2; AD5-6; AD13-1; Wray 2011:101</td>
</tr>
<tr>
<td>Do not hit caribou with a stick</td>
<td>Associated with a legend where caribou left after a person decided to own caribou</td>
<td>The morale of the story was that no one has the right to own caribou</td>
<td>Holland and Kkailther 2003:68; Breyant 1955:49-50</td>
</tr>
<tr>
<td>“Wounded caribou, you kill it”</td>
<td>Wounded caribou must be killed</td>
<td>The intention is to put injured caribou out of their misery and to ensure that the kill is completed</td>
<td>AD10-2</td>
</tr>
<tr>
<td>Do not chase caribou with a snow machine</td>
<td>Do not run caribou to exhaustion</td>
<td>Caribou will not return if disrespected in this manner</td>
<td>Kendrick 2013:184</td>
</tr>
<tr>
<td>Rule</td>
<td>Description</td>
<td>Comments</td>
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<tr>
<td>Remove the tip of the heart</td>
<td>The tip of the caribou’s heart is removed during butchery</td>
<td>I am unsure why this is done</td>
<td>Observed at Selwyn Lake (See Chapter 5)</td>
</tr>
<tr>
<td>Caribou heads enter the back of the tents</td>
<td>Caribou heads are treated differently than other caribou bones. Heads are brought into tents and houses from the back door</td>
<td>This applied to moose heads as well</td>
<td>AD1-3</td>
</tr>
<tr>
<td>Women do not step over caribou blood</td>
<td>Women do not step over caribou blood. Caribou blood is removed from paths. For instance, blood on snow is moved off a pathway by a snow shovel</td>
<td>Observed at Selwyn Lake (See Chapter 5)</td>
<td>Observed at Selwyn Lake (See Chapter 5)</td>
</tr>
<tr>
<td>Sites are cleaned up when abandoned</td>
<td>Sites are cleaned up when abandoned; wherein, garbage is collected and burned</td>
<td>While, most items are cleaned up, tent poles are left at site</td>
<td>Observed at Selwyn Lake (See Chapter 5)</td>
</tr>
<tr>
<td>Haul caribou to shore</td>
<td>Don’t leave caribou all over lakes in winter</td>
<td>Generally, caribou are hauled near the shore during initial butchery (see Chapter 5)</td>
<td>Kendrick 2003:185; AD4-6; AD10-2</td>
</tr>
<tr>
<td>Cover caribou remains with skin or snow</td>
<td>Caribou meat is covered to protect it from predators</td>
<td>This especially relates to meat caches</td>
<td>Kendrick 2003:185</td>
</tr>
<tr>
<td>Process meat as practical</td>
<td>Once meat is brought into a house or camp, it should be treated right away</td>
<td>Do not want meat to go bad, or to have blood on the floor</td>
<td>Kendrick 2003:184</td>
</tr>
<tr>
<td>Don’t leave animal remains around outside</td>
<td>Specifically, gather up animal remains, including bone. Birket-Smith (1929b:80), explains that: “[d]ogs must never gnaw caribou heads or the bones of furred animals and therefore they must be burned or placed in a tree to keep away from the dogs”</td>
<td>This is not always done (see Chapters 5 and 6)</td>
<td>Birket-Smith 1929b:80; Kendrick 2003:183</td>
</tr>
</tbody>
</table>

Abusing caribou is about the worst transgression that a hunter can commit. Denesųłiné are not to talk smart about caribou, chase caribou, or kill for pleasure. Talking smart includes bragging, insulting, or otherwise talking about caribou as a non-equal. However, leaving portions of animal carcasses after a hunt is not waste. Rather it is one link in the food chain that benefits wolves, wolverines, and even the smaller
rodents that leave gnaw marks on the bones and antlers. Denesųlinė are to clean up campsites and protect meat from predators. Women are not to step over caribou blood. By following these rules, Denesųlinė maintain good relations with each other, caribou, and the land.

Many of these rules are pragmatic and center on best practices for the bush, such as sharing the harvest, using all parts of the animal, and keeping campsites clean. Some reflect a different rationality that focuses on the relationship between caribou and harvesters. Based on interviews at Łútsël K’é:

However, starvation is not part of Denesųlinė cultural narratives as it is in other cultures. Although the absolute necessity of elder's knowledge of caribou ecology and metaphysical human-caribou relations for the purposes of survival have diminished, its role in the management of caribou and cultural identity and spiritual well being is recognized by community members as still relevant and important (Kendrick 2003:167).

The various ways they show respect for the herds work together to safeguard caribou availability since they connect survival with cultural practice, and point out that "[t]he gift of survival, [is] that gift of traditional skills passed from generation to generation" (Bussidor and Bilgen-Reinart 1997:4). To honour the animals, Denesųlinė leave antlers at the kill sites, remove the tips of hearts, and bring heads through the back of lodges (AD1-3; AD2-4; AD3-3). Similarly, some rules are about showing humility to caribou, such as rules to not laugh at, chase, or hit caribou with a stick.

When I asked if there were specific rules to show respect for caribou, at different times, the responses from AD1, AD2, AD3, and AD8 included the story "Do Not Hit Caribou with a Stick" (AD1-2; AD2-3; AD3-2; AD8-1). This story is also known as "How the Caribou came Back to Man" (Birket-Smith 1930:90-91). This story’s moral is that there are consequences of not following the rules (Birket-Smith 1930:90-91). Betsy Anderson from Tadoule Lake provides an abridged version of “Do Not Hit Caribou with a Stick”:

...one year, there was a lot of caribou everywhere. The people had lots to and lots of hide to keep them warm. A young Sayisi Dene woman walked up to one of the caribou and tagged it on the ear with a piece of hide dyed
with berries. "Next year when the caribou come back,' she said, "I'll know that this one is mine. You will be able to identify it because my tag will be on its ear." But the caribou were offended. It wasn't right for somebody to claim ownership to any animal in the herd. They decided to go away. Next year, people kept looking for signs of the caribou, but they saw none. All over the land, the Dene were starving. Their clothes made of caribou hide became tattered. The caribou stayed away. This went on for years. Finally, some medicine men got together to figure out a way to find the caribou and to make them return. One of the medicine men set out on a long journey to look for the caribou. He traveled far away. Other animals helped him along the way. A loon and a swan helped him cross a big lake. At long last, he found the caribou herd. He transformed himself into a warble fly, and he crawled under the skin of the caribou, near his ear. He talked to the animal who was the leader of the herd. "My people are starving", he said "We need you to come back". The caribou agreed to return, but on one condition. "As long as the people live and as long as you depend on us", said the caribou, "don't ever allow anyone to claim ownership of us again". The young girl who had tagged the caribou had to remove that tag and ask for forgiveness. The caribou roamed free after that. They were there when the people needed them (Bussidor and Bilgen-Reinart 1997:10).

AD1 shared the same story at Wholdaia Lake (AD1-3). The morale of this story extends beyond Denesųłiné, as it is also a tradition of Sahtu Dene.

There are negative outcomes for people who do not meet the obligations to respect caribou. For example, there are correct and incorrect ways to kill caribou; an oft-heard statement throughout Denendeh warns against hitting caribou with sticks. In cases where this occurs, results include the caribou avoiding the person and sometimes the community of those who did the deed (Wray 2011:91).

In the winter of 2005-2006, when the caribou did not come to Colville Lake, Sahtu Dene suggested that their absence was due either to increased oil and gas activities in the area or because a young person had hit a caribou with a stick the previous winter (Wray 2011:93). To explain the apparent disappearance of caribou from near Fond du Lac from 2005 to 2010, Denesųliné proffered that caribou stayed away because of the disrespect demonstrated when a toboggan packed full of caribou meat was purposefully burned (Sylianidou 2010:79). The concern is that if people treat caribou poorly, they will not return. Likewise, Father Mégret related that Denesųliné rebuke individuals who break this rule:
I saw a young guy one time; he came from the south. He was four years old. He was trying to break a caribou bone, and he held the knife by the blade and was hitting it with the handle. His grandfather jumped up and said "don't do that". They said it was bad luck. The caribou would disappear. That tradition is disappearing slowly (Holland and Kkailther 2003:68).

In a similar fashion, Father Breyant caused a major scandal in the fall of 1899 when he once struck a caribou with the butt of a rifle (Breyant 1955:49-57). His actions shocked the Denesųłinė near Fond du Lac “for they believe that the spirit of the caribou thus struck would tell all the rest of its races. These would never return and very shortly there would be disastrous famine” (Breyant 1955:49). For older Denesųłinė, biological counts are disrespectful to caribou because they think it is an insult to count them (Bussidor and Bilgen-Reinart 1997:2; Holland and Kkailther 2003:166).

8.4. Chapter Summary

Ethen-eldèli Denesųłinė emphasize practices that show respect for caribou in times of stress. Ritual and ceremony reinforce the spiritual connection between harvesters and caribou, such as with drum songs that connect people to caribou. Similarly, divination rites that harness inkonįje mollify anxiety by influencing where, when and how to hunt caribou. The lessons from such stories as “Do not hit Caribou with a Stick” and “His-Grandmother-Raised-Him” highlight rules for sharing, using everything possible from the caribou, and treating heads with respect. Physical handling methods (i.e., how people touch caribou) follow protocols that guarantee Denesųłinė show due respect to their prey. These rules operate at a spiritual level in which ritualised behaviour exhibits humility and admits their helplessness in controlling caribou.

Denesųłinė believe that their actions affect caribou noting that disrespectful behaviours decrease caribou availability. These actions link to cosmological and transformative relationships between the individual and caribou. Without fortifying this powerful relationship, the identity and resilience of Denesųłinė society would diminish. Thus teaching wise hunting practices shows respect for caribou and safeguards their presence, and thus the survival of the Ethen-eldèli Denesųłinė.
Chapter 9. Caribou is Life: The Changing Ethen-eldèli Denesųłiné Relationship with Caribou

Without caribou, the Ethen-eldèli Denesųłiné would simply not be. Herein I reflect on how caribou provide the Denesųłiné with the life force they need to survive. With this chapter, I show that the ever-changing Denesųłiné relationship to caribou moderates and reinforces the resilience of their traditions, practices, and activities to sustain existence. First, I review the goals of and the dissertation, highlight results, then address how Denesųłiné part in the co-management of the herds safeguard caribou, and explain how habitat degradation related to climate change and industrial development will harm caribou. Thirdly, I examine how Denesųłiné teach respect for caribou to harvesters amid educational and economic challenges. Then I share a reflexive discourse on the associated benefits and challenges of using a community-oriented approach.

I insist that northern and remote communities are resilient, viable, independent, and strong despite government interventions. Then I show that archaeological practice, including ethnographic archaeology, is a tool for indigenous communities to develop their own solutions that use the past to inform the present and plan for the future. Further research should be directed by communities to address their own issues and concerns. And last, I conclude by affirming how, for Denesųłiné, caribou is life.

I initially asked how does the relationship between the Ethen-eldèli Denesųłiné and the Beverly and Qamanirjuaq caribou herds maintain cultural continuity? To address this, I developed the following research goals:

1. Document the relationship between the Ethen-eldèli Denesųłiné and the caribou

2. Identify social and technological mechanisms that influence the resilience of the Ethen-eldèli Denesųłiné
3. Describe the use of travel ways of the Ethen-eldèli Denesųłiné in relation to caribou

4. Document the role of the ethnoarchaeological record in the construction of heritage

5. Identify past and current seasonal rounds and use of the land by the Ethen-eldèli Denesųłiné

6. Shed light on how Ethen-eldèli Denesųłiné establish their traditional territories and manage change

7. Seek to benefit northern people and their discourse by engaging ethnoarchaeological data and perspectives in documenting lifeways

8. Assess the advantages and disadvantages of the community-oriented research adopted here

Each chapter in the dissertation addressed sub-questions on how the Denesųłiné relationship to caribou is adaptive and reinforces cultural resilience.

In Chapter 2, I documented the relationship between the Ethen-eldèli Denesųłiné and the caribou by showing how caribou became their preferred prey. Then in Chapter 3, I established how caribou and Denesųłiné travel together through the seasons. I described caribou hunting in Chapter 4 to identify social and technological mechanisms that influence the resilience of the Ethen-eldèli Denesųłiné. I was taught how Denesųłiné provide for themselves including the methods and variations in how different individuals and social groups harvest and handle caribou. I also documented how Denesųłiné butcher, store, and eventually dispose of caribou.

An ethnographic and archaeological survey of the Wholdaia Lake caribou crossing in Chapter 5 showed how the Denesųłiné structured their harvest at water crossings, and identified that past strategies to keep dry meat campsites clean in the
1960s were reduced in the 1970s at a semi-permanent village on the north shore of the lake. I connected in Chapter 6 sites at Wholdaia I Samuel Hearne and Matonabbe’s 1771 and J. B. Tyrrell’s 1893 accounts of their journeys through the barrenlands. These accounts showed continued presence of Denesųłiné at Wholdaia Lake, including the operation of a caribou pound in 1771.

I wove together the threads from archaeological surveys, interviews, and histories together in Chapter 7 to comprehend the nature of Denesųłiné resilience. These showed that cultural practices and activities were flexible and allowed Denesųłiné to reconfigure older cultural elements and integrate new technologies. The Ethen-eldéli Denesųłiné interactions at frontiers with their neighbours showed how traditional territories were established, managed, and changed.

I characterized in Chapter 8 the Denesųłiné spiritual and ceremonial relationship to caribou, clarifying how they know about caribou through *inkonxe*, ceremonies, and divination rites, and spiritually connect with individual caribou. Because Denesųłiné believe that caribou will abandon people when they do not act appropriately, rules of harvest prevent disrespect. As such, cultural resilience is as much governed by how individuals navigate spiritual and ceremonial contexts as the physical means of sustenance.

### 9.1. Safeguarding Caribou

Denesųłiné co-manage responses to the changes that affect the caribou herds through the Beverly and Qamanirjuaq Caribou Management Board. Co-management with the BQCMB enables sustainable harvests of caribou (Kendrick 2000:1-29). Over the course of this study, caribou herds have declined. I observed first-hand the decreased availability of caribou for Ethen-eldéli Denesųłiné. Since 2010, only Qamanirjuaq caribou have been harvested by Fond du Lac, Black Lake, and Hatchet Lake Denesųłiné First Nations, while the Beverly herd is now too inaccessible, and restrictions have been placed on other caribou harvests in northern Canada. Moratoriums have been applied to the Bathurst and George River herds by territorial, provincial and some indigenous
governments, and hunting restrictions (i.e., quotas and 80 percent bull harvests) have been implemented for the Bluenose East and West herds (Government of Northwest Territories 2016:1; Wek’eezhi Renewable Resource Board 2016:7). In 2016, only the Porcupine, Beverly, and Qamanirjuaq caribou herds are without restrictions for indigenous harvesters.

Climate change has had a dramatic impact on caribou. The Beverley herd has abandoned its traditional calving ground and now calve on the edge of the Arctic Ocean along Queen Maud Gulf. Also, the frequency and extent of forest fires have increased on the caribou range. Only 15 percent of caribou winter habitat remains because 85 percent of the forested winter caribou habitat has burned since 1948. The Denesųłiné believe it is disrespectful to caribou not to suppress wildfires. AD4 questions, “[i]f they have the means, why can’t they put out the fires?” (AD4-7). Most provincial and territorial governments cannot afford to put out all of the fires. With a limited budget, the governments are protecting people first, and caribou last. While Denesųłiné seem to accept this reality, they still insist more can and should be done. They phrase it this way, “show respect for caribou, put the fires out” (AD4-7). Ongoing challenges to caribou are being assessed and managed by the BQCMB, which is trying to avoid moratoriums that limit or fully curtail harvest. Additionally, human population growth and industrial development affect caribou. Settlements increasingly centralize populations. Roads have expanded on the southern fringe of the winter range (Gunn, Russell, and Eamer 2011:14).

Roads such as the Athabasca Seasonal Road to Stony Rapids provide new access to caribou by unregulated hunters from southern Canada (Wakelyn 1999:4). A list of existing and proposed linear developments on the Beverly and Qamanirjuaq caribou ranges indicate there are 3,599 km of existing roads on the caribou range: 2,063 km of all-season and 1,536 km of winter roads (Table 9.1). There are proposals for 1,511 additional kilometres of road on the range: 1,311 km of all-season and 200 km of winter roads (Figure 9.1). Roads continue to be proposed and occasionally built on the caribou range to connect communities and resource development areas, especially mines (BQCMB 2014:9-10). For the Bathurst herd, the winter road to the Diavik Mine
assists fast snowmobiles that allow hunters to find caribou if they travel far distances (Nesbit and Adamczewski 2013:11). Roads also increase hunting pressure, and the mortality of wildlife due to collisions, and also interfere with seasonal migrations, such as sensory disturbances from the traffic and road dust that induce disorientation (Cameron et al. 2005:1; Nesbitt and Adamczewski 2013:21). While there are significant economic benefits to Canada and local peoples from mines and their infrastructure, there are negative consequences for caribou and their harvesters.

Table 9.1. Linear Developments on the Beverly and Qamanirjuaq Caribou Range.

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Name</th>
<th>Jurisdiction</th>
<th>Length (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing all season road</td>
<td>Fort Resolution to Fort Smith</td>
<td>NT</td>
<td>295</td>
</tr>
<tr>
<td>Existing winter road</td>
<td>Fort Smith to Fort Chipewyan</td>
<td>AB</td>
<td>228</td>
</tr>
<tr>
<td>Existing winter road</td>
<td>Fort McMurray to Fort Chipewyan</td>
<td>AB</td>
<td>280</td>
</tr>
<tr>
<td>Existing all season road</td>
<td>La Loche to Cluff Lake Mine (Highway 995)</td>
<td>SK</td>
<td>245</td>
</tr>
<tr>
<td>Existing winter road</td>
<td>Cluff Lake Mine to Lake Athabasca</td>
<td>SK</td>
<td>75</td>
</tr>
<tr>
<td>Existing all season road</td>
<td>Key Lake Road (to Uranium Mine)</td>
<td>SK</td>
<td>20</td>
</tr>
<tr>
<td>Existing all season road</td>
<td>Highway 905 to Wollaston Landing</td>
<td>SK</td>
<td>400</td>
</tr>
<tr>
<td>Existing all season road</td>
<td>Athabasca Seasonal Road to Stony Rapids</td>
<td>SK</td>
<td>220</td>
</tr>
<tr>
<td>Existing winter road</td>
<td>Stony Rapids to Fond du Lac (Lake Athabasca)</td>
<td>SK</td>
<td>100</td>
</tr>
<tr>
<td>Existing winter road</td>
<td>Wollaston Landing to Wollaston Post (Wollaston Lake)</td>
<td>SK</td>
<td>46</td>
</tr>
<tr>
<td>Existing all season road</td>
<td>Leaf Rapids to Lynn Lake and Kinoosao</td>
<td>MB</td>
<td>203</td>
</tr>
<tr>
<td>Existing all season road</td>
<td>Leaf Rapids to South Indian Lake</td>
<td>MB</td>
<td>88</td>
</tr>
<tr>
<td>Existing all season road</td>
<td>Thompson to Gillam (via Split Lake)</td>
<td>MB</td>
<td>296</td>
</tr>
<tr>
<td>Existing all season road</td>
<td>Thompson to Gillam (via York Landing)</td>
<td>MB</td>
<td>296</td>
</tr>
<tr>
<td>Existing winter road</td>
<td>Road to Wekwaiti</td>
<td>NT</td>
<td>207</td>
</tr>
<tr>
<td>Existing winter road</td>
<td>Tibbit to Contwoyto winter road (Tibbit to Ekati Diamond Mine)</td>
<td>NT</td>
<td>405</td>
</tr>
<tr>
<td>Existing winter road</td>
<td>Tibbit to Contwoyto winter road (Ekati Diamond Mine to Contwoyto Lake)</td>
<td>NT/NU</td>
<td>195</td>
</tr>
<tr>
<td>Proposed winter road</td>
<td>Virgin River winter road (Key Lake to Points North)</td>
<td>SK</td>
<td>120</td>
</tr>
<tr>
<td>Proposed all season road</td>
<td>Manitoba-Nunavut Road Proposal: Gillam to Churchill, Arviat, Whale Cove and Rankin Inlet</td>
<td>MB/NU</td>
<td>1100</td>
</tr>
<tr>
<td>Proposed winter road</td>
<td>Kiggavik Mine Road (Rejected by Nunavut)</td>
<td>NU</td>
<td>80</td>
</tr>
<tr>
<td>Proposed all season road</td>
<td>Bathurst Inlet Proposed Road (Contwoyto Lake to Bathurst Inlet Port)</td>
<td>NU</td>
<td>211</td>
</tr>
</tbody>
</table>

Source: After BQCMB 2014:9-10.
9.2. Using Heritage to Teach Respect for Caribou

The key to sustainability is the Denesųłiné belief that respectful behaviour keeps caribou near. Teaching respect for caribou by community elders to their youth is one example of the intergenerational transfer of knowledge. From my observations, I note that Fond du Lac, Black Lake, and Hatchet Lake Denesųłiné First Nations lead a traditional lifestyle by living off the land more out of necessity than as a conscious effort.
to preserve their mode of life. A total of 36,000 people live in northern Saskatchewan. Of these, 46 percent live on reserve. In 2010, 32 percent of the population was under the age of 15 (Irvine et al. 2011:3). Regional health agencies acknowledge a variety of social factors that affect human health trajectories: economics, education and employment, physical environment, social environment, and health practices (Irvine et al. 2011:8).

The Athabasca Health Authority (AHA) includes Fond du Lac, Black Lake, and Hatchet Lake Denesųliné First Nations. Figure 9.2 presents the age structure of a total population of 2,557 within the AHA. This figure also depicts the average population pyramid for Saskatchewan as a comparison. A very young population resides in the AHA, which has the highest percentage of <15-year-olds in the province. In 2000, it was 37.5 percent. In 2010, it was 35.0 percent (Irvine et al. 2011:29). This is a comprehensive comparative dataset with all of the communities of northern Canada represented (Irvine et al. 2011:32). The AHA has the lowest per annum residence mobility rate in Northern Canada at 8.2 percent. The five-year mobility rate is 14.0 percent (Irvine et al. 2011:35-36). This means that people do not regularly move out of the communities, or move homes within the community. The AHA has the lowest median before-tax income for people 15 years and over in northern Canada, which is 11,296$. Their income is less than half the Saskatchewan average of 23,755$ and Canadian average of 25,615$ (Irvine et al. 2011:44).
The AHA has the lowest levels of education attainment in northern Canada and the lowest level of high school graduates (Table 9.2). For the cohort aged 25-29 years old, only 26.5 percent have completed high school. For the group within the age bracket of 25 to 54 years old, only 23.7 percent completed their secondary education (Irvine et al. 2011:56). The AHA also has the second lowest employment rate in northern Canada (Irvine et al. 2011:61). Overall, this means that the population who live in the AHA face significant educational and economic challenges. These challenges may account for their maintaining a traditional lifestyle out of economic necessity and make any education campaign in the Athabasca Health Authority difficult.
Table 9.2. Levels of Education for the Athabasca Health Authority.

<table>
<thead>
<tr>
<th>Educational Attainment</th>
<th>Athabasca Health Authority (%)</th>
<th>Saskatchewan (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Certificate, Diploma or Degree</td>
<td>77.3</td>
<td>30.2</td>
</tr>
<tr>
<td>High School Certificate or Equivalent</td>
<td>7.6</td>
<td>26.8</td>
</tr>
<tr>
<td>College / Non-university Certificate or Diploma</td>
<td>2.7</td>
<td>14.6</td>
</tr>
<tr>
<td>Apprenticeship / Trades Certificate / Diploma</td>
<td>5.8</td>
<td>11.3</td>
</tr>
<tr>
<td>University Certificate / Diploma / Degree</td>
<td>4.8</td>
<td>12.9</td>
</tr>
<tr>
<td>University Certificate / Diploma Below the Bachelor Level</td>
<td>1.7</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Source: Data from Irvine et al. 2011:52.

Since the late 1980s, northern communities are becoming more complex and chaotic, thus placing burdens on youth who must grapple with understanding their cultural identities (Hansen and Antsanen 2016: 3-6; Kruchak 2016:1; Wray 2011:86). Harvesting caribou is considered an antidote to this anomie as it offers a means to re-engage with customary practices. Many communities have educational programs dedicated to teaching cultural knowledge (Wray 2011:86). Northern peoples want to make sure everyone harvests caribou properly and with respect. Oral traditions indicate respectful hunting maintains the health of the herds and community well-being.

One example is the Yukon First Nation collaboration with Carcross-Tagish First Nation, Champagne and Aishihik First Nations, Ta’an Kwach’an Council, Tr’ondëk Hwëch’in First Nation, Sheila Greer, and Catherine Bell on applying an indigenous approach to “heritage resource management … law, policy and practice” in the Yukon (Carcross-Tagish First Nation et al. 2016:2). This includes honouring long-standing cultural responsibilities for objects and sites, reinforcing traditional knowledge policy, and respectful collaborative stewardship of Yukon First Nations knowledge and resources (Carcross-Tagish First Nation et al. 2016:71-72).

Another such example is the work of the Sahtúot’įnę (Great Bear Lake) people of Déline, Northwest Territories (Bayha 2012:26-29). Teachers demonstrate traditional skills and ways of knowing that encourage listening and observing, augmented by a few questions. Their intent is to “develop relationships with everything, with caribou,” with wolves, with the land (Bayha 2012:28). Sometimes to move forward, people have to break with custom. Such is the case with “[n]ew knowledge systems. People hesitate.
They dismiss things. If it is not in the learning systems that we have, the universities and all of the learning systems that we have, we dismiss them” (Bayha 2012:28). Breaking with tradition requires a big sacrifice, so the payoff has to be substantial.

I realized right away with my people is that they learn things from caribou by observing. There’s no other way. I can’t go up to a caribou and ask him, you know, how do you feel today or what do you think about all of this development? You have to watch, observe and note behaviour. Our people have been doing that for thousands of years. Where do you find the caribou? In the stories, on the land. And in observing caribou, we learn something about what it means to be Dene (Bayha 2012:28).

Communities have to be cognizant of the challenges posed by technological change and how they preserve and conduct their cultural practices.

It is crucial that cultural and spiritual connections to the land and traditional customs and values be passed on to youth. This has become very challenging in recent years as the variety and availability of modern distractions has increased. The use of social media for barter and trade of caribou has recently emerged as a major issue that is causing an accelerating impact on the caribou herds (BQCMB 2014:7).

Knowledge sharing occurs at community feasts and ceremonies. Hunting teaches wilderness survival and the principles, laws, and rules of caribou harvest. Harvests also provide materials for crafts and ceremonies. The production of crafts and participation in ceremonies are important bonding experiences for the people involved (BQCMB 2008:1).

The true value of caribou for Aboriginal people is reflected in the strong traditional, cultural and spiritual relationship that exists between the people and animals. Harvesting caribou and other activities associated with use of caribou (e.g. for ceremonies and community feasts) continue to have enormous social and cultural values for maintaining traditional cultures for both present and future generations (BQCMB 2014:14).

Regarding stewardship, “[r]espectful and knowledgeable harvesting practices of indigenous people will be the best and cost effective approach in caribou management” (Ruttan 2010:77). Therefore, the BQCMB has a strong focus on education.
The Ethen-eldèli Denesųłinė and the BQCMB focus on teaching respectful hunting practices. Education priorities of the BQCMB (2014:47) are to:

- Increase efforts to educate hunters about the wise use of caribou, with messages that include the importance of preventing wastage, taking only what they need and harvesting bulls instead of cows when herds are vulnerable.
- Respect the caribou in uses of the caribou (including in their harvest) and transfer that respect to younger generations by promoting youth learning from elders.
- Share the importance of mentoring young hunters, encouraging good hunting promoting good practices, and “positive peer pressure.”
- Identify and teach good hunting and meat practices.
- Acknowledge the valuable role communities can play in caribou management and conservation.

The Athabasca Denesųłinė have the lowest educational attainment and income in northern Canada. There is a young and growing population of Ethen-eldèli Denesųłinė that will have to contend with local education and economic challenges. As shown earlier, Denesųłinė live a traditional lifestyle out of necessity. Therefore, caribou harvests may increase as the Denesųłinė populations grow and mature, placing more pressure on herds; thus it will be more pertinent to manage caribou harvest levels. Hunters may have to take fewer animals and continue to develop ways to reduce wounding losses through education initiatives. Teaching respectful caribou hunting practices now occurs at culture camps rather than on the family trapline. This is where elders now connect to youth and perform the intergenerational transfer of knowledge. Denesųłinė Nation leadership, elders, and local educators organize the camps; local schools also bring the elders into the classroom and use Denesųłinė speech in their courses.

The Athabasca Denesųłinė have developed an education campaign to make sure that harvesters follow proper cultural protocols. In interviews, AD4 and AD5 report that cultural training initiatives have been underway since 2009 under the direction of elders and community leaders. The aim is to connect youth with them by visiting special places on the land during annual cultural camps (Giroux 2015:7). Representatives from the three Athabasca Denesųłinė communities spend a week on the land. Elders share
oral traditions about the country and recall their experiences as they followed herds. At the camps, youth learn the cultural protocols and rules of harvesting. Elders, leadership, and educators, including the principals and teachers at the local schools support these efforts. This program aligns with the training initiatives set out in the 2013-2018 BQCMB Plan (BQCMB 2014:46-47). The overall goals of the camps are for youth to learn sustainable ways to harvest caribou.

9.3. Benefits and Challenges of a Community-Oriented Approach

The following discussion bears on the objective of the study to assess the advantages and disadvantages of the community-oriented research adopted here. Community-directed research has benefits and challenges. Like other modes of participatory action research, it is at once engaging and quixotic. This investigation is of local interest and the community partners asked to focus on caribou. As time went on, I realized that it was an excellent choice. As indicated in earlier chapters, caribou occupy a central place in Ethen-eldèli Denesųliné culture. The community partners enjoyed working with caribou and note that community perspectives and concerns on caribou are very public. Discussions on herd size, sustainable harvests, and fire management produce synergy among the communities as they too adapt to understand their role in the local ecology. They wish to contribute their experience and observations from their long occupation of the land. Communities struggle with internal concerns over hunting practices. The community partners used the research to explore methods to teach wise hunting methods to youth. Simultaneously, data from the research fill a need for teaching materials. The Denesųliné felt that very little research data was confidential, and public input had its place. Knowledge holders only considered specific sacred stories as private.

This project grew from my long-term relationships with the Denesųliné. From the outset, we established information sharing protocols, and we maintained a good network of communication throughout the project. Community leaders and I agreed on the
research topic, objectives, and parameters. We also agreed on an interview vetting process, with the intent being to confirm and refine all data accrued from oral history. Reviewing allowed the collection of supplemental data. The process was useful for knowledge holders who then had the opportunity to hear their interview and to comment on the results. They also shared additional insights that they thought of after the initial conversations. Vetting ensured that proprietary and confidential information remained private. Community partners and I shared project results in public forums, such as at community meetings, leadership and working group meetings, and in high schools. Short, plain language summaries worked well to explain the project and its results. Poster presentations and PowerPoints with clear visuals were helpful. The visual aids shared, such as maps, photos, and drawings, elicited memories and anecdotes about certain places. Text was limited as our meetings were conducted in the local language. When I shared data publicly, community members directly involved in the study explained the research to their peers. Professional translators reviewed presentations before meetings.

Community-directed research poses many challenges. For instance, challenges were found integrating protocols from descendent communities in archaeological research at the Milolii Beach at Kaua‘i in the Hawaiian Islands (Kahn et al. 2016:1-12), combining academic and indigenous "interests, needs and sensitivities" with the Mohegan Archeological Field School (Cipolla and Quinn 2016:124), or having archaeology provide alternative histories to community-based knowledge such as the collaboration by the residents of Injinoo, in Cape York, Australia with Shelley Greer (Greer 2014:57-66). For this study, the greatest challenge was the significant time commitment. I collaborated with three independent first nations and the Athabasca Denesųłiné Né Né Land Corporation. These partnerships injected unknowns into the research agenda. The first was that access to two communities is limited through most of the year. Fond du Lac Denesųłiné First Nation and Hatchet Lake Denesųłiné First Nation are accessible by winter roads in frozen conditions from mid-January to early April, and by barge and chartered boats in summer. All of the communities were also accessible by air. Initially, I directly coordinated with three first nations. Arranging meetings and getting community interest took a long time, as did learning local protocols
to gain support, and heeding the advice of band managers and band councillors who had an interest in the work. This project was successful due to the assistance of the Athabasca Denesųłiné Né Né Land Corporation, which has a communication system to connect with the Athabasca Denesųłiné First Nations. As the first phase developed, I met with many additional jurisdictions to acquire assistance and relevant reports and any data I could garner. The Government of Saskatchewan Heritage Conservation Branch, Parks, Culture and Sport and the Prince of Wales Northern Heritage Centre in Yellowknife assisted the project. This included reviewing heritage permits and sharing archaeological data. For work in the Northwest Territories, I consulted with the Aurora Research Institute in Inuvik to ensure the research aligns with their processes. The list of research contacts included Saskatchewan Environment and Resource Management Conservation Officers, the Royal Canadian Mounted Police, and the Fourth Canadian Rangers Patrol Group. For presentation to the high schools, their principals and teachers assisted. Devising a communications strategy to apprise and update this diverse group of institutions and organizations was difficult. The assistance of the Athabasca Denesųłiné Né Né Land Corporation made it easier.

Changes in governments produced some unique challenges. The situation of the Athabasca Denesųłiné Né Né Land Corporation evolved over the course of the project from 2009 to 2016. Initially they were a department of the Prince Albert Grand Council. Afterwards, they became an independent organization. Over the course of the study the devolution of federal authority to the Government of Northwest Territories occurred. While the research was on the periphery of this change, I did observe periods of friction and adjustment within and between institutions and organizations in the body politic as the new configurations emerged. Nevertheless, I was under time constraints and the impact did affect the project. Community-directed research requires great patience. Moreover, I was rewarded with strengthened relationships with all parties involved. Collaborative projects need time to establish personal connections before launching any grandiose scheme to meet expectations of local research partners. Time, therefore, is the limiting factor for community-oriented approaches (Atalay 2012:29-54; Atalay et al. 2014:15). There is never enough of it. However, within the time allotted I let the research
develop and mature. It allowed community partners to explore things that mattered to them at their own pace.

Community meetings were opportunities to build a network and establish new dialogues. At preliminary meetings with the communities, various Denesųlinė spoke of their mistrust of archaeologists. Even the host communities that formed this partnership were initially apprehensive about the project and me personally. They feared that I would visit and excavate heritage sites across their territories and that I would collect and keep any artifacts for myself. I gained their trust when I explained that what I wanted was for the communities to guide the research. This created the conditions for the community partners to act in their capacity as guides. Their first major decision determined the project focus and more specifically its scope would explore the Denesųlinė relationship to caribou as icon, metaphor, and quarry. The second important decision was to conduct research in multiple seasons so that archaeological surveys took up the summer. In winter, I interviewed knowledge holders and accompanied them when they were on the land. The multi-season approach increased opportunities for participant observation. This research strategy appealed to research partners who wished to share their knowledge in a traditional manner. This meant living the cultural practices; therefore, most interviews were at camps in proximity to where the activities took place. The community partners wanted to be on the land and wanted me there. This meant that I conducted the research on lands away from the main communities.

Participation was essential for accruing observations. I watched, listened, and learned in a traditional manner. I saw that what people say they do, and what they do can be different. This led to understandings of the nuanced differences between intention and practice. Participant observation revealed the changes in caribou disposal at dry meat camps and villages (see Chapter 5). A benefit of the community-oriented approach was coupling ethnographic analogy with archaeological techniques to study Denesųlinė. This meant that the research could employ a direct historical approach to investigate the past 4,000 years represented in the local archaeological record. At the same time, the research could emphasize the recent past.
I was conscious of gender bias and limitations of focussing specifically on caribou. Initially, most of the local contacts were male so the interview questions focussed on their activities. Once I realized this bias, and the potential research implications (Pfeiffer and Butz 2005:263-264), I made additional efforts to find female knowledge holders and gain their perspective. I invested some time in learning how to make dry meat, which then provided an opportunity to understand how Denesųlinė women contributed to food procurement plans, and all parts of living on the land. By focussing exclusively on caribou meant that the community partners and I did not explore other cultural practices in detail; for example, I did not obtain detailed knowledge of trapping, fishing, land claims, the resilience of language, kinship, and mechanisms of the intergenerational transfer of knowledge. With the exclusive scrutiny of barrenland caribou, the research had to overlook woodland caribou, wolves, wolverine, and grizzly bear, species that also are of considerable interest for wildlife biologists (Awan et al. 2010:8-9). While this project did not explore these side channels, they are seeds of future research.


The following summation supports the study objective to benefit northern people and their discourse by engaging ethnographic and archaeological perspectives in documenting lifeways. The study used a collaborative approach where communities suggested the topic, general methods, and specific areas of interest. It combined historical and archaeological research with interviews of knowledge holders and actively participated in cultural activities. The main lesson was that despite economic hardship and severe ecological change, the Denesųlinė have a way to embrace change and turn challenges into opportunities. This research did not involve an experiment about how people did things in the past. The work focused on the core of what it means to be Denesųlinė. Community partners wanted to learn how the past informs the present, and how they can plan for the future. Indigenous communities confront complex, permanent issues, and struggle to solve situations at societal, political, family, and individual levels.
The research shows where opportunities can be had, where communities can develop their own insights to help themselves and others solve the challenges they face each day.

In 2016, Canada, including governments and indigenous nations, struggle to find a social policy for the 21st century that includes people in northern and remote communities. At the time of writing, at La Loche, we see violence and turmoil (Warick 2016:1), at Kesachewan we see social dysfunction and perennial despair (Paling 2016:1), at Attawapiskat the emptiness of suicide (Barrera 2016:1, Nishnawbe Aski Nation 2012:1-11). As a country, we know that northern peoples do not live apart from modernity. Their lives are integrated into global cultures and national, regional, and local economies. Moreover, based on our government's abysmal interventions with indigenous communities, from the flawed Indian Act, the cultural fragmentation of residential schools, and the sixties scoop, only to list a few, we cannot trust our politicians to produce any solutions. In 2016, Jean Chretien, our longest-serving Indian Affairs Minister, and former Prime Minister, speaks as if northern communities are lost, and without economic activities cannot exist in their homelands. His solution is that “people have to move sometimes” (Chretien 2016:1, see Appendix K). This is the same attitude that fur traders exhibited when they enticed people to abandon their traditional lifeways to accommodate the fur trade economy, and equivalent to the 1900s, when missionaries and government agents coerced the Denesųłiné to move off the caribou ranges and settle in villages. Alarmingly, it is the same attitude that in the 1950s forcibly relocated the Sayisi Denesųłiné from their homeland to a hinterland and directly led to their starvation and death. We have to look for alternative explanations for the misery of those communities that only inspire suicide in their young people. In 2016, Canadian leaders tell indigenous peoples that their lifeways are not worth preserving. This study indicates the opposite. Northern and remote communities are strong, independent, resilient, and viable.

Indigenous communities have much to gain by investing in ethnographic and archaeological research. This research tells us something about the future, people are strong and adapt to a variety of significant social, technological and ecology change by
realigning traditional values and practices. Despite the fact that Fond du Lac, Black Lake, and Hatchet Lake Denesųłiné First Nations have the lowest educational and economic attainment of all communities in Canada, they prove that northern and remote communities are viable in the long term because they practice a traditional economy.

Ethnoarchaeology can be a useful tool for change. In situations where traditions change, community-oriented ethnographic and archaeological research centered on areas of interest or practical problems can provide greater context of cultural transitions. A community’s leadership, educators, and youth can use ethnoarchaeology to learn from their ways of doing things, abandon negative elements, and modify positive practices. Like the upgrades to their dogsleds, people use teachings about stewardship practice from the past and apply them to new situations. People are resilient, they hold dear their language and traditions, teach them to their youth, and maintain authority over their lands. But they do not do this alone. They work with their neighbours to guide the stewardship of key resources, such as through the Beverly and Qamanirjuaq Caribou Management Board, and incorporate new technologies such as snowmobiles, satellite phones, and innovative biological methods into their cultural practice. Above all, we learn that change comes from within, and must be community-based. Fred Pessl, an 80-year-old survivor of the tragic 1955 Moffatt expedition to the barrenlands, told me:

In my view, you and your colleagues, internationally, have the data, insight and the potential political energy to significantly impact North America’s (the World’s) response to worldwide global issues. I understand and share your enthusiasm of snowmobile traverses, hunts, and reoccupying historically significant places. Oh my, isn’t it such a wonderful feeling to just get somewhere in difficulty and know that someone else, a long time ago, got there too, maybe with some of the same apprehensions and felt something similar about being there. I assume that your commitment to the Dene[sųliné] is building understanding of how that culture is part of a sustainable past and how maybe that’s not a sustainable future; or maybe it is? (Fred Pessl, Personal Communication June 11, 2014).

Fred Pessl challenged me to see this study not as an exercise to study the past, but as a way for communities to connect with their past, and chart a course forward. Yes, there are hardships, life is challenging, especially in the north, but the legacy of what it was to
be Denesųlinė is not to be left behind, instead, it gives strength, perspective, and clarity for what it means to be Denesųlinė, and how to take authority of their own future.

9.5. Directions for Future Research

Communities should suggest future lines of research on subjects that are of interest to them. These additional research avenues can provide educational opportunities for Denesųlinė, especially youth, to further understand their past, reinforce their identity, and plan for their future. One avenue is to explore further the time-depth of caribou-human interactions by conducting archaeological surveys in traditional areas. Another is to broaden the discussion towards other species of cultural importance, such as fisheries, or towards traditional medicines. Likewise, future research can explore Denesųlinė ways of knowing about the world and inform community-specific means of teaching and learning.

Communities should take charge of their heritage further and tell their stories on their terms. As traditions change, some activities such as harvesting caribou with spears could fade from living memory within a few generations. Likewise, archaeological techniques often provide the only source of data for knowledge that has disappeared.

Further west, the eruption of Mount Churchill in the Saint Elias Mountains of Alaska and the White River ash fallout in 847 caused a population replacement of caribou in the Yukon (Coulter et al. 2012:5; Kuhn et al. 2010:1312-1321). Was there a synchronous change in the caribou herds further east? Archaeological excavations at caribou crossings could yield genetic evidence of change in regional caribou populations due to the eruption. Denesųlinė can apply their traditional knowledge, comparing these past situations, and develop insights on future scenarios.

One such scenario of community interest is the nature of treeline and its influence on caribou migration. The western portion of the Beverly and Qamanirjuaq caribou range treeline has shifted south due to recent forest fires. Traditional values built from what people did, such as past responses to shifts of the treeline can provide insights on human and caribou responses to climate change. While there were dramatic
shifts in areas where Beverly caribou calve, post-calve, and use in winter, since 2000, the use of seasonal areas by Qamanirjuaq caribou has not changed. However, I anticipate that if the Qamanirjuaq herd’s use of areas were to change, Denesųliné knowledge would suggest what the migration of the herd would look like, and where they will calve in the future.

This research shows that the Denesųliné relationship to caribou informs the nature of their adaptation to the country, so they can use travel corridors, establish their customary territory, cultivate social forms of adaptation, and live their seasonal rounds. This research has built robust links between oral histories and traditions, historical accounts and the places recorded as ethnographic and archaeological sites. This holistic approach embodies the kind of inquiry favoured by the community partners and is the mode of research most often cited by anthropologists working with indigenous people (Martindale and Marsden 2003:34; Oetelaar and Oetelaar 2006:391-392; Stewart et al. 2000:262-263). Future archaeological and ethnographic surveys should expand on the work I conducted at caribou water crossings. Researchers should turn their attention northward past the treeline, such as at the outlet of Wholdaia Lake, in the headwaters of the Dubawnt River, and along Rennie and Damant Lakes. Additional research on oral traditions and legends on caribou would be useful to determine and document the intergenerational transfer of knowledge. Since heritage values inform actions that reference the past, the archaeological record, which is part of an integrated whole, contains insight that can help contemporary leaders in their management decisions (Smith et al. 2003:75-78). Heritage is a social experience in which sharing knowledge and memories offer guidance in the present. It also involves how the interpretation of places and material objects supports local history (Labadi 2007:150-153; Meskell 2002:281; Nora 1989:18). As such, teaching moments can appear spontaneously, even while hunting caribou.
9.6. Caribou is Life

Inhabitants of the high latitudes have few options for food production, hence relying on traditional foods, and especially harvesting caribou, is critical for northern peoples. In the increasingly changing north of the twenty-first century, traditional harvests are the foremost means that indigenous communities ensure their food security. Furthermore, a decreased diet of traditional food will mean a rise in diseases that originate in metabolic disorders. Denesųłiné share their lifestyle with more than twenty distinct indigenous peoples in arctic North America and Eurasia (Kendrick 2003:196). Denesųłiné and their neighbours accept caribou as their main food source and have developed an impression of their culture around this species. Moreover, caribou are essential to Denesųłiné because they also offer spiritual sustenance. The BQCMB (2002b:25-26) state that:

Apart from purely economic factors, the use of caribou is important to the culture and traditional lifestyle of aboriginal people. This importance cannot be fully evaluated and quantified using the analytical tools of measures economic value. Yet the benefits are immense, because caribou confer considerable advantages and strengths upon life in aboriginal communities.

This is not just a modern phenomenon as there who harvested caribou with Athabasca Denesųłiné in the 1950s and 1960s made similar statements: “The role of caribou as ‘staff of life’ to past generations of indigenous people living on the land cannot be overstressed” (Ruttan 2012:93). Therefore, caribou is life.

By using ethnographic and archaeological methods, this research linked twenty-first century hunting activities with practices of the recent past. It connected these practices to historical records and specific sites at Wholdaia Lake. I learned that spearing caribou at water crossings is a sustainable hunting practice despite attempts to recast it as wasteful (Krech 1999). Spearing caribou was common practice in the 1970s, but not anymore. I was the first person in more than 20 years to learn the Ethen-eldêli Denesųłiné methods of spearing caribou. Besides me, the last time a hunter learned to spear caribou was in the 1990s, when elders taught a single novice hunter. At caribou kill sites, harvesters treat caribou heads with respect and remove them during the first
stage of butchery. They keep heads separate from other cuts of meat and bring them indoors through the back of tents and houses. Denesųlinė leave heads near houses and usually burn other caribou remains in hearths or deposit them in lakes. Antlers remain at kill sites where they are used to mark meat caches. A few antlers are made into tools, such as awls, fishing spears, and lance heads. Notably, no archaeological evidence has been presented of antler or bone lance heads fashioned in the Talttheilei tradition.

Divination using caribou bones embodies the spiritual pact that hunters have to their quarry (AD3-3). Carrying out a hunting career involves the taking of many caribou lives. Such a burden on the psyche has the hunter using and teaching respectful hunting practices to bring some respite to the aftermath of the chase. Harvesters travelled extreme distances to follow the herds through the seasons and trips of at least 2,000 to 3,000 km were not uncommon. Before the 1960s, a diet of traditional foods required many animals just to meet the calories needed in order follow the herds. From their long occupation, they have built up a lattice of traditional travel ways across their country. For example, I visited the Wholdaia Lake caribou crossing described by Samuel Hearne in 1771. Knowledge holders explained, on site, how crossings work. This model of spatial patterning may explain intention for situating critical travel nodes at water crossings.

This dissertation revealed understandings in the construction of heritage and its application in the daily activities of Denesųlinė. This investigation provided a first-hand observation of a customary lifeway shifting to the cultural sway of modernity. It gave a context for how Denesųlinė collaborate with the Beverly and Qamanirjuaq Caribou Management Board and other initiatives (BQCMB 2011:1). It contributes a database that future researchers can reference when planning their research trajectories concerning the value of the barren ground caribou herds to local peoples and reveals insights that anticipate the needs and policy of the future use of these caribou herds. This may include identifying social mechanisms to limit population declines or apply conservation methods to make sure that future generations can also harvest caribou. Continued co-management of the BQCMB ensures there are caribou for Denesųlinė to harvest. I concur with the observation that “[w]e should recognize that caribou declines may not always be followed by increases” (Nesbit and Adamczewski 2013:15). The BQCMB and
the Athabasca Denesųłiné support and engage education initiatives to help sustain the caribou herds. Skills that were once considered vital for all young people are now taught at culture camps that attempt to instill a connection to their ancient customs. However fragile, it supports the intergenerational transfer of knowledge.

Denesųłiné are thriving (Mease 2012:1). Their language and culture are strong (Cook and Howe 2005:294-309). Caribou still loom large in their lives. Many live off the land, subsisting on traditional foods (Government of Saskatchewan 2012:1). They are determined to uphold their right to have a say in the governance of their land and its resources (Government of Saskatchewan 1996:2-15). The Denesųłiné travel long-distances. While this is mainly to harvest resources, the long hunting trips are of value in themselves (Ames et al. 1988:2). For Denesųliné, the point is to do it, to travel and harvest, and if possible follow the old ways. Those who undertake long journeys gain an associated status because they are exercising their aboriginal rights to harvest caribou (Figure 9.3).

Figure 9.3. Attendees of a culture camp at Cochrane River
Source: Courtesy Tina Giroux.
To comprehend Denesųlı́nė, I learned how people respect barrenground caribou. Fond du Lac, Black Lake, and Hatchet Lake Denesųlı́nė First Nations live a traditional lifestyle out of necessity. Significant ecological change has occurred in the range evidenced by fluctuations in caribou herd populations. In conversation with AD10, he said aloud, while touching a caribou head and poking it in the eye with a finger, “whenever the opportunity presented itself. I focused on caribou.” He saw that “I didn’t spend time fishing” (AD10-1). He shook my hand and thanked me for what I was doing, and said, “As far as I am concerned you are the first person to seriously document the Denesųlı́nė connection to caribou” (AD10-1). I was encouraged to hear him say: “[y]our work is a wake-up call to the Denesųlı́nė” (AD10-1).
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Appendix A.

Annual Traditional Food Diet at Hatchet Lake Denesųłiné First Nation

A survey of 261 individuals from Hatchet Lake Denesųłiné First Nation in 1998 and 1999 (CanNorth 2000) showed that caribou composed over 82 percent of the traditional diet, with all other meats, including moose, beaver, and other small animals composing less than 1 percent (Tables A.1 and A.2).

Table A.1. Annual Traditional Food Diet at Hatchet Lake Denesųłiné First Nation.

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Food Type</th>
<th>Child Annual Diet</th>
<th>Adult Annual Diet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean Kg/Year</td>
<td>Max Kg/Year</td>
</tr>
<tr>
<td>Meat</td>
<td>Caribou</td>
<td>87.60</td>
<td>372.30</td>
</tr>
<tr>
<td></td>
<td>Moose</td>
<td>.58</td>
<td>9.89</td>
</tr>
<tr>
<td></td>
<td>Beaver</td>
<td>.04</td>
<td>.95</td>
</tr>
<tr>
<td></td>
<td>Other small animals</td>
<td>.07</td>
<td>55</td>
</tr>
<tr>
<td>Poultry</td>
<td>Ground birds</td>
<td>.07</td>
<td>1.50</td>
</tr>
<tr>
<td></td>
<td>Water birds</td>
<td>.73</td>
<td>7.41</td>
</tr>
<tr>
<td>Fish</td>
<td>All fish species</td>
<td>15.98</td>
<td>114.24</td>
</tr>
<tr>
<td>Plant resources</td>
<td>Berries</td>
<td>3.10</td>
<td>11.10</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>105.12</td>
<td>506.62</td>
</tr>
</tbody>
</table>

Source: Data from CanNorth 2000.

Table A.2. Summary of Annual Traditional Food Diet at Hatchet Lake Denesųłiné First Nation.

<table>
<thead>
<tr>
<th>Food Type</th>
<th>Child Annual Diet</th>
<th>Adult Annual Diet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Percent</td>
<td>Max. Percent</td>
</tr>
<tr>
<td>Caribou</td>
<td>83.3</td>
<td>73.5</td>
</tr>
<tr>
<td>All other meat</td>
<td>.7</td>
<td>2.2</td>
</tr>
<tr>
<td>Birds</td>
<td>.6</td>
<td>1.8</td>
</tr>
<tr>
<td>Fish</td>
<td>15.2</td>
<td>22.6</td>
</tr>
<tr>
<td>Berries</td>
<td>3.0</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Source: Data from CanNorth 2000.
Appendix B.

Population Estimates of the Beverly and Qamanirjuaq Caribou Herds

Table B.1. Population Estimate of the Beverly Caribou Herds based on Aerial Surveys.

<table>
<thead>
<tr>
<th>Year</th>
<th>Survey Type</th>
<th>Caribou Population (Mean)</th>
<th>Caribou Population (Error)</th>
<th>Breeding Cows (Mean)</th>
<th>Breeding Cow (Error)</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>Visual</td>
<td>159,000</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Thomas 1969:1-44; Campbell et al. 2012:99</td>
</tr>
<tr>
<td>1971</td>
<td>Visual</td>
<td>164,000</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Rippin 1971; Campbell et al. 2012:99</td>
</tr>
<tr>
<td>1974</td>
<td>Visual</td>
<td>124,000</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Moshenko 1971:1-17; Campbell et al. 2012:99</td>
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<tr>
<td>1978</td>
<td>Visual</td>
<td>130,000</td>
<td>N/A</td>
<td>52,504</td>
<td>4,797</td>
<td>Heard and Decker 1980:1-40</td>
</tr>
<tr>
<td>1980</td>
<td>Visual</td>
<td>104,960</td>
<td>18,683</td>
<td>46,649</td>
<td>N/A</td>
<td>Gunn and Decker 1982:16-17</td>
</tr>
<tr>
<td>1993</td>
<td>Photographic</td>
<td>86,728</td>
<td>17,943</td>
<td>37,654</td>
<td>5,682</td>
<td>Williams 1995:9</td>
</tr>
<tr>
<td>1994</td>
<td>Photographic</td>
<td>276,000</td>
<td>106,600</td>
<td>120,000</td>
<td>43,100</td>
<td>Williams 1995:1-34</td>
</tr>
<tr>
<td>2011</td>
<td>Photographic</td>
<td>124,189</td>
<td>13,996</td>
<td>52,825</td>
<td>2,638</td>
<td>Campbell et al. 2012:3</td>
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</table>
Table B.2. Population Estimate of the Qamanirjuaq Caribou Herd Based on Aerial Surveys.

<table>
<thead>
<tr>
<th>Year</th>
<th>Survey Type</th>
<th>Caribou Population (Mean)</th>
<th>Estimate Error</th>
<th>Breeding Cows (Mean)</th>
<th>Breeding Cow (error)</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>Visual</td>
<td>120,000</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Banfield 1954; Heard and Calef 1986:159</td>
</tr>
<tr>
<td>1955</td>
<td>Visual</td>
<td>149,000</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Heard and Calef 1986:159</td>
</tr>
<tr>
<td>1968</td>
<td>Visual</td>
<td>63,000</td>
<td>N/A</td>
<td>22,000</td>
<td>4,428</td>
<td>Parker 1972:1-88</td>
</tr>
<tr>
<td>1974</td>
<td>Visual</td>
<td>54,000</td>
<td>N/A</td>
<td>21,403</td>
<td>6,403</td>
<td>Hawkins and Howard 1974; Heard and Calef 1986:161</td>
</tr>
<tr>
<td>1976</td>
<td>Visual</td>
<td>43,800</td>
<td>N/A</td>
<td>15,380</td>
<td>2,800</td>
<td>Heard and Calef 1986:161</td>
</tr>
<tr>
<td>1980</td>
<td>Visual</td>
<td>39,000</td>
<td>N/A</td>
<td>13,000</td>
<td>1,260</td>
<td>Heard and Calef 1986:159-166</td>
</tr>
<tr>
<td>1982</td>
<td>Visual</td>
<td>180,000</td>
<td>N/A</td>
<td>41,000</td>
<td>7,200</td>
<td>Heard and Calef 1986:159-166; Gates 1985:215-228</td>
</tr>
<tr>
<td>1983</td>
<td>Visual</td>
<td>120,000</td>
<td>N/A</td>
<td>31,000</td>
<td>3,600</td>
<td>Heard and Calef 1986:161</td>
</tr>
<tr>
<td>1983</td>
<td>Photographic</td>
<td>230,000</td>
<td>59,000</td>
<td>71,000</td>
<td>17,200</td>
<td>Heard and Calef 1986:160; Heard and Jackson 1990a:1-18</td>
</tr>
<tr>
<td>1983</td>
<td>Visual</td>
<td>200,000</td>
<td>N/A</td>
<td>76,000</td>
<td>5,700</td>
<td>Heard and Calef 1986:161</td>
</tr>
<tr>
<td>1985</td>
<td>Photographic</td>
<td>272,000</td>
<td>142,000</td>
<td>97,000</td>
<td>17,400</td>
<td>Heard and Calef 1986:160; Heard and Jackson 1990a:1-18</td>
</tr>
<tr>
<td>1988</td>
<td>Photographic</td>
<td>221,000</td>
<td>72,000</td>
<td>99,000</td>
<td>29,000</td>
<td>Heard and Jackson 1990a:1-18</td>
</tr>
<tr>
<td>1994</td>
<td>Photographic</td>
<td>496,000</td>
<td>105,000</td>
<td>215,198</td>
<td>34,188</td>
<td>Campbell et al. 2010:10,63</td>
</tr>
<tr>
<td>2008</td>
<td>Photographic</td>
<td>348,661</td>
<td>44,861</td>
<td>155,154</td>
<td>13,558</td>
<td>Campbell et al. 2010:2,54</td>
</tr>
</tbody>
</table>
Appendix C.

Cultural and Palaeoenvironmental Chronology of the Beverly and Qamanirjuaq Range.

Figure C.1: Cultural and Palaeoenvironmental Chronology of the Beverly and Qamanirjuaq Range.

Note: The cultural chronology is based on sources in Appendix D (Table D.1). The d\(^{18}\)O values provides a proxy for global temperature variation, and is from GISP and GISP2 ice cores (Rasmussen et al. 2014; Seierstad et al. 2014). Temperature estimate is based on d\(^{18}\)O values analyzed from a peat core extracted near Selwyn Lake in the Northwest Territories (Tillman et al. 2010). The extent and movement of treeline is based on Nichols 1976, Sulphur et al. 2016, Timoney 1995, and Timoney et al. 1992.
### Appendix D.

#### Archaeological Research and Regional Exploration of the Caribou Range

**Table D.1. Archaeological Research in the Study Area arranged Chronologically.**

<table>
<thead>
<tr>
<th>Researcher</th>
<th>Year</th>
<th>Location</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. O. Downes.</td>
<td>1938</td>
<td>Reindeer Lake</td>
<td>Downes 1985, 1988; Hanna 2004</td>
</tr>
<tr>
<td>Richard MacNeish</td>
<td>1949</td>
<td>Stony Rapids</td>
<td>MacNeish 1951</td>
</tr>
<tr>
<td>Sheila Minni</td>
<td>1972-1974</td>
<td>Black Lake</td>
<td>Minni 1976</td>
</tr>
<tr>
<td>Michael Forsman</td>
<td>1971</td>
<td>Montreal Lake</td>
<td>Forsman 1976</td>
</tr>
<tr>
<td>James Millar</td>
<td>1980-1982</td>
<td>Peter Pond Lake, Buffalo Narrows</td>
<td>Millar and Ross 1982</td>
</tr>
<tr>
<td>Researcher</td>
<td>Year</td>
<td>Location</td>
<td>Reference</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---------------</td>
<td>----------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>McCullough, Ed</td>
<td>1980-1982</td>
<td>Lac La Biche</td>
<td>McCullough 1982</td>
</tr>
<tr>
<td>Gary Dickson</td>
<td>1980s</td>
<td>South Indian Lake</td>
<td>Dickson 1980, 1983</td>
</tr>
<tr>
<td>Leigh Sym</td>
<td>1990s</td>
<td>South Indian Lake</td>
<td>Brownlee and Syms 1999</td>
</tr>
<tr>
<td>Kevin Brownlee</td>
<td>1995-2010</td>
<td>South Indian Lake, Leaf Rapids</td>
<td>Brownlee and Syms 1999</td>
</tr>
<tr>
<td>Patrick Young</td>
<td>2000-2010</td>
<td>Buffalo Narrows, Peter Pond Lake</td>
<td>Young 2006</td>
</tr>
<tr>
<td>John W. Pollock</td>
<td>1976-1977</td>
<td>Northeastern Alberta</td>
<td>Pollock 1977</td>
</tr>
<tr>
<td>Nancy Saxberg and Barney Reeves</td>
<td>1995-2003</td>
<td>Northeastern Alberta</td>
<td>Saxberg and Reeves 2003</td>
</tr>
<tr>
<td>Alan Younie</td>
<td>2009-2010</td>
<td>Northeastern Alberta</td>
<td>Younie et al. 2010</td>
</tr>
<tr>
<td>Alan Korejbo</td>
<td>2009-2011</td>
<td>Northwest Saskatchewan, Clearwater River</td>
<td>Korejbo 2011</td>
</tr>
<tr>
<td>Type</td>
<td>Name</td>
<td>Age</td>
<td>Location</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------</td>
<td>-----</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>Exploration</td>
<td>Jens Munk</td>
<td>1619</td>
<td>Churchill River, Hudson's Bay</td>
</tr>
<tr>
<td>Fur trade</td>
<td>Henry Kelsey</td>
<td>1690</td>
<td>York Factory</td>
</tr>
<tr>
<td>Fur trade</td>
<td>Nicolas Jérémie</td>
<td>1694</td>
<td>York Factory</td>
</tr>
<tr>
<td>Missionary</td>
<td>Gabriel Marest</td>
<td>1694</td>
<td>York Factory</td>
</tr>
<tr>
<td>Fur trade</td>
<td>James Isham</td>
<td>1732</td>
<td>York Factory</td>
</tr>
<tr>
<td>Fur trade</td>
<td>Samuel Hearne</td>
<td>1770</td>
<td>York Factory, Churchill River, Denesuline caribou range</td>
</tr>
<tr>
<td>Fur trade</td>
<td>Philip Tumor</td>
<td>1774</td>
<td>York Factory, Churchill River</td>
</tr>
<tr>
<td>Fur trade</td>
<td>Peter Pond</td>
<td>1776</td>
<td>Lake Athabasca</td>
</tr>
<tr>
<td>Fur trade</td>
<td>David Thompson</td>
<td>1784</td>
<td>Western Canada</td>
</tr>
<tr>
<td>Fur trade</td>
<td>Fairford House</td>
<td>1795</td>
<td>Churchill River</td>
</tr>
<tr>
<td>Fur trade</td>
<td>Bedford House</td>
<td>1796</td>
<td>Reindeer Lake</td>
</tr>
<tr>
<td>Fur trade</td>
<td>Reindeer Lake Post</td>
<td>1798</td>
<td>Reindeer Lake</td>
</tr>
<tr>
<td>Fur trade</td>
<td>Sturgeon Creek Post</td>
<td>1800</td>
<td>Churchill River</td>
</tr>
<tr>
<td>Fur trade</td>
<td>Island Falls Post</td>
<td>1801</td>
<td>Churchill River</td>
</tr>
<tr>
<td>Fur trade</td>
<td>Egg Lake Post</td>
<td>1809</td>
<td>Churchill River</td>
</tr>
<tr>
<td>Fur trade</td>
<td>Fond du Lac</td>
<td>1816</td>
<td>Lake Athabasca</td>
</tr>
<tr>
<td>Missionary</td>
<td>Emile Petitot</td>
<td>1862</td>
<td>Northwest Territories</td>
</tr>
<tr>
<td>Missionary</td>
<td>Father Gasté</td>
<td>1870</td>
<td>Kazan River</td>
</tr>
<tr>
<td>Fur trade</td>
<td>Lac Du Brochet</td>
<td>1872</td>
<td>Reindeer Lake</td>
</tr>
<tr>
<td>Exploration</td>
<td>A.S. Cochrane</td>
<td>1881</td>
<td>Reindeer Lake, Wollaston Lake, Lake Athabasca</td>
</tr>
<tr>
<td>Exploration</td>
<td>J.B. Tyrell and J.W Tyrell</td>
<td>1892</td>
<td>Wollaston Lake, Cochrane River, Thelon, Dubawnt</td>
</tr>
<tr>
<td>Missionary</td>
<td>Father Breyant</td>
<td>1892-1902</td>
<td>Fond du Lac, Kazan River</td>
</tr>
<tr>
<td>Exploration</td>
<td>J. Lothhouse</td>
<td>1899</td>
<td>Kazan River</td>
</tr>
<tr>
<td>Treaty</td>
<td>Treaty 8</td>
<td>1899</td>
<td>Treaty 8 Area</td>
</tr>
<tr>
<td>Missionary</td>
<td>Duchaussois, P.</td>
<td>1900</td>
<td>Wollaston Lake, Thelon River</td>
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<tr>
<td>Anthropology</td>
<td>Robert Lowie</td>
<td>1906</td>
<td>Lake Athabasca</td>
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<td>Treaty</td>
<td>Treaty 10</td>
<td>1906</td>
<td>Treat 10 Area</td>
</tr>
<tr>
<td>Exploration</td>
<td>Frank Crean</td>
<td>1908</td>
<td>La Loche</td>
</tr>
<tr>
<td>Exploration</td>
<td>Thierry Mallet</td>
<td>1920</td>
<td>Kazan River</td>
</tr>
<tr>
<td>Anthropology</td>
<td>Kaj Birket-Smith</td>
<td>1921</td>
<td>Kazan River, Churchill River</td>
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<tr>
<td>Anthropology</td>
<td>Knud Rasmussen</td>
<td>1921</td>
<td>Kazan River, Churchill River</td>
</tr>
<tr>
<td>Type</td>
<td>Name</td>
<td>Age</td>
<td>Location</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------</td>
<td>------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Exploration</td>
<td>Helge Instad</td>
<td>1926</td>
<td>Great Slave Lake</td>
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<td>Ilia Tolstoy</td>
<td>1928</td>
<td>Kazan River</td>
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<tr>
<td>Exploration</td>
<td>W.H.B. Hoare</td>
<td>1928</td>
<td>Kazan River</td>
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<td>Fur Trade</td>
<td>South Reindeer Lake Post</td>
<td>1936</td>
<td>Reindeer Lake</td>
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<tr>
<td>Missionary</td>
<td>Jean Mégret</td>
<td>1947</td>
<td>Wollaston Lake, Reindeer Lake</td>
</tr>
<tr>
<td>Anthropology</td>
<td>Takashi Irimoto</td>
<td>1976</td>
<td>Wollaston Lake, Cochrane River</td>
</tr>
<tr>
<td>Anthropology</td>
<td>Ave Dersch</td>
<td>2005</td>
<td>Cree Lake</td>
</tr>
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</table>
# Appendix E.

## Terrain Type by Seasonal Caribou Range

Table E.1. Area of Terrain Type by Seasonal Caribou Range.

<table>
<thead>
<tr>
<th>Herd</th>
<th>Seasons</th>
<th>Range Area</th>
<th>Water</th>
<th>Land</th>
<th>Land Forested</th>
<th>Non-Forested Land</th>
<th>Burned Forested Area</th>
<th>Burned Land</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(ha)</td>
<td>(ha)</td>
<td>(%)</td>
<td>(ha)</td>
<td>(ha)</td>
<td>(ha)</td>
<td>(%)</td>
</tr>
<tr>
<td>Beverly</td>
<td>Calving</td>
<td>3,766,901</td>
<td>50,624</td>
<td>1%</td>
<td>3,716,277</td>
<td>99%</td>
<td>3,716,277</td>
<td>99%</td>
</tr>
<tr>
<td></td>
<td>Post Calving</td>
<td>10,497,248</td>
<td>2,091,476</td>
<td>20%</td>
<td>8,405,772</td>
<td>80%</td>
<td>8,319,983 (99%)</td>
<td>0%</td>
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<tr>
<td></td>
<td>Late Summer</td>
<td>23,289,223</td>
<td>5,760,812</td>
<td>25%</td>
<td>17,528,411</td>
<td>75%</td>
<td>14,664,882 (60%)</td>
<td>267,014 (8%)</td>
</tr>
<tr>
<td></td>
<td>Fall</td>
<td>22,646,407</td>
<td>3,169,022</td>
<td>14%</td>
<td>19,477,385</td>
<td>86%</td>
<td>9,372,588 (48%)</td>
<td>4,938,921 (25%)</td>
</tr>
<tr>
<td>Qamanirjuaq</td>
<td>Calving</td>
<td>2,935,993</td>
<td>672,823</td>
<td>23%</td>
<td>2,263,170</td>
<td>77%</td>
<td>2,263,170 (100%)</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Post Calving</td>
<td>17,815,859</td>
<td>2,944,434</td>
<td>16%</td>
<td>14,921,425</td>
<td>84%</td>
<td>10,511,695 (70%)</td>
<td>706,871 (16%)</td>
</tr>
<tr>
<td></td>
<td>Late Summer</td>
<td>9,973,975</td>
<td>2,041,555</td>
<td>20%</td>
<td>7,932,420</td>
<td>80%</td>
<td>7,429,572 (94%)</td>
<td>18,210 (4%)</td>
</tr>
<tr>
<td></td>
<td>Fall</td>
<td>2,916,000</td>
<td>617,474</td>
<td>21%</td>
<td>2,298,526</td>
<td>79%</td>
<td>1,970,905 (86%)</td>
<td>21,861 (7%)</td>
</tr>
</tbody>
</table>

**Source:** Data from NRCan 2012 and 2016, and National Forest Centre 2015
### Appendix F.

**Beverly, Queen Maud Gulf, and Qamanirjuaq Caribou Herd Daily Travel Rates**

Table F.1. Caribou Travel Distance in Kilometres.

<table>
<thead>
<tr>
<th>Herd First day of 5-day period</th>
<th>Beverly</th>
<th>Queen Maud Gulf</th>
<th>Qamanirjuaq</th>
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<tbody>
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<td></td>
<td>Mean</td>
<td>St.Dev.</td>
<td>Min</td>
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<td>4.2</td>
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<td>12.5</td>
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<td>0.1</td>
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<td>25-May</td>
<td>15.9</td>
<td>11.8</td>
<td>0.2</td>
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Herd
First
day of
Mean
5-day
period
30-May 12.6

Beverly

Queen Maud Gulf

Qamanirjuaq

St.Dev.

Min

Max

N

Mean

St.Dev

Min

Max

N

Mean St.Dev

10.7

0.3

66.6

530

11.7

8.8

0.1

61.2

133

11.7

9.6

Min

Max

N

0.0

62.5

354

04-Jun

10.5

9.0

0.1

67.1

524

9.6

9.1

0.2

56.1

150

12.5

9.8

0.0

63.4

418

09-Jun

6.4

7.5

0.0

52.3

556

6.0

6.0

0.1

26.8

152

6.6

7.0

0.0

39.2

455

14-Jun

3.8

5.2

0.0

41.4

555

3.1

3.6

0.0

28.5

149

6.2

6.1

0.0

36.4

479

19-Jun

3.9

4.2

0.0

36.1

559

3.5

4.2

0.2

28.0

143

7.4

6.2

0.1

49.9

471

24-Jun

6.2

5.4

0.0

33.3

524

5.7

5.6

0.2

35.7

154

9.3

6.4

0.1

54.8

440

29-Jun

10.8

7.3

0.2

46.8

547

8.3

7.2

0.2

41.1

158

12.9

7.9

0.0

53.4

389

04-Jul

14.3

10.1

0.0

63.0

613

10.1

8.6

0.1

44.0

169

16.1

8.3

0.3

52.3

388

09-Jul

18.2

12.1

0.3

73.9

615

13.0

11.0

0.7

67.2

175

17.8

8.9

0.4

58.1

399

14-Jul

20.3

11.9

0.0

74.0

617

13.3

9.1

0.9

59.2

170

19.9

9.9

0.4

58.5

382

19-Jul

26.3

14.4

0.1

87.0

583

17.4

11.9

0.0

54.3

167

19.9

10.9

0.3

58.6

384

24-Jul

23.1

13.8

0.0

83.4

595

14.4

12.2

0.1

73.5

173

22.1

11.5

0.0

77.4

378

29-Jul

18.6

12.2

0.3

67.4

593

13.9

13.4

0.2

78.6

175

22.2

13.0

0.4

74.7

344

03-Aug

12.7

10.6

0.0

75.3

617

13.3

12.6

0.1

58.9

174

22.0

13.2

0.0

66.6

301

08-Aug

10.0

9.7

0.1

79.8

621

9.4

10.3

0.2

65.1

179

17.8

12.9

0.1

81.6

332

13-Aug

6.9

6.4

0.1

57.9

587

9.1

9.1

0.1

54.3

166

14.2

12.4

0.0

96.1

364

18-Aug

7.0

6.4

0.0

39.1

529

7.6

8.5

0.1

43.9

146

10.8

9.7

0.0

56.3

335

23-Aug

6.3

6.4

0.1

45.8

535

5.9

6.0

0.1

26.9

149

9.3

9.1

0.0

49.8

348

28-Aug

6.3

6.0

0.0

35.4

523

4.0

4.0

0.0

23.4

143

8.3

7.4

0.0

47.5

338

02-Sep

6.4

6.0

0.0

55.0

520

6.4

7.4

0.1

49.4

122

7.6

6.7

0.3

33.1

299

07-Sep

7.1

6.1

0.0

37.9

521

8.1

7.8

0.4

41.8

142

7.0

6.5

0.2

46.7

359

12-Sep

9.2

6.9

0.2

46.8

507

9.0

7.8

0.2

39.1

146

8.6

7.4

0.0

38.6

331

17-Sep

10.3

8.1

0.1

51.6

512

9.2

10.2

0.1

50.7

132

9.4

8.4

0.1

63.9

285

22-Sep

10.7

8.6

0.1

56.4

525

9.2

8.1

0.1

41.6

140

11.1

9.1

0.2

47.9

366

27-Sep

12.2

10.5

0.1

64.9

468

13.6

9.9

0.6

46.3

135

10.7

8.7

0.0

77.0

347

02-Oct

14.3

11.7

0.0

67.3

517

15.9

11.4

0.1

62.9

136

10.6

8.4

0.1

61.8

354

07-Oct

11.2

8.7

0.0

62.3

521

14.0

9.9

0.3

48.9

132

12.0

9.1

0.3

52.4

353

12-Oct

11.5

8.6

0.0

51.0

517

17.5

10.6

1.7

51.3

130

14.5

10.5

0.2

59.5

340

17-Oct

11.1

8.6

0.1

44.3

504

15.0

11.8

0.6

85.0

135

13.1

10.1

0.0

85.5

348

22-Oct

12.2

9.6

0.0

49.6

513

13.0

8.7

0.5

46.6

129

13.1

10.7

0.3

74.2

356

27-Oct

11.5

7.6

0.0

62.9

505

13.2

8.9

0.7

59.3

126

13.8

9.2

0.2

63.9

315

01-Nov

10.5

7.9

0.1

54.8

509

12.8

9.1

0.3

41.0

133

16.1

11.0

0.3

64.1

324

06-Nov

10.9

8.7

0.0

58.5

498

12.2

8.3

0.3

50.1

137

17.0

11.5

0.1

69.7

329

11-Nov

9.5

7.7

0.0

59.7

507

12.7

9.7

0.3

46.9

138

14.8

10.9

0.0

55.4

342

16-Nov

9.6

8.5

0.0

60.0

501

11.3

8.1

0.4

42.9

154

12.6

10.4

0.1

67.1

360

21-Nov

8.8

8.6

0.0

48.5

514

9.5

8.2

0.3

39.3

201

10.9

8.5

0.1

52.7

333

26-Nov

9.0

9.4

0.1

97.1

503

9.4

7.7

0.1

34.9

185

8.8

7.6

0.0

44.3

320

01-Dec

8.5

7.7

0.0

48.8

497

10.0

7.9

0.2

36.7

203

7.5

7.8

0.0

51.5

321

394


| Herd First day of 5-day period | Beverly | | Queen Maud Gulf | | Qamanirjuaq | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | St.Dev | Min | Max | N | Mean | St.Dev | Min | Max | N | Mean | St.Dev | Min | Max | N |
| 06-Dec | 8.7 | 8.5 | 0.0 | 51.8 | 484 | 7.8 | 0.1 | 48.7 | 203 | 8.2 | 7.4 | 0.1 | 36.5 | 315 |
| 11-Dec | 8.0 | 6.8 | 0.1 | 36.1 | 484 | 5.8 | 0.2 | 31.9 | 194 | 9.7 | 8.8 | 0.1 | 52.2 | 310 |
| 16-Dec | 6.0 | 5.7 | 0.0 | 38.2 | 485 | 5.7 | 0.3 | 34.2 | 195 | 6.8 | 6.6 | 0.0 | 34.8 | 259 |
| 21-Dec | 7.1 | 7.7 | 0.1 | 44.3 | 490 | 6.2 | 0.0 | 28.6 | 181 | 8.3 | 9.6 | 0.0 | 58.2 | 228 |
| 26-Dec | 5.6 | 6.1 | 0.0 | 58.6 | 562 | 5.7 | 0.0 | 30.7 | 228 | 6.2 | 7.6 | 0.0 | 56.7 | 347 |

Source: Data based on satellite collared animals from Nagy and Campbell 2012:151-152.
## Appendix G.

### Human Travel Requirements

Table G.1. Daily Travel of Average Female with No Cargo.

<table>
<thead>
<tr>
<th>Duration (Hr.)</th>
<th>Calories</th>
<th>Pace (1km/h)</th>
<th>Pace (2km/h)</th>
<th>Pace (3km/h)</th>
<th>Pace (4km/h)</th>
<th>Dried (Kg)</th>
<th>Raw (Kg)</th>
<th>Marrow (Kg)</th>
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</thead>
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<td>2</td>
<td>3</td>
<td>4</td>
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<td>.09</td>
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<td>6</td>
<td>8</td>
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<td>.87</td>
<td>.17</td>
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<td>7.37</td>
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</tr>
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<td>24</td>
<td>48</td>
<td>72</td>
<td>96</td>
<td>6.10</td>
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</table>
Table G.2. Daily Travel of Average Female plus Cargo equivalent to Half Body Weight.

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<th>Pace (1km/h)</th>
<th>Pace (2km/h)</th>
<th>Pace (3km/h)</th>
<th>Pace (4km/h)</th>
<th>Dried (Kg)</th>
<th>Raw (Kg)</th>
<th>Marrow (Kg)</th>
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<td>.13</td>
</tr>
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<td>6</td>
<td>8</td>
<td>.77</td>
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<td>.26</td>
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<td>1.97</td>
<td>.40</td>
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<td>8</td>
<td>12</td>
<td>16</td>
<td>1.54</td>
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Table G.6. Daily Travel of Average Male plus Cargo equivalent to Full Body Weight.

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<th>Pace (3km/h)</th>
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<th>Dried (Kg)</th>
<th>Raw (Kg)</th>
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Appendix H.

Nutritional Information on Caribou

Table H.1. Nutritional Information on Caribou per 100 grams.

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<th>Meat Type</th>
<th>State</th>
<th>Calories</th>
<th>Fat (g.)</th>
<th>Saturated Fat (g.)</th>
<th>Trans Fat (g.)</th>
<th>Mono-unsaturated Fat (g.)</th>
<th>Poly-unsaturated Fat (g.)</th>
<th>Cholesterol (mg.)</th>
<th>Sodium (mg.)</th>
<th>Total Carbohydrates (g.)</th>
<th>Dietary Fibre (g.)</th>
<th>Sugars (g.)</th>
<th>Protein (g.)</th>
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<td>.0</td>
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<td>Raw</td>
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<td>22.90</td>
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<td>n/a</td>
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<td>.0</td>
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<td>0.94</td>
<td>.56</td>
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<td>52.00</td>
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<td>950.00</td>
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<td>.73</td>
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<td>45.00</td>
<td>.0</td>
<td>.0</td>
<td>.0</td>
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<td>126.91</td>
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<td>1.50</td>
<td>.73</td>
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<td>45.00</td>
<td>.0</td>
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<td>28.84</td>
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Source: Data from USDA 2014.
## Appendix I.

### Caribou-Human Travel Equivalences

**Table I.1. Caloric Requirements and Meat equivalent for the Daily Travel of Average Female with No Cargo.**

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<th>Pace</th>
<th>Herd</th>
<th>Beverly Herd</th>
<th>Queen Maud Gulf Herd</th>
<th>Qamanirjuaq Herd</th>
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<td>1 km/h</td>
<td>Calories/km</td>
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<td>689</td>
<td>689</td>
</tr>
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<td></td>
<td>Km / Year</td>
<td>3,234</td>
<td>3,091</td>
<td>3,552</td>
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<td>Average km/day</td>
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<td>8.5</td>
<td>9.7</td>
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<td>Dried Caribou (kg)</td>
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<td>Bone Marrow (kg)</td>
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<td>311</td>
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<tr>
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<td>Equivalent Caribou (female)</td>
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</tr>
<tr>
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<td>Equivalent Caribou (male)</td>
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<td>Equivalent Caribou (both)</td>
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<td>9.8</td>
<td>11.3</td>
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<td>344</td>
<td>344</td>
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<tr>
<td></td>
<td>Km / Year</td>
<td>3,234</td>
<td>3,091</td>
<td>3,552</td>
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<tr>
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<td>Average km/day</td>
<td>8.9</td>
<td>8.5</td>
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Table I.2. Caloric Requirements and Meat equivalent for the Daily Travel of Average Female with Cargo equivalent to Half Body Weight.

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<th>Qamanirjuaq Herd</th>
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<td>9.7</td>
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<td>884</td>
<td>1016</td>
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<td>456</td>
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<td>260</td>
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Table I.3. Caloric Requirements and Meat equivalent for the Daily Travel of Average Female with Cargo equivalent to Full Body Weight.

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<th>Qamanirjuaq Herd</th>
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<td>3,091</td>
<td>3,552</td>
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<td>Average km/day</td>
<td>8.9</td>
<td>8.5</td>
<td>9.7</td>
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<tr>
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<td>4,933,728</td>
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<td>4,063</td>
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<td>Equivalent Caribou (male)</td>
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<td>15.5</td>
<td>17.9</td>
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<td>19.8</td>
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<td>694</td>
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<td>3,552</td>
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<td>Average km/day</td>
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<td>8.5</td>
<td>9.7</td>
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<td>273</td>
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<td>14.3</td>
<td>13.6</td>
<td>15.7</td>
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<td>Equivalent Caribou (male)</td>
<td>8.1</td>
<td>7.8</td>
<td>8.9</td>
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<td>Equivalent Caribou (both)</td>
<td>10.4</td>
<td>9.9</td>
<td>11.4</td>
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<tr>
<td>3 km/h</td>
<td>Calories / km</td>
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<td>463</td>
<td>463</td>
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<td></td>
<td>Km / Year</td>
<td>3,234</td>
<td>3,091</td>
<td>3,552</td>
</tr>
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<td></td>
<td>Average km/day</td>
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<td>8.5</td>
<td>9.7</td>
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<td>9.1</td>
<td>10.5</td>
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<tr>
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<td>5.2</td>
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<td>Equivalent Caribou (both)</td>
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<td>7.6</td>
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<td>4 km/h</td>
<td>Calories / km</td>
<td>347</td>
<td>347</td>
<td>347</td>
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<tr>
<td></td>
<td>Km / Year</td>
<td>3,234</td>
<td>3,091</td>
<td>3,552</td>
</tr>
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<td>Average km/day</td>
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<td>8.5</td>
<td>9.7</td>
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<td>Bone Marrow (kg)</td>
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<td>157</td>
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<td>Equivalent Caribou (female)</td>
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<td>7.8</td>
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<td>3.9</td>
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### Table I.4. Caloric Requirements and Meat Equivalent for the Daily Travel of Average Male with No Cargo.

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<th>Qamanirjuaq Herd</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Calories/km</td>
<td>Km / Year</td>
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</tr>
<tr>
<td>1 km/h</td>
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<td>820</td>
<td>3,234</td>
<td>3,552</td>
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<td>Average km/day</td>
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<td>8.5</td>
<td>9.7</td>
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<td>13.4</td>
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<td>6.7</td>
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Table I.5 Caloric Requirements and Meat equivalent for the Daily Travel of Average Male with Cargo equivalent to Half Body Weight.

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<th>Qamanirjuaq Herd</th>
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Table I.6 Caloric Requirements and Meat equivalent for the Daily Travel of Average Male with Cargo equivalent to Full Body Weight.

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Appendix J.

Seeking the Archaeological Signature of Denesųliné Respect

Herein I explore where Denesųliné respect for caribou might be evident in the archaeological record. I first outline observations based on ethnoarchaeological work and interviews of knowledge holders, who talked about how they use all parts of the caribou. They shared that they treat heads with respect and handle them differently than the body. Therefore, I expect extensive use of caribou, evidenced by heavily processed caribou bone at habitation sites.

The reality is that very few caribou bones are present at the tenting sites that date from the 1890s to 1960s'1 and are associated with processing and the manufacture of dry meat. In fact, very few artifacts are present. Cultural evidence includes a few stones or the stove, and a metal can or two. Occasionally, past occupants left a caribou skull, a set of antlers, or tent poles, still well preserved. Almost no other materials are present. This is a function of short-term seasonal occupations and a cultural value to clean up sites during abandonment. There should be better cleaning up in snow-free conditions, because tools, meat, and bones can be lost in moderate to deep snow. In addition, dogs scavenge habitation areas. Based on the interviews, observations on site, and my experiences in the region, I believe that these tenting areas are good examples of the nature of activities that should occur in older sites, including those that predate contact. As to whether these sites are considered “archaeological,” the Government of the Northwest Territories has determined that all of the tent sites are archaeological, but only the two village sites and modern antler pile are non-archaeological based on their legislation and current process, procedures and values.

Setting that aside, relative to the longer-term history of the Denesųliné, observations at the tenting sites should extend into the past, because:

1. The same people would occupy these same areas.

2. These are mobile tent sites.

3. The sites are on a major caribou crossing.

4. The lifeway in the 1890s to 1960s is consistent with historical accounts of earlier activities. There is historical use of this crossing to at least 1771, in which entirely traditional methods were used/observed.
5. I expect the results of an archaeological survey of the area would be consistent with regional surveys (i.e., Gordon 1996), such that there should have a sequence of Taltheilei components, which were preceded by pre-Dorset, and likewise more general ‘middle-period’ components.

6. There is a direct connection/continuity between Taltheilei and the Denesųlinė (Gordon 1996).

7. Religious/spiritual activities that are inconsistent with the current Roman Catholicism of the Denesųlinė are representative of earlier traditional values.

Extensive surface scatters of artifacts were present at village sites from the 1970s and 1980s. Individual features such as can middens, or abandoned snowmobile parts are there. Most of the faunal remains that surround the houses are caribou, and approximately half are complete elements, such as humerus, tibia, femur, and skulls. About half of the skulls are broken at the foramen magnum for apparent brain extraction, which was used in tanning hides. Articulated sections include spinal column, and entire legs (i.e., front and hindquarters). Their scattered locations do not suggest caching. Based on the faunal assemblage, these sites occupants did not consistently extract marrow or regularly make bone-grease.

The reported staged butchery processes may have archaeological representation identifiable by distinct tool and faunal assemblages. Kill sites should include broken projectiles and complete caribou carcasses or near complete caribou carcasses with only the head removed. The primary butchery sites should include large cuts of caribou meat, and knives. The butchery processes outlined in Chapter 4 indicates that whole limbs are expected, whereas the body is separated into complete pelvis, lower and upper portions of caribou spine, right and left briskets, and caribou skull. During secondary butchery, each element should be separate, and the skulls kept separate from the limbs and meat. Secondary butchery should occur within campsites, and often within individual lodges. Tertiary butchery associated with dry meat and pemmican production should be associated with hearths, and split, fragmented, burned and/or calcined caribou bones. I also expect that knives, hammer-stones, and anvils are at tertiary butchery sites.

Knowledge holders recall placing pulverized bone fragments from bone grease production in hearths or stoves. Therefore, small calcined bone fragments should be all that remains. This is not the case based on the material evidence at the villages on Wholdaia Lake. Either the Denesųlinė were not making significant amounts of bone grease or that the hearths did not entirely consume bone fragments. In all cases, the respectful handling of bone did not occur in village sites in the 1970s and 1980s in the manner described by knowledge holders. The lack of faunal remains and the preponderance of caribou skulls in association with individual tents from the 1950s and earlier express ritual handling. I observed this during my participation in a caribou harvests.
Below, I hypothesize where Denesųliné respect for caribou might be evident in the archaeological record.

**Hypothesis 1**: at habitation sites, caribou skulls should be present outside of habitation sites. They should be in proximity to the either the rear of a lodge or adjacent to the entrance.

*Assumption 1*: Caribou heads are handled in a respectful way.

*Assumption 2*: Caribou heads are kept away from scavengers, including dogs and wolves.

*Assumption 3*: Caribou heads are kept whole, except for the base of the skull, which might be broken from brain extraction.

**Hypothesis 2**: Primary processing sites should contain antler pile features.

*Assumption 1*: Antlers are removed at primary processing sites out of respect to the animal.

*Assumption 2*: Antlers are left at primary processing sites, the remainder of the animal, including bones, would be hauled to secondary processing areas.

*Assumption 3*: Primary and secondary processing are spatially separated.

*Assumption 4*: Antler piles should be found on lake shorelines, or in nearshore underwater environments.

*Assumption 5*: Antler piles should be concentrated at the landing areas of caribou crossings.

*Assumption 6*: Antler piles at the landing areas of caribou crossings indicate seasonality by identifying either north trending movement in the spring and south trending movement in the fall.

**Hypothesis 3**: Ritual disposal of bone in hearths or lakes are likely in habitation sites and show respect for caribou. The distribution of faunal remains at habitation sites can indicate the presence or absence of respect practices.

*Assumption 1*: Habitation sites that evidence respect for caribou will have very little faunal material inside the habitation. Faunal material may be present in hearths as calcined fragments, but nowhere else.

*Assumption 2*: Habitation sites that do not evidence respect for caribou will have many faunal remains inside the habitation.
Assumption 3: Campsites are cleaned up when abandoned to ensure caribou are respected.

Assumption 4: Sheet middens of bone do not indicate respectful behaviour.

Hypothesis 4: Stone caches and cultural depressions should be associated with primary caribou processing sites and habitation sites.

Assumption 1: Caribou meat was cached to prevent waste.

Assumption 2: Stone cairns may indicate a cache, depending on spatial context (such as in direct association with a caribou crossing).

Assumption 3: Most caches should be empty. Cached caribou would have been removed.

Assumption 4: Caches may include whole caribou. This is indicative of hunters having a successful hunt, and being unable to transport the meat.

Future archaeological resources should be conducted due to community interest. One question is to apply knowledge gained in the thesis to further explore continuities and discontinuities. The study area is excellent for future work, because there is excellent information on historical and modern uses and values of the area, and an expectation that excellent pre-contact archaeological components will be related to caribou harvest. Caching can be directly assessed because this is an area where caches are found in modern times. It is also an area where caching occurred in historic times, and at least at three archaeological sites appear to be present in the area. As this is a community-oriented study, therefore, if the Denesųłinë want to know more about their past, this is an excellent spot to do (with the caveat that it is far away from current populations, and difficult to get to). Suggested direction for future archaeological research includes:

1. Focus archaeological survey at caribou crossings, preferably crossings connected to oral traditions.
2. Identify features within habitation sites and primary butchery sites.
3. Use diagnostic artifacts and radiocarbon dates from features to assess temporal depth of cultural practices, and potential changes over time.
4. Compare zooarchaeological recoveries between features, and identify patterns in the spatial distribution within and between habitation sites.
5. Survey shorelines and ridge tops with views of lake in multiple directions.
Appendix K.

Transcript of Jean Chretien Press Encounter, 2016

The following excerpt is a transcript from an encounter with media that Jean Chretien had on April 13, 2016 outside of the House of Commons in Ottawa immediately after meeting with Prime Minister Justin Trudeau, and on the same day that the Parliament of Canada responded to the suicide crisis in Attawapiskat. When reporters asked Canada’s former Indian Affairs Minister, and former Prime Minister, about the long-standing crises in Attawapiskat, he acknowledged the challenges indigenous communities face, and suggested a solution:

Jean Chretien: “It was terrible, I know, I know, I was Minister longer than anybody else, I was there six years, two months, three days, and a few hours. So I know the problem, that it takes time. But the problem is isolation, and you know, it is difficult to have economic activities in some of these areas. … I try to be patient, and try to solve the problems.”

Reporter: “You’d leave them there, and put resources in, right?”

Jean Chretien: “The problem is sometimes, you cannot, you know, it is people, people have to move sometimes. It’s desirable to stay, if they want to stay, but it’s not always possible. So you cannot have a statement that is generic. You know it is extremely difficult. It’s one case at a time. It is some, it is difficult culturally for them all the time. I was there with them, for nights, imagine me speaking to them in my English, they needed a translator to translate my English into English, and after that, translate into native language.”

Reporter: “Mr. Chretien, was it lost in translation?” (Chretien 2016:1).