

# Exploring Pre-Colonial Resource Control of Individual Sami Households

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**ABSTRACT.** In order to understand the use and control of resources by indigenous households and bands, information on territorial division is crucial. However, although indigenous resource use has been quantified in several studies, such information has usually been lacking. A unique map provides this kind of information for the Swedish Sami. Drawn by Jonas Persson Gedda in 1671, before the Swedish state started to interfere with Sami territorial division, it shows the borders of 37 household territories. We have combined the geographical information from Gedda's map with historical sources and modern land survey data to quantify the resources controlled by each household and relate them to taxation. Three crucial resources are identified: alpine heath together with subalpine birch forest, pine-dominated forests, and fishing waters. Only the fishing resource showed any correlation to taxation, which underlines its importance as the main subsistence mode, at least for the forest Sami. Mountain Sami, who lived primarily on reindeer husbandry, controlled abundant alpine heath and subalpine birch forests that were used as summer pastures, but virtually no pine-dominated forests with winter pastures. The necessary winter pastures were located in the territories of the forest Sami, who controlled extensive pine-dominated forests and who were able to combine reindeer herding and wild reindeer hunting.

**Key words:** northern Sweden, Sami, land use, historical maps, archival sources, 17th century, taxation, reindeer herding, reindeer hunting, fishing

**RÉSUMÉ.** Pour comprendre l'utilisation et la gestion des ressources des groupes de peuples indigènes, il est essentiel de disposer d'informations sur la division territoriale. Cependant, si l'utilisation des ressources des peuples indigènes a fait l'objet de plusieurs analyses quantitatives, les informations sur la division territoriale font le plus souvent défaut. Pour les Samis de Suède, une carte unique fournit ce genre d'information. Établie par Jonas Persson Gedda en 1671, avant que l'État suédois n'ait commencé à intervenir dans la division territoriale des Samis, la carte montre les limites de 37 territoires familiaux. Nous avons allié les informations géographiques de la carte de Gedda à des sources historiques et à des données topographiques modernes pour quantifier les ressources contrôlées par chaque famille et les lier au système de taxation. Trois ressources naturelles fondamentales ont ainsi été identifiées : les landes alpines avec les forêts subalpines de bouleau, les pinèdes et les pêcheries. Il appert que seules les pêcheries étaient corrélées au système de taxation, ce qui souligne leur importance en tant que mode de subsistance, pour les Samis de la forêt à tout le moins. Les Samis des montagnes, qui vivaient surtout de l'élevage des rennes, contrôlaient les landes alpines et les forêts subalpines de bouleau abondantes qui étaient utilisées comme pâturages estivaux, mais pratiquement pas de pinèdes offrant des pâturages hivernaux. Les pâturages nécessaires se trouvaient chez les Samis de la forêt, qui contrôlaient de vastes pinèdes et savaient combiner tant l'élevage des rennes que la chasse aux rennes sauvages.

**Mots clés :** nord de la Suède, Sami, utilisation des terres, cartes historiques, sources archivées, XVII<sup>e</sup> siècle, taxation, élevage des rennes, chasse aux rennes, pêche

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## INTRODUCTION

Several researchers have attempted to quantify the resource use of indigenous peoples in the Arctic and Subarctic (e.g., Krupnik, 1993; Andrews, 1994), but few have had access to geographical data on territorial division and hence on the natural resources available to smaller groups (Donald and Mitchell, 1975, 1994; Josefsson et al., 2010). This is also very much the case when it comes to the indigenous people of northern Europe, the Sami, whose subsistence

patterns and resource use in pre-colonial times are known only in broad outline. When the first detailed ethnographical account of the Sami was published in 1674, they were said to live primarily by hunting, fishing, and reindeer husbandry (Schefferus, [1674] 1971; see also Meriot, 1984). We now know that plant matter was an important complement, for example the inner bark of Scots pine (*Pinus sylvestris* L.) (Bergman et al., 2004), berries (Itkonen, 1948:291), green plants (Fjellström, 1964; Svanberg, 2000), and sometimes cultivated turnips (Lundius, [ca. 1674] 1983:27).

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Nevertheless, hunting, fishing, and reindeer husbandry stand out as the main subsistence modes (*sensu* Krupnik, 1993:7) of the Sami well into the 20th century (Nickul, 1977; Östlund and Bergman, 2006).

The traditional subsistence modes of the Sami were based on local natural resources, the control of which, as for many other indigenous peoples of the Arctic and Subarctic, was exercised through territorial division (Tegengren, 1952:16; Donald and Mitchell, 1975; Burch, 1988; Scott, 1988; Krupnik, 1993:40–43; Andrews, 1994). In the northernmost and easternmost parts of the Sami range, large territories were controlled by bands consisting of several households (Tanner, 1929:86–101; Vorren, 1980), although there was also a secondary division of household territories (Nickul, 1977:5). In the parts now belonging to Sweden, the best-documented territories are the ones that were held by single households. These were often called taxation lands (Swedish: *lappskatteländ*), since they were listed in cameral records (Holmbäck, 1922; Hultblad, 1968; Sköld, 1992; Korpijaakko-Labba, 1994; Marklund, 1999; Päiviö, 2000; Hansen and Olsen, 2004:284; Nikolaisen Kuoljok, 2005; Lundmark, 2006; Westerdahl, 2008). The existence of household territories among the Swedish Sami is suggested in historical sources from the mid-16th century and is well documented from the 17th century onwards (Holmbäck, 1922; Hultblad, 1968:38). Nevertheless, the exact distribution and extension of these territories are rarely known, since contemporary maps are almost entirely non-existent. Therefore, the traditional land use of the Sami has rarely been analyzed in any detail (but see Josefsson et al., 2010).

However, there is one detailed map showing Sami territorial division in a large region in early modern times. It was drawn by the land surveyor Jonas Persson Gedda in 1671, on the order of Johan Graan, the governor of Västerbotten county in Sweden, for the purpose of exploring the possibilities of raising tax incomes from the Sami districts (Swedish: *lappmarker*) in the interior of northern Sweden (Korpijaakko-Labba, 1994:374; Norstedt, 2011:14). Jonas Persson Gedda was commissioned, together with the clerk Anders Olofsson Holm, to map the Ume Sami district, the one nearest to the county capital. The expedition resulted in a detailed map, covering an area of 17 700 km<sup>2</sup>, which shows the division into 37 household territories of two entire Sami communities (*lappbyar*), Umbyn and Granbyn. The map is accompanied by a thorough descriptive account, written by the clerk Holm (1671), in which every territory is described at length. The documentation is exceptional in that it was made before the arrival of the first non-Sami settlers and also before the onset of state interference with Sami territorial division. It is true that the Sami had already been subject to some kind of taxation by Norse chieftains during the Viking Age (Bergman et al., 2007) and to regular taxation by various states at least since the mid-16th century (Wheelersburg, 1991; Hansen, 2010), and that these taxes must have influenced Sami resource use in various ways. However, according to the county governor Johan Graan, no registration of Sami lands or waters had

ever been carried out (Norstedt, 2011:14). It is equally true that Swedish jurisdiction had been exercised in the Sami districts since at least 1650, but judgements on territorial division were consistently made according to Sami custom throughout the 17th century (Lundmark, 2006:27). Therefore, the map clearly depicts a pre-colonial situation in the sense that it shows the distribution of resources made by an indigenous people without external interference. Since the mapping was never continued into other Sami districts, Gedda's map remains unique.

An important aspect of Gedda's map is that the name of the landholder is indicated for each territory. The same names are found in contemporary cameral records, allowing us to make the connection between tax levels and territories. At that time, Swedish Sami were taxed according to a system established by Duke Charles (the future Charles IX) in 1602 (Göthe, 1929:44–62; Tegengren, 1952:46–49; Lundmark, 1982:88–95, 2006:40–45; Korpijaakko-Labba, 1994:352–354). In theory, each adult Sami man was supposed to pay the same amount. In practice, however, the new taxes became a burden to most Sami, and a graded system evolved almost immediately. Each able man was registered for a certain *mantal*, literally meaning “the number of one man.” By 1620, almost all taxpayers were registered for less than one *mantal*, mostly one-half or one-fourth, but sometimes other fractions. A person with one-fourth *mantal* paid half as much as a person with one-half *mantal*, for example in dried fish (Lundmark, 1982:139–141; Sköld, 1992:10–12).

The basis of this tax differentiation is not known, and it has been debated whether it was related to the quality of the household territory (Korpijaakko-Labba, 1994:357–359) or was purely individual (Lundmark, 2006:40–45). However, even if taxes were individual, we know that they were not equal, and it seems reasonable to assume that they reflected the wealth of each taxpayer as perceived by the tax collector. Since the Sami made their living through direct use of natural resources, a person who held a territory where crucial resources were abundant must have had better opportunities to become wealthy than a person with a “poor” territory. Thus, tax levels should reveal something about the quality of the individual's territory. Gedda's map is the only document that permits this kind of analysis of entire Sami communities.

The overall aim of this study is to reach a better understanding of the resource use and control of indigenous Sami households in the 17th century. We endeavour to understand how different groups of Sami interacted to obtain access to all the resources they needed and to interpret overall land use in the 17th century in this region of Sweden.

## MATERIALS AND METHODS

### *Study Area*

The study area is located between 64°4' and 66°13' N in the Ume Sami district (*Ume lappmark*, later known as

*Lycksele lappmark*) in the interior of the county of Västerbotten in Sweden (Fig. 1). Most of the area falls in the northern and middle boreal forest zones, but it extends into the alpine zone of the Scandinavian mountain range in the west (Sjörs, 1963). The landscape is moderately broken, having elevations that increase from about 200 m above sea level in the east to generally around 700 m in the west, with summits that reach more than 1600 m.

The boreal forest is dominated by two coniferous species, Scots pine (*Pinus sylvestris* L.) and Norway spruce (*Picea abies* (L.) H. Karst.), with some occurrences of deciduous trees, mainly birches (*Betula* spp. L.). The coniferous forest grows up to about 500–600 m above sea level, where it is replaced by a subalpine belt of mountain birch (*Betula pubescens* subsp. *czerepanovii* (N. I. Orlova) Hämet-Ahti). Above 800 m, the vegetation is mostly treeless alpine heath.

Most of the area is drained by two large rivers, Umeälven and Vindelälven, which rise in the mountain range in the west, receive numerous confluent rivers, and finally merge not far from the river mouth at the Baltic Sea. Parts of the area are drained by the smaller rivers of Öreälven and Malån, which rise in the forest east of the mountain range. Between the rivers, the landscape is characterized by a large number of lakes, streams, and mires.

In the 17th century, the Sami of the Ume district were organized into four communities (*lappbyar*)—Umbyn, Granbyn, Ranbyn, and Vapsten—a division that was probably made by the Sami themselves (Hultblad, 1968:69). The first Swedish institution present in the district was the Lutheran church, established in Lycksele in 1607. Since the parish was vast and transport difficult, church services were restricted to two periods in winter when trade and taxation also took place (Göthe, 1929:52–56). The first settlers arrived in the district in 1678 (Egerbladh, 1965), but agricultural colonization remained of minor importance until the mid-18th century (Rudberg, 1957:132).

#### *Gedda's Map and Holm's Account*

Jonas Persson Gedda's (1671) map covers two of the four Sami communities in the Ume Sami district, Umbyn and Granbyn, with a total area of almost 17 700 km<sup>2</sup>. It shows the borders of 37 territories: 36 held by named Sami taxpayers and one held by the Church in order to provide resources for the clergymen (Fig. 1).

The scale of the map is approximately 1:100 000. The water systems are very well represented, including almost all of the larger lakes (more than 600), rivers, and streams (Fig. 2). Most of them can be identified on modern maps, either from their name or from their position in the water system. By contrast, distances are less accurately represented.

In the account written by Anders Olofsson Holm (1671) each of the 37 territories is described with respect to the possibilities of agricultural colonization, listing among other things fish and game resources and including numerous notes on the indigenous Sami population.

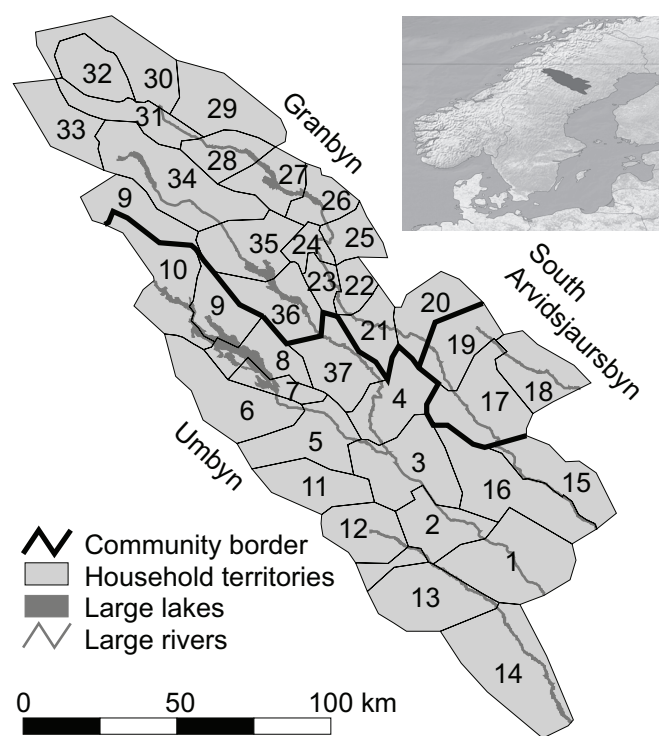


FIG. 1. The study area, consisting of the area mapped by Jonas Persson Gedda in 1671 and its location in northern Sweden, just south of the Arctic Circle. The mapped area includes the two Sami communities of Granbyn and Umbyn, as well as part of the community of South Arvidsjaurby. The area on the map is divided into 37 territories. All were held by Sami households except territory 1, which had been taken over by the Church in Lycksele. Data on lakes and rivers are from the Swedish board for land surveying © Lantmäteriet, i2012/901.

When analyzing the territories of the map, the digital reconstruction of borders by Norstedt (2011) was used. Data on possible resources were extracted both from the map and from Holm's account. The named lakes and parts of watercourses on the map were counted for each territory. From Holm's account, all information on the occurrence of fish species was noted, and the total number of species was summed for each territory. Verbal descriptions of the frequency of wild reindeer were standardized into an ordinal variable with four values: "abundant" (3), "regular" (2), "rare" (1), and "not mentioned" (0).

#### *Historical Texts*

In order to select what natural resources to analyze, we carefully read a selection of the so-called "clerical relations," written in the 17th century by clergymen who lived and worked among the Sami. These texts were the principal sources for Schefferus' *Lapponia*. We chose the texts by Olaus Niurenus, written between 1619 and 1645, mainly describing the Ume Sami district (Niurenus, [ca. 1640] 1983); by Samuel Rheen, written in 1671, mainly on the Lule Sami district (Rheen, [1671] 1983); by Olaus Graan, written in 1672 and apparently largely based on the work of Rheen, but with some interesting additions concerning the Pite Sami district (Graan, [1672] 1983); and last,

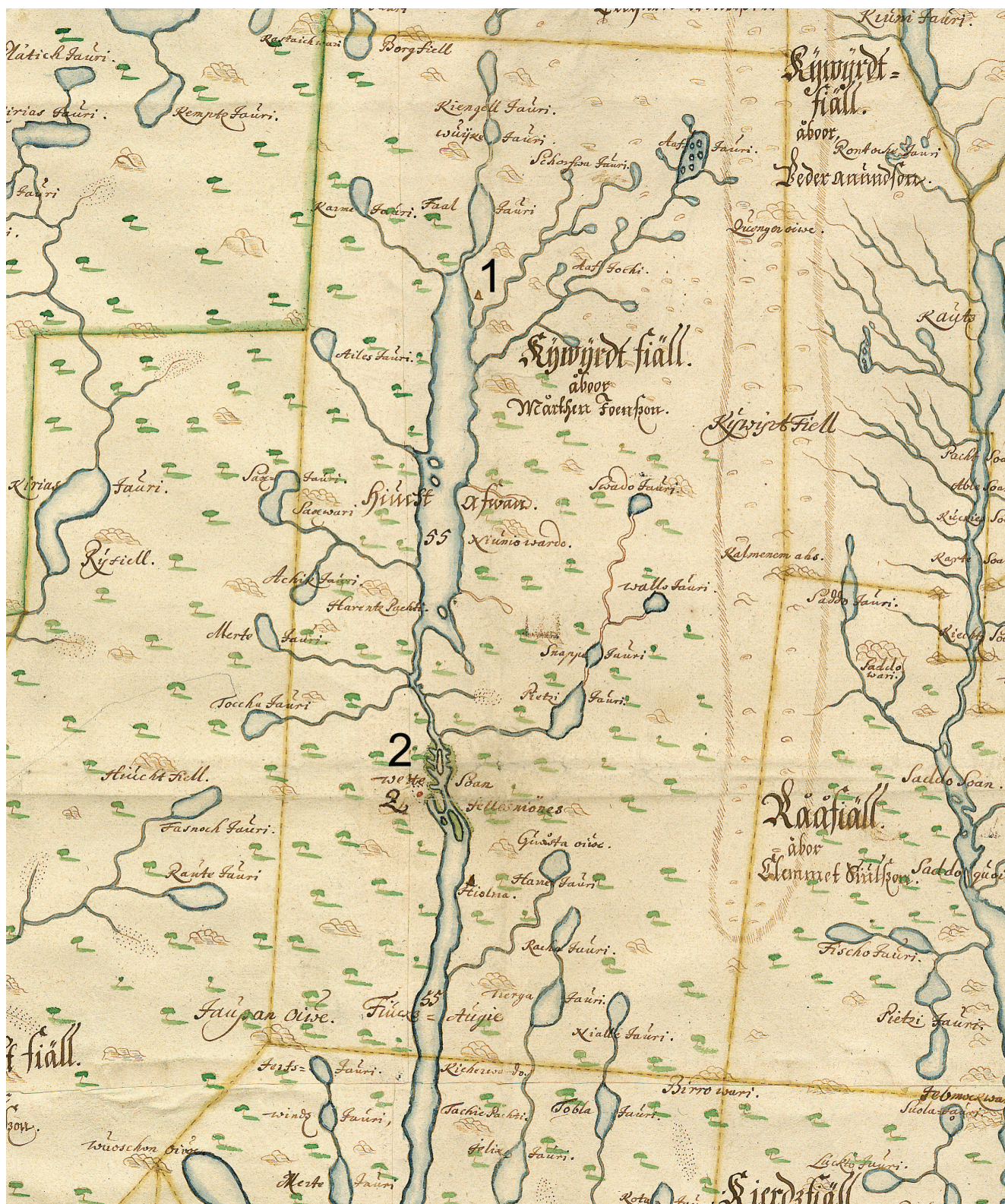


FIG. 2. Section of Gedda's map from 1671, showing the division of the area into Sami household territories. According to the text on the map, the territory in the centre of the section, Kywyrdt Fiäll, was held by Märthen Joensson. Holm added in his description that Märthen held this large territory (almost 900 km<sup>2</sup>) together with his two brothers, Sjul and Per, and a fourth man named Märthen Jönsson. Cameral records show that each of them was registered for one-fourth mantal and that they paid their taxes in dried pike. Almost all of the lakes in the section can be easily recognized on a modern map, which enables the reconstruction of territorial borders. The largest lake, Hiucht Afwan, nowadays known as Storjuktan, is located in the upper part of Juktån, a tributary to the river Umeälven. The triangle (1) by the upper part of the lake indicates a Sami settlement or campsite. The dot farther down (2), close to the big Z and the label "Wette Soan," indicates a site deemed suitable for agricultural settlement. The description that accompanied the map says that Lake Hiucht Afwan provided catches of grayling, "löjor" (probably a small specimen of whitefish), Arctic char, and brown trout. It also says that game was rather common in the territory, including wolves, Arctic fox, red fox, squirrel, stoat, and sometimes wild reindeer and wild fowl.

by the Sami Nicolaus Lundius, written between 1674 and 1679, describing mainly the Ume Sami district from the perspective of a person born in the Lule district (Lundius, [ca. 1674] 1983). The clerical relations of districts located farther north were not considered, since the conditions may have differed too greatly from those in the study area.

#### *Land Survey Data*

GIS data from the Swedish topographic map at 1:100 000 (“road map”), produced by the Swedish board for land surveying, were used for the analysis of areas of mountain summer pastures (defined as alpine heath plus subalpine birch forest) and water. The areal extent of mountain summer pastures is influenced by the long-term dynamics of the tree line (the ecotone between subalpine birch forest and coniferous forest), which are governed largely by climatic conditions (Kullman, 2013). Gedda’s map was made during a period of relative stability, known as the Little Ice Age, when the tree line is known to have been somewhat lower than it is today (Kullman, 2013). However, detailed studies from the Swedish mountains show that the expansion of tree populations into higher altitudes did not start until about 50 years ago (Kullman, 2005). Therefore, it seems likely that the areas of mountain summer pastures have not changed since 1671 to an extent that would significantly influence our results.

By contrast, we have considered potential changes in the area of water, since most Swedish rivers have been altered for the purposes of hydroelectricity production. Old maps were checked, but the only change that seemed substantial was the damming of Lake Storjuktan, which affected two territories, so we adjusted the areas of their associated water resources.

The Swedish topographic map at 1:100 000 was also used to analyze the length of rivers in each territory. Lines representing the major rivers were roughly drawn from the map. Where the border between two territories followed the river, one line was drawn inside each territory. The rivers were then cut into stretches inside each territory using ArcView GIS 3.3, and the length of each stretch was measured. For the territories that had more than one river, stretches were summed.

#### *Malmström’s Forest Map*

In order to assess the areas of winter reindeer habitat, we had to find sources other than the topographic map. In winter, reindeer feed primarily on ground lichens, especially species of the genera *Cladonia* Hill ex P. Browne and *Stereocaulon* Hoffm. (Skuncke, 1958:100–101), which thrive in dry forests where Scots pine is the dominant tree species. However, the topographic map distinguishes only between mountain birch forests and other forests, so it cannot provide data on lichen-rich pine forests. As an approximation, we decided to calculate the coverage of pine-dominated forests. These forests most commonly occur on dry soils of gravel, sand, and coarse-grained moraine (Malmström,

1949:54) and thus are determined mainly by non-anthropogenic factors. However, since Scots pine has been a preferred species for plantations in northern Sweden since the 1950s, extant data are likely to overestimate its natural occurrence. Instead, we made use of a forest map of the county of Västerbotten, drawn by Carl Malmström around 1940 (Malmström, 1949). The points on Malmström’s map indicating the volume proportion of each tree species were digitized, converted to grid surfaces with different proportions of pine using ArcView GIS 3.3 with the spatial analysis extension, and then converted to vector polygons. In order to exclude features such as lakes and mires, the polygons were cut to include only areas marked as forest on the topographic map. The area of pine-dominated forest (defined as surfaces with a volume proportion of pine exceeding 70%) was calculated for each territory.

Since all pine-dominated forests are not necessarily lichen forests, Malmström’s map should render a liberal estimate, but when checked against other data, our approximation seems to be fairly accurate. According to a government report, 26%–33% of the forests in the study area were lichen forests suitable for reindeer winter grazing (Tottie, 1966:233). The corresponding proportion calculated from Malmström’s map is 31%, which indicates that there was very good general agreement, although the estimates could diverge from actual conditions locally.

Also, this approximation of the areal extension of reindeer winter habitats in each territory turned out to correlate well with the estimates of the frequency of wild reindeer made by Holm in 1671 (Pearson’s  $r = 0.680$ ), which should be an indicator of the reliability both of Holm’s estimates and of our approximation.

#### *Cameral Records*

Information on tax levies was collected from original cameral records that have been scanned and are provided online by SVAR (Swedish Archive Information, 1669–74), a department of the Swedish National Archives. In the records, the taxation unit (*mantal*) and the actual amount paid are given for each individual Sami. The fractions used in the Ume Sami district in the 1670s were one-fourth, one-half, and three-fourths of a *mantal*, and taxes were paid in dried pike or money.

In cameral records of the 1670s, Sami taxpayers are listed according to communities, but no information is given about territories. Taxpayers were therefore linked to the territories shown on Gedda’s map using the map and Holm’s description as principal sources. On the map, the name of one of the landholders is given for practically all 37 territories. Apart from the territory taken over by the Church, the names represent Sami landholders. Holm’s (1671) description provides additional names for a couple of territories used by more than one household. In the few cases where the description and the map were contradictory, a list of taxpayers and territories made by the county governor Johan Graan in 1670 was also used.

Almost all the holders of territories shown on Gedda's map belonged to the Sami communities of Umbyn and Granbyn, but holders of some territories have often been registered in an adjacent community, South Arvidsjaurby in the Pite Sami district. Therefore, the cameral records for all three communities were checked.

The records from 1671 were used as the principal source, since they had been created in the same year as the map. However, they could render information only on Umbyn and South Arvidsjaurby, since Granbyn was missing. The most relevant records available for Granbyn are from 1669 and 1674 and present some minor differences, the taxation level having been raised for three landholders and lowered for one of them. If there is any connection between the taxes paid and the qualities of the territories, the data from 1674 should reflect this better than the ones from 1669, since the map had been made in between. For this reason, the records of 1674 were chosen as the principal source for data on Granbyn and as a secondary source for Umbyn. For two territories for which no landholders were found in the records from 1671 or 1674, the records from 1669 were used. In this way, data on taxation levels could be established for a total of 33 of the 36 territories under Sami control. For territories with several landholders, the taxes paid by all individual taxpayers were summed.

### *Statistical Analyses*

Pearson's product-moment correlation coefficient (Pearson's  $r$ ) was calculated using Minitab 16 for the relationship between the tax amount paid for each territory and all other variables, except the ordinal variable of reindeer frequency, for which Spearman's rank correlation coefficient was calculated. Means were compared using Student's  $t$ -test with a 95% confidence interval.

## RESULTS AND DISCUSSION

### *Size of Territories*

The territories shown on Gedda's map differ considerably in size, ranging from 143 to 953 km<sup>2</sup>, with an average of 475 km<sup>2</sup> (Table 1). The size of the territory in itself does not seem to have had anything to do with taxation, since the statistical correlation between area and tax level was very low (Pearson's  $r = 0.189$ ).

The territory sizes can be compared to data from other studies. From the same county, there is a map showing 52 Sami territories in the 19th and early 20th century, mainly located in, or close to, the Scandinavian mountain range (lowland territories had by then disappeared) (Österberg et al., 1913). Their areas range from 76 to 470 km<sup>2</sup>, with an average of 237 km<sup>2</sup>. Territory sizes can also be estimated from two large-scale reconstructions. The first, made by Westerdahl (2008:38–39), was based on a compilation of data from the period 1695–1928, still from the same county.

It shows territories in the mountain range with an average area of ca. 200–250 km<sup>2</sup> and forest territories, which are somewhat larger, ca. 250–300 km<sup>2</sup>. The other reconstruction, by Hultblad (1968:118), is from the county of Norrbotten and was based on judicial records from the 18th and 19th centuries. Crude measurements of his best-defined territories generally give values around 150–250 km<sup>2</sup>. Finally, the three territories studied by Josefsson et al. (2010) measured 97–244 km<sup>2</sup>.

The territories shown on Gedda's map of the Ume district from 1671 were thus comparatively large, probably because this map precedes all the other data, since many of the territories were divided later. Already in 1695, the 37 territories of Gedda's map had become 45, and more divisions would follow during the 18th and 19th centuries (Norstedt, 2011). Gedda's map apparently reflects an earlier situation when either population density was less, minimizing competition and allowing single households to control larger territories, or resource use was different and each household needed more space than in later times.

### *Critical Resources Identified in Historical Sources*

In all of the clerical relations examined (except those of Niurenus), the authors emphasized the division of the Sami into two major subgroups, mountain Sami and forest Sami, that differed in subsistence patterns and consequently in resource use. Mountain Sami lived almost exclusively on meat and milk products from their semi-domesticated reindeer, which they tended in the alpine mountain range in summer and in lowland forests in winter (Rheen, [1671] 1983:17–19; Lundius, [ca. 1674] 1983:10–11). Forest Sami could also own reindeer, but were not as dependent on them as were the mountain Sami. Usually, forest Sami lived all year round in the forest (Rheen, [1671] 1983:15; Graan, [1672] 1983:35; Lundius, [ca. 1674] 1983:10). In the Pite Sami district, reindeer-owning forest Sami sometimes sent their wives or children up to the mountains during the summer to tend and milk the reindeer along with the mountain Sami, while the husbands stayed by the forest lakes to fish (Graan, [1672] 1983:35). This practice is not known to have existed in other districts. In the Ume district, forest Sami were said to have summer huts built of timber near their reindeer pens, which implies that these pens were located in the forest (Lundius, [ca. 1674] 1983:27). Thus, the most important difference between mountain Sami and forest Sami when it comes to resource use seems to have been access to alpine reindeer summer pastures inside one's own territory.

In winter, mountain Sami descended to the boreal forest, where there was wood for fuel and where the reindeer herd was easily kept together in the deep snow (Rheen, [1671] 1983:17). The mountain Sami were then on the territories of the forest Sami, who had given them permission to let their semi-domesticated reindeer graze and also to hunt for wild reindeer (Lundius, [ca. 1674] 1983:10–11). Although it must have been essential for mountain Sami to have access

TABLE 1. The 37 household territories featured on Gedda's map of the Ume Sami district 1671 and their various resources. Details on how each variable was obtained are given in the Materials and Methods section. The territories are numbered as in Figure 1.

No.	Community	Name of territory	Type <sup>1</sup>	<i>Mantla</i> <sup>2</sup>	Total area (km <sup>2</sup> )	Extant land survey data			Malmström's map (1940)	Gedda's map (1671)		Holms description of Gedda's map (1671)	
						Mountain summer pastures area (km <sup>2</sup> )	Water area (km <sup>2</sup> )	River length (km)		Pine forest area (km <sup>2</sup> )	Number of fishing waters	Number of fish species	Wild reindeer frequency
1	Umbyn	Lycksele prästbord	Church	n/a	831	0	58	37	381	31	8	2	
2	Umbyn	Turberg	Forest	0.50	417	0	37	29	174	20	9	2	
3	Umbyn	Pausel	Forest	0.50	694	0	58	39	365	13	8	2	
4	Umbyn	Sveiter	Forest	0.25	480	0	29	27	215	17	7	2	
5	Umbyn	Djurberg	Forest	0.50	537	0	41	22	162	12	5	2	
6	Umbyn	Snaraberg	Forest	0.50	671	0	58	15	82	8	7	1	
7	Umbyn	Jissfjäll	Forest	0.50	182	0	38	7	80	5	3	1	
8	Umbyn	Djurfjäll	Forest	0.50	351	2	81	22	144	6	4	1	
9	Granbyn	Jukt fjäll	Mountain	0.25	733	236	78	24	75	11	5	1	
10	Umbyn	Tjuvekelis	Forest	0.25	596	7	90	30	60	11	4	1	
11	Umbyn	Saliskelis	Forest	0.50	424	0	17	0	13	3	5	2	
12	Umbyn	Stöttingsland (N)	Forest	0.50	416	1	13	0	25	6	3	1	
13	Umbyn	Stöttingsland (S)	Forest	0.50	620	0	15	18	25	22	4	1	
14	Umbyn	Mårdberg	Forest	0.75	953	0	25	49	208	15	4	3	
15	Umbyn	Staggovari	Forest	0.50	470	0	44	30	265	18	6	2	
16	Umbyn	Altavari	Forest	0.50	751	0	73	16	446	32	3	2	
17	Granbyn	Kidnihaas	Forest	0.25	650	0	40	31	250	16	n/a	2	
18	Arvidsjaurshbyn	Nädegobbild	Forest	n/a	442	0	31	29	149	8	n/a	2	
19	Arvidsjaurshbyn	Nuskulsoive	Forest	0.25	419	0	25	32	167	16	6	2	
20	Arvidsjaurshbyn	Ainajaur	Forest	2•0.50	398	0	38	28	173	19	8	2	
				+2•0.25									
21	Granbyn	Sandliden	Forest	0.50	297	0	31	17	146	16	8	1	
22	Granbyn	Abmonvari	Forest	n/a	182	0	20	9	75	5	8	1	
23	Granbyn	Uiffjäll	Forest	0.25	150	0	12	13	48	6	5	1	
24	Granbyn	Oulusjaur	Forest	0.25	143	0	11	10	53	7	n/a	1	
25	Granbyn	Svärdsavieso	Forest	n/a	244	0	13	9	109	4	n/a	1	
26	Granbyn	Nälfjäll	Forest	0.50	265	4	27	14	77	6	n/a	1	
27	Granbyn	Kierdsfjäll	Forest	0.50	336	2	44	20	87	10	n/a	1	
28	Granbyn	Råfjäll	Mountain	0.25	308	72	22	22	8	5	4	1	
29	Granbyn	Byrgfjäll (E)	Mountain	0.25	575	345	21	0	3	12	4	0	
30	Granbyn	Byrgfjäll (W)	Mountain	0.25	573	458	26	0	2	14	2	0	
31	Granbyn	Kyvyrtfjäll (N)	Mountain	0.50	339	246	10	18	16	16	2	0	
32	Granbyn	Amertfjäll	Mountain	0.25	362	336	14	0	0	10	2	0	
33	Granbyn	Dorifjäll	Mountain	0.50	413	313	32	0	0	15	2	0	
34	Granbyn	Kyvyrtfjäll (S)	Mountain	4•0.25	886	298	55	46	6	20	8	1	
35	Granbyn	Birkarliden	Forest	2•0.50	524	20	54	25	64	18	7	1	
36	Granbyn	Bläikfjäll	Forest	2•0.50	469	28	32	26	46	19	n/a	2	
37	Umbyn	Blåberg	Forest	0.50	479	1	33	32	198	18	7	3	
	Mean values:			0.50	475	64	36	20	119	13	5	n/a	

<sup>1</sup> The Church land is designated as such on Gedda's map, while the division into forest and mountain territories is based on this study.

<sup>2</sup> In the cameral records, the *mantal* (taxation unit) is given per taxpayer, not per territory. Since four territories had several taxpayers, the number of taxpayers with each *mantal* is given in the table. For statistical analysis, the *mantal* has been summed for each territory.

to reindeer winter pastures, they apparently did not have to control this resource inside their own territory.

Reindeer winter habitats were used not only for semi-domesticated reindeer grazing, but also for hunting wild reindeer. Although there was also some hunting in other seasons, winter was the most important time. From the beginning of January through the end of March, when the snow was deep, reindeer were pursued by hunters on skis, who could move swiftly over the snow, whereas the reindeer sank down into it (Rheen, [1671] 1983:23; Lundius, [ca. 1674] 1983:34). The importance of the winter reindeer hunt is underlined by the fact that when the first churches were established in the Sami districts in 1606, the obligatory attendance at services was altered to allow the Sami to “seek their subsistence in the wild” during February and March, since this was their “best time” (Hjorth, [1606] 1858:196). Furthermore, Nicolaus Lundius wrote that a person who killed a wild reindeer on someone else’s territory was taken to court and that a forest Sami could allow one or several mountain Sami to hunt wild reindeer on his territory (Lundius, [ca. 1674] 1983:11, 30). Both these observations imply that the hunting of wild reindeer in the Ume Sami district in the 17th century was a prerogative of the landholder, not a collective enterprise such as those described in the northern and eastern parts of Sápmi (Tornæus, [1672] 1983:55–59; Leem, [1767] 1975:185; Tanner, 1929:359; Tegengren, 1952:99–105; Vorren, 1982, 1998:152). The presence of wild reindeer must then have been a most valuable contribution to the value of a territory.

The third subsistence mode generally mentioned in the clerical relations is fishing. For mountain Sami, it was said that fish was not a substantial part of their diet (Lundius, [ca. 1674] 1983:10–11), although they bought it from other Sami since they wanted fish for their Friday fast (Rheen, [1671] 1983:17–19). Forest Sami, on the other hand, were generally described as living almost exclusively on fish, even fishing through the winter (Lundius, [ca. 1674] 1983:10–12). All but the poorest forest Sami moved from one fishing lake to another during the year, following the spawning seasons (Graan, [1672] 1983:35). Access to many fishing waters and a territory with many fish species spawning at different times should then have been very important for the wealth of forest Sami.

### *Reindeer Mountain Summer Pastures*

Gedda’s map covers an area that was mainly used by forest Sami, but also, to some extent, by mountain Sami. Since the historical sources describe these two groups as differing in resource use, it seemed appropriate to determine what territories were used by which group before proceeding to the analysis of resources. In Holm’s description of the map, only one territory is clearly stated as being used by mountain Sami, while three others are described in a similar way. However, the text is not clear on this point. Since the historical sources suggest that the main characteristic of mountain Sami resource use was access to mountain summer

pastures inside their own territories, land survey data were used to analyze which territories these were.

According to a standard manual on reindeer husbandry in Sweden, reindeer graze in the beginning of the summer in the valleys, where subalpine birch forest is predominant, and thereafter proceed up to the alpine heath (Steen, 1966:75–79). Hence, in our analysis, the areal extents of subalpine birch forest and alpine heath in the land survey data for each territory were summed in order to estimate the area of mountain summer pastures.

We found that about two-thirds of the 37 territories shown on Gedda’s map contained some mountain summer pastures, but in most cases, the area was so small that it could not have been of any practical importance. Attempts have been made to calculate the minimum size of herd for a household that depended almost exclusively on reindeer husbandry (as mountain Sami did, according to the historical sources): the number seems to be about 200 head (Lundmark, 1982:153–155). As 1 km<sup>2</sup> of summer pasture, defined as above, can feed about five reindeer (Steen, 1966:85), the area of pasture needed to feed a minimum herd through the summer should be about 40 km<sup>2</sup>.

Eight territories shown on Gedda’s map include more than 40 km<sup>2</sup> of mountain summer pastures. We have chosen to regard them as being used by mountain Sami. The other 28 territories on the map (excluding the territory which had been taken over by the Church) will be considered as forest Sami territories (Fig. 3).

Most of the eight mountain Sami territories contained considerably more summer pastures than the calculated minimum requirement of a household—one of them could theoretically have sufficed for 11 households—but only one had several taxpayers. It is true that a few people in the cameral records could not be connected to specific territories, but even if all of them had lived in the mountain Sami territories, there should still have been room for about 40 more. This means that most of the mountain territories were used to a lesser degree than the area of summer pastures would theoretically allow.

The statistical correlation between area of mountain summer pastures and tax level was low, both when considering all the territories on the map together (Pearson’s  $r = -0.158$ ) and when viewing the mountain territories separately (0.018). The holders of the three territories that contained most mountain summer pastures were registered for the lowest possible tax level (one-fourth *mantal*). If taxation was in any way related to wealth, almost unlimited access to mountain summer pastures apparently was not sufficient for reindeer herders to become wealthy. However, the analysis is complicated by the fact that the natural variations of productivity of alpine heaths have not been taken into account.

The mountain Sami in the area covered by Gedda’s map do not seem to have been perceived in general as particularly wealthy. The average tax level of the eight mountain Sami territories was 0.41 *mantal*, which is lower than the mean of all the territories shown on Gedda’s map (0.50)



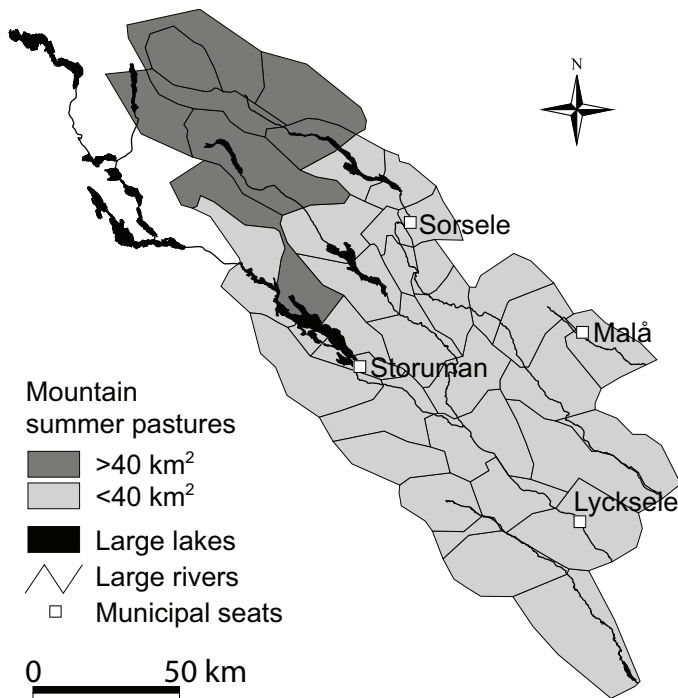


FIG. 3. Distribution in 1671 of territories in the Ume Sami district with more and less than 40 km<sup>2</sup> of mountain summer pastures, defined as the sum of the areas of alpine heath and subalpine birch forest. We consider the eight territories with more than 40 km<sup>2</sup> of mountain summer pastures to be mountain Sami territories, and the others, forest Sami territories. The territory around Lycksele belonged to the Church. Current municipal seats have been added for orientation. Data on alpine heath, subalpine birch forest, lakes, and rivers are from the Swedish board for land surveying, © Lantmäteriet, i2012/901.

and also lower than the mean (0.47) for the community to which they belonged, Granbyn. This seems to contradict the contemporary observation of Nicolaus Lundius ([ca. 1674] 1983:10) on the same area, that “the mountain Sami are very rich with both reindeer, silver and copper, quite contrary to the forest Sami....” This apparent contradiction might be a result of our limited sample—most of the mountain Sami in the Ume district belonged to two other communities, Ranbyn and Vapsten, whose territories were not included in Gedda’s map.

In conclusion, the use of extant land survey data to analyze the areal content of mountain summer pastures proved to be a useful way to identify mountain Sami territories. Also, we could see that access to mountain summer pastures was not an important determinant of wealth, as expressed through taxation.

#### *Reindeer Winter Pastures in Mountain Territories*

Summer pastures were not the only resources that the mountain Sami needed to feed their semi-domesticated reindeer. Although it has been pointed out that Sami groups have sometimes remained in the alpine mountains with their reindeer throughout the winter in the past (Bergman et al., 2008), access to winter pastures in pine-dominated lichen forests are usually considered to be the limiting factor for reindeer husbandry (Steen, 1966:77–82). Several

attempts have been made to estimate the minimum area of lichen pasture needed for reindeer winter nutrition in Fennoscandia: the results range from 8–10 hectares to 16–20 hectares per head (Kumpula et al., 2000). Specifically, for the region covered by Gedda’s map, the area has been estimated to be ca. 10 hectares per head (Tottie, 1966:107). A mountain Sami household should thus need 20 km<sup>2</sup> of lichen pastures in order to feed a minimum herd of 200 reindeer. This estimate is quite close to the areas of pine forest present in the three mountain Sami territories analyzed by Josefsson et al. (2010): 58.7, 23.0, and 27.2 km<sup>2</sup>.

Combining the estimated requirement of reindeer with our calculation of available winter habitats, the total number of reindeer that could be fed through winter in all 37 territories should be around 44 000. Reindeer winter pastures were thus abundant. However, Malmström’s forest map shows that their main extent was from the large lakes of Storvindeln, Storjuktan, and Storuman and farther down along the rivers, which means that there was very little of it in the mountain Sami territories (Fig. 4). In fact, only one of the mountain territories seems to have contained reindeer winter habitats sufficient for a minimum herd of 200 reindeer. Gedda’s map shows that this territory, Jukt fjäll (Fig. 1: no. 9), had a most curious shape, consisting of two almost separate parts. The upper part, with alpine heath and subalpine birch forest, is located in the area belonging to the community of Granbyn, while the lower part, with pine forest, is surrounded by territories belonging to the other community, Umbyn. The landholder himself belonged to Granbyn. It seems likely that the upper part was originally a separate territory and that the landholder had managed to obtain a second territory to secure winter grazing grounds for his reindeer. Nevertheless, he was registered for the lowest possible tax level.

With respect to its resource content, Jukt fjäll resembles the three mountain Sami territories studied by Josefsson et al. (2010). All these territories included more or less similar proportions of different vegetation types, which were used during different parts of the year: alpine heath for summer pastures, birch forest for spring and autumn land, and pine forest for winter land. In other words, each territory seemed to contain all the resources that a mountain Sami household needed all year round. However, in our study area, this was an exception. Apart from Jukt fjäll, all other mountain territories contained little or no winter pasture. The reason for this is quite simply that mountain forests in our study area are dominated by spruce, not pine, and rarely contain the ground lichens preferred by reindeer in winter.

By using Malmström’s forest map to estimate the area of reindeer winter habitat available, we can thus show that all but one of the mountain Sami territories drawn on Gedda’s map were incomplete, in the sense that they did not contain all the resources needed to pursue reindeer herding year round. The implication is that most mountain Sami in this area must have taken their reindeer to winter pastures outside their own territories.

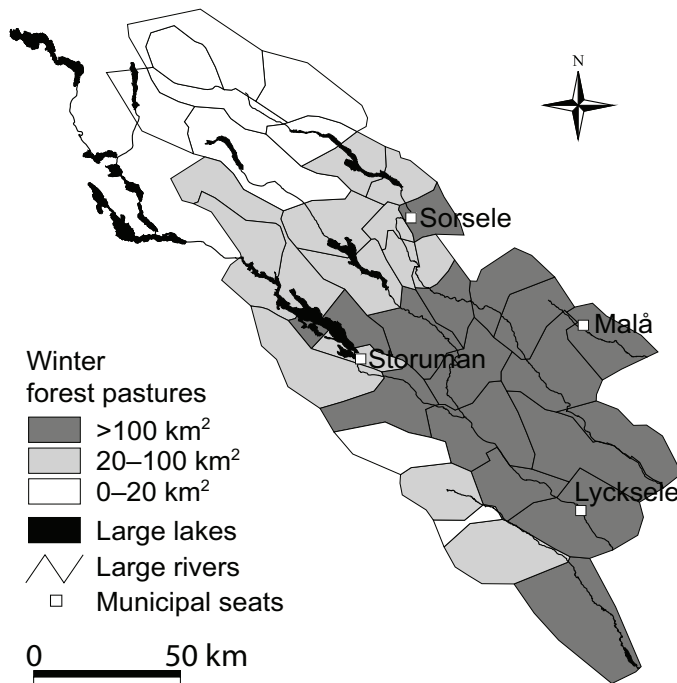


FIG. 4. Distribution in 1671 of territories with different areas of winter forest pastures in the Ume Sami district, defined as surfaces with a volume proportion of pine exceeding 70%. Only territories with more than 20 km<sup>2</sup> of such pastures could feed 200 reindeer through the winter (the estimated minimum herd of a household that depended entirely on reindeer). Current municipal seats have been added for orientation. Areas of pine-dominated forest have been calculated from Malmström's map from the 1940s. Data on lakes and rivers are from the Swedish board for land surveying, © Lantmäteriet, i2012/901.

#### *Reindeer Winter Pastures in Forest Territories*

The forest Sami territories were, in general, much better provided with reindeer winter habitats than the mountain Sami territories. According to our calculations, based on Malmström's map, all forest territories together contained pine-dominated forests sufficient for more than 39 000 reindeer. The number of reindeer that could be fed during the winter in a single territory ranged from 130 to 4500, with an average of about 1400.

As shown in the previous section, all but one of the mountain Sami of Granbyn must have migrated to winter pastures outside their territories. According to the historical sources, they usually found these pastures in territories held by forest Sami, who received valuable food items for taking them in. This practice must have created an interesting relationship of interdependence between the two groups.

However, the mountain Sami of Granbyn were not the only winter visitors to forest Sami territories in the Ume district, since there were two other communities farther west, Ranbyn and Vapsten, that consisted entirely of mountain Sami. Their territories contained even less winter habitat than the ones in Granbyn, and their reindeer were most certainly brought to lichen pastures in the same forest Sami territories. According to cameral records from 1674, Ranbyn had 15 taxpayers and Vapsten, 17. With the mountain Sami of Granbyn added in, the total number of mountain

Sami households that needed winter pastures for their reindeer amounts to 33. This means that at least 6600 reindeer should have been brought to forest Sami territories by mountain Sami, if the minimum herd of a household was 200 head. This is not many compared to the possible total of 39 000 reindeer.

The mountain Sami were not the only ones in need of winter pastures, since the forest Sami could also keep reindeer. In his description accompanying Gedda's map, Holm (1671) twice mentioned reindeer pens in forest Sami territories, and he also wrote about the damage caused by wolves to the forest Sami's reindeer. Nevertheless, although he wrote a good deal about the fishing activities of the forest Sami and described the mountain Sami as being completely dependent on reindeer herding, he did not write a single explicit statement about the reindeer husbandry of the forest Sami. The overall impression from Holm's account is, therefore, that reindeer husbandry was of minor importance to the forest Sami in 1671, which is confirmed by the contemporary observer Nicolaus Lundius, who wrote that the forest Sami of the Ume district did not have so many reindeer (Lundius, [ca. 1674] 1983:11).

No more detailed information is available on the number of reindeer kept by the forest Sami of the Ume district in 1671. Reindeer censuses were sometimes carried out, but the one closest in time seems to be the one from 1605, when only 19 out of 34 forest Sami households kept reindeer. The three households with most reindeer had around 30, while the remaining 16 had between 5 and 27 (Wheelerburg, 1991). The average was 13.6 reindeer per taxpayer. Although this is long before 1671, nothing indicates that the reindeer stock had changed much among the forest Sami. Even as late as 1746, the forest Sami of the Ume district were said to live mostly on fish, and in winter, on provisions provided by the visiting mountain Sami (Stobée, [1746] 1919:72).

It seems safe to assume that the average number of reindeer per forest Sami taxpayer was about the same in 1671 as in 1605, which should give a total of about 460 head for all forest Sami together. When this figure is added to the minimum number brought by mountain Sami, there should still have been room for 32 000 reindeer. In other words, the forest Sami controlled much more of this crucial resource than was used for reindeer husbandry. Perhaps this is the reason why the statistical correlation between tax levels and area of pine-dominated forest per territory is very low (Pearson's  $r = 0.064$ ): since most of the forest territories contained more of these resources than any one household could need, differences were relatively unimportant.

#### *Presence of Wild Reindeer*

The same winter habitat resources were used by both semi-domesticated reindeer and wild reindeer. Holm mentions the presence of wild reindeer in the descriptions of 32 of 37 territories, using expressions equivalent to "abundant" or "regular" in 15 cases, all of them concerning

forest Sami territories (including the one taken over by the Church). Wild reindeer are mentioned in only three of the eight mountain territories, and even in those are said to occur “sometimes” and “not often.” In 1671, the wild reindeer of the area were thus mostly forest-dwelling.

Since wild reindeer have been extinct in Sweden since the 1870s (Ekman, 1910:14–15), not much is known about the behaviour of this forest variety. It probably had much in common with the extant forest reindeer in Finland, which, unlike many other populations of reindeer and caribou, do not undertake long migrations but remain in the forest throughout the year (Rankama and Ukkonen, 2001). In any case, the wild reindeer of the Ume district should have had the same winter habitat preferences as the semi-domesticated ones. This is an interesting situation, since the presence of wild reindeer is today perceived as highly problematic for reindeer husbandry. In Alaska, the expansion of the Western Arctic Caribou Herd has caused a dramatic decrease in the number of semi-domesticated reindeer, since the reindeer wander off with the caribou (Kofinas and Russell, 2004). In parts of Russia where the number of wild reindeer has increased rapidly, the development has been similar, both because the wild reindeer lead away the semi-domesticated animals and because of damage they cause to pastures (Klokov, 2004). However, none of the Swedish 17th century sources mention anything about wild reindeer causing problems for reindeer husbandry. One reason for this could be that the wild forest reindeer did not undertake long migrations and thus did not lead semi-domesticated reindeer very far away. Another reason could be that the Sami of the 17th century kept comparatively small herds that were much more tightly guarded than the herds in present-day Alaska and Russia, so that mixing with wild reindeer was prevented.

As shown in the previous section, forest Sami reindeer husbandry in the area was probably of minor importance in 1671. Instead, the hunting of wild reindeer must have been an important way of procuring both furs and meat, and the presence of wild reindeer in one’s own territory should have been of great value. Still, the correlation between wild reindeer frequency and taxation is rather low (Spearman’s  $\rho = 0.274$ ). If taxation was related to wealth, control of wild reindeer was apparently not enough to make a household wealthy.

Our analysis of the occurrence of wild reindeer according to Holm (1671) has resulted in a new image of forest Sami land use, especially when combined with the information on reindeer winter pastures extracted from Malmström’s map. The forest Sami must have developed a system of coexistence between wild and semi-domesticated reindeer, which permitted them to use the pine-dominated forests for hunting, grazing, and letting pasture to mountain Sami. When this system worked well, the reindeer-related resources must have made a most valuable contribution to the economy of forest Sami households.

### *Fishing Waters and Fish Species*

Next to reindeer husbandry and hunting, the subsistence mode that is consistently linked to 17th century Sami is freshwater fishing, especially for forest Sami. The importance of fishing is reflected in Holm’s description of Gedda’s map, which contains such a wealth of information on fish and fishery that it is obvious that the Sami had a thorough knowledge of the subject. The presence of fish is noted in 72 named lakes and parts of watercourses and, in more general terms, in 19 further instances (mostly for whole territories). In total, 11 different species are mentioned (in order of descending frequency): northern pike (*Esox lucius* L.), European perch (*Perca fluviatilis* L.), common roach (*Rutilus rutilus* L.), European whitefish (*Coregonus lavaretus* L.), grayling (*Thymallus thymallus* L.), brown trout (*Salmo trutta* L.), Arctic char (*Salvelinus alpinus* L.), “löja” (probably a small specimen of whitefish, or maybe vendace, *Coregonus albula* L.), burbot (*Lota lota* L.), ide (*Leuciscus idus* L.), and common bream (*Abramis brama* L.). According to Holm, all but the burbot were eaten by the Sami.

The historical sources indicate that the Swedish forest Sami moved between fishing lakes to follow the spawning of the fish (Graan, [1672] 1983:35), which is exactly the same as has later been said about the annual migrations of the Skolt Sami of Russia (Nickul, 1977:3). The reason for this pattern was that the fishing equipment of the Sami was simple and rendered good catches only under favourable conditions, such as fish spawning or migration (Hultblad, 1944). Since the timing of these events is different for different fish species, access to many species should be a prerequisite for fishing as a main subsistence mode. The territories in the Ume Sami district were generally well supplied in this respect, since Holm mentioned, on average, 5.3 fish species per territory. Significantly more fish species were mentioned in forest territories (mean: 5.8) than in mountain territories (mean: 3.6).

Also, different populations of a fish species can spawn at different times, as witnessed by Fellman (1906b:122) in his detailed description of whitefish in various lakes in Inari, Finland. Therefore, access to a large number of water bodies should be an efficient way of securing a good and stable resource base. Another reason to control many lakes is to allow a rotational system with one or two years of “fallow” (Fellman, 1906a:341–342). In general, the territories shown on Gedda’s map were well provided with fishing waters, ranging from 3 to 32, with a mean of 13. Of these, 83% were lakes and 17% were parts of watercourses. Water area ranged from almost 10 to more than 90 km<sup>2</sup>, with a mean of 36 km<sup>2</sup>.

Pålsson (1988) noted that anthropologists have largely ignored fishing in comparative studies because fishing tends to be seen either as a last resort or as mere fun. The field still seems in want of research, for we have found no quantitative data on the requirements of lake-based fishing as a main subsistence mode. However, since most of the forest Sami seem to have controlled a wealth of both

fish species and water, we suspect that Lundius ([ca. 1674] 1983:11) came quite close to reality when describing them as eating “solely fish.” There are interesting parallels to this among eastern Sami groups such as the Skolt of Petsamo (Nickul, 1977:3) and the Sami of Inari (Fellman, 1906a:341), who have depended mainly on lake fishing.

It would have been more difficult for a mountain Sami to be dependent on fishing. According to Holm, a mountain Sami who had lost his reindeer could not stay on his territory, but had to move to lower altitudes where hunting and fishing were better. Our data indicate that the reason was not a lack of water bodies, since there was no statistically significant difference between mountain and forest territories in this respect. The generally low productivity of the alpine lakes and the low number of fish species were probably more important, since Holm wrote that fishing in the mountain lakes was generally “very weak” and the catch consisted mostly of trout and char.

When the statistical correlation between tax levels and different resource variables is analyzed by territory, three variables related to water and fish stand out: the number of fish species mentioned by Holm (Pearson’s  $r = 0.416$ ), the number of named water bodies on Gedda’s map (0.357), and the length of river stretches inside each territory (0.351). In fact, these three variables showed the highest correlation of all to taxation. We do not know the process by which control of abundant fishing resources translated into higher taxes, but if taxation was in any way related to wealth, control of good fishing facilities seems to have been an important determinant.

## CONCLUSIONS

By analyzing the Sami territories shown on Gedda’s map from 1671 with a combination of historical sources and extant data, we have been able to describe in detail what natural resources were available for single Sami households in the Ume district and make qualified assessments of how these resources were used before the fundamental transformation of Sami society by the advent of agricultural colonization.

Our image of the mountain Sami territories is dissimilar to the one reported by Josefsson et al. (2010), since they found that every single territory contained all the resources that a household needed. Conditions are different in our study area, where mountain Sami controlled virtually no winter pastures inside their own territories and had to migrate to forest Sami territories in winter. In exchange, the forest Sami received some remuneration. This must have created an interesting relationship of interdependence between the two groups. Although this relationship is mentioned in historical sources, it has not, to our knowledge, been noticed in any scientific studies. Further research is needed to explore the nature of this relationship in different parts of the Sami area.

Another matter brought out by our study is the fact that the Sami of the 17th century herded domesticated reindeer in areas where wild reindeer were simultaneously present. The forest Sami seem to have developed a complex management system that permitted them to use the pine-dominated forests for hunting wild reindeer and grazing of their domesticated reindeer, as well as letting mountain Sami use the land for winter grazing.

Our study gives prominence to freshwater fishing as a subsistence mode among the forest Sami in northern Sweden in the 17th century. We even suspect that the resource use of this group can be better understood by making comparisons with the fisher Sami of Inari and Petsamo than by drawing conclusions from their mountain Sami neighbours. Most of the earlier studies that have been carried out on forest Sami focus on the 19th century (Wiklund, 1921; Manker, 1939, 1968; Ruong, 1944; Östlund et al., 2003). By that time, the forest Sami had undergone a radical cultural transition and had become almost as dependent on semi-domesticated reindeer as the mountain Sami. Some studies have been made of the transition period, which occurred during the second half of the 18th century (Marklund, 1999, 2004), but the resource use of the forest Sami in earlier times is very poorly understood. Our study is an important contribution to the knowledge of early forest Sami history.

It is clear that a broad analysis of various historical records, including maps and cameral documents and also more recent data, opens new possibilities for understanding past land use of indigenous peoples.

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