Caribou Hunting at Mingo Lake: A Comparative Study of Pre-Dorset and Late Dorset Hunting Methods

by

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Caribou are a very important resource in the Arctic because they provide food, raw material for weapons and tools and skins for warm winter clothing. The methods used to hunt these animals have been studied extensively by ethnographers who lived with and observed Inuit groups during the late 19th and early 20th century. At that time, hunting methods were changing due to the fur trade and the introduction of rifles but there were still groups who used older methods of hunting that would have been similar to techniques used by ancient arctic peoples. LdFa-1 is a multi-component caribou-hunting site on the northwestern corner of Mingo Lake, Southern Baffin Island, Nunavut that was used by the Pre-Dorset, Dorset, Thule, and Inuit. The focus of this paper is the distinct Pre-Dorset and Late Dorset occupations. The Pre-Dorset lived from around 4,500 B.P. to 2,700 B.P. before developing into the technologically different Dorset culture, who survived until sometime before 700 B.P. before disappearing for reasons that are still unclear to archaeologists. The Pre-Dorset and the Late Dorset both hunted caribou at Mingo Lake but the only surviving evidence for the methods they used are in the form of a few stone endblades and harpoon heads. Due to this limited archaeological evidence, a study that combines ethnographic accounts with the archaeological data has the potential to determine which techniques for hunting caribou at Mingo Lake would have been possible by each culture with the technology it possessed.

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Chapter 1

"This is our food, this is our clothing": Caribou and Seal hunting in the 21st Century

1.1 Introduction

Site LdFa-1 on southern Baffin Island, Nunavut is a multicomponent caribou-hunting site that was occupied by the Pre-Dorset and Dorset cultures who lived in the Arctic from 4500 years B.P. to sometime before 700 years B.P. (Appelt et al. 2016; Milne and Park 2016). My research looks at the different caribou hunting methods that may have been employed by these two cultural groups. Because hunting sites can be difficult to date and interpret, archaeological research on prehistoric hunting practices is not commonly conducted (Brink 2005; Friesen 2013; Howse 2019). Interpretations of prehistoric hunting methods are sometimes based on ethnographic analogy of historic Inuit from the time when they were still exclusively living on the land, but this method requires caution and speculation (see chapter 2). Despite these challenges, it became clear in my research on LdFa-1 that hunting has been an important practice continuously for thousands of years in the far North. Though the methods have changed a lot over the many years that people have occupied the Arctic - bows and arrows and sleds have been replaced with rifles and snowmobiles – hunting has deep-rooted cultural meaning that persists in the far North today. However, the public discourse on hunting outside the Arctic is largely negative.

This chapter will address these negative portrayals of hunting practices and how they have gravely affected northern Inuit communities. While a wide range of animals are hunted

in the North, this chapter will focus on those that are discussed most commonly: seal and caribou. In the past, hunting was important for subsistence reasons and this is still true today, but conservationists and animal rights groups tend to place themselves on the opposing side of the Inuit by blaming over-hunting for population decline or presenting hunting as an evil and immoral act (Arnaquq-Baril 2016; Butterworth 2014; Kenny and Chan 2017; Rogers 2020).

Despite these deep-rooted problems, there have been changes in how Inuit hunting has been perceived (Gregoire 2017; Parlee and Caine 2017) but the discussion on hunting practices in the Arctic needs to continue in order to inform the public on its cultural and economic importance. My research focuses on caribou hunting specifically, but seal hunting is just as relevant in this discussion because seals are incredibly important in northern communities both economically and ideologically. Despite this importance, seal hunting has developed a very negative reputation outside the Arctic due mostly to the spread of misinformation in the media.

1.2 The Seal Hunt

As the result of anti-sealing protests organized by animal rights groups throughout the 1970s and 1980s, the European Union banned the import of products made from harp seal pups. This was a huge win by animal rights groups because they ended the practice of an activity they considered to be inhumane and immoral. The demand for seal skin products dropped significantly and the entire market collapsed (Hennig 2018:407). Despite the fact that these protests were aimed at one annual seal hunt in Labrador, most seal hunters are

actually Inuit who live throughout Arctic Canada and the collapse of the seal skin market completely crashed their economy (Arnaquq-Baril 2016; Wenzel 1991:1). Inuit have hunted seal for over a thousand years and while the nature of this hunt has changed, its importance has not. There are few economic options in Nunavut and seal hunting not only maintains cultural traditions, it is an essential source of food and raw material and it allows Inuit to participate in the global economy sustainably. Harvesting harp seal pups (which Inuit have never done) has been illegal for nearly 40 years now, but companies that support animal welfare continue to appeal to the public to fight against sealing (Gregoire 2017).

The anti-sealing campaigns, while well-intentioned, affected Canadian Inuit the most and yet they were completely ignored in these protests (Arnaquq-Baril 2016). When they were acknowledged, the focus was on subsistence hunting and the idea that selling sealskins was non-traditional and without subsistence benefit (Wenzel 1991:143). However, due to the crash of the seal skin market, Inuit could no longer afford to hunt or even buy market foods. Hunting is an expensive activity and the price of ammunition and maintaining equipment is high so selling seal skins was a way to cover this cost (Wenzel 1991:3). Inuit are now the most food insecure indigenous people in any developed country, they have the highest poverty and unemployment rate and the highest cost of living (Arnaquq-Baril 2016). In her 2016 documentary about the effects of anti-sealing campaigns on Inuit communities - *Angry Inuk* - Alethea Arnaquq-Baril says that seal hunting is "not just about tradition […] hunting is still the best way to feed Inuit."

In an attempt to revitalize the seal skin market and to raise awareness about Inuit seal hunting and how the protests were negatively affecting Inuit communities, the #sealfie campaign began (ᑯᐸᑦ ᐅᑲᑯᖅ ᑕᑦᑐᐃᓂ 2018, Twitter; Arnaquq-Baril 2016; kivvaq 2018, Twitter; Paatsaali School 2018, Twitter). This campaign was aimed at celebrating sustainable Inuit seal hunting and showing off beautiful seal skin products. Unfortunately, the campaign received a lot of negative feedback from social media users and animal rights groups. For example, according to a Global News article, activists claimed that the #sealfie campaign was "misguided" because organizations like People for the Ethical Treatment of Animals (PETA) and the Humane Society of the United States (HSUS) were not opposed to the Inuit seal hunt but rather the commercial hunt on Canada's east coast (Kennedy 2014). What these companies continue to fail to understand is that hunting is the basis of the economy in many Inuit communities and anti-sealing campaigns that fail to acknowledge the huge role Inuit play in the seal hunt ruins the reputation for all seal products.

This portrayal of Inuit as only being able to practice "traditional" activities or hunt for subsistence is problematic (Parlee and Caine 2017:7) because it ignores the fact that Inuit are a part of the contemporary world and they are affected by decisions made by conservationists, governments, international organizations and animal rights groups in regard to hunting. The disconnect between how animal rights groups and the public perceive seal hunting and what it actually looks like needs to be mended, especially since both groups generally want the same thing: to protect the seal population. A similar disconnect exists between conservation biologists and Inuit caribou hunters.

1.3 The Caribou "Crisis"

The discourse on caribou hunting has similar issues. In the 1950s, biologists did not understand caribou population dynamics as much as they do today and cited Inuit over-hunting as the major factor in population decline; what they perceived to be a "crisis" (Parlee et al. 2018:3). Conservation efforts were often aimed at harvesting quotas which put immense pressure on Inuit communities who rely on hunting as a food resource (Parlee and Caine 2017:5). Today, caribou population dynamics are much better understood and there are increasing studies on alternate threats to population levels such as climate change (Parlee and Caine 2017:4). However, restricting harvesting is still the focus of wildlife management institutions despite the fact that its effectiveness in achieving conservation objectives is not certain (Kenny and Chan 2017:2; Parlee and Caine 2017:4; Rogers 2020). "Some people think the answer for declining caribou population is to implement more centralized governance and control over Inuit" (Parlee and Caine 2017:4), but Inuit feel there is too much control and it is unnecessary because they are aware of changes in caribou populations. For example, earlier this year, the Government of Nunavut asked for even lower harvest limits on two declining caribou herds despite the profound impact it would have on Kugluktuk, a community that relies on these herds for food and clothing (Brown 2020). The manager of the community's Hunters and Trappers Association said that Inuit are aware of the population decline and that their own policies have been put in place to protect the herds such as banning all sports hunts and not allowing hunters to hunt around the community (Brown 2020). The imposition of harvest limits creates problems for northern communities

and Inuit knowledge of caribou population dynamics needs to be respected and addressed in conservation efforts.

There are many oral accounts across northern communities that talk about years when caribou were abundant and when caribou did not come (Parlee and Caine 2017:5). One oral account comes from Billy and Eileen Jacobson who were interviewed about their lives on the land near the Anderson River, N.W.T.:

> *Eileen*: They said there was a decline of the caribou, declining of the herd. Bluenose Herd. And so now even us at our camp we have to have a tag to… kill a caribou. We can't just go out there and shoot caribou like we used to.
> *Billy*: But there's still a lot, [they're not] in any big danger yet, but… the past numbers are way down… I think, what causes it myself is, they just run through a big cycle ah. A huge cycle. It will take years to come back again… Nothing to blame any one thing on anyway. It's a number of things that [contribute]… I think the main one is the cycle. [Billy and Eileen Jacobson 2011]

This account is only one example of the first-hand knowledge that Inuit elders have on the significant caribou population fluctuations. Frank Pokiak, an elder from Tuktoyaktuk, N.W.T. says that elders know the caribou will leave again and he explains that they know how to harvest sustainably; for example, by harvesting other resources like waterfowl and moose when the caribou population is low (Pokiak 2017:34). Today, there is greater

acknowledgement of traditional knowledge (Last 2020; Nunatsiaq News 2019; Parlee and Caine 2017:12) but the discourse on this subject needs to continue for governments to accept that Inuit have the knowledge and capacity to manage their own resources (Parlee and Caine 2017:10).

1.4 Hunting and Arctic Archaeology

Archaeological investigations of past hunting practices, especially from sites that are thousands of years old and have poor preservation, focuses on only the material culture left behind. However, we know that hunting has been an essential subsistence activity in the far North since the arrival of the first human groups thousands of years ago. Not only did hunting provide food, but also many other resources like tent coverings, warm and soft bedding, raw materials for tools and weapons and most importantly warm skin clothing for the harsh Arctic winters (Burch 1972; Stenton 1991:18). The Pre-Dorset and Dorset are the focus of my research and the Dorset disappeared at least 700 years ago, but the Thule and their successors, the Inuit, continued to exploit caribou for their essential resources in the same places that the Pre-Dorset and Dorset did (Friesen 2013; Howse 2019; Park 2009). Inuit hunting practices likely differ from those of their biologically and culturally distinct predecessors but the importance of being successful in their hunting does not.

It is important for archaeology to be relevant to the present and the public discourse on hunting practices that are entangled with the economic and cultural necessity of hunting in the North can be brought into the light through continued research on the long history of caribou hunting in the Arctic. My research is largely inferential, drawing from a combination

of ethnographic descriptions of Inuit hunting practices and archaeological data in the form of artifacts and site features. While the following chapter does not directly address the issues of the public discourse on hunting practices, it does look at changing caribou hunting methods from the Pre-Dorset times up until historic Inuit times and it highlights how essential caribou hunting was – and still is today – in the Arctic. The root of the issues around Inuit hunting practices is a misunderstanding and ignorance of the Arctic environment and how humans have adapted to live in such a unique landscape. Archaeological research on past human-animal relationships in the Arctic can increase the public's understanding of the continued importance of hunting today.

I will submit the second chapter of my thesis to the *Canadian Journal of Archaeology* for potential publication. Recent publications on LdFa-1 have been published in this journal (Milne et al. 2012; Park et al. 2017). The *Canadian Journal of Archaeology* is a peer-reviewed scholarly journal that is affiliated with the Canadian Archaeological Association (CAA). According to their website, their mandate is to "document the processes and results of Canadian archaeology, and to serve as a venue for descriptive studies, cultural historical syntheses, theoretical explorations, and sociocultural analyses relating to the practice and politics of archaeology" (Canadian Archaeological Association). I believe my research in the Canadian Arctic fits this mandate.

Chapter 2

Caribou Hunting at Mingo Lake: A Comparative Study of Pre-Dorset and Late Dorset Hunting Methods

2.1 Introduction

Animals are the main source of food in the Arctic. Many of the material, social and cultural practices of prehistoric arctic peoples were centered around their relationship with the animals they hunted. This relationship is represented in the landscapes they chose to inhabit, the weapons they skillfully manufactured and the art they carefully crafted (Howse 2019; Maxwell 1976; Maxwell 1985: 95,160; Odgaard 2018:87). Understanding the sophisticated hunting strategies developed over the thousands of years when the Pre-Dorset and Dorset cultures occupied the Arctic can shed light on this human-animal relationship. An important animal that was hunted by nearly every arctic culture is the caribou. Caribou are an essential resource in the far North because they provide food, skins for clothing, bedding and tent coverings, and raw material for various tools, weapons and art pieces (Burch 1972:343; Maxwell 1976:67-69; Pasda 2013; Spiess 1979; Stenton 1991:18). However, the details of the strategies that were used to hunt caribou are somewhat of a mystery because all that is left behind archaeologically are caribou bones and small parts of the weapons that were used to hunt them. For this reason, many archaeological studies that look at prehistoric hunting techniques focus on zooarchaeological or lithic analyses (Howse 2008; Howse and Friesen 2016; McAvoy 2014; Pasda 2013; Spiess 1979). Another way to understand how the Pre-

Dorset and Dorset used their weapons to hunt animals in the Arctic is to look to the ethnographic record.

In the late 19th and early 20th centuries, researchers and explorers recorded and published detailed accounts describing the way of life of the many Inuit groups who lived and flourished in the far North (Balikci 1970; Birket-Smith 1929; Boas 1888; Jenness 1922; Rasmussen 1908; Stefánsson 1919; Turner 1894). The ethnographic record provides detailed information on how caribou can be hunted in the Arctic, but the people studied in those accounts had a different material culture than both the Pre-Dorset and the Dorset who came before them. The Thule are the direct biological ancestors of the Inuit so drawing on ethnographic data from the Inuit to understand Thule cultural behaviour is readily justified. However, caution should be exercised when doing this with the Pre-Dorset and Dorset who preceded the Inuit by hundreds or thousands of years and are not biologically or culturally linked to them. Despite these limitations, the environments and resources encountered by the Pre-Dorset and Dorset were very similar to those encountered by the Inuit so a connection can certainly be made between how these different groups of people exploited this unique part of the world.

At LdFa-1 – a multicomponent site situated on the north-western shore of Mingo Lake, southern Baffin Island, Nunavut – both the Pre-Dorset and the Dorset hunted caribou (McAvoy 2014; Milne 2005; Milne 2008; Milne et al. 2012; Park 2009). The materials that the people of these two different cultures left behind that could have been used to hunt these animals at this single location differ. LdFa-1 thus offers a unique opportunity to compare the

hunting strategies employed by both the Pre-Dorset and the Dorset under similar circumstances. Since a limited number of relevant lithic artifacts were present at LdFa-1, a study that combines ethnographic accounts with the archaeological data has the potential to determine which techniques for hunting caribou at Mingo Lake would have been possible by each culture with the technology it possessed.

2.2 Background

2.2.1 Pre-Dorset and Dorset

Pre-Dorset

4500 years ago, the Canadian Arctic was populated by people known to archaeologists as the Arctic Small Tool tradition (ASTt). The Pre-Dorset are one of three regional variants of the ASTt and they lived and flourished in the Canadian Arctic from around 4500 B.P. to 2700 B.P. (Milne and Park 2016:694). In the interior of southern Baffin Island during the warm seasons, the Pre-Dorset, as later groups would, exploited the availability of raw toolstone, predictable subsistence resources (e.g., caribou, fish, waterfowl) and opportunities for social interactions (Krause 2018; McAvoy 2014; Milne and Donnelly 2004; Milne et al. 2013; Park et al. 2017).

The Pre-Dorset lived in small, egalitarian bands comprised of single-family units and they likely would have cooperated closely with nearby families (Milne and Park 2016:697). They practiced a dualistic economy meaning they lived off seasonally available resources from both the land and sea. The seasonal round generally consisted of periods of nomadism

where people were traveling between winter and summer camps and periods of sedentism where they camped and exploited the local resources (Bielawski 1988:56; Milne and Park 2016:696). Regional settlement and mobility patterns vary considerably (Bielawski 1988; Helmer 1991) but the Pre-Dorset sites in southern Baffin Island where large resident caribou herds move to different areas of the island on their annual migration routes (Ferguson et al. 1998; Maxwell 1985:82) likely represent a mobility pattern of hunting, camping and traveling in the interior in the warm months and moving back to the coast and sea ice in the winter.

Non-lithic artifacts are rarely preserved at ASTt sites so much of what we know about the Pre-Dorset comes from their stone tool assemblages (Bielawski 1988:53). The stone hunting implements include endblades, bifaces and bipointed sideblades that are hafted on wood or antler pieces to create weapons such as bows and arrows, lances and harpoons (Helmer 1991:306; Milne and Park 2016:695). Using this weapon inventory, the Pre-Dorset became very effective caribou hunters (Gordon 1996; McAvoy 2014; Milne et al. 2013; Taylor 1967:225-227). Watercraft are another useful "weapon" for caribou hunting and are well-represented in ethnographic accounts of Inuit hunting but evidence for their use by the Pre-Dorset is very limited and has only been found on Saqqaq sites (a regional variant of the ASTt) in Greenland where wooden objects have been preserved (Grønnow 2012). Evidence for the presence of dogs and their role in Pre-Dorset hunting and other activities is similarly limited (Morey and Aaris-Sørensen 2002).

Dorset

The Dorset are generally understood as being the biological and cultural descendants of the Pre-Dorset (see Ryan 2016 for discussion) and are subdivided into Early, Middle and Late periods. The Dorset component at LdFa-1 is Late Dorset. The Late Dorset lived from around 1500 B.P. to sometime before 700 B.P. when a changing climate may have acted as a catalyst for Late Dorset population movements and local extinctions and their eventual disappearance by the time the Thule arrived (Appelt et al. 2016:784).

Some Late Dorset sites have high visibility and good preservation which has allowed archaeologists to understand a great deal about them through their material culture. The Late Dorset constructed larger dwellings than the Pre-Dorset and have been interpreted as more sedentary than their predecessors and more reliant on marine resources (Hodgetts et al. 2003; Maxwell 1985:122;). This interpretation is based on site locations and sizes, faunal evidence for marine mammals as the primary subsistence resource, specialized harpoon technology, and the absence of the bow and arrow. Inland sites like LdFa-1 confirm, however, that the Late Dorset were fully capable of exploiting key terrestrial resources such as caribou.

Despite the lack of bow and arrow technology (Appelt et al. 2016:785), the Late Dorset had an impressive material culture. For example, they developed a variety of toggling harpoon heads each with special hunting applications (Appelt et al. 2016:785; Maxwell 1985:135; Park and Stenton 1998:31-38). They used meteoritic iron, copper, ivory, antler and bone to manufacture their tools and weapons and to carve exquisite art works (Appelt et al.

2016:785; Maxwell 1985:145). Like the Pre-Dorset, evidence for the use of watercraft and dogs in hunting and other activities is limited (Mary-Rousselière 1979; Morey and Aaris-Sørensen 2002).

2.2.2 Site LdFa-1

LdFa-1 is a multicomponent site located on the northwest corner of Mingo Lake on southern Baffin Island, Nunavut containing Pre-Dorset, Late Dorset, Thule and Inuit components (Figure 1) (Park 2009; Park et al. 2017:68). Stenton first identified the site in 1991 and Milne returned to excavate in 2004 and 2007 as part of a project investigating how the Pre-Dorset and Dorset exploited the inland terrestrial ecosystem (Milne 2005; Milne 2008). Further excavations were carried out in 2008 by Park and a geophysical survey was conducted on part of the site by Landry in 2014 (Landry et al. 2015; Park 2009). The site contains spatially distinct Pre-Dorset and Dorset components which offer a unique opportunity to compare occupations by the two cultures within the same geographic and seasonal context (Figure 2). LdFa-1 is the largest of 13 additional sites described by Milne (2008) around the shore of this naturally occurring narrow of Mingo Lake; five of which contained Pre-Dorset cultural material and the other eight consisted of hunting structures, meat caches and tent rings with no definitive cultural attribution.

Baffin Island is home to numerous caribou herds that migrate from their wintering locations in highland valleys to coasts and inland lakes during the warm seasons (Maxwell 1985:138). Caribou move through the inland lake districts after calving further to the north and various migratory paths have been observed by Inuit (Ferguson et al. 1998). There are

three well-defined caribou trails at LdFa-1 along its East-West axis and during excavations, caribou were observed crossing from the south shore to the north shore where they encountered the steep Mingo Lake esker which is several kilometres long (Milne 2005, 2008; Park 2009). Based on the caribou traffic running through the site and the advantageous topography, it makes sense that the main quarry would have been caribou.

LdFa-1 contained a rather large faunal assemblage comprised of almost exclusively caribou (McAvoy 2014:77; Milne et al. 2012:278). The Dorset component contained the most caribou remains, but this may be due to differential preservation. Tool-making may also have been an important activity here for both the Pre-Dorset and Dorset as some of the caribou bones were being made into tools and many of the lithic artifacts were burins which are used to carve materials like bone and antler into tools (Krause 2018; Park et al. 2017). The lithic assemblage also includes large amounts of debitage which indicates that stone tool-making was another important activity at the site. Of the complete tools, 19 were endblades used to tip weapons like arrows, spears, lances and harpoons. There were also two complete self-bladed harpoon heads (Figure 3).

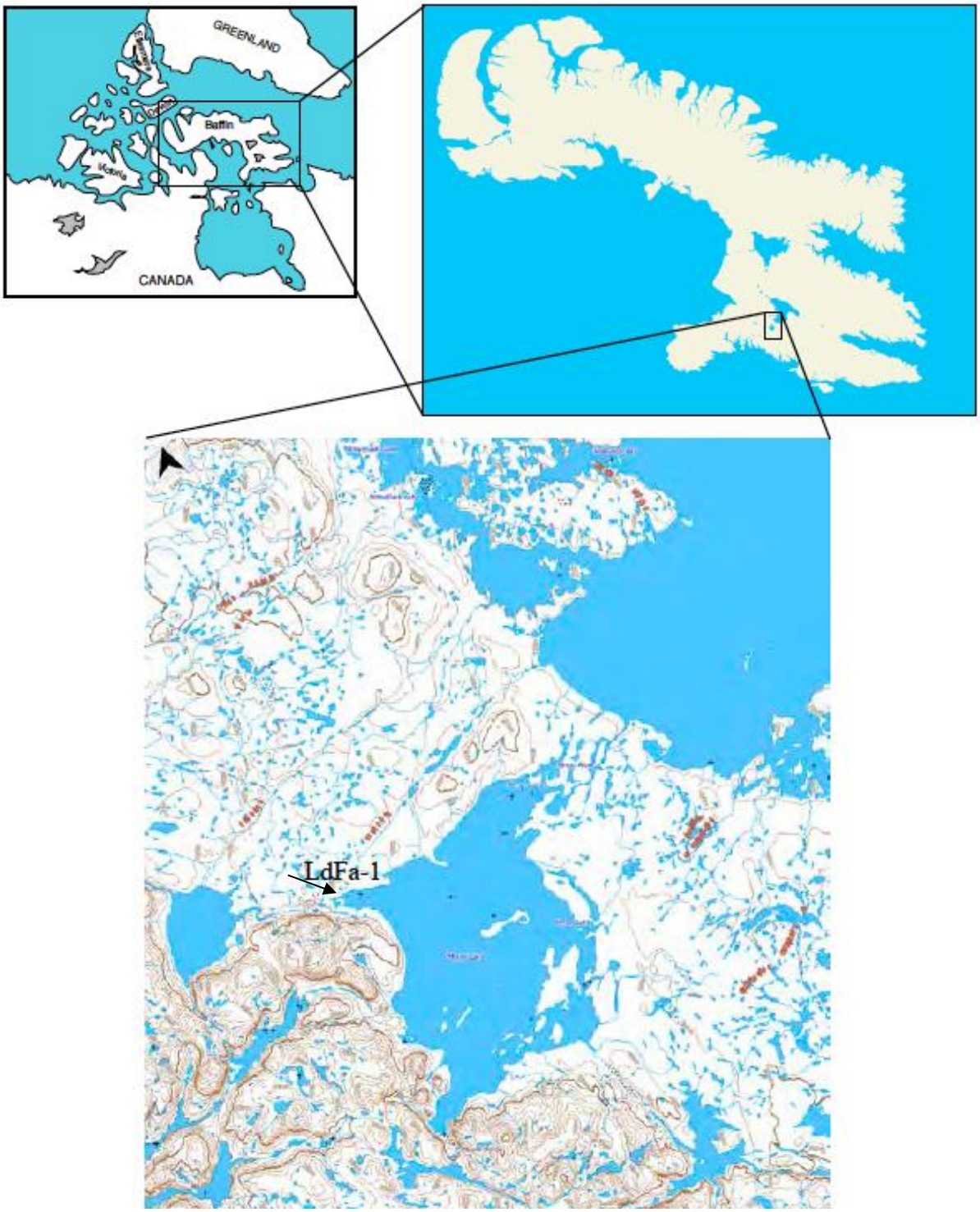


Figure 1: Location of Mingo Lake and LdFa-1 (from Park 2009)

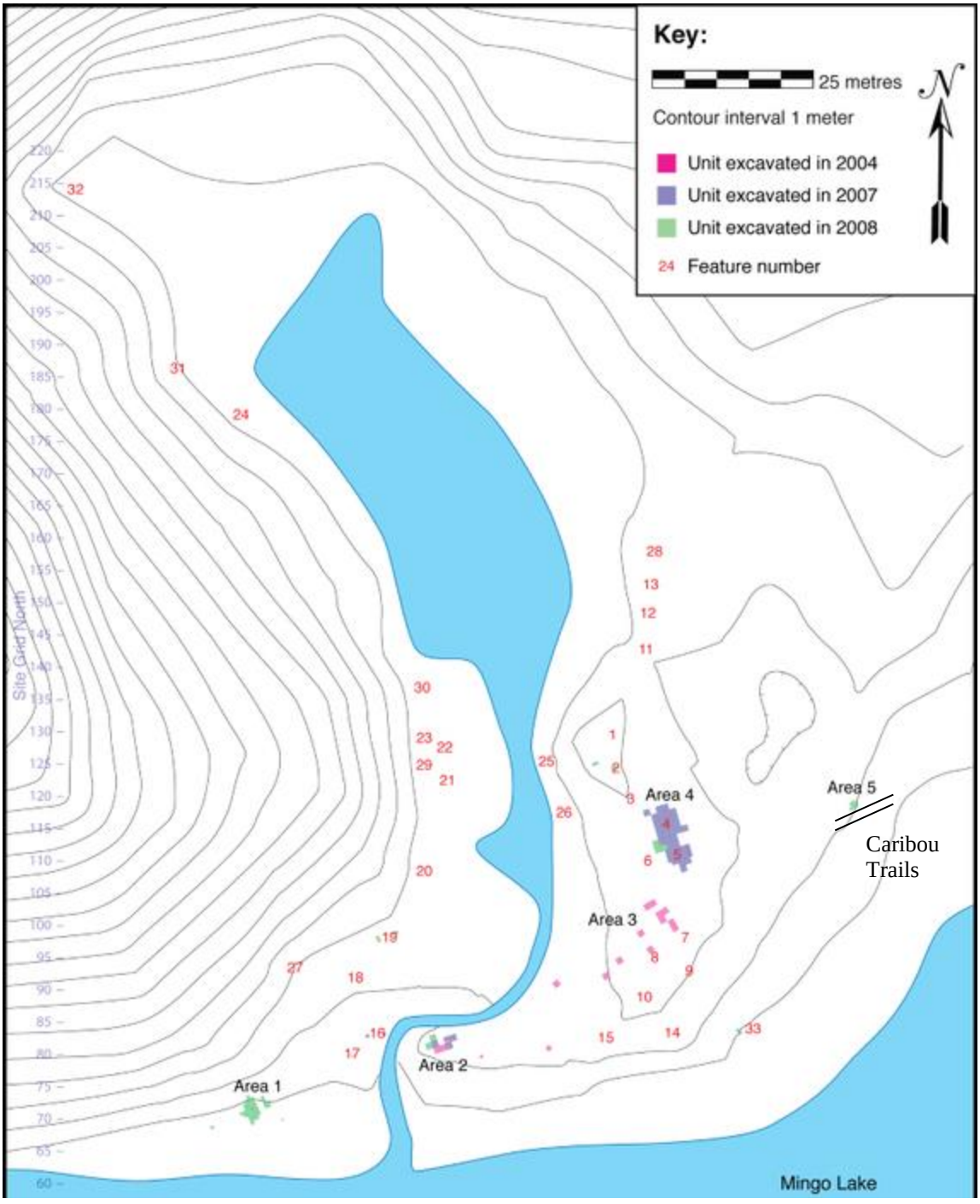
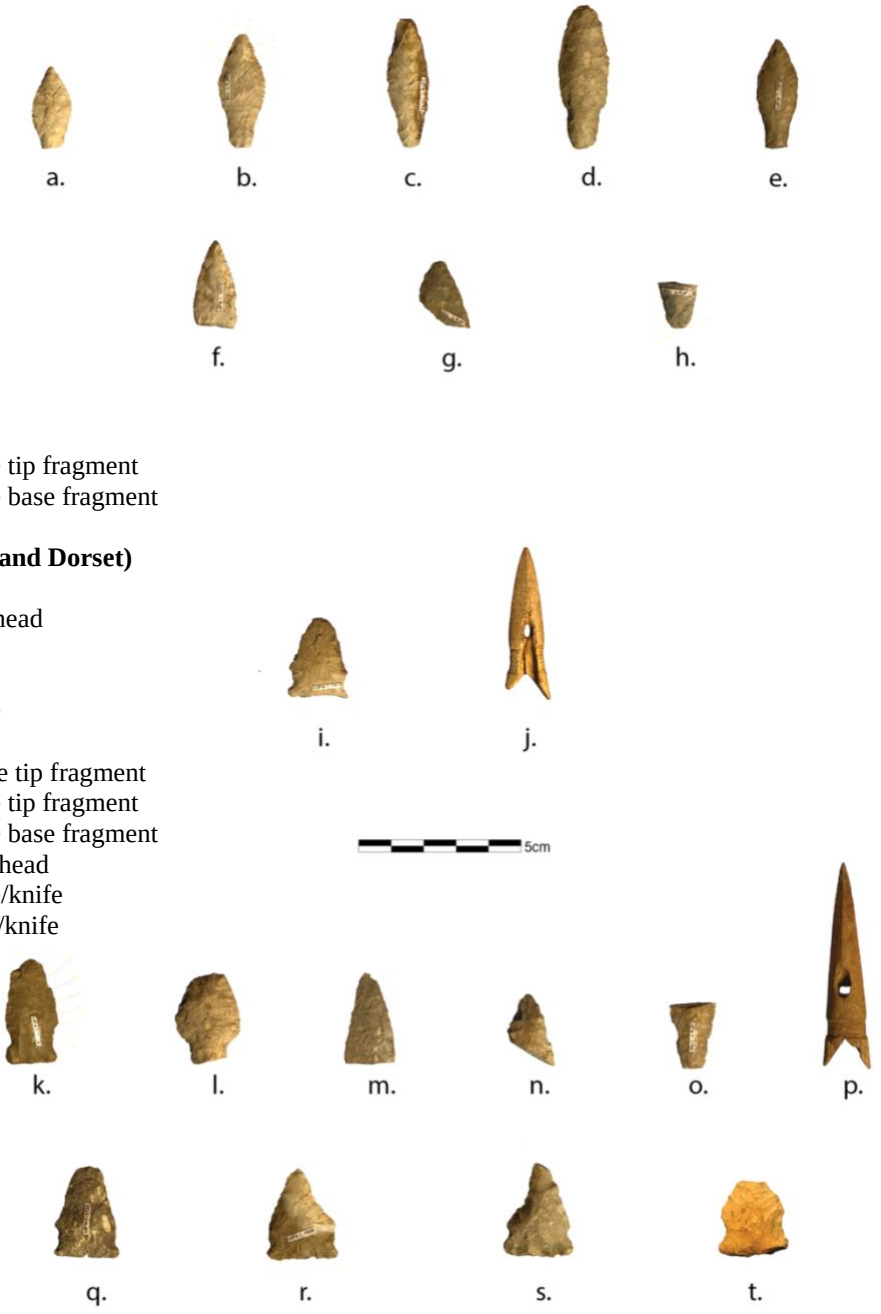


Figure 2: Map of LdFa-1 excavations. Area 1 - Dorset; Area 2 - Pre-Dorset and Dorset; Area 4 - Pre-Dorset. Caribou trails excavated at Area 5.



Area 4 (Pre-Dorset only)

a. LdFa-1:1123 - endblade
b. LdFa-1:709 - endblade
c. LdFa-1:1478 - endblade
d. LdFa-1:710 - endblade
e. LdFa-1:796 - endblade
f. LdFa-1:1231 - endblade
g. LdFa-1:1626 - endblade tip fragment
h. LdFa-1:1334 - endblade base fragment

Area 2 (both Pre-Dorset and Dorset)

i. LdFa-1:1423 - endblade
j. LdFa-1:2230 - harpoon head

Area 1 (Dorset only)

k. LdFa-1:1959 - endblade
l. LdFa-1:2298 - endblade
m. LdFa-1:1741 - endblade tip fragment
n. LdFa-1:2336 - endblade tip fragment
o. LdFa-1:1799 - endblade base fragment
p. LdFa-1:2585 - harpoon head
q. LdFa-1:1728 - endblade/knife
r. LdFa-1:1838 - endblade/knife

Figure 3: Projectile Points, endblades and harpoon heads from LdFa-1

2.2.3 Caribou Ethology

Caribou were an essential resource in the Arctic because they provided a broad range of food items as well as raw material from their bones, antlers and sinew used to manufacture weapons and tools (Stenton 1991:18). The most important material they provided was skin. Caribou skin was used to manufacture winter clothing and many activities in the cold arctic winters involved extended periods of outdoor activity so keeping warm was essential (Stenton 1991:18). An integral part of successful caribou hunting is a deep understanding of caribou behaviour and migration patterns. The strategies employed by Inuit hunters are often dependent on (1) knowledge of how caribou will behave in certain situations and, thus, (2) on being able to predict where they can be encountered.

The way caribou handle sensory data is important to understand when hunting them. Although they can see movement from great distances, their eyesight is quite poor. Caribou recognize certain patterns of movement; for example, the movement patterns that wolves create when hunting will trigger the caribou's flight response and they will flee (Spiess 1979:36). If the movement they see is unrecognized, however, the caribou will move closer to investigate – this also has to do with their curious nature as anything that can arouse this curiosity will attract them (Spiess 1979:36). Caribou's hearing does not appear to be any better than that of a human, but they have a keen sense of smell which they use to communicate with each other and if they detect a human scent, they will move away from it (Spiess 1979:37). Each of these reactions to sensory data would have been known to hunters

and taken advantage of in their hunting techniques. Another important aspect of caribou behaviour is how they migrate and what routes they take.

Caribou migrations are not always consistent, but they can be predicted up to a certain point. Rather than track and follow a herd of migrating caribou who would be impossible to keep up with, hunters would set up camp where caribou are likely to be encountered (Burch 1972:345-346). Caribou will often follow the exact path that previous migrating groups took so if there are known caribou paths, caribou will likely come by again (Spiess 1979:38). They also follow certain terrain features in a predicable way; for example, they will move along gentle slopes when possible, travel in narrower lanes when in steep areas, course natural features such as rivers or steep slopes before crossing them (Spiess 1979:38) and move to higher ground or into the water when being harassed by mosquitos (Douglas Stenton, personal communication 2020). Hunting methods such as drives would take advantage of this behaviour as a herd's movements could be controlled because they move along features in predictable ways. Ambush hunting techniques would take advantage of the areas that caribou would habitually frequent such as lake narrows (Gordon 1990:282).

Many caribou populations migrate great distances each year, going south in the winter and moving up north in the summer. However, resident herds on the islands of the Canadian Arctic Archipelago migrate more locally and at most move from one side of an island to the other (Spiess 1979:47). The resident herds on Baffin Island spend the warm months on the coasts and on the shores of inland lakes (Maxwell 1985:138). Caribou populations also fluctuate cyclically, meaning there can be decades during which their

populations are quite low (Ferguson 1998). On Baffin Island, during periods of low population, caribou were less often found on the coasts so hunters had to move inland to find them (Stenton 1991:28).

The Pre-Dorset and Dorset clearly exploited caribou in order to get raw materials for their tools and weapons and they likely used caribou skin for clothing. It was important for hunters to understand caribou migration patterns and behaviour in order to hunt them successfully.

2.3 Caribou Hunting Technology and Methods

We possess vivid ethnographic descriptions of a variety of caribou hunting techniques from times when Inuit were still using their traditional technologies. Caribou are one of the most easily killed of all game animals (Burch 1972:365) and there are many different strategies that can be employed to dispatch them. The ethnographic accounts include descriptions of the weapons used, the material needed to manufacture them and the geographical contexts in which the caribou hunts took place. Different techniques were used by different Inuit groups depending on the time of year and the terrain but in general there is remarkable similarity between the methods used. The variation largely lies with the different technologies each group possessed. The following descriptions are summaries of the main caribou hunting methods that were recorded ethnographically along with their respective material culture requirements.

2.3.1 Bow and Arrow Hunting

Ethnographically, one of the most commonly cited caribou hunting weapons is the bow and arrow. According to Stefánsson (1919), the bow was the most important of all the summer hunting implements when caribou was the chief source of food. Archaeologically, this weapon's North American Arctic origins have been traced back as far as 5,500 years (Grønnow 2012: 29). The ethnographic record contains detailed accounts of Inuit groups across the Arctic hunting with bows and arrows that likely resemble the techniques used by ancient hunters.

Material Culture Requirements

The bow and arrow hunter's toolkit includes the bow, arrows and some kind of quiver or bag to hold arrows and spare heads (Birket-Smith 1929; Boas 1888; Jenness 1922; Stefánsson 1919). The arrows are most often made of a wooden shaft, a head made of caribou antler or bone and a stone or metal tip. The wood that comprised the arrow-shafts would have come from driftwood as most regions of the Arctic are devoid of trees. Arrows sometimes had foreshafts made of antler which fit tightly into a slit at the end of the wooden shaft and the other end was fletched with feathers (Birket-Smith 1929:104; Stefánsson 1919:90, 92). Alternatively, the entire arrow could be made of wood with a slit at the end for a metal tip (Boas 1888:508; Stefánsson 1919:84,90).

Descriptions of bows are also fairly consistent. They were often made of three pieces, either of driftwood or antler and musk-ox horn (Birket-Smith 1929:103; Boas 1888:502; Stefánsson 1919:85). These different materials were always held together with sinew – tough

connective tissue – from caribou, often from the back legs (Birket-Smith 1929:103; Stefánsson 1919:89). Bows were also almost always backed with sinew to strengthen and reinforce them and which created the bow's shooting power. The bowstring was also made of sinew.

Hunting Methods

There were two main methods for hunting caribou with the bow and arrow: stalking and driving. Both of these methods require the hunter to have a deep understanding of caribou behaviour and migration patterns.

Caribou drives were communal activities that could involve a large group of people and be quite extensive or could be a spontaneous event involving only a few hunters. Very large numbers of caribou could be dispatched this way. Drive lanes have been studied archaeologically and ethnographically many times (Birket-Smith 1929:110-111; Boas 1888:501-502; Brink 2005; Friesen 2013; Jenness 1922:149-151; Odgaard 2018; Stefánsson 1919:58). In general, they can be broken down into two main types: drives into the water and drives on land. Drives that lead caribou into the water involve kayak and lance hunting which will be discussed further in the following section.

Stefánsson (1919) describes one example of hunting caribou using drives that involved a group of people that would include men, women, children and dogs. The drive itself consisted of raised piles of stones or sod called "cairns" arranged in a V-shaped fence. The goal of the drive was to move a herd of caribou to the angle of the "V" where they could not escape and where concealed hunters could shoot them with bows and arrows. The other

people involved in the drive – called “beaters” - would be responsible for keeping the caribou moving by waving flaps of skin and howling in order to imitate a wolf; other times they would go to windward and the caribou would smell them and move away. The cairns would often have flaps of skin or some other object that would wave around to deter the caribou from wandering outside the V and should any stragglers do so, they would be coaxed back in line by people stationed near the openings. Stefánsson (1919) estimated that six to eight caribou can be killed in this way and sometimes not a single caribou escapes this hunt. This is one example of a drive, but topography often influenced the way the drives were organized and topographical features were carefully utilized (Jenness 1922:149). Jenness (1922) suggests that drives were most often used to hunt caribou with the bow and arrow, but Balikci (1970) claims that stalking was a more effective use of this weapon.

Stalking simply involves a hunter getting close enough to a caribou to accurately shoot it. The accurate range of a bow and arrow against caribou lies somewhere between 25-70 metres but there are different distances cited in the ethnographies (Birket-Smith 1929:107; Jenness 1922:145; Stefánsson 1919: 96). Stalking requires less organization than a drive, but the hunter still needs to be aware of caribou behaviour. Balikci (1970) describes stalking in detail: Stalking generally required two hunters who would slowly approach the caribou, hiding behind any natural features such as rocks or tufts of grass or simply lying down whenever the animal looked their way. In some cases, the second hunter would act as a blind for the first so the caribou would think there was only one person. If the terrain was not suitable for concealing the hunters, they would stand and use their bows and sticks as antlers

and imitate the caribou, getting closer and closer until within range. Caribou also have a curious nature and would sometimes simply approach the hunter. Hunters would often have to make *ad hoc* decisions using this method depending on the caribou's behaviour towards them, the wind direction and the terrain (Balikci 1970). Another less common bow and arrow hunting method described by Balikci (1970) and Birket-Smith (1929) involved taking advantage of the thin ice in autumn. The caribou would be driven onto a lake with thinning ice and fall through. Once this happens, the hunters can easily shoot or spear the trapped animal. The idea behind most bow and arrow hunting techniques involved getting as close as possible to the caribou to increase the chances of hitting it.

Archaeological Evidence

Due to the preservation conditions that favour lithic components, the non-lithic aspect of Paleoeskimo technology (especially Pre-Dorset) has been much less studied (Milne and Park 2016). Very few actual bows and arrows have survived archaeologically but there are exceptional sites where driftwood fragments are found (Grønnow 2012). A Saqqaq site near Disko Bay, Greenland had a few wood bow and arrow fragments that are quite similar to the weapons described in the ethnographic record. The Saqqaq bow was composite, comprised of three attached parts and most likely reinforced with sinew (Grønnow 2012:29). In most cases, however, the endblades are often the only evidence of bow and arrow technology that survives. Without the organic component, archaeologists must determine if endblades tipped arrows based on their size and shape. For example, two types described by Grønnow (2012) from the Saqqaq site were 40-60 mm bifacial leaf-shaped endblades that were either slender

or broad. Another category of archaeological evidence that could indicate bow and arrow hunting – apart from the weapons themselves – includes stone structures associated with hunting activities such as cairns, hunting blinds and meat caches. However, these structures are difficult to date accurately.

Pre-Dorset Use of the Bow and Arrow

Due to the presence of arrow endblades at Pre-Dorset sites - and rarely bows and arrows themselves at Saqqaq sites - it is clear that the Pre-Dorset had this technology (Grønnow 2012; Helmer 1991:306, Figure 7; Maxwell 1985:89; Milne and Donnelly 2004:Figure 15; Taylor 1967:241). "Bifacial projectile points with tapered stems of flint-like raw materials are found at [ASTt] sites all the way from Alaska to East Greenland. Many of them probably served as arrowheads" (Grønnow 2012: 29). Some Pre-Dorset sites also contain organic evidence of bows and arrows in the form of antler bow braces and handle fragments (Maxwell 1985: 88). These bows were probably small and sharply recurved, backed with sinew and made of jointed driftwood fragments, antler or musk-ox horn. The arrows had long and slender antler foreshafts slotted for bi-pointed stone tips and wooden arrows slotted at the end for square-based triangular points (Maxwell 1985:89). These are similar to the ones described in ethnographies and to the ones found at the Saqqaq sites. In terms of acquiring the raw material to manufacture bows and arrows, the Pre-Dorset would have had access to raw material to create the endblades needed to tip arrows as well as the organic parts for the arrows and bows (Eggerston and Laeyendecker 1995; Milne et al. 2013). In summary, the Pre-Dorset did use bow and arrow technology to hunt caribou.

Dorset Use of the Bow and Arrow

There is no evidence of complete bows or arrows on any Dorset site that has been excavated so far, nor of endblades small enough and of a shape that would suggest that they were used on arrows. This has led archaeologists to conclude that the Dorset did not use bow and arrow technology (Appelt et al. 2016:785; Maxwell 1985:138; Stenton and Park 1998:44). Maxwell (1985:110) speculates that this was due to changing exploitation strategies – it became possible for the Dorset to hunt caribou in the water so land-hunting technologies were no longer needed. This explanation is possible, but the assumption is that the Dorset culture is derived from the Pre-Dorset which means they knew about bow and arrow technology and deliberately abandoned it despite its proven usefulness in land mammal hunting. Another possible explanation is that they simply lost the technology due to similar circumstances in which the Inughuit lost much of their technology until it was reintroduced by Inuit from Baffin Island (Rasmussen 1908:32).

2.3.2 Kayak and Lance Hunting

Hunting caribou with a kayak and lance or spear is another very common method cited in the ethnographic literature. Despite this proven technology ethnographically, kayaks are made entirely of organic materials so evidence of them does not survive well in the archaeological record.

Material Culture Requirements

The kayak is considered to be a hunting implement because hunting caribou and sea mammals is its primary purpose, travel being the second. A kayak needs a considerable

amount of wood for the frame and paddle or alternatively bone and antler. The attachments and coverings are made from animal skin – most often seal skin - and sinew (Stefánsson 1919:97). There are some descriptions of hairless caribou skin coverings, but these would not be waterproof like the seal skin ones and would therefore require more maintenance and care to prevent rotting (Birket-Smith 1929:185). Birket-Smith (1929) estimated that five caribou skins or nine seal skins were required for the average kayak. Kayaks cannot be in the water for more than a few days because the skin will rot so they are placed on high piles of stones above the ground to dry them out and to protect them from dogs or wolves (Robert Park, personal communication 2020). This is also done when the hunting season is over and the frames are stored on stone piles and saved for the next year of hunting (Balikci 1970:47; Jenness 1922:136; Stefánsson1919:98;). Skins had to be replaced when they wore out, lasting at least one year but no longer than four years according to Stefánsson (1919:144).

Kayak hunting is done with a lance or spear. The lance is described as a light and elegant weapon with a shaft made of wood, sometimes a foreshaft of antler and usually a point made of iron (Birket-Smith 1929:109). The head is not barbed like that of the bow and arrow as it is intended to be thrust into the animal successively (Birket-Smith 1929:109; Stefánsson 1919:84). Boas (1888:494) describes a lance that has a loose point but this does not make sense if the weapon is meant to be repeatedly stabbed into the caribou and Birket-Smith (1929:109) says these types of lances were not used in caribou hunting. Lances could also be quite simple weapons: Jenness (1922) describes the caribou lance as merely a short knife attached to the end of a long pole.

Hunting Methods

Hunting caribou with kayaks is a successful strategy for a few reasons. Unlike terrestrial hunting, kayakers can easily catch up to swimming caribou and are thus able to lance them repeatedly (Balkci 1970:44). Caribou also float in the water so hunters can continue to dispatch other animals without having to retrieve them immediately and they can easily be dragged up on shore (Burch 1972:343). Balikci (1970:44) categorizes kayak hunting into two types: (1) hunting at natural crossing places and (2) using drives to create artificial ones. These crossing places would be narrow parts of lakes, rivers or fjords which allowed the hunter to control the caribou's movements better and prevent them from spreading out (Birket-Smith 1929:111). Natural crossing places are where caribou habitually cross on their annual migrations. Camps would be set up at these crossing places and hunters would lie in wait in their kayaks when caribou were spotted (Boas 1888:501). Where there was no natural crossing place, caribou would have to be driven into the water using some kind of drive system. These drives were similar to those used in bow and arrow hunting but they ended at a lake. Using lines of stone cairns set up according to the topography, caribou were driven into the lake and hunters waiting in their kayaks could paddle out to lance them (Jenness 1922:124,149). Turner (Taylor and Turner 1969:146) witnessed a drive into water where a group of people simply surrounded the caribou and cairns were not needed. Success is often ensured when hunting caribou using kayaks.

Archaeological Evidence

Like most Paleoeskimo sites, the stone tip is the only part to survive from a lance except in cases of exceptional preservation. If a site contains stone endblades that *could* tip lances, it is not certain that this would be their purpose because endblades that fit lances are very similar to those that fit harpoon heads (Stenton and Park 1998:43). Evidence for kayaks is even more rare to come across archaeologically since they are made from wood and skins. The skins would certainly not survive but some sites have wood fragments of what would have likely belonged to kayak-like vessels (Grønnow 2012; Maxwell 1985; Mary-Rousselière 1976). Kayak stands made of piles of stones would survive and would be a good indication of the use of kayaks, but stone structures such as these are often difficult to date. On most sites, the stone tip of a lance is the only object that could indicate kayak and lance hunting. Other archaeological evidence would be the location of the site. For example, if it is situated near a crossing place or if there are cairns present that could have been used to drive caribou into the water.

Pre-Dorset Use of Kayaks and Lances

Given the usefulness of this hunting method and the location of some Pre-Dorset sites near crossing places, it is possible they used kayaks and lances to hunt caribou. Although Pre-Dorset sites rarely have direct evidence of kayaks, there is a Saqqaq site on Greenland that contained an almost complete rib of a watercraft that was probably kayak-like (Grønnow 2012:41). Stone endblades that could fit lance heads are more commonly found because they preserve better but antler lance heads have been found at a few Pre-Dorset sites. These heads are either slotted for stone blades or sharpened to a point (Maxwell 1985:89). The lance

heads are sometimes perforated for a line hole which suggests they are meant to detach from the valuable wooden shaft and be held on to from a line in a similar fashion to a harpoon (Maxwell 1985:89; Taylor 1963:129). Having the caribou attached to a line may be useful for terrestrial lance hunting but would not make sense in a kayak because (1) without a drag float (there is no evidence that the Pre-Dorset or the Dorset had drag float technology) (Appelt et al. 2016:785; Maxwell 1985:86) the struggling animal would tip the boat and (2) lancing from a kayak is meant to be done with quick, successive jabs to dispatch the animal quickly. The Pre-Dorset may have used kayaks and lances to hunt caribou as it is a very effetive method but the scanty evidence for kayaks and the possibility that lance heads were meant to be detachable suggests that hunting caribou with lances was not always done from a boat.

Dorset Use of Kayaks and Lances

Like the Pre-Dorset, kayaks rarely survive on Dorset sites but there is evidence of kayaks from Nunguvik, a site on Baffin Island. The site had possible kayak ribs as well as toys that looked like kayaks (Mary-Rousselière 1976; Mary-Rousselière 1979). It is likely the Dorset used some type of watercraft and based on their hunting technologies, a kayak-like vessel seems the most likely, but this assumption is based more on common sense rather than direct archaeological evidence (Arima 1994; Howse 2019:90). Unlike the Pre-Dorset, the lance was one of the only caribou-hunting weapons the Dorset had at their disposal. Dorset lances are largely unchanged from Pre-Dorset times consisting of an antler head either self-bladed or slotted for an endblade or sideblade (Maxwell 1985:138). However, *Late* Dorset sites rarely have antler lance heads so lances may only have consisted of a wooden shaft

tipped with a stone blade. Maxwell (1985) says only two methods of caribou hunting would have been possible for the Dorset and one of these is driving caribou into the water and lancing or harpooning them from kayaks. I have already discussed the problems with attaching a line to a caribou from a kayak without a drag float, but dispatching caribou from a kayak with a "regular" lance was just as possible for the Late Dorset as it was for the Pre-Dorset.

2.3.3 Terrestrial Lance and Harpoon Hunting

Ethnographically, lancing caribou on land is rarely mentioned (Friesen 2013:21; Boas 1888:635). There are no detailed descriptions of how this would have been done. There is no mention of using a harpoon to kill caribou in the ethnographies. However, given that the lance and harpoon were the only known caribou hunting weapons available to the Dorset, we must consider how they might have been used.

Material Culture Requirements

The lance has already been described in a previous section. Harpoons are quite unique hunting implements and most often associated with sea mammal hunting. The harpoon's design and ingenuity mostly has to do with preventing a wounded sea mammal from swimming away or diving after it is hit with the first blow. The harpoon head is stuck into the animal and the barbs or basal spurs that cause it to "toggle" prevents the head from pulling out of the wound (Park and Stenton 1998). The harpoon line is attached to the head and this is used to control the wounded animal and prevent it from escpaing. On the ice or at the floe-edge, the hunter holds the line but in a boat, it is attached to a drag float (essentially a

balloon) so the hunter can keep track of where the animal is swimming (Park and Stenton 1998). There is some variety in how the weapon is designed but the materials needed to manufature a harpoon are similar to those needed to contruct a bow and arrow: wood, antler, sometimes ivory, sinew and a flint-like material or iron (Birket-Smith 1929:127).

Hunting Methods

Ethnographies do not mention hunting caribou with harpoons but there are a very few descriptions of lancing them on land. Boas (1888) briefly discusses lancing caribou on land in connection with the "Tornit", known now as the "Tunit". Tunit is a term used by the Inuit that means people who came before them and most researchers have interpreted this to refer to the Dorset (Friesen 2013:22). This interpretation, however, is not certain (Park 1993:219-220). According to Boas (1888:635), the Tunit had harpoons and lances but not bows or kayaks so it is useful to look at his description of how hunting was done with a lance on land. He describes a line of cairns connected by ropes like the ones used by the Inuit, but instead of hiding at the end of the line hunters would hide behind the cairns and lance any caribou who attempted to escape. According to Boas (1888), the hunters would then grab the animal by the hind leg and drag it behind the line but it is not likely that even a strong hunter would be able to drag a wounded caribou. Balikci (1964, as cited in Friesen 2013:21) also describes a caribou drive that may have been built by the Tunit but used by the Inuit. The drive consisted of two stone walls converging at a narrow gap about two metres wide where a single hunter waited with a lance. The caribou were driven to the gap by up to fifteen individuals where

they were easily speared. According to Friesen (2013), this is the only mention in the ethnographic record of Inuit lancing caribou on land.

Based on these brief descriptions, the general strategy employed to hunt caribou with a lance (or harpoon) on land would have likely involved getting as close to the animal as possible and limiting its chances of getting too far away from you once it was wounded.

Archaeological Evidence

The archaeological evidence for lances has already been discussed, and the evidence for harpoons is similar: antler lance and harpoon heads survive archaeologically but more often the stone endblades are the only evidence for lance or harpoon hunting. Like bow and arrow hunting, the presence of cairns or whether the topography was ideal for a caribou drive can indicate lance and harpoon hunting as well. For example, because the Dorset used lances they had to get closer to the caribou so their drives would end in a narrower gap (Friesen 2013). Finally, the faunal assemblage can indicate whether lance hunting took place. Using a lance, the hunters may have only been able to target slower animals such as smaller and younger caribou (Howse 2019:91). Because the Dorset did not have bows and arrows, if caribou were being killed at a Dorset site then the assumption is that either lances or harpoons were being used.

Pre-Dorset Use of Lances and Harpoons on Land

The Pre-Dorset had bows and arrows and almost certainly would have most often used this weapon against caribou instead of harpoons or lances. However, inland Pre-Dorset sites on Banks and Victoria Islands where muskkoxen and caribou were hunted contain

barbless and self-bladed toggling harpoon heads (Maxwell 1985:100). Both of these sites are located inland where sea mammals cannot be found so the presence of harpoon heads suggests that caribou were being hunted with harpoons (Maxwell 1985:100). Gordon (1996) describes caribou water-crossing sites occupied by the Beverly Pre-Dorset that contained endblades that likely tipped harpoons but seemed to lack bow and arrow and lance technology. Gordon (1996:155) imagines a scenario where the hunters would attach the harpoon line to a brush-catching caribou rack which would act as a cumbersome drag and slow the animal on land. This scenario is certainly plausible and would explain why some inland caribou hunting sites have harpoon heads. Pre-Dorset lance heads that seem to be designed to detach from the foreshaft may have been used against caribou on land as well since they would not have been effective in a kayak (Maxwell 1985). The exact method of using these weapons is difficult to decipher but this limited evidence makes it possible that the Pre-Dorset at least occasionally used harpoons and lances to hunt caribou.

Dorset Use of Lances and Harpoons on Land

Lances and harpoons were the only caribou hunting weapons available to the Dorset. Harpoons are most often associated with sea mammal hunting but there are a few mentions in the archaeological literature of hunting caribou with harpoons. Harpoon endblades vary considerably in length and width and this could be related to the type of animals that were hunted with them. Sørensen (2012:280) suggests that long harpoon points were used for terrestrial instead of sea mammals. The Ballantine site on Victoria Island contained Early Dorset harpoon heads along with a high percentage of caribou bones which suggests caribou

hunting was done with harpoons (Taylor 1967). The problem with hunting caribou with harpoons is that the Dorset would have had to control the animal themselves while it struggled (Appelt et al. 2016); this may be possible with seals in the water, but a wounded caribou would be much more difficult to hold on to. The scenario described above by Gordon (1996) for the Beverly Pre-Dorset may have happened in Dorset times as well. Possible evidence for this comes from a Dorset site on Melville Peninsula which contained numerous harpoon heads and most intriguingly, an ornamented bone plate that depicts a caribou either pulling or dragging a roughly triangular, cross-hatched object behind it (Mary-Rousselière 1979:29-30); this object may be a caribou drag used in terrestrial harpoon hunting. There are very few mentions of hunting land mammals with harpoons but there are enough examples that we must entertain the possibility, especially for the Dorset.

Archaeologically, hunting caribou with lances on land is the most commonly cited method suggested for the Dorset. It is almost always assumed that this method involved drives because dealing with larger numbers of caribou would have been more successful than stalking individuals (Friesen 2013, Howse 2019; Maxwell 1985:138). These drives would have likely been set up in an area where the topography gave the hunters certain advantages and greater control over the animals' movements because lances are close-range weapons so the caribou would have to be ambushed (Churchill 1993; Howse 2019).

2.4 Caribou Hunting at LdFa-1

Despite the importance of organic materials in caribou hunting, the hunting technologies of the Pre-Dorset and Dorset who lived on southern Baffin Island are known

largely from stone tool remains (Maxwell 1985). The implements that may have been used to hunt caribou at LdFa-1 appear to be represented through a small collection of stone endblades and antler harpoon heads. Despite this small amount of evidence, ethnological analogy and archaeological evidence from other Pre-Dorset and Dorset sites can suggest the possible ways these two cultures could have hunted caribou at Mingo Lake using the tools available to them.

Caribou was the main quarry at LdFa-1. An early faunal analysis revealed that 93% of the remains from the Pre-Dorset component and 98% of the remains from the Dorset component were caribou (McAvoy 2014:77; Milne et al. 2012:278). This number is significant given, for example, that other Dorset sites have only 7.5% to 55.9% caribou in the faunal assemblage (Milne et al. 2012:281). The Pre-Dorset and Dorset developed successful caribou hunting techniques despite their apparent technological disparity compared with the later Thule and Inuit people. The northwestern corner of Mingo Lake saw occupations by the Pre-Dorset, Dorset, Thule and Inuit which suggests it had some kind of advantage for caribou hunting such as aggregations during animal migrations. This advantage could have also had to do with the topography and its natural funneling effect on caribou herds or the narrows at this part of the lake which are habitually crossed by caribou allowing hunters to exhibit greater control over the swimming animals (Figure 4) (Pasda 2014, Stenton 1991:36). No evidence of large-scale caribou drive systems has been found at LdFa-1, but cairns possibly associated with directing caribou movements have been identified at sites on the south shore of Mingo Lake (Milne 2008:30). Since these cairns cannot be confidently associated with the

Figure 4: Aerial view of LdFa-1. Mingo Lake esker visible.

Pre-Dorset or the Dorset, this discussion will look only at the LdFa-1 site. Table 1 summarizes the various caribou hunting methods described ethnographically and the associated archaeological correlates and evidence. Based on this evidence, it is certain that the Pre-Dorset had bows and arrows to hunt caribou and the Late Dorset had harpoons.

Table 1: Summary of caribou hunting methods and material culture requirements

Hunting Method	Archaeological Correlates	Archaeological Evidence		LdFa-1	
		Pre-Dorset	Late Dorset	Pre-Dorset	Late Dorset
Kayak	Kayak parts, stands	Yes?*	Yes?	No	No
Bow and Arrow	Endblade, arrow shafts, bows	Yes	No	Yes	No
Drive System	Cairn alignments	Yes?	Yes?	No	No
Lance	Lance heads, endblades	Yes	Yes	Yes?	Yes?
Harpoon	Harpoon heads, endblades, harpoon shafts and foreshafts	Yes	Yes	Yes?	Yes

*"Yes?" means evidence thus far is either limited or not certain

2.4.1 Bow and Arrow Hunting

Bow and arrow hunting is one of the most commonly cited caribou hunting methods in the ethnographies and the Pre-Dorset seemed to have had bow and arrow technology at LdFa-1 based on the size and shape of the endblades. Though Stefánsson (1919), Birket-Smith (1929) and Jenness (1922) all attest to the importance of drives in bow and arrow hunting, descriptions from Boas (1888) and Balikci (1970) indicate that the bow and arrow was most useful in individual hunting strategies. Therefore, elaborate drive systems are not necessary in hunting caribou with this weapon so the Pre-Dorset may have leaned toward this strategy at LdFa-1.

The biggest issue with this method would be preventing the caribou from escaping after the first few shots were fired. Stenton (1991:36) describes a similar scenario at Nettilling Lake where there are eskers and moraines near a caribou-hunting site (also associated with a water-crossing location) but the caribou's movements "are in no way controlled by these landforms and animals can easily avoid or escape attempts to direct their movements". LdFa-1 is bordered by the lake and the steep esker and caribou have a tendency to course along natural barriers such as these before crossing them (Spiess 1979:38). If, for example, the observed movements of caribou in 2007 and 2008 (moving west along the northern shore toward the site) were also typical of caribou movements near LdFa-1 in Pre-Dorset and Dorset times, then they would have been funneled through the site and perhaps less capable of escaping concealed hunters. There are a number of ways the hunters may have approached this situation; for example, digging pits or constructing hunting blinds to conceal themselves and waiting for the caribou to pass by. The caribou's path may have, of course, significantly differed from today but their predictable behaviours combined with the topography at LdFa-1 likely presented advantages for hunters to stalk or ambush the animals and get within the 20m range needed for accuracy without the need for elaborate drives. The Late Dorset at LdFa-1 did not have bow and arrow technology so they would have had to use a different hunting method.

2.4.2 Kayak and Lance Hunting

Kayaks are a proven technology in caribou hunting ethnographically and the northwestern corner of Mingo Lake is certainly suited to this method. Caribou have been

observed crossing the narrows of Mingo Lake and if caribou were being killed at a water-crossing, "some form of boat technology should be kept in mind as probably having been used" (Spiess 1979:111). The endblades from both the Pre-Dorset and Dorset components could certainly have tipped lances but this is difficult to determine with certainty as endblades for lances varied considerably in size and shape (Stenton and Park 1998:43). There are problems with inferring that this method of hunting was used at LdFa-1, however. First, there is no evidence of kayaks at LdFa-1. Second, most ethnographic examples of kayak hunting describe drives with cairns or a number of people waving flaps of skin to get caribou in the water and no such drive system can be associated with the Pre-Dorset and Dorset components at LdFa-1. Finally, the site is situated down the shore from where the caribou were observed crossing. Furthermore, Milne et al. (2012:280) estimate that the Late Dorset would have traveled a minimum of 70 kilometres inland to reach LdFa-1 which means they would have had to transport the materials to build kayaks (some of which can only be found on the coast) quite far. Stefánsson (1919:57) does describe the Copper Inuit carrying kayaks on sleds or on their backs as far as 160 km so it is possible that the Pre-Dorset and Dorset transported kayaks inland for caribou hunting but given the limited archaeological evidence and number of logistical issues, this method is not the most likely scenario at LdFa-1.

2.4.3 Terrestrial Lance and Harpoon Hunting

Lance and harpoon hunting are the final caribou hunting methods that may have been practiced at LdFa-1. These methods are the most difficult to imagine without the use of drives or a large group of people but the topography at the site may have been advantageous

enough for hunters to get close to the caribou. The endblades from the Dorset component likely tipped either lances or harpoons. According to Maxwell (1985), Late Dorset lance heads are not commonly found which suggests their lances may have been closer to what Jenness (1922) described: a knife attached to the end of a long pole. There are problems with this method as well. Although the topography at LdFa-1 may have funneled caribou in a certain direction, it would not have constricted them as much as a stone wall would have. If the hunter concealed themselves in a pit or behind a blind to wait for the caribou to pass them, they would likely only be able to get one hit with their lance before the caribou ran off. The wounded animal could eventually be retrieved but it would end up quite far from the site which did not seem to be the case at LdFa-1. The Late Dorset component is situated right next to the shore and there were complete caribou skeletons in the faunal assemblage so the animals would likely have been dispatched nearby. If lances did not work at LdFa-1, harpoons would be the only other weapon the Late Dorset could have used.

There were two Dorset-style, self-bladed, un-barbed toggling harpoon heads at LdFa-1 and the endblades from the Late Dorset component could tip harpoon heads. The hypothetical method described above where a drag is attached to the harpoon line to slow down the fleeing caribou (Gordon 1996:155; Mary-Rousselière 1979) may have been used by the Dorset at LdFa-1 as a large drag would certainly prevent caribou from getting too far from the site. There may be other advantages to having a line when caribou hunting but on land it would be difficult for the hunter to control the animal themselves. Another possible scenario at LdFa-1 would be harpooning the caribou on land and allowing it to escape to the

nearby water where the hunter could then control it from the shore. Caribou do take to the water when spooked as they can swim much faster than their natural predators; wolves (Arima 1975, as cited in Spiess 1979:110). Both of these scenarios are inferential but the presence of self-bladed harpoon heads and endblades that could tip harpoon heads suggests that this weapon was used by the Late Dorset to hunt caribou at LdFa-1.

2.5 Conclusion

It is important to point out that caribou are never available full-time in any one locale for a long period of time (Stenton 1991:28) but the Pre-Dorset and Dorset clearly chose LdFa-1 because caribou habitually frequent it. Hunting and monitoring away from the site may have occasionally been necessary as well to meet consumer needs (Stenton 1991:29) but it seems like most of the hunting occurred quite near LdFa-1. The descriptions of which caribou hunting methods may have been used by the Pre-Dorset and Dorset at LdFa-1 are somewhat speculative, but this study is meant to start a conversation for further studies looking at inland activities during the Pre-Dorset and Dorset time periods; specifically, how they exploited terrestrial resources. The Pre-Dorset and Late Dorset occupied the same location roughly 2,000 years apart presumably for the same reasons – to hunt caribou – but tackled this activity in quite different ways due to technological differences.

LdFa-1 is a uniquely informative site for a few reasons. First, it is located inland and most Pre-Dorset and Dorset sites thus far excavated have been located on the coast. Second, the main quarry was caribou when sea mammals were thought to be more important for both the Pre-Dorset and even more so the Dorset economy. Third, it is a multicomponent site

which allows for a comparison between Pre-Dorset and Dorset hunting technologies and techniques where they would have been dealing with similar caribou populations, weather conditions and geography. It is my hope that this study further demonstrates LdFa-1's uniqueness and how its Pre-Dorset and Dorset components can be differentiated given their commonalities (i.e. season, location, geography and wildlife resources). This inland site presents an alternative, more comprehensive view of both the Pre-Dorset and Dorset economy. Traditionally, it is thought that the Dorset relied less on caribou and more on seal than their predecessors but LdFa-1 demonstrates both the importance of caribou as a subsistence resource throughout Arctic prehistory, and the efforts made by the earliest Arctic human populations to acquire it.

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