Reindeer Herders' Association

Guide to examining reindeer husbandry in land use projects

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This guide was produced in the project "Guidelines for examining reindeer husbandry in land use projects (Reindeer EIA)".

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FOREWORD

Many significant changes have taken place in land use in northern Finland over the past few decades. Various different kinds of (industrial) land use projects have arrived alongside the traditional uses of nature, partly restricting these. Land use projects within the reindeer husbandry area that are currently underway or in their planning stages include mining operations, wind power construction, and peat production (Figure 1). Tourism also continues to expand as a land user. Each of these require different operational areas. Reindeer husbandry is one of the most traditional livelihoods in the northern regions. Being a livelihood that requires expansive areas, other forms of land use always have some impact on the use of the environment by reindeer husbandry. The planning and placement of various operations within the reindeer husbandry area requires high-quality assessment and consultation practices, as well as procedures.

The guide for taking reindeer husbandry into account concerns plans and projects associated with the use of areas. The emphasis is placed on the EIA and land use planning inspection perspective. The guide is the first to concentrate exclusively on reindeer husbandry. This guide has been made due to the necessity to better take into consideration the requirements for practising reindeer husbandry in procedures associated with land use planning. Reindeer husbandry is often unfamiliar ground for organisations conducting impact assessments. Therefore, the purpose of this guide is not only to provide information about reindeer husbandry, but also to provide support in conducting a successful assessment. The guide is intended for supporting bodies responsible for the project, consultants, authorities operating in statutory procedures, as well as for the reindeer herding cooperatives subject to impact assessment.

The guide undertakes to be as concrete as possible in the assessment of impacts related to reindeer husbandry. Its purpose is to clarify practices for taking reindeer husbandry into account and to provide advice based on planning procedures implemented over the past few years and the experiences obtained from these. However, this guide does not examine the impacts of reindeer husbandry on the environment. Efforts are made to mitigate the impacts of reindeer husbandry on the environment using internal planning, including reindeer husbandry planning tasks and cooperation with various actors.

This guide has been compiled based on work done by a wide group of experts. The project is financed by the regional development fund of the Regional Council of Lapland.

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In autumn 2012, the guide was sent for statements to altogether 65 different bodies, and 25 statements were received. The guide has been edited and supplemented on the basis of the statements received. This guide will be updated in the coming years once practical experience from its operation has been obtained. The committee in fact welcomes all information regarding practical experiences and suggestions for improvement.

The committee wants the guide to be used as broadly as possible. It is hoped that the guide will assist different stakeholders in reaching a common understanding, facilitate the planning of projects having impacts on reindeer husbandry, as well as improve the assessment of impacts and taking reindeer husbandry into account. Genuine interaction and mutual respect, recognition of reindeer husbandry practices, and the minimisation of detrimental impacts focused on reindeer husbandry play a key role.

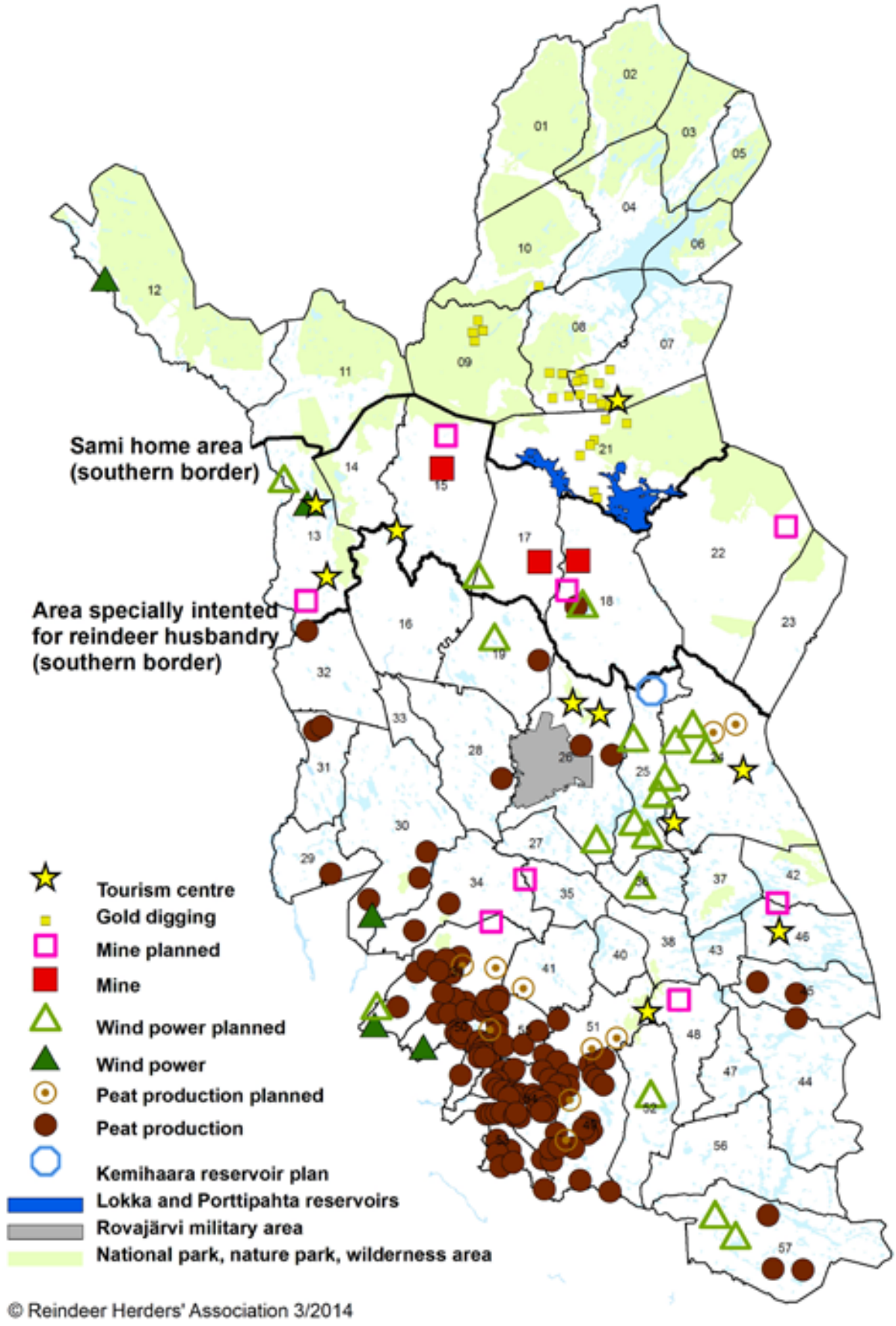


Figure 1.
Current land use within the reindeer husbandry area and planned land use projects (situation as of March 2014) (reindeer herding cooperative number, see Figure 2).

CONTENTS

SUMMARY

The guide for taking reindeer husbandry into account concerns plans and projects associated with land use. The emphasis is placed on the environmental impact assessment (EIA) and land use planning inspection perspective. This guide has been made due to the necessity to better take into consideration the requirements for practising reindeer husbandry in procedures associated with land use planning. The guide is a tool for assistance in investigating the impacts of land use projects on reindeer husbandry. It highlights which matters should be taken into consideration in the planning for the project and the assessment of impacts, and which means are available for the implementation of such. The guide is intended for supporting bodies responsible for the project, consultants, authorities operating in statutory procedures, as well as for the reindeer herding cooperatives subject to impact assessment. The guide was compiled using committee cooperation. The committee holds representatives of various authorities, organisations responsible for projects and associated consultants, in addition to visiting experts, reindeer herding cooperative representatives and researchers.

The Reindeer Husbandry Act (848/1990) safeguards the **reindeer husbandry rights**, i.e. free herding rights: "Subject to the restrictions provided in this Act, reindeer herding may be practised in the reindeer herding area irrespective of land ownership or possession rights" (Section 3). The Act also specifies areas specifically intended for reindeer herding: "The [State] land in this area may not be used in a manner that may significantly hinder reindeer herding" (Section 2.2). Section 53 of the Reindeer Husbandry Act stipulates the obligation for consultation in land use matters concerning State land throughout the entire reindeer herding area: "When planning measures concerning State land, which will have a substantial effect on the practice of reindeer herding, the State authorities must consult the representatives of the reindeer herding cooperative in question."

Reindeer husbandry is the oldest of the viable natural economies still practised in the northern regions. Reindeer husbandry maintains Sámi and Finnish cultural tradition and landscapes, language and subsistence for those who do not have sufficient employment opportunities elsewhere. Reindeer husbandry is an expansive user of land area as it is based on expansive natural grazing lands and the free roaming of reindeer either year-round or for most of the year. Activity associated with reindeer husbandry is usually found almost throughout the reindeer herding cooperative area. According to their natural grazing cycle, the reindeer graze on different grazing lands during different times of the year, and the reindeer husbandry tasks are performed in line with the reindeer's natural annual cycle. In addition to grazing areas, the reindeer herding cooperatives have a variety of operational areas, such as breeding grounds (calving, rutting) and other areas and structures associated with reindeer husbandry work.

The guide describes a variety of observed, potential **impact mechanisms** concerning reindeer husbandry. External changes in the operating environment and grazing areas affect reindeer grazing grounds and the use of reindeer grazing grounds, practising of the livelihood, usability of structures, reindeer slaughter and calving yields, the number of accidents, mandatory prevention of harm to the livelihood, and supplementary feeding, thereby causing the increased workload and costs. These factors affect the feasibility of the livelihood, and large-scale projects could even impact on the reindeer herding culture in the region.

Reindeer husbandry practices and activities vary by region, which means it is especially important to investigate the regional activities when conducting assessments. Merely stating the percentage of the reindeer herding cooperative area does not reveal the magnitude of the impact as this is affected by the project location in relation to the reindeer husbandry operational areas. When assessing the impacts of land use projects, it is important to specify each project area in question, as well as the **significance** of the project's impact on the region of the reindeer herding cooperative stakeholders. This assessment shall utilise the expertise of the reindeer herding cooperatives concerning their own regions.

One of the most important tasks of the legal procedures is **participation**: interaction with people whose housing or work may be affected by the project. Different means of participation include for instance various consultations (stipulated by the Reindeer Husbandry Act and other laws, such as consultation with authorities), work conducted in steering or monitoring groups, small group meetings and statements. In the case of reindeer husbandry, depending on the situation, participation is usually seen by the Chief of the reindeer herding cooperative or even reindeer herders in a broader sense. Wherever possible, participation should take into consideration the busiest times of reindeer husbandry activity, particularly during calf marking, and round-up times, as the reindeer herders can be working with the reindeer in the field for weeks and are not necessarily reachable. It is important to contact the reindeer herding cooperative as early as possible, when the project is in its design stages, for instance prior to submitting the EIA programme to the authorities. The contact details for the reindeer herding cooperative are available from the Reindeer Herders' Association. Well-functioning, genuine interaction at the commencement of the EIA procedure will assist with the planning of the project, as well as its operation in the area in the future. Mutual respect and equal treatment are the key factors.

The **documentation of the current state** of reindeer husbandry prior to commencing the project is not only very

important as far as regards assessments, but also for the monitoring of the project impacts. The various methods and materials, which can be used to gather information about the current situation and the assessment of impacts include, for instance, different statistics, GIS data related to the reindeer husbandry, and nowadays also GPS monitoring of reindeer. Map inspections and interviews of reindeer herding cooperative representatives, group work and other discussions are important.

In the **assessment of impacts** it is vital to describe the changes caused by the project compared to the current situation. Impacts can be assessed in relation to different impact mechanisms: impacts on grazing areas, grazing, reindeer husbandry activities, structures, and so on. In the assessment of the impacts focused on the reindeer husbandry, particularly the location of the project in relation to the reindeer husbandry, activity areas needs to be taken into account. Thereby, the specification of the significance of reindeer husbandry in the planned area acts as a foundation for the assessment of impacts.

Means for **mitigating harm and minimising detrimental impacts** should be determined in connection with the impact assessment. These include for instance: taking into consideration the hopes and needs of the reindeer herding cooperative in terms of infrastructure placement, minimising environmental changes by centralising activities, routes and passages, assurances concerning the routes of travel for reindeer and reindeer herders in such a way that travel and the moving of livestock is not hindered, fencing of hazardous areas, improvement of safety, notifications of accidents, and maintaining continuous interaction and communication. Damages can also be compensated for. The prevention and mitigation of harm caused by the project is always case-specific, and actions shall be negotiated and agreed with the local reindeer herding cooperative.

In respect to the **monitoring** of the project, it is essential that the current state of reindeer husbandry is recorded during the planning stages for the project, which with monitoring facilitates the comparison of observed matters to the documented data. It is recommended for the representatives of the project and the reindeer herding cooperatives to convene at least once a year for the purpose of monitoring. In the meetings the impacts of the operations can be examined using mutually agreed indicators (e.g. changes in reindeer grazing and reindeer husbandry activities). With projects, which put potential loading on the environment from the perspective of the reindeer livelihood, it is important not only to monitor the impacts focused on reindeer husbandry, but also the environmental impacts and the effects on vegetation used by reindeer for nutrition and on the drinking water.

REINDEER HUSBANDRY ACT AND REINDEER HUSBANDRY ADMINISTRATION

REINDEER HUSBANDRY ACT

The Reindeer Husbandry Act (848/1990) (RHA) is special legislation that shall be considered, when operating within the reindeer herding area. The Reindeer Husbandry Act for instance specifies the reindeer herding area, how reindeer should be handled and marked, the tasks of the reindeer herding cooperative, and the duties of its officials. A few sections of the Act also concern land use issues in relation to reindeer husbandry itself and in connection with other land users.

The Reindeer Husbandry Act safeguards reindeer herding rights for reindeer herders. The Act provides for free grazing rights for reindeer husbandry: "Subject to the restrictions provided in this Act, reindeer herding may be practised in the reindeer herding area irrespective of land ownership or possession rights." (RHA, Section3) This means that reindeer can freely roam the areas and acquire their nutrition from these (Government Bill no. 244/1989). There are, however, restrictions associated with grazing, i.e. reindeer are not permitted to graze in certain areas or cause damage to these areas. Areas such as these include farmlands, sapling stands in forest regeneration areas, and south of the Sámi residential areas, on grounds or gardens of permanent residences. These are stipulated in Section 31 of the Act, which provides for the prevention of damage caused by reindeer. The right to practice reindeer herding is intended as a permanent right (Government Bill no. 244/1989). This means that other bodies within the reindeer herding area are obliged to tolerate the damages caused by reindeer, with the exception of the areas mentioned in the Act.

The Reindeer Husbandry Act specifies the reindeer herding area intended for practising reindeer husbandry, which extends out from Northern Ostrobothnia and Kainuu as far as northernmost Lapland (Figure 2). The reindeer herding area is divided into two parts. The Act specifies the northern area, i.e. the area specifically intended for reindeer herding: The [State] land in this area may not be used in a manner that may significantly hinder reindeer herding. Transfer of ownership or leasing of land in this area may only be on the condition that the landowner or lessee does not have a right to receive compensation for damage caused by the reindeer (RHA, Section 2). The last sentence is also valid for places south of the special herding area, in such areas located within the municipalities of Salla or Kolari, or Kittilä, as Section 55.4 of the RHA keeps the former Section 2.2 of the Reindeer Husbandry Act (444/48) in force concerning the transfer of state lands that entered into force prior to 1990.

Section 53 of the Reindeer Husbandry Act stipulates the obligation for consultation in land use matters concerning State

land throughout the entire reindeer herding area: "When planning measures concerning State land, which will have a substantial effect on the practice of reindeer herding, the State authorities must consult the representatives of the reindeer herding co-operative in question." This section of the Act is discussed later herein (p. 27).

According to the Government Bill for the Reindeer husbandry Act (244/1989), in respect to the thriving of reindeer, it is important that reindeer are not unnecessarily disturbed. This means the assurance of suitably peaceful grazing and mating grounds on the pastures. Consequently, Section 42 provides for the prevention of disturbing reindeer: "Reindeer must not be frightened. Compensation must be paid for any damage or inconvenience caused to the reindeer owner and the reindeer herding cooperative as a result of frightening. Driving off reindeer with the purpose of preventing damage is not regarded as frightening reindeer." The clause also mentions stray dogs, which are found chasing reindeer during periods, when dogs must be kept on a leash as intended by the Hunting Act (615/1993), or mutilating reindeer during hunting periods. Furthermore, logging must be carried out so that it does not cause any damage to reindeer. In the Government Bill for the Reindeer Husbandry Act (244/1989), the increased disturbance caused by tourism in the reindeer herding area is also mentioned. Section 47 of the Reindeer husbandry Act specifies reindeer herding offence fines for frightening reindeer.

THE DIFFERENT SECTIONS OF THE REINDEER HERDING AREA AND THEIR DIFFERENCES

The **reindeer herding area** covers approximately 36% of Finland's total area. Reindeer husbandry is divided by area and reindeer numbers into units of varying sizes, reindeer herding cooperatives. The **reindeer herding cooperative** is not only a regional unit, but also an economic and administrative unit. It is a community comprising reindeer owners, i.e. shareholders of the reindeer herding cooperative, whose task it is to ensure that the reindeer of its area are cared for in accordance with laws and regulations. There are 56 reindeer herding cooperatives in Finland's reindeer herding area (Figure 2).

The different parts of the reindeer herding area differ from one another by natural geography, as the reindeer herding area reaches out from the expansive bog plains of Northern Ostrobothnia via the coniferous tree dominated forest regions of Metsä-Lappi (Forest Lapland) to the open fell highland areas of northern Lapland. The differences between the areas is also evident in reindeer herding habits and cultures.

The reindeer herding area can be divided into three areas: **reindeer herding area, area specially intended for reindeer husbandry**, and the **Sámi Homeland area**, which also includes the **Skolt Sámi area.** The Sámi Homeland areas are stipulated in the Act on the Sámi Parliament (974/1995, Section 4) and the reindeer herding areas in the Reindeer Husbandry Act (848/1990). The Skolt Act (253/1995) specifies the Skolt area, within which there are two reindeer herding cooperatives in addition to some parts of three other reindeer herding cooperatives. Particularly in areas intended for reindeer husbandry (20 northernmost reindeer herding cooperatives) and in the Sámi Homeland district (13 northernmost reindeer herding cooperatives) reindeer husbandry is an especially important livelihood. In this area, for instance, an individual can own more reindeer than those living in the more southern areas, and the position of the livelihood as a land user is much stronger. Other acts also stipulate for reindeer husbandry and Sámi culture requirements to be taken into consideration, which plays its own part in strengthening the status and rights of the reindeer livelihood in the aforementioned areas. The Act on Metsähallitus (1378/2004) stipulates that the management, use and protection of natural resources governed by Metsähallitus in the Sámi Homeland referred to in the Act on the Sámi Parliament (974/1995) shall be adjusted to ensuring the conditions of the Sámi people to practise their culture and, in the reindeer herding area referred to in the Reindeer Husbandry Act (848/1990), they shall be adjusted to fulfilling the obligations laid down in the Reindeer husbandry Act. The Sámi Homeland, Skolt area, and area specifically intended for reindeer husbandry, as well as related consultation and hearing obligations, are also mentioned in the new Mining Act (621/2011).

The national parks and the wilderness areas established in Lapland in 1991 also have important significance from the reindeer herding perspective (Figure 1), as these areas often restrict the use of other forms of land use (e.g. forestry). Reindeer husbandry is permitted in the national parks: the making of required cabins, reindeer fencing and other structures, taking of wood required for reindeer herding, as well as reindeer-related setting up camp, making fires, and travelling using motor vehicles. The purpose of using the wilderness areas is to retain the wilderness characteristics of the areas, safeguard Sámi culture and natural economies, as well as the development of the diverse use of nature and its preconditions for use. For instance, the building of roads and mining operations is forbidden in the wilderness regions without express permission from the Council of State. Some of the areas have been entirely protected from forest felling, while some permit limited forestry activities. Similarly, any land areas of the wilderness area belonging to the State and related access areas shall not be assigned or leased without express permission from the Council of State. However, no permission is required for the issuing of access rights for satisfying the requirements of the reindeer husbandry, fishing, hunting or gathering, if these are in accordance with the management and utilisation plans for the wilderness area in question..

Nro	PALISKUNTA
1	Paistunturi
2	Kaldoaivi
3	Näätämö
4	Muddusjärvi
5	Vätsäri
6	Paatsjoki
7	Ivalo
8	Hammastunturi
9	Sallivaara
10	Muotkatunturi
11	Näkkälä
12	Käsivarsi
13	Muonio
14	Kyrö
15	Kuivasalmi
16	Alakylä
17	Sattasniemi
18	Oraniemi
19	Syväjärvi
21	Lappi
22	Kemin-Sompio
23	Pohjois-Salla
24	Salla
25	Hirvasniemi
26	Pyhä-Kallio
27	Vanttaus
28	Poikajärvi
29	Lohijärvi
30	Palojärvi
31	Orajärvi
32	Kolari
33	Jääskö
34	Narkaus
35	Niemelä
36	Timisjärvi
37	Tolva
38	Posion Livo
39	Isosydänmaa
40	Mäntyjärvi
41	Kuukas
42	Alakitka
43	Akanlahti
44	Hossa-Irni
45	Kallioluoma
46	Oivanki
47	Jokijärvi
48	Taivalkoski
49	Pudasjärvi
50	Oijärvi
51	Pudasjärven Livo
52	Pintamo
53	Kiiminki
54	Kollaja
55	Ikonen
56	Näljänkä
57	Halla

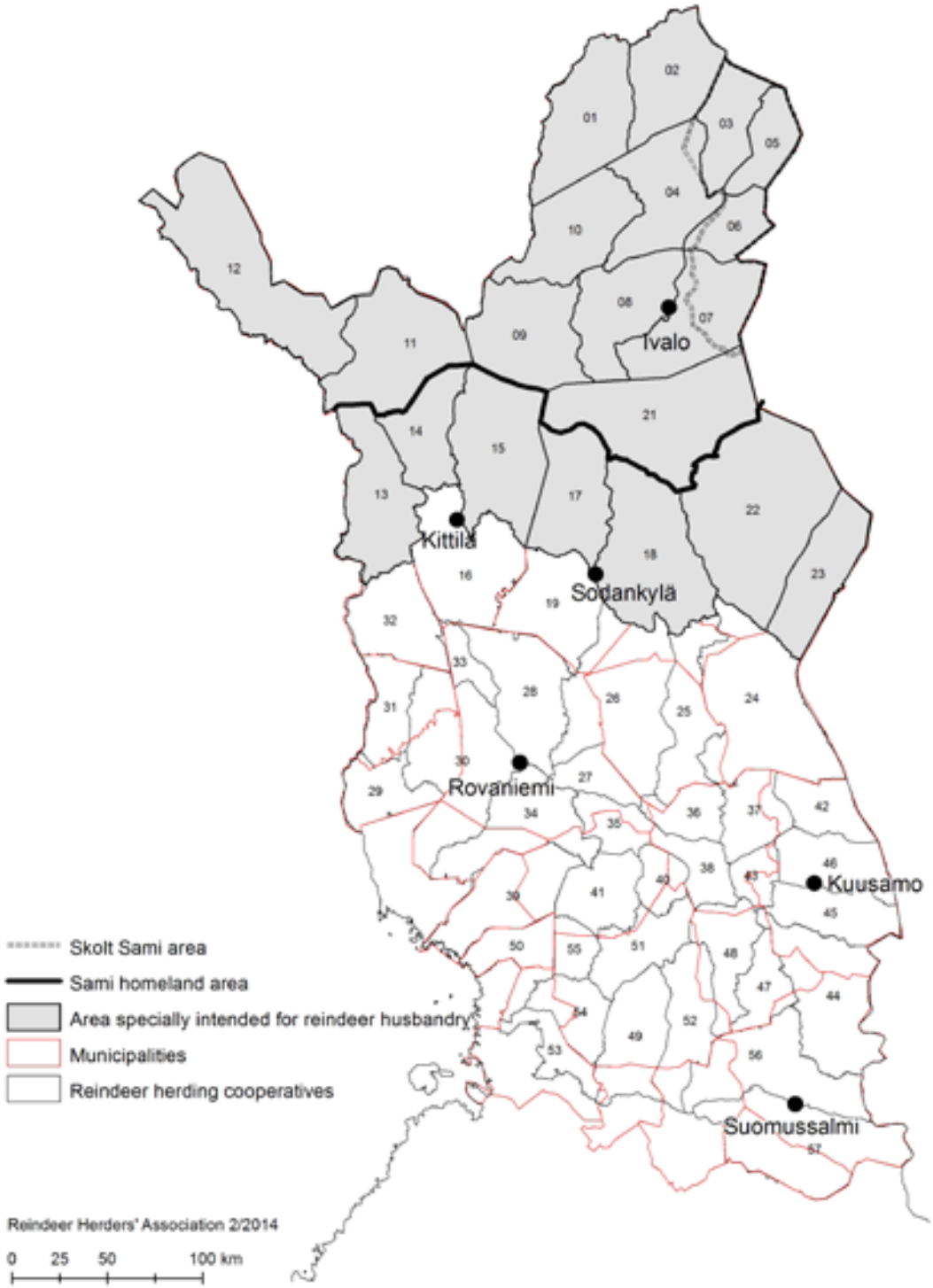


Figure 2. The different parts of the reindeer herding cooperatives and the reindeer herding area (situation as of February 2014).

SPECIAL ISSUES CONCERNING THE SÁMI HOMELAND AND SKOLT AREA

Within the Sámi Homeland (Figure 2), the authorities shall reserve an appointment to be heard and to negotiate with the **Sámi Parliament** in all far-reaching and important measures, which may directly and in a specific way affect the status of the Sámi as an indigenous people, and which concern the following matters in the Sámi Homeland: community planning, the management, use, leasing and assignment of state lands, conservation areas and wilderness areas, prospecting for and exploitation of deposits containing mining minerals, as well as gold panning taking place on state-owned land and water areas; or any other matters affecting the Sámi language and culture or the status of the Sámi as an indigenous people in relation to the use of land areas (adapted from Section 9 of the Act on the Sámi Parliament 974/1995). However, within the Skolt area (Figure 2) as intended by the Skolt Act (253/1995), the state and local authorities shall book an appointment in the **Skolt village meeting** and **Skolt Council** for issuing statements concerning far-reaching and important measures affecting Skolt livelihoods and living conditions.

The **Akwé: Kon Guideline**s (Ministry of the Environment 2011) are voluntary guidelines for the conduct of cultural, environmental and social impact assessments regarding developments proposed to take place on, or which are likely to impact on, sacred sites and on lands and waters traditionally occupied or used by indigenous and local communities. The Akwé: Kon Guidelines form part of the implementation of the Convention of Biological Diversity ratified by Finland (articles 8 (j) and 10 (c)). The purpose of the guidelines is to safeguard the preservation of natural diversity, as well maintaining the relationship of the culture of the indigenous peoples with nature and traditional knowledge, innovations and practices. A central issue of the guidelines is that the planning processes for projects identify the harm caused, and present means for the prevention, mitigation or compensation of such. The guidelines also form a procedure that safeguards the participation of indigenous and local communities in the preparation of projects and plans, assessment of impacts and decision making, and monitoring. It is the policy of the Ministry of the Environment for the guidelines to be applied in assessments focused on the Sámi Homeland, which potentially affect Sámi culture, livelihoods and cultural heritage. The guidelines do, however, also mention local communities. To date, the Akwé: Kon Guidelines have been applied to the management and use of the planning tasks of Metsähallitus. For instance, the drafting process for the management and use of the planning of the Hammastunturi wilderness area is handled by an independent Akwé: Kon committee, which is responsible for presenting the concerns of the Sámi and the assessment of the impacts caused by the plans on Sámi culture. It is highly recommended for the guidelines to be applied to all projects located within the Sámi Homeland.

REINDEER HERDING COOPERATIVES AND THEIR OPERATIONS

Any citizen of the European Economic Area can own reindeer in Finland. However, the reindeer owner practising reindeer husbandry must be a **shareholder of the reindeer herding cooperative** and the reindeer owner shall officially live within the municipal area, in which area their reindeer herding cooperative is entirely or partly located.

The reindeer herding cooperative is governed by a six-person board, with the **reindeer owner** acting as chairman and the **deputy reindeer owner** as the vice chairman. In addition, the reindeer herding cooperative appoints a treasurer, foremen, counters, damage assessors, and so on. The reindeer owner is the Chief of District in the reindeer herding cooperative, who is responsible for overseeing that all practical tasks belonging to the reindeer herding cooperative are conducted. The reindeer owner has an official responsibility and serves a term of three years at a time. The task of the **board** is to direct the activities of the reindeer herding cooperative, and to handle the preparation and execution of the decisions made in the general meeting for the reindeer herding cooperative. The senior decision-making authority of the reindeer herding cooperative is the **general meeting.** General meetings are held in April and May following the completion of the reindeer husbandry year, and in September or October prior to the commencement of round-up. Issues handled in the meetings include, for instance: reindeer herding cooperative economy, reindeer numbers and future reindeer herding tasks. The duties of the reindeer owner and officials, shareholder rights and responsibilities, reindeer herding tasks, and other activities related to reindeer husbandry are specified in the Reindeer husbandry Act and Decree.

The Ministry of Agriculture and Forestry regulates the **reindeer numbers** by confirming to the reindeer herding cooperatives the highest permissible number of reindeer livestock (i.e. the reindeer left to live over the winter) for a decade at a time. In its own activities, the reindeer herding cooperatives shall implement the stipulation of the ministry and keep reindeer numbers within the prescribed limits. Consequently, each year the reindeer herding cooperatives formulate a slaughtering plan for the numbers of reindeer to slaughter. The Lapland Regional State Administrative Agency monitors reindeer numbers (Figure 3). The maximum permissible number of reindeer livestock for the reindeer herding area for the 2010 – 2020 term has been specified as 203,700 heads. In the northern reindeer herding area, the maximum number of reindeer for a reindeer owner is 500 live reindeer (area specifically intended for reindeer husbandry and a few other reindeer herding cooperatives) and 300 live reindeer in the southern reindeer herding area (Ministry of Agriculture and Forestry Decree 450/2010).

The task of the reindeer herding cooperative is to keep the reindeer within their own reindeer herding cooperative area and to manage the tending for the reindeer in their area. The joint tasks of the reindeer herding cooperative, such as herding the reindeer into enclosures and calf marking, are handled in working groups of reindeer herders led by a foreman. In addition, the northern reindeer herding cooperatives often have **reindeer herding communities**, where the reindeer owners belonging to the herding unit tend to the reindeer together. For instance, during the winter months, the reindeer herding communities intensively herd their reindeer and can leave hay in the terrain to assist with reindeer herding activities. In the Sámi Homeland, the reindeer of the reindeer herding communities are usually owned by family communities (siidas) or relatives, i.e. the reindeer owned by family and relatives are tended to in the same herd. Reindeer belonging to reindeer owners residing in the same area can also be tended in the same herd regardless of family ties.

REINDEER HERDERS' ASSOCIATION

Every reindeer herding cooperative is a member of the Reindeer Herders' Association. The Reindeer Herders' Association was established on the basis of the Reindeer Husbandry Act and, therefore, is not a registered association (ry), as is the norm for associations. The role of the Reindeer Herders' Association is to work as a link between the cooperatives, direct reindeer husbandry, develop reindeer herding and the research of such, as well as handling reindeer husbandry relations with the rest of society. The legal task of the Reindeer Herders' Association is also to influence the livelihoods and interested groups connected with reindeer husbandry to preserve their conditions of operations. In addition, it is responsible for constructing and maintaining reindeer fences along national borders. The Association approves new reindeer earmarks and maintains a Reindeer Earmark Register as its official duty. The Association also publishes literature, including the Poromies [Reindeer Herder] periodical and promotes research activities by maintaining the world's only experimental reindeer farm, Kutuharju. The Reindeer Herders' Association is also an advisory organisation for reindeer herding cooperatives and reindeer owners, and it acts as a liaison between reindeer herding cooperatives and the state authorities.

The Reindeer Herders' Association is often involved in a number of committees and procedures related to land use, but it does not officially represent the reindeer herding cooperatives of the area. Therefore, the Association **cannot agree or negotiate** on behalf of the reindeer herding cooperative. However, the Association operates the role of reindeer husbandry **expert and the communicator of information,** which makes it an important participant in various procedures.

Figure 3. Reindeer husbandry organisation in Finland.

REINDEER AND REINDEER HUSBANDRY

REINDEER GRAZING GROUNDS AND THE USE OF PASTURES

Reindeer have a distinct annual rhythm which is evident with, for instance, the strong growth in the summertime. In the wintertime, the life of the reindeer is about survival with scarce nutrition and low consumption of energy. Reindeer graze in the reindeer cooperative area according to their natural rhythm, a **grazing cycle**, in different grazing areas during different times of the year. The grazing cycle is regular each year, providing there are no exceptional changes in the weather conditions. The grazing cycle can cover tens, or even hundreds, of kilometres. The grazing cycle of the reindeer is not only determined by nutrition and the availability of such, but also the tranquility and homogeneity of the areas. Reindeer herders can direct the grazing cycle using grazing cycle fencing.

The reindeer year begins in May or June, when the calves are born. The calving areas are usually the (southern) slopes of fells and hills with little snow cover, or the bog regions (higher tussocks), from which snow thaws earlier. Reindeer usually lose a lot of weight after the harsh winter. During and following the snow thaw period, reindeer need to locate green nutrition in order to build up strength and become rehabilitated. The calves are born in May, and also require plenty of nutrition from the female. In the springtime, the female reindeer, for instance, utilise the nutrient-rich rhizomes of sedges and cottongrass, and the very first shoots, which sprout in the bog regions once these begin to thaw. The **summertime grazing areas** are nutrient rich bogs, open felling areas, stream front meadows and open fell highlands, from which the reindeer feeds off various grasses, sedges, hay and the leaves from deciduous trees. It is typical for a reindeer to be constantly on the move when it is grazing, and when it roams, it always seeks the most fresh plants and plant parts in the best stage of maturity with high nutrient contents (e.g. Warenberg et al. 1997). In the autumn, the reindeer traverses forests and fell heathlands particularly for seeking mushrooms, which contain an abundance of protein, sugar, fat and vitamins. The reindeer eat mushrooms to accumulate extra fat for surviving the long winter. The mating season for the reindeer, i.e. rutting, occurs from the end of September to November, and this is the time when the reindeer continue to graze on heathlands.

In the winter, the most important source of energy for the reindeer is lichen containing carbohydrates, which it digs up from beneath the snow. The reindeer is the only animal that uses lichen as nutrition, as the lichen acid it contains is toxic for other animals. Lichen is of special importance to the reindeer as, with its carbohydrate diet, the reindeer requires less water than it would consume on a protein diet. In the winter, the reindeer gets water from the snow. However, the melting of the snow in the body consumes even more of the already scarce energy reserves. In the winter, the reindeer supplements its diet with shrubs, grasses and sedges. In the early spring, a time when the snow cover is too thick or hard for digging, reindeer residing in forest areas eat arboreal lichen, i.e. lichen growing on trees, and wander expansive areas of the snowscapes in search of arboreal lichen blown off the trees by spring storms or fallen down with snow. The wintertime grazing grounds are especially dry and barren lichen habitats of pine and fell heathlands, as well as old growth spruce and pine forests, which are good areas for the growth of arboreal lichen. According to the national forest inventory data, old growth forests have more lichen and arboreal lichen that forests managed by the forestry industry.

It has been estimated that the reindeer uses up to 350 different plants and lichen for nutrition during its annual cycle. As with other species of deer, the reindeer is a ruminant, but greatly differs from cows, which eat merely hay, precisely because of the reindeer's wide-ranging and flexible nutrition habits. The reindeer is sensitive to changes in its diet as it cannot endure sudden changes in nutrition, rather its rumen microbiota will need to have time to adapt to the change (Warenburg et al. 1997).

REINDEER HUSBANDRY STRUCTURES

Reindeer husbandry structures include various **fencing structures** and **cabins.** The fences divide areas by effectively directing and preventing the movement of reindeer. The special characteristics of the area (e.g. terrain, road network, waterways) and reindeer herding requirements determine the placement of fencing in the terrain: fencing is erected in places where it is best able to perform its task. Others traversing and operating in the area shall take reindeer fencing into account in their activities: these are the property of either the reindeer herding cooperative, individual reindeer herder, or are owned by the state. No holes may be made in the fences without permission/notification and, when travelling along roads and routes, assurances need to be made to see that the gates remain shut.

Barrier fences are used to keep the reindeer within the reindeer herding cooperative area. Particularly in the northern areas, the reindeer herding cooperatives areas are entirely fenced. On the state borders between Finland and Russia, and Finland and Norway, there are *frontier reindeer barrier fences*. Fencemakers, employed by the Reindeer Herders' Association from the state budget, maintain and repair these fences throughout the entire border with Russia. The maintenance of the fencing on the Norwegian border is shared with the Norwegians. The reindeer's grazing cycle and staying in the seasonal areas is directed using **grazing cycle fences.** In this way, the summer and winter pastures can be kept separate by using them in a planned and sensible manner. For example, protecting the winter pastures from trampling reindeer in the summer will preserve sensitive lichen.

Reindeer are herded into *round-up enclosures* for round-up, i.e. counting the reindeer and separating the breeding reindeer from slaughter animals. The round-up enclosures can also be used in the summer for calf marking. In some reindeer herding

cooperatives the round-up enclosure includes a *feeding enclosure*, an enclosure that can cover many square kilometres, and is used for holding reindeer for days or weeks prior to herding smaller herds into the round-up enclosure. The round-up enclosures usually include up to tens of kilometres of guiding fences *(siula)*, larger *feeding enclosures* with fences made from mesh and/or boards, a round-shaped wooden built separation pen *(churn)*, where the actual separation takes place, and the side pens owned by reindeer herding families, or joint side pens *(offices)* (Figure 4). Not all reindeer fences are permanent, as some fences are made from lightweight materials into *movable fencing* for the purpose of reindeer separation and calf marking procedures.

The fences owned by the reindeer herding cooperatives also include protective fences, which are erected to prevent reindeer from damaging crops. Other fence types include the private nursery enclosures owned by reindeer owners and other enclosures, which are either located in connection with reindeer farms/housing or more distant from these (particularly large entireties covering tens of hectares). In the winter months, these are used for tending reindeer at varying intervals depending on reindeer herding method and the condition of pastures. For instance, a reindeer herder may keep only unhealthy reindeer in the nursery enclosure, or all the reindeer he/she owns. The reindeer can be in the enclosure only during mid-winter, or they can be retained up to the calving period and released once the calves have been born and marked. In this way, the fenced areas are significant from the perspective of organising the tasks of a reindeer herding family.

The occupational housing, i.e. cabins, is usually located in connection with the round-up enclosures along reindeer routes of travel, or at herding sites. These cabins are collectively used by all reindeer herders. Within the Sámi Homeland, the reindeer herding cooperatives often have family-specific cabins (Figure 5) in connection with the round-up enclosures, and overnight stays along the reindeer's route of travel, which are in traditional sod huts or Lappish kota shelters. In connection with the round-up enclosues, there may also be the reindeer herding cooperative slaughterhouse and associated structures, such as alleys, along which the reindeer are driven to the slaughterhouse. The reindeer herding cooperatives can also have shared slaughterhouses, which are not located in connection with the enclosures, e.g. in the municipal centre. In at least one reindeer herding cooperative operating in the Sámi Homeland, a children's school has even been build by the round-up enclosure, as the entire family lives by the round-up enclosure during the round-up period. The intensity of the use of round-up enclosures and cabins varies. Herding cooperatives have main round-up enclosures that are used several times per year for larger reindeer numbers. In addition there are smaller enclosures that are used once or twice a year. Important reindeer cabins, which are in continuous use for months during the herding and round-up times, can be particularly found in the larger reindeer herding cooperatives where distances are large. In addition to accommodation, these cabins also have cultural significance. The cabin culture maintains and passes down reindeer husbandry culture to the younger generations, which is vital for the continuation of the livelihood. However, there are also reindeer herding cooperatives, where the cabin culture has died out. Instead of staying in the cabins, the herders will travel home to sleep. Nevertheless, the cabins act as important support bases during herding procedures for the purpose of reindeer round-up.

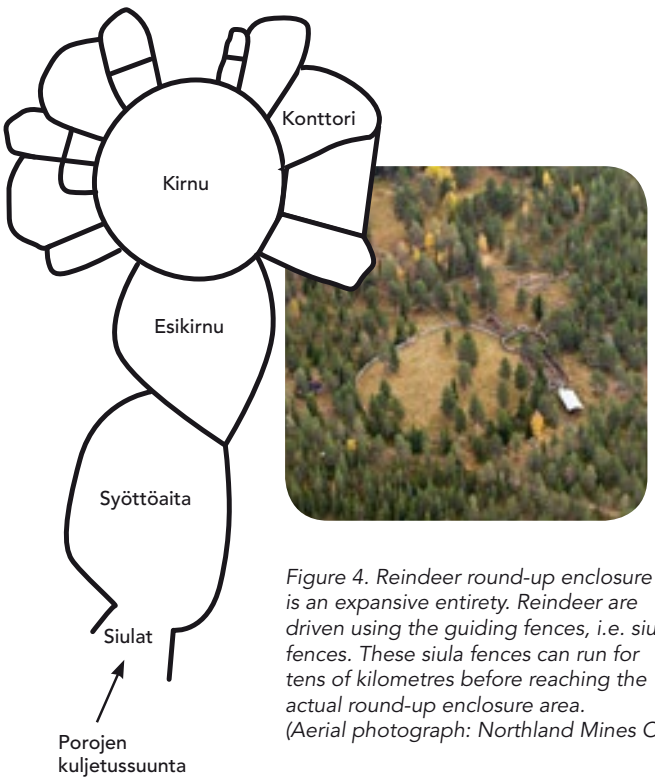


Figure 4. Reindeer round-up enclosure is an expansive entirety. Reindeer are driven using the guiding fences, i.e. siula fences. These siula fences can run for tens of kilometres before reaching the actual round-up enclosure area. (Aerial photograph: Northland Mines Oy)

Figure 5. Family reindeer cabins at the Ailigas round-up enclosure in the Paistunturi reindeer herding cooperative. (Picture: M. Anttonen, 2010).

REINDEER HUSBANDRY WORK AND OPERATING AREAS

Reindeer husbandry is a wide-ranging form of land use. Reindeer husbandry is a **natural economy**, and its feasibility is based on expansive natural grazing lands and the free roaming of reindeer either year-round or during most of the year. Activity associated with reindeer husbandry is usually found almost throughout the reindeer herding cooperative area. Every hectare is in some way used by reindeer husbandry, although the importance of these areas varies from the perspective of reindeer husbandry. Reindeer husbandry practices vary according to the region and even according to reindeer herding cooperative, which makes it difficult to make a general overview. Indeed, the reindeer husbandry practices shall be verified in the assessments. The following paragraphs describe general patters in the annual reindeer husbandry cycle.

The annual cycle of the reindeer also determines the work and life of the reindeer herders. The busiest herding times are the calf marking in June–July and the reindeer round-ups from late September to January. The reindeer herding year begins in early June, when the new calves have been born (Figure 6). The first task of the reindeer herding year is the gathering of the reindeer into the summertime enclosures and the **marking** of calves born in the spring. Work begins around Midsummer, when the **harrasment of blood-sucking insects** (räkkä) make the reindeer flock into **large herds** (tokka). These large herds are herded and driven into the summer marking enclosures, which are either permanent or movable. Permanent enclosures are expansive entireties located close to summertime reindeer gathering sites. In some areas, movable enclosures are employed for the summertime marking of calves. The reindeer gathering is done on foot and using ATVs and cross-country motorcycles for assistance. In some reindeer herding cooperatives, calves are not marked in joint calf marking occasions, but earlier in the calving enclosure, or then later in the autumn in connection with the round-up, as the calves usually follow their dam through to the following spring.

During the summertime, when the reindeer are in the summer pastures, in a number of areas winter fodder is prepared for the reindeer, such as dry hay, leaf fodder, and silage. In the autumn, nature once again assists the reindeer herders in gathering the reindeer for autumn round-ups. Reindeer begin their mating season at the end of September and in October, when the reindeer males together gather the females into their harems or **rutting herds.** These small herds are then herded together to form larger herds and directed, or herded, into round-up enclosures where separation of the reindeer takes place. The gathering and herding of reindeer is done on foot and using ATVs, or snowmobiles in the winter. Small helicopters are also used in many places for searching, gathering and herding reindeer.

In the reindeer round-up, the reindeer are driven in batches into smaller enclosures, i.e. separation pens (kirnu) (Figure 4), where the reindeer for slaughter are separated from the others. Reindeer to be slaughtered, and those left to live, are moved into smaller side pens, called offices (konttori). The breeding reindeer to be kept alive are "read", i.e. counted and the logkeeper is informed, who will then record the reindeer and its owner in the reindeer register. The counters then make visible cuts in the fur as as sign that the reindeer has been through the round-up. The majority of the reindeer herding cooperatives also treat their reindeer for parasites. In connection with the round-up some of the males are castrated. The reindeer belonging to other reindeer herding cooperatives are removed and taken back to their own reindeer herding cooperatives, usually using road vehicles. Particularly in the reindeer herding cooperatives of the Sámi Homeland in mid-winter, reindeer are also "resolved", i.e. the reindeer livestock belonging to each family is separated into their own herd.

Following the round-up season, the reindeer herders start their winter tasks, the most important of which are reindeer herding and supplementary feeding. In many places reindeer are fed in the forest or home enclosures (nurseries) during winter. Feeding the reindeer helps them survive the winter.

Figure 6. The reindeer husbandry year 1 June – 31 May is the natural annual rhythm for the reindeer. The figure is a generalisation and does not represent reindeer husbandry throughout. For instance, sometimes reindeer are separated as late as February and not all areas herd reindeer into large herds for the calving.

Particularly in the Sámi Homeland area, reindeer are usually kept together in herds during the wintertime by herding them in family groups using a snowmobile and a reindeer dog. Hay can also be used to help with herding. In April, when the calving period approaches, the reindeer are freed from the nurseries or large herds to travel towards their calving grounds and summertime pastures. In some areas the females give birth at the home nurseries or in larger enclosures and are released after calf marking has been performed.

The natural grazing cycle of the reindeer is always used in reindeer husbandry tasks. Reindeer husbandry tasks are conducted according to how the reindeer naturally traverse the areas and assemble in these areas. The gathering and herding of reindeer into round-up enclosures requires substantial work and workforce, and often uses established routes, which experience has found to be favourable. Reindeer prefer to travel upwind, thereby acquiring information as to what lies ahead. The travel of reindeer is sensitive to disturbances and will not be successful if forced: if something unexpected is met on the route (obstacles, people, machinery, dogs, smells) the herd can easily disperse and will have to be rounded up again.

In addition to having different **grazing grounds** for different times of the year, reindeer husbandry also utilises a variety of operational areas: e.g. **calving grounds** and **rutting areas,** other **reindeer gathering areas, reindeer routes of travel, waterway crossings, herding places, round-up enclosure areas**, worksite housing, i.e. **cabin** areas, as well as **routes leading to these operational areas.** In addition to the conventional operational areas and structures of the reindeer herding cooperatives, the private **nursery areas** and **calving enclosure areas** of home farms can also be significant operational areas for reindeer husbandry. Reindeer husbandry practices vary throughout the reindeer herding area and, for the purpose of assessment, the reindeer herding practices and activities practised in each area need to be known.

THE SIGNIFICANCE OF DIFFERENT AREAS
FOR REINDEER HUSBANDRY

The free grazing rights (RHA, Section 3) and natural pastures are prerequisites for a feasible reindeer husbandry. As stated above, the reindeer herding cooperatives need a variety of areas during different times of the year in order to function successfully. **The significance of different areas for the reindeer husbandry varies with each reindeer herding cooperative.** Some areas are used more than others for reindeer or reindeer husbandry activities in the reindeer herding cooperative. For instance, the majority of reindeer may cross one area to change its grazing ground, but cross another area much less. Or a certain area is used by the majority of females for calving, others much less. **Nevertheless, every area has its own importance:** these can, for instance, be used as reserve areas allowing the pastures to regenerate and used later or kept in reserve for the reindeer, when needed. However, in some years the weather conditions can direct reindeer to graze in areas that are normally of less importance, for instance on shore areas with little snow, or on the slopes of hills, where the pasture base can be unfrozen. These areas are important, even if these are not intensively and continuously being used.

The importance of the areas also varies between reindeer herding cooperatives. For instance, some reindeer herding cooperatives will have scarce winter pastures, while others have scarce summer pastures. When assessing the impacts of a land use project it is important to specify each **project area in question, as well as the significance of the project impact region on the reindeer herding cooperative stakeholders.** This assessment needs to **utilise the knowledge of the reindeer herding cooperatives about their area**, as the situation varies from one cooperative to another, and there are no general rules of thumb that can be issued. Nevertheless, the winter pastures and nutrient rich summer pastures, as well as areas of breeding season, are among the most important. With sufficient winter pastures, the reindeer do not need supplementary feeding, which affects the profitability of the reindeer economy. The reindeer gain strength for the coming winter from the summer pastures and grow the reindeer herders' principle source of income: meat for slaughter. The tranquillity of calving areas is also extremely important for the success of calving, and the peacefulness of the rutting area assists in ensuring a good gestation period.

THE SOCIO-ECONOMIC AND CULTURAL
SIGNIFICANCE OF REINDEER HUSBANDRY

Identifying cultural issues is vital for a successful assessment of impacts. Reindeer husbandry is a traditional livelihood in northern Finland, and as such has an important cultural significance. Reindeer husbandry is part of the reindeer herder's identity, which forms the basis for an entire way of life lived in the traditional way to the rhythm set by nature: work can only be done when nature allows (e.g. gathering of reindeer, herding, making fodder, etc.). Reindeer herders are very closely attached to their surroundings: as they traverse nature a lot, they know the reindeer herding cooperative area throughout and have often settled in remote districts precisely because they have chosen reindeer husbandry as their profession, because the reindeer cannot be relocated away from their areas. Reindeer husbandry culture and customs vary area by area. Nevertheless, the reindeer husbandry culture always has a strong sense of community: the reindeer of the herding cooperative are tended together by the herders, and round-up work requires a lot of manpower. The culture is handed down from the eldest descendant to the children through practical reindeer herding work and other associated tasks (making fodder, utensils, handicraft etc.). Indeed reindeer husbandry is a profession, which is difficult to enter without having grown up in the culture and learned practical skills throughout life. Viable reindeer husbandry is also vital for retaining the Sámi and Finnish reindeer culture, Sámi language and culture, and for passing these on to the next generations.

Reindeer husbandry has always had important significance in keeping Finland's remote districts inhabited (MTT 2008). The social importance of the sector is enhanced by the fact that the economic significance of the reindeer livelihood is greatest in the border areas, where finding employment in their home districts would otherwise be difficult. In addition to providing full-time employment in the reindeer husbandry, it also employs around the same number of people on a seasonal basis and through small enterprises (meat processing, tourism, and so on) (Kemppainen 2005). The reindeer economy also has significant linkage with other livelihoods in the area, such as tourism and agriculture (MTT 2008). The reindeer is very important for the image of Lapland. In addition to meat and processed meat, reindeer is also used for making other products, such as handicrafts, which use reindeer leather and bone.

It is traditional of the reindeer economy for a reindeer herding family to receive income from a number of different sources. According to a study conducted by MTT (2008), within Finland's reindeer herding area the importance of the sources of income vary and depend on the size of the herds. According to this study, the largest source of livelihood for all households owning over 80 reindeer comes from the reindeer economy and, calculated together with income received from meat processing and direct sales, this forms approximately 42 – 61% of the total income for a reindeer herding family. For instance, with a reindeer herd of 150 – 200 heads, 40% of the family's income is received from the reindeer economy and 18% from meat processing and direct sales. The number of retired persons is most significant with small reindeer herds (MTT 2008: 23–24). The greatest expense of reindeer husbandry comes from work costs and supplementary feeding.

The challenges the reindeer economy faces today are the viability of the livelihood and socio-cultural endurance, i.e. the continuation of reindeer husbandry. According to the report, the **biggest challenge** for the endurance of reindeer husbandry throughout the world is the **loss of pastures**, which in Fennoscandia is particularly affected by the expanding infrastructure and other forms of land use (Jernsletten & Klokov 2002).

Safeguarding the commercial and cultural status of reindeer husbandry is important when planning land use for northern Finland, as at the same time the livelihoods and traditions of the people living in the boundary areas are supported. Reindeer husbandry and its associated side industries, such as meat processing and reindeer farm tourism, are of course also developed within the livelihood.

BACKGROUND FOR THE LEGAL ASSESSMENT OF IMPACTS

EIA ACT AND DECREE

The purpose of the Act on Environmental Impact Assessment Procedure (468/1994) (EIA Act) is to promote the assessment of environmental impacts and to unify taking factors into consideration in planning and decision making, while at the same time increase the public's supply of information and opportunity for participation (Section 1).

According to section 4 of the EIA Act, the environmental impact assessment procedure shall be applied to such projects and related alterations for which an assessment is required to enforce an international agreement binding on Finland, or which may have significant adverse impacts due to the special features of Finland's nature and environment. A list of projects, which are subject to the application of the assessment procedure, can be found in Section 6 of the EIA Decree (2006/713). These include e.g. collection and processing of natural resources (mines), permanent alteration of forest, swamp or wetland nature exceeding 150 hectares (peat production), energy production or projects associated with transmission (large wind power parks, power lines), and large traffic-related projects (roads, railways). Projects can also be required to conduct an EIA procedure in other cases if, for instance, the characteristics of the project (e.g. joint impacts with other projects), project location (e.g. current land use, historically and culturally important areas), or the nature of the impacts (complexity, duration, reversibility) so require.

Even if the EIA procedure would not be applicable to the project, the organisation responsible for the project must still be sufficiently **aware of the environmental impacts of the project** (EIA Act, Section 25), for instance the impacts focused on the reindeer husbandry. This may require an independent study for assessing the impacts.

ENVIRONMENTAL IMPACT ASSESSMENT PROCEDURE

In the EIA procedure, the most important issues are the assessment of impacts, inspection of the project alternatives, as well as participation of stakeholders who may be impacted by the project. The EIA procedure is a *planning procedure, not a decision-making procedure*: For instance, no permits are granted in the EIA procedure. The course of the EIA procedure, as intended by the EIA Act, is shown above the red dashed line in Figure 7. The studies associated with the EIA and the interaction task is initiated earlier. For example, contact should be made with the reindeer herding cooperative (see Participation) and the EIA monitoring group for the project, which can convene prior to the official commencement of the EIA procedure.

LAND USE AND BUILDING ACT

The purpose of the Land Use and Building Act (132/1999) (MRL) is to arrange the use of the region and its construction in such a way that good requirements are created for a good living environment, as well as promoting ecologically, economically, socially and culturally sustainable development. As with the EIA Act, the intention is also to safeguard the opportunity for participation of everyone in the preparation of the matter, planning quality and interactivity, diversity of professionalism, as well as overt communication of the matters in question (MRL, Section 1). The Land Use and Buildings Act provides for e.g. taking into consideration and promoting a variety of plans and national land use objectives.

Figure 7. A project and the course of the EIA procedure. The EIA procedure reaches completion at the dashed line.

AREA PLANNING

Planning directs the development of the region and municipalities and the use of areas. In the hierarchy of the planning system, the most general is the *regional plan*, which is followed by the *master plan*, and the most detailed is the *local detailed [street] plan*. MRL 77 a, b and c specify the wind power master plan, which, for instance, grants the entitlement to wind power construction permits.

The regional plan directs the regional use of areas within the region. The regional council must see to it that a regional plan is drawn up as needed and is kept up-to-date and developed (MRL, Section 27). Master and detailed plans are made by the local councils (municipalities). On the municipal level, the master plans direct the society structure of the municipality, or its part, and land use in general, as well as consolidating different operations. The function of the local detailed plan is to make detailed specifications of the intended purpose for each area and to direct construction. The MRL stipulates e.g. content requirements for plans, and the assessment of impacts in the planning procedure.

Planning procedures include a variety of means to be taken into consideration, which are of importance for reindeer husbandry and use area allocations, plan markings and regulations. For instance, areas that are of importance for reindeer husbandry purposes can be marked, such as grazing grounds, and reindeer routes of travel or transportation. Planning regulations can, for example, safeguard the reindeer's route of travel through the area, or even further throughout the entire plan area, as well as safeguarding the land use requirements for reindeer husbandry. Examples of area plans that have taken into consideration the land use requirements of the reindeer husbandry.

In regional planning, the focus is on resolving issues associated with the regional structure. Within the municipalities inside the reindeer herding area, reindeer husbandry, due to its nature, requires special consideration for the use of areas in regional planning. In the regional plan, the area allocations related to reindeer husbandry, as well as markings and regulations, are normally of a general nature and not individually itemised. However, these do have significance on the results of consolidation of potentially conflicting objectives. The markings could also be itemised in local descriptions, particularly in areas where plans more detailed than

the regional plan are not expected. The status of reindeer husbandry in relation to other forms of land use is different in the areas specifically intended for reindeer husbandry and the Sámi Homeland compared to the rest of the reindeer herding area. Therefore, the level of accuracy of the plans could also be different in these areas. The regional plan is significant in directing municipal planning, as well for use in other measures related to arranging the use of areas. For instance, the authorities have an obligation to ensure the progression of the regional plan.The directing of the structure of society is an essential role of the master plan. The accuracy of plans in the master plan could favourably facilitate the making of solutions for the use of areas associated with reindeer husbandry. Solutions for use of areas associated with the structure of society can have indirect impacts on the possibilities for practising reindeer husbandry, e.g. with the increase in disturbances. For example, impacts causing disturbances can be caused by interference related to the use of areas allocated for construction, areas excluded as inadequate for construction, or area allocations associated with traffic and traffic areas. In planning it is essential to understand the impacts of area reservations on various planning levels, as well as the legal effects of the provisions issued concerning the use of areas, or the directive effect towards more detailed planning. Furthermore, it should be noted that it is not the intention to create local detailed plans for the entire area covered by the master plan.

With local detailed plans, the directive effect of the master plan plays a central role in matters related to reindeer husbandry. The master plan shall identify the importance of the area to be planned from the reindeer husbandry perspective and issue the necessary regulations, for which site-specific solutions are sought in local detailed planning. When drafting the local detailed plan, the plan must not substantially weaken the quality of anyone's living environment in a manner that is not justified by the plan's purpose (MRL, Section 54). Once the local detailed plan has been given legal force, it should be noted that no operations can be placed in the area, which would interfere with the other use of areas indicated on the plan, or which are harmful, or which compromise the prevention of disturbances caused by environmental impacts, or are contrary to the local detailed plan regulations concerning restrictions.

NATIONAL LAND USE OBJECTIVES (VAT)

The national land use objectives (VAT) are used to ensure that issues of national importance are taken into consideration in regional and municipal planning, and in the work of the state authorities (Ministry of the Environment 2000 and 2009). VAT is a Government decision (30 November 2000 and 13 November 2008) based on the Land Use and Building Act. Government authorities must take national land use objectives into account, promote their implementation and assess the impact of their actions on local structure and land use (MRL, Section 24.1). In regional and other land use planning, national land use objectives must be taken into account in a way that promotes their implementation (MRL, Section 24.2.). This obligation legally applies to all planning.

The general guidelines are used for the legal assessment of general planning (not master plans or local detailed plans specifically directing construction). Therefore, the task of the regional plan and master plan is to promote the safeguarding of the requirements of reindeer husbandry in the use of areas. According to the VAT's General Guidelines under section 4.7 "Areas of outstanding interest as natural and cultural sites":

> "Land use should promote the preservation of coastal regions, and the Lapland fell area and Vuoksi waterways, as particularly significant natural and cultural areas. At the same time, the prerequisites for housing and for business and industry should be maintained. The particular features of these areas should be recognised, and land use should be adapted in a balanced way so as to safeguard the preservation of the exceptional natural and cultural values and natural carrying capacity. At the same time, the preservation of characteristic villages and cultural milieus adapted to the natural conditions is to be safeguarded so that they remain unbroken entities. ---
>
> In the Sami home region in Lapland, land use should take account of the right of the Sámi people, as an indigenous nation, to maintain and develop their own culture in order to safeguard their traditional livelihoods. In the reindeer herding area, the land use prerequisites for reindeer husbandry are to be safeguarded."

In the General Guidelines of section 4.2 "A well-functioning regional structure" national land use guidelines associated with reindeer husbandry, due to its characteristics and location, can also be handled using the following guidelines:

> "The development of the regional structure and the land use should primarily be based on the individual strengths and location factors of the areas."
>
> "In land use planning, businesses and industry in areas of dispersed settlement, as well as individual activities, are to be taken into account, and also the need for new permanent residents in the countryside."

The national land use objectives related to planning must be identified in the initial stages of the EIA programmes and planning for projects. The EIA and planning reports shall process VATs: What is the relationship of the project with VAT? Will the project also impact other VATs? And, do these conflict with one another? The EIA report presents a justified estimate as to how the implementation of the project promotes VAT. Therefore, the report shall, for instance, examine in what ways

the prerequisites for the area use of reindeer husbandry can be safeguarded within the scope of the project. The authorities shall also provide statements on the implementation of VAT.

National Land Use Objectives form an entirety. Many guidelines, other than those mentioned above, support or otherwise indirectly impact the prerequisites for reindeer husbandry. These are related to, for instance, tourist resorts, connection networks and other infrastructure. In respect to the application of VAT, it should also be noted that the objectives have not been put in mutual order of importance. These objectives are of equal value, which means that attempts need to be made in such a way, and using alternatives where two or more objectives can be realised as well as possible. Potential conflicts must be meticulously justified in the planning report.

CONSOLIDATION OF PROCEDURES

When planning projects, the procedures to be consolidated are the EIA and necessary planning procedures (regional, master and local detailed plan) and the Natura Assessment. Furthermore, the various EIA procedures of expansive projects (e.g. mine, railway and power line) can be consolidated, as well as the consultations as intended by Section 53 of the Reindeer Herding Act. Sections 5.1 and 9.1 of the EIA Act stipulates the consolidation of procedures. In addition, Section 65 of the Nature Conservation Act provides for the possibility of conducting a Natura assessment as part of the EIA procedure. Consultations are discussed in the following chapter, Participation.

In order to avoid overlapping, consolidation can agree on, for example: timetables, arranging participation, studies, inspection of alternatives, assessment of impacts, and for how the combined impacts of different projects should be conducted. Wherever possible, efforts to consolidate the planning and EIA procedures for the same project should also be made from the perspective of participation (Figure 8). This is also recommended because long, consecutive procedures can often be cumbersome and timetables may be prolonged. When combining procedures in consultations and other events, it is important to clearly state the intentions of the procedures, i.e. what exactly is the issue on which, for instance, planning has an impact and why it is important for the stakeholders to be involved in planning tasks. It is very possible that projects such as these have never been seen before in the reindeer herding cooperative area; consequently knowledge of the progress of these is minimal.

Wherever possible, the timetables for procedures need to take into consideration the annual cycle of the reindeer livelihood. Autumn and early winter are the busiest "harvesting times" in reindeer husbandry. From around October to December, and even through to February, reindeer herders are conducting round-ups and separations (Figure 6) and can be located far from municipal centres, perhaps even in places with no mobile telephone reception. Especially in the reindeer herding cooperatives within the Sámi Homeland, reindeer are intensively herded into large herds out in the fell highlands from February until the snow thaws. In the summertime some reindeer herding cooperatives mark calves for a couple of weeks around Midsummer. During these times, it is unlikely that the reindeer herders would have time to attend meetings or other events. This situation varies according to cooperative and is resolved by asking the cooperative in question. Accordingly, it is worth contacting the reindeer herding cooperative in good time for the planning of the progression of procedures.

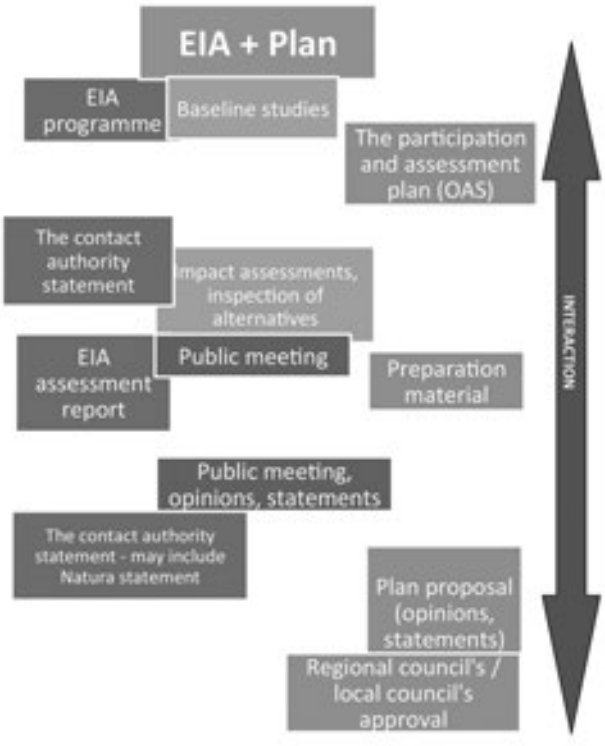


Figure 8. Consolidation of procedures in projects that require an EIA procedure and plan.

PARTICIPATION

In procedures related to land use, there are various ways to participate. Participation is planned and presented on a case-by-case basis during the EIA programming stage. The realisation of participation in planning procedures is planned in the participation and assessment plan (OAS). Most important is that the local actors, including the reindeer herding cooperative, are involved in the process, as the local inhabitants and entrepreneurs have the right to receive information pertaining to projects that impact them. Indeed one of the most important tasks of the EIA procedure is interaction and the travel of information between the company responsible for the project and the local inhabitants, and this is precisely the role handled by participation measures. Participation can even be used to resolve conflicts between project stakeholders, as they have the opportunity to present their own views, hear the views of others, and thereby learn to understand these views. Participatory measures also ensure commitment to the project. .

When planning a project, the company responsible for the project must **contact the reindeer herding cooperative as early as possible**, preferably prior to submitting the EIA programme. The reindeer herding cooperative is represented by the Chief of District. The contact details for the Chief of District for the reindeer herding cooperative are available from the Reindeer Herders' Association (www.paliskunnat.fi).

EIA PROGRAMME AND PARTICIPATION AND ASSESSMENT PLAN (OAS)

The realisation of participation during the EIA procedure is planned in the EIA programme and the participation and assessment plan (OAS) for the planning procedure. These focus on the means and schedules of participation, and registers the participants in the project. In the reindeer herding area, it is always the reindeer herding cooperative, which manages the area, where the project is located that is represented in participation. The Reindeer Herders' Association may only participate in the role of expert.

STEERING AND MONITORING GROUP

Steering, monitoring, or similar groups comprising local and regional actors are often established for projects with the task of directing or monitoring the project's progress. A representative of the reindeer herding cooperative shall be called to join the group in order to provide the reindeer herding cooperative with up-to-date information on the events occurring within their area. The reindeer herding cooperative is usually represented by the Chief of District. The Chiefs of District from other reindeer herding cooperatives can also be invited to join the group, if the project is expansive and its impacts extend beyond the project area. If the project is located within an expansive reindeer herding cooperative area, and if the area is intended for the reindeer husbandry of a certain internal area in the reindeer herding cooperative ("reindeer herding community"), and it is the opinion of the Chief of District that the representative of this area (e.g. foreman) has better knowledge of practical operations, then the representative of the reindeer herding community should also be invited to join the group. The reindeer herders, who traverse during their occupation, usually have good knowledge of other natural surroundings and conditions, which means they can also provide valuable information of the project area from perspectives other than reindeer husbandry. The invitation to the group must always be addressed to the reindeer herding cooperative, which then decides, if other representatives, in addition to the Chief of District officially representing the reindeer herding cooperative, should participate in the event. The Reindeer Herders' Association often participates in monitoring groups with the role of expert.

PUBLIC MEETING

Two public meetings are usually arranged during the EIA procedure: one during the EIA programming stage and one upon completion of the EIA report. The plans can also be handled at the same time. Public hearings are also arranged for planning procedures. The public meetings are normally publically announced and the meetings are open to all. In these public meetings information about the project is distributed, and there is the possibility to present opinions and attitudes towards the impacts of the project or the plan. At the same time, the stakeholders also hear the opinions of others and can, for instance, relate the detrimental impacts they suffer to the impacts caused on others. In the public meetings it is also possible to hear the opinions of other reindeer owners than the official representatives of the reindeer herding cooperative, which provides more depth for the baseline information of the project or the assessment of its impacts.

STATEMENTS

The authority shall always request statements from the reindeer herding cooperative concerning procedures performed in their area, both in the EIA and planning procedures. In the EIA, statements are requested on the EIA programme and the EIA report. The plans are available for viewing and statements on such can be submitted during the preparatory stage and the proposal stage. The Mining Act also stipulates the hearing of the reindeer herding cooperative in a number of permit processing stages

A statement can and should be requested from the Reindeer Herders' Association, but no laws directly stipulate such. However, when issuing requests for statements in the reindeer herding area, it is worth remembering that in matters related to reindeer husbandry a statement requested from the Reindeer Herders' Association alone is insufficient **as the reindeer herding cooperative in the project area is the true stakeholder for the procedures** as the party practising reindeer husbandry in the area. However, if no statement is requested from the Reindeer Herders' Association, some wider perspective pertaining to reindeer husbandry may go unnoticed. The Reindeer Herders' Association monitors various projects

throughout the reindeer herding area. In this case, the Association can obtain information about certain example solutions implemented elsewhere in the reindeer herding area. The statement of the reindeer herding cooperative is usually issued by the Chief of District and/or its council. In expansive projects, the annual general meeting of the reindeer herding cooperative can also take a stand on the project.

STATEMENT ISSUED BY THE CONTACT AUTHORITY

One of the forums for participation in the EIA procedure is the statement issued by the contact authority given on the EIA programme and report. The contact authority collates all the statements issued during the EIA stage and provides its statement on the basis of these and its expertise, which, for instance, discusses the adequacy of the assessment programme. For example, during the reporting stage, the contact authority statement states whether or not the procedure has included sufficient research, comparison, assessment and participation. The statement also takes a stand on the eligibility for the implementation of the project and the realisation of national land use objective guidelines. The project stakeholders can see a summary of all parties submitting a statement and opinion on the project, which ensures a comprehensive overview of the impacts of the project and the attitudes of its participants.

PRIVATE DISCUSSIONS

Private discussions with the inhabitants or actors of the project area are useful means of obtaining "tacit information" on the area that will not necessarily be otherwise achieved in public meetings or other wider connections. These discussions are also used to build trust between the company responsible for the project, or between authority and the project stakeholders. The key individual in discussions related to reindeer husbandry is the Chief of District for the reindeer herding cooperative. The Chief of District has considerable information about issues concerning the reindeer herding cooperative, the views of the cooperative on the project, and about possible other key persons who could participate. When discussions are held with the official representative of the reindeer herding cooperative, assurances are made that the information available is not ambiguous or merely the irrelevant opinions of individuals.

SMALL WORKING GROUPS

In the EIA for large projects in the reindeer herding area the social impact assessments, or reindeer husbandry impact assessments, have been conducted in such a way that discussions about the impacts of the project and means for mitigation were conducted in small working groups. In cases such as these, reindeer husbandry has often been handled in its own small working group, which includes representatives from the reindeer herding cooperative (e.g. a delegation appointed at the annual general meeting, or the council) and the Reindeer Herders' Association. The groups can also include participation by the company responsible for the project, e.g. a mining company representative in either all or some of the meetings. This may, however, alter the atmosphere of the meeting and lead to matters not being discussed as openly as they would have been without the presence of the project representative. In each procedure it is vital that the participants are explained the objectives and role of the small working group tasks. A consultant establishes and convenes the small working groups.

The benefit of a small working group, compared to interviews with individuals, is that in larger groups the impacts of the project are discussed and thereby examined, in addition to many local residents receiving correct information about the project during its various stages. The small working groups have often functioned well with the important task of interaction in the EIA. Good experiences have been obtained from small working group operation in expansive, complex projects (e.g. mines). The location of the project can also be such that requires the broader examination of matters using small working groups. This is the case when, for instance, the project is located in an area sensitive from the reindeer husbandry perspective and has wide-reaching impacts. Expansive projects affect the activities of reindeer herders residing in the various parts of the reindeer herding cooperative area, and the examination of their views in small working groups is important for enabling all of the project's impacts to be considered.

One of the tasks of the small working group can also be joint meetings with other small working groups. This facilitates communication between the stakeholders and others, and the opportunity for stakeholders to tell of matters related to the project and its impacts that they feel are important from a personal standpoint. The stakeholders learn to understand each other's points of view, which can in turn mitigate local conflicts caused by the project. Small working groups can continue to convene following the commencement of the project. The groups can, for instance, monitor the impacts caused by the project from their own standpoints and thereby be a part of the monitoring programme for the project.

CONSULTATIONS AS INTENDED BY SECTION 53 OF THE REINDEER HUSBANDRY ACT

The Reindeer Husbandry Act is special legislation that needs to be taken into account in land use projects located in northern Finland. The Act states that "When planning measures concerning State land that will have a substantial effect on the practice of reindeer herding, the State authorities must consult the representatives of the reindeer herding co-operative in question." (Section 53 of the Reindeer Husbandry Act). For example, each year Metsähallitus consults with the reindeer herding cooperatives about forestry measures conducted on state land located within the reindeer herding cooperative area. Metsähallitus has also engaged in consultations with the reindeer husbandry concerning the relinquishing (sale/lease) of state land for the purpose of wind power parks, mining, and so on. Furthermore, if the municipal plan is planned for

state land, it is the responsibility of the local council to negotiate with the reindeer herding cooperative. The Reindeer husbandry Act does not specify in more detail in connection with which procedure consultations should be arranged, therefore the implementation of these consultations **must be planned for projects on a case-by-case basis.** The legal procedures associated with the various stages of the project can focus on different issues, which is why it is important for negotiations to continue throughout the various stages of the project (EIA, planning, concession, railway master plan, etc.), although with the consolidation of procedures, some negotiations can be combined (e.g. EIA and planning, if simultaneous).

The representatives from the reindeer herding cooperative in question, as intended by the Reindeer Husbandry Act, shall be called to the consultations. Attendance must be seen by at least the *Chief of District for the reindeer herding cooperative,* and preferably by other members of the cooperative council. The invitation must always be addressed to the reindeer herding cooperative, which then decides if other representatives, in addition to the Chief of District officially representing the reindeer herding cooperative, should participate in the event. An individual reindeer herder, or reindeer herding community, is not entitled to negotiate on behalf of the reindeer herding cooperative, as the cooperative is always represented by the Chief of District. The *Reindeer Herders' Association* cannot be a negotiating party in the consultations, but is permitted to be present in the role of expert. The other party to the negotiations is the (state) *authority* and attendance may also be seen by e.g. a *local council representative* (especially if the project plans were drawn up simultaneously by the local council). If the state authority is other than Metsähallitus, it is called to attend as the administrator of state land. The role of the ELY Centre in these consultations as the contact authority (EIA procedures) is to be aware of the impacts of the project, and, on the other hand, the ELY Centre is also the state authority responsible for directing municipal planning. The ELY Centre grants a variety of support schemes for entrepreneurs. The *company responsible for the project* can also be in attendance to provide information about the project and hearing of its impacts. These broad-based consultations could be beneficial, for instance in such a way that everyone in attendance receives information about the impacts of the project on the reindeer husbandry and can engage in measures required by such, such as taking the matter into consideration in the further preparation of the project. There have been some good experiences gained in Lapland from wide-ranging consultations such as these, which can also be recommended for use elsewhere. The convener of the consultations is usually Metsähallitus as the administrator of state-owned land or the ELY Centre, if it acts as the contact authority (in the EIA). The Regional Council of Lapland has convened consultations in the regional planning procedures for Lapland. With municipal planning, the local council usually convenes consultations. The expansion of consultations, as described above, requires the consent of the parties as intended by law, i.e. from the reindeer herding cooperative and state authority.

It should be noted that consultation is not the same as hearing. The consultation is *one instrument that should be used for agreeing how to operate in project matters, which concern reindeer husbandry.* The consultations will focus on thoroughly examining operations and their impacts that have been brought up during the planning and studies conducted for the project (adequacy and reliability of reindeer husbandry study). The *goal of consultations shall be the seeking of solutions and the mitigation of unfavourable impacts.* The consultations convened with the reindeer herders during the EIA process should preferably be initiated prior to the submission of the EIA programme, in order to reach agreement and common understanding as to what needs to be investigated in the procedure as far as reindeer husbandry is concerned. The second consultation can be arranged prior to submitting the report to the authorities. In this way, consultations will examine how the impacts have been studied (reliability of studies), what impacts have been recognised, and if any means of mitigation exist. The consultations can be used to verify whether, for instance, the impacts exceed the limits of significantly hindering reindeer herding, as intended by Section 2 of the Reindeer husbandry Act. Deficiencies and errors in the assessment may also be noticed during the consultations, such as impacts or means of mitigation that were not identified during the conducting of research. The consultations are appointed in accordance with the Reindeer husbandry Act, and minutes of which are kept, inspected and signed. In the EIA, the contact authority and the authority responsible for ratifying or approving the plan shall make assurances that the consultations have been held.

Consultation obligations, such as those intended by Section 53 of the Reindeer husbandry Act, can be recommended for applying to projects not located on state land, even if such is not a legal responsibility.

OTHER CONSULTATIONS

In the regional plans for the Lapland region, the consultation obligation for projects on state land that essentially affect the reindeer husbandry have been broadened in regulations covering the entire plan area to also concern others (authorities), for instance the local councils in association with planning procedures.

For plans it is recommended to initiate consultations with stakeholder groups already during the research stage. In municipal plans (obliged by the regional plan) consultations should be arranged no later than following the public viewing period for the preparatory material. These can examine the possible position of the reindeer herding cooperative, or other impacts presented by the cooperative, and the taking

of these into consideration (mitigation) in the plan. A consultation can also be convened with the reindeer herding cooperative prior to the publication of the preparatory material and again before the publication of the proposal stage, which is an established procedure in the regional plans for the Lapland region. In some cases the reindeer herding cooperative and the Reindeer Herders' Association also participate in the statutory authority consultations in municipal and regional planning procedures, which has proven to be a good way of ensuring the adequate consideration for reindeer husbandry.

If the project is regarded as being detrimental for the industry, negotiations need to be convened between the project implementer and the industry sector for efforts into mitigating and compensating harm. Good practices of consultation shall be followed in consultations. This means that the plans are discussed at a stage, where they can still be influenced. The end result should be to attempt to reach agreement on how the harm caused by the project can be mitigated and compensated, how these can be monitored, and how to react to monitoring findings.

IMPACT MECHANISMS

At least the following kinds of impacts can affect reindeer husbandry during the operational period for the land use project:

1) impacts on reindeer pastures
   (a) direct and indirect removal of pastures intended for reindeer husbandry: reindeer avoid certain areas, or the areas cannot be fully used for reindeer husbandry
   (b) alteration of pastures
   (c) fragmentation of pastures
   (d) uneven wearing of pastures
   (e) possible hazardous substance residues in the reindeer's nutrition
2) impacts on reindeer grazing (disturbance)
3) impacts on reindeer husbandry
   (a) operation: for instance the reindeer routes of travel will be disturbed
   (b) structures: for instance round-up fences and barrier fences remain within the project region, the intended purpose of these is altered, or are no longer used
4) reindeer accidents (in traffic or the project area)
5) impacts on reindeer health and wellbeing
6) socio-economic impacts and impacts on the viability of the industry (as a consequence of the above-mentioned impacts)
7) impacts on reindeer husbandry culture

IMPACTS ON PASTURES

Land use projects always cause the loss or alteration of pastures. Quantitative losses are caused by pastures being covered by infrastructure. Losses of pastures normally occur on a wider area than merely what infrastructure covers, as disquiet areas normally remain in-between and around these areas, which reindeer and reindeer husbandry can no longer use. The project can also cause direct obstructive impacts, which means that the reindeer, or reindeer herder, is unable to access pasture or other areas of activity due to the location of the project. In some cases alterations to the pastures occur instead of direct losses. For instance, with power lines the pastures are not entirely unavailable for use by reindeer husbandry, but the flora in these areas changes when the tree stands are removed. The change can also be noticed on the edges of forested areas. The alteration can lead to a change in the grazing of reindeer. For instance, if trees with arboreal lichen are removed from early spring grazing areas, it becomes a less important early spring area and the reindeer could wander to another area. The best grazing areas are the homogenous, expansive pastures that retain pasture tranquillity. The fragmentation of grazing areas into smaller parts also affects the usability of pastures from the reindeer husbandry perspective. The cumulative impact on land use of sizeable projects or numerous small projects can also impact the condition of other grazing areas (e.g. lichen pastures) throughout the reindeer herding cooperative area, as

the homogenous grazing areas will be fragmented and the grazing pressure and/or trampling increases in the remaining grazing areas and leads to the wearing of such. Similarly, other areas can remain underused.

During their annual cycle reindeer use different grazing areas. Winter pastures are regarded as a minimum factor in reindeer husbandry. The number and condition of these determine the survival of reindeer through the winter and thereby also on the viability of the reindeer economy, as good winter pastures means less supplementary feeding (feeding costs are high). However, particularly in the southern and central parts of the reindeer herding area, the majority of reindeer herding cooperatives have to provide supplementary feeding or take reindeer into nurseries. The most significant of the qualitative losses of pastures are usually winter pastures (particularly old growth forest, i.e. the best arboreal lichen and lichen pastures) or pasture types, which are otherwise scarce in the reindeer herding cooperative. The significance of better quality summer pastures (nutrient rich bogs, forest mires, river and stream fronts) can be high, as these areas are used by reindeer to build up strength for the approaching winter. The area can also be of functional value, perhaps having little snow cover in a difficult winter, which will make it easier for the reindeer to obtain their nutrition. The areas of breeding periods, i.e. rutting and calving, are also functionally valuable.

The location of the project determines the quantity and quality of impacts it causes. When assessing the impacts of a project, in addition to assessing quantitative losses in pastures, qualitative losses (type of pasture/function) also need to be assessed, and the assessment must describe the **importance of the area for the livelihood**. Qualitative losses can be assessed in relation to the pastures of the entire reindeer herding cooperative: e.g. if the project is located in pasture types that are already abundant/scarce. The loss of pastures leads to an increased need for supplementary feeding, the value of which can also be estimated. The duration of the project and the impacts of the project on the environment are important: if the area can be restored after the completion of the project, or if it will be entirely excluded from use in grazing (e.g. mines, reservoirs).

It is also significant, if the project requires the use of chemicals, which are harmful for the environment, or if, for instance, materials are excavated from the soil that could contaminate the surrounding nature and, via this, have an impact on the plants reindeer use for nutrition or the drinking water (heavy metals, radioactive materials). If the project causes impacts on the environment, the residues in the plants reindeer use for nutrition could also have impacts further up the food chain (cf. The radiation exposure caused by the nuclear tests in the Kola Peninsula in reindeer herders eating a lot of reindeer meat (STUK 2010).

IMPACTS ON THE USE OF REINDEER PASTURES

There are seasonal differences and differences between the sexes in the disturbances to reindeer pastures. The female reindeer form approximately 80% of the reindeer winter herd and represent its most important productive part. In early spring, as gestation is in its final stages, and during the calving period, reindeer must not be caused stress and excess consumption of energy. The peacefulness of the pasture area is also important in ensuring successful calving and rutting. According to research, particularly in the early spring and early summer, gestating females have been seen to be sensitive to disturbances caused by human operations, such as tourism, traffic and military drills, and therefore avoid these areas of disturbance (e.g. Helle & Särkelä 1993, Vistnes & Nellemann 2001, Vistnes 2008, Helle et al. 2010, Anttonen et al. 2011). In these cases, an area is formed in the neighbouring area of disturbance that is less used for grazing and reindeer husbandry or lies completely outside these areas, thereby causing extra grazing pressure elsewhere. As a result of sudden disturbances caused by human operations, the separation of the calf from its dam is possible. Young calves will not survive without their dam's nutrition and protection. Calves can also easily drown in steep edged ditches or channels (e.g. peat production area). It is also possible that young calves will not be able to escape predation, if deep ditches are along the escape route.

The male reindeer and castrated bulls, have been found to be less sensitive to human caused disturbances in all times of the year (e.g. Helle & Särkelä 1993, Vistnes & Nellemann 2001). On the other hand, during the middle of the summer, when periods of insect swarms bother the reindeer, they search for protection from these bloodsucking insects from gravel pits, roads or other open areas, which have unfavourable wind conditions for the insects, thereby not being disturbed by human operations or infrastructure. For instance, it is known that in the middle of the summer, males seek refuge from the insect harrasment in mining areas. In addition to sex and season, the disturbance behaviour of reindeer is also affected by how much the reindeer are used to human activities and by the size of the herd (large herds can endure more disturbance) (Reimers & Coleman 2006). Reindeer can become adapted to human activity, for example if activity occurs in an area that offers good nutrition (e.g. Skarin 2007), or if the reindeer tries to avoid activity that would be detrimental to its health, such as insect harrasment (e.g. Skarin et al. 2004).

It is also possible that the project causes unpredictable impacts. For instance, it could be possible – if the project is particularly large and/or located in a sensitive area – that the reindeer start to wander away from the reindeer herding cooperative area. Examples of these are caused by natural conditions, where the base of the pastures is frozen or mouldy, or large reservoirs constructed. When pastures are polluted, the reindeer can travel long distances to end up in other

reindeer herding cooperative areas. When some reindeer start the journey, the reindeer met on the way join the others, and soon there are hundreds of reindeer on the move.

EXAMPLES OF IMPACTS – MINES AND REINDEER GRAZING

Practical experiences of reindeer behaviour close to mines have been obtained from the Pahtavaara, Kittilä and Kevitsa mines. According to the Sattasniemi Reindeer Herding Cooperative, following the construction of the Pahtavaara Mine, grazing of reindeer in the neighbouring areas has changed. At the Sattavaara enclosure, located close to the mine (approximately 3.5 kilometres south-west as the crow flies), which used to operate as the main round-up enclosure, now handles fewer reindeer than before. This means that reindeer no longer naturally migrate with the same intensity to these areas close to the round-up enclosure from which they could be herded for round-ups. The number of reindeer processed was at its lowest during the initial years of the mine. However, during the operational stage of the mine, males had accessed the mining area to find refuge from insect harrasment, even though the mining area is fenced, as Pahtavaara is located in summer grazing grounds, and the males and bulls, opposite to the females bearing calves, do not avoid disturbance caused by humans in the summertime. Apparently, a few Sattasniemi male reindeer have drowned in the slurry basins in the search of refuge from insect harrasment. Kittilä Mine was constructed on the reindeer's migration route for their autumn grazing cycle. Now the movement of reindeer has turned away from the mine, as the mine and its overland runoff areas form a physical obstacle for migration, and the reindeer no longer come to the farm nursery located in the village of Kiistala close to the mine. According to accounts by reindeer herders, the areas nearby the mine have also been deserted by reindeer. The reindeer of the Kevitsa Mine area primarily dug up their nutrition during the expansive construction stage in early winter 2010 from an area approximately 0.5–1 kilometres from the mining area, despite having earlier still gathered on the grazing grounds within the mining area even during the early construction stage.

IMPACTS ON REINDEER HUSBANDRY ACTIVITIES

The impact of a land use project on the availability of reindeer husbandry structures can be either directly or indirectly prevented. Structures, such as round-up enclosures or boundary fences between reindeer herding cooperatives, can be entirely covered by operations. During the construction stage, openings may have to be made in the fences due to access to the area or the structure itself (road, power line corridor) and later its maintenance. In this case the fences lose their significance as structures preventing the movement of reindeer, and barriers need to be built. The making of these barriers always increases the workload of reindeer herders, as constant care needs to be taken that the fences remain shut, especially on the boundaries of the reindeer herding cooperatives.

The use of the reindeer husbandry infrastructure can indirectly become complicated or prevented, for instance, if it is not possible to herd reindeer into the round-up enclosures. When moving reindeer, they are gathered on foot or using ATVs or snowmobiles, sometimes assisted by a small helicopter or a dog, into a single large herd and moved onwards making use of their natural instincts. The moving of reindeer is sensitive to disturbances and will not be successful if forced. For instance, sudden movement, noise or smell ahead of the herd being moved, or an unnatural opening could scare the reindeer and scatter the herd. This means that reindeer herding and moving has to be started again from scratch. If there are roads or snowmobile trails along the route, reindeer can travel along these to the wrong direction. When taking herds through difficult areas (power line corridor, road, tracks) a bigger workforce is required. The extra work incurs extra expenses and thereby affects the viability of the livelihood. For instance, the cost of one flight hour by helicopter alone is hundreds of euros. If the use of the round-up fencing is made significantly complicated or prevented, the reindeer husbandry practices for the entire area will need to be reorganised. Making new arrangements is a substantial and time-consuming process, as the locations of round-up areas have usually been determined over decades or even centuries, and the finding of a new site is not a simple matter.

Many reindeer herding cooperatives use light helicopters for herding and moving reindeer during round-up times. According to aviation law, during a normal flyby, helicopters shall maintain a safe distance from wind power stations of 600 metres horizontally and 300 metres vertically. In the case of reindeer husbandry, the matter is of a chartered flight task, allowing these limits to be reduced, if the nature of the task requires such. In these cases, the compromising of safe distances is at the pilot's own discretion and responsibility. This means that the stipulated safety distances will not prevent the transportation of reindeer through wind power parks by using a helicopter. Nevertheless, the transportation of reindeer could become more difficult, if the reindeer are

disturbed by the noises and movement made by the wind power mills.

If forested areas are cleared during snow cover in the winter, for the purpose of e.g. power lines, tall stumps remain in the cleared areas that can potentially damage off-road vehicles. The new infrastructure could also pose a safety risk for reindeer husbandry operations. Examples of these are power line structures, especially if a helicopter is used for moving reindeer. If the helicopter cannot get close to the power lines, the reindeer can learn to stay beneath the power lines, making the task more difficult. When flying, rivers are often used for assistance in navigating to the work site and if these power lines cross rivers, there is the risk of an accident. In reindeer transportation situations, the pylons and guys could also pose some sort of risk also for reindeer herders using off-road vehicles.

It is also significant for reindeer husbandry if, by changing the grazing cycle of reindeer, the project indirectly impacts the obligations of reindeer husbandry as to the protection from damages caused by reindeer on crops, forest regeneration areas and the gardens and yards of permanent residences. Keeping reindeer within the reindeer herding cooperative area is also stipulated by law, and, if the project has an impact on reindeer wandering to other reindeer herding cooperative areas, extra work and expenses will be incurred from moving and herding the reindeer to their own reindeer herding cooperative.

IMPACTS ON THE REINDEER ECONOMY

Changes in the grazing of reindeer also impact on the feasibility of the livelihood. This was confirmed with e.g. the study conducted by the Finnish Forest Research Institute (Helle et al. 2010), which examined the impacts of the Rovajärvi military exercise area on the activities of the Pyhä-Kallio Reindeer Herding Cooperative. Due to the disturbances, reindeer can gather in certain areas more than is usual. According to the study, because of increased competition for food, more stress, and the increased wearing of pastures within the impact region of the Rovajärvi military exercise area, the calves to be slaughtered lost an average of one kilogram in weight, and the calf percentage fell by five percent. As the reindeer husbandry tasks had to be moved from autumn to January–February due to the military exercises, around 24% of reindeer were not handled in the autumn, which meant an average drop in carcass weight by approximately 2.1 kg/carcass. These all impact the meat production of the livelihood and slaughter income and weaken the viability of the livelihood. In addition, the work time for reindeer husbandry tasks was estimated in Pyhä-Kallio to be 1.9 times and the herding costs 1.5 times those of neighbouring reindeer herding cooperatives, even though there were no other fundamental differences between the reindeer herding cooperative areas or practices. Reindeer may also have to be given supplementary food in depleted or worn pastures more than before, which also increases the costs of the livelihood and compromises feasibility.

If the use of reindeer husbandry structures are prevented or made significantly more awkward, the reindeer husbandry practices of the reindeer herding cooperative, or its part, will have to be reorganised (e.g. moving fences, building new fences). This incurs extra costs for planning operations. In particular, an important round-up enclosure remaining underused could incur the need to plan operations to become more effective. However, the placement of structures in the reindeer herding cooperative area is no simple task, as the project could cause a number of simultaneous changes, and a semi-domesticated animal is difficult to control. It takes time before the changing grazing cycle becomes permanent. It is likely that prior to this some preliminary experiments will need to be done before identifying permanent solutions at a later date.

Due to other disturbances caused on grazing or the grazing cycle, the reindeer herding cooperative can incur extra expenses from reindeer wandering into neighbouring reindeer herding cooperatives. The reindeer herding cooperative may have to pay extra costs for reindeer separated from neighbouring reindeer herding cooperatives, or for calf marking fees for calves marked in neighbouring reindeer herding cooperatives. The reindeer herding cooperative also incurs extra expenses and losses from transporting reindeer to their own reindeer herding cooperative, adding more representatives for the round-up times of neighbouring reindeer herding cooperatives, and from the unmarked calves left in the neighbouring reindeer herding cooperatives.

If, by stipulation of the Ministry of Agriculture and Forestry, the maximum number of permitted reindeer needs to be reduced due to the reduction in pasture area and the uneven wearing of pastures, this would also mean a significant drop in the viability of the livelihood. Particularly for reindeer owners, who have a size of reindeer herd that is close to the lower limit for receiving the subsidy for living reindeer, these cuts could result for them in having to relinquish the livelihood, as their herd could fall below the lower limit for the subsidy, if reindeer numbers are uniformly reduced from reindeer owners. The subsidies of other nations also adhere to the limit of 80 living reindeer in a herd. At worst, because of the fall in the viability of the livelihood, change in land use can cause uncertainty about the future, thereby making it difficult to find young people to continue with the reindeer herding livelihood. This also has cultural impacts, if the centuries-old livelihood diminishes away to nothing.

Reindeer husbandry can incur substantial economic impacts, if, due to a certain project, the quality of reindeer meat was compromised (e.g. heavy metals, radiation). The image of clean nature and consumer imagination are sensitive to negative news coverage, and this could reflect on the meat production of the entire reindeer herding area.

TRAFFIC IMPACTS AND OTHER DAMAGES

Due to other land use and human activities, reindeer can be increasingly exposed to a variety of damages in its grazing grounds. The most accidents occur in traffic.

Each year, reindeer road collisions account for around 3500–4500 reindeer. Tourism, mining and other increased human activity also increase traffic numbers on the roads in the north, and particularly the numbers of heavy goods vehicles can increase. Heavy traffic causes proportionately more reindeer accidents. Research shows that the share of heavy goods vehicles of the traffic on Lapland's roads is approximately 10% of traffic, whereas their accidents with reindeer account for around 20% of accidents (Lapland ELY Centre 2011). The majority of road traffic accidents with reindeer occur in November–December in dark and slippery conditions, which usually leads to the loss of breeding animals left to live over the winter. It has been estimated that the number of reindeer accidents can increase in relation to traffic numbers, if the maximum number of permitted reindeer remains the same (Nieminen M., verbally informed).

The majority of reindeer accidents on railways occur in mid-winter and mid-summer. In the winter, when the snow cover is thick and soft, reindeer can easily walk along railway tracks, if these occur along their migration route from one grazing area to another, because reindeer prefer walking on firm ground rather than wading through deep snow. In mid-summer during the periods of insect swarms, the reindeer often seek refuge from insect harassment by moving to windy railway embankments situated higher than the surroundings. This is how the reindeer become exposed to railway accidents. In accidents such as these, a number of reindeer are usually killed at the same time, as this is the time reindeer move in larger herds (e.g. female and calf herds in the summer), or rutting herds. In 2011 a total of 355 reindeer died in railway accidents (Reindeer Herders' Association 2012).

Reindeer killed in road and railway traffic accidents are compensated to the reindeer owner either through the Finnish Motor Insurers' Centre or VR (state railways) (private railways may be introduced in the future – the compensation matters associated with such need clarification!). However, the monetary compensation received for the loss of a breeding animal does not fully compensate for the loss, as this does not take into account the losses of future calf generations. It takes about 3–4 years before a calf, to replace the breeding female, matures enough to be able to produce calves itself. Furthermore, not all reindeer lost in accidents are ever found, for instance if they survive the collision and are injured and disappear into the forest for shelter. On the other hand, the aftermath of railway accidents with reindeer is normally so devastating that the reindeer owners have difficulties in ascertaining who the reindeer belong to, as the reindeer heads (earmarks) are often missing. In these cases, the compensation is paid to the reindeer herding cooperative. Extra damages are caused by the fact that reindeer killed in traffic often belong to the reindeer owners of certain areas, which means that these reindeer herders suffer comparatively more from their losses. The railway itself is an obstacle for reindeer and reindeer husbandry, as the Railways Act (110/2007) forbids movement on the track or crossing the track using e.g. a snowmobile. The manager of the railway infrastructure can grant a temporary permit to cross a railway using a snowmobile during times of snow cover, at railway crossings located along forest roads, on which the use of motor vehicles, other than snowmobiles, is forbidden (Railways Act, Section 17). Securing the safety of reindeer and reindeer herders requires adjustments, such as fencing both sides of the track and adding a sufficient number of crossings and underpasses. However, a fenced track in particular splits the reindeer herding cooperative area.

Other accidents can also be caused by land use. Particularly male reindeer could be attracted by the stockpiles and basins of mining areas to seek refuge from swarms of bloodsucking insects, as these areas have air currents that are unfavourable for bloodsucking insects. In mining areas reindeer are exposed to a variety of accidents, including traffic and blasting accidents, waste that can damage the reindeer's hooves, and waterlogged, sinking impacts of tailings ponds. There have been documented cases of reindeer drowning in slurry basins at operating and decommissioned mines. However, the reindeer have also caused some disturbances, for instance by breaking the wing mirrors of cars owned by the mine employees in the mine car park.

In the peat production areas and e.g. in the neighbouring areas of mines, wherever ditches are excavated for the drainage of areas, the reindeer will be exposed to accidents. Bogs are summer pastures, open and windy areas that are natural areas for the gathering of reindeer in the summertime. Peat production areas typically have deep, steep-sided ditches with a high water level, and even the legs of adult reindeer are not able to reach the bottom of the ditch through the mud. Reindeer falling into ditches, which cross their routes of travel, find it difficult to get out of the ditch, especially young calves. The number of reindeer dying from drowning is nevertheless difficult to estimate, as reindeer are not normally found from ditches, unless someone, such as a contractor, were to notice. Only the bones accumulating on the screen at the end of the ditch provide some understanding of the numbers of reindeer drowning. At least to date, no compensation has been paid for the reindeer losses in peat production areas.

EXAMPLES OF IMPACTS – TRAFFIC ACCIDENTS

As a result of other forms of land use, the number of accidents with reindeer increase. The most accidents occur in traffic. For instance, following the establishment of the Suurikuusikko Mine, twice as many reindeer were killed in traffic compared to the time prior to the mine. Traffic accidents occur on certain road sections, which means that accidents are focused on the reindeer of certain reindeer owners. These accidents have an impact on the structure of the herds of the reindeer owners, as the majority of accidents occur in the winter, when the victims are only the reindeer used for breeding.

Railway accidents usually occur in the winter, when the snow cover is soft and the reindeer prefer walking along the tracks, along solid ground. The other accident peak is in mid-summer, when the reindeer seek refuge from insect harrasment on windy railway embankments, which are higher than the surroundings. As a train approaches a reindeer, the reindeer attempts to flee by running along the rail track, if the snow cover is deep or the railway embankment is high. During both of these times, a large number of reindeer could be killed. For instance, the Palojärvi Reindeer Herding Cooperative has lost up to 33 reindeer in train accidents over a period of two days. In winter 2011–2012, the total number of reindeer lost by the cooperative in train collisions was over 150

With reindeer hit by trains, it is sometimes difficult to ascertain the reindeer owner. In these cases the compensation is paid to the reindeer herding cooperative, and the reindeer owner will not receive compensation for the property losses.

IMPACTS ON CULTURE

Cultural manifestations associated with reindeer husbandry include, for instance, reindeer herding habits and traditions, as well as the physical forms related to the cultural heritage of reindeer husbandry, such as the landscape, place names or reindeer husbandry structures (round-up enclosures, barrier fences, cabins, sod huts, summer and winter villages, etc.). The language spoken by reindeer herders can also be regarded as being associated with culture. In both the Sámi and Finnish languages there are many special words related to reindeer husbandry, from the physical characteristics of reindeer to various reindeer husbandry methods and weather conditions. The internal structures for the reindeer husbandry of the reindeer herding cooperative reflect culture: Are the reindeer of the reindeer herding cooperative tended in reindeer herding communities, in family communities according to village? What sort of workforce is involved? Will work require overnight in the cabins, or is the workplace visited from home? And so on.

With the introduction of industrial activity in the reindeer herding cooperative area, a variety of changes may occur in the culture of the reindeer herding cooperative or the reindeer herding community. These can include the changing of traditional reindeer husbandry habits and practices, disappearance of traditional knowledge (e.g. sacred sited, language, useful flora) or traditional skills (handicrafts).

New forms of land use could impact the reindeer economy by reducing its viability and thereby making the future of the livelihood uncertain and lessening the appeal of practising the livelihood. This could lead to difficulties in finding young people to continue the livelihood. This will cause substantial impacts, as a centuries-old livelihood, which has maintained local culture, knowledge of nature and receiving subsistence from nature, diminishes. The continuation of reindeer husbandry and the passing on of these skills to future generations is of vital importance and must be safeguarded. Otherwise the traditional information about the livelihood and a certain area will disappear.

If reindeer husbandry becomes more difficult and ends, people will probably be left with no reason to live in the villages. In this way the diminishing of reindeer husbandry would have impacts on the population structure (negative migration of people of working age and ability) of the northern (remote) villages, and via this also on the structure of society, welfare and safety. Consequently, the decline in the reindeer economy will also be evident in the traditional cultural landscapes: yards, buildings and fields will be untended, if villages lose their permanent residents.

SOCIAL IMPACTS

The social impacts of projects could be compromising the continuation of the livelihood due to its changing age structure (young people migrate away from the area), local conflicts (reduction in sense of belonging with society, social inequality between reindeer owners), and economic uncertainty. The health (harmful substances, diseases) and safety (risk of injury) of reindeer herders are matters to be handled in the social impact assessment. As a result of other land use, conflicts may arise between local actors. For instance, if obstacles or disturbances in pastures guide or move reindeer to cultivated areas, conflicts can arise between reindeer owners and farmers. This could lead to the obligation of the reindeer herding cooperative to pay compensation and erect fencing, which incurs extra expenses.

New land use projects can also be beneficial for the local community if, for instance, these create new jobs. Various seasonal jobs, or the permanent employment of the spouse, increase the income of a reindeer herding family and the welfare of the reindeer herding community. On the other hand, if the reindeer herders take on other work, they will have to give up reindeer husbandry practices. If men of working ability are away from reindeer husbandry work, this will cause significant harm to the actual work of the reindeer herding cooperative: work will pile up and be delayed, work efficiency is reduced, costs rise, which lead to a rise in herding fees collected by the reindeer herding cooperative, reindeer will not be handled at the right time leading to a fall in slaughter yields, and the herd and the production of such will diminish. Changes are gradually occurring in reindeer herding communities: conflicts arise and the sense of social belonging of the reindeer herders suffers ("are we reindeer herders or miners?"). On the other hand, the potential growth in demand for services related to reindeer meat, reindeer handicrafts or reindeer-related services, could benefit the reindeer community, although selling reindeer meat is not a problem today either. However, demand may raise the price received by the producer.

In the scientific world in particular, there is talk about the term traditional ecological knowledge (TEK), distinguishable from scientifically produced knowledge. This means the knowledge acquired by the generations of people, who have continued to live in the area on the nature as well as historical, cultural and spiritual living in certain environments (see e.g. Inga & Danell 2012). For instance, in Canada information like this must be taken into consideration in the assessment of environmental impacts. The counterpart statutory procedure in Finland is mainly the social impact assessment. In the Akwé: Kon Guidelines published in 2011 (Ministry of the Environment 2011) concerns cultural, environmental and social impacts on indigenous and local communities, and the assessment of such.

Cultural and social impacts can be evident in large projects, or if there are a number of joint impacts of smaller projects, or if the project is located in an area that has special cultural significance. Consequently, these impacts will not necessarily be assessed in the procedures of the smallest of projects.

BASELINE STUDIES

BASELINE STUDIES CONCERNING REINDEER HUSBANDRY

Information about current conditions in the area is important in the assessment of impacts associated with reindeer husbandry, as the baseline information is the information on the basis of which the assessment of impacts is based in the EIA and plans. Documented data on the reindeer husbandry activity and reindeer grazing in the project area are also important for the monitoring of impacts during the operational stage.

There are various types of projects in different regions. Mines often cover extensive area and require complex infrastructure, such as roads, railways and power lines. In this case, the baseline studies are focused on an expansive area, at least on the entire reindeer herding cooperative area where the project is located, as the project has probable impacts on areas outside the actual project area. In some cases, studies will even cover a number of reindeer herding cooperatives. Expansive projects usually cause many different types of impacts, the investigation and documentation of which can require a number of different methods. In large-scale projects, reindeer husbandry studies can be compiled into a separate report. Wind parks and peat production areas are usually much more local, and their impacts do not necessarily extend throughout the entire reindeer herding cooperative area. In small projects, there can be fewer types of impacts (e.g. excluding culture impacts) and less work input could be sufficient for the investigation of such. In this case, the matters concerning reindeer husbandry can be handled in the general report, not in a separate report.

The Akwé: Kon Guidelines (Ministry of the Environment 2011) shall be applied in the assessment of the environmental, social and cultural impacts of projects located in the Sámi Homeland area.

Studies conducted in the EIA procedure

In practice the EIA programme is usually conducted as a background task handled by experts, and information about the entire project will be available for local actors once the contact authority has announced the commencement of the public viewing period. The EIA programme shall, however, comprehensively describe the baseline situation of the area. If an appropriate description of the current situation of reindeer husbandry is not given by, for instance, the EIA programme, it will be difficult to assess whether or not the studies will be sufficient. Material for determining the current condition of reindeer husbandry already exists, but studies always require discussions with the reindeer herding cooperative, as reindeer husbandry practices vary in different parts of the reindeer herding area. Therefore, it is recommended to contact the reindeer herding cooperative, or in practice the Chief of District, already prior to submitting the EIA programme. The box below shows the basic matters that are recommended to be known already during the EIA programming stage.

The following basic matters must be described in the EIA programme (see next section for materials and methods mentioned):

- *Basic information about the reindeer herding cooperative (reindeer, reindeer owners, traffic accidents, predation), location in the reindeer herding area, and the special characteristics (statistics, publications, interviews) of reindeer husbandry activities*
- *The nature of reindeer husbandry activities in the project area and the entire reindeer herding cooperative (reindeer husbandry GIS data, map-based tasks and interviews)*
- *Description of the basic infrastructure of the nature of reindeer husbandry in the project area and the entire reindeer herding cooperative (reindeer husbandry GIS data, map-based tasks and interviews)*
- *The location of the project area in relation to the grazing of reindeer and other activities (reindeer husbandry GIS data, map-based tasks and interviews, possible GPS collar data)*
- *Pasture inventory data on the pastures of the reindeer herding cooperative (FGFRI or Metla)*
- *Reindeer density data on the project area (e.g. processing information from the closest round-up enclosure or interviews)*
- *How important the area is for the reindeer herding cooperative activities, i.e. the significance of the area from the reindeer husbandry perspective: What proportion of the reindeer graze or are handled in the area? How many reindeer herders does the project then directly impact on? What is the significance of e.g. the round-up enclosure (main enclosure or less used)? (on the basis of the aforementioned data and interviews of Chief of District)*
- *Landownership of the project area, which affects various sectors of the reindeer herding area, e.g. the liability of the reindeer herding cooperative for compensating for damages caused by reindeer, consultation obligation with authorities, etc.*
- *The need for consultation as intended by Section 53 of the Reindeer husbandry Act, and possibly how it can be made compatible with EIA and planning procedures.*

Studies for planning procedures

In plans associated with projects, the same baseline studies and assessment of impacts are used, which were used for the EIA. Studies performed for the EIA procedure are usually relatively wide-ranging and are therefore also sufficient for planning procedures. Project plans are usually local and consequently the study areas are relatively small. The master plans, on the other hand, can cover large areas of the municipality and thereby also large areas of the reindeer herding cooperative. There can be many reindeer herding cooperatives in the plan area. The participation and assessment plan (OAS) identifies what studies are intended to be conducted, as well as what impacts are assessed and how the impacts are assessed. The OAS can be supplemented and in order to determine the adequacy of the OAS, a negotiation with the ELY Centre can be requested before the plan proposal is available for public viewing.

The following basic matters must be described in the preparatory material for the local detailed plan or disposition plan (see next section for materials and methods mentioned):

- *Basic information about the reindeer herding cooperative (various statistics and publications)*
- *The nature of reindeer husbandry activities in the area (reindeer husbandry GIS data, map-based tasks and interviews/consultations/statement)*
- *Description of the basic infrastructure of reindeer husbandry activities in the area (reindeer husbandry GIS data, map-based tasks and interviews/ consultations/statement)*
- *Location of the area in respect to grazing of reindeer (reindeer husbandry GIS data, map-based tasks and interviews/consultations/statement)*
- *How important the area is for the reindeer herding cooperative activities, i.e. the significance of the area from the reindeer husbandry perspective: What proportion of the reindeer graze or are handled in the area? How many reindeer herders does the project then directly impact on? What is the significance of e.g. the round-up enclosure (main enclosure or less used)? (on the basis of the aforementioned data and interview of Chief of District)*
- *The need for consultation as intended by Section 53 of the Reindeer husbandry Act, and possibly how it can be made compatible with EIA and planning procedures.*

The **regional plan** *can be supported using available materials and data on reindeer husbandry in the area on the general level, as well as on the basis of information received in consultations and statements about, for example, areas and structures important for reindeer husbandry, and the need for coordination.*

STUDY MATERIALS AND METHODS

Statistics

There are a variety of statistics issued by different bodies, which can be used for describing the basic facts about the reindeer herding cooperative. The Reindeer Herders' Association gathers statistics on the reindeer economy (reindeer registers of reindeer herding cooperatives) and publishes them annually in the year's second edition of the Poromies *(Reindeer Herder)* journal. Information can also be requested direct from the Reindeer Herders' Association. The Lapland ELY Centre publishes statistics on, for instance, the economy of the livelihood (e.g. reindeer owners eligible for support, i.e. reindeer owners aged 18 – 65 owning over 80 live reindeer and who practice reindeer husbandry as their principle livelihood), and investment support. The reindeer economy statistics are published each reindeer husbandry year. The reindeer husbandry year begins on June 1st and ends on May 31st. Other statistics, such as the reindeer killed in road traffic accidents or reindeer found killed by predators, are published each calendar year. These are also published in the year's second edition of the Poromies journal.

INFORMATION ABOUT REINDEER PASTURES

RIn the reindeer study conducted by the Finnish Game and Fisheries Research Institute (FGFRI), the condition of reindeer pastures is monitored and reindeer pastures are surveyed, particularly in the areas specifically intended for reindeer husbandry. FGFRI pasture classification was conducted using earth observation. In addition to estimating the numbers of pastures and nutrition flora, the FGFRI inventory also undertakes to estimate the usability of pastures by incorporating into the pasture inventory, e.g. coverage of areas directly claimed by infrastructure constructions, as well as an estimate of the coverage of areas on which disturbance is caused for each reindeer herding cooperative, as in addition to reindeer husbandry, the other land use in the area will cause fragmentation and wearing strain on the pastures (Kumpula et al. 2009). The pastures of the southern and central reindeer herding area are surveyed by the Finnish Forest Research Institute (Metla) in connection with conducting forest inventories. If this data can be utilised, the quality of pasture losses in the project area can be calculated using the data. Qualitative pasture losses may otherwise be estimated on the basis of the information received on the reindeer herding cooperative area. FGFRI pasture classifications have been made using the Landsat satellite image data, the resolution of which is 30x30 metres. If more precise satellite or aerial images are available for the EIA and, if the resources allow, more accurate pasture classifications could be conducted to support the assessment of reindeer impacts. The POROT project jointly managed by the Finnish Environment Institute (SYKE) and FGFRI was initiated in summer 2012, which involves creating a GIS database for the reindeer husbandry comprising data from various sources. It is estimated that this information will be available for the planning of land use from 2014 onwards.

GIS DATA OF REINDEER HERDING COOPERATIVES

Reindeer husbandry activities in the reindeer herding cooperative and planned project area are probably easier to comprehend, if presented verbally and using maps (Figure 9). In the early 2000s, the Reindeer Herders' Association has gathered reindeer husbandry Geographical Information System (GIS) data illustrating by the reindeer herding cooperative the various **reindeer grazing grounds, other functional areas, reindeer husbandry structures, grazing cycle, routes of travel, and other reindeer husbandry activities**. For some reindeer herding cooperatives this data is no longer up-to-date or ambiguous, so the updating of such needs to be checked with the reindeer herding cooperative in question, and should also be corrected or supplemented with interviews. Due to the copy-right for the GIS data in the reindeer herding cooperative concerned, and for the purpose of obtaining rights to use the data, a written agreement must be entered into with the reindeer herding cooperative. The contact template is available from the Reindeer Herders' Association. Some reindeer herding cooperatives may refuse requests to use the data. FGFRI and SYKE are implementing the reindeer husbandry GIS data project (POROT). The project will update the GIS data material by reindeer herding cooperative for some of the cooperatives, which is estimated to be available for assistance in land use projects in 2014. There are also other organisations, such as Metsähallitus, that hold GIS data associated with reindeer husbandry and the forests in the region. Information held by the National Land Survey of Finland can include some GIS data related to reindeer husbandry (e.g. fencing details from the topographic database).

REINDEER HUSBANDRY PLANS OF THE REINDEER HERDING COOPERATIVES

Reindeer husbandry plans have been made for the reindeer herding cooperatives in collaboration between the reindeer herding cooperatives and the Reindeer Herders' Association. These plans describe the basic activities of reindeer husbandry in the reindeer herding cooperative, as well as future plans and needs for improvement. The reindeer husbandry plan is primarily made for the internal operations of the reindeer herding cooperative and the development of its operations. However, it could also be possible to obtain these plans from the reindeer herding cooperative for the purpose of studies and impact assessments.

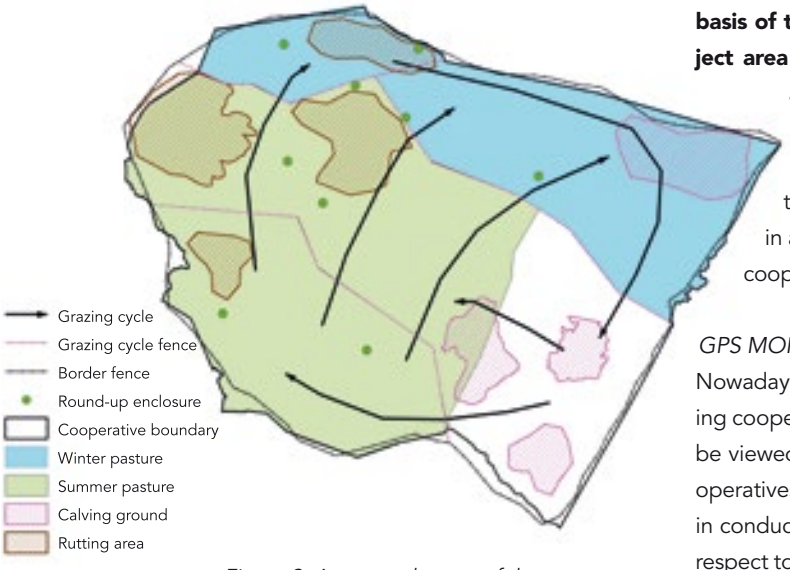


Figure 9. An example map of the operations of an imaginary reindeer herding cooperative.

MAP-BASED TASKS

Map-based tasks have been recognised as being good methods for assessing impacts focused on the reindeer livelihood. The aforementioned reindeer herding cooperative GIS data should be used in assisting with map-based tasks. Using map tasks, the GIS data can be supplemented and updated. For instance, the routes of travel of the reindeer, areas through which reindeer can be moved and the river crossing routes for reindeer and/or reindeer herders, could be marked on the map. Using maps, the reindeer herders can easily describe the activities of the reindeer herding cooperative, and an outsider will find it easier to understand their activities. The maps can also be used to describe and estimate the **importance of the project area** on the reindeer herding cooperative as an entirety, or estimate the **extent of the impact region** with regards reindeer husbandry activities. Likewise, maps can be utilised to search for **mitigation means** for the impacts of the project, for instance alternative road, railway or power line alignments, or other alternative modes of operation for the implementation of the project. Map-based tasks can also be used to seek alternatives for reindeer husbandry activities, if the project is initiated (e.g. where to move the round-up enclosure and how it would function in this case). It could be necessary for the reindeer herding cooperative to independently contemplate already during the planning stage how reindeer husbandry should react and make preparations, if the project is realised. It must be the intention for every assessment, EIA and planning procedure to present a clear map, or maps, of reindeer husbandry activities in respect to the baseline study and impact assessment.

In map-based tasks and the conclusions reached, it should be taken into account that **making assessments merely on the basis of the percentage of the area allocated for the project area does not reveal all of the project's impacts.** In addition, it should also be examined in what area the project is located in relation to the activities of the reindeer herding cooperative. Even a project that takes up a smaller area could be significant, if located in areas critical for the activities of the reindeer herding cooperative.

GPS MONITORING OF REINDEER

Nowadays, GPS collars are used in a number of reindeer herding cooperatives, which enable the movements of reindeer to be viewed on a computer screen. If the reindeer herding cooperatives provide GPS data about reindeer grazing for use in conducting studies, this could be important information in respect to the baseline studies and monitoring. The company responsible for the project can also acquire GPS collars for the

reindeer of the area for the monitoring of the project impacts, and identifying impacts already during the planning stage of the project, if the reindeer herding cooperative is willing to participate. In this case, monitoring data should be available for use by the reindeer herders and the company responsible for the project. A few dozen collars should be acquired as early as possible, depending on the impact area and its number of reindeer. Collars can be either used on females, which make up the majority of the reindeer herd and are therefore important to monitor, or on castrated bulls. Collars cannot be fitted to males, which have not been castrated, as their neck expands during the rutting period. In addition to providing information on the impact of the project once operations have commenced, the GPS collars also provide the reindeer herding cooperative with precise data that can be used for planning reindeer husbandry activities as a result of changes in the use of reindeer pastures. For instance, how can a round-up enclosure be relocated? If GPS collar data is not available, the grazing of reindeer and reindeer densities in the area shall be assessed on the basis of interviews with the representatives of the reindeer livelihood, or using the number of reindeer handled at the closest round-up enclosure.

INTERVIEWS

The supplementation of the data and the understanding of the livelihood activities require interviews with representatives of the reindeer herding cooperative. The reindeer herding cooperative is usually represented by the Chief of District, but it is also recommended to interview other reindeer herders in the area, especially if the project is expansive. For example, a group interview of a few persons (e.g. board of the reindeer herding cooperative) could be a good way of surveying all the impacts of the project. Using interviews, an understanding of **what significance the project area has** for the reindeer herding cooperative, as well as information on, for instance, reindeer grazing and reindeer densities is attained. In this way, interviews examine how reindeer husbandry works in the entire reindeer herding cooperative area, and in the project area in question during the various stages of the annual cycle for reindeer husbandry. Furthermore, interviews will also provide information on the potential impacts of the project and the means of mitigating the impacts.

SMALL WORKING GROUPS

In the assessment of the impacts of projects, the reindeer owners of the neighbouring regions of the project shall be involved in the procedure (interviews, surveys). This is especially the case, if the only representation of the reindeer herding cooperative in the steering or monitoring group is the Chief of District. The opinions of the reindeer herders of the neighbouring areas (if the Chief of District is not from the area) shall be taken into account and assurances must be made for keeping these reindeer herders informed about the project. In some projects, separate small working groups are established for the assessment of (social) impacts. In this case, a separate group can be established for the reindeer husbandry and convened members can include a number of reindeer owners, for instance the board of the reindeer herding cooperative in the project area.

SURVEYS

Various surveys conducted for the local inhabitants and other actors are typical methods employed in EIA studies. It is probably normal for the survey to be sent to persons residing in certain neighbouring areas, and the survey shall include a few questions concerning reindeer husbandry. The survey can also include general questions with reindeer husbandry as an alternative (e.g. how the individual uses the project area, or on what form of use is the project estimated to impact). An independent survey can also be made for those involved in reindeer husbandry and either addressed to all the reindeer owners, or, for instance, to those who are primarily involved in reindeer husbandry and receive the majority of their subsistence from the livelihood. These active reindeer owners probably know more about the conditions in the project area and, therefore, also the impacts of the project on these conditions. The reindeer herding cooperative can provide information to whom the survey, intended for active reindeer owners, should be sent to. In this case it is worth remembering that this is not a question of random sampling.

FIELD INSPECTIONS

Field inspections for the reindeer husbandry can clarify what type of reindeer grazing occurs in the area. For instance, in the terrain, types of growing habitats and forest age can be used to define the pasture classification of the area. For instance, in the FGFRI pasture inventory (Kumpula et al. 2009), the old growth and mature forests of mesic and submesic pine/spruce forests are classed as arboreal lichen pastures, the deciduous forests into shrub, leafy and grassy pastures, and the nutrient-poor forest into lichen pastures. The terrain can also be inspected, if the area has any lichen, arboreal lichen or other nutrition plants. In general, it is good to form a general picture of the area. Photographs also tell a lot. In the terrain, it is also possible to estimate how the area is located in relation to reindeer husbandry. For example, does the area have reindeer husbandry structures? What types of structures? For what purposes? Are these new sites, or sites that are significant for the purpose of cultural heritage? And so on. The number of reindeer can be monitored in the planned area or neighbouring areas, and attempt to conceive what pasture of what season is concerned. The reactions of reindeer to people (e.g. fleeing distance) can be estimated. The assessment of reindeer behaviour and pastures does, however, require some knowledge of reindeer and reindeer husbandry. In this case, the Chief of District or local reindeer herder can be used for assistance and as a guide, and with whom discussions can be had, which focus on the assessment of the impacts of the project. The reindeer density of the area can also be estimated using the pellet-group analysis. This method has been used in scientific studies (e.g. Helle & Särkelä 1993, Skarin 2007, Helle et al. 2010) and in, for instance, the monitoring of impacts in Swedish wind power projects. The advantage of the analysis is that it can be used for obtaining information pertaining to the overall abundance of reindeer in the area over a period of a few months from an extensive area, while at the same time allowing study of the flora in the area (Skarin 2007).

ASSESSMENT OF IMPACTS

The EIA procedure will estimate the direct and indirect impacts of the project, as well as comparing the project alternatives and possible sub-alternatives. The EIA procedure shall inspect the construction stage and operational stage. Plans also need to assess their impacts on various sites, and reindeer husbandry is one of the foci for assessment in the reindeer herding area. In the assessment of impacts, it is always vital to describe the changes caused by the project compared to the current situation.

Wherever possible the assessment of impacts should also assess the cumulative impacts of the project with the land use operations already existing in the area, as jointly these could cause significant impacts on the reindeer husbandry. The accumulation of different projects and operations in the area could lead to exceeding the threshold, leading to significant impacts on the operations of the reindeer herding cooperative.

With respect to the reindeer livelihood, the impacts types mentioned earlier in this guide should be assessed. These and the assessment methods are listed in the box below. The impacts must be made into a format that facilitates measurement and comparison for the reindeer husbandry.

*The **entities to be assessed for the reindeer husbandry**, as well as the materials and methods conducted for the assessment of such:*

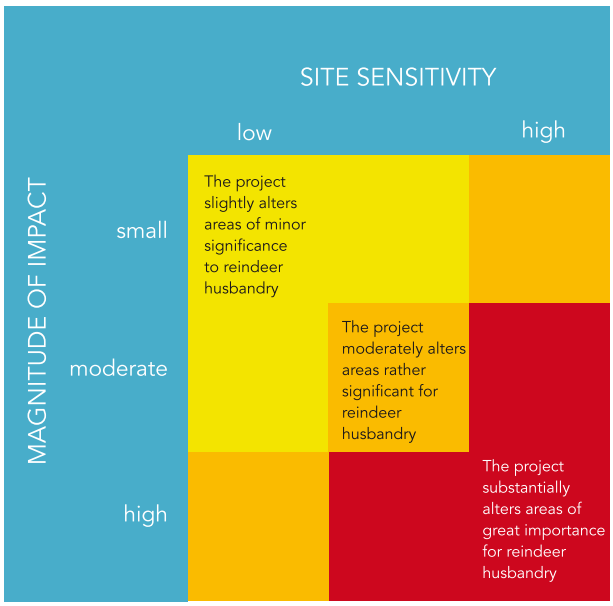
- *Impacts on reindeer pastures*
  - *Reindeer herding cooperative GIS data, data from elsewhere, map inspections, interviews*
- *Impacts on reindeer grazing (disturbance)*
  - *Possible GPS data, interviews in reindeer herding cooperative*
- *Impacts on reindeer husbandry (operations and structures)*
  - *Reindeer herding cooperative GIS data, map inspections, interviews*
- *Reindeer accidents (in traffic or in the project area)*
  - *Statistics, calculations, interviews*
- *Socio-economic impacts, including impacts on the viability of the livelihood (as a consequence of the aforementioned impacts), (expansive projects or the combined impact of numerous projects)*
  - *Statistics, interviews, surveys, small working group tasks*
- *Impacts on the reindeer herding culture (expansive projects or the combined impact of numerous projects)*
  - *Interviews, surveys, small working group tasks*

SIGNIFICANCE OF IMPACTS

The impact focused on the reindeer husbandry is a single component among all the other impacts of the project. The significance of the project impacts on the reindeer husbandry can be estimated in relation to other subjects researched. In the assessment of the impacts focused on the reindeer husbandry, particularly the location of the project in relation to the reindeer herding activity areas, needs to be taken into account. Thereby, the specification of the significance of reindeer husbandry in the project area acts as a foundation for the assessment of impacts. The impact caused by the change can be compared to the own activities of reindeer husbandry, and on whether or not the impact entirely prevents activities, somewhat prevents, can be compensated for, or is without impact.

Table 1 shows one way of estimating for assessment the significance of impacts caused by a land use project. This simultaneously assesses the sensitivity of the site, as well as the magnitude of the impacts. The matrix can be used for separately estimating different impact types, or assessing the various alternatives for the project. If the project significantly alters areas important for reindeer husbandry (shaded red), mitigating measures need to be sought for the project to facilitate the reduction in the significance of impacts (achieving orange or yellow shading).

Table 1. A matrix illustrating the sensitivity of sites and the magnitude of impact is one way of assessing the significance of impacts caused by a land use project.



In the area specifically intended for reindeer herding, assessments must be capable of determining whether or not the project causes impacts, which could significantly hinder reindeer herding, as intended by Section 2.2 of the Reindeer Husbandry Act. In this case, in its statement, the contact authority for the EIA could issue its position on the exceeding of limits. In practice the assessing of significant harm could be difficult and, at the very least, it will require wide-ranging expertise. The causing of significant harm could prevent the granting of a permit for operations or a plan, which would facilitate the project in the area. For instance, the Mining Act (Section 50) stipulates that "An ore prospecting permit, mining permit, or gold panning permit must not be granted, if activities under the permit in a special reindeer herding area would cause considerable harm to reindeer herding. However, a permit may be granted regardless of an impediment referred to in subsection 1, if it is possible to remove such an impediment through permit regulations." Using planning procedures, the EIA shall seek an alternative and way of implementation for the project to ensure the limits for significant harm, as intended by Section 2.2 of the RHL are not exceeded. Nevertheless, it is possible that a conflict remains in the post-EIA planning, but, as planning progresses, a solution needs to be identified, or e.g. the mining permit shall not be granted.

INSPECTION OF ALTERNATIVES

There can be large differences between the project alternatives in respect to reindeer husbandry, depending on how the alternatives are located as far as reindeer husbandry practices or the grazing of reindeer is concerned. Also the possible sub-alternatives for the projects (e.g. the concentration plants, tailings ponds, stockpiling areas of mines) must be examined in the assessment of impacts. Table 2 shows an example of a matrix used to illustrate the comparison of alternatives. The comparison of alternatives can also be conducted for different types of impacts, for instance: which alternative has the greatest impact on reindeer husbandry structures and the availability to use such, which pastures (quantity and quality), and so on. The mutual comparison of different impact sites (reindeer husbandry, traffic noise, fauna, social impacts, etc.) can be performed using a similar matrix (Table 3).

Table 2. Comparison of alternatives by type of impact on reindeer husbandry (imaginary scenario).

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Reindeer pastures	expansive area, important pasture type	rather large area and/or many such grazing types in the reindeer herding cooperative	minor losses of grazing areas that are otherwise abundant
Reindeer husbandry structures	entire round-up enclosure is lost	minor impacts on less important structures, e.g. new barrier fencing	use of the round-up enclosure is made somewhat more difficult, e.g. due to movement being awkward
Grazing of reindeer	grazing is slightly disturbed	moderate disturbance of the grazing cycle, but the reindeer can probably use the neighbouring regions for some times of the year	grazing is prevented in the neighbouring regions and the grazing cycle of the reindeer herding cooperative will change significantly

Table 3. Mutual comparison of the environmental impacts of a project (imaginary scenario).

	ALTERNATIVE 1	ALTERNATIVE 2	Justifications
Social impacts			Alternative 2 has significant positive impacts on the local economy and employment.
Reindeer husbandry			Alternative 1 has significant negative impacts on pastures and reindeer husbandry structures.
Bird populations			Alternative 2 has a moderate impact on the nesting area.

JOINT AND CUMULATIVE IMPACTS

The impact region for a land use project from the perspective of reindeer husbandry is either the entire reindeer herding cooperative or part of the cooperative area. The assessment of impacts must assess its connection with other projects and what other operations are located within the project area and its impact region. Therefore, baseline studies and impact assessments must take into consideration what already exists in the operational area, i.e. what impacts are already focused on the activities of the reindeer herding cooperative already prior to initiating the new project.

The combined or cumulative impacts of projects usually have more magnitude, or impact more stakeholders than individual projects. If a number of similar projects are to be placed in the reindeer herding cooperative area, when combined these could have substantial impacts on the activities of the reindeer herding cooperative. For instance, in Northern Ostrobothnia and Southern Lapland there are reindeer herding cooperatives that have dozens of peat production facilities in their area, which cover thousands of hectares. This inevitably impacts the summer grazing conditions for the reindeer and the amount of damage caused to reindeer.

Cumulative impacts are ways of understanding the long-term accumulation of various types of land use forms in the area. To date, the cumulative impacts of land use forms on reindeer husbandry have been studied rather little, but some examples from Finland can be found. In the Ivalo Reindeer Herding Cooperative area, reindeer GPS collars were used to study the impacts of various land use forms on the grazing of reindeer during different times of the year. Altogether, human activities cover 1.2% of the reindeer herding cooperative area, but, depending on the season, human activity can cause an area of disturbance covering 27–39%, where reindeer graze less than outside the area. Reindeer are most sensitive to disturbances in the early spring (Anttonen et al. 2011). In the winter pasture inventory conducted in the reindeer study of FGFRI, the coverage and disturbance areas caused by infrastructure and human activity in the area specially intended for reindeer herding has been calculated according to reindeer herding cooperative. The coverage area varies from around half a percent to two percent, and the disturbance area from a few percent up to a quarter of the reindeer herding cooperative area (Kumpula et al. 2009). However, instead of calculating percentages of the area of the reindeer herding cooperative, it should also be examined in what area the project or projects are located in relation to the activities of the reindeer herding cooperative. Even a project that takes up a smaller area could be significant, if located in areas critical for the activities of the reindeer herding cooperative.

THE PREVENTION AND MITIGATION OF DETRIMENTAL IMPACTS

The goal-oriented principle for the prevention and mitigation of harm is that, following monetary and other compensation, the reindeer herding cooperative should be in the same financial condition as it would be, if the project is not implemented. Efforts are made in the EIA procedure to seek ways of preventing and mitigating the impacts caused by the project. Measures can be stipulated e.g. when granting the environmental or mining permits. In planning procedures, harm can be mitigated using plan regulations and markings. There are a variety of ways that exist for reducing the impacts of land use projects focused on the reindeer livelihood. These are listed in the box below.

The harm caused to reindeer husbandry can be mitigated using a variety of monetary or other forms of compensation, and by making temporary changes to activities. For instance:

- Construction of new reindeer husbandry structures, such as fences or cabins, or relocation of existing (monetary, material or work compensation).
- Monetary compensation for the damages, losses, harm (loss of pastures, increased workload, increased supplementary feeding costs, damages, etc.) experienced by the reindeer herding cooperative.
- Other compensation for the loss of pastures (e.g. areas removed from cultivation of fodder in peat production sector).
- Monetary compensation for the loss of livelihood or the voluntary relinquishing of the livelihood (applies to large projects where impacts are substantial, such as a mine located in a functionally important area).

The prevention and mitigation of harm caused by the project is always case-specific, and these actions **shall be negotiated** and agreed with the reindeer herding cooperative. Reindeer herding cooperatives differ from one another, so no uniform example for monetary compensation can be given. There can be a variety of justifications for compensation, three examples of which are as follows:

1) Specification of some kind of formula for calculation (e.g. problems based on studies, such as the quantitative and qualitative losses of pastures, obstacle/disturbance impact, increased workload, etc.), the sum in euros is calculated and compensated.

2) Agreement is first reached on the annual compensation in the "basic part" (as above), with the addition of a "moving parts" package that enables compensation for unpredicted damages and harm observed during monitoring procedures. The "moving parts package" can also be used for the general development of the activities of the reindeer herding cooperative of local reindeer herding community.

3) Compensation via the findings of monitoring procedures, i.e. impacts are monitored and compensation is provided accordingly.

Harm can be prevented and mitigated
using e.g. the following measures:

- *Taking into account the needs and preferences of the reindeer herding cooperative, if it is possible to be flexible with the placement of infrastructure. Leaving space for peaceful routes of travel for reindeer and reindeer herders in the placement of operations. Minimising changes to the environment by concentrating on operations, routes and passages. No operations shall be placed in sacred or sites of cultural historical importance.*
- *By assuring the routes of travel for reindeer and reindeer herders past/under/over structures in such a way that travel and the moving of reindeer is not prevented (underpasses, bridges, guiding fence structures).*
- *Fencing off hazardous areas: e.g. mining area, slurry basin, railway.*
- *Improvement of safety: e.g. slipping on steep-edged basins and ditches, and bridges with ditches and channels, marking of power line stays and cables using so-called "marker balls", earthing of wire mesh fencing beneath the power line, fencing off dangerous areas.*
- *Notifying the reindeer herders about the presence of reindeer in hazardous areas – the reindeer herder have the best expertise for the removal of the reindeer.*
- *By notifying of the reindeer injured or killed in the project area.*
- *Informing the emergency call centre on reindeer accidents, who will pass the information on to the reindeer herding cooperative. It is also important to inform them about collisions with reindeer where the reindeer did not die, or the vehicle is not damaged – a reindeer that has a broken leg or is otherwise injured, can often be found later in the forest. The animal must not be allowed to suffer.*
- *By preventing traffic accidents in advance: communication, speed limits, warnings, protective fencing, underpasses and overpasses, fencing on both side of the rail track, scaring devices (e.g. alarm sound) to prevent reindeer from travelling on the railway tracks/roads, etc.*
- *By staying in contact with the reindeer herding cooperative, informing of coming events and the possible dangers associated with these.*
- *Planning operations in cooperation with the reindeer herding cooperative: e.g. taking into account the timetable for reindeer husbandry tasks.*
- *Interruptions in operations during critical times for reindeer husbandry: e.g. the stopping of wind power plants or traffic during the times, when reindeer are transported through the area.*
- *By not snowploughing roads/only snowploughing when necessary.*
- *Clearing practices for power lines: clearing during periods of no snow cover in order to ensure no stumps are left, and only reasonably tall vegetation is left.*

EXAMPLES OF THE MITIGATION OF IMPACTS
– peat production

Peat production is a temporary activity and, following production, the area is relinquished for future use. The boundary areas of the production area are often decommissioned from production after about ten years, and almost every year a bog base is released from production. These areas then become reindeer grazing grounds. When peat production is completed, the more remote areas are returned for use in reindeer husbandry. Peat production areas have been proven to be good cultivation beds for forage intended for the winter feeding of reindeer. For instance, the reindeer herding cooperative of the Paarnitsa-aapa area of Sodankylä has cultivated grasses in the areas removed from peat production and baled two harvests in the area during the summer. In addition, since the early winter, the reindeer have been able to dig up nutrition themselves from the cultivated areas. At Viidansuo in Pudasjärvi, on the other hand, turnips are cultivated for the autumn feeding of reindeer.

Turnips cultivated as reindeer fodder in an area decommissioned from peat production in the Viidansuo area of Pudasjärvi (Photo: Pentti Åman 2006).

MONITORING OF IMPACTS

Projects usually monitor the impacts caused on the environment, such as water quality. The monitoring of impacts caused by the project can also be conducted for the reindeer husbandry, and in fact this has been recommended in EIA statements issued by contact authorities over the past few years. The ways for monitoring the project need to be designed and presented in the EIA reporting stage and in plan reports. In respect to monitoring, it is essential that the current state of reindeer husbandry is recorded prior to the commencement of the project, which, with monitoring, facilitates the comparison of observed matters to the documented data.

Monitoring can be agreed at the same time as negotiations regarding the mitigation and compensation of harm focused on reindeer husbandry. The means for monitoring can be contemplated together and at the same time agree how to react to the impacts recognised in monitoring procedures, if, for instance, impacts are noticed to be more significant than earlier estimated. There also needs to be the capability of reacting to totally unpredictable impacts during the implementation of the project.

It is recommended for the representatives of the reindeer herding cooperatives to convene at least once a year for the purpose of monitoring. In the meetings, the impacts of the operations can be examined using mutually agreed indicators. In addition to these discussions can be held on, for example, the communication of the activities of both parties, successful cooperation and liaising, possible damages and the compensation of such, as well as the restoration/rehabilitation of the area at the end of the project lifecycle. A monitoring report can also be made in collaboration with an approved body. In the municipal plans, the municipality monitors the impacts of the plan.

Monitoring requires knowledge about the behaviour of reindeer and about reindeer husbandry, which means that in addition to various statistics and materials (e.g. GPS positioning), the interviews of the reindeer herding cooperative representatives and bookkeeping are important. The box below illustrates possible monitoring indicators.

Particularly with mining projects and other projects, which put potential loading on the environment from the perspective of the reindeer livelihood, it is important not only to monitor the impacts focused on reindeer husbandry, but also the environmental impacts and the effects on vegetation and drinking water used by reindeer and the concentrations of harmful substances in water. For instance, heavy metals can access the reindeer's body through nutrition and accumulate in reindeer meat and internal organs. Also other harmful substances released into the environment and the

The monitoring programme *can monitor the following matters associated with the reindeer economy, e.g.:*

- *Changes in the use of reindeer pastures or routes of travel (reindeer GPS collars or changes in the reindeer densities of the area: e.g. processing information from the closest separation enclosure or pellet-group analyses).*
- *The number and fitness of reindeer for slaughter using, for instance, calving percentages or the carcass weights of slaughtered calves, the changes in which can indicate disturbances in grazing conditions (reindeer herding cooperative bookkeeping, interviews).*
- *Alteration or complication of reindeer husbandry activities (own monitoring of the reindeer herding cooperative).*
- *The increase in reindeer husbandry work or the cost of work in the area (own bookkeeping of the reindeer herding cooperative).*
- *Traffic and other damage numbers (statistics and reindeer herding cooperative bookkeeping of the areas, interviews of damage assessors).*
- *Reindeer herders or reindeer herding community adapting to the project.*
- *Impacts when the project expands.*
- *Joint impacts, if the area has other similar types of projects.*
- *Other environmental impacts (water quality, change in vegetation, concentration of harmful substances such as heavy metals).*

potential exposure of animals to radiation shall be monitored and the danger posed on the health of animals or meat quality by harmful substances prevented. All damages related to harmful substances must be immediately informed to the reindeer herding cooperative.

EXAMPLE OF MONITORING – Monitoring of wind power project in Sweden

The following model has been used in a few wind power projects in Sweden:

- *Agreements have been made with the reindeer herding cooperatives (Sameby) concerning the monitoring of impacts and compensation for the loss of pastures.*
- *Reindeer and reindeer density has been monitored in the area (GPS collars and/or pellet density calculations)*
  - *Two years prior to the commencement of the project (baseline)*
  - *During the construction stage (approximately one year)*
  - *2 – 3 years of the operational period*
- *In addition, reindeer herders have also been interviewed concerning e.g.:*
  - *How may reindeer have been in the project area? At what time of the year? How long did they stay in the area? i.e. has the area had a few male reindeer for the entire summer, or have large herds of hundreds of reindeer travelled through the area in the autumn during a single day?*
  - *What have the weather conditions been like? Are there normal snow conditions or difficult snow conditions? Has the ground in the area frozen during winter preventing reindeer digging food? And so on.*
  - *Have any changes been observed in the behaviour of reindeer? Do the reindeer stay in herds or do they disperse? Do they stay in one place or wander? Do the reindeer graze normally?*
  - *Have there been any exceptional conditions in reindeer husbandry work? Did herding take place in the wind parks, or was it necessary to go around the parks? Was it successful to transport the reindeer via/towards the wind park?*
- *In this way it will be clarified what other impacts, other than those caused by the construction of wind power parks, will have an effect, as well as shedding light on changes in reindeer behaviour and reindeer husbandry tasks.*
- *It should be noted that the monitoring period can be too brief if the conditions are unfavourable. Monitoring should be continued, if this is the case.*

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APPENDIX 1: Explanation of terms

LIVING REINDEER	a reindeer left to live over the winter following the autumn separation, usually a breeding reindeer.
HERDING TASK	work related to the gathering and separation of reindeer.
BULL	a castrated male reindeer.
SUMMER MARKING, CALF EAR-MARKING	an event in the summertime where the reindeer are gathered together and the calves that were born in the spring are marked with the earmarks of their dams. The calves not marked in the summer are marked in the round-up.
REGISTERED (READ) REINDEER	a reindeer over a year old intended for slaughter or to be left alive, which has been "read", i.e. counted as belonging to its owner and added to the reindeer register of the reindeer herding cooperative.
REINDEER HERDING COOPERATIVE	the basic administrative, economic and geographic reindeer herding unit. The appropriate reindeer husbandry actor in land use procedures.
REINDEER HERDERS' ASSOCIATION	a central association for reindeer husbandry acting as a link between reindeer herding cooperatives, manages the reindeer husbandry, promotes reindeer herding and its research, and handles reindeer husbandry relations with the rest of society.. Also acts as an advisory association. The Association holds the role of expert in land use procedures.
SMALL (RUTTING) HERD	a herd comprising a few reindeer, e.g. during the rutting season.
PILTTA EARMARK	a metal (slaughter piltta) or plastic (conventional) extra earmark fixed to the reindeer's ear. For instance, reinder used for competitions or in tourism each have their own piltta earmark with a personalised regration number.
REINDEER LIVELIHOOD	the practising of a reindeer husbandry-related profession, where people work and receive subsistence.
CHIEF OF DISTRICT	manager of the reindeer herding cooperative acting with official responsibilities. Handles the performance of practical issues of the reindeer herding cooperative, represents the reindeer herding cooperative in official instances, supervises activities in line with the Reindeer husbandry Act, etc. Represents the reindeer herding cooperative in land use procedures.
REINDEER HERDER	a profession (male or female), reindeer herding cooperative shareholder, reindeer owner.
REINDEER HUSBANDRY	umbrella term, including livelihood, economy, culture and everything else essential.
REINDEER HUSBANDRY YEAR	June – 31 May the official reindeer husbandry calendar, in for instance bookkeeping.
REINDEER ECONOMY	managing of finances related to the practising of reindeer husbandry, and the income and costs of such.
RUTTING	the reindeer mating season is September to November.
INSECT HARRASMENT	swarms of bloodsucking insects (mosquitos, blackflies) make the reindeer gather into large herds in mid-summer (insect harrasment time) and seek refuge from the insect harrasment from the open and windy fell highlands and bogs. Male reindeer in particular can also access roads, gravel pits and areas close to buildings.
LARGE HERD	a herd of reindeer comprising dozens of reindeer.
REINDEER HERDING COMMUNITY	a working community comprising family members, relatives or otherwise reindeer herding cooperative shareholders who together tend to their reindeer, either through the winter or throughout the year, usually in a specific area.
CALF	a reindeer in the first year of its life.

APPENDIX 2: TAKING REINDEER HUSBANDRY INTO ACCOUNT IN ORE PROSPECTING

The website of the mining authority granting ore prospecting permits, i.e. the Finnish Safety and Chemicals Agency (Tukes), has information about ore prospecting and permit applications (http://tukes.fi/en/Branches/Mining/)

The critical issues associated with ore prospecting from the reindeer husbandry perspective are: the planning of operations, the operations in general, and rehabilitation of the traces of these operations.

1. When planning prospecting measures, contact needs to be made sufficiently early with the reindeer herding. It is insufficient to call them once activities are underway. Contact needs to be made well in advance with the reindeer herding cooperative (usually the Chief of District) in order to receive information pertaining to, for instance, if the reindeer graze, calve or rut in the area, and at what times, what reindeer husbandry tasks practiced in the area, and at what are the approximate times these are underway. The Chief of District for the reindeer herding cooperative can also be contacted when going to the area, but, in this case, visits could be planned in such a way that reindeer husbandry tasks, or times critical for reindeer, are not disturbed.
    - For instance, evening discussions and meetings with the reindeer herding cooperative are good ways of communicating and receiving information.
    - Tukes requests a statement from the reindeer herding cooperative throughout the reindeer herding area, when considering ore prospecting permits.
    - Metsähallitus can require contact with the reindeer herding cooperative, when considering ore prospecting on a smaller scale with the consent of the landowner. It is possible to receive this consent prior to the actual permit being granted by the mining authority, if the site is subject to an application according to the Mining Act. The Metsähallitus consent is always granted for the entire application area.
        - consent is not granted for the Sámi Homeland area.
        - consent is not granted for protected areas, protection programme areas, or for Natura 2000 areas (e.g. wilderness areas).
2. During the operational stage, reindeer or reindeer husbandry work can be disturbed by off-road traffic, low-flying aircraft and drilling. For instance, in late winter, the females might give birth early to their calf, if the females are forced to flee. Operations in the reindeer routes of travel can disturb the movement of reindeer (noise and movement of machinery, excavations, drilling, etc., as well as unfamiliar marks in the terrain, which the reindeer follow).
    - Ore prospecting activities (especially flights) should be timed for times of the year to ensure that these cause as little as possible harm for animals – contact necessary.
    - Round-up fencing, or other structures, shall not be damaged: travel to the area shall be done through gates, and the gates need to be kept shut. If excavations or related activities are conducted within an enclosed area, special care must be taken to mark and cover these areas.
    - Discussions need to be held and agreements reached regarding the routes of travel for the reindeer with the reindeer herder (and landowners). The shortest route is not always the best, rather it may be better to go around the structures, reindeer husbandry activities or reindeer, if these exist in the area.
    - When handling soil materials, efforts shall be made to avoid making cliffs or banks too hazardous for travelling using motor vehicles. Soil extraction sites, experimental pits, stockpiling areas, and so on, should be shaped with low-gradient slopes. If this is not possible, the pits must be distinctly marked:
        - Tagged safety lines and other lines pose a safety risk for reindeer, as they get accustomed to the lines and start to travel over or under them. These lines can easily get tangled in the reindeer's antlers, meaning the reindeer could become trapped, starved or choked to death.
        - Wider safety tape loosens, breaks and can easily get covered by snow.
        - The best way of marking these pits is by fencing them off, e.g. using wooden roundpole fences or colourful plastic mesh fencing. A mesh fence requires sturdy poles and careful attachment.
        - Reflective snowplough guiding poles are also to be easily noticed.
        - It is worth asking the opinion of the reindeer herding cooperative about marking such areas. The reindeer herding cooperative must be informed about hollows, excavations and the marking of these.
3. In rehabilitation measures, it is important for all possible hollows and excavations to be covered and landscaped in order to ensure that these do not pose risks, when using off-road vehicles in reindeer herding tasks. Furthermore, no long pipes shall be left sticking out of drill holes that can cause collisions with off-road vehicles. For the reasons of the safety to the reindeer, no wire, string, tagged safety lines or similar shall be left in the terrain. These could get tangled with the reindeer's antlers and around the animal's neck. Other items can also get tangled with strings/lines: branches, posts, and so on, which the animals then drag behind them with the risk of becoming trapped. Waste (glass, metal), which can damage the reindeer's hooves, must not be left in the terrain. If harm is caused by operations (e.g. female gives birth to a calf too early, herd disperses, reindeer husbandry structures are damaged), these shall be compensated for.

A guide for ore prospecting in protected areas, the reindeer herding area and Sámi Homeland area (KTM 2007) is being updated in 2014, and includes more detailed information about operating within the reindeer herding area.

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