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WILD REINDEER HUNTING IN ARCTIC NORWAY: LANDSCAPE, REINDEER MIGRATION PATTERNS AND THE DISTRIBUTION OF HUNTING PITS IN FINNMARK

Abstract

Hunting pits for wild reindeer are found in large numbers across northern Fennoscandia. In Finnmark County, Arctic Norway, hunting pits are the most common category of cultural heritage site. Based on the distribution and density of hunting pits throughout Finnmark we have identified what we see as significant distribution patterns. Most hunting pits in Finnmark are located adjacent to the inner fjords and the large rivers of the interior, while such sites are almost absent in the outer coastal areas. Furthermore, our analyses indicate that a majority of hunting pits are located along the Deatnu (Fi. Teno, No. Tana) waterway, and that a large percentage of the pits are found in two geographical areas. One cluster is located at the Várjjat (No. Varanger) Isthmus in Eastern Finnmark, and the other is found by the lower Kárášjohka (Fi. Kaarasjoki, No. Kárásjohka) and upper Deatnu Rivers in inner Finnmark. There are ample reasons to assume that both areas had a very high abundance of wild reindeer in prehistoric times and in the Medieval Period. Hunting pits in inland Finnmark have been dated to the Late Stone Age and the Early Metal Period, whilst hunting pits on the Várjjat Isthmus have been connected to Sámi reindeer hunting in the Medieval Period. However, we argue that hunting pits both in the interior and at the Várjjat Isthmus could have been used over a long period of time and may be partly contemporary. The hunting pit systems in both clusters are located adjacent to the Deatnu River – the largest waterway in Finnmark, and the river may have been an important premise for the use of these sites throughout prehistoric and historic times.

Keywords: wild reindeer, hunting pit, distribution, landscape, Arctic Norway, Fennoscandia

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INTRODUCTION

Across northern Fennoscandia hunting pits used for hunting wild reindeer are found in large numbers. The pits appear as circular or oval depressions in the ground, often surrounded by a low wall of soil. Their size normally ranges between two and five meters in diameter, with a depth of up to one and a half meters. Hunting pits are often found organized in rows. Some of these hunting pit systems can be very large, consisting of several hundred individual pits. In Finnmark, the northernmost county in Norway (Figs. 1–2), hunting pits for wild reindeer are the most numerous category of cultural heritage site (Riksantikvaren 2009). In this area of northern Fennoscandia hunting pit systems have been investigated since the first half of the 1900s. These studies have primarily been surveys, focused on documenting the sites. Especially the Várjjat (No. Varanger)[1] area in eastern Finnmark has been a focal point for surveys in Norway, as well as for discussions concerning the role and significance of wild reindeer hunting (Vorren 1944; 1998; Olsen 1987; Odner 1992; 2001; Hambleton & Rowley-Conwy 1997; Hansen & Olsen 2004; Risbøl 2009a). On the adjacent Finnish side of the border especially Näkkälajärvi (1964), Halinen

Fig. 1. Finnmark, the northernmost county in Norway. Map data: The Norwegian Mapping Authority.

(2005) and Manninen (2007) have contributed to research concerning hunting pit systems and wild reindeer hunting.

Hunting pits and hunting pit systems have proven difficult to date accurately, mainly because of a general lack of datable material that can be directly related to the pits and their period of use. Accordingly, only a relatively small number of hunting pits in Fennoscandia have been radiocarbon-dated. Excavations have yielded dates covering a time span of almost 4000 years, from the Late Stone Age (5000–1800 BC) to AD 1600 (Mulk 1994; Furset 1995; 1996; Halinen 2005). Interestingly, the existing radiocarbon dates seem to indicate that in Finnmark the age of the hunting pits differs depending on where in the county they are located. The oldest hunting pits, found in the interior of Finnmark, date to approximately 3000 BC (Furset 1995; 1996). Hunting pits in the Várjjat area nearer to the coast have so far not been radiocarbon-dated, but they are estimated to be from the time period AD 1200–1600 (Munch & Munch 1998). This apparent time span of almost 4000 years separating hunting pits in different parts of Finnmark, is probably a contributing factor as to why the total distribution of all hunting pit systems throughout Finnmark has so far not been analysed.

Expanding networks and interaction between the hunter-gatherers in northern Fennoscandia and the metal-producing societies in Russia during the last centuries BC have been seen as part of a process leading to the emergence of Sámi ethnicity (Olsen 1984; Jørgensen & Olsen 1988; Hansen & Olsen 2004). As mentioned above, hunting pits in the Várjjat area are estimated to be from the period AD 1200–1600. These hunting pit systems are considered an important part of Sámi subsistence and economy, especially in the Medieval Period (AD 1000–1550) (Odner 2001; Hansen & Olsen 2004). Dates from hunting pits found in the interior of Finnmark, however, precede the emergence of Sámi ethnicity among hunter-gatherers in Fennoscandia. This may be one of the reasons why hunting pit systems in the inner parts of Finnmark only rarely have been connected to Sámi landscape use and subsistence economy.

The objective of this paper is to analyse the spatial distribution of hunting pits in relation to landscape and reindeer migration patterns. Analyses are based on a review of the total distribution of mapped hunting pit systems throughout Finnmark. The resulting distribution patterns are discussed in relation to wild reindeer migration patterns and to landscapes.

THE DISTRIBUTION OF HUNTING PIT SYSTEMS IN FINNMARK

The analyses in this paper are mainly based on data obtained from The Norwegian National Sites and Monuments Record (Riksantikvaren 2009). The main body of this record is made up of registrations resulting from a systematic national archaeological survey for the Public Land Use Maps (Økonomisk Kartverk) carried out between 1963 and 1991. In Finnmark only 18 % of the total land area was covered by this survey, leaving out uninhabited areas considered to be of low economic value. Additional surveys have been conducted in later years, and the extent of the surveyed area is continuously expanded. The database is also being continuously updated. Still, it is important to bear in mind that part of the distribution pattern of archaeological sites in Finnmark may be attributed to survey activity. We will discuss this later. The analyses are, in addition, based on data originating from The Reindeer Husbandry Admin-

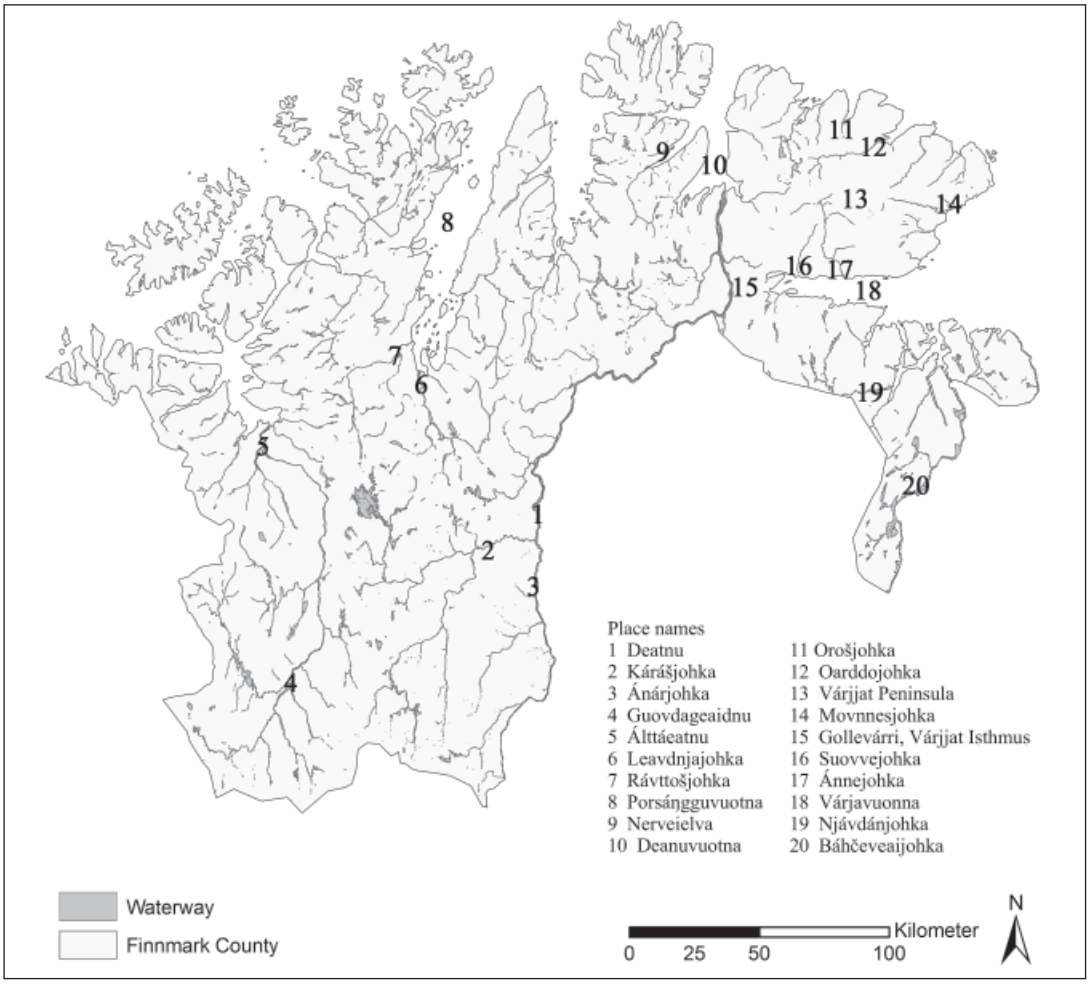

Fig. 2. Place names in Finnmark mentioned in this paper. Map data: The Norwegian Mapping Authority.

istration (Reindriftsforvaltningen 2008) and The Norwegian Mapping Authority (Statens Kartverk 2009). Topographical data used in the analyses are vector-based feature layers (scale range 1:25 000 to 1:100 000) describing the larger waterways in Finnmark, that is, large rivers (wider than 15 m and longer than 100 m) and lakes connected to the larger rivers (Statens Kartverk 2009).

These data have been used to produce maps of the distribution and density of hunting pits throughout Finnmark, as well as of their distribution in relation to water systems and modern reindeer migration routes. The distribution of mapped hunting pit systems is interpreted through visual evaluation, and the interpretations are based on what we perceive as significant patterns in the distribution of pits. Density, in this case the number of pits within a given area, is seen as a significant variable when describing the distribution of hunting pit systems throughout Finnmark. Kernel density estimation (KDE) has been used to measure and present the changing density of hunting pits. KDE is a non-parametric technique in which a two-dimensional probability density function ('the kernel') is placed across the observed data points in order to create a smooth approximation of its distribution from the center of the point outwards (Connolly & Lake 2006: 175).

In order to produce an overview of the distribution of hunting pit systems we have based our analyses on the number of pits, rather than on the number of hunting pit systems. As previously mentioned, many of the sites were registered during the 1963–91 surveys for the Public Land Use

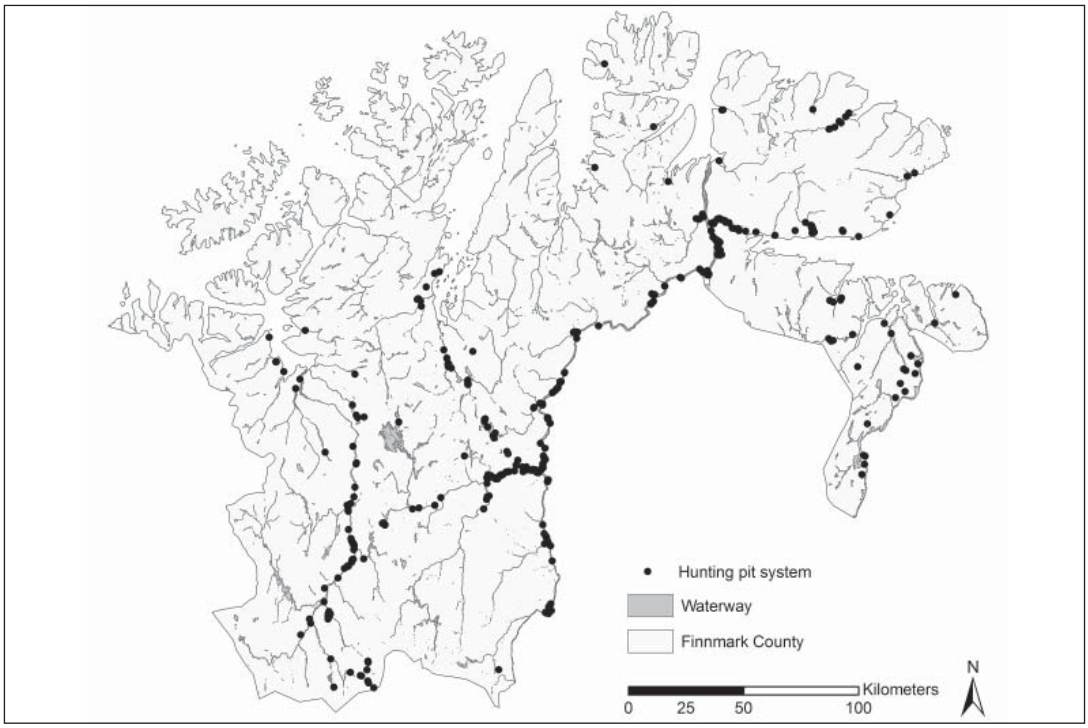

Fig. 3. The distribution of hunting pit systems in Finnmark County. The map also shows the larger rivers in Finnmark. According to The Norwegian Mapping Authority a larger river is a river that is more than 15 meters wide over a length of at least 100 meters. Map data: The Norwegian Mapping Authority.

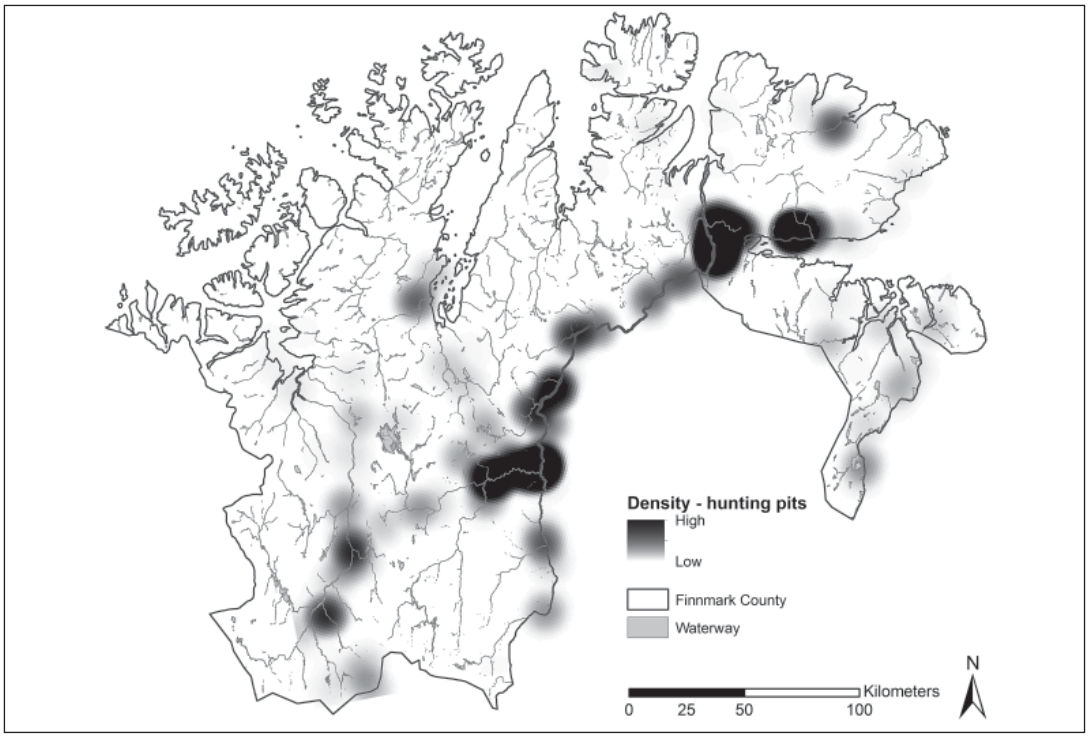

Fig. 4. Density analysis of hunting pits in Finnmark. Map data: The Norwegian Mapping Authority.

Waterway	D≤250 m		D≤500 m	
	N	%	*N*	%
Deatnu	1581	29,8	2139	40,3
Álttáeatnu-Guovdageaidnu	192	3,6	276	5,2
Leavdnjajohka	30	0,6	30	0,6
Rávttošjohka	3	0,06	6	0,1
Nerveielva	6	0,1	6	0,1
Suovvejohka	3	0,06	3	0,06
Ánnejohka	66	1,2	128	2,4
Movnnesjohka	3	0,06	4	0,08
Oarddojohka	71	1,3	71	1,3
Njávdánjohka	15	0,3	21	0,4
Báhčeveaijohka	39	0,7	44	0,8
Storelva	–	–	7	0,1
All rivers and connected lakes	2533	47,7	3297	62,1

Key: D= distance.

Table 1: Hunting pits (N= 5309) in areas along the large rivers in Finnmark County. Source: Riksantikvaren 2009.

Maps, and the methodology of this survey led to a somewhat arbitrary demarcation of hunting pit systems. For example, a gap wider than 50 m in a line of hunting pits meant that the site was recorded as two hunting pit systems, even if the gap could be attributed to a natural phenomenon such as boulders.

Figure 3 visualizes the distribution of hunting pit systems throughout Finnmark, and the pattern indicates clear accumulations of pits in certain geographical areas. A limited number of hunting pit systems can be found in the outer coastal zone, while the majority of sites are located in the inner fjord areas and in inland areas. This impression is supported by density analysis conducted on the basis of the number of pits in the county. Figure 4 is a visual presentation of the changing density of hunting pits throughout Finnmark. Areas that stand out as having a high density are found in the inner fjord areas and further inland, especially along the Rivers Deatnu (Fi. Teno, No. Tana) and Kárášjohka (Fi. Kaarasjoki, No. Kárásjohka). A large concentration of pits is also located by Ánnejohka (No. Vestre Jakobselv) just north of the Várjavuonna (No. Varangerfjorden). Several hunting pit systems have been registered in the area, one of which is comprised of 450 pits. This hunting pit system alone constitutes the majority of the concentration by Ánnejohka which encompasses a total of 581 pits. As can be seen in Figure 4 and Table 1, sizeable concentrations of hunting pits are also located along the Álttáeatnu–Guovdageaidnu (No. Alta–Kautokeino) water system, and the Rivers Oarddojohka (No. Syltefjordelva) on the Várnjarga Peninsula (No. Varangerhalvøya), Rávttošjohka (No. Stabburselva) west of the Porsáŋgguvuotna (Fi. Porsanginvuono, No. Porsangerfjorden), Leavdnjajohka (Fi. Lemmijoki, No. Lakselv), the Njávdánjohka (No. Neidenelva) and the Báhčeveaijohka (No. Pasvikelva) along the Russian border. The distribution and density maps (Figs. 3–4) show a clear tendency in the placement of hunting pit systems. A majority of the sites are located in areas nearby major waterways and lakes connected to the larger rivers. Of altogether 5309 recorded hunting pits, 62,1 % are found within 500 meters of a large waterway while 47,7 % are located no more than 250 meters from a large river or lake.

Areas with a high density of hunting pits are primarily found along the Deatnu waterway. It is by the Deatnu, or by one of its several tributaries that most of the larger concentrations of pits are located (Fig. 5); 40,3 % of the registered hunting pits in Finnmark are found within 500 m of Deatnu and its tributaries. The largest numbers are found along the Deatnu and Kárášjohka Rivers, respectively 1261 and 738 of 5309 pits are found within 500 m of them.

Two areas stand out with an exceptionally high density of hunting pits – areas of a relatively small geographic extent with clusters of more than 1000 pits (Fig. 5). One cluster is the well-known concentration of hunting pits on the isthmus between the Deatnu Valley and the Várjavuonna. According to The National Sites and Monuments Record 1558 hunting pits are located in this area, a clear indication of the abundance of hunting pits in the Várjjat region, and especially on the isthmus. Ørnulf Vorren started surveying wild reindeer hunting sites in the Várjjat area as early as the 1940s (Vorren 1944; 1998). By 1996 he had documented 3358 individual hunting pits, out of which 2685 were located on the isthmus between the Deatnu Valley and the Várjavuonna (Vorren 1998: 19). Some new pits were also found in 2008

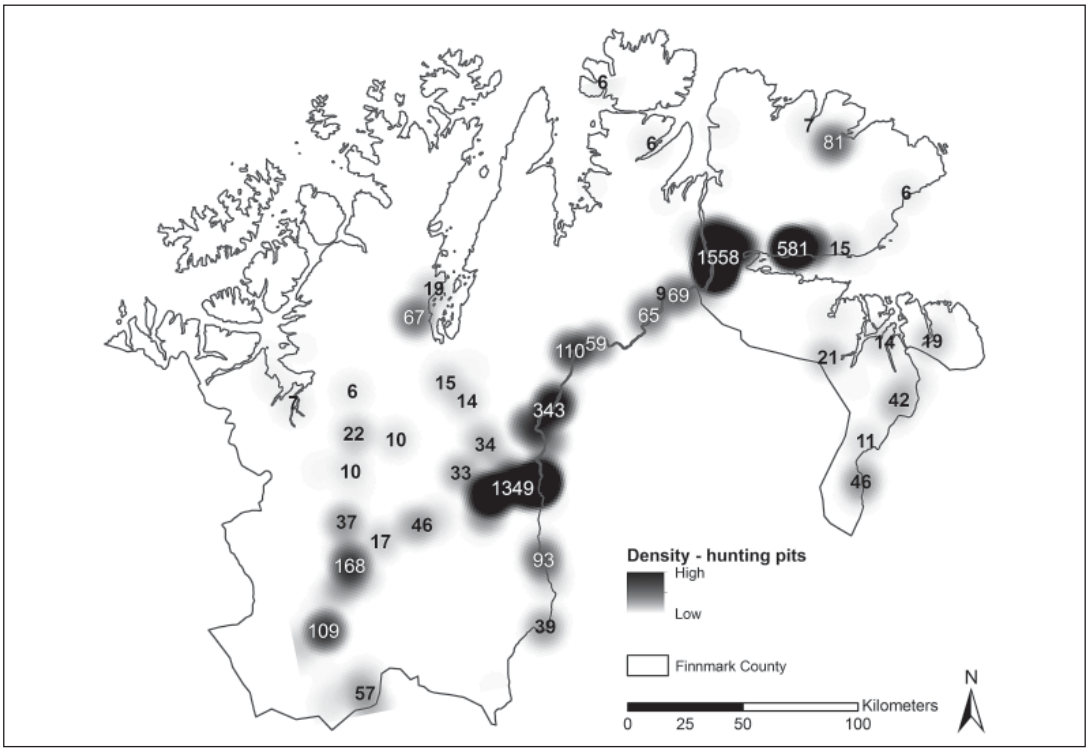

Fig. 5: Concentrations of hunting pits consisting of more than five pits have been numbered in this map. Map data: The Norwegian Mapping Authority.

as a result of a survey based on airborne laser scanning (Risbøl 2009a; 2009b). The National Sites and Monuments Record does not yet include all of Vorren´s sites, nor the registrations from the laser scanning survey. When these sites are included, the cluster of hunting pits on the isthmus between Deatnu Valley and the Várjavuonna will be even more prominent.

A very high number of hunting pits is also situated along the lower Kárášjohka River / upper Deatnu River (Figs. 5–6). This second cluster consists of 1349 individual pits. In The National Sites and Monuments Record the total number of hunting pits in the municipality of Kárášjohka (No. Karasjok) is 1952 (Riksantikvaren 2009), which means that 69 % of documented pits in the municipality are found within this relatively small geographic area along the river. In sum, these two cluster areas include more than half of the hunting pits in Finnmark recorded in The National Sites and Monuments Record; that is 2907 or 54,8 % out of a total of 5309 hunting pits.

Compared to the Várjjat area, fewer surveys have been conducted in inland Finnmark. The cluster at the lower Kárášjohka River / upper Deatnu River is located in one of the few areas in the interior where systematic surveys have been conducted, and it could be argued that the concentration of hunting pits in this area is actually the result of variations in survey intensity. However, other systematic surveys, both in inland Finnmark and in coastal areas, have failed to identify comparable concentrations of pits (Vorren 1978: 148–9; Simonsen 1987). Recent extensive surveys further support this pattern. For instance, a survey carried out in 2005–6 in the interior of the municipality of Porsánggu (Fi. Porsanki, No. Porsanger) covered an area of 80 square kilometres, but it did not result in more than 10 sites with a total of 17 hunting pits (Barlindhaug et al. 2007). In our opinion this indicates that the high density of hunting pits along the lower Kárášjohka River / upper Deatnu River is significant, and not merely a reflection of survey activity.

DATING HUNTING PITS

Hunting pit systems throughout the Várjjat area have so far been dated on the basis of written

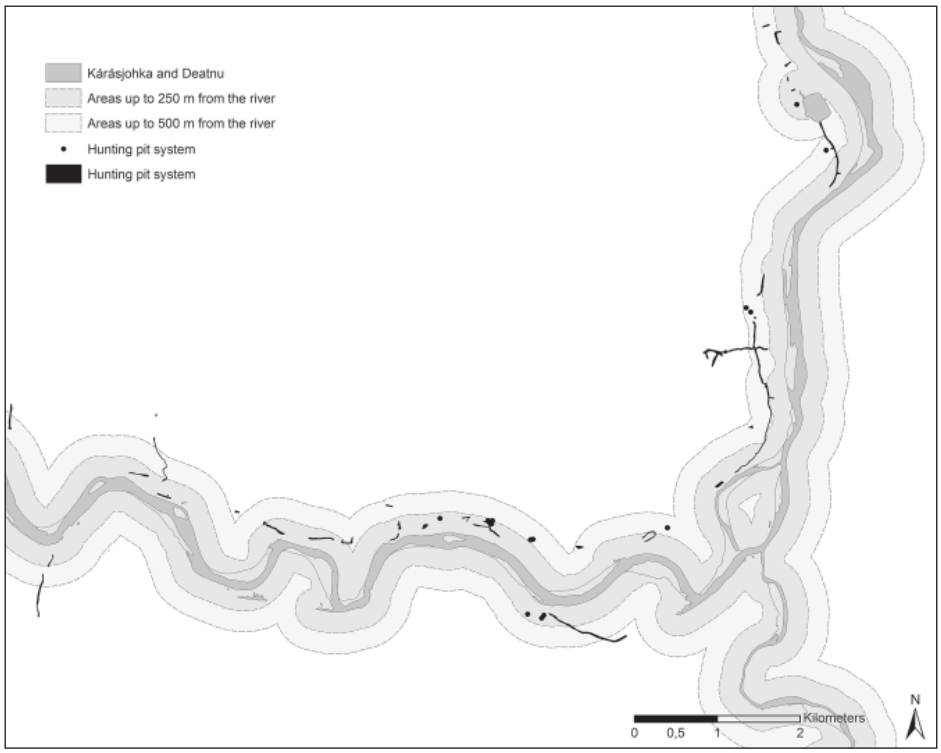

Fig. 6. Hunting pit systems near the rivers Deatnu and Kárášjohka. Map data: The Norwegian Mapping Authority.

sources, ethnographic data, and the archaeological excavations at the settlement site Vuopmángieddi at Gollevárri. The site at Vuopmángieddi is located just south of a large hunting pit system, and it was excavated as early as 1965–6 (Munch & Munch 1998: 106–33). Remains of 16 turf house dwellings were documented, as well as meat caches found in screes in the vicinity of the settlement. The turf house dwellings had a hearth in the centre of the floor area and midden deposits were found just outside the entrances. Iron knives, spears and arrowheads, antler spoons, awls and semi-finished antler objects were among the artefacts recovered from the site. In addition, the excavations uncovered large deposits of reindeer skulls with antler stubs still attached. Organic material from the site was not radiocarbon-dated in the 1960s, but during the 1990s new samples were taken. Based on both the archaeological material and the radiocarbon dates, Jens Storm Munch and Gerd Stamsø Munch suggested that AD 1200–1600 was the main settlement phase at Vuopmángieddi (Munch & Munch 1998: 130–3; Vorren 1998).

Based on archaeological excavations, Knut Odner (1992; 2001) argues that Sámi winter sites were located by the coast in Várjjat in the Medieval Period. Odner's research indicated that settlements by the coast were inhabited from October till May. At Geačevájnjárga at Selešnjárga (No. Angsnes) by the Várjavuonna, he found large amounts of reindeer bones which mostly belonged to the meaty parts of the animals. Unlike at the site of Vuopmángieddi, reindeer antlers were largely absent at Geačevájnjárga. This lack of antler may indicate that the actual hunting and butchering happened somewhere else, and that only the meat was brought to this site. Geačevájnjárga has been dated to the 13th century AD, and is contemporary with the hunting site at Vuopmángieddi. Odner suggests a connection between Geačevájnjárga and Vuopmángieddi, where the first could have been a Sámi winter site whilst Vuopmángieddi is believed to have been inhabited in autumn. Hambleton & Rowley-Conwy (1997) have questioned Odner´s conclusion. The assemblage from Odner´s excavation came from the inside of a dwelling, and they have pointed out that it is unlikely that butchery waste from

a kill-site would be represented in this context. However, like Odner, they find it plausible that the bones stem from wild reindeer and not from a domesticated herd since the reindeer bones were mostly adults and no reindeer milk teeth were found in the assemblage.

Hunting pits in the inland municipalities Kárášjohka and Guovdageaidnu (No. Kautokeino) have been excavated by Povl Simonsen (1987), Ole Jacob Furset (1995; 1996) and Petri Halinen (2005). Simonsen´s excavation did not give any definite results regarding the age of the pits; Furset and Halinen's excavations have provided eight radiocarbon dates from hunting pits in Guovdageaidnu and eight dates from Kárášjohka. Halinen (2005: 73, 154) has also radiocarbon-dated material from hunting pits in Eanodat (Fi. Enontekiö) and Anár (Fi. Inari) in northern Finland near the Norwegian border. The excavated pits on both sides of the Norwegian–Finnish border showed no traces of wooden constructions inside, and Halinen and Furset's dates were all based on seed samples taken from the old surface layer under the soil wall surrounding the pit. Thus, the dates provide a terminus post quem for when the hunting pits were dug (Furset 1995; 1996; Halinen 2005: 73). It should also be mentioned that according to a test done by Halinen (2005: 73), charcoal samples give older radiocarbon dates than seed samples. The hunting pits in Guovdageaidnu were dated to the time period 3326–807 cal. BC (Furset 1995: 60). The samples from Kárášjohka gave similar results and date to 2915–834 cal. BC (Furset 1996: 39). All the existing radiocarbon dates from sites with hunting pits in the interior of Finnmark have resulted in dates ranging from the Late Stone Age and the Early Metal Period (1800 BC–BC/AD). The majority of the dates are, however, from the Late Stone Age. Also the majority of the dates from Finland stem from the Late Stone Age. Based on these results, Halinen (2005) concludes that the use of hunting pits was at its peak during the final phase of the Late Stone Age and the beginning of the Early Metal Period, and that it became a marginal phenomenon towards the final phase of the Early Metal Period. According to him, other techniques such as wooden hunting fences and hunting with bow and arrow became more common during the 1st millennium AD. Traces of wooden fences have been found in Ohcejohka (Fi. Utsjoki, No. Utsjok) by Ailigasjávvri, and they have been radiocarbon-dated to the time period between 8th and 14th centuries AD (Zetterberg et al. 1996: 120). Halinen also questions Vorren's (1998) estimated dates for the Várjjat area, and suggests that the primary use of the hunting pit systems at Gollevárri ended in the middle of the Early Metal Period (Halinen 2005: 108).

As shown in the above discussion, researchers have placed the hunting pits within the two clusters in Finnmark at opposite ends of a time axis lasting approximately 4000 years. The age of the pits has been directly or indirectly determined using different dating methods. We agree with Halinen's view that the hunting pits at the Várjjat Isthmus could be much older than suggested by Vorren. Based on the radiocarbon dates from hunting pits in inland Finnmark and northern Finland it is plausible that the hunting pit systems in the Várjjat area also could have been established as early as the Late Stone Age. There is, as far as we can see, no reason to assume that hunting pits were in use in the interior for thousands of years before this hunting method came into use in the Várjjat area. However, when it comes to the questions concerning the cessation of this hunting technique, we are less sure in our conclusions than Halinen. In our opinion, one cannot exclude the possibility that hunting pits have been in use in the 1st millennium BC and up until the first centuries after AD 1000. Although wooden hunting fences are known from ethnographic sources, few traces of wooden fences from the Iron Age (BC/AD–AD 1000) and the Medieval Period have actually been found. Enclosures and hunting fences made of stone are known on the Várnjarga Peninsula (Hansen & Olsen 2004), and they are estimated to originate in the Medieval Period. The radiocarbon-dated seeds that were taken from the old surface surrounding the hunting pits does not provide any evidence concerning when the pits went out of use. In northern Sweden, Inga-Maria Mulk (1994: 160–9) has provided 18 radiocarbon dates of charcoal samples taken from 17 hunting pits. Only two of the samples were dated to the Late Stone Age, and they were both samples of the old surface surrounding the pits. Interestingly, a sample taken from the old surface around a third hunting pit was dated to cal. AD 1440–1615. The majority, nine samples, fell within the 1st millennium AD, four were from the 1st millennium BC and the last two were dated to cal. AD 1431–1952. Mulk's dates support the possibility of a more or

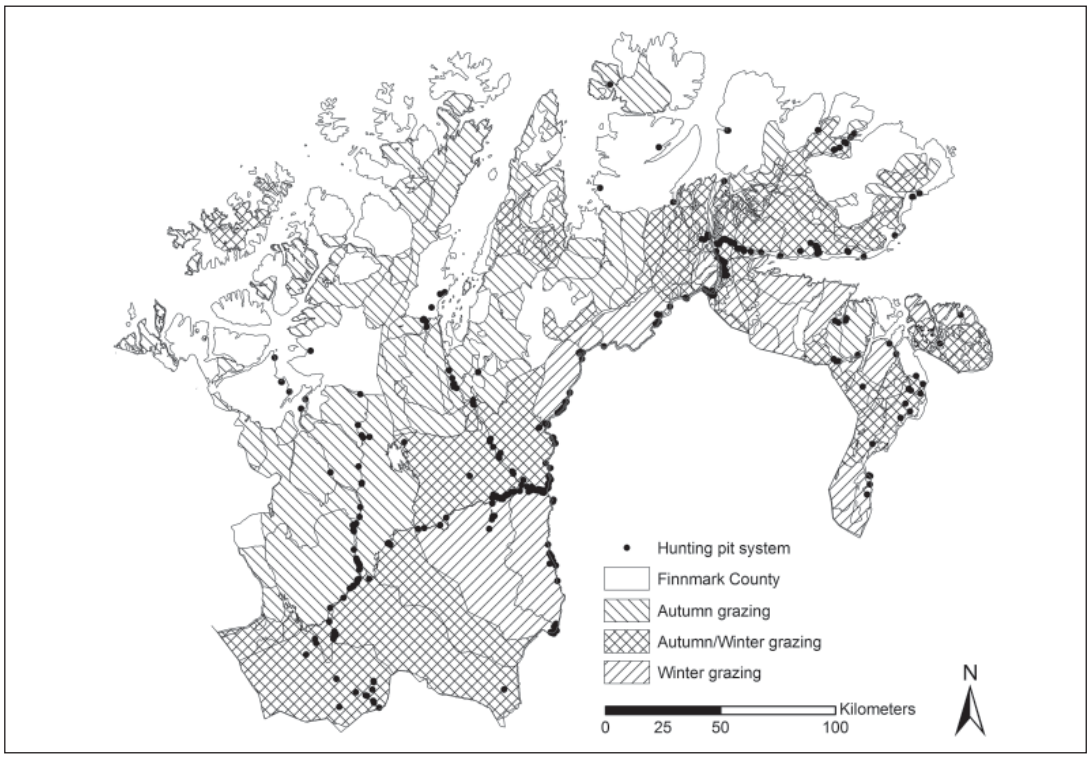

Fig. 7. Winter and autumn grazing areas for domesticated reindeer in Finnmark. Map data: The Reindeer Husbandry Administration and The Norwegian Mapping Authority.

less continuous use of hunting pits from the Late Stone Age until the Medieval Period. Signs of long-term use of hunting pits have also been found in Eanodat Näkkälä. Dated charcoal samples from the old surface and from the bottom of the same pit showed a time span of over 2000 years (Halinen 2005: 73). Three samples from the old surface layer gave the following results: 1260–920 cal. BC, 1690–1430 cal. BC and 2290–1940 cal. BC. The lowermost sample was dated to cal. AD 430–650. However, even though hunting techniques may have undergone changes from the Late Stone Age to the Medieval Period, it seems that the areas in Finnmark where hunting pits are concentrated continued to be important and preferred hunting grounds.

HUNTING PIT SYSTEMS AND WILD REINDEER MIGRATION PATTERNS

The concept 'affordance', introduced by Peter Gibson (1986), implies that the landscape itself can be seen as holding certain qualities and possibilities which humans might act upon, such as good fishing grounds in a salmon river, sheltering rocks on a windy plain or wild reindeer routes and river crossings. The landscape also offers qualities which have influenced religious and symbolic actions. Landscape is therefore not only a cognitive construction, a phenomenon without influence upon human perception of it (Gibson 1986; Knappet 2005; Ingold 2007; Olsen 2010).

It must be emphasised here that the migration routes of wild reindeer in prehistoric Finnmark and northern Fennoscandia are unclear. The herds inhabiting these areas today are domesticated, and the level of concurrence between prehistoric and present day reindeer migration routes has yet to be established. In our opinion one can assume that areas with high seasonal concentrations of wild reindeer were preferred as prime locations for hunting pit systems. In a research project conducted by the Norwegian Institute of Nature Research in southern Norway, prehistoric hunting systems were surveyed and related to the migration routes of wild reindeer herds (Jordhøy et al. 2005; Jordhøy 2007). Results showed that

the largest hunting systems were located along the migration route between winter and summer pastures, areas that are still today reindeer grazing areas.

Vorren and others have viewed the cluster of hunting pit systems on the isthmus between the Deatnu Valley and the Várjavuonna in the context of a high density of wild reindeer present in this area in autumn (Vorren 1998; Odner 2001; Hansen & Olsen 2004). The reindeer migrated from the summer pastures on the Várnjarga Peninsula, and passed through the narrow isthmus between Deatnu and Várjjat on their way to the winter pastures in the interior. At that time of the year, having spent the summer on rich pastures, the reindeer were fat and the furs were of optimum quality. This migration pattern is still present among domesticated reindeer herds in the area today (Reindriftsforvaltningen 2008).

In our opinion, the cluster of hunting pits at the lower Kárášjohka River / upper Deatnu River could reflect a similar situation. According to maps published by The Reindeer Husbandry Administration in Norway, the land along the western side of upper Deatnu and on both sides of the lower Kárášjohka is used as autumn and winter pastures for domesticated reindeer (Reindriftsforvaltningen 2008). The clusters of hunting pits are located in areas that today are border areas between autumn and winter pastures (Fig. 7). Reindeer herds are moved inland during autumn from the coastal summer pastures in western Finnmark, and the herds cross the plains southward to the northern banks of the Kárášjohka River and the Deatnu River. The upper parts of the Deatnu became a national border in 1751, and according to Steinar Pedersen (2008) the new border had consequences for the Sámi in the Ohcejohka area (today's Finland). Before the border was established the Sámi moved their domesticated reindeer herds across the Deatnu River and further on to coastal Finnmark during spring. This migration route was in accordance with the reindeer herds' old habitual behaviour as they migrated to the coast to flee parasites and insects in the interior during the summers. Interestingly, Pedersen also mentions that in the mid-18th century AD the Sámi in the Ohcejohka area had hunting pit systems along the western (Norwegian) side of the Deatnu River which were considered to be better hunting grounds (Pedersen 2008: 78–9).

Further west, by the Kárášjohka River, the migration routes were not influenced by the new border. According to Sámi reindeer husbandry today, the area at the lower Kárášjohka River / upper Deatnu River has a very high concentration of reindeer in late autumn. One can imagine that the Kárášjohka and the Deatnu form a barrier which could have caused an accumulation of wild reindeer on the northern river banks. According to Sámi engaged in reindeer husbandry in the area, the reindeer prefer crossing the Deatnu either by swimming or by walking on solid ice covered with snow. If the animals arrive when the river is about to freeze, they wait for the ice to thicken. This means that the number of animals at the northern bank can increase drastically as more and more reindeer arrive. There are also examples from Canada and Eurasia mentioning reindeer and caribou river crossings as important hunting sites (Baskin 2003; Stewart et al. 2004). Baskin (2003: 37–9) reports several examples of reindeer river crossings in Eurasia, which have been used as hunting sites since prehistoric times.

Migration patterns of wild reindeer in prehistoric times should also be considered in relation to climate and vegetation. The climate in northern Fennoscandia was at its warmest between 6000 and 4800 BC (Eronen & Zetterberg 1996; Hicks & Hyrvärinen 1997). The warm climate allowed pine forests to expand into coastal areas in Finnmark (Juul 1925). As suggested by Bryan Hood (1992), during the time period when the pine forest was at its maximum, the winter areas of the wild reindeer herds could have been closer to the coast. However, the oldest hunting pits in the interior Finnmark are dated to around 3000 BC (Furset 1994; 1995) and at that time the climate had already become colder and more unstable and the pine forests were decreasing in the coastal areas. By 2500 BC the pine forests in coastal areas, in inland of western Finnmark and at the Várnjarga Peninsula had disappeared (Hicks & Hyrvärinen 1997). This indicates that wild reindeer, due to changes in temperature and vegetation, had their winter grazing areas in the interior of western Finnmark as early as the 3rd millennium BC. The migration routes between summer and winter pastures could therefore have remained more or less the same for several thousand years, and locations close to the annual migration routes and to natural barriers like major rivers and river crossings, would have been especially attractive as hunting locations.

CHANGING SETTLEMENT PATTERNS AND NETWORKS

All of the hunting pits dated by Halinen (2005) and Furset (1995; 1996) in inland Finnmark belong to the Late Stone Age and the Early Metal Period. More than 200 settlement sites from the Late Stone Age have been identified on Finnmarksvidda (the plains in the interior of Finnmark), and many occur in areas along the Álttáeatnu–Guovdageaidnu River and by the great Lake Iesjávri (Hood 1995: 85). Marianne Skandfer (2009: 96–7) has documented seven settlement sites with houses by the Deatnu and Kárášjohka Rivers. These houses resemble the 'Gressbakken house', the most common type of house in coastal Finnmark during the time period 2200–1800 BC (Schanche 1994). In northern Finland, on the eastern banks of the Deatnu River, several sites from the Late Stone Age–Early Metal Period have been excavated at Ala-Jalve (Rankama 1986; 1997). Among the recovered items are arrow heads, arrow shafts, scrapers and pot shreds. As Tuija Rankama (1986: 37) points out, the Ala-Jalve assemblage includes elements, which are also found at settlement sites along the Norwegian Arctic coast.

Archaeological evidence, such as the multitude of settlement sites dating to the final centuries of the Late Stone Age, found along the coast of Finnmark, seems to indicate a high population density in these areas (Olsen 1994; Schanche 1994). Kjersti Schanche (1994: 172–7) has estimated that the population by the Várjavuonna in the final phase of the Late Stone Age consisted of approximately 1250 individuals. Furthermore, at Gavesluohkta close by the mouth of the Deatnu River in the Deanuvuotna (No. Tanafjorden), there is a very large settlement site with 111 registered dwellings from the Late Stone Age and the Early Metal Period (Id No. 126911 in The Norwegian National Sites and Monuments Record).

Based on the number of settlement sites and hunting pit systems in the interior of Finnmark, Bryan Hood (1995: 85) has argued for an intensified utilization of the interior during the end of the Late Stone Age. Halinen (2005) suggests that the numerous systems of hunting pits were constructed and used seasonally by people from the coastal 'Gressbakken' villages around the Porsáŋgguvuotna and Várjavuonna. Skandfer´s (2009) identification of 'Gressbakken houses' by the Kárášjohka River and the Deatnu River and Rankama´s (1986; 1997) excavations at Ala-Jalve can be seen as supporting this view.

The settlement pattern in Arctic Norway went through major changes during the Early Metal Period (Olsen 1994). Settlement patterns in coastal areas changed as a result of a more nomadic lifestyle and the increasing importance of the interior areas for the subsistence economy as networks gradually developed between hunter-gatherers in Fennoscandia and farming societies in Russia. These processes are seen as part of a consolidation amongst the hunter-gatherer societies in Fennoscandia leading to the emergence of Sámi ethnicity (Olsen 1994; Hansen & Olsen 2004). Settlement sites dating to the Early Metal Period have been documented by the Álttáeatnu–Guovdageaidnu River, and in Báhčaveadji (Simonsen 1963; 1985; Olsen 1985; Hood & Olsen 1988; Jørgensen & Olsen 1988; Skandfer & Bruun 2006). However, relatively few settlement sites from the Early Metal Period and from the first centuries of the Iron Age have been documented in inland Finnmark.

This situation changed during the final phase of the Iron Age. At that time linearly organised rectangular hearths became common throughout the Sámi settlement area (Simonsen 1979; 1997; Halinen 2009; Hedman & Olsen 2009). The average size of these hearths is about one meter by two meters, but some are even larger. In Finnmark rectangular hearths are mainly found in central inland areas (Simonsen 1979; 1997; Hedman & Olsen 2009), and a total of 129 rectangular hearths are registered in The Norwegian National Sites and Monuments Record (Riksantikvaren 2009). Rectangular hearths are also documented in Sweden and in Finland (Bergman 1988; Mulk 1994; Hamari 1996; Hedman 2003; Halinen 2009). In Norway, Simonsen was the first archaeologist to examine these structures, and he interpreted them as cremation graves (Simonsen 1979; 1997). Current research, such as Hedman and Olsen's excavations in Báhčaveadji, suggests that these sites functioned as winter dwellings by Sámi who were both reindeer hunters and herders (Hedman & Olsen 2009). In their opinion the emergence of similar sites over a vast area ranging from the south Sámi regions in Norway and Sweden to the Kola Peninsula added a new visibility and uniformity to the Sámi material culture. On the basis of excavations in northern Finland Halinen

has pointed out that the linear organisation of hearths and dwellings continued until the 15th and 16th centuries AD, when single huts became common. Both Halinen (2009: 111–3) and Mulk (1994: 255, 264) have explained this change as a change in economy resulting from the development of reindeer pastoralism.

Several researchers have discussed the large number of hunting pits in eastern Finnmark in the context of the contemporary taxation of the Sámi (Vorren 1998; Hansen & Olsen 2004). In the Medieval Period Sámi societies were involved in trade networks with, among others, the Norwegian authorities and the Novgorod Republic, and they paid taxes to both administrations (Hansen 1996). This situation created an increasing demand for furs, not only for taxes, but also as merchandise for trade and exchange. Tax accounts from the 16th century AD state that the Sámi in Várjjat presented the county governor not only furs but also live reindeer as tax for their use of the hunting sites. The decline of wild reindeer hunting started, according to Hansen & Olsen (2004: 187), sometime after AD 1600. Accounts from the 16th and 17th centuries AD document taxes paid to the county governor at Vardøhus in Várjjat, and according to these records the hunting sites were desolate by AD 1690 (Niemi 1983: 182–3; Hansen & Olsen 2004: 187).

DEATNU RIVER – *THE MAIN STREET*

The highest accumulations of hunting pit systems found in the interior Finnmark are located in areas adjacent to the Deatnu River and some of its tributaries (Table 1 and Fig. 5). Hunting pits are also found in great numbers on the Finnish side of the border along Deatnu and Anárjohka (Fi. Inarijoki) (Halinen 2005; Manninen 2007). Hunting pits on the Finnish side are not included in our investigation, but we believe their inclusion would have strengthened the trends in the distribution pattern even more.

Deatnu is the largest waterway in Finnmark and it runs from its headwaters, the Kárášjohka and Anárjohka Rivers, for 360 kilometres towards its outlet in the Deanuvuotna. On its way towards the Deanuvuotna, the river runs through areas just west of the Várjavuonna, where only a narrow isthmus separates this fjord and the Deatnu Valley. In the Late Stone Age and in the 2nd millennium BC the sea level was several metres higher than today in this area, and the distance between Deatnu and Várjjat was considerably shorter. The multitude of hunting pit systems along the Deatnu River speaks of an extensive exploitation of wild reindeer in inland areas, while the areas surrounding both the Deanuvuotna and the Várjavuonna are rife with settlement traces. In such a context, the Deatnu waterway can be seen as a 'highway' covering a great distance and connecting the interior and coastal areas.

Landscape can be seen as an important premise for the societal changes that occurred in Fennoscandia from the Late Stone Age and up to AD 1600. It is our opinion that the Deatnu waterway provided some of the premises for wild reindeer hunting and, not least, a flexibility that made possible the extensive exploitation of the reindeer resources that are documented by hunting pits, for example in the area by the lower Kárášjohka River / upper Deatnu River.

Deatnu, as a waterway, may have served as a connection between people living far apart, as well as an entryway for people who wanted access to resources not readily available close to their settlement areas. The cluster of hunting pits at the lower Kárášjohka River / upper Deatnu River indicates a level of hunting activity that would have exceeded local needs for meat, antler and furs. The hunting pit systems are located close to the Deatnu, and the closeness to a river of this size and length must have made it possible to transport surplus over long distances either by boat or by sledge on the river ice. Surplus could be moved either further inland or downstream to the Deanuvuotna and Várjavuonna and further along the coast. The river provided the local population with opportunities for participation in a wider network of exchange and trade. This waterway also made the inland areas accessible for others such as tax collectors or people involved in trade and exchange. We suggest that the areas with marked clusters of hunting pits (Fig. 4) maintained their importance for a long period of time, through changing networks, exchange patterns and systems of taxation. The Deatnu provided a flexibility regarding changing settlement patterns as the waterway made it possible to combine hunting activity at the lower Kárášjohka River / upper Deatnu River with seasonal settlements in other, and occasionally, distant areas. It is also worth mentioning that in addition to the assumed abundance of wild reindeer resources and the

good transport possibilities, the river itself was, and still is, one of the best salmon rivers in the world. The rich salmon fisheries are of course also a resource, which has made the areas adjacent to the Deatnu River attractive through millennia.

CONCLUSIONS

Hunting pits for wild reindeer are found in great numbers across northern Fennoscandia. In Finnmark hunting pits are the most common category of cultural heritage site, and a total of 5309 individual pits have been documented in this county (Riksantikvaren 2009). The Várjjat area in eastern Finnmark, with 1558 hunting pits, has been the focal point for surveys as well as for discussions concerning the role and significance of wild reindeer hunting in prehistoric and early historic times. Based on analyses of the distribution pattern of all mapped hunting pit systems throughout Finnmark, we have identified two major clusters or areas with a very high density of hunting pits. The first is the well-known Várjjat cluster. The second area with an especially high density of hunting pits is located by the lower Kárášjohka and upper Deatnu Rivers in the interior Finnmark. In both areas there is ample evidence of seasonal abundance of wild reindeer.

Several questions concerning hunting pits are still to be answered, and central to many of these questions is the absence of reliable dates. More radiocarbon dates taken from hunting pits will hopefully clarify when the pits were dug and the time span they were in use. Radiocarbon dates would also throw light upon the uncertainties regarding the age of hunting pits in the Várjjat area. So far, these pits are dated through their assumed association with the near by Vuopmángieddi settlement site and through written sources. There is also a need for more radiocarbon dates to determine whether hunting pits in different geographical areas belong to separate time periods, or if they are more or less contemporaneous.

The existing radiocarbon dates indicate that hunting pits in the inland municipalities of Karášjohka and Guovdageaidnu were established during the Late Stone Age and the Early Metal Period. A stable and annually occurring seasonal migration of wild reindeer from the coast towards the interior would have made this a particularly attractive hunting ground, until the marked decline in the wild reindeer stock around AD 1600. The hunting pits in Várjjat are estimated to date to the Medieval Period, but their construction and first use may date back to an earlier point in time. The hunting activity and the use of hunting pit systems within the two clusters may in fact overlap in time.

Another premise for the long-term use of the hunting pits in these areas is the closeness to the Deatnu waterway. The Deatnu River, its headwaters and tributaries, connects the vast inland of Fennoscandia to the coastal areas. In prehistoric and early historic times the river provided transportation opportunities for people and goods in many directions. The river, in many ways, provided a flexible foundation for sustaining networks, even if such networks were in a constant state of change through thousands of years and through changing settlement patterns and forms of society. Hunting pits were, and still are, highly visible imprints in the landscape. The fact that many hunting pits were established during the Late Stone Age connects historically known Sámi hunting techniques to a Fennoscandian tradition that is more than 4000 years old.

ACKNOWLEDGEMENTS

We want to thank senior researcher Dr. Hans Tømmervik (Norwegian Institute of Nature Research) for comments on the manuscript. We also thank *Fram – High North Research Centre for Climate and the Environment* for funding.

NOTES

[1] North Sámi place names and orthography have been used throughout the paper. The Finnish and/or Norwegian names are given in parentheses when they occur for the first time in the text.

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