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From: **EAZ**
Ethnographisch-Archäologische
Zeitschrift
vol. 56., issue 1/2, 2015



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Caribou Hunting in Alpine West Greenland – An Archaeological Investigation

Abstract

In 2014–2015 surveys have been made in the mountain range north of Kangerluarsunnguup Tasersua, a large inland lake south of Nuuk (West Greenland). As evidence of Paleo-Inuit and Norse is scarce, no detailed information can be given on caribou hunting during these time periods. In contrast, 88 sites connected with caribou hunting in Late Thule (c. AD 1600–1700) and the Colonial time period (c. AD 1700–1950) have been registered. These sites indicate three distinct alpine hunting grounds. Every hunting ground was used by small, mobile groups of hunting companions, only one also by small, related households who stayed at one spot for a longer time period. Households and hunters preferred to sleep at medium height to hunt caribou here as well as in the highest areas. Caribou hunting with the help of drive lanes was done rarely. In contrast, the main hunting method was using single or few stone-built shooting coverts which are situated in small, natural bottlenecks.

Keywords: survey, stone-built structures, Nuuk area, Thule period, Colonial time period, hunting methods

Karibujagd im alpinen Westgrönland – Eine archäologische Untersuchung

Zusammenfassung

In den Jahren 2014 und 2015 wurden Surveys in den Bergen nördlich des Kangerluarsunnguup Tasersua, einem großen See im Inland südlich von Nuuk (Westgrönland), durchgeführt. Aufgrund seltener materieller Belege aus der Zeit der Paläo-Inuit und der Wikinger liegen keine detaillierten Informationen zur Karibujagd dieser Epochen vor. Im Gegensatz dazu konnten 88 Lokalitäten aus der Zeit der späten Thule-Kultur (ca. AD 1600–1700) und der Kolonialzeit (ca. AD 1700–1950) dokumentiert werden, die drei deutlich abgegrenzte, alpine Jagdgebiete belegen. Jedes Gebiet wurde von kleinen, mobilen Gruppen von Jagdgefährten genutzt, nur eines auch von wenigen Familien für einen längeren Aufenthalt aufgesucht. Familien und Jagdgruppen schliefen bevorzugt in mittlerer Höhenlage, um hier und in den höchsten Höhen zu jagen. Nur selten wurden Karibus mit Hilfe von aus Steinen gebauten Leitsystemen gejagt. Es überwiegen einzelne oder kleine Gruppen aus Steinen gebauter Ansitze, die sich direkt bei schmalen, natürlichen Engpässen befinden.

Schlüsselwörter: Survey, Strukturen aus Stein, Nuuk-Bezirk, Thule-Kultur, Kolonialzeit, Jagdmethoden

„[...] the walker draws a tale from impressions
in the ground“

(Ingold 2015, 48).

Introduction

The most important caribou habitat of Greenland is the inland tundra at the western side of the island, between Disko Bay in the north and the southern border of the Nuuk Municipality (fig. 1). Here, archaeological investigations of prehistoric caribou hunting are carried out as foot surveys to search and document sites without excavations. Research focus is on broad valleys, deep-seated plains and large lakes where many summer camps and hunting sites have been found.¹ In contrast, caribou hunting in alpine West Greenland is known from one locality only (Nellemann 1969/70; Rosing 1958). This is astonishing, as many caribou/reindeer hunting sites and artefacts have been found in the alpine area of northern North America and Northern Europe.² Therefore, in 2014–2015 research with a focus on the alpine mountains was done in the area north of lake Kangerluarsunnguup Tasersua (fig. 2; 3). This region was chosen as access to the mountains is fairly easy and as the lake is one of the best archaeological investigated inland areas: Before damming Kangerluarsunnguup Tasersua in 1993 to provide energy for the hydropower plant at Buksefjord, the whole lake shore was investigated by Hans Kapel (1993), resulting in many sites on the shore.

Research area

Ameralik is the fjord where Nuuk, the capital of Greenland is situated, its inner, eastern part is called Ameralla (fig. 2). Kangerluarsunnguaq („small peculiar fjord“) or Buksefjord is the first long fjord south of Ameralik. At the mouth of this fjord Utoqqarmiut is situated (fig. 2), a settlement abandoned in 1963. Qeqertat Timerliit Illue is situated on a small island nearby where five winter tent houses were occupied from the 16th into the 19th century (Gulløv 1997, 329–334; fig. 107). The river which flows into the head of Kangerluarsunnguaq starts at a watershed c. 10km to the east. Behind the watershed the c. 250m high and 30km long Kangerluarsunnguup Tasersua („large lake of the small peculiar fjord“) is situated. The western end of the lake is called Isua („the end“) as the outflow of the lake is on its eastern side (fig. 2). The mountain range north of Kangerluarsunnguup Tasersua (fig. 3) is divided into two different parts by a narrow valley leading to the c. 700m high lake Amitsorsuaq („the slender one“): East of the valley the more gentle hills of Oqaatsut Qooruat („cormorant valley“) do not reach heights above 1130m, in contrast to the western part which is characterized by the up to 1500m high, more

1 Grønnow 1986; 2009; Grønnow et al. 1983; Jensen et al. 2017; Odgaard 2007; Pasda 2014.

2 Alix et al. 2012; Andrews et al. 2012; Callanan 2012; 2013; 2014; Dickson/Mudie 2008; Hare et al. 2012; Helwig et al. 2014; Nesje et al. 2012; Richards et al. 2007; Vanderhoek et al. 2012; Vedeler/Jørgensen 2013.

Fig. 1: West Greenland (indicated are major towns, borders of municipalities and regions with archaeological research on prehistoric caribou hunting).

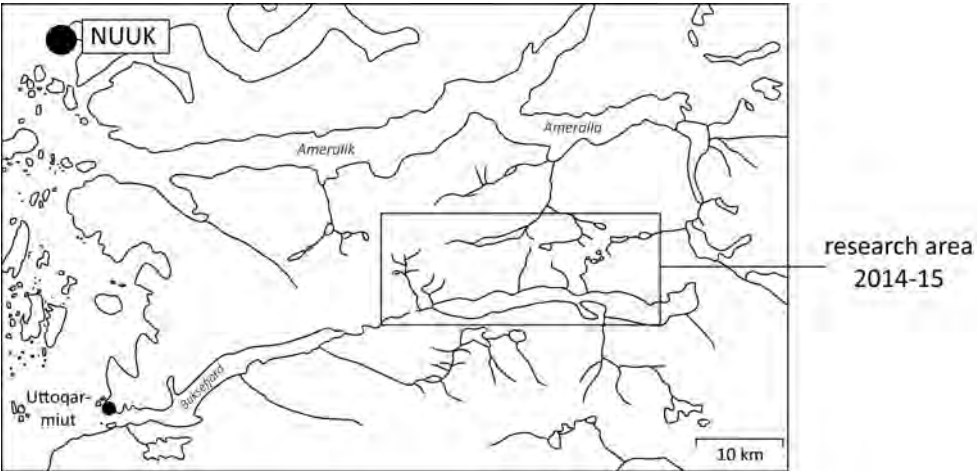
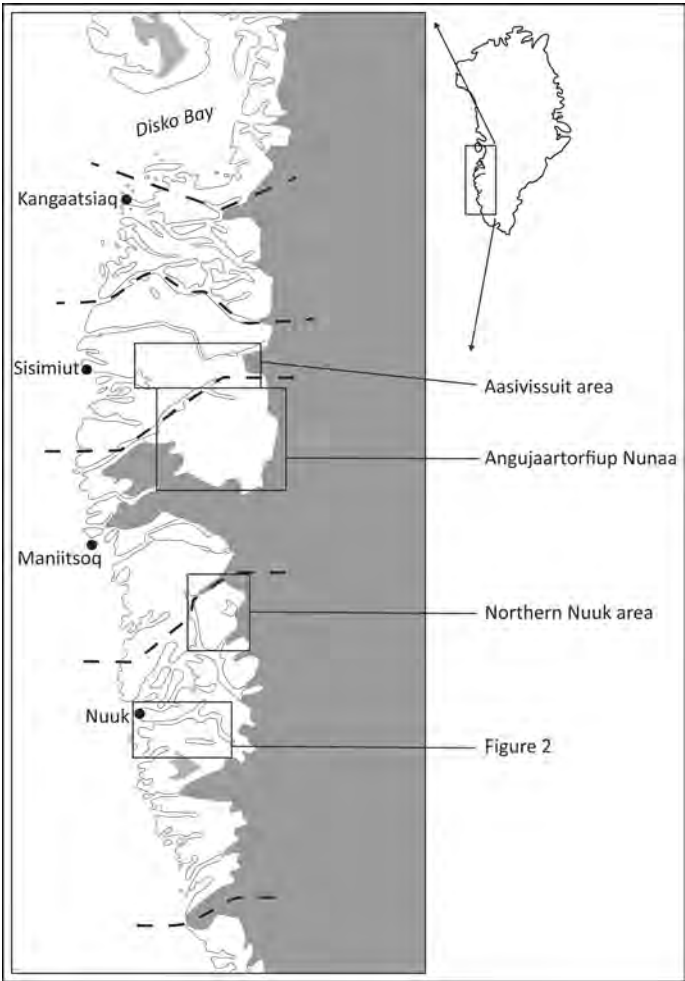


Fig. 2: Central part of the Nuuk region with fjords, place names and research area.

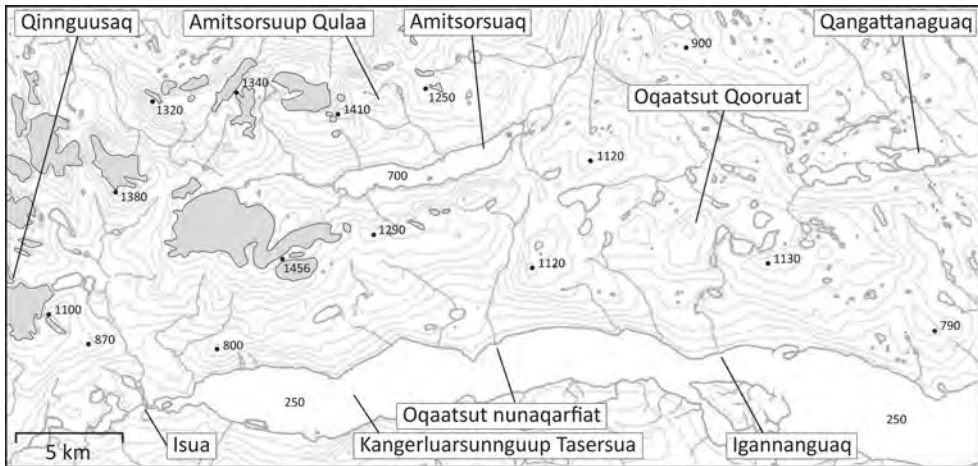


Fig. 3: Research area with place names, glaciers (grey) and height in metres above sea level (map based on www.nunagis.gl).

rocky and glaciated mountains of Amitsorsuup Qulaa („above the slender one“) and Qinguusaq (fig. 3).

Here, the alpine zone is defined as the area above c. 700/800 m where snowbed vegetation dominated by grass and few centimetres high dwarf-shrub species occurs (Jedrzejek et al. 2012; Sieg et al. 2007). Today the tongues of local glaciers reach a height around 900–1000 m. The most common birds in the mountains are ptarmigan and songbirds, on the lakes few ducks and geese can be found (Kapel 1993, 88). Beside caribou, many arctic hare and few polar foxes are the only mammals present in this area. Caribou do short migrations between summer and winter ranges, some stay year round in one area (Tamsdorf et al. 2005). Herd size is low with a mean size of less than five animals (Cuyler et al. 2002). In summer the alpine zone is not devoid of caribou as they prefer plants of high nutritive value to forage on young phenological vegetation stages by avoiding insect harassment and hot temperatures.³

During surveys seasonal and perennial snow patches were checked whenever possible. Bird feathers, feces, fur and tracks of caribou have been observed regularly. Cartridges found on two snow patches indicate presence of late 19th to 20th century caribou hunters, but no indication of prehistoric hunting connected with snow patches was found. However, the alpine area north of Kangerluarsunnguup Tasersua is characterized by many stone-built structures which will be presented in the following sections.

3 Fredskild/Holt 1993; Rosvold 2016; Tamsdorf et al. 2005; Thing 1984, 27.

Stone-built structures and features

In West Greenland most archaeological structures (Gulløv 1983, 182–184) are easy to distinguish from natural phenomena but often difficult to document by photos in a surrounding which is dominated by stones and rocks (e. g. fig. 5; 6c). The most obvious structure is the tent house which is a more lightly built version of the Thule winter house with an entrance passage, a small cooking niche and a large main room (Grønnow et al. 1983, 26). Like the winter house, the summer tent house has been used by a household, maybe a family of 5–6 persons during an extended period of several weeks (Grønnow 1986, 68; Gulløv 1997, 358; Petersen 1986, 168–170). Early Thule (14th/15th century) dwellings are small but built out of few large rocks which enclose two rooms, a 2 × 2 m large main room and a small, round cooking niche, but lack a distinct entrance passage (Grønnow 1986, fig. 2). This summer tent house type may have been used in Late Thule times also (Pasda 2014, fig. 3). Tent houses of the Colonial time period (AD 1700–1950) are much larger and built out of many small and mid-sized rocks. The main room, often of rectangular shape, may be as large as 4 × 3 m (fig. 4a) and shows a long entrance passage with a distinct cooking niche (Grønnow et al. 1983, 25–27). Other tent house types existed in the Colonial period, e. g. with a single, quadrangular to rectangular room and no cooking niche (fig. 4b) but a short entrance passage or windshield-like construction (Kapel 1993, 27; 36; 67).

Tent rings are defined by head-sized stones that are arranged in an oval or circle of 4–6 m diameter (fig. 5) resulting from fixing dome- or roof-shaped canvas tents to the ground. Canvas tents are evidence of the most recent period of caribou exploitation as they became widely available only after AD 1900.⁴ Like the summer tent house, the light tent was inhabited by a family/household (Hansen 2008, 183; Petersen 2003, 42; 145).



Fig. 4: Summer tent houses (a: Amitsorsuaq, b: Isua).

4 Birket-Smith 1924, 160; Hansen 2008, 184; Knudsen 2008, 170; Petersen 2003, 42.



Fig. 5: Tent ring (in front of the human figure).

Hunters' beds are characterized by a low, round, oval or rectangular wall built out of rocks and turf (fig. 6). Hunters' beds may be as old as Early Thule (Gulløv 1997, 438). Their construction and use has been described in various sources from the early 18th century into the 1930s⁵: As the summer months in the continental inland are connected with long dry periods (Taurisano et al. 2004), Greenlanders could sleep without a roof but needed a shelter against wind by construction of walls. Instead of open-air hunter's beds, during rainy periods Greenlanders used rock shelters, naturally confined localities with stone-built walls under the overhang (fig. 7). Sometimes, hearths are situated near hunters' beds/rock shelters, e. g. a stone slab on two rocks or a u-shaped hearth built out of three small rocks.⁶ In contrast to the tent house and the tent which were inhabited by a family over an extended time period, a hunters' bed/rock shelter was used just as an overnight accommodation by a small travel group walking inland or during few days by mobile hunting companions, carrying the most necessary, e. g. hunting tools (Pasda 2004, 40–41) and fresh or dried fish (Kapel 1993, 88).

5 Giesecke 1910, 567; Gripp 1941/42; Grønnow et al. 1983, 52; Rink 1974, 272; Thisted 1999, 508.

6 Birket-Smith 1924, 381–383; Grønnow et al. 1983, 36; Hansen 2008, 187; Petersen 2003, 39; Rink 1974, 274–275; Thisted 1999, 19; 508.



Fig. 6: Hunters' beds (measure rule is 1 m long).



Fig. 7: Rock shelter (in front of human figure).

In general, these stone-built features are not distributed randomly in the landscape but occur at certain spots and areas⁷: Tent houses are the dominant feature of camps in the inner fjord where the seafaring routes ended, of camps at large lakes where inland travel by umiak ended and of hunting camps in the main caribou hunting grounds. Hunters' beds and rock shelters are the most common structure in valleys which were traversed by people walking from the coast or large lakes to the main hunting grounds but occur often also in the hinterland of inland summer camps where specific task-groups made expeditions into secondary hunting areas.

In the Arctic most animal bones are destroyed within a century or less when they remain on the surface (Friesen/Stewart 2013, 98; Pasda 2004, 65). Thus, the material record of hunting caribou by stalking is reduced to exceptional stray finds like arrow points or, in recent times, cartridges (Grønnow 2009, 203; Pasda 2004, 23). However, as in other parts of the Arctic⁸, caribou hunting with stone-built drive lanes and shooting coverts was also done in West Greenland (Grønnow 2009; Jensen et al. 2017, 60–62; Pasda 2014). Caribou drive lanes consist of several stone-built inussuit (sing.: inussuk, „like a human“) which are situated according to microtopography to lead caribou into a natural, bottleneck-like feature or towards shooting coverts where hunters laid in ambush. The shooting covert is a low, linear or slightly curved wall built out of several rocks (fig. 8). The inussuk is often just a single rock placed on a rock surface or a prominent boulder (Pasda 2014), but complex inussuit occur also (fig. 9). Of course, other features can be found also, for example a single inussuk, a single hearth or a stone-built meat cache, but these are not presented in this study.

7 Grønnow 1986, 74–78; Grønnow et al. 1983, 23–24; Jensen et al. 2017, 55–56; Petersen 1986, 165–171.

8 Benedict 2005; Binford 2009; Blehr 1990; Brink 2005; Friesen 2013; Gordon 1990; Hultkrantz/Vorren 1982; Indrelid/Hufthammer 2011; Jordhøy 2008; Nesje et al. 2012; Stewart et al. 2000; 2004.



Fig. 8: Shooting coverts (note: covert a is 2,3m long).



Fig. 9: Inussuk of a caribou hunting drive lane at Amitsorsuaq (measure rule is 1 m long).

Paleo-Inuit

In West Greenland Paleo-Inuit occupation started in the 3rd millennium and ended approximately 2000–2500 years later (Grønnow 2016; Jensen 2016). In the research area, Paleo-Inuit sites are known from the Ameralik, e. g. at Eqluit (fig. 11: 1; Gulløv/Kapel 1988, 42–43). Inland presence of Paleo-Inuit is demonstrated by lithic artefacts at Isua (fig. 11: 2; Kapel 1993, 72–73; 191) and at the eastern end of Kangerluarsunnguup Tasersua (fig. 11: 3; Gulløv/Kapel 1988, 42–43). The most important Paleo-Inuit presence on the northern shore of Kangerluarsunnguup Tasersua is at Igannanguaq („the little pot-like mountain“; fig. 11: 6) where >100 lithics have been excavated (Kapel 1993, 83–84; 205–208). No lithics are known from Oqaatsut nunaqarfiat („site where the cormorants live“; fig. 11: 5; Kapel 1993, 44–45), but in 2014 two artefacts (fig. 10) have been found here on the recent lake shore which is situated some metres above the inundated site. The raw material is a white quartzite which is common in the Nuuk area (Sørensen 2012, 59–61). One artifact is bifacially retouched (fig. 10: above), the second artifact (fig. 10: below) may derive from the preparation of a bifacially prepared core (Sørensen 2012, 95–96). However, no details are known of Paleo-Inuit caribou hunting in the far inland: In West Greenland lots of caribou bones occur in some coastal and inner fjords sites (Gotfredsen/Møbjerg 2004; Jensen 2006, tab. 8.11; Møhl 1972) but in the far inland, beside lithic artifacts, only few Saqqaq sites with faint tent rings have been found, indicating caribou hunting in summer (Grønnow 2004, 100). In Saqqaq times, caribou

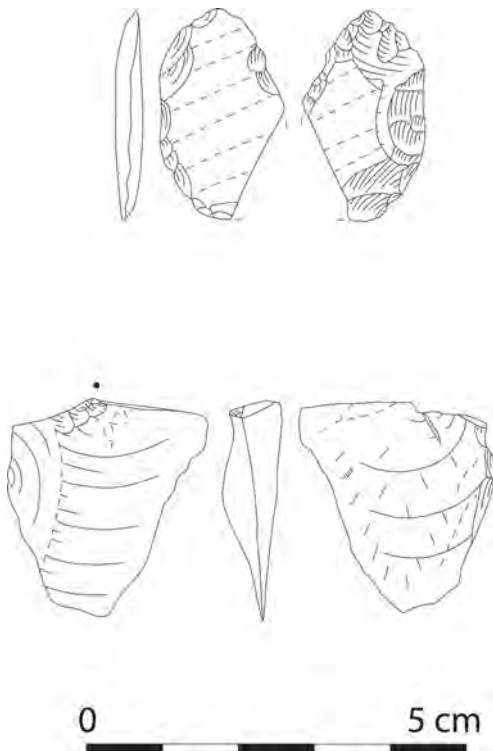


Fig. 10: Bifacially modified quartzite (above) and quartzite flake (below), collected from the surface above the inundated site Oqaatsut nunaqarfiat.

hunting was done with wooden arrows with a lithic point propelled by bow or spear throwers (Grønnow 2011, 11). After Saqqaq times, Greenlandic Dorset people did not manufacture stone arrow points (Sørensen 2012, 316–317; 321; 339; 341) as neither the bow and arrow nor the bow drill existed in that period (Gulløv 2004, 21). Maybe, during Dorset times caribou hunting was done with lances after driving animals with the help of a combination of stone-built inussuit, fences, and shooting blinds (Friesen 2013). The scarce material evidence of Paleo-Inuit inland occupation may result also out of landscape changes as ice and snow cover were different than today: In the Holocene Thermal Maximum the inland ice was 5–20 km behind its present limits and many local ice caps and small glaciers receded or may have disappeared (Forman et al. 2007; Kelly/Lowell 2009, 2103; Weidick 1996). With the onset of the Neoglacial in the 3rd millennium BC glaciers growth started again, but the inland ice remained near or inside of its present position for approximately two millennia.⁹

Norse

Norse settlement in Greenland started just before AD 1000 and lasted for nearly 500 years (Arneborg 2004). Beside Southern Greenland, the second largest occupation of Norse was the ‘Western Settlement’ in the inner Nuuk fjord and Ameralla (fig. 2), a settlement with 80 farms, occupied by 500–1200 people (Madsen 2014, tab. 1), which terminated around AD 1400 (Arneborg et al. 2012a, 4). The Western Settlement landscape was different from today as glaciers were smaller, sea level was some metres lower, inner fjords were not blocked by icebergs and ice debris, river valleys were not silted up and tidal flats were smaller (Weidick et al. 2012, 15). In general, Norse farms were situated in areas with pasture plants (Barlow et al. 1997, 491), but Greenland Norse „could be rightly termed hunter-farmers“ (Madsen 2014, 96) as their economy was a mix of animal husbandry/pastoralism and hunting/fishing, especially of seals (Arneborg et al. 2012a, 6; 2012b, 126; 128; Barlow et al. 1997). The Western Settlement may have been important also due to better access to the hunting grounds in Disko Bay and Melville Bay further north (Ljungqvist 2005, 25). In the research area, Norse farms occur only in its northeastern part and not around Kangerluarsunnguup Tasersua (fig. 11) as this lake demarcates the southern limit of the Western Settlement (Arneborg 2004, 248) where at the head of Buksefjord its most southern farm is situated (fig. 11: 4). The reason to establish a farmstead here remains obscure, but the small size of the farm and its surroundings unsuitable for husbandry have been emphasized (Kapel 1993, 21–22).

Caribou was an important resource in the Western Settlement (Arneborg et al. 2012a, 7; 2012b, 130): The amount of caribou bones varied through time (Enghoff 2003, 36; McGovern et al. 1996, 107), but in Norse sites near the research area 15–17 % of all determined animal bones are from caribou (tab. 1). Caribou hunting was done in autumn (McGovern 1983–84, 100) and with a focus on adult individuals (Enghoff 2003). Bow and arrow with arrowheads made of caribou antler were used (Bergrlund 1986, 110; Roussell

9 Benniscke/Sparrenbom 2007; Forman et al. 2007; Weidick/Benniscke 2007, 42; Weidick et al. 2012, 54–55.

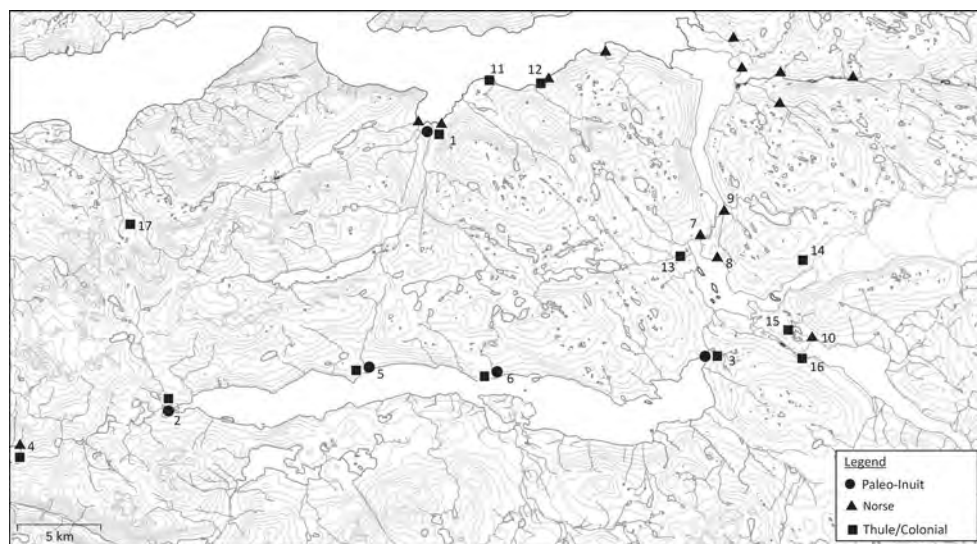


Fig. 11: Research area with Paleo-Inuit (dots), Norse (triangles) and a Thule/Colonial site (square) mentioned in the text.

1936, 105–108), the use of metal bolts shot by crossbows is far from being accepted (Lynnerup 1998, 92). Maybe dogs were used for caribou hunting, but this method is difficult to interpret as dogs of all sizes are present (Enghoff 2003). As Norse society was highly stratified (Arneborg et al. 2012a, 6; 2012b, 126–128), deer hunting may have been restricted and allowed by permission of elites only (Arneborg et al. 2012b, 130). For example, the amount of caribou bones is the highest in high-ranked farms (McGovern 1983–84, 100; 1991; Perdikaris/McGovern 2007, 206). When taking eight to ten persons per farmstead into consideration (Arneborg et al. 2012a, 2; Madsen 2014, 110) one may speculate that the Norse farms at the southern limit of the Western Settlement (fig. 11: 1; 7–12) could provide a sufficient number of participants for communal caribou hunting organized by the owner of a high-ranked farm. This presumed communal hunting may have been a short affair as no Norse upland shelters have been found in the Western Settlement

Tab. 1: Caribou bones in Norse sites near the research area.

Site	Area	Dating	NISP mammals	NISP caribou	Reference
Eqaluit (fig. 11: 1)	inner fjord	Norse	4387 (100 %)	755 (17,2 %)	Møhl 1982, 291
Nipaatsoq (fig. 11: 7)	inland	Norse	2334 (100 %)	391 (16,8 %)	McGovern 1983–84, 119
Gården under Sandet (fig. 11: 8)	inland	Norse	8117 (100 %)	1192 (14,7 %)	Enghoff 2003, 22–23

(Christensen 1990, 163; McGovern 1980, 255) – but one has to take into consideration that Norse stone-built caves (Guldager et al. 2002, 119–124; 133; 137; Hinnerson Berglund 1998) are difficult to distinguish from later Thule/Colonial rock shelters (Pasda 2004, fig. 26; 30; 2014, fig. 2c). However, in contrast to Norway, where Viking/medieval reindeer hunting sites with huts, pitfalls, fences and stone-built cairns occur¹⁰, nothing comparable has been found in Greenland. Caribou hunting drives connected with two inland Norse farms (fig. 11: 9; 10; Knuth 1944) have been mentioned (Blehr 1982, 17) but may be from the Thule/Colonial time period also (Christensen 1990, 164; McGovern et al. 1996, 112). Maybe driving caribou into lakes (and fjords?) to kill them from boats has been done in the Western Settlement as in medieval Norway (Blehr 2012; Indrelid/Hufthammer 2011, 48–49).

Thule/Colonial time period

Lake shore

In the Nuuk area, the start of Thule winter settlement in the inner fjords and of Thule caribou hunting coincides with the end of the Western Settlement (Gulløv 1997, 88; 97; 344–345; 2016, 903–904). However, detailed information on inland use is available only from the Late Thule and Colonial time periods. In that time period glaciers advanced to reach their maximum in the 18th and 19th century, 1–2 km far away from their recent position (Bennicke/Sparrenbom 2007; Forman et al. 2007; Kelly/Lowell 2009). For example, east of Kangerluarsunnguup Tasersua the glacier lobes of the inland ice were 1,5–3,5 km west of their recent position (Weidick et al. 2012, 48–49). During this historic glacial maximum, nivation activities of seasonal and perennial snow patches may have been important (Christiansen 1998), winter occupation in the inner fjord region ceased (Gulløv 1997, 417–418) and access to the inland caribou hunting grounds was difficult (Weidick et al. 2012, 31).

In the research area, Thule/Colonial inland travel may have been not that different from what is known from historical sources from the 1920s and 1930s (Kapel 1993, 87–89) when caribou hunting around Kangerluarsunnguup Tasersua took place in August and September. In that time period the large lake was reached from different coastal and fjord settlements. From the south hunters from Kangerluarsussuaq made a long journey over fjords, lakes and a portage to reach the southern shore of Kangerluarsunnguup Tasersua in front of Igannanguaq (fig. 11: 6). From the Ameralla Greenlanders came to the eastern end of Kangerluarsunnguup Tasersua (fig. 11: 3), where a summer camp with many small tent houses is situated (Gulløv 1983, 162), or further east (fig. 11: 15), where tent rings were found (Gulløv 1983, 165–166). Hunting parties of Utoqqarmiut sailed into the fjord, to carry umiaks, kajaks and equipment over portages to Isua (fig. 11: 2). Afterwards umiak parties sailed further east, each umiak used by 10–12 persons (Cranz 1995, 728; Petersen 1986, 180–181). Inland travel could be very fast, e. g. the eastern

10 Hultkrantz/Vorren 1982; Hufthammer et al. 2011; Indrelid/Hufthammer 2011; Jordhøy 2008.

end of Kangerluarsunnguup Tasersua (fig. 11: 3) could be reached from Utoqqarmiut within three days. In contrast, some groups preferred to interrupt the journey frequently to hunt for one or two days, e. g. on the slope north of Igannanguaq or to walk uphill from Oqaatsut nunaqarfiat (fig. 11: 5) to Amitsorsuaq.

Many Thule/Colonial camp sites are situated on the southern shore of Kangerluarsunnguup Tasersua (Kapel 1993) but are far away from the alpine zone south of the lake. In contrast, three sites, now inundated by the artificial lake rising, are known which are connected with caribou hunting in the alpine area immediately above the northern shore of Kangerluarsunnguup Tasersua: Igannanguaq (fig. 11: 6) was a large camp site with 15 summer tent houses, 13 tent rings, a grave, a meat cache and several hearths (Kapel 1993, 50–55; 215). Radiometric dating and artifacts indicate that Igannanguaq was used from the 16th century till the 20th century, resulting in re-use of older features and occurrence of recent tent rings around older facilities (Kapel 1993, 53). Two tent house types occur, maybe indicating two differently old occupations: Five tent houses have a single room only, five other tent houses have a c. 3 × 1,5 m large room and a 1,5 × 1,0 m large cooking niche. Oqaatsut nunaqarfiat (fig. 11: 5) was a small camp site with four tent houses, maybe of Late Thule age (Kapel 1993, 44–45; 77). Isua, situated at the western end of the lake (fig. 11: 2), is another large camp site with 13 tent houses (fig. 4b), ten tent rings as well as meat caches and graves (Kapel 1993, 31–37; 69–74). Two excavated houses are of the Colonial period, dating from c. 1750 to the 1900s. The amount of people living in these three summer camps is difficult to estimate as at least at Igannanguaq the number of stone-built features increased over time. However, when all houses of the same type at Igannanguaq and Oqaatsut nunaqarfiat were occupied simultaneously, maximum group size may have been 20–30 people per summer camp.

Tab. 2: Caribou bones in Thule/Colonial sites near and in the research area.

Site	Area	Dating	NISP mammals	NISP caribou	Reference
Umiiivik (fig. 11: 12)	inner fjord	Colonial	3482 (100 %)	29 (0,8 %)	Møhl 1982, 289
Tuperluk (fig. 11: 11)	inner fjord	Colonial	1249 (100 %)	145 (11,6 %)	Møhl 1982, 288
Egaluit (fig. 11: 1)	inner fjord	Colonial	?	? (12–16 %)	Meldgaard 1977
Igannanguaq (fig. 11: 6)	Inland	Thule/Colonial	410 (100 %)	286 (69,8 %)	Kapel 1993, 115
Isua (fig. 11: 2)	Inland	Colonial	214 (100 %)	206 (96,3 %)	Kapel 1993, 113

Three Colonial sites in the inner fjord north of the research area contain caribou bones (tab. 2). Only single caribou bones were excavated at late 18th century-long house at Umiiivik, which may be a result of its short occupation (Gulløv 1983, 160–161; 1997, 322–323). The two other sites contain 12–16% caribou bones: the summer site of the 1750s in

Eqaluit (Gulløv 1983, 159; 1997, 319) and the three winter houses of the early 19th century in Tuperluk (Gulløv 1983, 159–160; 1997, 319; 323). In contrast to the inner fjord sites, caribou bones are the most dominant ones at the inland sites of Kangerluarsunnguup Tasersua (tab. 2). As organic preservation may have been the same in the whole area, the high amount of caribou bones in the far inland is material evidence of caribou hunting as the main subsistence activity at inland summer camps.

Mountains

Due to the 2014–2015 survey 88 archaeological sites were registered in the mountains north of the three summer camps (fig. 12; 14), most of them not known before (Neubeck/Pasda 2014; 2015). The stone-built features are difficult to date but as the sites at the shore of Kangerlussuargunnguup Tasersua were occupied in Late Thule and Colonial times (see above), the mountain sites may have been used in these time periods also. This caribou hunting in the mountain range remained a widespread phenomenon till the 1950s (Kapel 1993, 9) as during the surveys in every alpine area fragments of colonial ceramics or glass sherds were found near hunters' beds or initials and years scratched in lichen on used rock overhangs were seen.

According to the distribution of stone-built features three distinct alpine hunting grounds are present in the mountains north of Kangerluarsunnguup Tasersua (fig. 12). In the most eastern part of the mountain range, immediately above the large summer camp Igannanguaq, hunting was done by following the stream uphill to spend the nights in hunters' beds/rock shelters (fig. 12: right). As indicated by the historic sources of the 1920s/1930s already (see above), caribou hunting did not involve prolonged camping in

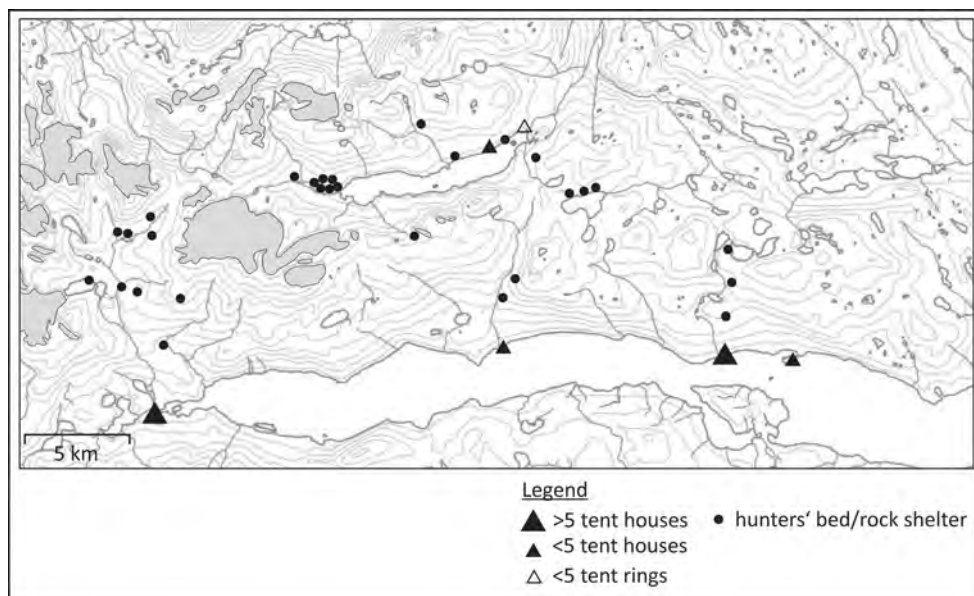


Fig. 12: Thule/Colonial summer camps (tent houses/tent rings) and overnight facilities (hunters' beds/rock shelters).

the mountains as no tent house was found and not a single site has been found at the two lakes at Qangattanaguaq (fig. 3) – the next site is a rock shelter (Gulløv 1983, 163) situated further east and below, near the mouth of the river (fig. 11: 13).

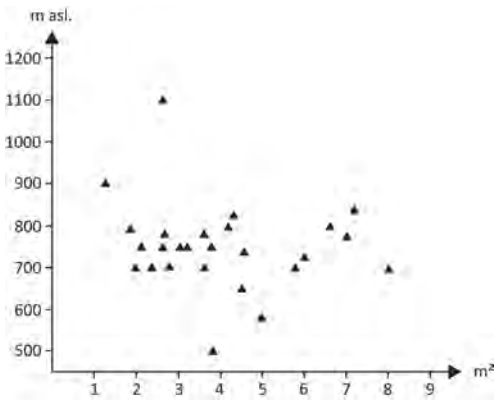
In the central part of the mountain range (fig. 12: centre), above the small summer camp Oqaatsut nunaqarfiat, the occurrence of few hunter's beds/rock shelters indicate hunting in the narrow valley as well as at the first large lake east of the valley. Many stone-built features occur at Amitsorsuaq which is at an average height of 700 m high. The dense concentration of seven hunters' beds/rockshelters west of Amitsorsuaq has to be emphasized in contrast to the occurrence of two hunters' beds in the surrounding high mountains. This may indicate that mobile hunting parties preferred to recuperate at medium height rather than to spend the night in the high mountains. However, at the only pass in the mountain range between Amitsorsuaq and Kangerluarsunnguup Tasersua a small hunters' bed (fig. 6c) is situated which indicates that 1100 m high passes were not avoided. It should also be emphasized that Amitsorsuaq is the only area in the mountain range with presence of tent houses and tent rings (fig. 12). This may indicate that to hunt caribou only here families/households stayed for a longer time period.

A hunting ground not mentioned by the historic sources of the 1920s and 1930s (see above) is situated north of the large summer camp Isua at the western end of Kangerluarsunnguup Tasersua (fig. 12: left) as many single hunters' beds/rock shelters were found in the main basin at 800 m a. s. l. This hunting ground seems to be connected to Isua as the first site which may indicate access from the north, from Ameralik, is situated too far away (fig. 11: 17).

The low numbers of tent houses and tent rings indicate that the number of persons involved in alpine caribou hunting was low: When supposing that all features of a site have been occupied simultaneously, the four tent rings at Amitsorsuaq show that not more than four families/households camped together in the early 20th century here. This number was lower in Late Thule/Colonial times as the summer camp at Amitsorsuaq is divided into two spots, each one with different tent house types: At one spot two small, round tent houses with a cooking niche occur, at the other spot 100 m far away, two rectangular tent houses (fig. 4a) are situated. This may indicate that in Late Thule as well as in Colonial times only two families/households stayed together at Amitsorsuaq. Group size of people using hunters' beds/rock shelters was small also: The enclosed space of most hunters' beds/rock shelters is between 2–5 m²; few are larger, but never exceed 8 m² (fig. 13). When taking smaller body size of people in Thule times into consideration (Jørgensen 1989), three to five persons may have spent the night in these confined spaces (fig. 6; 7). Only two hunters' beds are situated higher, between 900 and 1100 m (fig. 13). One of them is small (fig. 6c), the other one is the smallest hunters' bed found in this area. This may indicate that when caribou hunting involved sleeping in the high alpine area, this was done by a single hunter or two hunting companions.

44 stone-built hunting structures occur in the alpine area (tab. 3; fig. 14). These hunting sites are difficult to date. According to Grønnow (2009, 201; Grønnow et al. 1983, 27–31; 53; 81–84) small-scale hunting drives and shooting coverts, which predominate in the research area (tab. 3), were used mainly when hunting was undertaken with a bow and arrow (c. AD 1300–1750/1800) as well as with flintlock muzzleloaders, which were introduced to the Nuuk region in the second half of the 18th century (Gulløv 1997, 277;

Fig. 13: Size and height above sea level of hunters' beds and rock shelters.



Israel 1969, 72). This may indicate a Thule/early Colonial age of these features. However, the recent artefacts associated with some hunters' beds/rock shelters (see above) may indicate their use well into the mid-20th century.

Among the 44 hunting sites (tab. 3) no large systems with many inussuit (class a and c) and only two large covert systems (class b) are present. The majority is represented by small systems, among them small covert systems (class e) and solitary hunting blinds (class g) the most common. The amount of inussuit in small systems is low, maybe reflecting the general lack of drive lanes in the research area. The unsophisticated appearance of many small hunting sites (fig. 8b; c) and the low number of inussuit may indicate that most of them have been built within a short period of time (Burch 2012, 40; Friesen 2013; Grønnow 2009, 206). Supposing that all shooting coverts of one site have been used simultaneously by one hunter, the high amount of small, class d, e and g hunting systems (tab. 3) indicate that one to three hunters were active. As only two class b hunting

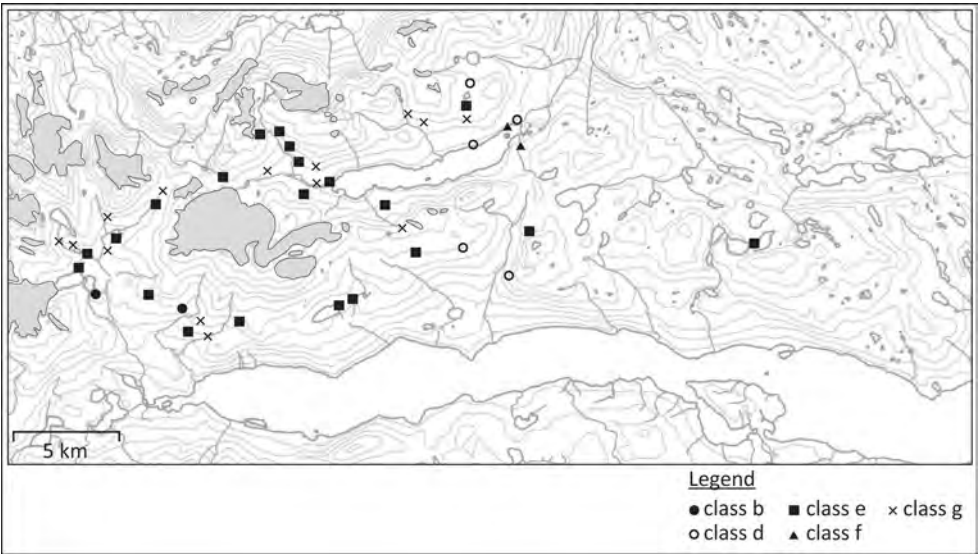


Fig. 14: Caribou hunting sites (definition of classes: see tab. 3).

Tab. 3: Hunting-systems in the mountains north of Kangerluarsunnguup Tasersua.

class of hunting system	sites	concealing features	inussuit
a: large combination (>2 hunting blinds + rows of >15 inussuit)	–	–	–
b: large covert system (>7 hunting blinds)	2	18	–
c: large inussuit system (row with >20 inussuit)	–	–	–
d: small combination (< 3 hunting blinds + row with 2–16 inussuit)	5	12	16
e: small covert system (< 8 shooting blinds)	21	59	2
f: small inussuit system (row with 2–21 inussuit)	2	–	6
g: solitary hunting blind	14	14	2
total (n)	44	103	26

note: definition of classes a-g according to Grønnow (2009, tab. 1).

Tab. 4: Height above sea level of different hunting systems.

height	class b	class d	class e	class f	class g	total
601–800 m a. s. l.	1	3	7	2	6	19
801–1000 m a. s. l.	1	1	13	–	7	22
1001–1200 m a. s. l.	–	1	1	–	1	3
total (n)	2	5	21	2	14	44

note: for definition of class see tab. 3.

sites occur, each with nine shooting coverts, nine hunters were the rare maximum size of hunting groups. Thus, massive (tent houses) and light structures (hunters' beds/rock shelters) as well as hunting structures (tab. 3) show that during caribou hunting only few people lived and hunted in these mountains.

No class of hunting system is connected to a special height, as nearly all occur between 600–1000 m a. s. l., with only three sites situated higher (tab. 4; fig. 14). This may point out the decisive factor for the presence of a hunting structure: As West Greenland caribou flee when humans are within c. 100 m (Aastrup 2000, 86–87; Blehr 1997; Roby/Thing 1985, 85), for safe shooting a caribou hunter with bow and arrow or a flint-lock gun has to get within 20 m (Blehr 1987, 88; 2012, 116; Grønnow et al. 1983, 46–49). Thus, stone-built hunting systems are not situated near snow patches but in obvious natural

bottlenecks where caribou paths converge, where topography funnels movement of caribou – like beside a small creek or ravine, in a narrow valley, on the edge of a high plateau (fig. 8b), on a high pass (fig. 8c) or at the bending of plain (fig. 8d). As no difference of topographical situations between different classes was detected, this may indicate that the different ways of hunting – individual caribou hunting (class g) versus hunting by companions (classes d and e) or by larger groups (class b) – were done in comparable settings.

Tab. 5: Comparison of alpine hunting grounds north of the three summer camps at Kangerluarsunnguup Tasersua.

characteristics	Isua (fig. 11: 2)	Oqaatsut nunaqarfiat (fig. 11: 5)	Igannanguaq (fig. 11: 6)
tent houses in summer camp at lake shore	many	few	many
overnight localities in associated alpine hunting ground	many	many	few
stone-built hunting systems in associated alpine hunting ground	many	many	one
special characteristic of alpine hunting	class b hunting sites here only	class d hunting sites here only	–

One has to emphasize that the amount of tent houses of low summer camps does not always correlate positively with the amount of the overnight localities hunters' bed/rock shelter in the mountains behind (tab. 5). This is due to successive use of the hunting grounds over centuries in accordance with caribou population cycles which resulted in differences in human group size, composition, mobility and hunting methods, thus over time creating a diverse material record (Grønnow et al. 1983; Meldgaard 1983): As many hunting systems occur in areas where many overnight localities have been found (tab. 5), this shows that the more hunters used an area over a longer time span the more hunting systems were built. Maybe, Amitsorsuaq at medium height of 700 m a. s. l. was the focal hunting ground north of Kangerluarsunnguup Tasersua over centuries which resulted in the accumulation of more diverse camp sites and different hunting sites (fig. 12; 14), e. g. class d hunting sites are present here only (tab. 5). The presence of only one hunting site above Igannanguaq (tab. 5) may indicate that in an alpine area not clearly defined by ridges and watersheds hunting methods without stone-built structures have been the most common. However, maybe occupants of Igannanguaq did not frequent the mountains that often but stayed low to use another hunting method: Here caribou crossed the Kangerluarsunnguup Tasersua by swimming from one shore to the other (Kapel 1993, 92) to become an easy prey for hunters using kayaks (Grønnow et al. 1983, 29–30; 81–83).

The predominance of small hunting systems in the research area (tab. 3) is present also in other caribou hunting grounds in West Greenland, in Angujaartorfiup Nunaa and

in the northern Nuuk area (fig. 1), but not in the Aasivissuit area with its few but large systems (Pasda 2014, tab. 3; 4; 6). This supports the interpretation made by Grønnow (2009) that topography influences presence of hunting systems: When a single valley funnels all caribou movements, like at Aasivissuit, large hunting systems predominate as caribou hunting was concentrated on few spots. In the research area, in Angujaartorfiup Nunaa and in the northern Nuuk area many small, natural topographical bottlenecks are present which did not support large, stone-built hunting sites. The only exception is north of Isua (tab. 5) where the only two large hunting sites are situated at the start of the two most important creeks of the research area (fig. 14).

Conclusion

Lithics from the lake shore and bones in low-lying medieval farmsteads proof Paleo-Inuit and Norse caribou hunting, but no stone-built structures of these time periods have been found in the alpine area. Different hunting methods as in the last 400 years may have been employed, maybe connected with less glacial ice and snow cover during these time periods. However, despite glacial advance and increase of nivation processes 200–300 years ago nearly 90 stone-built structures, dating from the late Thule period into the 20th century, have been registered in the mountains north of Kangerluarsunnguup Tasersua. This material record of caribou hunting may have been created by successive and brief summer stays of one or two dozens of people. Shape, size and location of alpine sites do not differ from sites situated in the caribou hunting grounds in lower elevation. Hunting site types show an adjustment of hunting methods to local topography and movement of single or few caribou. The hunting sites do not occur in a chaotic manner but represent three different alpine hunting grounds (fig. 15) which are defined by their topography, limited by steep mountain ridges, glaciers and local watersheds and which are connect-

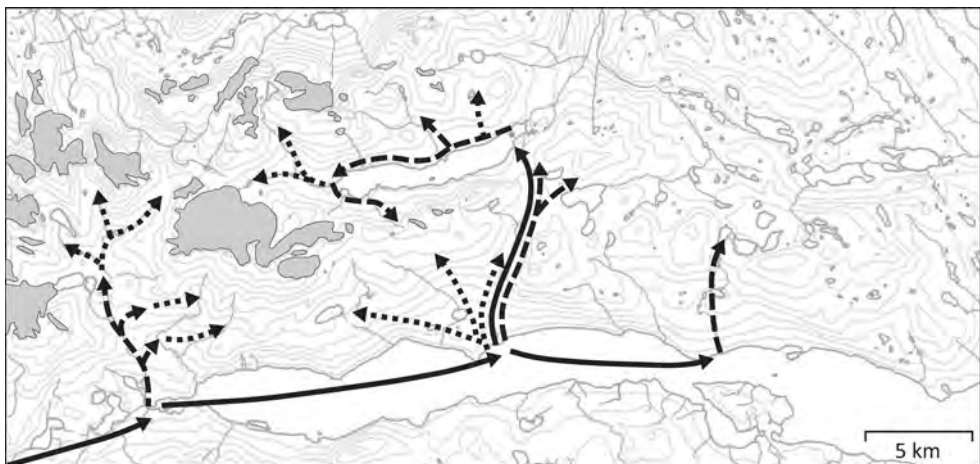


Fig. 15: Three alpine hunting grounds north of Kangerlussunnguup Tasersua used by residential moves of families/households (line), by logistical moves of small task-specific groups (broken line) as well as by hunting expeditions (dotted line). Note: summer camps at the southern lake shore and return routes are not shown.

ed with a low summer camp. A high basin (fig. 15: left) was used often by small task-specific groups which spent one or few nights here to hunt by using stone-built shooting coverts. Only here two large hunting sites occur, maybe because of presence of two major topographical bottlenecks. An alpine area without defined valleys and mountain ridges (fig. 15: right) was used not that intensively as only single hunters' beds/rock shelters and only one stone-built hunting structure are present, maybe because of better hunting opportunities in lower elevations. A third area (fig. 15: center) is defined by a distinct lake at medium height with access to various alpine settings. It was used most frequently by small task-specific groups who spent the night at medium height to hunt here and higher up by using stone-built shooting coverts. However, this area is the only one where few related households spent a longer period at one camp to hunt caribou in its alpine surroundings.

Acknowledgement

Research was funded by the Deutsche Forschungsgemeinschaft (Bonn/Germany; grant Pa527/12-1) and supported by the Greenland National Museum & Archives and by Nukissiorfiit (both Nuuk/Greenland).

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