GUIDANCE DOCUMENT

Indigenous-led participatory and cumulative impact assessment on indigenous cultural landscapes and traditional ecosystem services (IPCIA)

Anders Blom, January 2023

STIFTELSEN
PROTECT SÁPMI

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1.0 SUMMARY

This report has been written as a result of a collaboration between Stiftelsen Protect Sápmi in Norway and the international certification organization Aluminium Stewardship Initiative, ASI. The knowledge and advice presented in this publication is based on Protect Sápmi' s more than 10 years of experience with indigenous led participatory and cumulative impact assessment on indigenous cultural landscapes and traditional ecosystem services.

Protect Sápmi has built its experience on impact studies related to reindeer husbandry in the area known as Sápmi - the land of the Sami peoples. Reindeer husbandry is the traditionally practiced ecosystem service that the indigenous Sami people practice in the northern parts of Norway, Sweden, Finland and on the Russian Kola Peninsula. Although the methods described in this report are based on experiences from Sápmi, these are to a large extent transferable to other parts of Mother Earth where the traditional areas of Indigenous Peoples, their indigenous cultural landscapes, are threatened. Some of the methods and techniques described may be difficult to directly implement in different parts of our earth and may therefore naturally require adaptations. We hope that the principles on which these methods are based will have a more universal applicability. It is our hope that this report will be inspiring for Indigenous people in different parts of our earth in their work to defend their lands, their culture and our common future.

2.0 INTRODUCTION - BACKGROUND

There are around 477 million people who belong to one of the world's more than 5,000 different Indigenous Peoples[1].

Although indigenous peoples are found in more than 90 countries, most of them live in Asia - as many as 70 percent. Indigenous peoples make up just over 6% of the earth's population. The global importance of Indigenous Peoples who manage a quarter of the world's land surface cannot be overemphasized; these territories contain a richer biodiversity than protected areas. Indigenous territories are a source of global solutions to climate change and carbon cycle management, while delivering sustainable livelihoods and strengthening sustainable ecosystem services based economies.

In the long history of indigenous issues at the United Nations considerable thinking and debate have been devoted to the question of the definition or understanding of "Indigenous Peoples". But no such definition has ever formally been adopted by any United Nations-system body. One of the most cited descriptions of the concept of "indigenous" was outlined in the José R. Martínez Cobo's Study on the Problem of Discrimination against Indigenous Populations.

After long consideration of the issues involved, Martínez Cobo offered a working definition of "*indigenous communities, peoples and nations*". In doing so, he expressed a number of basic ideas forming the intellectual framework for this effort, including the right of Indigenous Peoples themselves to define what and who Indigenous Peoples are. The working definition reads as follows[2]:

Indigenous communities, peoples and nations are those which, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing on those territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal system.

This historical continuity may consist of the continuation, for an extended period reaching into the present of one or more of the following factors:

a) Occupation of ancestral lands, or at least of part of them;
b) Common ancestry with the original occupants of these lands;
c) Culture in general, or in specific manifestations (such as religion, living under a tribal system, membership of an indigenous community, dress, means of livelihood, lifestyle, etc.);
d) Language (whether used as the only language, as mother-tongue, as the habitual

[1] https://www.ilo.org/global/publications/books/WCMS_735607/lang--en/index.htm
[2] http://www.un.org/esa/socdev/unpfii/documents/SOWIP/en/SOWIP_web.pdf

means of communication at home or in the family, or as the main, preferred, habitual, general or normal language);
e) Residence on certain parts of the country, or in certain regions of the world;
f) Other relevant factors.

On an individual basis, an indigenous person is one who belongs to these indigenous populations through self-identification as indigenous (group consciousness) and is recognized and accepted by these populations as one of its members (acceptance by the group). This preserves for these communities the sovereign right and power to decide who belongs to them, without external interference".

Many indigenous groups around the world risk losing the opportunity to influence how forests and land are to be used and protected. As a result, they also risk losing the possibility of livelihood and their existence. This is despite the fact that it is possible to prove that they have used the land for generations and that these common rights are recognized in conventions and declarations. Marginalization, discrimination, threats and persecution are some of the factors that mean that all groups in society are not given an equal opportunity to make their voices heard. This applies to Indigenous Peoples in Norway, in the Amazon, in North America, in India, in Africa, in Australia, yes all over the world. The threat to the territories of indigenous peoples requires that Indigenous Peoples themselves emerge to a greater extent than before and in a pedagogical way describe the impact they are exposed to in the form of encroachment on their legal or customary territories.

Ever since the end of the 19th century, the indigenous Sami people in Kiruna, Sweden, had been affected by an extensive mining operation that had serious consequences for their traditional industry - the reindeer husbandry industry. In 2012, negotiations began with the large mining company LKAB. After more than a year of negotiations, a co-operation agreement was concluded between the mining company and the Swedish Sami villages concerned; Laevas and Gabna. Part of this agreement was that all types of impact that the affected Sami villages could be exposed to would be evaluated in a cumulative perspective. To describe what such a perspective might look like then implemented, it was decided that a manual would be drawn up, a manual that would describe how the mining company and the affected Sami villages would in practice carry out cumulative impact assessments.

The Sami are one of the world's Indigenous Peoples and the only Indigenous Peoples in northern Europe. The Sami live in four countries Russia, Finland, Norway and Sweden. This large area of land is called Sápmi. Sápmi spreads throughout the northern part of the North Calotte, from the Russian Kola Peninsula in the east to the Swedish province of Dalarna in the south and to the Norwegian coast in the west. Sápmi as a concept includes both the country Sápmi and the Sami people.

One of the most important cultural carriers for Sami culture is the traditional reindeer herding industry. An industry that has been run since time immemorial within Sápmi.

A working group was established with representatives of both the Sami rights holders and LKAB - who were also responsible for financing the work. The project was led by a steering group where Anders Blom was included as a representative of the Sami villages Laevas and Gabna. In the parts of the manual that include mapping tools, collaboration has taken place with the Swedish University of Agricultural Sciences, SLU.

The manual was completed in 2015 and has since been a guide in the cumulative impact assessments carried out in relation to the affected Sami villages and the mining company LKAB. The parties agreed that the method manual, in its initial phase, should not be seen as a complete working model, on the contrary, this is a work that must continue to develop as new knowledge is added and as the Sami rights holders try to use the method.

Anders Blom was also active in Norway, where he participated in creating a Sami organization that works to protect Norwegian Sami rights holders to their territories - the Protect Sápmi Foundation (Protect).

The Protect Sápmi Foundation is formed by Sami interests and is governed by a board consisting of Norwegian Sami's. Everyone who works in "Protect" is of Sami origin and has a connection to the traditional reindeer herding industry.
The purpose of the Protect Sápmi Foundation is to maintain and develop the Sami cultural landscapes, including promoting Sami business interests adapted to the demands of modern society. The foundation shall build up and maintain a professional, solid and professional organization in order to be able to provide assistance to safeguard Sami rightsholders' area of interests, land and resource rights and development opportunities. Based on such interests and rights, the foundation shall be a central premise supplier and interaction partner with the authorities and new business actors in their work with and activities in Sami areas. The foundation shall provide qualified advice and assistance as well as participate in negotiations on behalf of Sami interests as a basis for new activity in the Sami areas.

With permission from the Swedish Sami villages Laevas and Gabna and the mining company LKAB, "Protect" received the rights to use and develop the working method described in the original manual. In its work with Norwegian Sami's, "Protect" has for the past 7 years worked with this model in several of Norway's Sami reindeer herding districts. During the years, the model has developed as experience has been gained from more than 10 very extensive studies that have been carried out.
The manual that was the beginning of this development is still relevant, but due to lack of resources it has not been revised and developed in line with the experience gained.

2022 "Protect" got in touch with ASI - Aluminium Stewardship Council. The reason for this contact was that "Protect" in one of its participatory cumulative impact assessments (IPCIA) had encountered a company that was certified in accordance with the ASI standard.

The Aluminium Stewardship Initiative (ASI) is a global non-profit standard setting and certification organization. ASI brings together producers, users and stakeholders in the aluminium value chain with a commitment to maximize the contribution of aluminium to a sustainable society. Working together, ASI aims to collaboratively foster responsible production, sourcing and stewardship of aluminium.

The current IPCIA study described the negative impact a newly established wind farm had in relation to the traditional reindeer husbandry industry in the area; Øyfjellet wind power farm versus Reindeer herding district 20, Jillen-Njarke. An important component in the establishment of the current wind energy park was a supply agreement for electricity signed between the owners of Øyfjellet wind power farm and an ASI certified aluminium smelter. ASI was allowed, with the permission of the relevant right holders, to take part in the IPCIA that "Protect" established together with the reindeer grazing district Jillen-Njarke.

For ASI, the presented IPCIA about Øyfjellet wind power farm represented a novelty. Never before, to their knowledge, had a method been seen internationally to carry out similar studies in which Indigenous Peoples themselves both participated in the analysis and, via an indigenous organization, also carried out this IPCIA entirely. The ASI and its Indigenous Peoples Advisory Forum (IPAF) saw the benefits of spreading knowledge about this work to a wider audience. A project proposal was drawn up there as a first step, it was proposed that "Protect" should develop the previously written manual on cumulative impact assessments so that it reflects the current state of knowledge and that it could become a tool in the international arena.

A project team was set up, consisting of:

- Anders Blom , main writer, Norway
- Nicholas Barla, India
- Professor Bipin Jojo, India
- Dr Vincent Ekka , India
- Cameron Jones - ASI Director of Assurance , Australia
- Leo Carlowitz - ASI Specialist Consultant ,Germany
- Mark Annandale – ASI, Adviser IPAF, project lead, Australia
- Dr Fiona Solomon – ASI, CEO, project oversight

For the Protect Sapmi Foundation, this means reformulating the manual so that it no longer only focuses on the Sami reindeer herding industry but can also find use in the context of other Indigenous Peoples and to translate all material from Swedish and Norwegian to English.

This document is the result of this work.

3.0 PARTICIPATORY CUMULATIVE IMPACT ASSESSMENT

The origins of cumulative impact assessments began in the early 1970s, primarily in the USA, when it was realized that proposed projects needed to be analysed in relation to their location and surrounding land uses. Further, agencies that processed multiple concurrent permit approvals for similar types of projects also realized that such approvals needed to incorporate consideration of all applications in close spatial and temporal proximity to each other, as such actions often contribute to cumulative effects.

In the practice of Environmental Impact Assessment (EIA) in the USA, the term "cumulative effects" was first mentioned in guidelines of the Council on Environmental Quality (CEQ) in 1973. In mid-1979, CEQ's first EIA-related regulations defined a cumulative impact (effect) *"impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertake such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time"*.

In the 20-year period encompassing the 1980s and 1990s, environmental impact studies in both the USA and Canada began to routinely incorporate cumulative effects considerations in study documents. Further, other definitions appeared. For example, the Canadian Environmental Assessment Agency (CEAA) has suggested a simple definition which later also spread internationally: *"Cumulative effects are changes to the environment that are caused by an action in combination with other past,present, and future human actions."*[3]

The definition of cumulative effects that we came to use in the first manual aimed at Sami reindeer husbandry was:

"Cumulative effects can be described as how an activity or measure together with other ongoing, past and future activities/measures affects the reindeer husbandry in an area ".

During the 10 years that Protect Sápmi has been active primarily in Norway, it has not always been obvious that impact analyses must be carried out in a cumulative perspective - experiences from reality point in a different direction. There are more examples of impact assessments that do not take into account the cumulative aspects than those that do. In 2021, an event occurred that will be a watershed in the implementation of cumulative analyses in relation to the reindeer-herding Sami in Norway. Protect Sápmi had carried out a participatory cumulative impact assessment

[3] Cumulative Effects Assessment and Management (CEAM), Modified on Tue, 22 Sep 2009

on behalf of a Norwegian Sami reindeer herding district - Sør-Fosen sijte. An investigation that included studies of the impact a very extensive wind farm, Fosen wind farm, would have on reindeer husbandry in the surrounding area eventually came to be finally decided in Norway's Supreme Court. The Supreme Court decided to revoke the concession to operate the wind farm in question and it wrote in its judgment, among other things:

Pointing in particular to statements from the UN Human Rights Committee, the Supreme Court found that it will amount to a violation of Article 27 ICCPR[4] if the interference has significant adverse effects on the possibility of cultural enjoyment. ***Although the interference in itself may have such serious consequences that it amounts to a violation, it must also be considered in context with other projects, both previous and planned.***[5]

How are cumulative impact assessments applied in the international world? There are several scientific studies[6][7]and investigations by various organizations such as the International Finance Cooperation[8] which show that today there is no accepted international definition of a cumulative impact assessment and how they should be performed. Different countries make different interpretations and it is not particularly daring to claim that when it comes to the cumulative impact that Indigenous Peoples may be exposed to, there are few good examples where such investigations have led to desirable protection. One of the reasons for this is that the knowledge of Indigenous Peoples, their traditional knowledge and their sensitive habitats is often lacking by the decision-makers, consultants and researchers tasked with delivering impact assessments.

Although some countries, where there are Indigenous Peoples, have started to apply the concept of CEAM in relation to projects that may affect the unique living environment of the Indigenous Peoples, it is still not a rule that the affected indigenous peoples have a participatory role in these assessments. Indigenous Peoples living in their traditional territories often have unique traditional knowledge about these areas. A knowledge that encompasses biodiversity, climate conditions and traditional ecosystem services. Not integrating this knowledge with the knowledge that consultants and modern researchers in the field of impact assessment can offer is not only a big mistake but also an expression of a lack of understanding and respect for a knowledge that has been developed over the centuries.

An important finding is that there are cumulative impact assessments that affects Indigenous People showing that some projects have been subject to minor adjustments, but there are relatively few examples where projects have been stopped.

[4] International Covenant on Civil and Political Rights
[5] https://www.domstol.no/en/supremecourt/rulings/2021/supreme-court-civil-cases/hr-2021-1975-s/
[6] https://www.sciencedirect.com/science/article/abs/pii/S0195925522000300
[7] https://www.sei.org/publications/impact-assessment-indigenous-self-determination-scalar-participation/
[8] https://www.ifc.org/wps/wcm/connect/58fb524c-3f82-462b-918f-0ca1af135334/IFC_GoodPracticeHandbook_CumulativeImpactAssessment.pdf?MOD=AJPERES&CVID=kbnYgI5

This must be put in relation to Indigenous Peoples' right to self-determination. If there is no recognition of these rights as they are described, for example, in the United Nations Convention ILO 169 and the United Nations declaration of the Rights of Indigenous Peoples (UNDRIP), there is also no incentive for authorities and companies to actively support the participation of Indigenous Peoples in cumulative impact assessment. The right to self-determination and the right to participate in impact assessment are of course different sides of the same process.

In recent years, a movement has begun to emerge within the international indigenous community where Indigenous Peoples themselves take the initiative to formulate how participatory impact assessments should be carried out. An example of this is the so-called Aashukan declaration.

In March 2017 Indigenous participants from around the world gathered in the Cree community of Waskaganish in Northern Quebec, Canada, to talk about impact assessment.

The exchange was organised by the Niskamoon Corporation and the Indigenous Peoples Section of the International Association for Impact Assessment (IAIA).

Picture: Niila Inga signing the Aashukan declaration on behalf of the Sami People

The goal of the exchange was to reconcile development and the protection of Indigenous culture and lands. The result is the Aashukan Declaration, a set of principles designed to ensure Impact Assessment leads to positive outcomes for Indigenous People, the environment and development.

The principles are:

1.Indigenous Peoples' Rights *are the foundation upon which all discussions must be initiated. Following international best practices, this includes territorial Rights, the Right to self-determination, and the Indigenous Right to say YES or NO.*

2. Relationships *must have integrity and be based on humility, respect, reciprocity, community empowerment, sharing, mutual learning, and sustained long term engagement. Our timelines are based on our values, processes and social organisation, and should be respected.*

3. Processes *must achieve clear communication, transparent decision-making, be inclusive, and be founded on the worldview of the Indigenous Peoples that are impacted.*

4. Outcomes *must be multi-faceted and oriented towards mutual benefits, a commitment towards the prevention of harm, and the enhancement of the well-being of Indigenous Peoples based on their own definitions and criteria.*

The issue of participation in impact assessment is a question that is a little more complex than just being about the participation of the indigenous peoples affected. The experience that we at Protect Sápmi have built up over the past 10 years shows that even if indigenous peoples have participated in the analyses, this is not a guarantee that their values, knowledge and right to self-determination have been integrated into the processes. This does not have to be due to malice on the part of those who carried out the analyses, it is often more about the fact that those, often external consultants, who carried out the work did not have sufficient knowledge and linguistic understanding to be able to value what came out of the processes. Within the Sami language there are e.g. nearly 300 words for snow. Words that are all significant in explaining reindeer husbandry in a holistic way. For us at Protect Sápmi, it is therefore necessary that those who are to interpret an impact on reindeer herding must also come from this environment themselves.

If you summarize our experiences with participatory cumulative impact assessment, our values within Protect Sápmi are quite close to the program statement found in the Aashukan declaration, but in addition to this, it is our firm opinion that the process of carrying out a participatory analysis must also be led by indigenous people who have the right prior knowledge, linguistic understanding and the right tools. Only then can we approach a situation where cultural distinctiveness and traditional knowledge lay the foundation for a full understanding of the impact of a proposed project and thereby work to support self-determination.

4.0 PARTICIPATORY MAPPING

For over five centuries, cartographic map-making has played a pivotal role as a political technology of empire-building, settler colonialism, and the dispossession of Indigenous lands. This is a system that today, five centuries later, causes many conflicts between Indigenous Peoples and various nation-states and their legal systems that have

For over five centuries, cartographic map-making has played a pivotal role as a political technology of empire-building, settler colonialism, and the dispossession of Indigenous lands. This is a system that today, five centuries later, causes many conflicts between Indigenous Peoples and various nation-states and their legal systems that have appropriated the right of veto to decide on land issues. In a situation where Indigenous Peoples challenge the general legal understanding of who has the right to certain land and how this land is to be used, the Indigenous Peoples often end up in a difficult and conflict-like situation where Indigenous Peoples are often required to bear a very high burden of proof. Indigenous Peoples, who rarely have formal land titles, must then prove that they have a historical and cultural connection to their territories. In addition, courts have typically required Indigenous Peoples to show evidence of a "continuous" and "traditional" connection to their territories.

One of the challenges for many Indigenous Peoples is to have their rights to land recognized under a dominant legal system. Most legal systems have adopted Western approaches to judgments based on formal and written evidence, while often indigenous customs, traditions and land laws are oral and not formally written. In addition, most national tenure systems are based on land ownership being an exclusivity, a property model that is based on a property right that is individual and exclusive. This notion of exclusivity is usually not found in Indigenous Peoples' traditional view of land use, which is usually based on collective and communal use of the land.

The use of maps as evidence of national and/or private land occupation, ancestral ties to a territory and traditional land use has increasingly become an important means for Indigenous Peoples to prove land rights. Mapping of indigenous cultural territories is often important because in most situations the courts and authorities are located far from the affected areas, and because these bodies would not have access to or direct knowledge of the affected territories if they did not have access to maps. In such contexts, the mapping of territories can offer some important elements to support Indigenous Peoples, especially by enabling the inclusion of traditional and cultural land use mapping.

Historically, mapping has predominantly been an instrument of colonization and administrative control. However, this has changed as mapping has increasingly become an instrument for local communities to challenge the dominant narrative of land use and tenure. Mapping is used today by Indigenous Peoples as a method to document land use in order to negotiate land and resource rights. The goal of the mapping is to record hunting, fishing, trapping and gathering patterns as well as important cultural and religious sites. Therefore, maps and mapping techniques have also increasingly played an important role in supporting evidence of land rights in disputes.

The translation of cultural, spiritual and other significant traditional attachments to a territory is not always a simple process. There are a variety of mapping techniques and

methods.They vary from highly participatory approaches involving sketch maps to more technical efforts using geographic information systems (GIS), Global Positioning Systems (GPS) and remote sensing. All these methods are technically quite advanced and there is an obvious risk that these tools in the "wrong" hands can also be used against the Indigenous Peoples involved in a process. Especially if the mapping is carried out by different specialists who are not themselves part of the indigenous community.

Picture: 3D participatory mapping brings together technology, science and indigenous peoples' traditional knowledge in Chad (Source G-STIC, Hindou Oumarou Ibrahim)

The response to these dangers has been an increased focus on participatory mapping, enabling Indigenous Peoples to directly create their own maps rather than relying on surveyors and specialized technicians. Mapping has moved from a traditionally high-tech and specialized field to a much more accessible and participatory approach where indigenous communities themselves can play a role. There are several names for such mapping techniques – "participatory land use mapping", "participatory resource mapping", etc. All these refer to the idea of direct involvement of the affected indigenous communities. The use of less technically demanding approaches to mapping, such as participatory three-dimensional modelling or even community sketch maps on paper, has also enhanced community participation. In recent years, digital information technologies have become more accessible in design, usability, availability and price, making them much more accessible to Indigenous Peoples. While the use of many technologies historically remained beyond the reach of resource-poor groups, the proliferation of affordable electronic devices over the past two decades has increased the availability of cell phones, computers, and other devices to many previously technologically underserved communities.

This combination of communication and mapping techniques, which is growing in use but not yet ubiquitous, has been implemented with great success in a number of projects with Indigenous Peoples. In Sweden, for example, the Sami reindeer herders have long applied a GIS-based map system "reindeer management plan". Today 55% of

the total land area in Sweden is used for reindeer husbandry. Other land users as well as the reindeer husbandry are using the same land for different purposes and this has at times been a source of conflicts. Because of that, a need for a dialogue between these different land users grew. During the last half of the 20th century different methods for the dialogue have been developed. The latest of them is the development of Reindeer husbandry plans, which corresponds to the forestry plans, and RenGIS, a Geographical Information System for the reindeer husbandry.[9]

In large parts of our world, development has not progressed as far as within Sápmi when it comes to applying GIS and digital map systems. It is therefore recommended that Indigenous people and their national and regional organizations carry out a Needs Assessment and Develop Work-Plan and Budget. Needs assessments take a comprehensive look at an organization's infrastructure, personnel, hardware, software, data, applications, and training requirements. The costs of the Needs Assessment will vary depending on the number of Indigenous Peoples to be consulted and if the Needs Assessment involves only one community or more than one community. Where GIS has already been set up without a Needs Assessment, the Assessment can help with a course correction.

Indigenous Peoples should consider sharing resources in a common administrative/governance structure to operate a GIS program if there are no conflicts in doing so. Where outside consultants are needed, consider having a portion of the work conducted in the community, where mentoring, training and skills-transfer to local staff can add capacity while the work is being completed. It is important to learn from the experiences of others. If the knowledge and implementation is to be handled by an IPO (Indigenous Peoples Organization), which can be a good solution, then the responsible GIS technicians must have a high readiness to assist individual rights holders in their Indigenous Cultural Landscape.

It is also important to remember that maps that are developed, even if it is done with the support of an IPO, constitute intellectual property that belongs to the Indigenous Peoples affected by the map work - not the IPO, authorities or companies that wish to establish themselves within the affected indigenous community. Use and Develop Confidentiality and Usage Protocols for Cultural Data a cultural data inventory is often a keystone dataset for Indigenous Peoples' mapping. Cultural data inventories cover subjects such as locations of harvest sites for fish, birds and game, structures and occupancy locations like cabins, tent-frames, tents or other shelters, places where wood can be cut or minerals can be found, and locations of community significance like old village locations, gathering places or spiritual sites. Taken together, cultural features represent the ways the land is important to the community. Cultural inventories are sensitive. For one thing, members of the community may have marked spots on maps they wouldn't want shared with outsiders. For another, a point in a database on its own doesn't relay the full story of that feature's importance, which can lead to a

[9] https://www.uppsatser.se/uppsats/7c6eeb702c/

misinterpretation of the site's value. To make sure that the community has its say in interpreting cultural datasets, care needs to be taken to control who has access to information and how they are permitted to use it. A good rule of thumb is that raw cultural data will never leave the community without a signed confidentiality and data sharing agreement in place.

4.1 Mapping as a tool for impact assessment of indigenous people's land and safeguarding of indigenous rights – example from Protect Sápmi

The Protect Sápmi foundation has since 2016 invested in a GIS model for participatory mapping. This model is based upon free and open-source software and data. Each analysis is conducted together with the organization or group of indigenous people whose land is affected. The system consists mainly of two pieces of software: GIS client and a database engine. The GIS client is QGIS. A popular software for GIS work. It is well maintained and feature rich. It also has a living community writing hundreds of add-ons or discussing problems online. QGIS is a user-friendly Open-Source Geographic Information System (GIS) licensed under the GNU General Public License.

QGIS is an official project of the Open-Source Geospatial Foundation (OSGeo). It runs on Linux, Unix, Mac OSX, Windows and Android and supports numerous vector, raster, and database formats and functionalities.

For storage of the larger datasets a local database was setup. The selected database is PostgreSQL. QGIS requires Windows 8, 64 bit or higher because QGIS uses Python 3.9 or later, which is not available for Windows 7. It is wise to have a PC with 8 Gig ram memory and a processor that works at 2 GHz or faster. It is advisable to have a memory capacity of 30 - 40 GHz. The installation file itself takes about 1 GIG.

Norway is an almost ideal country to work in when it comes to maps. There is a lot of data supplied by various government branches and non-profit organizations. The Norwegian mapping institute supplies free, high resolution background maps under an open license. The Norwegian mapping institute also supplies datasets with most data of interest. Roads, buildings, height maps, administrative boundaries, power grid to mention a few. Their data is released under Creative Commons Attribution 4.0 International[10].

When you start a mapping process with an affected Sami community each investigation has a number of steps. The initial stages are all about collecting information on the Reindeer herding district or the area that the district represents. A first step is to search

[10] You are free to: Share — copy and redistribute the material in any medium or format. Adapt — remix, transform, and build upon the material for any purpose, even commercially. This license is acceptable for Free Cultural Works. The licensor cannot revoke these freedoms as long as you follow the license terms.

through the above-mentioned national data sources to find out more about the area. Once basal knowledge has been acquired it is time to interview representatives of theReindeer herding district in order to get their view over what the disturbances are in the district. This list not only contains existing disturbances but upcoming ones as well. This list is the basis of our investigation.

Together with the district representative we will work out how much these disturbances affect the area. The size of the disturbance zones will be decided based on a combination of traditional knowledge, scientific studies and prejudicing rulings from a court of law. Note that upcoming disturbances will have often have two zones; One zone represents disturbance during the construction phase where a much larger area is affected. The other zone represents operational disturbance. Each object will be described in its own journal, showing both the selected disturbance zone as well as how this object affects reindeers, humans and the environment. Once everything is identified and added to the our QGIS installation, we can start calculating the ratio of affected versus unaffected land. This is a long process where each disturbance is compared with the area we're looking at. Any part of the disturbance zones overlapping the investigated area is kept. In the end all trimmed disturbance objects are combined into one single polygon of which we calculate the final size. This size is then compared to the size of the area of the district. At this stage we will be able to calculate a percentage of affected area.

In section 7 later in this document, we will go through, in a step by step model, an example with reference to a real case that Protect Sapmi carried out.

When working with participatory mapping, it is important to determine the terminology for how the area to be mapped is named. This is often expressed in terms of land areas or territories. However, such terminology is only one-dimensional. A land area where indigenous people live always contains a much more multidimensional description.

This can usually be described based on:
• Multiple values are considered (environmental, social, cultural and economic);
• Identification with the area that is relationship-based;
• Culturally important landscape features that are tangible and intangible;
• Evidence of stewardship activities based on collectively held responsibilities for the territory.

A concept that better captures the diversity in a land area where indigenous people live their lives is "Indigenous Cultural Landscape" (ICL). The cultural landscape concept was primarily discussed in the fields of human geography and anthropology, until popularity increased when it was adopted in the International Convention for the Protection of the World's Cultural and Natural Heritage (or the World Heritage Convention) by UNESCO in 1992. Since then, the term has been used in several management contexts, including cultural heritage, environmental assessment and sustainable development, to name a

few. Within the forest certification program FSC (Forest Stewardship Council), a definition has been established following inspiration from the First Nations in Canada:

"Indigenous cultural landscapes (ICL) are living landscapes to which Indigenous peoples attribute environmental, social, cultural and economic value because of their enduring relationship to the land, water, flora, fauna and spirit as well as their present and future importance to their cultural identity. An ICL is characterized by features maintained through long-term interactions based on land-care knowledge and adaptive livelihood practices. They are landscapes over which Indigenous peoples exercise responsibility for stewardship".

In the future, in this document when we describe areas where Indigenous Peoples live their lives, we will use the term ICL when these areas are to be described.

If you summarize participatory mapping, you can divide its functions into three areas:
1. Mapping to determine the boundaries of the ICL where the affected Indigenous Peoples live. Most often, this is an area of land where the Indigenous Peoples concerned have developed a customary right based on the fact that they have lived and practiced their culture in this area since time immemorial. More rarely, it concerns land for which there is a land title.

2. Mapping to determine how an ICL is used and which traditional ecosystem services are important within this ICL.

Here it is described, for example:

a. Areas for settlements
b. Areas for hunting
c. Areas for gathering food
d. Area for fishing
e. Area of pasture for pastoralists
f. Area for drinking water
g. Areas that have important spiritual significance
h. Areas that have a special cultural significance, etc

3. Mapping to determine external impact on an ICL and its traditional ecosystem services. What negative impact does e.g., the presence of a new mine in this ICL and its traditional ecosystem services. Within Protect Sápmi, we have mostly worked with mapping to describe how an ICL is used and in what way an intruder such as a mine or a wind farm affects the traditional ecosystem services (Reindeer husbandry) found in this area.

5.0 INTERNATIONAL LAW

When you work with participating cumulative impact assessment together with affected Indigenous Peoples, you must always remember that this is work that aims to strengthen Indigenous Peoples' self-determination. The legal basis for this self-determination may vary. Many nation-states do not recognize the rights of Indigenous Peoples, and if they do, it is often with great limitations in these recognitions. Parallel to the national legislation, however, there is international law, which is much clearer with regard to the rights of Indigenous Peoples.

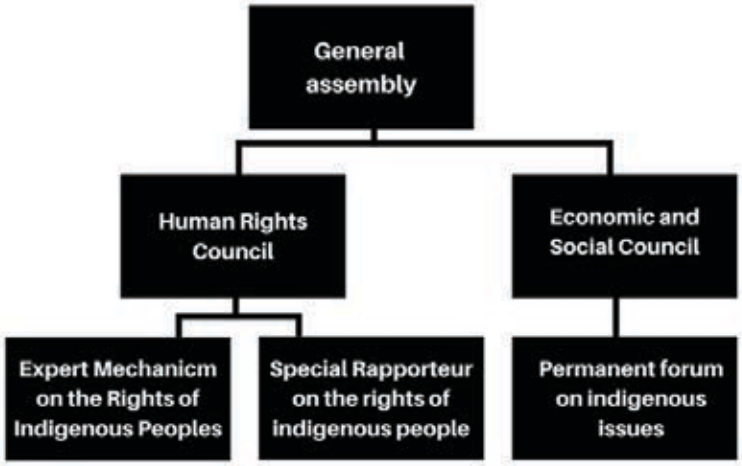
International law is a system of treaties and agreements between nations that governs how nations interact with other nations, citizens of other nations, and businesses of other nations. Treaties are binding for the countries that have ratified them, while agreements and declarations are to be seen as strong recommendations to follow. The latest instrument of international law adopted by the international community regarding indigenous peoples is The United Nations Declaration on Indigenous Peoples (UNDRIP) adopted by the United Nations General Assembly in 2007. Already in the introduction of UNDRIP, section 3 states;

" Indigenous peoples have the right to self-determination. By virtue of that right they freely determine their political status and freely pursue their economic, social and cultural development."

Today there are several conventions and declarations that are relevant to indigenous peoples within international law. Among the most important are:

- United Nations Covenant on Civil and Political Rights
- United Nations Covenant on Educational, Social and Cultural Rights.
- Indigenous and Tribal Peoples Convention, 1989 (ILO 169)
- United Nations Convention on the Elimination of Racial Discrimination
- United Nations Declaration on the Rights of Indigenous Peoples
- The Convention on Biological Diversity
- Discrimination (Employment and Occupation) Convention, 1958 (ILO 111)

The United Nations human rights system has two main components: the Charter-based bodies and the treaty-based bodies. The former is so called because they derive their authority from the Charter of the United Nations, its constituting document. The latter are so called because they are established by specific human rights treaties, such as the International Covenant on Civil and Political Rights, which provides for the establishment of the Human Rights Committee.

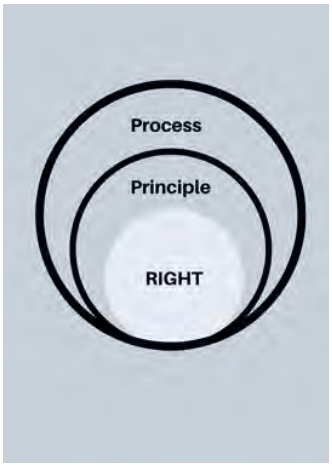


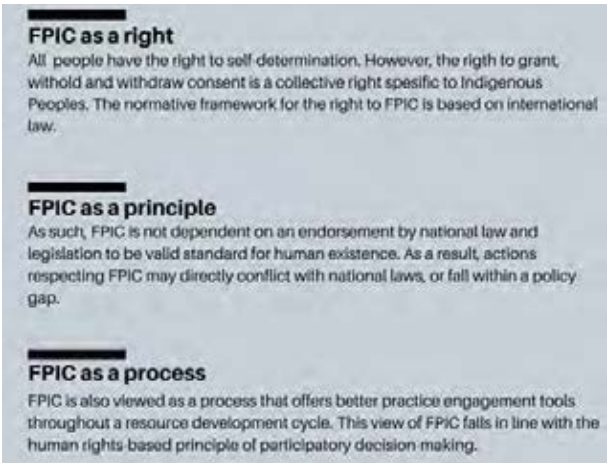
5.1 Free Prior and Informed Consent, FPIC

"Land is the foundation of the lives and cultures of Indigenous peoples all over the world... Without access to and respect for their rights over their lands, territories and natural resources, the survival of Indigenous Peoples' particular distinct cultures is threatened." [11]

Free Prior and Informed Consent, FPIC, is one of the most important instruments of international law for indigenous peoples in their efforts to achieve self-determination. Several articles of the United Nations Declaration on the Rights of Indigenous Peoples are related to, and affirm, the Right of Self-Determination and Free, Prior, Informed Consent over development affecting Indigenous lands, territories and resources and the obligations of State governments, as well as corporations, to implement the Declaration and respect the UNDRIP minimum standards in their relations with Indigenous Peoples. The right to FPIC is not only found in UNDRIP, but is also present in several other declarations, conventions and voluntary market-related tools for sustainable business.

FPIC as a concept contains many dimensions; It can be seen as a right, as a process and as a principle.





[11] Permanent Forum on Indigenous Issues,Report on the Sixth Session 25 May 2007

For Protect Sápmi, FPIC forms the foundation for how we work. By introducing FPIC in relation to various infringers of an ICL, we emphasize the rights that Indigenous people have within their ICL. The concepts included in FPIC, Free Prior and Informed Consent, help us create the process that the work to implement FPIC entails. Since the legal system or international law is not always sufficient, FPIC is also often found as a principle in voluntary systems for viable industrial development.

In August 2018, the United Nations Expert Mechanism on the Rights of Indigenous Peoples (EMRIP) released a study[12] on a human rights-based approach to Free, Prior and Informed Consent in accordance with its mandate under Human Rights Council resolution 33/25. The EMRIP Study stated that human rights are the basis of Free, Prior and Informed Consent, particularly the collective human right of self-determination, as described in the following excerpts from the Study:

3. Free, prior and informed consent is a human rights norm grounded in the fundamental rights to self-determination and to be free from racial discrimination guaranteed by the ***International Covenant on Civil and Political Rights****, the* ***International Covenant on Economic, Social and Cultural Rights and the International Convention on the Elimination of All Forms of Racial Discrimination****. The provisions of the Declaration (UNDRIP), including those referring to free, prior and informed consent, do not create new rights for indigenous peoples, but rather provide a contextualized elaboration of general human rights principles and rights as they relate to the specific historical, cultural and social circumstances of indigenous peoples (see A/HRC/9/9, para. 86)…*

14. Free, prior and informed consent is a manifestation of indigenous peoples' right to self-determine their political, social, economic and cultural priorities. It constitutes three interrelated and cumulative rights of indigenous peoples: the right to be consulted; the right to participate; and the right to their lands, territories and resources. Pursuant to the Declaration, free, prior and informed consent cannot be achieved if one of these components is missing.

There are many similar definitions of the various components of an FPIC process. Within Protect Sápmi, we have for several years applied the definition in the table below. This definition can be applied in all indigenous contexts regardless of where in the world these Indigenous Peoples live. For us at Protect Sápmi, however, the definition given below has been decisive for the development of our method for participatory impact analyses.

[12] United Nations Human Rights Council. 2018. Free, prior and informed consent: a human rights-based approach. Study of the Expert Mechanism on the Rights of Indigenous Peoples, A/HRC/39/62. https://www.right-docs.org/doc/a-hrc-39-62/.

Free	Prior	Informed	Consent
Opportunity for the Sami rights holders (Indigenous Peoples) to freely participate in the process that arises when, for example, a mine is to be built By free is meant that in the process there must not be; • Coercion, threats and manipulation • Discrimination • The lack of capacity to participate in a process	Early participation in the process for the Sami rights holders (Indigenous Peoples): • Before all authority decisions • Before the industrial activities have been started • Early agreement on the process management (process agreements)	Sufficient information for the Sami rights holders (Indigenous Peoples) to be able to make their own informed decisions through: • Participatory impact assessment • Traditional Indigenous knowledge is included • Social and cultural factors are included • The information is provided in the language with which the rights holders are most comfortable • Cumulative perspective is included in the analysis and assessments	Consent from the Sami rights holders (Indigenous Peoples) – means the right to say yes, no or give a modified decision. The right to give or withhold consent is not eternal – if circumstances change, a yes can become a no and a no can become a yes

Indigenous and Tribal Peoples Convention, 1989 (No. 169) (Article 16) [13]

As mentioned above, there are several writings in various international law documents that describe the right to FPIC. In ILO 169, reference is made to FPIC processes in several articles. However, this is most clearly described in Article 16.

1. Subject to the following paragraphs of this Article, the peoples concerned shall not be removed from the lands which they occupy.

2. Where the relocation of these peoples is considered necessary as an exceptional measure, such relocation shall take place only with their free and informed consent. Where their consent cannot be obtained, such relocation shall take place only

following appropriate procedures established by national laws and regulations, including public inquiries where appropriate, which provide the opportunity for effective representation of the peoples concerned.

3. Whenever possible, these peoples shall have the right to return to their traditional lands, as soon as the grounds for relocation cease to exist.

4. When such return is not possible, as determined by agreement or, in the absence of such agreement, through appropriate procedures, these peoples shall be provided in all possible cases with lands of quality and legal status at least equal to that of the lands

[13] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C169

previously occupied by them, suitable to provide for their present needs and future development. Where the peoples concerned express a preference for compensation in money or in kind, they shall be so compensated under appropriate guarantees.

5. Persons thus relocated shall be fully compensated for any resulting loss or injury.

International Covenant on Civil and Political Rights; HUMAN RIGHTS COMMITTEE Ninety-fifth session16 March-3 April 2009 [14]

The International Covenant on Civil and Political Rights (ICCPR) has often been of great importance in preserving and securing indigenous rights. In particular, article 27 and its interpretation by the UN Human Rights Committee have been of great importance in many legal trials; "In those States in which ethnic, religious or linguistic minorities exist, persons belonging to such minorities shall not be denied the right, in community with the other members of their group, to enjoy their own culture, to profess and practice their own religion, or to use their own language." Not as clearly, it has been highlighted that the interpretation of i.a. article 27 should be done with full consideration of FPIC.

7.6 In the Committee's view, the admissibility of measures which substantially compromise or interfere with the culturally significant economic activities of a minority or indigenous community depends on whether the members of the community in question have had the opportunity to participate in the decision-making process in relation to these measures and whether they will continue to benefit from their traditional economy. The Committee considers that participation in the decision-making process must be effective, ***which requires not mere consultation but the free, prior and informed consent of the members of the community.*** *In addition, the measures must respect the principle of proportionality so as not to endanger the very survival of the community and its members.*

International Covenant on Economic, Social and Cultural Rights; (U.N. CESCR Committee, General Comment No. 21, Right of Everyone to Take Part in Cultural Life, (43rd Session, 2009), E/C.12/GC/21, at para. 36 -37.)[15]

The convention text in the International Covenant on Economic, Social and Cultural Rights is not entirely clear as regards FPIC. However, in its interpretation of the convention, the UN CESCR Committee has created greater clarity in this matter.

"Indigenous cultural values and rights associated with their ancestral lands and their relationship to nature should be treated with respect and protection in order to prevent the deterioration of their special way of life, including their livelihoods, the loss of their natural resources and, ultimately, their cultural identity ... ***one must respect the principle of free informed consent from indigenous people in all matters covered by their specific rights .."***

[14] https://digitallibrary.un.org/record/653270
[15] https://www.ohchr.org/sites/default/files/Documents/Issues/IPeoples/FreePriorandInformedConsent.pdf

The Convention on Biological Diversity 1992

The Convention on Biological Diversity, CBD, consists of a convention text but also several text/version changes. [16]In addition to the CBD texts, there is also a voluntary guideline; Akve Kon developed to aid in the interpretation of CBD.

"The Cartagena Protocol on Bio-Safety (2000) to the Convention on Biological Diversity also recognizes The Fifth Conference of Parties (COP) to the CBD Decision V/16 expresses a firm commitment to the implementation of PIC in its general principles: "access to traditional knowledge, innovation and practices of indigenous and local communities should be subject to prior informed consent or ***prior informed approval from the holders of such knowledge****, innovations and practices /."[17]*

Decision V/16 further calls upon:

"Parties to take measures to enhance and strengthen the capacity of indigenous and local communities to be effectively involved in decision-making related to the use of their traditional knowledge, innovations and practices relevant to the conservation and sustainable use of biological diversity subject ***to their prior informed approval and effective involvement PIC applies in the transboundary movement, transit, handling and use of all living organisms.***

Akwe Kon; Voluntary Guidelines to CBD[18]:

"Establishment of a process whereby local and indigenous communities **may have the option to accept or oppose a proposed development that may impact on their community**." (Article 8)

*"****Prior informed consent*** *corresponding to various phases of the impact assessment process should consider the rights, knowledge, innovations and practices of indigenous and local communities; the use of appropriate language and process; the allocation of sufficient time and the provision of accurate, factual and legally correct information. Modifications to the initial development proposal will require the additional prior informed consent of the affected indigenous and local communities". (Article 53)*

Convention on the Elimination of All Forms of Racial Discrimination[19]

The Convention on the Elimination of All Forms of Racial Discrimination contains no specific text on FPIC. The committee responsible for the work with the convention, CERD, has, however, considered that this convention must also be interpreted with FPIC integrated.

*"The Committee for the Elimination of Racial Discrimination (CERD) has issued a recommendation that calls on member states to ensure that "****(d) Ensure that members of***

[16] https://www.cbd.int/decisions/cop/5/16
[17] Decision V/16 above n 8, Annex: Programme of Work, 1. General Principles 5, at 139-42.
[18] https://www.cbd.int/doc/publications/akwe-brochure-en.pdf
[19] General Recommendation No. 23: Indigenous Peoples : . 08/18/1997. Gen. Rec. No. 23. (General Comments)

Indigenous peoples have equal rights in respect of effective participation in public life and that no decisions directly relating to their rights and interests are taken without their informed consent; " [20]

United Nations Declaration on the Right of Indigenous Peoples, UNDRIP [21]

The most important instrument of international law in terms of FPIC is probably the United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP). The UNDRIP is not legally binding and UNDRIP has no international monitoring mechanism. As it now stands, there is no international body who is going to oversee these principles and compliance.

However, UNDRIP sets out minimum human rights standards to be followed by State governments and corporations and there are, as mentioned above, various United Nation human rights bodies that can be relied on by Indigenous Peoples to report breaches of human rights by State governments and corporations .

Within UNDRIP there are several Articles that directly refer to FPIC. Article 32 is perhaps the most relevant in connection with participatory cumulative impact assessments of encroachment on indigenous cultural landscapes.

- Article 10: Indigenous Peoples shall not be forcibly removed or relocated from their lands or territories without their FPIC.
- Article 19: States shall obtain the FPIC of Indigenous Peoples before adopting legislative or administrative measures that may affect them.
- Article 28: Indigenous peoples have the right to redress, including restitution or, when this is not possible, just, fair and equitable compensation for lands, territories and resources, which have been confiscated, taken, occupied, used or damaged without their free, prior and informed consent (FPIC).

United Nations Declaration on the Right of Indigenous Peoples (UNDRIP), Article 32

1. Indigenous peoples have the right to determine and develop priorities and strategies or territories and other resources.
2. States shall consult and cooperate in the good faith with the indigenous peoples concerned through their own representative institutions **in order to obtain their free and informed consent prior to the approval of ant project affecting their lands or territories** and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.
3. States shall provide effective mechanisms for just and fair redress for any such activities, and appropriate measures shall be taken mitigate adverse anvironmental, economic, social, cultural or spiritual impact.

[20] General Recommendation No. 23: Indigenous Peoples : . 18.08.1997
[21] https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf

5.2 FPIC in voluntary market-related sustainability instruments

FPIC does not only appear in international law. The concept has also been widely spread into various voluntary instruments for sustainable business and sustainable development.

Examples of such instruments are:

- United Nations Global Compact
- International Finance Cooperation, IFC
- Forest Stewardship Council, FSC
- Aluminium Stewardship Initiative, ASI
- Equitable Origin
- Equator Principles
- ICMM (International Council on Mining and Metals)
- OECD and others

Among these instruments, there is a variety of different control possibilities to follow up compliance with the instrument's principles and criteria. Somewhat simplified, these control possibilities can be divided into those that have a built-in third-party verification via external auditors and those that are only based on an internal control. The value of these voluntary instruments to follow FPIC should not be underestimated. In a world where there is an increased market interest in sustainable products, sustainable also in the sense of human rights, a credible certification system can increase the possibility of good business and profits for the certified companies. This applies in particular to those companies and organizations that are connected to a certification system with third-party verification.

Companies with connections to various industrial sectors often testify to the importance of striving towards responsible and sustainable behaviour. The international consulting company Ernst & Young publishes an annual report "Top 10 business risks and opportunities for mining and metals[22]". In the report for 2022, based on interviews with leaders within the branch, it is concluded that the greatest risk is linked to social conditions and the environment:

"As environmental, social and governance (ESG) factors become a bigger priority for investors, shareholders and a broader group of stakeholders, miners are doing more to integrate ESG into corporate strategies, decision-making and stakeholder reporting.... Companies are also under increasing pressure to take more responsibility for their impact on communities, and go beyond their regulatory obligations. Miners that help drive the long-term, sustainable economic and social growth of the regions in which they operate can leave a positive legacy beyond the life of a mine."

One of the world's largest furniture companies, IKEA, decided in 2012, to set a goal that their used wood would come from sustainable sources, which included FSC®-certified and recycled wood, by 2020. In the fiscal year of 2020, more than 98% of the wood used

[[22] https://www.ey.com/en_us/mining-metals/top-10-business-risks-and-opportunities-for-mining-and-metals-in-2022

of IKEA products was FSC-certified or recycled. In the case of FSC, this means that if thewood that IKEA buys comes from areas where Indigenous People live, this wood material must have been felled after an FPIC process has been carried out with these Indigenous Peoples. fThis means large financial values for the companies that can supply FSC certified wood material to IKEA and at the same time respect Indigenous Peoples right through a FPIC process.

Appendix 3 contains a number of examples of how different voluntary market-related systems deal with indigenous rights and FPIC. The reported examples are not the only ones that exist, but they show how various industry-related sectors have taken up issues related to indigenous self-determination, rights and FPIC.

5.3 Implementing FPIC in Indigenous Cultural Landscapes

As already mentioned, FPIC contains many dimensions such as an expression of rights and self-determination, a process and in some cases a principle. How to implement FPIC in an ICL in a situation far removed from political, academic and polemical discussions. This is an issue that has engaged many different actors in both the legal/international law fields as well as the voluntary certification organizations. Many have today solved this by creating manuals and guides on how FPIC can be implemented in relation to indigenous peoples.

Today there are guides designed by:

- FSC
- UN REDD
- Oxfam and others
- Equitable Origin
- FAO
- USAID

Most of these guides are designed to assist various industrial companies and authorities in how to interpret FPIC and design an FPIC process. A smaller number are written and designed to assist and prepare indigenous people for an upcoming FPIC process. Below are some examples of FPIC manuals.

5.3.1 Forest Stewardship Council, FSC

Over the years, FSC has developed two versions of its FSC Guidelines for the Implementation of the Right to Free, Prior and Informed Consent, FPIC. In the latest version, FSC describes the work of implementing an FPIC process in seven steps[23]:

[[23] https://fsc.org/en/document-centre/documents/resource/332

Each step has a description of how a certified forest company should approach the task. The document is extensive and has the ambition to be instructive, but despite this, there are today many certified companies that have difficulty fully understanding how an implementation should take place. In recent years, FSC has strengthened its standard in terms of FPIC and today it is therefore mandatory for certified forest companies to apply FPIC in their daily operations within areas where indigenous peoples may be affected by them. The FSC system is based on creating national standards guided by the international regulatory framework. This has also created interest in designing national FPIC manuals. To date there are national FSC developed FPIC manuals in Canada and Norway.

The FPIC process as described above is largely reminiscent of the process that Protect Sápmi applies in connection with IPCIA investigations. This is no coincidence as Protect Sápmi has participated in the development of FSC's manuals on FPIC.

Since the official FSC manual is written with the certified companies as target group, there has been a discussion within FSC about also designing a guide for how indigenous people should prepare for an upcoming FPIC process. This manual has been developed in collaboration between FSC's Permanent Indigenous Peoples Committee (PIPC) and the FSC Indigenous Foundation. The manual follows the seven process steps in the official FSC guide but with an indigenous perspective. The advice and recommendations in this manual are valid in many contexts in relation to different types of infringements of ICL.

STEP 1:

Prepare to engage with FSC, the forest company, certification bodies and other stakeholders

To move forward in an FPIC process, it is recommended for Indigenous Peoples to first define their Indigenous Cultural Landscapes and to conduct a high-level capacity assessment. The activities below are a framework to analyse existing and needed internal capacity, what to research, and plans for conservation, use and management of lands and forests.

- Map the Indigenous Cultural Landscapes
- Assess history, language, culture and Indigenous law
- Assess collection of information, documents and evidence
- Estimate the value of forest resources taken from Indigenous land title/treaty lands annually (e.g., timber, fish and wildlife).
- Assess support for decision making and negotiation readiness
- Understand The Organization seeking certification
- Learn about the Forest Stewardship Council (FSC) and related stakeholders
- Prepares a draft preliminary FPIC Process Agreement and budget (if necessary) to present to The Organization. This preliminary agreement can identify the steps in a coming FPIC process.
- Understand and analyse legal rights
- Engage internal actors and educate about the proposed activities
- Assess if there is interest to engage further

STEP 2:

Prepare for further engagement and agree on the scope of the FPIC process

If the Indigenous Peoples decide to proceed with further engagement, the Indigenous Peoples' Organization immediately prepares a draft longer-term FPIC Process Agreement and budget to present to the certified company and other sources that may support the costs to the Indigenous People's Organization to participate in the engagement process. The FPIC Process Agreement plays a critical role in establishing the scope of an FPIC process.

The FPIC Process Agreement is not an FPIC Agreement. It is a formal mechanism negotiated between the certified company and the affected rights holder early in the FPIC process. It is used to guide early engagement expectations such as cultural protocols, appropriate means of validating an agreement (e.g., oral testimony or ceremony), and the design of an FPIC process.

[[23] https://fsc.org/en/document-centre/documents/resource/332

STEP 3:

Conduct mapping and impact assessments

Now that there is a FPIC Process Agreement in place, as well as an understanding of available capacity and budget, the Indigenous Peoples' Organization should proceed with conducting territory mapping and related impact assessments. This includes exploring the range of options for mapping methodologies, depending on administrative capacity, funding, access to satellite images, computer mapping hardware/software and project organization that includes staff and community involvement. Across different regions, Indigenous Peoples' experiences and situations lead to varying capacity to perform mapping and impact assessments.
The first point the Indigenous People's Organization should consider is how the mapping project will address and include Indigenous cultural and environmental knowledge, which is the property of Indigenous Peoples. It is very important that the original maps and related information are kept in Indigenous People's possession and that appropriate, perhaps edited, versions of the maps and related information are shared through the proper protocols with The Organization. Funding of the mapping project by the certified company does not undermine Indigenous ownership of their knowledge.

STEP 4:

The Indigenous Peoples' Organization informs affected Indigenous rights holders and the certified company

The Indigenous Peoples' Organization, in accordance with their protocols, processes and institutions, consults and discusses the results of the mapping project, impact assessments and the relationships with their Indigenous rights holders and the certified company.

If the results of the Indigenous Peoples' mapping project led to revised changes to The Organization's plans or activities, these changes are presented to the certified company with detailed explanations.

The Indigenous Peoples' Organization decide if they want to enter into negotiations with the certified company for an **FPIC Agreement. FPIC Agreement** is a binding agreement between the Indigenous Peoples' Organization and the certified company. The agreement is binding with relation to the circumstances described in the agreement.

If a decision is made by the Indigenous People to stop negotiations with the certified company and end the **FSC FPIC Process Agreement**, the reasons are communicated internally to Indigenous Peoples and the certified company.

STEP 5:

Indigenous Peoples decide on negotiating an FPIC Agreement

Upon deciding to negotiate with the certified company to develop a mutual FPIC Agreement, the Indigenous Peoples' Organization uses information collected in previous steps and discussions with stakeholders to begin negotiations.

The Indigenous People's Organization determines the readiness of the certified company to discuss measures to: mitigate the negative and optimize the positive impacts; compensate for past, current, or future losses or damages associated with the activities of the certified company; implement benefit-sharing (revenue, job opportunities, and co-management options); address the conditions and process for withdrawing consent; design and implement a dispute resolution process; and introduce new ideas to the negotiating table.

Review and ensure compliance of all parties' obligations and targets established through the FPIC Process Agreement.

Identify internal skills or if outside advisory support is required in the fields of conflict management, negotiation, mediation, advocacy techniques, monitoring and reporting, transparent and accountable bookkeeping, and transportation.

STEP 6:

In accordance with Indigenous Peoples' customs, traditions and institutions, verify and formalize the FPIC Agreement

Ultimately, it is up to the Indigenous People, in accordance with their protocols, processes and institutions to give their Free, Prior and Informed Consent to the FPIC Agreement with the certified company, clearly stating whether the Agreement is "binding" and providing reasons for withdrawing consent, in the event that should occur.

Normally this is a written agreement, but agreements can also be ratified through the Indigenous People's ceremony, custom and tradition should this be the community's wish.

If the Indigenous People withdraw consent for the FSC-certified forest company's forest plans and activities, the reasons should be substantive and explained to the certified company in plain and clear terms. The decision to withdraw consent should not be arbitrary.

STEP 7:

The Indigenous Peoples' Organization and the certified company implement and monitor the FPIC Agreement

The Indigenous People's Organization addresses the implementation of the FPIC Agreement with the certified company, by identifying the frequency of joint meetings and indicators for monitoring the FPIC Agreement process, as well as operations and activities in the field with the FSC-certified forest company.

5.3.2 Equitable Origin (EO) - FPIC360°: Monitoring and Verifying Free, Prior and Informed Consent (FPIC)

In recent years, EO has worked on developing a tool to be able to verify and monitor an FPIC process from its initial steps until a possible agreement between the parties concerned. The tool is called FPIC360°. FPIC360° is an initiative in partnership with the Roundtable on Sustainable Biomaterials (RSB) and the Coordinator of Indigenous Organizations of the Amazon River Basin (COICA). Protect Sápmi has also participated in this work.

The FPIC360° framework focuses not just on the outcome of an FPIC process, but also considers the process used to achieve that outcome, the conditions under which the process three elements - the Process, the Conditions under which is happens, and the Principles of FPIC.[24]

- **Process:** The FPIC360° tool provides guidance on the steps that FPIC process should include and examples of evidence that can be used to verify it.

- **Conditions:** The FPIC360° tool provides guidance on the conditions that should be in place to ensure that the FPIC process happens in a responsible, equitable manner and how to verify them with:
  - Conditions for the community
  - Conditions for the project developer

- **Principles:** The FPIC360° tool provides guidance on how to verify the principles of FPIC to consider whether the process was conducted free from coercion, prior to the decision in order to allow enough time to consider the aspects under consideration, where communities are sufficiently informed (e.g. provided with information in accessible formats), and demonstrated consent (e.g. agreements) with the affected communities

EO uses 8 main criteria to describe the process of achieving FPIC. All steps can be documented and verified via either a web-based tool or via an off-line based Excel solution.

[[24] https://www.equitableorigin.org/programs/free-prior-and-informed-consent/

1. ESTABLISH THE SCOPE OF THE PROJECT
2. ESTABLISH THE PROJECT DEVELOPER'S OBLIGATION TO ACHIEVE FPIC
3. ESTABLISH WHO ARE THE RIGHTS-HOLDERS TO FPIC
4. ESTABLISH THE WILLINGNESS OF POTENTIALLY AFFECTED RIGHTS-HOLDERS TO CONSIDER THE PROPOSED PROJECT
5.ESTABLISH HOW THE PROPOSED PROJECT MAY IMPACT IDENTIFIED RIGHTS-HOLDERS
6. ESTABLISH IF THE COMMUNITY WANTS TO ENTER INTO NEGOTIATIONS
7. NEGOTIATED AGREEMENTS
8. ESTABLISH HOW SUSTAINABLE THE FPIC PROCESS IS

In the FPIC360° program there is a section that goes through and describes the conditions for the indigenous peoples affected by the process as well as a section that concerns the conditions for the companies seeking consent for their activities.

In the description of conditions for affected indigenous people, there are questions about:

1. Community representatives
2. Gender
3. Marginalized and vulnerable groups
4. Community consensus
5. Community institutional capacity
6. Technical knowledge and capacity
7. Cross cultural understanding

In the description of conditions for the companies concerned, there are questions about:

1. Procedures and Processes
2. Destignated project personell
3. Participation in Multi-Stakeholder Working Group
4. Recognition of customary systems
5. Technical knowledge and capacity
6. Gender
7. Marginalised and vulnerable groups
8. Cross-cultural understanding
9. Collaborative design

EO FPIC360° is a relatively new tool, so there are not yet any major experiences to report. However, the fact that both COICA and Protect Sápmi contributed to the development of the tool shows that there is a genuine interest from EO in creating a useful tool to support the implementation of FPIC within the certified energy sector.

6.0 TRADITIONAL KNOWLEDGE

In the work of carrying out IPCIA, traditional knowledge is one of the most important bases for the final result. The question of how the concept of traditional knowledge should be defined has been discussed in many forums, including the United Nations Permanent Forum on Indigenous Issues. In its 2019 session, this forum discussed the generation, transmission and protection of traditional knowledge. In this document, the following definition was presented:[25]

Traditional knowledge refers to the knowledge, innovations and practices of indigenous peoples. Developed from experience gained over the centuries and adapted to the local culture and environment, traditional knowledge is often transmitted orally from generation to generation. It tends to be collectively owned and can be expressed in stories, songs, folklore, proverbs, cultural values, beliefs, rituals etc. It is also the source for the traditional use and management of lands, territories and resources, with indigenous agricultural practices that care for the earth, without depleting the resources. Indigenous peoples follow oral traditions, with dances, paintings, carvings and other artistical expressions, that are practiced and passed down through millennia.

Traditional knowledge is at the core of indigenous peoples' identities, cultural heritage and livelihoods. The transmission of traditional knowledge across generations is fundamental to protecting and promoting indigenous peoples' cultures and identities and as well as the sustainability of livelihoods, resilience to human-made and natural disasters, and sustaining culturally appropriate economic development. Traditional knowledge underlines indigenous peoples' holistic approach of life, which is a central element of the world's cultural and biological diversity.

Another way of describing Indigenous Traditional knowledge has been presented by The Assembly of First Nations in Canada, they have described indigenous knowledge as consisting generally of four interlinked components including:

1.Creation stories and cosmologies which explain the origins of the earth and its people;

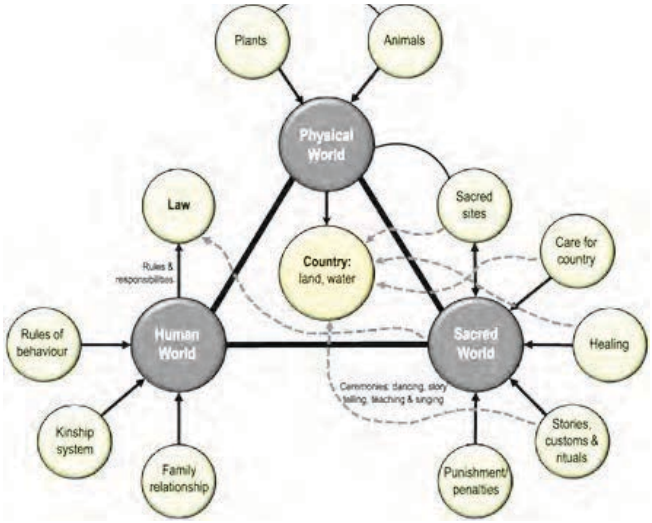
2. Codes of ritual and behaviour that govern peoples' relationships with the earth;

3. Practices and seasonal patterns of resource utilisation and management, that have

[25] https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2019/04/Traditional-Knowledge-backgrounder-FINAL.pdf

evolved as expressions of these relationships;

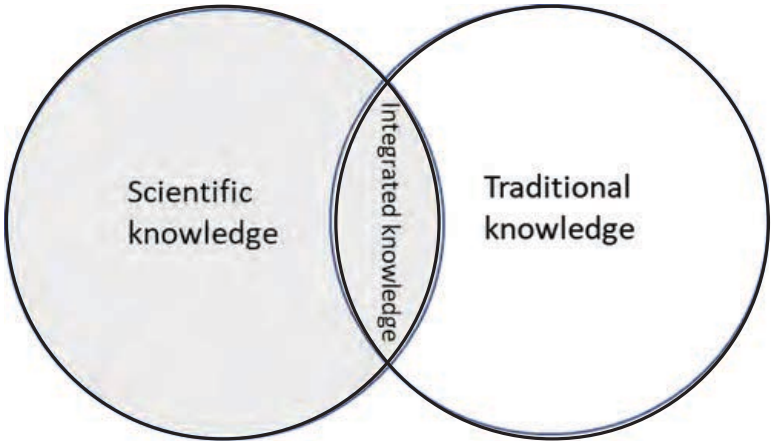
4. Body of factual knowledge that has accumulated in connection with these practices .
It is generally these last two components, the practices and facts that have been the focus of the interpretations of traditional knowledge in practice and in research. In the figure below presents the various elements of indigenous knowledge pictorially. In this representation traditional knowledge exists within a web of indigenous knowledge.
The traditional knowledge has the country, the Indigenous Cultural Landscape, as its epicenter. This center is then surrounded by the physical world, the human world and the sacred world. All dimensions become important when assessing the value of this traditional knowledge and none can be disregarded[26]



Most impact analyses carried out today base their ideals of knowledge on so-called scientific knowledge. In such a context, the traditional knowledge of Indigenous Peoples is often regarded as less valuable knowledge. This is regrettable and often means that the so-called scientifically based impact analyses miss large parts of the information that is necessary for a result that is credible. Scientific knowledge is usually described as knowledge based on evidence and included in scientific theories: consistent and deductively complete sets of propositions around a topic of scientific interest, which describe it and give it a verifiable explanation. To some extent this is true, but it must be remembered that "scientific truths" change over time. Once upon a time, it was scientifically established that the earth is flat. Scientific theories can be renewed, modified or even substituted by another one to the extent that their results or interpretations respond better to reality and are consistent with other scientific postulates proven as true.

Should one then disregard scientific knowledge in the execution of an IPCIA and only relate to traditional knowledge? Within Protect Sápmi, we have chosen a different path. For us, traditional indigenous knowledge is the basis for our values and our work, but we also see scientific knowledge as an important source of information when it is integrated with traditional knowledge.

[26] Source: Adapted from Sangha et al. (2015). Charles Darwin University, Darwin, NT 0810, Australia



Our approach is that scientific knowledge can add important information when it becomes integrated into traditional knowledge - not the other way around.

The key to traditional knowledge is found in the language. In the traditional language, one often finds a richness of nuance that goes far beyond the ability of the national languages to describe landscapes and territories and the traditional ecosystem services that can be found in these landscapes. In the Sami languages there are e.g. words and descriptions about nature, climate and grazing conditions that completely lack their equivalent in the Scandinavian languages. A consultant who is to carry out a consequence analysis of the establishment of an extractive industry within a Sami reindeer herding area and who lacks the linguistic understanding and insights into the traditional knowledge can be closely compared to a blind traffic controller who must pilot an airplane to a safe landing.

It can be easy to think that traditional knowledge is static and unchangeable, this is not true. Traditional knowledge can be compared to an iterative process where the previous knowledge forms the basis for a newly developed knowledge. In this way, it can be said that traditional knowledge is centuries-old knowledge that changes with time but never loses its fundamental values. Acquiring traditional knowledge therefore requires many generations of practice, while it only takes 6-8 years to create a scientific doctoral knowledge.

Traditional knowledge has been referred to in different contexts with other concepts. Traditional ecological knowledge (TEK) is one such concept. In the extension of these definitions, a novel concept has emerged in the landscape and urban planning fields called ecological wisdom (EW). EW is defined as the best expertise of pure improvisation for and from ecological practice that enables a person or community to make not only ethical judgments, but also take circumspect action on ecological practices. It originates from the idea of re-learning local culture, which has been proven to integrate human behaviour and nature to produce a sustainable landscape. In this sense, it is relevant to connect this concept to Indigenous Peoples. There is an undiscussed wisdom among many Indigenous peoples where they transform the transgenerational traditional knowledge into a traditional ecological wisdom.

The poet TS Elliot once wrote in his poem The Rock:

> **"Where is the wisdom we have lost in knowledge?**
> **Where is the knowledge we have lost in information?"**

This is an important reminder that just because many non-Indigenous impact assessment practitioners have access to information does not necessarily lead to knowledge. Just because these people think they have knowledge, this does not necessarily lead to wisdom. The only ones who can verify if the information is true, if the knowledge is real and if the wisdom is genuine are the Indigenous Peoples who have been living in their ICLs since time immemorial.
An important part of traditional knowledge is the practice of traditional ecosystem services.

6.1 Indigenous Spiritual Practices

Indigenous spirituality is a more complex phenomenon than the term spirituality alone, as generally understood, implies. Indigenous spirituality is closely bound up with culture and ways of living in Indigenous communities and requires a more holistic or comprehensive approach. Some spiritual practices are so much a part of the culture of a particular geographical area, and always have been, that they can better be described as a tradition. Indigenous Peoples' spiritual practices are based on nature -- the spirits that live in animals, trees, the landscape. They are the spirits that govern the weather, the hunt, the crops -- anything that is life sustaining. They are in the heavens and on earth - so much a part of all that is that they are more than a religion -- they are a sustaining and integral part of life.

Picture: The sacred place Uluru (Ayers Rock) in Australia

Indigenous spirituality is found all over the world where Indigenous people live. Even though there can be big differences in living conditions between an Arctic tribe and an indigenous community in Brazil, there are nevertheless common denominators and principles that govern spirituality regardless of location. You can call this a common cosmovision.

Some of these principles are:

- Human beings are created to live in harmony with the natural world – with Mother Earth. The concept of relationships is integral to Indigenous Peoples spiritual traditions. These relationships apply both to living and dead ancestors and animals, both to material and immaterial phenomena in the indigenous cultural landscape where they live their lives.

- There is a profound interconnection among all of creation. All animate and inanimate parts of the Indigenous Cultural Landscape are endowed with spiritual values and thus deserve the utmost respect.

- Gratitude is a central concept in Indigenous Peoples traditions – mankind expresses gratitude to the natural world for abundant gifts that ensure survival and flourishing

- Indigenous Peoples has a distinctive spiritual relationship with traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other natural resources

- Values and traditions of the people are gifts from the Creator. Values such as wisdom, love respect bravery, honesty, humilityand truth enables right living.

Having faced centuries of brutal conquest and colonisation many indigenous peoples worldwide live with a historical legacy – and ongoing forms – of discrimination, hostility and violence including undue restrictions on their spiritual and religious traditions, customs and ceremonies, ceremonial objects and religious and cultural sites.

When working with an IPCIA, full consideration must be given to the spiritual values that prevail in the area where the investigation is taking place. To an outside non indigenous observer, it is easy to miss the significance of sacred sites, traditional burial grounds and areas of special spiritual significance. This underlines the importance of having the participatory perspective in the work with the cumulative analysis.

6.2 Indigenous Peoples Traditional Ecosystem Services

To begin with, let's define what is an ecosystem. It's a biological system made up by a community of living beings and the natural environment in which they live, called a system because all the parts interact and affect one another. The interactions occurring in these ecosystems generate 'services' that we use on a daily basis and benefit all of us.

Ecosystems render services that are essential for the quality and sustainability of the lives of people.

In this sense, ecosystem services are benefits that ecosystems bring human beings, so they can fulfil themselves in all respects.
The Millennium Ecosystem Assessment (MA)[27], a major UN-sponsored effort to analyse the impact of human actions on ecosystems and human well-being, identified four major categories of ecosystem services: provisioning, regulating, cultural and supporting services.

1. Provisioning Services
Fruits, vegetables, trees, fish, and livestock are available to us as direct products of ecosystems. A provisioning service is any type of benefit to people that can be extracted from nature. Along with food, other types of provisioning services include drinking water, timber, wood fuel, natural gas, oils, plants that can be made into clothes and other materials, and medicinal benefits.

2. Regulating Services
Plants clean air and filter water, bacteria decompose wastes, bees pollinate flowers, and tree roots hold soil in place to prevent erosion. All these processes work together to make ecosystems clean, sustainable, functional, and resilient to change. A regulating service is the benefit provided by ecosystem processes that moderate natural phenomena. Regulating services include pollination, decomposition, water purification, erosion and flood control, and carbon storage and climate regulation.

3. Cultural Services
The importance of ecosystems to the human mind can be traced back to the beginning of mankind with ancient civilizations drawing pictures of animals, plants, and weather patterns on cave walls. A cultural service is a non-material benefit that contributes to the development and cultural advancement of people, including how ecosystems play a role in local, national, and global cultures; the building of knowledge and the spreading of ideas; creativity born from interactions with nature (music, art, architecture); and recreation.

4. Supporting Services
Ecosystems themselves couldn't be sustained without the consistency of underlying natural processes, such as photosynthesis, nutrient cycling, the creation of soils, and the water cycle. These processes allow the Earth to sustain basic life forms, let alone whole ecosystems and people. Without supporting services, provisional, regulating, and cultural services wouldn't exist.

[27] https://www.millenniumassessment.org/en/index.html

In addition to the definition developed by The Millennium Ecosystem Assessment (MA), there is a fifth category of ecosystem services – Indigenous Peoples traditional ecosystem services. These are services that are linked to the traditional indigenous culture and its knowledge. In a way, you can say that these services are subsets of several of the services defined by the MA, but they also have their own independent meaning. For reindeer-herding Sami, reindeers are an important food resource. The traditional reindeer husbandry is completely dependent on access to the right type of pasture, while the reindeer, through their grazing, contribute to preserving the landscape and its biological diversity. This ecosystem service is built up over the centuries and is well described in the traditional knowledge and in the traditional language. For a gathering people in India, the traditional collection of plants can mean both a service for their survival but also a service that perpetuates biological diversity. For an Indigenous People in Borneo, the traditional ecosystem services may include an old relationship with the Orangutans who live in the area, a relationship where the Orangutans contribute medicine in the form of chewed bark that is used to cure certain childhood illnesses.

IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services) recognizes that Indigenous Peoples possess detailed knowledge on biodiversity and ecosystem services. This knowledge is formed through their direct dependence on their local ecosystems, and observations and interpretations of change generated and passed down over many generations, and yet adapted and enriched over time. Indigenous peoples and local communities from around the world often live in remote areas, interacting with nature and managing resources that contribute to society at large. They also suffer directly from the pressures of expanding agriculture frontiers and commodity production, such as mining, logging, and energy. They are often better placed than scientists to provide detailed information on local biodiversity and environmental change, and are important contributors to the governance of biodiversity from local to global levels.

When we within Protect Sápmi carry out an IPCIA, we look for indicators of an encroachment of negative significance by linking these indicators to the negative impact on the traditional ecosystem services that the reindeer-herding Sámi depend on. The same methodology can be used for other indigenous peoples whose traditional ecosystem services are affected in a negative sense.

7.0 To practice indigenous-led participatory and cumulative impact assessment on traditional ecosystem services

7.1 Introduction

The work with an IPCIA is in many ways very similar to an FPIC process. The steps reported in previous chapters regarding examples of FPIC processes are repeated to a large extent in the work with IPCIA. It is important that, well in advance of any decision on encroachment on their landscape, the indigenous rights holders are allowed to participate in a process that, under free conditions, gives them the opportunity to make informed decisions.

Before the work with the participatory impact analysis can begin, an initial work must be carried out.

1.Initial work	Comments
A rights holder contacts Protect	It is important to state that the request to Protect to assist is based on a legitimate request where the concerned rights holders have made a decision guided by the traditional and/or legitimate decision-making order that prevails in the village/organization in question. Protect never undertakes an assignment unless such a decision exists. Protect also does not undertake assignments for companies interested in purchasing our services unless this has been sanctioned by the relevant rights holder. It is important to clarify that Protect will not act as legal representative for the rights holders. If a legal representative is requested, it is primarily a matter for a lawyer. Protect must be seen as a facilitator, a resource reinforcement and a capacity for the concerned rights holders
Orientation of what the matter is about	The concerned rights holders explain what the matter is about and what they want help with. Most often, the case concerns the establishment of an industrial activity within the Indigenous cultural landscapes (ICL) where the rights holders live their lives. Not infrequently, the rights holders have already been in contact with the concerned company/organisation that want to establish operations within the ICL of the rights holder and they now want help with the dialogue with this company/organization and to discuss the possibility of an IPCIA.
Establishing a budget	Protect does not have the funds to start work without external financing being arranged. It is unusual for the rights holders themselves to have access to such funds. The basic assumption is that the company that may cause the potential negative impact must also pay for the work that the rights holder wants Protect to help with.

Contact with the concerned company/organization that wishes to establish operations within the rights holders' ICL.	If the company concerned is positive about an organized collaboration, a Process Agreement is prepared in which the conditions for the continued work are regulated.
A) A Process Agreement is drawn up and signed by the parties	It is important to state that this agreement does not imply a position on the matter, but is only a regulation of how the continued cooperation is to be carried out. A Process Agreement may include (but is not limited to): • An agreed scope of the IPCIA process • Timelines for implementation of the work • Representation in the process; • Expiry date of the Process Agreement; • Frequency and location of meetings • How decisions will be made; Clear steps in the process, in line with continuous and iterative decision making; • Terms of verification and observation of the process • Financial commitments for the process; • Acceptable use of advisors, facilitators, and observers; • Capacity-building strategy, if necessary; • Mechanism for monitoring the process; • Types of documents to be shared; • Strategies for intellectual property • Interim dispute resolution process, • Record of actions taken in the process. Work on the IPCIA can now begin
B) The company/organization concerned does not want to enter into a process agreement	Protect now recommends the rights holders to seek other external funds if they continue to wish assistance from Protect in the work to carry out an IPCIA. Here it may be relevant to apply for funds from different authorities (the Sami Parliament) or different other funds
The rights holders arrange their own financing of the work	The work with IPCIA can now be started, however, not in close cooperation with the concerned company/organization that wishes to establish itself within the rights holder's ICL

The work with IPCIA is divided into three sub-areas:

1. Description and analysis of the consequences of a planned activity in a cumulative perspective. This material is presented in a first report (Report I)
2. Identify the need for and proposals for adaptation and mitigation measures to reduce the negative impact of the planned activities. This is reported in a second report (Report II)
3. Analysis of how to compensate, financially and otherwise, for the residual effects that remain after any adaptation and mitigation measures. This is reported in a third report (Report III):

In some cases, there has been requests for a Baseline study. A Baseline study is an IPCIA that has not been initiated by a specifically planned encroachment in the concerned rights holder's ICL. A baseline study may be relevant in, for example, a reindeer herding district that already has such high pressure from external disturbances that one wants to clarify the baseline that exists today in order to thereby be prepared for new future disturbances. For Protect, the most common work has been attributable to the first three sub-areas.

Before the real work with the impact analyses can begin, it is important that the indigenous people's organization (IPO) that will assist the concerned rights holders make an agreement with the concerned Indigenous Peoples on how the work is to be conducted. According to our experience at Protect, it is important to hold a meeting with the responsible representatives of the affected indigenous people. In our work in Norway, this usually means a meeting with the district board that is responsible for the reindeer husbandry and that represents the rights holders in the area in question.

At such a meeting, we go through, among other things:

- The basics of participatory cumulative impact assessment
- The basics of participatory mapping
- The basics of national and international law including Free Prior and Informed Consent, FPIC
- The importance of Traditional knowledge
- A description of how the traditional ecosystem services are designed in the district, within Sapmi this means describing how the reindeer husbandry is carried out.

It is important to bring fully understanding that an adviser, such as Protect, will not be able to carry out an IPCIA without the relevant rights holders/Indigenous Peoples fully participating in the process. They stand for the traditional knowledge and the adviser's job is to package this knowledge together with them so that it becomes credible, accurate and illustrative. In order for the work to be as good as possible, it is recommended that a working group be appointed of the concerned rights holders who can participate in the continued work. If there is a Process Agreement drawn up, this should guarantee that the members who will be part of the working group will be compensated for the time they spend on this work.

The working group that is appointed should well reflect the knowledge, culture and structure that prevails in the current indigenous community. This is not a working group to consolidate power structures, but a group that is expected to be able to highlight all aspects of culture, traditional knowledge and knowledge of traditional ecosystem services that are represented in the current community. It is also important to create a balance where all perspectives are given space; Young and old, men and women.

7.2 Description and analysis of the consequences of a planned activity in a cumulative perspective

The work begins by describing what we call the Primary Object, that is, the potentially negatively influencing activity that is the reason for the investigation, could be, for example, a mining activity, a wind farm or a major forest clearing. Basic data about the project is entered in a journal for Primary Objects (see appendix 1). The journal contains two parts, a first part that contains basic information and a second part that describes the impact the Primary Object will have on the affected indigenous community. The second part will be filled in a little later in the process – in the Risk and Vulnerability analyse.

When the Primary Object is described, the work begins with creating content in the started IPCIA process.

This work takes place in stages:

I**.**Geographical and temporal limitations

I**I.**Descriptions and impact analyses of the consequences of the planned activities for the affected indigenous community

III. Cumulative impact assessments

All these stages depend on tools to be able to make accurate analyses and assessments. In our work within Protect, we apply Geographical Information Systems (GIS) for mapping and a model for Risk and Vulnerability analysis - RAV. These tools will be described below.

7.2.1 Geographical and temporal delimitations

Delimitations need to be made both in time and space, and the spatial demarcation is to some extent dependent on the size and effect of the planned activity. When it comes to the impact of different activities on indigenous people's traditionally practiced ecosystem services, it is our opinion that this must be described on three levels. Our experience is primarily based on our knowledge of reindeer husbandry, where even modern research shows that the local scale is often misleading when it comes to the assessed impact on the reindeer herd, as the effects become more visible when you look at a larger surrounding area.[28]

In our work, we therefore divide the geographical description into three levels:

A. Local impact; the direct area that is affected by the Primary Object
B. Intermediate impact; a larger area adjacent to the Primary Object
C. Regional impact; usually a larger part of the Indigenous Cultural Landscape, can be the entire land of rights of the community concerned.

[[28] Skarin Anna, Åman Birgitta (2014) Do human activity and infrastructure disturb domesticated reindeer? The needfor the reindeer´s perspective: Polar Biologyl

When we later do a summary study of the cumulative effects, these should therefore preferably be analysed on a local, intermediary and regional scale, where it can sometimes often be justified to do the analysis over the entire area of the concerned indigenous community/ICL, including any surrounding country. In this context, the surrounding area means adjacent indigenous communities, as it is usually the case that the effects also spread across the village boundaries. It is better to start with a wide delimitation to narrow it later if you see that it is sufficient. If there are no maps of the entire area to which the affected indigenous people claim rights, mapping should begin at this level and then work its way down through intermediate to local scales. Within reindeer husbandry in Norway, we have already established maps of the boundaries of the various Sami reindeer herding districts, but in large parts of the world this is not obvious.

It is now that the work of working with maps begins. Within Protect, when we work at this level, our Sami Protect Sápmi advisors, including our map technician, sit together with the reindeer herding district's working group and systematically work our way through the different geographical levels and digitize and illustrate this with the help of GIS maps.

At this stage of the work, we begin to ascertain the extent to which the planned project will involve disruptions for the current rights holders. The description we make to highlight the adverse impact and the importance and quality of the areas is based on.:

- The landscape, to what extent is the landscape impacted?
- The traditional ecosystem service (in our case the traditional reindeer husbandry), to what extent is the traditionally ecosystem impacted?
- The human being, to what extent is the human being in the Indigenous community impacted.

7.2.2 Descriptions and analysis of the consequences of the planned activities for the affected indigenous community

Many Indigenous communities have already been exposed to major impacts in addition to the current Primary Object. We call the various types of interference that may be relevant besides the Primary Object, Secondary Objects. They can represent everything from insignificant disturbance factors to objects that have a large negative impact. In the continued cumulative analysis work, we bring together disturbances from both the Primary Object and the various Secondary Objects. Only then can we see the full cumulative effect for the concerned Indigenous community.

The work of describing and analysing the consequences of the planned Primary Object is carried out in several partially parallel steps. In some cases where there is already a significant problem with already established disturbance objects, Secondary Objects, it can sometimes be good to start by describing the Secondary Objects in order to

thereby determine the degree of adaptation possibilities that remain for the planned Primary Object.

1.The first step involves using maps/GIS maps to describe the impact of land areas that the Primary Object may cause

2.The second step involves using maps/GIS maps to describe all other objects of disturbance, historical and contemporary, which also might have an impact of the affected Indigenous People. The so-called Secondary Objects

3.The third step involves using a number of analysis tools, the RAV model, to describe the impact that Primary Objects and Secondary Objects have for the ICL (Indigenous Cultural Landscape), the traditional ecosystem services and for humans

4.The fourth step involves making a cumulative description of the total impact that the concerned indigenous people may be exposed to by combining the Primary Object with all Secondary Objects

5.The fifth step; the cumulative analyse

6.The reports

77.2.2.1 Step 1 - description of the potential negative impact of the Primary Object

The work within the first step means that the working group appointed by the rights holders sits down with their assistant advisors from the IPO (Indigenous Peoples Organisations) that has been engaged. With the help of map techniques, you draw in, digitize, the Primary Object on a map. This work is not only aimed at describing where on the map this Primary Object will end up, it is more about describing the disturbance zone that the Primary Object is expected to create in relation to the local, intermediary and regional level. That is, the area where there is a high risk that the traditional ecosystem services of the affected Indigenous People will be affected in a negative and significative sense. Within Protect Sápmi, we base these assessments on an integration of traditional knowledge and scientific knowledge. There is today in the Scandinavian countries a lot of research that shows the impact of different disturbance sources on reindeer husbandry. The disturbance zones that may be reported in the form of scientific studies must only be seen as an indication. Only when this knowledge is integrated with traditional knowledge does it become meaningful.

When you make the assessment of which zone of influence applies to a Primary Object, you must also analyse the disturbance during construction and the disturbance during the upcoming continuous operation. Usually, the disturbances during a construction phase of, for example, a wind farm are more extensive than the disturbances during the

upcoming operation phase. When digitizing in the selected map system, you should therefore draw in both of these different elements of disturbance.
For indigenous peoples who lack this type of scientific reference to assess disturbance zones, it is primarily the traditional knowledge that must be guiding. However, there may be scientific studies that are not familiar to the affected Indigenous People and it will then be the advisory IPOs who must find and present this knowledge.

7.2.2.1.1 An example from Sápmi

The illustrations of the first step in this section come from an analysis that Protect carried out in the Norwegian Reindeer District Jillen-Njaarke. For several years, this reindeer grazing district has been involved in a conflict concerning the establishment of a wind farm within their reindeer grazing areas. The map material used is background maps from Norwegian authorities. With this as a background, the GIS system QGIS has been used to create the various map layers that illustrate the impact that the landscape, the reindeer (the traditional ecosystem services) and humans are at risk of suffering. This analysis is done at the three geographical levels; local, intermediate and regional level.

The Local level

The extent of the impact on reindeer husbandry, on the traditional ecosystem service, is at the local level governed by the type of activity in question. In the Scandinavian countries, research has been conducted for several years to map how different interventions affect reindeer husbandry. According to this research, which has also been partially confirmed via various legal processes, you can expect about a 5 km disturbance zone around a wind farm. Disturbance in this context means that the reindeer more or less avoid this area. Since Protect' s ideals of knowledge are based on traditional knowledge, we now take the scientific information into a discussion with the rightsholders working group where we compare scientific knowledge with traditional knowledge. Sometimes this means that the zone of influence becomes larger than the scientifically claimed one, sometimes it becomes smaller. For other indigenous peoples with other traditional ecosystem services, basic work is required to produce indicators of disturbance that are relevant in their context. However, the lack of any scientific data on disturbances to the traditional ecosystem services of these indigenous peoples should not be a deterrent, as we assume that traditional knowledge has priority.

In the case of the wind farm within the Jillen-Njaarke reindeer herding district, after discussions with the reindeer herders, we started from a 5 km disturbance zone. In connection with the Wind Power Park, there are also new connecting roads and power lines which were also assessed to have a disruptive effect.

Figure: The local level; The green lines represent roads where the wind turbines were planned to be built. The yellow lines are the Reindeers migration routes. From a local perspective, it is clear that the new wind farm will seriously disrupt the ability of the reindeers to move through this area

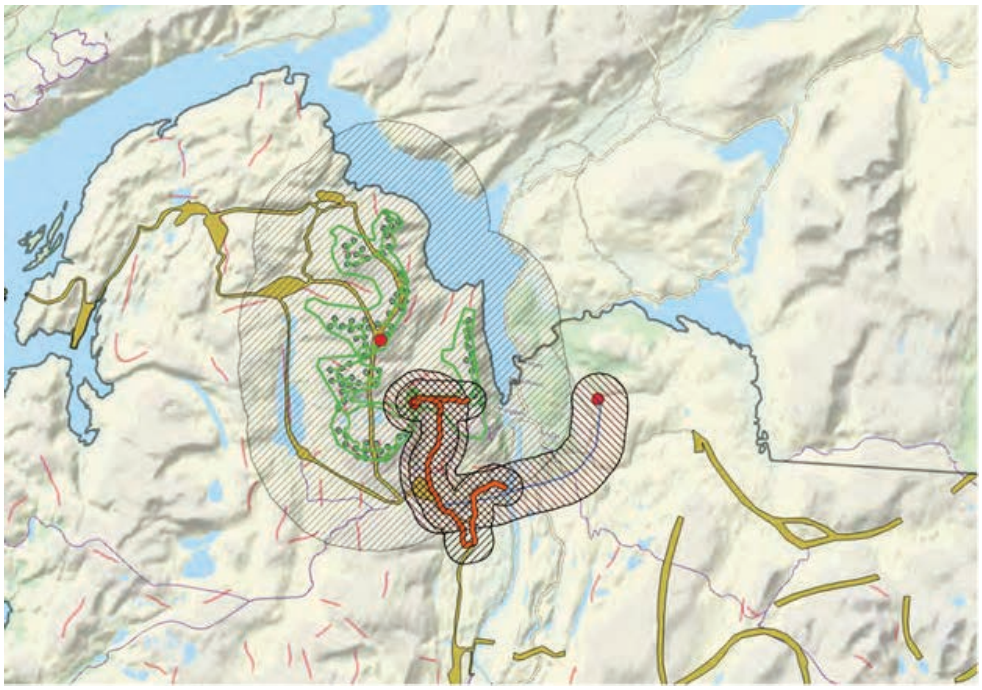


Figure: Disturbance zone (dashed area) for the Wind Power Park (in green) 5 km, influences for connection roads 1 km, influences on connection power lines 1.5 km.

Since the impact on the local level is described, this information is entered in the form of a digital map and describing text in the Primary Object's journal (See appendix 1)

The intermediate level

The next work effort will be to describe the intermediate level. Reindeer farming is an activity where different seasonal grazing areas are important. An intermediate description in this context can be the description of a complete area for seasonal grazing. The reindeer stay and graze during the spring in one seasonal area, during the summer, autumn and winter in another seasonal areas. This is an ancient pattern that is necessary for reindeer to survive and reproduce in a way that is both ecological and sustainable. This movement pattern is largely controlled by the reindeer themselves. Disturbances that affect this natural movement pattern can therefore have major consequences.

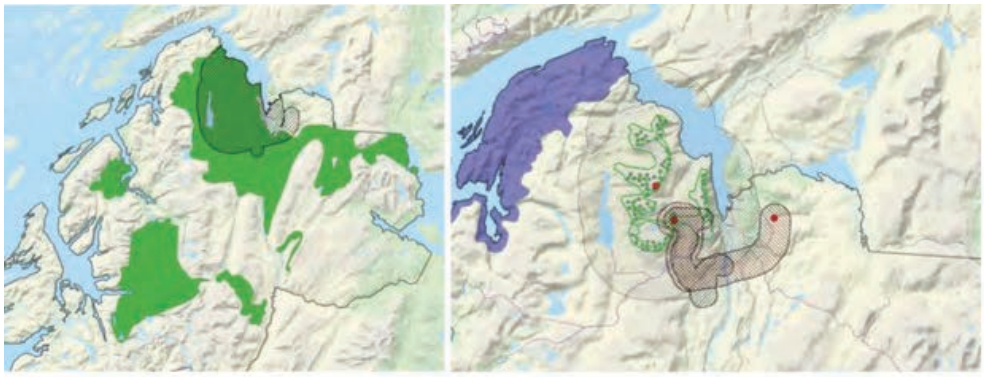


Figure: The Primary Object's impact on summer and winter grazing areas. Winter pasture in blue and summer in green.

The regional level

Finally, you can combine all the intermediate map analyses and then get an illustration of the total impact at the regional level, i.e. in this case the entire reindeer herding district. This is then fed into the further analysis work.

7.2.2.2 Step 2 - Temporal limitations and descriptions of the Secondary Objects

The second step in the process involves using maps/GIS maps to describe all other objects of disturbance, besides the Primary Object, historical and contemporary, which also might have an impact of the affected Indigenous People. These objects are, as already mentioned, called Secondary Objects.

The temporal delimitation is made in two dimensions:

Present situation, which is a description of the accumulated history
Future situation

In the analysis, the focus should be on the future because it is the future possibilities of continuing to practice the traditional ecosystem services that we want to secure.

However, a basic rule should be that in the continued cumulative analysis, all activities that have produced, produce or will produce negative effects/impact together with the Primary Object must be described. These objects, the Secondary Objects, are the basis for us to later be able to do a cumulative impact assessment.

The work of determining current Secondary Objects can be carried out in several ways, but it may be appropriate to follow a certain order:

A. List all the different Secondary objects that affect the concerned indigenous community based on the current situation. Since this is a description of the accumulated history, do not discard any item because it is old if it still has a disturbance effect. This description is carried out at all three geographic levels; local, intermediate and regional.

B. List the future activities that may affect the traditional ecosystem services divided in the same way as above. It is difficult to go further than 10 years in time because the plans then become so uncertain that it is most appropriate to leave them out of the analysis.

A question you have to ask yourself is how safe the future projects and objects must be to be included in the cumulative analysis? To assess this, you can use a simple list of projects and activities with an increasing degree of uncertainty:

- Secured
- Decided
- Under permit review
- About to be submitted for approval
- Reasonably predictable
- Follow-up activities that are dependent on the current Primary Object
- Included in current authority plans.
- Included in current authority plans and submitted for decision
- Hypothetical
- Discussed idea
- Guess based on available information

Examples of existing Secondary objects can be:

- Roads and infrastructure
- Mines
- Hydropower
- Buildings and Communitys
- Power lines
- Wind power
- Nature conservation areas
- Tourist activities
- Examples of future Secondary Objects can be:
- New roads and infrastructure
- New mines and other extractive industry
- New energy-related investments
- Expansion of building areas etc.

Based on the lists of Secondary Objects, work is now being started to register these and digitize these objects using the GIS program that is selected. The objects are registered in a Secondary Objects journal (see appendix 2). When assessing the degree of impact, the secondary objects in question have on the traditional ecosystem services, the same methodology as for the primary object is applied. Within the Sami areas where Protect operates, as previously mentioned, we have access to a great deal of scientific data on how reindeer are affected by various sources of disturbance. We merge this scientific knowledge (Protect together with the reindeer grazing district's working group) with the traditional knowledge. In indigenous contexts where there is no corresponding scientific data to use regarding a potential impact on the traditional ecosystem services, the traditional knowledge naturally weighs heavily.

7.2.2.3 Step 3 - Risk and Vulnerability analysis- RAV

The third step involves using a number of analysis tools, the RAV model, to describe the impact that Primary Objects and Secondary Objects have for the ICL (Indigenous Cultural Landscape), the traditional ecosystem services and for humans.

In the work with IPCIA, we recommend the use of a risk and vulnerability method (RAV). This is a model for risk classifying the consequences for an Indigenous Peoples community in several dimensions. In Sápmi, this is a risk analysis of Reindeer husbandry. The reason for using the RAV model is to be able to assess the combined consequences in the cumulative analysis. This third step is carried out partly in parallel with steps 1 and 2.

In the RAV model, we describe both **direct and indirect** effects of the planned activity (**Primary Object**) and later other activities that may have a significance in the upcoming cumulative analysis (**Secondary Object**). All consequences are described for both the landscape, the traditional ecosystem service (in our case based on the Reindeers need) and from a human perspective. The direct impact is often the impact that arises in direct connection to e.g. a planned mine. The direct impact is thus most often visible in the local perspective, while the indirect impact is most often visible in the intermediate and regional perspective. Since many impacts analyses are carried out solely with regard to the local perspective, crucial information for the total impact is thereby missed. In our model, we therefore work in several dimensions; direct, indirect and cumulative.

The analysis begins with a text description of the consequences where the extent of the consequences is determined.

A matrix, as the one below, can be used to help in this work. the assessment is made by the relevant Indigenous Peoples working group together with their assisting IPO. In the matrix the severity of the impact(limited impact, impact and major impact) is combined with the three areas of impact; Landscape, Traditionally practiced ecosystem services and the human being.

An example from an assessment in a reindeer herding district in Sápmi in connection to the establishment of a new mine (**the Primary Object**) could look like this:

The likelihood of the consequence occurring can be assessed using the attached matrix below, the assessment being made by the relevant Indigenous working group together with their assisting IPO:

Occurance of consequenses	**Probability**
75-100% chance of the consequences occurring	High probability
50-75% chance of the consequences occurring	Likely
25-50% chance of the consequences occurring	Less likely
0-25 % chance of the consequences occurring	Low probability

Impact	**Landscape**	**Traditionally practiced ecosystem services**	**The human**	**Probability of the consequence occurring**
Limited impact/damage at the local level				
Impact/damage at the local level				
Major impact/damage at the local level	The local site is no longer available due to the establishment of a new mine, the landscape is permanently damaged. High risk for: • Polluted air • Polluted water	The reindeer can no longer use the area in question because the area is fenced and the grazing resource destroyed. Important historical migration trails are stopped. High risk for • Disturbance noise • High dust level • Disturbing traffic	Increased workload as the disappearance of the area in question means the need for alternative grazing and new alternative migration routes Traditional knowledge of the area may be affected	High probability

Limited impact/damage at the intermediate level				
Impact/damage at the intermediate level				
Major impact/damage at the intermediate level	Increased fragmentation of the landscape, deteriorating functionality, biological diversity loss, traditional knowledge of cultural-historical remains at risk of being lost	Only sporadic grazing is possible. The reindeer do not stay in the area, the possibility of grazing deteriorates significantly. Can affect reindeer numbers in the short and long term. High risk for: • Disturbing trafic • Disturbing noise	Extensive work, environment problems, stress, strain, increased costs. Traditional knowledge of the area is affected	Likely
Limited impact/damage at the regional level				
Impact/damage at the regional level	New migration trails must be prepared, which affects the appearance and function of the landscape	The reindeer's natural movement patterns have been disturbed, which means the risk that the herd will spread outside the lands of reindeer herding districts' right	The reindeer herders now have to put in a lot of work to find reindeer and return them to the district's lands, and also need to use fodder to get the reindeer to stay on the right pastures. There is a risk that the total reduction in grazing resources may mean that the number of reindeer herders must be reduced	Likely
Major impact/damage at the regional level				

The likelihood of the consequence occurring can be assessed using the attached matrix below, the assessment being made by the relevant Indigenous working group together with their assisting IPO:

Occurance of consequenses	**Probability**
75-100% chance of the consequences occurring	High probability
50-75% chance of the consequences occurring	Likely
25-50% chance of the consequences occurring	Less likely
0-25 % chance of the consequences occurring	Low probability

Guided by the completed assessment of potential impact and damage, the information is entered into a RAV matrix. This matrix is intended to illustrate the severity of a possible impact as well as the need for adaptation measures and measures to avoid negative impacts and damage. In the RAV matrix, you can find out how serious the potential impact is on a 10-point scale divided at local, intermediate and regional level for both ICL, the traditional ecosystem services and for humans. If the investigation covers many objects, it may be appropriate to wait with the risk classification until you have gone through and mapped all affected Primary and Secondary Objects. When you look at the whole, the risk classifications can both increase or decrease compared to when you assess each individual object in isolation from each other.

The RAV matrix shows also the relationships between direct and indirect negative impact distributed on the three levels; ICL, traditional ecosystem services (in our example connected to the Reindeer) and the impact that humans are exposed to (in our example connected to the Sami reindeer herders). Our experience at Protect is that external consultants who carry out impact analyses within an ICL rarely have the understanding of how a local impact can create major problems at an intermediate or regional level in the sensitive conditions that often prevail in an ICL where Indigenous people perform traditional ecosystem services.

The matrix is completed for each Primary Object and Secondary Object and entered into the journal for the Object. All factors that may have a negative impact are entered into separate RAV matrices: Noise, lost pasture, pollution, etc.

The colouring of the matrix is important because this becomes an indicator of whether

the disturbance is of such a degree that it must be remedied in some form. This information will later form the basis of the analysis that will be carried out in Report II regarding measures to reduce damage and different types of adaptation measures.

Primary Object				Loss of grazing land/destroyed grazing resource					
	Risk and vulnerablity - RAV matrix								
	ICL			Ecosytem services			The human		
Consequences	Local	Inter-mediate	Regional	Local	Inter-mediate	Regional	Local	Inter-mediate	Regional
High probability									
Direct impact									
Indirect impact									
Likely									
Direct impact									
Indirect impact									
Less likely									
Direct impact									
Indirect impact									
Low probability									
Direct impact									
Indirect impact									
Extent of Secondary Object impact	10	7	4	10	7	7	10	8	8

8 to 10	Action absolutely necessary
5 to 7	Action must be considered
2 to 4	Action should be considered
0 to1	No action necassary

When the RAV analysis is completed with the Primary Object and all identified Secondary Objects, it may be appropriate to compile these in graphic tables that illustrate the level of damage and the need for measures that may exist within the three levels; local, intermediate and regional. Below is an example of how such a compilation might look based on the chosen example regarding the establishment of a new mine within a Sami reindeer herding district.

Diversification of the Primary Object's impact at the Local level for the ICL										
Poluted air										
Poluted water										
Poluted land										
Disturbance noise										
Loss of biodiversity										
Permanently dammaged soil										
	1	2	3	4	5	6	7	8	9	10

Diversification of the Primary Object's impact at the Local level for the ICL										
Poluted air										
Poluted water										
Poluted land										
Disturbance noise										
Loss of biodiversity										
Permanently dammaged soil										
	1	2	3	4	5	6	7	8	9	10

Diversification of the Primary Object's impact at the Local level for the humans										
Loss of grazing land										
Arrange alternative feed										
Polluted water										
Polluted land										
Disturbance noise										
High dust level										
Increased workload										
Increased stress										
Loss of spiritual places										
impact on traditional knowledge										
Disturbing traffic										
	1	2	3	4	5	6	7	8	9	10

Diversification of the Primary Object's impact at the Intermediate level for the ICL										
Poluted air										
Poluted water										
Poluted land										
Disturbance noise										
Loss of biodiversity										
Permanently dammaged soil										
	1	2	3	4	5	6	7	8	9	10

Diversification of the Primary Object's impact at the intermediate level for the ICL										
Poluted air										
Poluted water										
Poluted land										
Disturbance noise										
Loss of biodiversity										
Permanently dammaged soil										
	1	2	3	4	5	6	7	8	9	10

Diversification of the Primary Object's impact at the Intermediate level for the Reindeers										
Loss of grazing land										
Polluted air										
Polluted water										
Polluted land										
Disturbance noise										
High dust level										
Disturbing traffic										
	1	2	3	4	5	6	7	8	9	10

Diversification of the Primary Object's impact at the Intermediate level for the humans										
Loss of grazing land										
Arrange alternative feed										
Polluted water										
Polluted land										
Disturbance noise										
High dust level										
Increased workload										
Increased stress										
Loss of spiritual places										
impact on traditional knowledge										
Disturbing traffic										
	1	2	3	4	5	6	7	8	9	10

Diversification of the Primary Object's impact at the Regional level for the ICL										
Poluted air										
Poluted water										
Disturbance noise										
New migration routs										
Fragmentation of the landscape										
Loss of biodiversity										
	1	2	3	4	5	6	7	8	9	10

Diversification of the Primary Object's impact at the Regional level for the ICL										
Poluted air										
Poluted water										
Disturbance noise										
New migration routs										
Fragmentation of the landscape										
Loss of biodiversity										
	1	2	3	4	5	6	7	8	9	10

Diversification of the Primary Object's impact at the Regional level for the Reindeers										
Loss of grazing land										
Polluted air										
Polluted water										
Disturbance noise										
Disturbing traffic										
	1	2	3	4	5	6	7	8	9	10

Diversification of the Primary Object's impact at the Regional level for the humans										
Loss of grazing land										
Arrange alternative feed										
Polluted water										
Disturbance noise										
Increased workload										
Increased stress										
Loss of spiritual places										
impact on traditional knowledge										
Disturbing traffic										
	1	2	3	4	5	6	7	8	9	10

7.2.2.4 Step 4 - The cumulative description

The work of compiling the cumulative consequences in the current case also takes place in several steps. Based on the digitized map material produced during the analysis of the Primary Object and Secondary Object, category-wise map layers are now created in which the various disturbance sources that are investigated are described.

7.2.2.4.1 Example case from Norway:

This case has now been going on for several years. In one ring corner is the reindeer herding district in Norway, in the other corner are representatives of the Norwegian authorities and international financial and industrial representatives.

The conflict is about what consequences a construction of a wind power farm will have for the Reindeer herding district, who since time immemorial has used the area in question for their traditional reindeer husbandry.

In this case the Secondary Objects described was:

- Image 1; Areas with disturbance zones for buildings, urban areas and cabins
- Image 2; Areas with disturbance zones for power grids
- Image 3; Areas with disturbance zones for some selected roads
- Image 4; Areas with disturbance zones for hydro power plants and dams
- Image 5; Areas with disturbance zones for railways
- Image 6; Areas with disturbance zones for potential mines and quarries
- Image 7; Areas with disturbance zones for wind power farm
- Image 8; Areas with disturbance zones for some snow mobile tracks

After the description of each category a summary of all existing disturbance zones were produced in the GIS program as one single polygon – Image 9.
As previously mentioned, the size of the avoidance zones that Protect uses is based on both scientific knowledge but also traditional knowledge. A typical result of such a fused knowledge regarding avoidances for the current traditional ecosystem service, in this case based on the behaviour of the reindeer, can look like in the table below. The avoidance is measured in meters in relation to the current source of interference.

Impact zones

Type	Meter
Buildings populated centres	1000
Buildings outside centres	1000
Rural buildings	1000
Industry	3000
Fields of cabins	1000
Camping and accommodation	1000
Airport	3000
Helicopter landing	1000
Mining of gravel	1000
Mining in operation	3000
Dog sledge	1500
Hiking trails	1000
Snowmobile trails	1000
Cross country trails	500
22kV power lines	50
66kV power lines	1000
132kV power lines in operation	1500
132kV powe lines - construction	2500
420kV powe lines in operation	2500
420kV power line - construction	4000
Hydro power – under construction	500
Hydro power and dams	0
European motorway	1000
County way	750
Private way	500
Municipal way	750
Wind power	5000
Railway	1000
Construction road construction period	3000
Construction road in operation	1000

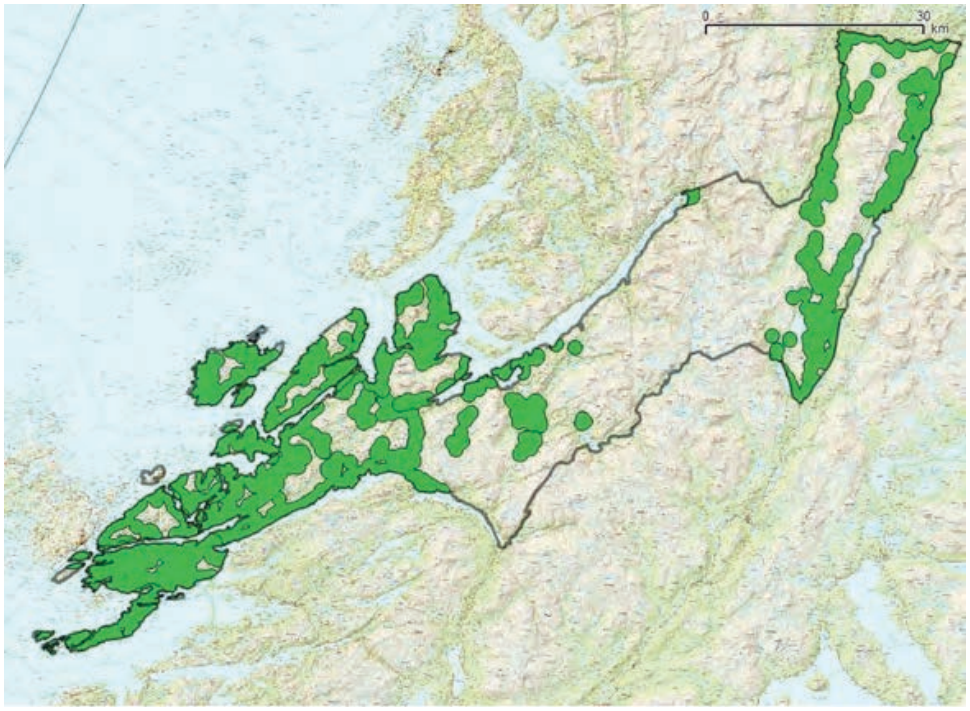


Image 1: This image shows the selected area with buildings, cities and cabins with selected disturbance zone. Drawn in green.

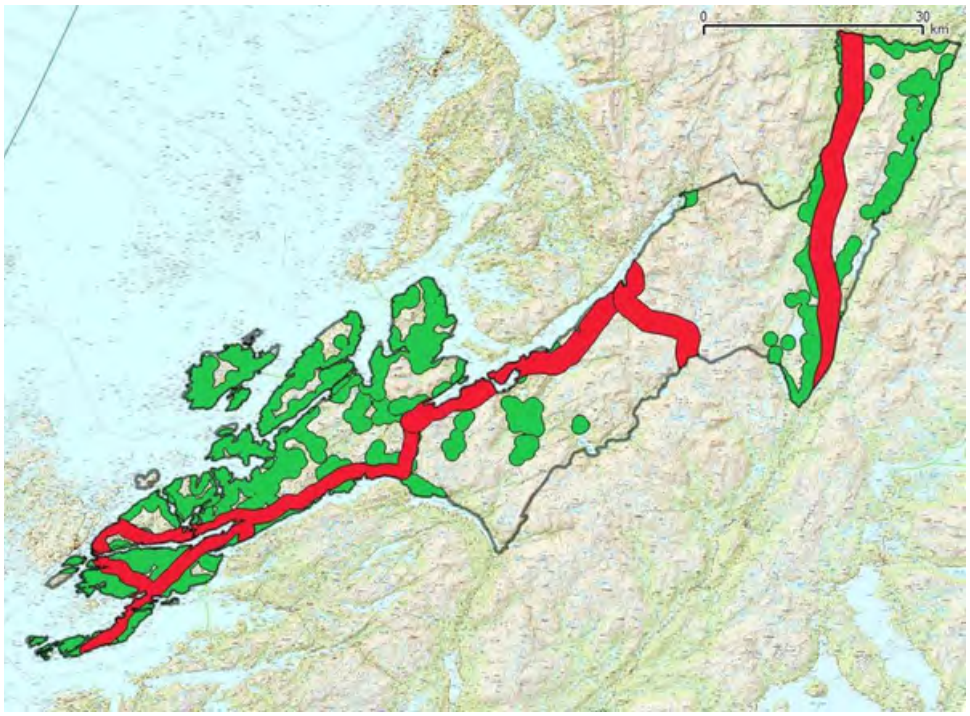


Image 2: The selected area with disturbance zones for power grid drawn in red

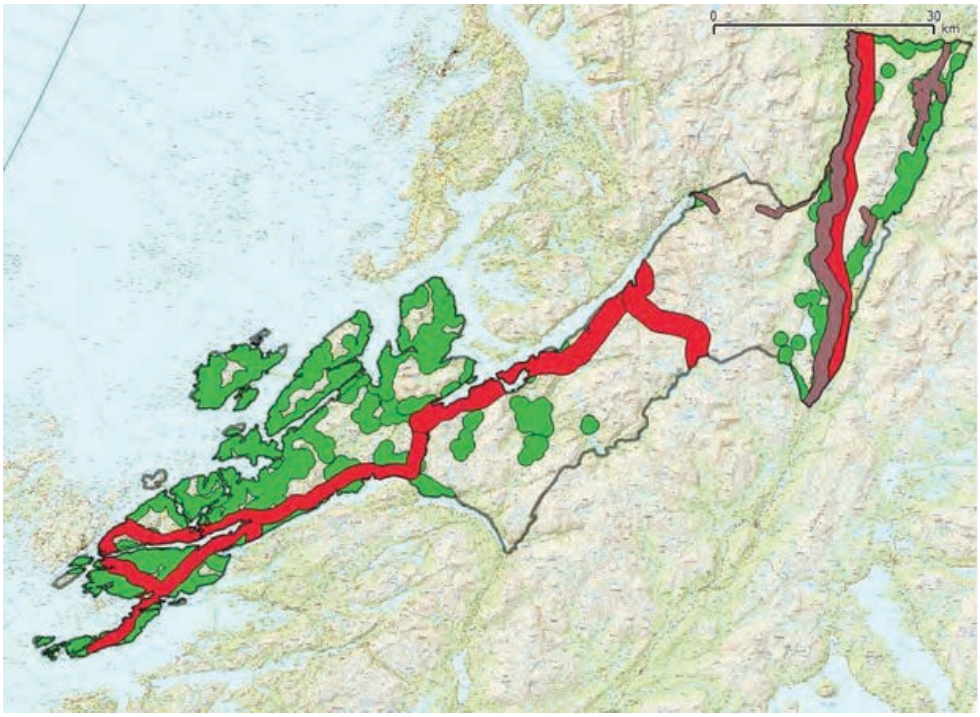
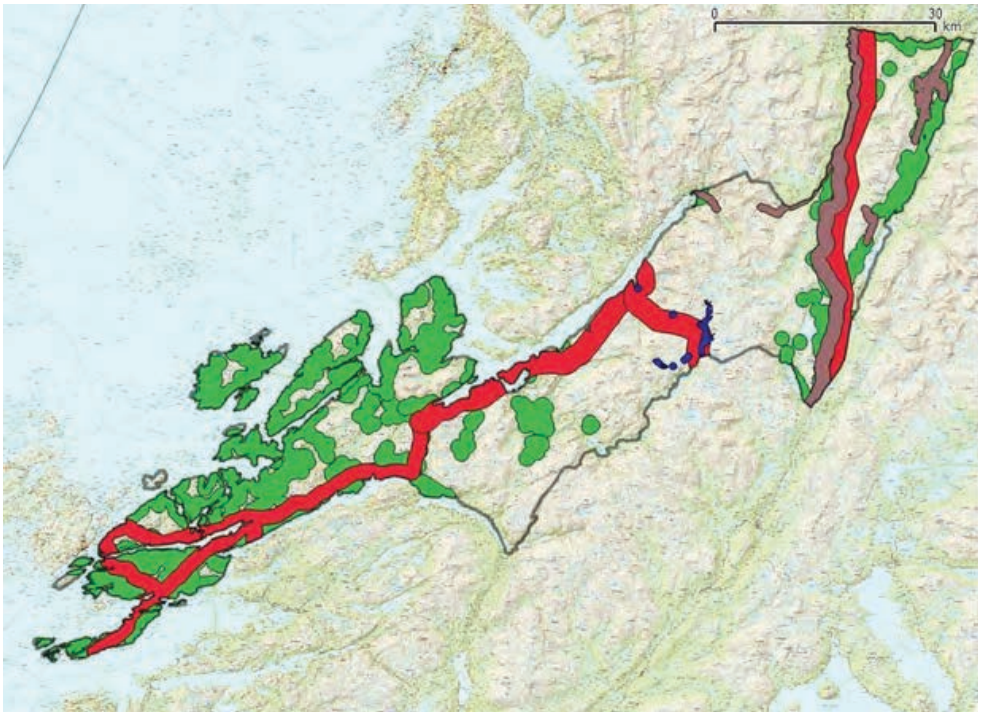


Image 3: Some selectedroads are causingextra disturbances. Here coloured in brown



IImage 4: Hydro power plantsand dams are added with selected disturbance zones coloured in blue.

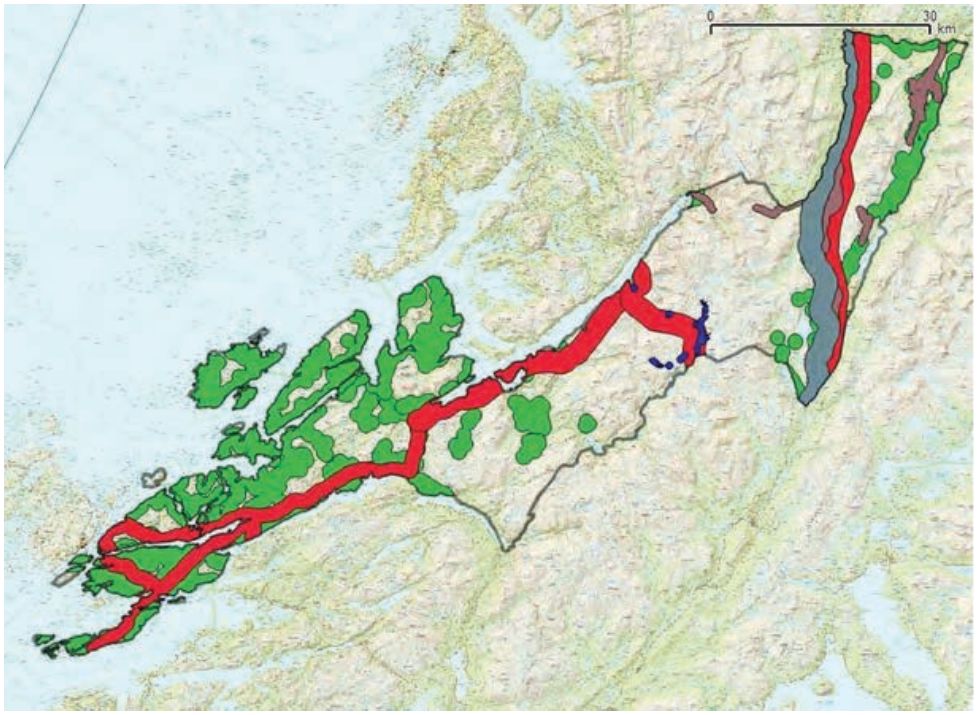


Image 5: A railwaygoes straight throughthis area, here drawn in grey.

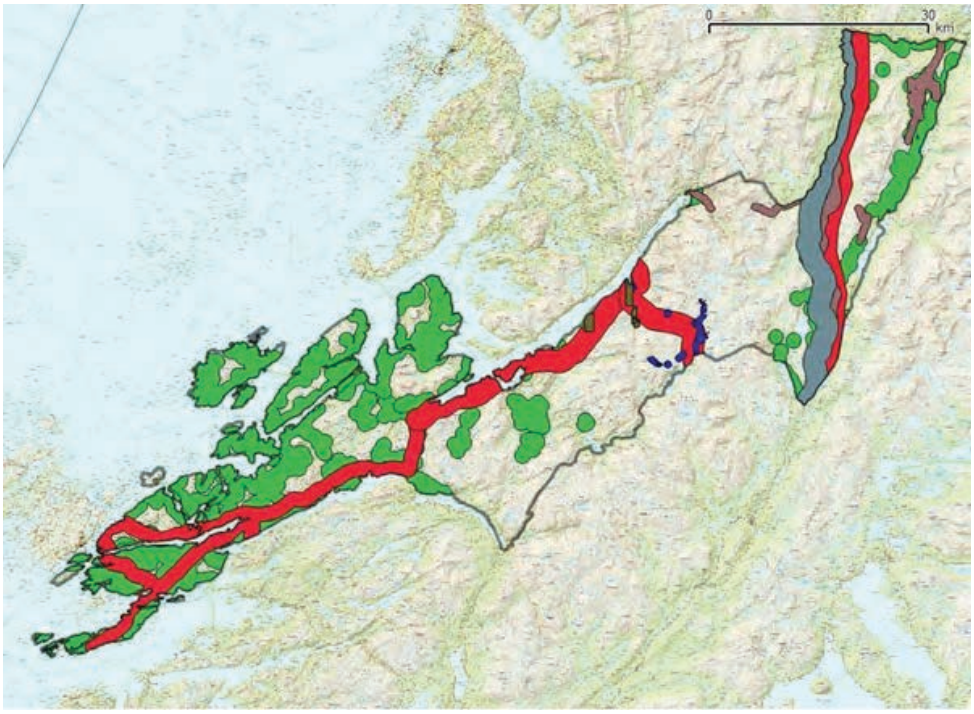


Image 6: This image adds potential mines and quarrieswith disturbance zones in brown.

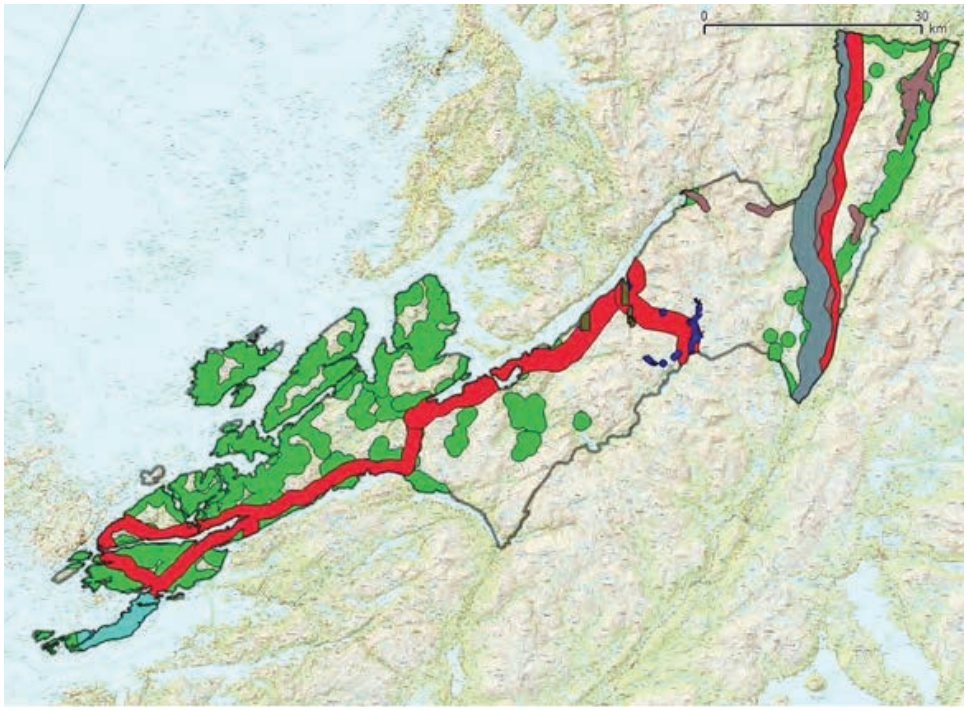
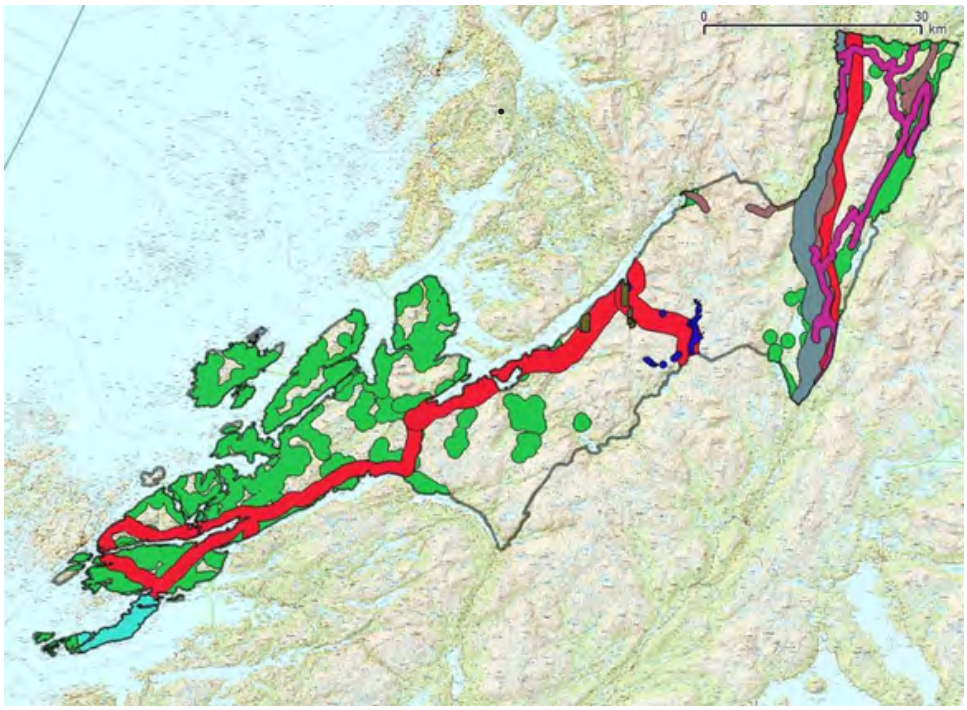


Image 7: Wind power farms are added, here drawn in mint green.



8: There are a few snowmobile tracks in the area. They are coloured purple

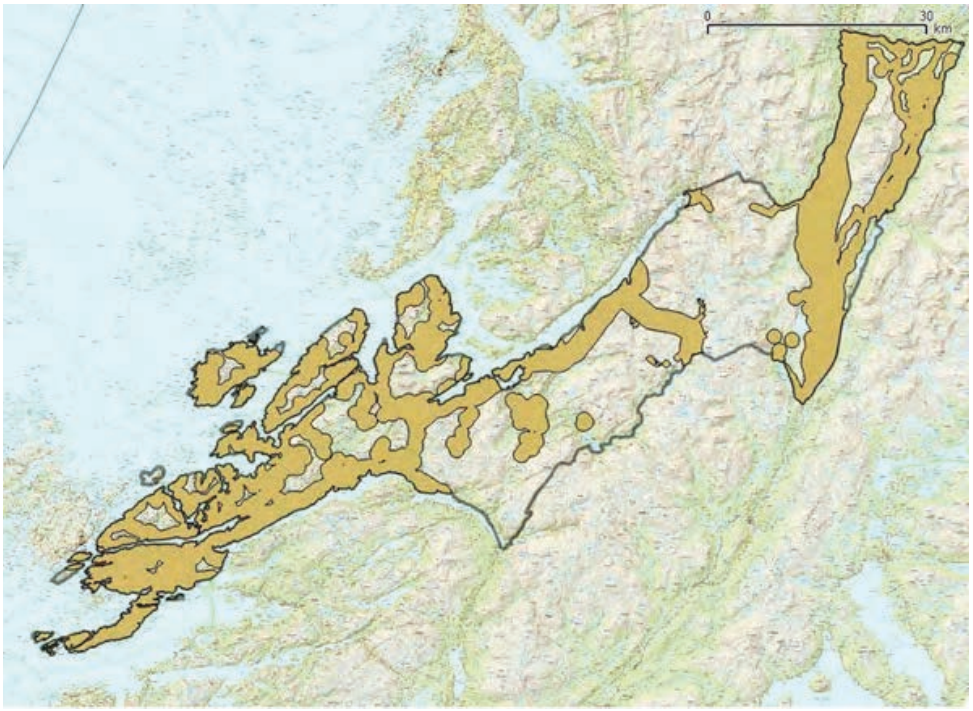


Image 9: This image shows a summaryof existing disturbance zones. This singlepolygon is colouredlight brown.

Within the area of the reindeer herding district in question, at the time of the survey, several different new projects were under construction alongside the current Primary Object. These were described in their respective Secondary Object Journals. Since industrial facilities under construction often create a greater impact and disturbance than is expected during the upcoming regular operation, it is important to do the same type of mapping work as above regarding these sources of disturbance as well. The map layers with disturbance information for objects under construction and/or under planning were added to the polygon describing the total cumulative impact in the district.

The Secondary Objects that were relevant here were:

- Image 10: Areas for disturbance zones for power grid upgrades
- Image 11; Areas for disturbance zones for new European main road during construction
- Image 12; Area for disturbance zone for new windmill farm under the construction phase
- Image 13; Areas for disturbance zones for new hydro power plants

The GIS work is completed by making a total compilation of existing disturbances together with new Secondary Objects under development/construction with their avoidance sons (Image 14). This compilation shows how much more land will be affected in total during the expansion. The last picture shows the total impact when all objects have left the construction period and transitioned into an operational period, this shows a slightly smaller impact.

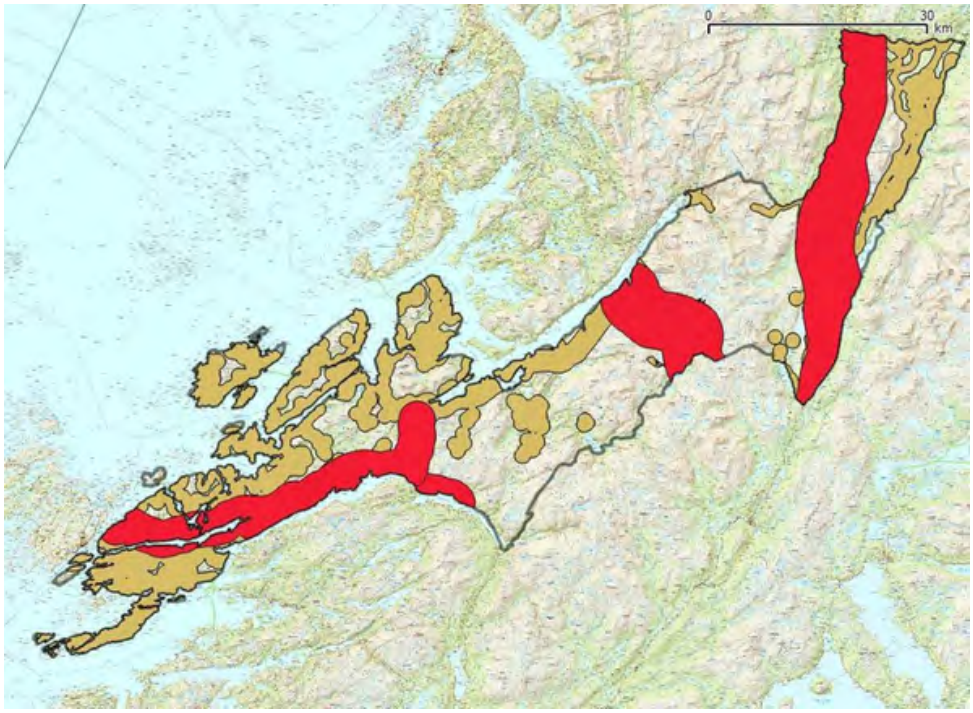


Image 11: The new E6 road during construction. Coloured brown.

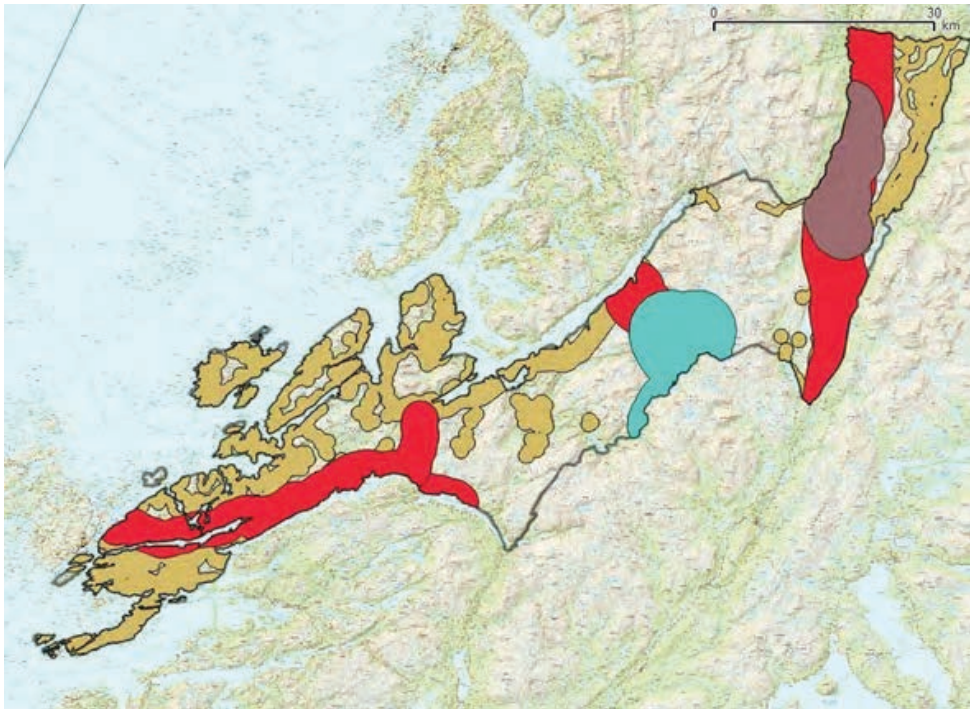


Image 12: New windmillfarm in mint green.

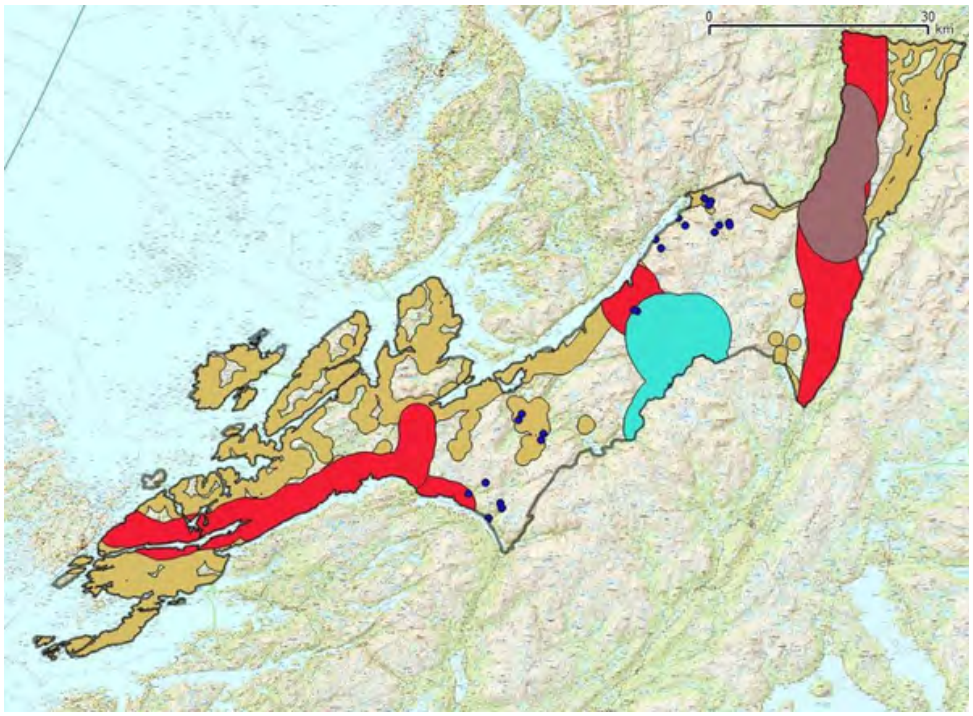
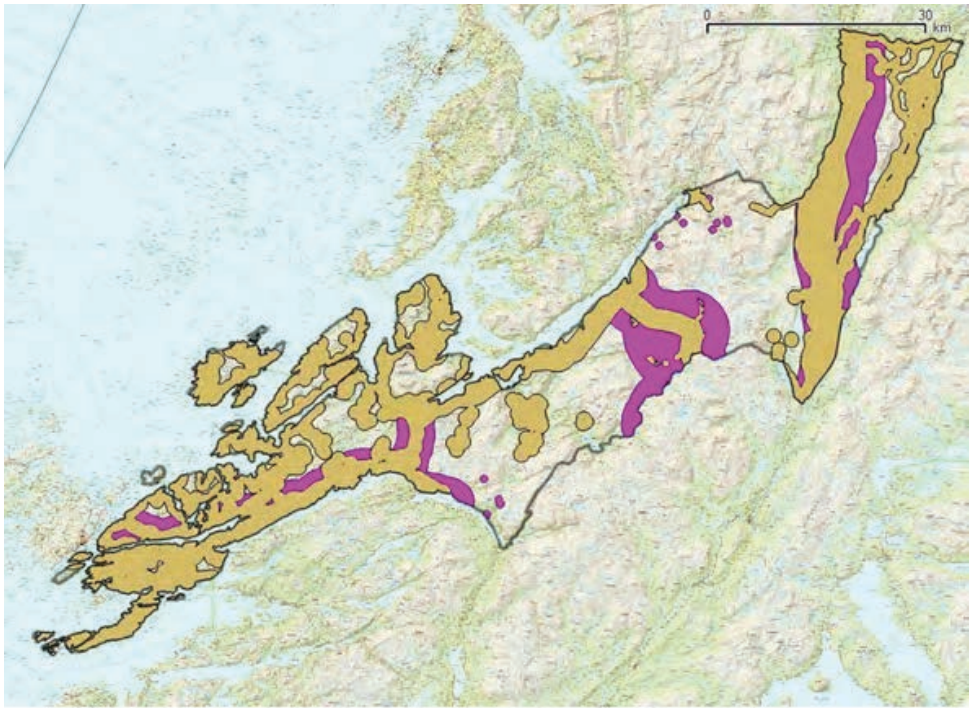


Image 13: Plannedhydro power in this area. Colored blue.



IImage 14: This image shows a comparison between existing disturbances in light brown and new / potential disturbances during their construction phase. It illustrates how much more land will be affected if everything is built at once.

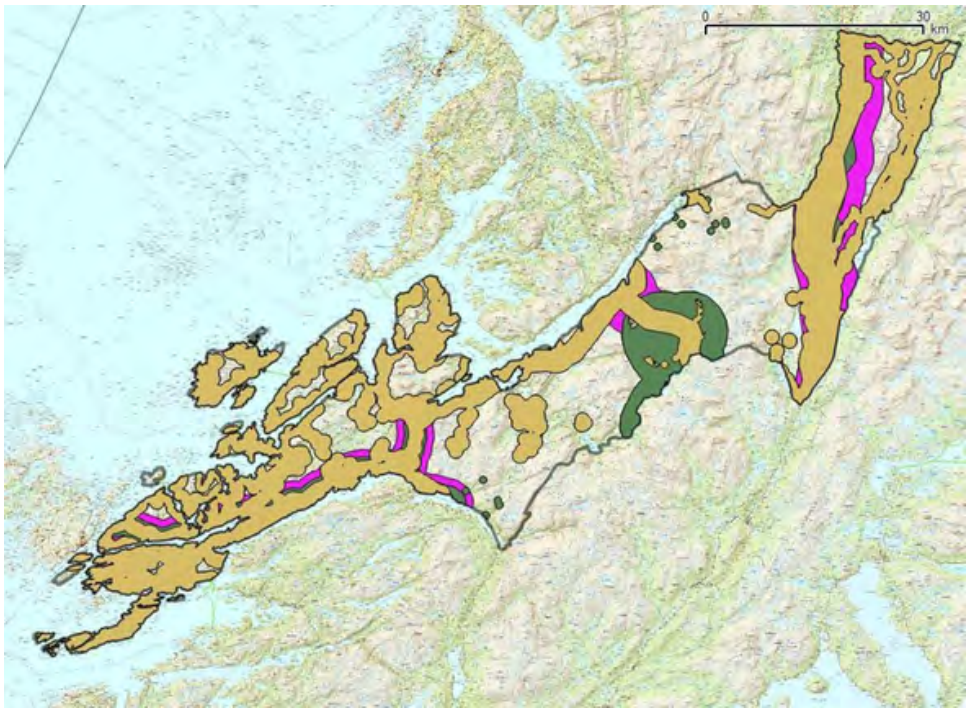


Image 15: The green color represents the disturbance causedby objects as they are no longer in the construction phase. More land will be affected than if nothing was built at all, but still less than during the construction phase.

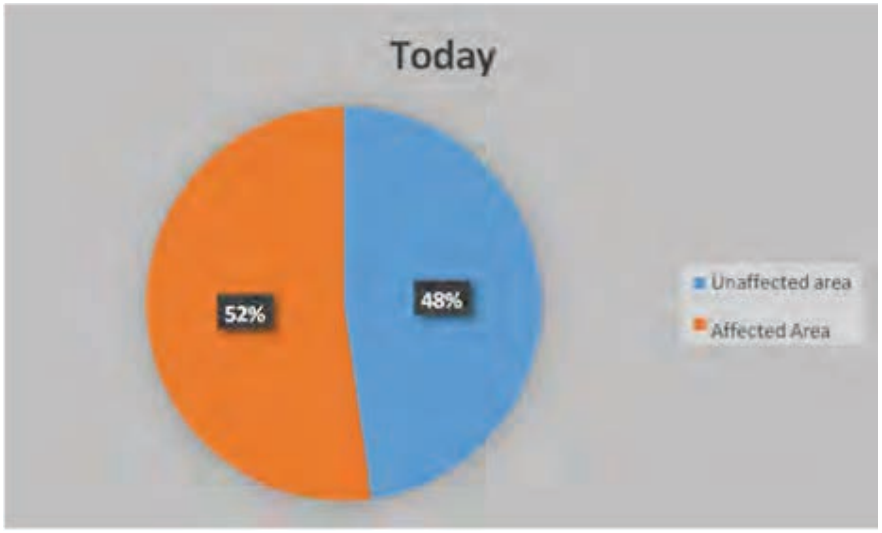
7.2.2.5 The cumulative analyse

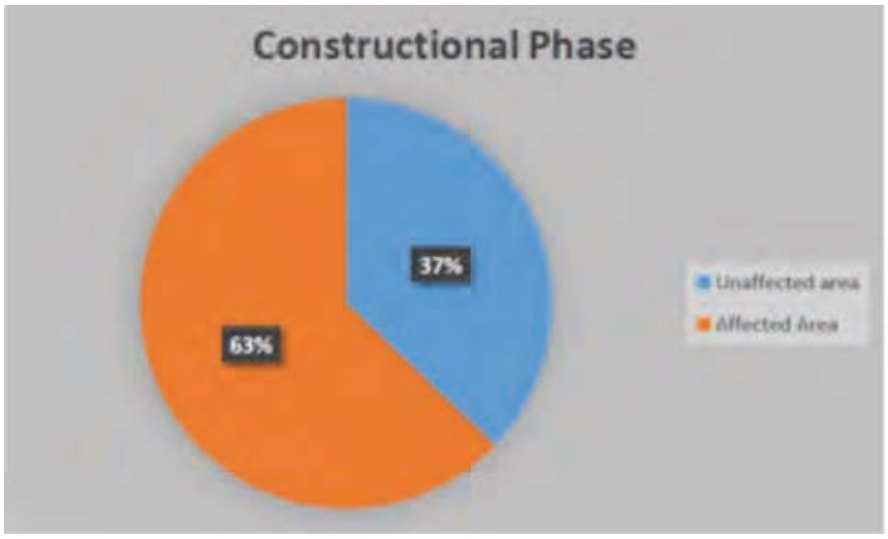
At this point in the IPCIA process, we have reached the point where we can do a final cumulative analysis of the investigated area. With the help of the GIS maps created in the process, we can now relatively easily obtain information about:

- The total land area of the investigated area where the concerned indigenous people have their land of rights, in our example a real Norwegian reindeer herding district
- The total land surface which is already today affected by various Secondary Objects.
- The number of Secondary Objects can vary, but it is not unusual in Norwegian reindeer herding districts for these to amount to more than 50 Secondary Objects.
- The total land surface that will be affected during a construction phase. Depending on the situation in the investigated area, there may be several Primary Objects and Secondary Objects that are in or about to be built.
- The total land surface when all Objects transition into an operational phase.

Area	Area (km 2)	Percent of district
The district	2 416	100 %
Affected area today	1 262	52 %
Affected area with during constructional phase	1 518	63 %
Affected area with during operational phase	1 405	58 %

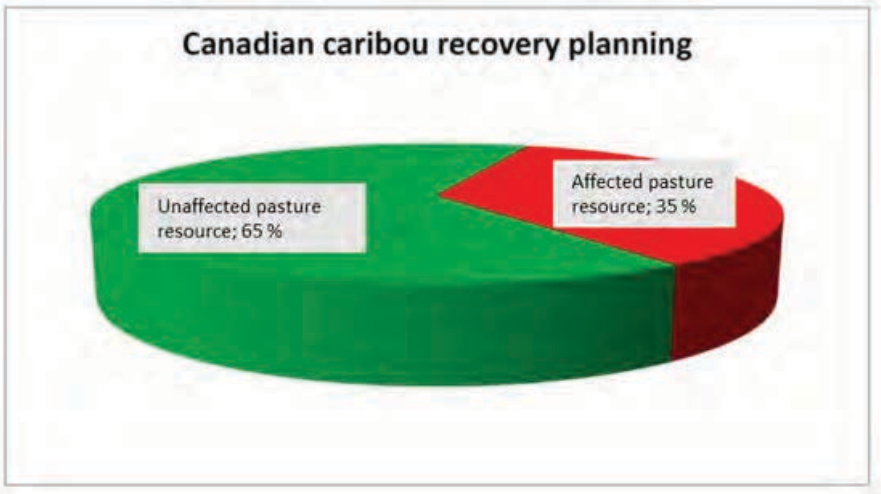
As we can see above, if all of the new objects really are built another 10% of this district will be affected. That's 241 square kilometers. A very large area. Some of this area is permanently affected, which is why only about half of the area affected during the construction phase is reclaimed. In this particular example over half the district is affected to varying degrees.





A question you have to ask yourself is how much impact of an ICL should you be able to accept? When it comes to reindeer husbandry in Norway, there are no official limit values for how much land one can accept to lose through impacts of various kinds before the resource that the traditional ecosystem service entails can no longer be used in a sustainable and traditional way. There is currently no research in Norway that forces the authorities in this regard to establish such limit values.

In Canada, work has been going on for several years to ensure and recreate a healthy sustainable reproduction of wild reindeer; Canadian Caribou Recovery Planning[29]. In this work, which has primarily been conducted based on environmental and nature conservation aspects, it is assessed that a wild reindeer has a limited ability to survive and reproduce if the affected environment is greater than 35%. The reality in many Norwegian reindeer herding districts is that few districts have a degree of disturbance that is at or below 35%.



It is not easy to say what limit values you can imagine for other traditional ecosystem services for other Indigenous Peoples in the world, but a reference should be made here to international law.

International Covenant on Civil and Political Rights, ICCPR, article 27 is the most widely accepted legally binding provision on minorities and Indigenous Peoples. Article 27 reads:

> *In those States in which ethnic, religious or linguistic minorities exist, persons belonging to such minorities shall not be denied the right in community with the other members of their group, to enjoy their own culture, to profess and practice their own religion, or to use their own language.*

Article 27 constitutes the main universal legally binding norm for the safeguarding of minority and indigenous cultures. In this context, particularly significant is the expanded interpretation given both to its meaning – in such aspects as the broad

[29] https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/rs_boreal_caribou_revised_0811_eng.pdf

conception of its core concept, 'culture', the positive content of its accorded protection, the recognition of its collective dimension, and even of its potential linkage to the right of self-determination. Central to the reading and interpretation is the need for minorities and indigenous peoples to have an opportunity to effectively participate in decisions affecting their cultural rights, which extends to a state obligation to gain their free, prior and informed consent, when the proposed measures seriously undermine their cultures.

The question of whether Article 27 is applicable in relation to reindeer husbandry in Norway has recently been decided by Norway's Supreme Court[30]. The case concerned whether the establishment of a wind power park, the Fosen wind power park, within an already heavily burdened reindeer herding district could be a violation of ICCPR article 27. The Supreme Court ruled that licenses for wind power development on Fosen was invalid as the construction violates Sami reindeer herders' right to enjoy their own culture:

"The main issue in the Supreme Court was whether the development violates the reindeer herders' rights under Article 27 ICCPR. The provision sets out that persons belonging to an ethnic, religious or linguistic minority shall not be denied the right, in community with the other members of their group, to enjoy their own culture. It is undisputed that reindeer husbandry is a protected cultural practice..... Pointing in particular to statements from the UN Human Rights Committee, the Supreme Court found that it will amount to a violation of Article 27 ICCPR if the interference has significant adverse effects on the possibility of cultural enjoyment. Although the interference in itself may have such serious consequences that it amounts to a violation, it must also be considered in context with other projects, both previous and planned. The total effect of the development determines whether a violation has taken place. As a starting point, there is no room for a proportionality assessment balancing the minority's interests against other interests of society."

The conclusion that must be drawn from the content of Article 27 and its recent interpretation by Norway's Supreme Court is that if an individual or a group of Indigenous Peoples can no longer practice their culture due to negative influences over which they have no control, this is a limit value for what can be considered acceptable. Within the framework of the interpretation of what is a culture, of course, lies the traditional knowledge and the practice of the traditional ecosystem services. This is not unique to the Sami reindeer husbandry, but is to be regarded as a universal truth in relation to Indigenous Peoples worldwide.
In section 5.3 above, experiences with voluntary certification systems and their importance for the implementation of FPIC are reported. In a discussion about how much negative impact an ICL should be able to accept, it should be emphasized that certain certification systems create conditions for an acceptance of Indigenous rights that go further than what an interpretation of international law provides at hand.

[30] Supreme Court judgment 11 October 2021, HR-2021-1975-S (case no. 20-143891SIV-HRET, case no. 20-143892-SIV-HRET and case no. 20-143893SIV-HRET)

8.0 Written Reports

When all the analyzes have been carried out together with the relevant Indigenous People's working group, the work now begins to document the work. It is important to remember that these documents are part of the FPIC process that has been ongoing throughout the time that the impact assessments have been ongoing. By documenting the result of the process that has now been going on for some time, the basis is created that makes it possible for the affected indigenous people to make an informed decision on the matter. Should they give their consent, should they refrain from giving their consent or should they give a modified consent.

The reports that will be the result of this documentation are not documents owned by the writers who assisted in the process, the Indigenous Peoples Organization (IPO) which has been a resource for the concerned indigenous peoples. **This is a document whose intellectual property belongs to the concerned Indigenous Peoples.**

Within Protect, as previously mentioned in this document, it is recommended that the report be written in several different sub-reports:

- Description and analysis of the consequences of a planned activity in a cumulative perspective. This material is presented in a first report (Report I)
- Identify the need for and proposals for adaptation and mitigation measures to reduce the negative impact of the planned activities. This is reported in a second report (Report II)
- Analysis of how to compensate, financially and otherwise, for the residual effects that remain after any adaptation and mitigation measures.. This is reported in a third report (Report III)
- In cases where an FPIC agreement has been implemented, a main agreement has been drawn up. (Report/Document IV)

The first report (Report I) is based on the work described in this document, that is, the cumulative assessment of all the impact that both Primary and Secondary Objects can cause. If the concerned Indigenous people come to the conclusion in their assessment that they do not intend to give their consent to the planned Primary Object against the background of the cumulative analysis, then the process stops here provided that this decision is respected by the relevant authorities and the representatives of competing land interests. An example of such a report can be found in appendix 4. The report is a participatory impact mapping and professional reindeer husbandry investigation in relation to Øyfjellet wind power park and the Sami reindeer herding district Jillen Njaarke. The report was carried out in collaboration between the Sami reindeer herding district and Protect Sápmi in 2019. The report, which is a cumulative study, largely follows the structure of this document, this manual. The work of designing a completereport (Report 1) is extensive work. To give an idea of how such a report can be

disposed of, the table of contents that applies to the report presented in the appendix is presented here:

Content

If, on the other hand, one can voluntarily consider going ahead with a consent or a modified consent, this is almost always associated with proposals for adaptation and mitigation measures to reduce the negative impact of the planned activities. In a situation where the Indigenous Peoples are forced against their will by the authorities to accept a planned activity, here too there is a need to propose measures that can minimize the damage that the planned activity may entail This is reported in a second report (Report II). The work to develop this type of report, is based on the RAV analysis carried out in Report I. In the journals prepared for the Primary Objects and the Secondary Objects, there is the basis and information needed to be able to describe the different types of adaptation measures and damage reduction measures that are required at both local, intermediate and regional level.

It is likely that adaptation and mitigation measures to reduce the negative impact of the planned activities will not be sufficient to deal with the damage caused to the Indigenous Peoples in question. In this context, it usually makes sense to prepare a third report that describes the remaining damages and the cost to compensate for those. In this context, Protect often supplements this description with a financial calculation such as e.g. describes the alternative cost of feeding, compared to free grazing, for a reindeer herding district that has lost significant pastures and demands for financial compensation. This is described in Report III.

In cases where an FPIC agreement has been implemented that gives a potential developer the right to implement its business plans, a master agreement is drawn up. This agreement regulates the conditions associated with the consent but also rules and guidance on how this agreement must be followed up. (Report/Document IV).

There is another type of report that may be relevant. We are talking here about a so-called Baseline study. It happens that an Indigenous Peoples community feels that they are so affected by various types of external disturbances that

they want to describe their situation in order to slow down and oppose new proposals for the exploitation of their rightful land. A Baseline study is established using the same cumulative technique as described above but with the difference that there is no Primary Object. The work will then be focused on describing all objects of disturbance that may be current for this Indigenous People. Compared to the work above, it means mapping all the objects that have been called Secondary Objects above and doing a RAV analysis of them. A developed Baseline study is a very effective tool in the meeting with a future potential Primary Object. The problem is that few Indigenous communities have the resources to carry out such a study on their own.

List of Appendix

1. Example of Primary Object Journal
2. Example of Secondary Object Journal
3. FPIC in voluntary market-related sustainability instruments
4. Example of an IPCIA (Report I)

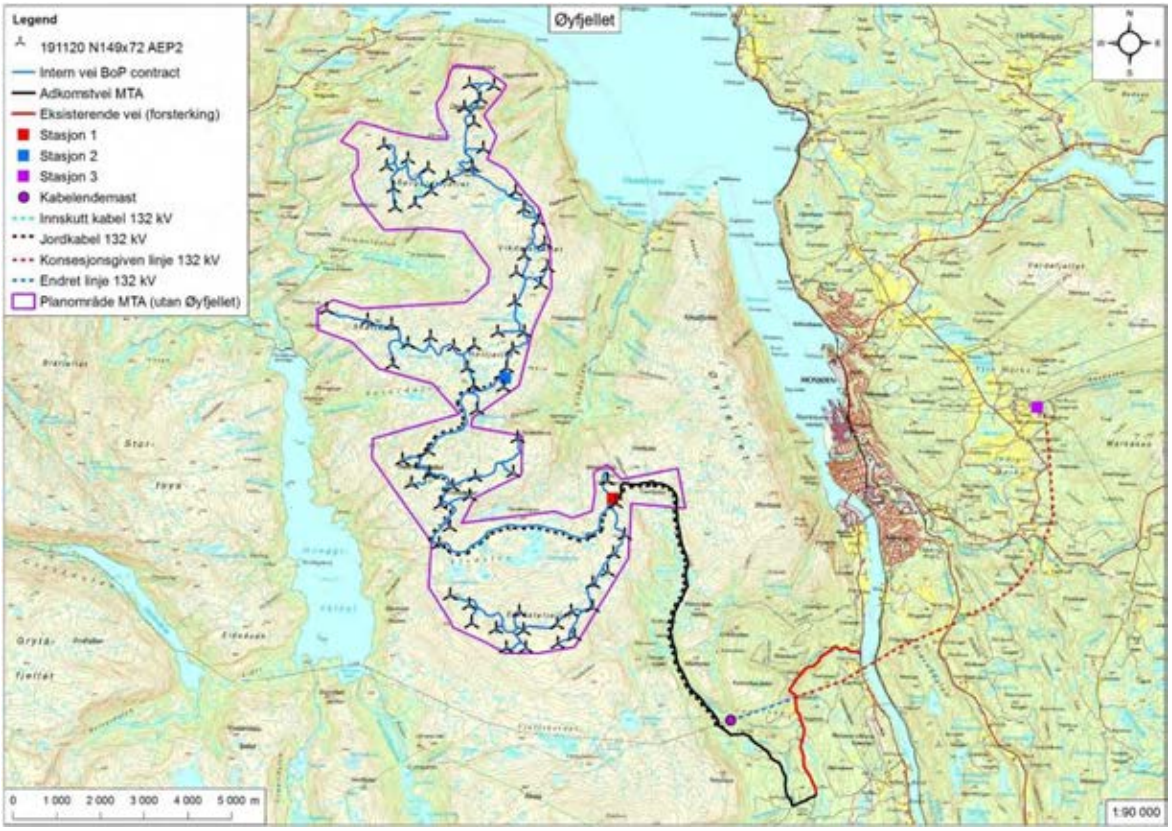
APPENDIX 1

Example of Primary Object Journal

STIFTELSEN
PROTECT SÁPMI

PRIMARY OBJECT, NAME OF OBJECT:

Øyfjellet wind farm



TYPE OF OBJEKT:

Forestry	
Wind power	X
Mine	
Infrastructure	
Tourism	
Extractive Industry	
Gravel Pit	

Other business:	

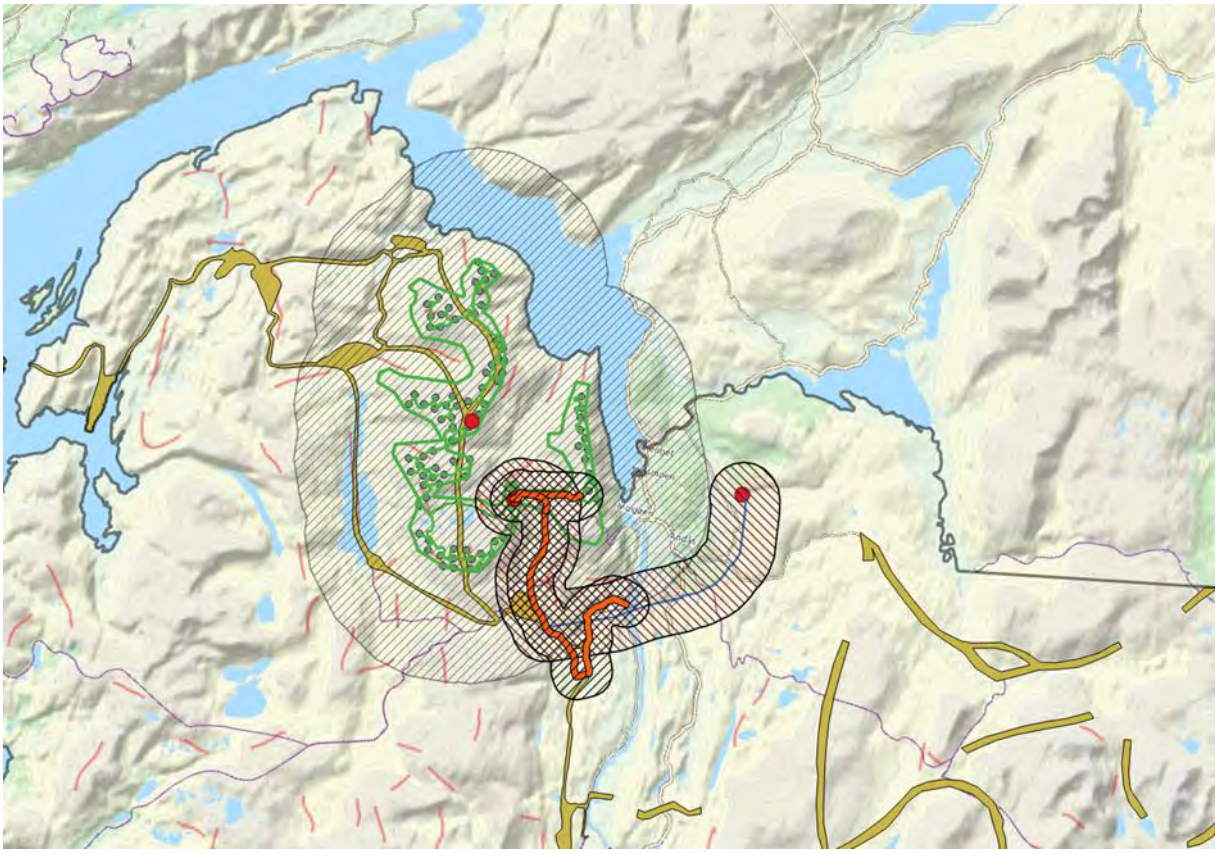
DESCRIPTION AND INFORMATION OF THE OBJECT:

Object owner	Eolus wind
Contact person	Mr XXXXXXX
Contact details	Xxxxxxxxx xxxxxxxxxxx
Geographical location of the intended infringing activity	In the Municipality of Vefsn, close to Mosjoen
Timetable for the planned intrusion activity	The project started in 2011 and was fully developed in December 2022

Description of the planned primary object with regard to known or presented information regarding the object's technical, environmental and infrastructural aspects. Existing information about the legal person/company behind the object. Summary of contacts and discussions that have already taken place between the concerned indigenous people and representatives of the object.	The installation of 72 Nordex N149/5.x MW turbines – with a hub height of 105 meters and a rotor diameter of 149 metres – was completed in the 4th quarter 2021. The Sami village of Jillen Njaarke has been against the installation since the plans was presented: • 5.7 2011; The Norwegian Water Resources and Energy Directorate, NVE, received a notification from the developer regarding the planning of Øyfjellet wind farm, and the notification was sent for consultation to affected interests on 21 November 2011. NVE arranged a meeting with local and regional authorities and a public meeting in Mosjøen on 06.12.2011. NVE's draft study program was submitted to the Ministry of the Environment before it was determined 04.01.2013. • 5.9.2013; Status review IA (impact assessment) prepared by the consulting firm Norconsult AS, including reindeer

	husbandry impact assessment. • 6.1.2014; Application for a license (and expropriation permit) submitted by the developer to the authorities • 20.8.2014; Inspection and meeting with NVE (The Norwegian Water Resources and Energy Directorate) and Norconsult AS in Mosjøen; theme Reinfjellet wind power (in the calving area) and Øyfjellet wind power. At this time, there were plans for two extensive wind farms within the reindeer grazing district • 4.9.2014; A first draft process agreement between the parties, from Protect Sápmi (protect). The reindeer grazing district had sought support from Protect. A first step in Protect's work is always to obtain permission for a process agreement between the parties in which the conditions for the continued process between the parties are regulated[1]. • 3.11.2014; Response from Eolus Wind to the draft process agreement • 5-6.11.2014; Meeting between district and Protect, i.a. information is received that NVE will reject application from Fred Olsen Renewables for a license for Reinfjellet wind power. In November 2014, NVE rejects Reinfjellet wind power plant, but grants a license for Øyfjellet wind power • 6.11.2014; Negotiation meeting between the district and the developer in Mosjøen about the process agreement. • 13.11.2014; Eolus Vind Norge AS. Øyfjellet wind farm. Vefsn municipality,Nordland county. Expropriation permit. The Norwegian Water Resources and Energy Directorate (NVE) refers to the application of 6.1.2014 for expropriation of necessary land and rights for construction and operation of Øyfjellet wind farm with grid connection and associated infrastructure. • 3.12.2015; Jillen-Njaarke reindeer grazing district is appealing NVE's decision. They point out that the upper reindeer numbers for the district are set at 2200 animals, and that there are several reasons why in 2013 there were only 1645 reindeer in the district. According to the reindeer grazing district, man-made interventions constitute a significant cause of the problems of maintaining the desired scope of activity. In this context, hydropower plants, power lines, roads, cultivation, housing development and the open pit of Brønnøy Kalk are mentioned. The reindeer grazing district believes that the licensing authorities must assess the sum effects of the interventions • 23.2.2015; A new draft agreement is being prepared by the developer.

	• 24.3.2015; Negotiation meeting between developer and district about the process agreement, the district's lawyer Hjermann and Protect participate. • 17.6.2015 and 4.7.2015 new process agreement draft from Protect Sápmi • 22.7.2015; New draft agreement with addition from Adv. Hjermann, sent to Eoulus 2.9.15 • 16-01-2016; OED, the Ministry of Petroleum and Energy, decided on the appeal from Jillen Njaarke. NVE's decision of 13 November 2014 in which Eolus Vind received a license for the construction and operation of the Øyfjellet wind farm is confirmed by changing terms 16 to the following: *Reindeer husbandry* *The licensee shall facilitate the conclusion of an agreement with the Jillen-Njaarke reindeer grazing district on a proposal for mitigating measures for reindeer husbandry in the area for the construction and operation phase. The proposal will, among other things, ensure access to the Vimer beetles in the northwest by mitigating measures related to the relocation through the planning area. Measures to secure relocation to andfrom the winter pastures in the northwest shall be submitted to the County Governor of Nordland for an assessment in accordance with the Reindeer Husbandry Act. Proposals for mitigating measures shall be presented in the detailed plan for the measure, cf. condition 13. The detailed plan shall be approved by N VE. If no agreement is reached between the concessionaire or the reindeer herding district on mitigating measures, NVE mustconsult the reindeer grazing district before the detailed plan can be approved.* • 2.4.2017; New draft process agreement prepared by Protect and lawyer Hjermann, was not signed by the other party.
Chosen impact zone	Disturbance zone (dashed area) for the Wind Power Park (in green) 5 km, influence zone for connection roads 1 km, influence zone connection roads 1.5 km.



	Landscape	Traditionally practiced ecosystem services	The human	Probability of the consequence occurring
Limited impact/damage at the local level				
Impact/damage at the local level				
Major impact/damage at the local level	The planned wind farm with its connecting roads and connecting lines will completely	The reindeer will no longer be able to voluntarily pass the area in their migrations between different	The reindeer herders will have a very big problem in arranging the relocation of the reindeer as the old	High probability

	destroy the local landscape and create direct obstacles in the hiking trails/migration routes that pass through the area	seasons. The area's grazing resource will completely cease	migration routes will become impossible to use	
Limited impact/damage at the intermediate level				
Impact/damage at the intermediate level				
Major impact/damage at the intermediate level	Since the natural movement routes between the winter and summer grazing land will be interrupted, this will partly require the establishment of new routes, which will affect the landscape in the intermediate area. There is also a risk that the barrier effect of the wind farm will lead to overgrazing of the landscape in areas within the intermediate level.	Since time immemorial, the reindeer have followed the traditional hiking trails. The destruction of these and the disturbance caused by the wind farm increases the risk that the reindeer will not be able to use the pasture in a large area and may also create an escape behaviour into other unsuitable pastures. Ultimately, there is a risk that the reindeer herd will have to be reduced.	The reindeer herders must find new ways to manage the reindeer herd and its relocation. Limitations in the pasture resource may mean that you are forced to feed the reindeer with purchased fodder. This is a cost that there is no room for. The risk that the reindeer herd will have to be reduced also means an obvious risk that some reindeer herders will have to leave their traditional livelihood. New paddocks and fencing will probably have to be built to control the reindeer in the new situation	High probability
Limited impact/damage				

at the regional level				
Impact/damage at the regional level				
Major impact/damage at the regional level	The connection between different landscape types will become more difficult and the landscape will experience fragmentation	Fragmentation at the regional level will mean that the traditional ecosystem service, pasture, will be unevenly loaded, which in turn may lead to a reduced availability of pasture for the reindeer. The disturbance may also mean increased stress for the reindeer and thereby create a negative impact on the rate of new-born calves	As the district only has a limited area that they can use, the fragmentation and loss of areas means that the opportunity for all reindeer herders to continue their traditional profession may be limited. There is also a risk that the winter pasture resource, which is the most critical pasture, will be affected in a serious sense. This will create major problems in keeping the herd together within the district boundaries.	

Primary Object				Loss of grazing land/destroyed grazing resource					
	Risk and vulnerability - RAV matrix								
	ICL			Ecosystem services			The human		
Consequences	Local	Inter-mediate	Regional	Local	Inter-mediate	Regional	Local	Inter-mediate	Regional
High probability									
Direct impact									
Indirect impact									
Likely									
Direct impact									
Indirect impact									
Less likely									
Direct impact									
Indirect impact									
Low probability									

Direct impact									
Indirect impact									

Extent of Secondary Object impact	10	10	8	10	10	8	10	10	10

8 to 10		Action absolutely necessary
5 to 7		Action must be considered
2 to 4		Action should be considered
0 to1		No action necessary

Primary Object				Loss of migration routes					
	Risk and vulnerability - RAV matrix								
	ICL			Ecosystem services			The human		
Consequences	Local	Inter-mediate	Regional	Local	Inter-mediate	Regional	Local	Inter-mediate	Regional
High probability									
Direct impact									
Indirect impact									
Likely									
Direct impact									
Indirect impact									
Less likely									
Direct impact									
Indirect impact									
Low probability									
Direct impact									
Indirect impact									

Extent of Secondary Object impact	10	10	10	10	10	10	10	10	10

8 to 10		Action absolutely necessary
5 to 7		Action must be considered
2 to 4		Action should be considered
0 to1		No action necessary

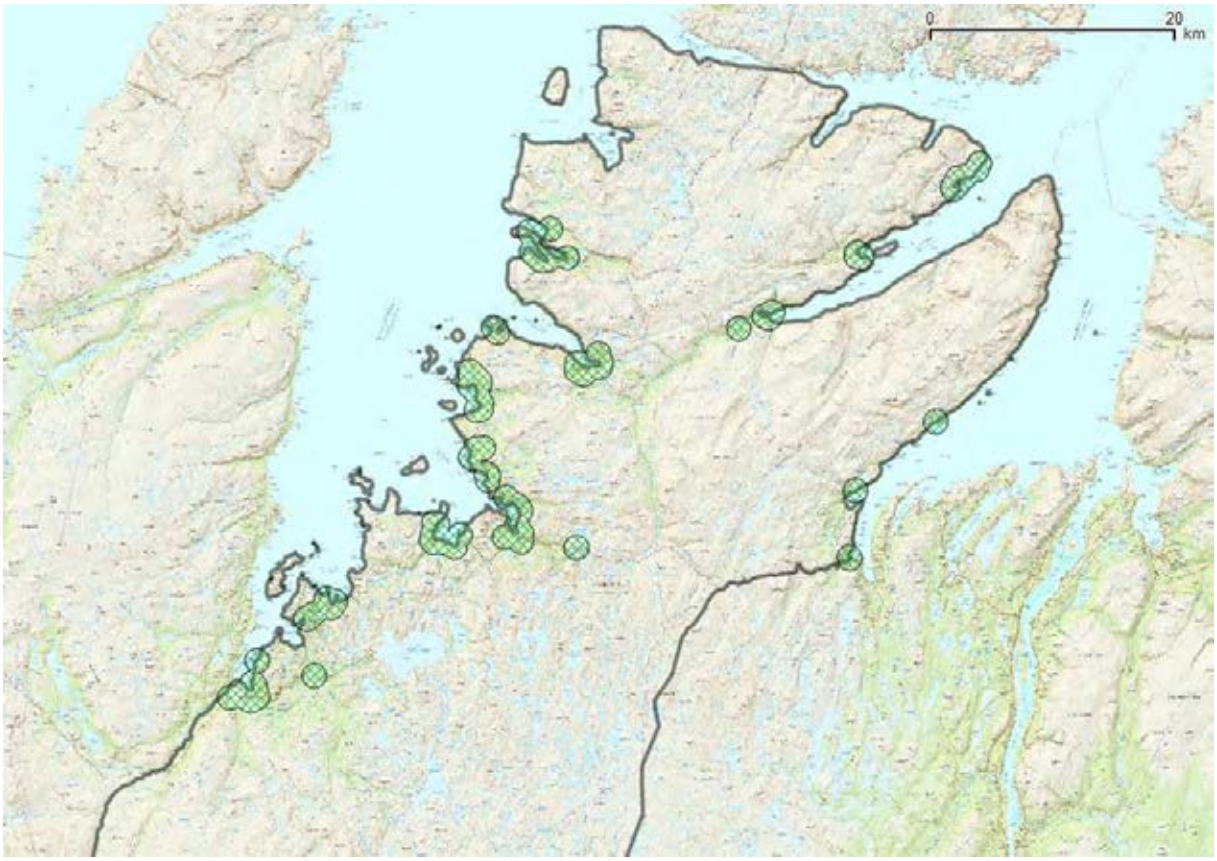
APPENDIX 2

Example of Secondary Object Journal

STIFTELSEN
PROTECT SÁPMI

SEKUNDARY OBJECT, NAME OF OBJECT:

Nr. 9 – Buildings



Description

Object owner	Private
Time of establishment	The entire post-war period
Status	In regulary use
Geographical location	In the summer grazing district
Activity period	All year round
Description of the object	Detached houses and cabins, semi-detached houses, terraced houses, blocks of flats, other houses
Selected impact zone	1000 meter
Data source	The Mapping Authority, NIBIO

	Landscape	Traditionally practiced ecosystem services	The human	Probability of the consequence occurring
Limited impact/damage at the local level	The Reindeers do not use this area	There has been no grazing in this local area since the last 50 years	No extra work for the herders	Low probability
Impact/damage at the local level				
Major impact/damage at the local level				
Limited impact/damage at the intermediate level				
Impact/damage at the intermediate level	Some disturbance might occur due to increased human activities	Some disturbance might occur due to human activities (hunting) disturbing grazing	Some extra work might occur in order to keep the reindeers in the area	Likely
Major impact/damage at the intermediate level				
Limited impact/damage at the regional level	Some disturbance might occur due to increased human activities	Some disturbance might occur due to human activities (hunting)disturbing grazing	Some extra work might occur in order to keep the reindeers in the area	Likely
Impact/damage at the regional level				
Major impact/damage at the regional level				

Secondary Object				Buildings					
	Risk and vulnerability - RAV matrix								
	ICL			Ecosystem services			The human		
Consequences	Local	Inter-mediate	Regional	Local	Inter-mediate	Regional	Local	Inter-mediate	Regional
High probability									
Direct impact									
Indirect impact									
Likely									
Direct impact									
Indirect impact									
Less likely									
Direct impact									
Indirect impact									
Low probability									
Direct impact									
Indirect impact									

Extent of Secondary Object impact	1	4	3	1	4	3	1	4	3

8 to 10		Action absolutely necessary
5 to 7		Action must be considered
2 to 4		Action should be considered
0 to1		No action necessary

APPENDIX 3

FPIC in voluntary market-related sustainability instruments

STIFTELSEN
PROTECT SÁPMI

Appendix 3 - FPIC in voluntary market-related sustainability instruments

In this appendix, a number of systems for corporate ethical and social responsibility are reported. In many situations where a country's laws and regulations do not recognize and respect the rights of Indigenous Peoples, these systems can be very important for the Indigenous Peoples who are affected by the operations of the certified companies.

The UN Global Compact[1]

The United Nations Global Compact is a strategic policy initiative for businesses that are committed to aligning their operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment, and anticorruption. This document is not binding for the companies that want to work according to the principles in this strategic policy document. However, the document provides clear guidance regarding FPIC and indigenous peoples.

*The right of indigenous peoples to give or withhold **free, prior, and informed consent** for the use of their lands, resources, traditional knowledge, or intellectual property ("FPIC") is one of these special protections for indigenous peoples. It is a recent development in international law that has rapidly gained widespread support, although it is not always effectively implemented in national law or practice. Companies wishing to respect this right should build upon their existing consultation processes so that they can demonstrate that they obtained consent for their activities.*

*The legal and practical guidelines regarding indigenous peoples' rights are evolving rapidly and require companies to update their approaches. Companies should ensure that they carry out effective due diligence on indigenous peoples' rights and traditions before undertaking projects. They should adjust their policies and procedures to address the right to **FPIC** found in the UNDRIP, which is supported not only by significant human rights jurisprudence, but also the most recent IFC Performance Standards and the 2013 Equator Principles. The process to obtain FPIC should be developed in collaboration with the affected indigenous peoples and should respect their traditional decision-making methods*

International Finance Corporation, IFL[2]

IFC is the largest global development institution focused on the private sector in developing countries. IFC, a member of the World Bank Group, advances economic development and have the ambition to improve the lives of people by encouraging the growth of the private sector in developing countries. In 2012, launching new Performance Standards to guide the environmental and social sustainability of its investments, the International Finance Corporation (IFC), established special safeguards for indigenous peoples, the Indigenous Peoples Performance Standard 7 (PS7).

Indigenous peoples are particularly vulnerable to the adverse impacts associated with project development, including risk of impoverishment and loss of identity, culture, and natural resource-based livelihoods. PS7[3] seeks to ensure that business activities minimize negative impacts, foster respect for human rights, dignity and culture of indigenous populations, and promote development benefits in culturally appropriate ways. Informed consultation and participation with IPs throughout the project process is a core requirement and may include **Free, Prior and Informed Consent** under certain circumstances.

[1] https://www.unglobalcompact.org/

[2] https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/home

[3] https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/performance-standards/ps7

IFC articulates its understanding of FPIC in PS7, which commits IFC clients to "obtain" FPIC from indigenous peoples only in specific circumstances. First the client/borrower must proactively identify indigenous populations. Once indigenous peoples are identified, the client must evaluate whether these populations will experience impacts that necessitate FPIC, specifically:

• Impacts on Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use (PS7, paragraphs 13 and 14)

• Relocation of Indigenous Peoples from Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use (PS7, paragraph 15)

• Severe Impacts on Critical Cultural Heritage (PS7, paragraphs 16 and 17)

The PS7 is an important instrument. In principle, a project cannot be financed unless consent according to FPIC has been achieved in cases where this is relevant in relation to the standard. However, there are criticisms that point to far too few investment objects being handled in accordance with FPIC. This may be due to a lack of knowledge on the part of the indigenous peoples concerned, but also a lack of routines for following up on compliance with the standard.

Forest Stewardship Council - FSC[4]

The Forest Stewardship Council (FSC) is an international, non-governmental organization dedicated to promoting responsible management of the world's forests. Since its foundation in 1994, FSC has grown to become one of the world's most respected and widespread forest certification systems.

FSC's certification system, which now covers more than 220 million hectares of forest worldwide[5], enables businesses and consumers to choose wood, paper and other forest products made with materials that support responsible forestry. The system is based on a third-party certification, where external auditors/control bodies check that the certified companies concerned follow the standard. A deviation in relation to the standard leads to demands for correction or, by extension, a lost certificate. Such a loss can be very financially burdensome.

FSC's certification system is based on 10 principles, principle three (3) is about Indigenous Peoples:

> *The Organization (certified forest company) shall identify and uphold indigenous peoples' legal and customary rights of ownership, use and management of land, territories and resources affected by management activities.*

Linked to principle three (3) there are indicators and criteria that must be followed so that the certificate is not compromised. In these, FPIC has a central role.

> *3.2 The Organization (certified forest company) shall recognize and uphold the legal and customary rights of Indigenous Peoples to maintain control over management activities within or related to the Management Unit to the extent necessary to protect their rights, resources and lands and territories. Delegation [6]by Indigenous Peoples of control over management activities to third parties requires Free, Prior and Informed Consent*

> *3.3 In the event of delegation of control over management activities, a binding agreement between The Organization and the Indigenous Peoples shall be concluded through **Free, Prior and Informed Consent**. The agreement shall define its duration, provisions for renegotiation, renewal, termination, economic conditions and*

[4] https://fsc.org/en/fsc-standards

[5] Before the war in Ukraine

[6] By delegation is meant that affected indigenous people give the right to a certified forestry company to conduct forestry within their indigenous cultural landscape

other terms and conditions. The agreement shall make provision for monitoring by Indigenous Peoples of The Organization's compliance with its terms and condition

3.6 The Organization shall uphold the right of Indigenous Peoples to protect and utilize their traditional knowledge and shall compensate Indigenous Peoples for the utilization of such knowledge and their intellectual property. A binding agreement as per Criterion 3.3 shall be concluded between The Organization and the Indigenous Peoples for such utilization through ***Free, Prior and Informed Consent*** *before utilization takes place and shall be consistent with the protection of intellectual property rights*

FSC is a certification instrument that obliges certified companies to apply FPIC in relation to the indigenous peoples affected by their activities. This means that regardless of whether the country where the forestry activities take place has recognized the rights of indigenous people or not, the certified company must follow the FSC standard if they want to keep their certificate. This means that this voluntary commitment often goes much further in protecting the rights of indigenous peoples than national legislation and international law can demonstrate.

FSC is a very complex system and there is a constant need to improve and clarify this system, especially in relation to indigenous peoples. Within the FSC, there is therefore a special committee set up for the international board consisting of indigenous representatives, the Permanent Indigenous Peoples Committee (PIPC). PIPC monitors that indigenous issues within FSC are followed and that principles and criteria are implemented in international forestry. A few years ago, FSC also established a special foundation, the FSC Indigenous Foundation, which works operationally with indigenous issues within FSC.[7]

Aluminium Stewardship Initiative, ASI[8]

The Aluminium Stewardship Initiative, or ASI, is a standards and certification body that oversees standards for the production, recycling and trading of aluminium which aims to ensure that aluminium is produced, recycled and traded to high social and environmental standards. The ASI was established in 2015 and has a Secretariat based in Australia, Europe and Canada, which oversees the development and use of two standards: the Performance Standard, and the Chain of Custody Standard. Social and environmental conditions for ASI certification are primarily found in the Performance Standard, a document negotiated between 2012 and 2017. In 2022 a new performance standard was issued and within this Standard there are three Criteria of particular concern to indigenous peoples, Criterion 9.3, 9.4, 9.5 and 9.6. The new standard will now be gradually implemented over the coming year. It is still too early to assess how the effects of this, in relation to the previous standard, tightened regulations on FPIC will be experienced by indigenous peoples.

9.3 Indigenous Peoples*.*

The Entity shall:

[7] www.fscindigenousfoundation.org

[8] https://aluminium-stewardship.org/

a. Implement Policies and processes that ensure respect for the rights and interests of Indigenous Peoples, consistent with international standards, including ILO Convention 169 and UN Declaration on the Rights of Indigenous Peoples.

b. Develop and document a process for identifying Indigenous Peoples based on their linguistic, social, governance and resource-linked characteristics rather than state recognition.

c. Demonstrate internal capacity (personnel, resources) to implement the process through evidence-based analysis that includes meaningful stakeholder engagement.

d. Review the Policies and processes at least every 5 years.

e. Review the Policies and processes after any changes to the Business that alter risks to the rights and interests of Indigenous Peoples.

f. Review the Policies and processes on any indication of a control gap.

g. Publicly disclose the latest versions of the Policies and processes.

h. Demonstrate internal capacity to map indigenous communities by their cultural characteristics, rather than legal designations, and to engage meaningfully.

i. Inform Indigenous Peoples of the relevant ASI Performance Standard requirements and the ASI Certification Audit process, including their involvement, in a manner that is accessible, timely and understandable.

9.4 Free, Prior, and Informed Consent (FPIC).

The Entity shall Consult and cooperate in good faith with the Indigenous Peoples concerned through their own representative institutions in order to obtain their ***Free, Prior and Informed Consent (FPIC):***

a. For New Projects or Major Changes to existing projects that may have Material impacts on the Indigenous Peoples associated culturally and living on the relevant lands within the Entity's Area of Influence, prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water, energy or other resources.

b. Where engaged in Bauxite Mining:

i. Prior to commencing a new phase of operations affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.

ii. Prior to altering an existing Mine Rehabilitation and closure plan affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.

c. Where FPIC is required in 9.4 a or b: Demonstrate that the consent is supported by the Indigenous Peoples community.

9.5 b. Where a project may significantly impact on cultural, historical or spiritual heritage that is essential to the identity of Indigenous Peoples, priority shall be given to the avoidance of such impacts. Where the impacts are unavoidable, the Entity shall obtain ***the Free, Prior and Informed Consent of Indigenous Peoples.***

9.6 Displacement.

The Entity shall

*h. Obtain the **Free, Prior and Informed Consent** of Indigenous Peoples where Indigenous Peoples are involved in the displacement*

In 2015, a group of indigenous peoples' organisations, representatives and supporters met to review the content of the proposed ASI Performance Standard, indicators to measure whether companies are meeting the Standard and possible governance of the Standard. This expert group meeting advised the ASI that an Indigenous Peoples Advisory Group be established to support the implementation of elements of the Performance Standard that directly impact on indigenous peoples. This group, the Indigenous Peoples Advisory Forum (IPAF) is now established and active within ASI. The group consists of indigenous representatives from different parts of the world.

Equitable Origin[9]

Equitable Origin, EO, is an independent, non-profit organization that partners with business, communities and government to support responsible energy development. EO have its main office in New York.

Equitable Origin created the world´s first stakeholder-led, independent, voluntary standards system for energy development. EO work with communities, companies and governments to promote social and environmental best practices, transparency and accountability in natural resource development.

EO's mission is to protect people and the environment by ensuring that energy development is conducted under the highest social and environmental standards. In order to achieve its goals, EO has developed a standard EO100™. Guided by this standard, companies in the oil and gas sector and other energy areas such as wind power can certify their operations. The EO100™ Standard provides a framework to monitor on-the-ground performance as well as company-level policies. The tool confirms responsible business practices through independent verification with the option of a third-party certification.

The standard is built on five (5) principles. Principle three (3) deals with indigenous peoples and their rights.

Principle 3: Indigenous Peoples' Rights

The goal of this Principle is to ensure:

- Development is carried out in ways that recognize, respect and address the specific rights, traditions and cultural implications for Indigenous Peoples whose territory or livelihoods may be affected by the project in accordance with international and voluntary standards as listed in Annex II.

Principle 3 is additional to other Principles - all of which apply to Indigenous Peoples.

Objective 3.1 Free, Prior & Informed Consent (FPIC):

Operator obtains the FPIC of the affected communities of Indigenous Peoples when the project activities may affect the rights of Indigenous Peoples as established in the United Nations Declaration on the Rights of Indigenous Peoples and ILO Convention 169 on Indigenous and Tribal Peoples, and in the Constitution of the country of operation.

In special performance targets for principle three, it appears in which situations certified companies must apply FPIC:

[9] https://fpic360.org/

Operator shall apply FPIC in the following situations and any others where it is required by local laws:

Performance targets 1

- When a project impacts Indigenous Peoples´ lands and natural resources subject to traditional ownership or under customary use;
- When the Operator proposes to store or dispose of hazardous materials on Indigenous Peoples´ land or territories;
- When a project occasions the relocation of Indigenous Peoples from lands and natural resources subject to traditional ownership or under customary use;
- When a project may significantly impact priority ecosystems that Indigenous Peoples may rely on for cultural, spiritual, or livelihood purposes;.
- When a project may significantly impact critical cultural heritage that is essential to the identity and or cultural, ceremonial or spiritual aspects of Indigenous Peoples' lives; or
- When the Operator proposes to use the cultural heritage including traditional knowledge, innovations and or practices of Indigenous Peoples for commercial purposes.
- Where FPIC was not obtained by the host government, prior concession holder, or by the Operator, Operator shall conduct an FPIC process before it starts project activities.

Performance targets 2

- Operator shall publicly disclose how it determines FPIC and how it has ensured that those participating in FPIC consultations are the relevant stakeholders with the authority to represent their community's interests

EO certified companies are found today mainly in the USA and Latin America, but the ambition is for the standard to be more widespread.

APPENDIX 4

Example of an IPCIA (Report I)

STIFTELSEN
PROTECT SÁPMI

PARTICIPATORY IMPACT MAPPING AND PROFESSIONAL REINDEER HUSBANDRY INVESTIGATION

In relation to

Øyfjellet vind power park

The report was commissioned by

Reinbeitedistrikt 20 - Jillen Njaarke, org.nr. 897 737 272, by

STIFTELSEN pro TECT SÁPMI

June 2019

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Innhold

Introduction

Reindeer grazing district 20 - Jillen Njaarke - has ordered a separate professional reindeer husbandry, cumulative study of the planned Øyfjellet wind farm's impact on reindeer husbandry. The report shall be used as part of the knowledge base for the district's position on the matter. The project has come about after negotiations between the developer and the reindeer grazing district.

The Protect Sápmi Foundation («Protect») has been given responsibility for the study, and the reindeer grazing district will be deeply involved in the work. Protect Sápmi's assessment methodology, which is a combination of the cumulative method and the use of traditional reindeer husbandry knowledge, has been used.

Senior adviser, MSc in Economics Anders Johansen Eira is responsible for the reindeer husbandry content. Senior advisor, civil engineer Tim Valio has been responsible for the map technical work, including production of the map material, mapping of impact area with associated areas of influence in relation to various reindeer husbandry interests and calculated affected and untouched reindeer husbandry area. The geographical information system developed by Protect Sápmi has been used. Senior advisor Svein Ole Granefjell, who is experienced in South Sami reindeer husbandry, has assisted in connection with. the concluding chapters.

The district's internal reindeer husbandry professional committee has made valuable contributions to area descriptions in a reindeer husbandry context, the reindeer husbandry's use of the various areas and assessment of the consequences of various intrusion on the reindeer grazing district's activities. Reindeer owners Torstein Appfjell and Ole Henrik Kappfjell have participated in all the meetings, while reindeer owners Per Anders Kappfjell have participated in two meetings.

Methodology

There are several models for assessing the consequences of adverse impact on reindeer grazing land. For example, in a report on the Fálesrášša wind farm[1], Bioforsk has classified the value of reindeer grazing land in three classes; small, medium or large while consequence "is graded according to a narrow scale; from very large positive consequence to very large negative consequence ".

Protect Sápmi finds this type of model relatively general and contextually imprecise. It also does not attempt to assess cumulative effects.

In NVE's report 10-2004 on reindeer grazing and land encroachment, it is stated on page 20[2]: *»... for reindeer husbandry, one will never be able to predict the effect of an encroachment on reindeer grazing land if one does not know and understand the holistic use of reindeer husbandry in the area. A complete overview of the overall use can only be given by the reindeer owners (siida) who use the area. Development measures located in the "wrong"*

[1] Rapport vol. 6 Nr. 99 2011 concerning Fálesrášša vindpark, Bioforsk 2011.
[2] Report nr. 10 – 2004 from NVE and «Reindriftsforvaltningen», 2004.

place can create a barrier effect and fragment the reindeer grazing land so that undeveloped and undisturbed areas become impossible to use because it becomes impossible to move the reindeer to them. "

NVE's approach has been chosen as an important starting point, because it sheds light on the reindeer owners' knowledge of reindeer husbandry and not least on holistic use.

Traditional reindeer husbandry knowledge

Reindeer grazing district 20 Jillen - Njaarke is in the South Sámi language area. A number of Sami, reindeer husbandry terms have been used in communication at meetings with the district. Norwegian is used as the language of communication in the dialogue because the investigators speak Northern Sami and Norwegian, while the practitioners speak South Sámi and Norwegian. The reindeer husbandry description is based on the District plan and available land use maps from the Norwegian Directorate of Agriculture. The land use maps show how the areas were used at the time the maps were made, but the use has changed somewhat since then. The district has supplemented with information on changes in land use since then. Changes in use are due to increased land encroachment, structural changes in the district and partly climate change.

The areas' function for reindeer and reindeer husbandry in different periods today is the basis of the assessments. Using Sami concepts about reindeer husbandry in the dialogue is done to understand the traditional knowledge. Norwegian lacks words that literally correspond to many Sami concepts, with their implicit technical understandings. The investigator has therefore had to "recode" the understandings that the South Sámi reindeer husbandry concepts contain, to Norwegian - via Northern Sámi. This exercise requires reindeer husbandry professional insight. Nevertheless, there will be nuances that the Norwegian-language version does not manage to capture.

The definition of traditional knowledge in accordance with The Ottawa Principles are [3] *"a systematic way of thinking and knowing that is elaborated and applied to phenomena across biological, physical, cultural and linguistic systems. Traditional Knowledge is owned by the holders of that knowledge, often collectively, and is uniquely expressed and transmitted through indigenous languages. It is a body of knowledge generated through cultural practices, lived experiences including extensive and multigenerational observations, lessons and skills. It has been developed and verified over millennia and is still developing in a living process, including knowledge acquired today and in the future, and it has been passed on from generation to generation. "*

Traditional knowledge must in accordance with The UN Convention on Biological Diversity be recognized in line with research-based knowledge. The member states of the Arctic Council, including Norway, have decided that Arctic areas will be managed using all available knowledge, including the indigenous peoples' traditional knowledge. The traditional reindeer husbandry knowledge about reindeer and reindeer husbandry has been accumulated

[3] Ottawa Traditional Knowledge Principles - approved by all permanent indigenous peoples' organizations in the Arctic Council in 2015

through generations, and stored in the reindeer herding Sami's common memory[4]. The knowledge is mainly not recorded, but is available orally through discourses about e.g. reindeer, reindeer grazing, snow conditions, terrain formations, topography and the interaction between animals and humans in different landscape types and seasons. Although knowledge is contextual, it also has general elements.

Insight into practical reindeer husbandry in these areas from the reindeer husbandry professional committee reveals the area's reindeer husbandry significance, especially the reindeer's behavior and challenges in working with reindeer in the current and associated terrain. Such insight into nature, topography and grazing, together with the experiences of the reindeer's behavior and terrain use individually and in herds in the relevant area during the affected periods, ensures contextual relevance that is important in the analysis section. The focus is on changes that the encroachment will create in the interaction between reindeer, humans and the landscape in question.

Knowledge of other land encroachments in the district is also included in the factual basis, including experiences of effects from these. The method provides acceptance and legitimacy, especially among reindeer owners.

The cumulative method

Traditional knowledge is supplemented by a model developed following an agreement between the mining company LKAB in Kiruna, Sweden, and the Sami villages of Gabna and Leavas in northern Sweden[5]. This work was once led by Anders Blom, former chairman of the board of the Protect Sapmi Foundation. The model is based on several international examples from e.g. Canada[6], the USA[7] and Sweden[8], and has been used in specific cases within Sami reindeer husbandry, for example in Leveäniemi[9], with results that both the developer and the reindeer husbandry perceive as real and relevant.

Reindeer husbandry in the mentioned Sami villages and in reindeer grazing district 20 is nomadic, so that the knowledge is transferable to Sami reindeer husbandry in Norway - although the effects of land encroachment obviously depend on different variables in different cases. Nomadism makes it natural to see the area in question with associated areas in connection with the district's other land use. The most important thing about the model, however, is that it has a cumulative perspective. Of particular interest is the cumulative effect

[4] Defined by Reindeer herder Nils Isak Eira, Fossbakken
[5] Same village in Sweden corresponds to reindeer grazing districts in Norway, although there are some differences between these.
[6] Cumulative Effects Assessment and Management, Canadian Environmental Assessment Agency (CEAA), modified on Tue, 22 Sep 2009.
[7] Guidance on Cumulative Effects Analysis in Environmental Assessments and Environmental Impact Statements, U.S Department of Commerce, National Oceanic & Atmospheric Administration. National Marine Fisheries Service, Issue Number 1, 2012.
[8] Cumulative effects and consequences. Treatment in environmental assessment and environmental impact assessment for roads. VTI report 674. Folkesson Lennart, Sweden 2010.
[9] Reindeer husbandry analysis Leveäniemi, Mining consequences for Leavas and Gabna Sami villages, 9.11.2014.

of the possible changes on reindeer husbandry, both operational consequences and risk changes that the intervention creates during the construction and operation period.

The method manual [10]for the cumulative model defines that *"Cumulative effects describe how an activity together with other ongoing, past and future activities / measures affects the reindeer husbandry industry in an area".*

The number of encroachments and the size of these define the level of risk for the reindeer grazing district. Increased interventions and activities with their areas of influence result in increased operational disadvantages and increased consequences. The consequences are categorized according to geographical scale with a focus on land use, animal welfare and the use of input factors.To show the total intervention situation, all area interventions (secondary objects) with associated impact zones are mapped. A separate object journal is created for each area intervention. Protect Sápmi has further developed the original cumulative method for a process that combines research on impact zones with reindeer owners' experiences and traditional reindeer husbandry knowledge. The process takes place in three steps:

Step 1: Data collection – Mapping

The data collection step is the start of the process. Representatives of Protect Sápmi and representatives of the district meet here. All existing impact objects in the district are reviewed and mapped. The mapping takes place with the help of map material from the Mapping Authority[11], NVE[12], NGU[13], the Directorate of Fisheries[14] and NIBIO[15]. Each object is graded based on how serious the impact is on the landscape, the reindeer herd and the reindeer husbandry work. The severity assessment is made in relation to different geographical scales.

The size of the impact zones is set on the basis of research-based figures[16].[17] Any discrepancies are always within the research knowledge, so as not to exaggerate the effects. In types of intervention that are not covered by research, the impact zone is determined on the basis of experience through a discussions with the district's representatives. They know their own reindeer husbandry areas best.

It is important to emphasize that an impact zone not only indicates the impact on reindeer, but also the interaction between reindeer and landscape. This interaction again has consequences for reindeer husbandry work. The impact zone therefore also says something about the actual

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[10] Cumulative consequences for the reindeer herding industry, Gabna / Leava's Sami villages and LKAB, Manual version 1, April 2015.
[11] https://www.kartverket.no/
[12] https://www.nve.no/
[13] http://www.ngu.no/
[14] http://www.fiskeridir.no/
[15] http://www.nibio.no/
[16] Anna Skarin, Birgitta Åhman (2014) Do human activity and infrastructure disturb domesticated reindeer? The need for the reindeer's perspective, Polar Biology https://link.springer.com/article/10.1007/s00300-014-1499-5
[17] Nicholas J.C. Tyler et al (2016) Cryptic impact: Visual detection of corona light and avoidance of power lines by reindeer, Wildlife Society Bulletin, http://onlinelibrary.wiley.com/doi/10.1002/wsb.620/full

work with reindeer being affected in the area. However, not all domino effects of this are possible to show in map images.

Step 2: Cumulative analysis

With all objects mapped, the cumulative analysis begins. The cumulative picture gives a holistic view of how large a part and which parts are directly affected today. In the analysis work, it is first studied how much influence different objects and object types have separately, for example buildings, roads, electricity networks, mines, outdoor life and others. Finally, the primary object is assessed, and how it, together with all the secondary objects in total, affects the reindeer husbandry activities.

Step 3: Reporting

The results are presented as cumulative map overviews, with accompanying assessments. The object journals established in step 1 are included as an appendix. Here, the various assessments appear in more detail.

Different colors are used to illustrate types of procedures and distinguish them from each other. For example, buildings, cabins and outbuildings are marked in green, hydropower and aquaculture are blue, larger power lines are red, etc. Color explanations appear from the captions.

Delimitations

With regard to the effect of different impacted activities on the reindeer husbandry, both research and the reindeer owners' experiences show that the impact varies according to the type of intervention, scale and time - including the season.

Scale

The method manual delimits the geographical scale into three levels:

1. Local level; ie the part of the reindeer husbandry seasonal area where the measure / activity is planned to be established. The directly affected immediate area within the impact zone. In Sami ***báiki.***

2. Intermediate level; grazing and living areas used during days, weeks and months. includes the seasonal area within which the impact object is located. In Sami ***orohat***.

3. Regional level, including migration and migration camps used between seasonal pastures. The district's total seasonal areas. On Sami ***johtolat***.

The planned construction area is located within an area with various seasonal pastures, including spring and summer pastures. But winter grazing is also affected, including moving path´s to and from, with its grazing and gathering places. The survey shows that autumn and early winter grazing are also affected, mostly by power lines. The same applies to mowing tracks. The local scale therefore includes the planned development area with connection line and roads, as well as the closest connected areas that naturally belong together in a reindeer husbandry context.

The intermediate scale includes the entire seasonal grazing area. The pasture is used as part of the whole throughout the reindeer husbandry year, where different grazing parts have different functions. The functions can vary in relation to, for example, animal categories and by both week and month, daytime and nighttime in an interaction with weather, wind and temperature conditions. Climatic conditions in different years also affect land use, degrees of aggregation and time of relocation. Effects are assessed against these factors in the relevant terrain and landscape type in spring, summer, autumn and winter.

In the regional scale, effects are studied in relation to the interaction with other seasonal pastures, and what sum effects the intervention gives in land use, use of input factors and economic benefits.

A number of research studies have been conducted on the effects of encroachment and disturbance on reindeer on various scales. Research[18] has shown that the effects on the local scale are often misleading when it comes to assessing the impact on reindeer herds, because the effects only become more visible when studying the impact in a somewhat larger geographical perspective. This is supported by the traditional reindeer husbandry knowledge, where effects on the connections and movements between seasonal pastures are just as important as the effects on the seasonal areas themselves and the local area.

The encroachment with associated disturbances has effects for the landscape, for the reindeer herds' land use, migration and grazing behavior and through it for the reindeer husbandry work. Additional work can in turn affect the district's capacity to manage reindeer grazing resources in a long-term and sustainable way. To understand the whole, one must understand the reindeer grazing district's resource base based on geography and seasons, and their significance and quality for reindeer husbandry from the perspective of both the reindeer and the practitioners.

It is especially important to see this intervention in relation to other interventions and disturbances. In sum, it is the new cumulative situation that this encroachment creates, that affects the most.

Geography and time

The mapping of area encroachments covers the entire district, and assessment of consequences is limited to the registered encroachment objects. Assessment of direct and indirect consequences has been made in isolation for each intervention in separate object records (appendices) in relation to landscapes, reindeer and humans. The relevant area intervention (the primary object) is then seen in connection with the secondary objects in the comprehensive, cumulative analysis.

The secondary objects are sorted into two periods; accumulated land encroachment to date and future planned activities that the investigator is aware of. The future land encroachments, beyond the primary object, are listed. For capacity reasons, these have not been analyzed so

[18] Do human activity and infrastructure disturb domesticated reindeer? The need for the reindeer's perspective: Polar Biology. Anna Skarin og Birgitta Åhman, Sverige 2014.

thoroughly in this report, but the objects have been identified. An analysis of future secondary objects will of course be associated with greater uncertainty than an analysis of existing ones. In relation to the latter, there is of course experiential knowledge.

Model for sustainable reindeer husbandry

A reindeer grazing district is the formal organizational unit that looks after the interests of reindeer owners vis-à-vis the authorities and others. The form of organization and management is regulated in the Reindeer Husbandry Act, with e.g. rules on annual meetings, electoral records, election of the board and determination of district plan, annual report, accounts and budget. Decisions are made by majority decision in the board and annual meeting.

The reindeer grazing district does not own reindeer, but can be the owner of common infrastructure, such as fences and slaughterhouses.

The Siida concept

To understand the consequences of encroachment on a reindeer grazing district, it is an advantage to understand the Sami term *Siida.*

Siida has several different meanings based on the contexts in which the term is used. In recent times, the Siida concept is explained in the context of reindeer husbandry as a form of organization of Sami reindeer husbandry. The Reindeer Husbandry Act defines Siida as a «*group of reindeer owners who carry out reindeer husbandry jointly on specific areas*». Especially among the older generation, Siida is also understood as the home and community of the reindeer herder - no matter where the siida may be in the relocation area

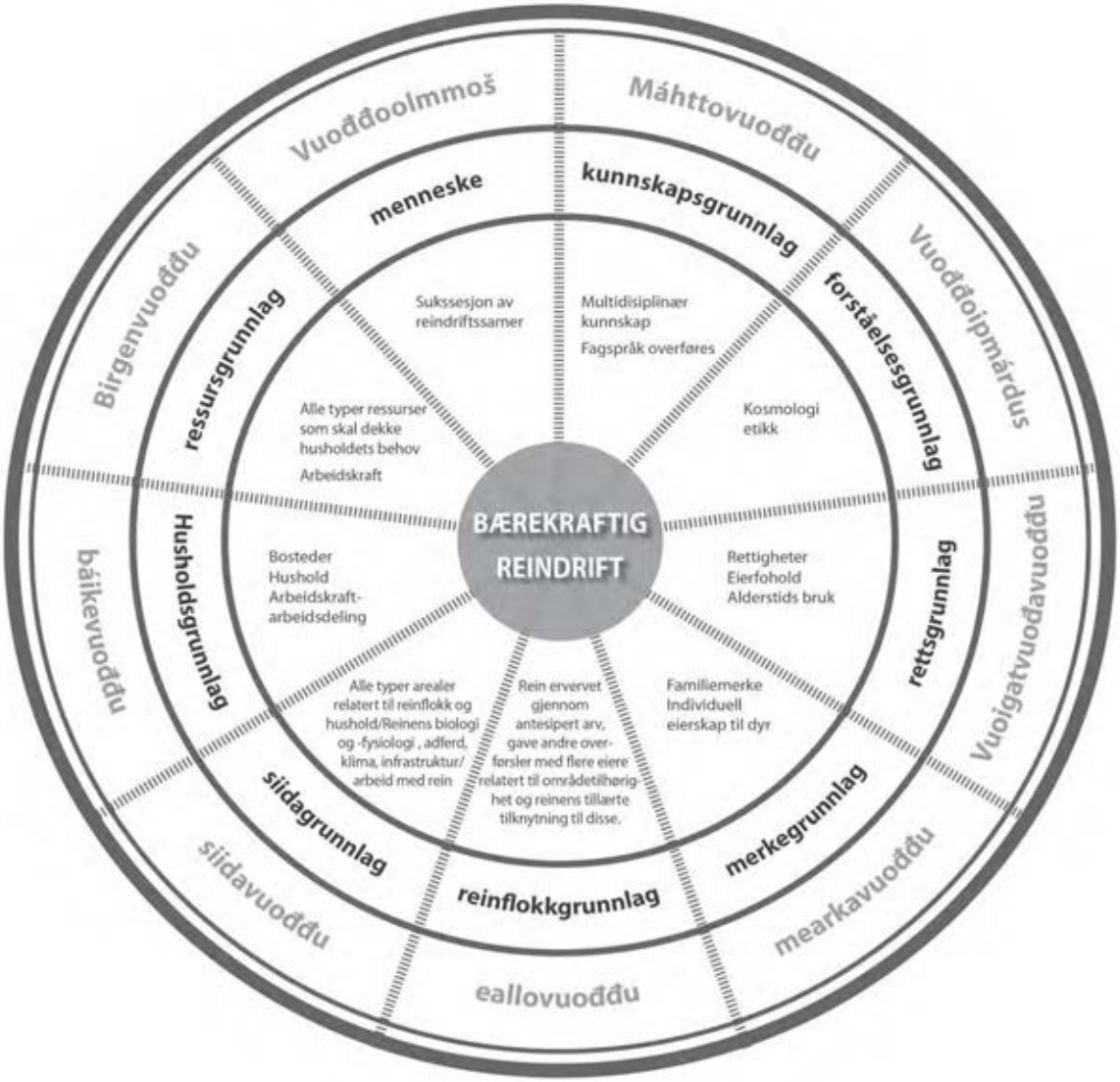
To illustrate the understanding, one can use the "*Model for sustainable reindeer husbandry rooted in the practical knowledge of Sami reindeer herders*". The model has been developed by a research group[19] at Sami University College, the International Center for Reindeer Husbandry and the Norwegian University of Environmental and Life Sciences in the *Dávggas* project.

Foundations for sustainable reindeer husbandry

The model is based on a doctoral dissertation by Phil.dr. Mikkel Nils Sara[20] "Siida ja siiddastallan at Sami University College, and focuses on the elements that ensure sustainablereindeer husbandry. The model looks like this:

[19] Inger Marie Gaup Eira, Mikkel Nils Sara, Hanne Svarstad and Svein D. Mathiesen: Norwegian myths-Sami reindeer husbandry, chapter 2: Seeing as a state or as a Sami reindeer owner - Two understandings of sustainable reindeer husbandry (2015)

[20] Sara, M. N.,*"Siida ja Siiddastallan" "Being siida – on the relationship between siida tradition and continuation of the siida system" – UiT (2013)*



Model for sustainable reindeer husbandry(the picture has not been able to e translated)

The continuity of the Siida is explained by 9 different, cohesive foundations - *vuođđu* - on which reindeer husbandry bases its future. The model shows that the following basis must be in place if reindeer husbandry is to function sustainably:

1. Humans / vuođđoolbmot

2. Siida basis / siidavuođđu

3. The basis of understanding / vuođđoipmardus

4. The knowledge base / máhttovuođđu

5. The reindeer herd basis / eallovuođđu

6. The resource base / birgenvuođđu

7. Household basis / báikevuođđu

8. The legal basis / riektevuođđu

9. The individual/family earmark on the reindeers / mearkavuođđu

The model illustrates that if one of the foundations is affected, it will affect other foundations. This is the main reason why a reindeer husbandry analysis must necessarily be relatively complicated, because these interacting connections must be identified and mapped.

In general, however, we can state that, for example, loss of grazing areas by land encroachment will have both direct and indirect consequences, with both short-term and long-term effects. An area loss means that the reindeer herd loses part of the seasonal pastures - the *siida basis* - which in turn affects the production and survivability of the reindeer herd - *the reindeer herd basis*. In the next round, this will affect the individual reindeer owners 'finances and the district's workforce - *the resource base* - which in turn affects the reindeer owners' household - *the household base*. In the longer term, the household's poorer finances can have an impact on the family's transfer of knowledge to children and young people - *the knowledge base* - in that reindeer husbandry families must prioritize free time to have dialogue with intervention actors and authorities, handle extra work and provide other sources of income. This use of time and resources is at the expense of training children and young people in traditional knowledge and the professional language of reindeer husbandry. This in turn can have a negative impact on recruitment - *the people in the siida*. There is a risk that the siida's future generation will lose the basis of understanding, ie the holistic understanding of and belief in the future of their business.

The foundations 3 and 8 are elaborated below, cf. above.

Vuođđoipmárdus – the basis for understanding, foundation nr. 3

Vuođđoipmárdus - the basis of understanding - refers to the reindeer husbandry Sami's understanding of reindeer husbandry. Central to this mindset is the relationship with the reindeer that live in their natural environment and according to their own natural behavior, but which are followed and managed by the reindeer owners. At the same time, reindeer owners try to protect the reindeer from external threats and otherwise only assert themselves when required. Preferably, the reindeer herder will avoid disturbing the reindeer in their natural environment (Magga et al., 2001). The reindeer owner acknowledges that he has no total control over either the reindeer or other natural environments, and thus adapts his own activity to the reindeer's natural instincts and natural environment.

The Sami expression "*Jahki ii leat jagi vielja"*, in english "A year is not another year's brother", means that for reindeer husbandry, variations from year to year are common. During the year cycle, a complex interplay develops between different conditions such as. weather, grazing conditions, snow and ice conditions, reindeer behavior and condition, impact from various encroachments, labor force etc. The interaction means that you have to make different choices from year to year, e.g. choice of time for relocation, which grazing areas to relocate to, whether to relocate the flock together, in smaller flocks or let the reindeer spread between

the seasonal areas, what kind of human effort is required under different conditions, when and for how long different collection sites will be used, etc.

Such variations in the natural environment and other conditions mean that reindeer husbandry is highly dependent on the existence of maneuvering options and alternative grazing areas and relocation pathways for adaptation to the best interests of the siida during the entire year cycle. Climate change means that the need for spatial room for maneuver and flexibility is increasing, and will increase further in the future.[21]

In land management, the siidas have a long time perspective in the use of renewable resources. While companies and commercial actors have a time perspective in their long-term strategies of, for example, 10 years and 30-50 years for infrastructure developers, the siidas make their assessments from an eternity perspective; one must ensure future generations a sustainable siida foundation - with all 9 foundations intact.

Riektevuođđu – the legal basis, foundation nr. 8

The siida have their legal rghts for the use of the siida basis - the grazing and resource areas - on the basis of e.g. age use/customary rights. The right to use and manage seasonal pastures and migration routes is a collective siida right, and which has been respected and maintained within the siida system and between different siida (Gaup Eira et.al 2016). This means that in the case of land encroachment within one reindeer husbandry area, it cannot be assumed that the district can move its reindeer herd over to the neighboring district. It will break Riektevuođđu.Over time, there have also been closures of operating units in some siidas. The principle is then that the rights are distributed to the remaining members of the district, and if the liquidation is extensive, it has been common - and necessary - to bring in new people to the siida / district to secure the resource base, e.g. in the form of labor, to maintain sustainability.

Description of the reindeer grazing district – the district plan

Sami reindeer husbandry has been practiced in the district since ancient times. The main features are fixed, but some things can change from period to period. The description of the district is taken from the district plan.[22]

The district plan for Jillen Njaarke was sent out on 27.02.2017 to the following bodies:

Affected municipalities:

Alstahaug, Vevelstad, Sømna, Bindal, Brønnøy, Grane, Vefsn, Hemnes and Hattfjelldal.

County Governor:

The county governor of Nordland, the Reindeer Husbandry Section,

[21] Cf. The climate research project «Ealat» 2008-2014, which was a collaborative project between Sami University College, International Center for Reindeer Husbandry, NASA, University of St. Petersburg, Norwegian University of Environmental and Life Sciences, University of Tromsø, University of Tallinn, Norwegian Meteorological Institute m. fl.

[22] District plan for the period 2016 - 2021, adopted by the district's annual meeting.

The National Park Board in Lomsdal / Visten National Park
Nordland County Municipality

The district plan is based on the Reindeer Husbandry Act of 15 June 2007 no. 40 and is adapted to the local conditions in the Jillen-Njaarke reindeer grazing district.

*§ 1 - **The purpose of the Reindeer Husbandry Act is, among other things**:*
For the Sami reindeer grazing area, the law shall facilitate an ecological, economic and cultural sustainable reindeer husbandry based on Sami culture, tradition and custom for the benefit of the reindeer husbandry population themselves
and society otherwise. The Act shall contribute to securing the reindeer husbandry areas in the Sami reindeer grazing area as the most important resource basis for reindeer husbandry.

*§ 3 - **The following in relation to international law applies to the application of the law**:*
The law must be applied in accordance with the rules of international law on indigenous peoples and minorities.

*§ 4 - **The Reindeer Husbandry Act states, among other things, the following about grazing rights**:*
Within the Sami reindeer grazing area, it shall be assumed that there is a right to reindeer grazing within
the framework of this Act, unless otherwise provided by special legal conditions. In the event of an encroachment on the rights of reindeer herding Sami, compensation shall be granted in accordance with general principles of expropriation law.

*§ 62 - **Regarding district plans, the Reindeer Husbandry Act states:***
The district board shall prepare a district plan for the district which shall contain the information about the activities in the district that is necessary for the public planning.

District boundaries

Pursuant to **§** 2 of the Reindeer Husbandry Act, the Sami reindeer husbandry area shall be divided into reindeer grazing areas and reindeer grazing districts. Authorization to make such a division lies with the Ministry of Agriculture (area boundaries) and the Reindeer Husbandry Board (district boundaries).

Previously, the Jillen-Njaarke reindeer grazing district was divided into two independent districts, Brønnøy / Kvitfjell and Brurskanken. After a study on a new district division in the **co**unty of Nordland in 1998 (A. J. Kosmo), it was decided to merge these into a new district which was named Jillen-Njaarke reindeer grazing district.

The current limits were set in the Reindeer Husbandry Board's case 27/99 of 27.04.99, and are as follows:

From the sea into the Tosenfjord - over Rismålstinden - over Jordbruvatnet, Jordbruelva, Gåsvasselva, Svenningelva down to Trofors. Auster-Vefsna to Fisklauselv - up to Fisklausvatn, over the water and down to Røssvatnet - into Tustervatn to Tverrberget. From Tverrberget westwards through Stillvasshola to Almdalen - from there down Herringelva and Fustavassdraget to Vefsnfjorden. Vefsnfjorden outwards - northwards around the mainland and out towards the sea - from there southwards to the border in the south. In the same decision, grazing zones within the winter grazing area in the district were also adopted.

The district borders in the north on Røssåga / Toven, in the east on Byrkije and in the south on the Voengelh-Njaarke reindeer grazing district.

The district is a year-round district and has all seasonal pastures within its boundaries and is not affected by the Norwegian / Swedish reindeer grazing convention.

Administrative matters and organization

The district is divided into two siida groups (operating groups), of which one siidae group has spring, summer and autumn pastures in the eastern part and winter pastures along the coast. The other siidae group has all seasonal pastures in the western part.

There are a total of four siida shares in Jillen-Njaarke. Each siida consists of a leader and several family members with reindeer in their own mark. A siidae section in the western part is relatively newly established and is under construction.

Jillen-Njaarke reindeer grazing district is organized with its own board. In the current period, the board consists of three members: Chairman Torstein Appfjell and board members Ole Henrik Kappfjell and Jon Aslak Kappfjell

The board deals with matters concerning the district. The chair of the district board represents the board when this is not assembled, and maintains contact with outsiders on behalf of the district.

Jillen-Njaarke reindeer grazing district extends over nine municipalities and one county municipality, which all have their own strategies and goals for their land use planning. With so many players on the field, this is a major challenges with the management of the district's land. With the amount of different external cases the district has at times, case processing may not always be optimal for the benefit of the industry.

The Jillen-Njaarke reindeer grazing district will encourage both public authorities and private actors, who are planning interventions or activities in the district's areas, to obtain information about the district on the map portal http://nordlandsatlas.no/flexviewers/reindrift/

On this website, there is information about the district's boundaries, seasonal pastures, relocation pathways and other public information about the reindeer husbandry's use of the areas. In cases where intervention or change of use of areas is planned, it is requested that the district be contacted for clarification of planning.

Grazing

All grazing within the district takes place in an operating community where the reindeer graze together in larger or smaller flocks regardless of owner. This form of operation is common in reindeer husbandry and is in accordance with traditional use of the areas. All site shares have equal grazing rights within the district.

Natural conditions

The basis for domestic reindeer husbandry lies in the reindeer's ability to utilize various grazing plants throughout the year. The grazing is therefore roughly divided into spring, summer, autumn and winter pastures.

In winter, the reindeer mostly graze lichens, but also other plants that it finds under the snow. At other times of the year, various grass and herbaceous plants are grazed. Availability and quality of the pastures varies from year to year, i.a. due to temperature and precipitation. In winter, the amount of snow and the consistency of the snow in particular are decisive for whether the pastures are accessible.

On the Helgeland area, there may be mild weather and rain in the middle of winter and later frost, which can lead to icing of the pastures, especially on the east side of Vefsna. Off the coast, winter grazing is good, but climate change is noticeable here as well. In the pre-Christmas winter, the snow usually does not come until closer to Christmas, and already in April the snow can thaw away. Inland, it is usually a full winter one month longer than on the coast. Both siidaes have their winter pastures within approved winter grazing zones, see section 4

The open bare gound pastures, both spring, summer and autumn, are good throughout the district. These pastures consist of a large number of plants, both herbs, grass and lichen, which are rich in protein and necessary for the reindeer's growth and muscle building. To find the best plants and plant parts, the reindeer roam a lot and need large areas to thrive.

Due to topography, fjords and watercourses, the seasonal pastures, especially on the west side of Vefsna, are naturally divided into several localities. For the entire grazing area, both eastern and western, it is important that the reindeer can move between all the grazing areas, in addition to the fact that it is also moved under the control of the reindeer owners. Reindeer husbandry is therefore dependent on the natural moving and transport pathsways between the grazing areas not being closed by intervention. If these were to be lost, it would have catastrophic consequences for reindeer husbandry in the district.

The reindeer husbandry year starts on 1 April when moving to the spring pastures and calving land, and is here divided into eight seasons to provide a better understanding of the grazing use in the district.

Spring (april-mai)

The district has good lichen pastures which are the main pasture in the spring. There is also some swamp grazing where it germinates early. Here there are several deep valleys located in the north / south direction. In these valleys, it is early spring so that the reindeer also have access to green pasture. The climatic conditions meet the requirements for such grazing areas.

As the calving season approaches, the females move towards their usual calving areas while the rest of the herd remains in the lowlands.

Eastern siida: Early spring grazing is mainly from Grane and north to Mosjøen on the east side of Vefsna. Further from Mosjøen and into Herringen and up towards Herringbotnet.

Western siida: Early spring grazing is from Tosenveien in the south, north on the west side of Svenningdalen, Stavassdalen, Holmfjellet, Eiterådalen and Sørvassdalen. The area in Indre Visten from Storbørja north and east in Sætermarka and Laksmarka is also spring pasture

Spring summer (mai-juni) - calving

The calving areas are located in hilly terrain that becomes early spring fertile. These are areas that the reindeer cows themselves have chosen and used for calving areas since time immemorial. See section 2.8.1.

In June, the reindeer begin to move towards the summer pastures.

Eastern siida: Calving takes place along the entire Reinfjellet from Grane and northwards, and in Klubbfjellet on the east side of Haustreisdalen and up to Herringbotnet, Vestre Geittindskardet, Torrisfjellet, Slettfjellet, the area around Skalvatnet and Hanskvasshaugene.

West siida: Hundåla and east / south end of Hundålvatnet, Sørvassdalen and Vikdalen. Fjellskardet, Holmfjellet, Stavassdalen, Dempa and Sarvejællan.
Other calving land in Indre Visten is in the area from Storbørja north and east in Sætermarka and Laksmarka.

Summer (juni-august) – marking of the calfs

The summer pastures are in higher-lying areas, usually above the forest boundary, where the snow lies long over the summer. Here the reindeer herd seeks midsummer to meet their needs grazing, tranquility, cooling and as few insect irritations as possible within short distances.

The calf marking takes place in the period 25 June to 15 August. The start of calf marking depends of the heat and snow conditions in the area. All available grazing area is used for summer grazing. Fences are used as needed.

The eastern siidae has calf marking fences in Appfjellet, Geittindskardet, Åkervikfjellet, Slettfjellet and in Haustreisdalen. The western siidae has calf marking fences at Svenningskardet and Øvre Gåsvatn.

Eastern siida: The reindeer graze in early summer from Reinfjellet, Herringbotnet and the north side of the Brurskanken massif towards Røssvatnet, south towards Åkervikfjellet. Late summer Granefjellet, Pilfjellet, Appfjellet, Geittindskardet, Buksfjellet and Torrisfjellet.

Western siida: From Demmeldalen, Vikdalsfjellet and southwards the mountain massif, the east side of Hundålvatnet and Sørvassdalen, Fjellskardet. Holmfjellet and Visttindene, Kvitfjellet, Måsskardet, Sarvejællan, Feitskardet, Langskardet, Hjortskardene, Elgvidda and Jordbruvatnet.
Indre Visten and the mountain massif west of Laksmarkdalen as well as higher mountain areas on the Vevelstad Peninsula are also summer grazing areas for the reindeer.

Autmnsummer(august–september)

After calving, the main herd stays in lower-lying summer / early autumn land. Many plants are still green and thus important grazing plants for the reindeer. The reindeer will naturally

spread throughout the area to be able to utilize this pasture in addition to fungi which is an important mineral source.

Early autumn slaughter and marking of remaining unmarked calves takes place in Jamtfjelldalen and in Dempa, and usually starts around 1 September and lasts for at least 2 weeks.

About. 10.-15. September, the rutting season begins, see section 2.8.2.

Eastern siida: Has late summer and early autumn grazing in Appfjellet, Vardfjellet, Pilfjellet and Granefjell.

Western siidae: Fjellskardet, Sjølegda, Holmfjellet, Måsskardet, Feitskardet, Langskardet, Hjortskardet and Gåsvatnet. The Visten area, Stormarka and the area Storfjorden, Storbørja are also alternative late summer and early autumn grazing areas.

Autumn and autumn winter (oktober-december)

After the rut, the reindeer gather naturally in larger flocks. Autumn and early winter grazing consists of meadows, pine and spruce forests in lower mountain areas. The quality of the autumn pastures is usually very good, but can vary from year to year. It is primarily temperature, precipitation and climate that determine this. In late autumn, the reindeer migrate west towards more accessible low-grazing areas.

In November / December, gathering begins for pre-Christmas slaughter, parting and preparation for moving to the winter grazing areas.

Eastern siida: Herringbotnet, Herringen, Vardfjellet, Reinfjellet, Rossvoldfjellet.

Western siidae: Fjellskardet, Sjølegda, Holmfjellet, Måsskardet, Feitskardet, Langskardet, Eiteråfjellet, Stavassdalen, Dempa, Hjortskardene and Sarvejællan. The area in Visten, Stormarka and the area Storfjorden, Storbørja.

Winter and autumnwinter (december-mars)

The winter grazing area by the coast is divided into 5 grazing zones with grazing time mainly from November / December until mid-April. The winter pastures on the coast are primarily used, but in some years with good climatic conditions and available pastures in the mountains, one can choose to postpone the move to the coast and utilize the pastures in the mountain areas. The winter grazing zones are used by both the eastern and western siidaes.

The winter pastures consist of hilly coastal landscape with heather, marshes and some reindeer lichen in it the bottom vegetation. In areas with old-growth forests, three lichens are present.

In the outer coastal areas, there is a lot of cultivated land, but still some reindeer grazing left on rocks and marshes.

The winter pastures on the coast are also partly affected by variations in temperature and precipitation, but poor grazing conditions occur only for shorter periods of time. The main

challenge for the utilization of the coastal grazing areas is the problem when the reindeer move in on cultivated land during periods of mild weather.

Core areas with special value for reindeer husbandry

During the reindeer husbandry year, there are certain periods where the reindeer need as much rest as possible as it is more susceptible to harmful influences and disturbances. These periods are especially the calving and embossing time, the mating time and during gathering for slaughter and moving of reindeer.

Calving places / time

Normal calving time is from the end of April until the beginning of June. The bulk of the calves are born in the month of May. In Jillen-Njaarke, the first calf is born around 25 April, so the herd must be in the calving places before that time. See section 2.3.

The reindeer cows are calf-heavy and naturally characterized after a long winter and need grazing rest both before and during calving. During this time, they are vulnerable and react negatively to human disturbances or other unrest. It takes very little before the young mothers leave the calf, which can mean that newborn calves do not have the opportunity to survive. For the small calves, there are two things that are vital, namely enough milk and that they are allowed to walk undisturbed with the mother for the first couple of days, ie the time it takes to establish a bond between mother and calf (embossing time one).

Rutting / mating

After the autumn slaughter, around 10.-15. September begins the rutting period which lasts until about mid-October. The bulls form a harem, and the reindeer gather in small flocks and pull down towards lower areas and valleys. During this period, the basis for next year's calf production will be laid. The cows are rutting approx. 1 day. Each rutting period lasts between 12-24 hours. If the cow is not fertilized in the first rutting cycle, it will return after 11 to 20 days. Disorders during the oestrus period can lead to delayed fertilization with late birth of calves. It is therefore important that the reindeer are not disturbed during this period. See section 2.5.

Collection areas

Collection areas naturally have boundaries where the reindeer thrive and gather temporarily. These are important areas in the district during collection for relocation, calf marking, separation or slaughter.

Eastern siida: The northern end of Reinfjellet, the area around Hjartfjellet and Holmvatnet as well as Jamtfjellet and Jamtfjelldal.

Western siitda: Litjfjellet, Dempa and Sarvejællan, Stavassdalen and Eiteråfjellet.

Main routes for moving east / west
Moving to / from winter pasture is required for Jillen-Njaarke. Due to natural conditions such as short days, grazing conditions and topography, a traditional move to the winter pastures on the coast is made difficult. During this period, car transport is most often used.
The spring migration, on the other hand, usually takes place in the traditional way down the hill and in several stages. There are three different moving and driving routs that can be used depending on the driving and grazing conditions. The eastern and western sides use the same main relocation berth to Vefsndalføret.

Moving and traction parhways for reindeer have their own protection in the Reindeer Husbandry Act § 22 and shall not be closed by encroachment or disturbance.

Choice of relocation
If the winter pastures are used in the inner Velfjord, the herd is pushed up towards the high mountains by Lande, further past Leiråvatnet and down on Bjørnstokkvatnet. If the pastures are good and the migration conditions are good, the herd is pushed further over Elgvidda and down Måsskardet, around Kvitfjellet and down into Stavassdalen. From Stavassdalen, the herd is moved over Eiteråfjellet and down to Grane and over Vefsna.

If the winter pastures on the Brønnøy peninsula are used, the herd is moved up towards the high mountains by the Langfjord and further up Tettingsdalen, through Lappskardet and further down to Lomsdalen. In Lomsdalen it is early spring and here we usually let the herd rest and graze for a few days before the move continues further east. From Lomsdalen, the road can continue through Velfjordskardet and down to Måsskardet. The herd is then moved down to Fallan in Stavassdalen.

The other moving route from Lomsdalen goes up Henriksdalen, between Visttindene and down Holmfjellet. From here, the herd is moved over Sirijordsaksla, past Kvitfjellnasen and down into Stavassdalen. The herd can also be pushed from Holmfjellet, over Eiteråfjellet and down to Grane.

If the winter pastures are used in the northern part of the district, the reindeer are moved from Hundåla, after Hundålvatnet and to Hundålvassryggen. If the ice conditions are uncertain, the high mountains from Demmeldal to Hundålsvassryggen are used. And then down to Øksendalsnakken. Further over Vefsna by Forsjord or Eiterstraumen.

In addition to these relocation routs, there are also relocation / traction routs between grazing areas within the district.

Reindeer numbers and production

The upper permitted number of reindeer for Jillen-Njaarke is 2200 animals in the spring flock, determined by the Reindeer Husbandry Board in case 107/2011. The same decision states that the upper reindeer numbers for the district will be up for a new assessment. The total number of reindeer as of today is 1779 animals. One goal is to increase the number of reindeer to the upper permitted limit and build up a good herd structure to ensure the largest possible production.

In recent years, the number of reindeer and slaughter has decreased dramatically. It is related to large losses of predators and collisions with reindeer on the railway. These losses affect the harvest and make it difficult to achieve an optimal composition of the herd and a good

production in the district.

Reindeer population development in the district over a 10-year period:[23]

Tabell 2. *Reintall i sluttstatus for de 10 siste driftsårene (korrigert reintall per 31. mars unntatt siste år).*

REINBEITEDISTRIKT	REINTALL I SLUTTSTATUS (pr. 31. mars)									
	05/06	*06/07*	*07/08*	*08/09*	*09/10*	*10/11*	*11/12*	*12/13*	*13/14*	*14/15*
18 - Voengelh-Njaarke	1 688	1 980	2 090	2 304	2 342	2 338	2 233	2 353	2 227	2 233
20 - Jillen-Njaarke	2 061	2 100	2 032	2 114	2 038	1 813	1 715	1 732	1 794	1 779
19 - Byrkije	1 021	855	1 070	1 173	1 375	1 298	1 446	1 472	1 662	1 488
21 - Røssåga/Toven/Syv Søstre	1 061	1 013	1 003	871	710	214	175	240	263	461
23 - Hestmannen/Strandtindene	1 168	1 263	1 303	1 301	1 375	1 439	1 480	1 320	1 310	1 222
22 - Ildgruben	1 000	1 001	1 000	930	965	931	1 014	953	899	896
24 - Saltfjellet	3 060	3 335	3 388	3 567	3 780	3 302	3 371	3 376	3 473	3 497
25 - Balvatn	1 100	1 074	841	775	907	973	1 098	1 059	947	920
26 - Duokta	841	780	781	790	788	786	789	711	733	697
27 - Stajggo-Håbmer	711	889	929	959	988	1 001	931	1 007	770	672
28 - Frostisen	140	100	78	82	148	184	388	413	421	398
29 - Skjomen	133	167	202	235	251	250	238	192	171	202
NORDLAND	**13 984**	**14 557**	**14 717**	**15 101**	**15 667**	**14 529**	**14 878**	**14 828**	**14 670**	**14 465**

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Meat production[24]

Tabell 7. *Totalt slakteuttak og slaktekvantum (inkludert privat salg og eget forbruk), prosentvis slakteuttak og produktivitet i driftsåret 2014/15. Prosentvis slakteuttak og produktivitet er beregnet i forhold til antall rein ved driftsårets start (korrigert reintall per 1. april 2014). Med produksjon per livrein menes slakteuttak og reintallsendring omregnet til kg per rein i vårflokk.*

REINBEITEDISTRIKT	TOTALT SLUTTAK	TOTALT SLKVANTUM	SLAKTE-PROSENT	SLUTTAK pr.livrein	PRODUKSJON pr. livrein	
	(antall dyr)	*(antall kg)*	*(% av vårflokk)*	*(kg/dyr)*	*(kg/dyr)*	
	14/15	*14/15*	*14/15*	*14/15*	*13/14*	*14/15*[1]
18 - Voengelh-Njaarke	358	9 342	16 %	4,2	1,9	4,8
20 - Jillen-Njaarke	117	5 396	7 %	3,0	2,7	3,3
19 - Byrkije	701	20 449	42 %	12,3	11,3	10,3
21 - Røssåga/Toven/Syv Søstre	39	620	15 %	2,4	0,8	2,4
23 - Hestmannen/Strandtindene	205	7 725	16 %	5,9	0.7	6,1
22 - Ildgruben	290	7 633	32 %	8,5	6,7	8,2
24 - Saltfjellet[3]	-	-	-	-	-	-
25 - Balvatn	35	585	4 %	0,6	2,8	0,8
26 - Duokta[3]	-	-	-	-	-	-
27 - Stajggo-Håbmer	74	3 025	10 %	3,9	-1,0	2,8
28 - Frostisen	74	1 669	18 %	4,0	4,2	1,4
29 - Skjomen	3	0	2 %	_[2]	_[2]	_[2]
NORDLAND	**2 200**	**66 898**	**15 %**	**4,6**	**4,0**	**4,3**

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1 Siste års produktivitetstall er foreløpig da det dels er beregnet på grunnlag av ukorrigerte reintall.
2 Det foreligger ikke tallgrunnlag til å gjøre beregninger knyttet til slakteuttak, slaktekvantum og produksjon.
3 Ikke oppgitt som følge av mangler ved tallgrunnlag for beregninger.

[23] The table is not possible to translate but the content describes the number of Reindeers in all districts in the County of Nordland.

[24] The table is not possible to translate but the content describes the total meat production for all districts in the Nordland county the year 2014/2015. Jillen Njaaarke slaugheterd and sold 5 396 kg.

Average slaughter weights[25]:

Tabell 12. *Gjennomsnittlige slaktevekter for kalv (miessi) i de siste 10 driftsårene, basert på data fra listeførte/ registrerte slakteribedrifter.*

REINBEITEDISTRIKT	GJENNOMSNITTLIGE SLAKTEVEKTER KALV (kg)									
	05/06	*06/07*	*07/08*	*08/09*	*09/10*	*10/11*	*11/12*	*12/13*	*13/14*	*14/15*
18 - Voengelh-Njaarke	21,2	20,8	20,7	20,3	21,6	19,6	21,0	21,2	21,5	21,9
20 - Jillen-Njaarke	19,5	21,0	20,5	22,1	-[1]	21,7	21,8	21,6	-[1]	21,3
19 - Byrkije	21,0	21,7	21,6	22,0	21,2	20,1	20,3	19,0	21,9	21,9
21 - Røssåga/Toven/Syv Søstre	19,9	20,4	21,0	20,8	22,1	22,8	-[1]	-[1]	-[1]	22,5
23 - Hestmannen/Strandtindene	19,5	22,6	22,2	20,9	22,1	20,2	23,6	21,1	-[1]	23,6
22 - Ildgruben	22,1	23,8	22,8	22,6	22,8	21,6	20,8	21,2	22,9	22,4
24 - Saltfjellet	20,3	22,7	21,2	21,8	21,0	21,2	21,1	20,7	22,5	22,2
25 - Balvatn	22,8	23,4	23,5	22,1	-[1]	-[1]	-[1]	22,1	21,7	-[1]
26 - Duokta	20,1	19,7	20,7	22,9	20,3	22,3	21,7	23,2	23,5	-[1]
27 - Stajggo-Håbmer	23,9	21,8	22,4	22,4	-[1]	20,3	-[1]	23,0	23,8	-[1]
28 - Frostisen	-[1]	-[1]	-[1]	-[1]	-[1]	24,4	-[1]	25,9	22,9	-[1]
29 - Skjomen	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]
NORDLAND	**21,2**	**21,9**	**21,5**	**21,6**	**21,6**	**20,9**	**21,1**	**21,1**	**22,3**	**22,1**

Landbruksdirektoratet 2016

1 Det foreligger for få eller ingen slaktedyr til å si noe om gjennomsnittlig slaktevekt.

Reindeer meat processing

In the Jillen-Njaarke reindeer grazing district, a small-scale processing company, Brurskanken reindeer, has been established

Grazing zones and grazing times

The winter pastures on the coast are divided into 5 winter grazing zones with set grazing times, decision case 13/3, 04.03.03 in the Reindeer Husbandry Board. The purpose of the decision is to give the district a tool to manage the grazing resources the district has. Grazing times will also add guidelines to decrease the level of conflict with agriculture.

There is no plan for a detailed distribution of the winter pastures between the siida groups. However, this means that the utilization should take place on the basis of an appropriate use, depending on where the summer pastures are utilized. However, it must be notified in good time to the district board what plans the siida share has for utilization of the winter pastures.

If, on the other hand, there are factors such as major predatory game problems that indicate that a move is required, no obstacle shall be placed in the way of moving to the coastal pastures much earlier.

As of today, we see no reason to change grazing zones and grazing times, but would like to emphasize that exceeding grazing times within reasonable limits should not be regarded as

[25] The table is not possible to translate but the content describes the average slaughter weights for calfs the last 10 years in all districy within the County of Nordland

illegal grazing. However, the district will work for more appropriate grazing zones and flexible grazing times for the future.

Zones	Time	Area description
1, 3	15.12-15.04	The very outer parts of the winter pastures in the district, respectively in Brønnøy and Sømna municipalities.
2	15.12-15	Brønnøypeninsula with border east from Velfjorden to Ursfjord.
4	01.11-30.04	Inner Velfjord, as well as the areas towards Harrangsfjorden / Bindalsfjorden.
5	15.12-15.04	The outer parts of the northern part (Hundåla and Husvik area as well as Visten) of the district, including the islands outside ..
	01.01-31.12	The rest of the district

Fences, cabins and facilities

Marking and slaughtering facilities

East siida:

- Two stationary facilities: Sjåmoen and Jamtfjelldal.
- Four marking fences: Appfjellet, two in Geitingskaret, and Åkervikfjellet.

West siida:

- Two stationary facilities: Sarvejællan and Dempa.

Shepherds' huts

With regard to the western siida, the district has initiated a process to clarify ownership and use of former reindeer herding cabins.

Eastern siida: Four private shepherd cabins and a boathouse: Åsskardet Jamtvollan, Vesterbukta, Raudvatnet and Tvildal and boathouse in Vesterbukta. The district has no shepherd huts in the eastern side.

West siida: District cabins: Småvatnan, Stavassdalen and Melkebekken.

Shepherds' huts that belong to others

Eastern siida: There are two cabins in the district owned by previous siida owners. The district will try to take over these. If no agreement is reached on takeover, the cabins must be demolished / moved and the area cleared.

- Shepherd's cabin in Haustreisdalen: Owner Ole Martin Renberg.
- Shepherd's cabin in Sørbukta: Owner Sten Renberg.

Vestre siida: There are several shepherd cabins in the area, built by previous reindeer owners, for which ownership must be clarified. The district will, in the same way as in the eastern siida, try to take over these**.**

- Fjellskardet.

- Sørvassdalen.
- Melkebekken. Hytte.
- Krongelvatnet.
- Svanvatnet og på Okan,
- Stavassdalen.

Future need for fencing and shepherds' cabins

All facilities in the district are dilapidated and in poor condition. The district therefore believes that it is most appropriate that the fencing facilities are demolished and new facilities built in the following places:

East siida:

- Sjåmoen. The district is planning a new main facility for slaughter, separation and relocation. In connection with the fencing system, it is necessary to set up a shepherd's hut / rest and tool shed. The area is owned by Sigmund Kjemsås. Today, there is a lease agreement for annual rent. The district envisages a long-term agreement or an expropriation of leased land so that the area is included in a zoning plan for reindeer husbandry purposes.
- Jamtfjelldal. Need for new facilities for autumn slaughter.
- Calf marking fences on old markings, e.g. seaweed in Kjerringvatnet and in Tvildalen.

West siida:

- Lande. Unloading / loading fence for use during moving.
- Stavassdal. Need for new construction fence.
- Upper Gåsvatn. New calf marking fence. In connection with the fencing system, there is a need for a shepherd's hut.
- Fence Tosenveien, will be moved to a new appropriate location where new facilities will be built.
- Accommodation cabin in Måsskardet. Important to reduce bare ground
- driving in the national park.
- District cabin by Elgvidda.

Need for restoration, maintenance and cleanup

Bro Jamtvollan: This is destroyed by ice / snow and later taken by the river. The bridge has been used by the district and several hikers. A new bridge is desirable to replace the old one. The district has applied for and been granted funding for the bridge. The bridge was completed in the autumn of 2016.

Reindeer fences: The district needs to set up new calf marking fences on old marking sites, e.g. in Kjerringvatnet and in Tvildalen in the eastern siida and in Øvre Gåsvatn in the western siida. In addition, all work fences on both the east and west siidas must be upgraded and maintained.

Clean-up: In collaboration with Statskog and the National Park Board, the district will carry out a major clean-up of old fence sites and old reindeer husbandry cabins used by previous reindeer owners. Funding has been applied for through the Norwegian Directorate of Agriculture and the National Park Administration.

Office space and warehouse building

It is planned to establish a district office and warehouse building in the center of the district.

Interventions and disturbances - the district's own overview

Jillen-Njaarke reindeer grazing district extends over nine municipalities. This means that reindeer husbandry in the event of an intervention is exposed to (bit by bit policy), ie an individual case processing that does not take into account sum effects and the overall burden. The same applies to an extensive use of exemptions from adopted plans and legislation, e.g. when it comes to the construction of cabins and boathouses as well as motor traffic in open country.

Protection of reindeer husbandry areas (the natural basis for Sami culture) is a responsibility incumbent on the authorities at all levels. In order to achieve this responsibility, the sum effects and strain on reindeer husbandry should be emphasized when planning interventions.

Below is an overview of interventions and disturbances that are negative for reindeer husbandry:

Hydropower development

- Røsvassregulera - Vefsnoverføringa
- Potholder / Dog eel reed regulation
- Tettingsvatnet / Langfjorden
- Dam at Nedre-Sæterstivatnet, the drinking water reservoir in Brønnøy.
- Mini power plant

The first and largest hydropower development took place as early as the 1950s with the Røsvass regulation and later the Vefsn transfer in the 1960s. In this connection, the construction road to Gluggvatnet was built. The development led to climatic changes in that shutters from open water settle like frost on the ground before the snow comes. Bad ice with cracks can cause reindeer to get caught in the ice.

The Hundålvass regulation creates uncertain ice and makes it difficult to move across the lake. In the event of a further dam, there is a danger that spring / early summer land towards Sørvassdalen may be lost.

Dam at Tettingsvatnet / Langfjord power plant. With this dam, it led to a more difficult relocation route.

Dam at Nedre-Sæterstivatnet, the drinking water reservoir in Brønnøy.One of two moving berths from Sæterstifjellet and westwards. Uncertain ice conditions combined with the topography around the lake contribute to difficulties in moving reindeer.

As a result of investing in "renewable energy" through mini-power plants, there is a massive interest in the development of small and medium-sized mountain rivers and streams. This gives the district extra work with both inspections and statements. We experience that even though reindeer husbandry has been involved in inspections and planning, there may still be unforeseen consequences that we are unable to anticipate. In the event of a development, there will be disturbances in the grazing area during the construction period and seizure of grazing areas, which makes it difficult to move reindeer in several grazing areas.

The sum of all such power plants can have a major negative impact on the total utilization of the grazing area.

Wind power development

- Reinfjellet. Planned development that will give the district direct grazing loss. We have opposed a development here, and NVE has refused the license. However, the developer has appealed the refusal and the final decision in the case lies with the Ministry of Petroleum and Energy.
- Øyfjellet. NVE has granted a license. The district is in dialogue with the developers, and an agreement is being worked on. The final decision lies with the Ministry of Petroleum and Energy.

Reinfjellet is a central grazing area for reindeer husbandry throughout the operating year. In the month of May, reindeer calving takes place along the entire Reinfjellet. Otherwise, the district uses the area for autumn and early winter grazing. Reinfjellet is an important collection area for reindeer husbandry. The district can not accept wind power development here.

Øyfjellet wind farm is located in the northern part of the district. A development of the scope planned will contribute to the area not being used for reindeer husbandry.

Power lines

- Mosjøline from Røssåga power station over Storbakken - Almdals fjellet, down in Almdalen to Herringen and over to Mosjøen. This was built in connection with the regulation of Røssvatnet in 1957.
- Tunnsjøline from Nedre Røssåga power station. It has a route that enters Jillen-Njaarke by Fustvatn, to Marka, the east side of Reinfjellet, along Granefjellet and over Vefsna. Built in 1968.
- New Tunnsjøl line from Nedre Røssåga power station with a route over Tverrberget to Herringbotnfjellet, further north towards / and under Brurskanken, past Holmvatnet in Haustreisdalen, from here parallel to the old line along Granefjellet and over Vefsna. Built last in the 1970s. The license deals with upgrading from 300 to 420 kv voltage level.
- Vevelstad to Tilrem, new power supply for Sør-Helgeland. Completed now in 2016.
- Tosbotn - Lande. Completed in 2016.

Recent research shows that interference from power lines is far greater than previously thought. The avoidance area for reindeer is larger along the power lines, which means lost grazing area (Tyler, N.J.C et al. 2014).

Mineral extraction / mining

- Brønnøy lime, open pit Akselberg on the border between winter grazing zones 2 and 4. Ursfjord and Velfjord affect the migration route.
- Forbergskog - Lislremman. Shipment port that causes relatively large disturbances and affects important moving routs and the winter grazing area in Brønnøy.
- The district is aware that Brønnøy lime is looking at the possibility of expanding its activity, but per. today we do not know of any concrete plans. Any expansion here will affect the district's grazing area.

Agriculture and forestry

Agriculture

The winter grazing areas along the coast have been exposed to massive new cultivation, which has meant that reindeer husbandry has lost large areas. This was related to the policy in the mid-1970s, where agriculture improved its framework conditions, e.g. with increased subsidies for new cultivation. Interventions in grazing areas, such as digging bogs for new cultivation, are activities where reindeer husbandry has had a limited impact.

Additional industries have gradually been added to agriculture, e.g. deer breeding, which entails fencing of large grazing areas as well as blocking of moving and traction paths.

Forestry

Intensive forestry in the district has destroyed large parts of the winter grazing reserves through the removal of old-growth forest types with rich lichen growth. The clear-cutting means that previously sheltered forest pastures are opened up. The forests also have good early spring / summer pastures as it becomes snowy and green early here.

Forest road construction. Provides generally good accessibility to outfields with consequent increased activity and disturbance.

Recreational buildings

- Camping and caravan site at Sjåmoen.
- •Sjøanlegget - an area with a massive development of ski resorts / alpine resorts, etc. which together provide a major intervention in an area where reindeer husbandry has had a separation and slaughter fence for many years.
- Gluggvatnet cabin field, Grane municipality.
- Storvatnet cabin field, Hattfjelldal municipality
- Storvatnet in Velfjord
- Scattered cottage settlements in the district.

The problem with cabins and the facilitation of new cabin fields as well as camping and caravan pitches is that these generate increased traffic and disturbances not only in the immediate area, but also in the immediate mountain and outback areas. Large concentrations of humans mean that the reindeer react with grazing deviation, ie it moves away from good grazing areas. The reindeer loses energy during a stressful escape and has less time for grazing.

In the case of cabin construction and other facilities within the reindeer husbandry area, it is important that the district is consulted early in the process.

Traffic and outdoor life

Reference is made to section 65 of the Reindeer Husbandry Act. Traffic in areas where reindeer graze.

Events and arrangements for traffic and outdoor life in the district:

- Ski / ski resort at Sjåmoen. There is a trail network for dog sledding right next to the fence facility at Sjåmoen.
- Sjøbergmarsjen, newly established from 1984, first week in August.Organized traffic with marked tourist trails, i.a. Sjøbergmarsjen, a memorial march that runs from Austerfjorden to Eiterådalen through the collection area for reindeer in the Visten area.
- Exercise and other organized activities.
- Small game hunting and training of hunting dogs. The district has a good dialogue with Statskog when it comes to areas for training hunting dogs and in relation to e.g. delayed hunting start when gathering reindeer for autumn slaughter. Small game hunting takes place all over the district and can lead to disturbances during the mating season, especially when the hunt takes place with a dog. May lead to delay in mating, see section 2.8.2.

Roads and railroads

- NSB. The railway follows the Svenningdal and Vefsnadal lines and divides the district lengthwise. Blocks moving and traction tracks between seasonal pastures on the section Grane - Mosjøen.
- Loss of grazing area along the railway.
- E6 on the east side of Vefsna.

Due to many collisions on the railway, Jernbaneverket wants the reindeer herd to be moved earlier to winter grazing on the coast. This proposal, which intervenes in the utilization of grazing areas, is not compatible with traditional Sami grazing management. Such a move could also contribute to an intensified conflict in the winter grazing area where there is a lot of cultivated land.

Movement and the reindeer's natural features:

Likewise, moving to spring pasture in the western side will be a challenge. In the spring, there may still be snow in the spring grazing areas, while there is bare ground in the lowlands. Then the reindeer pull down into the valley floor where the railway also goes to find better pastures.

We try to herd the reindeer to prevent small flocks from getting on the railway track. Nevertheless, there are reindeer collisions on the railway, which we are unable to prevent. This is because the reindeer follow their natural migration routes. When the reindeer arrive on the railway track where there is less snow, they stop to rest and to graze in the ditch edge by the track.

Primary solution:

The reindeer grazing district has had large losses of reindeer due to collisions with trains on the Nordlandsbanen line. We are in dialogue with the authorities and the railway authority to set up barrier fences along the Nordland line. The section in the reindeer grazing district where most reindeer have been hit and killed is the railway section Laksfors tunnel to Mosjøen. If we put in place a barrier fence on this section of the Nordlandsbanen, the loss figures for reindeer killed by trains in Jillen-Njaarke rbd. reduced considerably.

Improvement of E6, Brattås –Lien:

The reindeer grazing district has had a good dialogue with Veivesenet to facilitate so that the relocation area for reindeer will remain, so that the reindeer herds can also be moved in the traditional way between the eastern and western sides in the future.

During the same meetings, Jernbaneverket has also participated, and an agreement has been reached between the Reindeer Grazing District and Jernbaneverket on measures to prevent reindeer collisions in the Brattås - Lien area.

Motorized traffic in open country

As of this year, it has been decided to open a trail network for recreational driving with snowmobiles in Hemnes, Hattfjelldal, Grane and Vefsn municipalities. The district has been in dialogue with the respective municipalities during the case processing, and the municipalities have taken into account the views that the district has expressed with regard to the opening and closing of the trail network as well as the choice of routes.

The district is of the opinion that even with scooter trails, not all illegal driving will cease. From the reindeer husbandry side, it is important that funds are set aside for monitoring traffic.
The district considers itself to have too little experience to make any assessment of the creation of the scooter trails in the district.

Predatory game damage and loss prevention measures

Jillen-Njaarke reindeer grazing district has lynx, wolverine and eagle within its grazing area. In addition, bears and wolves have also been observed in the district. There is no doubt that much of the meat production is lost due to protected predators.

The management plan for predatory game in Nordland is now under revision. There is a clear distinction between grazing animals and predators, which the Jillen-Njaarke reindeer grazing district sees as an impossibility. This will lead to an increased problem between the reindeer husbandry industry and the administration.

Central authorities want to resolve this conflict through increased use of preventive measures. Today's measures are largely related to spring and calving time and do not cover the losses that the district has for the rest of the reindeer husbandry year. Future measures must be adapted to the individual reindeer grazing district. And must also to a greater extent have an equal burden distribution between the districts so that breeding of predators is distributed throughout the reindeer grazing area.

Motor traffic in the reindeer grazing district

The reindeer husbandry industry's permit for the use of motor vehicles / vessels in open country is authorized in the exemption provisions in the Motor Traffic Act and in section 23 of the Reindeer Husbandry Act.

The district is dependent on the use of motorized vehicles in its operation. Snowmobiles, motor boats, open-field vehicles, motorcycles / ATVs and helicopters are used.

Snowmobiles are used on snow-covered ground in all parts of the district where it is drivable, also in protected areas. Each siida share has several snowmobiles divided into owner and reindeer owners associated with the siida share. There can be several snowmobiles in use at the same time. If necessary, help is also hired during busy periods.

As of today, each siida share has the opportunity to issue a driving license to those who are engaged in reindeer husbandry work. In addition, the driving licenses must be certified by the district chairman / leader. During carpooling or driving with a reindeer owner from the district, a driving license is not required.

ATVs are mostly used for transporting fence material or other equipment and possibly food reindeer, etc., but can also be used during collection / moving and herding of reindeer, also in protected areas.

It is first and foremost the reindeer owners associated with a siida share that use ATVs and motorcycles. If there are others who drive on assignment for a siida share, these will have issued a driving license signed by the siida share manager and certified by the district chairman / leader.

Motorboat is used for fishing.

Helicopters are used as needed, especially in connection with the autumn and spring gatherings. Occasionally also when gathering for calf marking.

To avoid unnecessary wear and tear in the terrain, driving is limited to what is most necessary. Several driving routes have been established within the district. These are written

down on the district's land use map and are described in a separate table, see sections 8.2 and 8.3.

Use of off-road vehicles, also in protected areas

Reindeer Husbandry Act §62, 2 paragraph point 3:

"Rules of use for off-road vehicles shall also be stated in the plan"

Reindeer Husbandry Act §23, 2nd paragraph:

"Use of off-road vehicles shall be limited as much as possible, and shall as far as possible take place along fixed tracks"

Main routes for off-road driving

In the Jillen-Njaarke reindeer grazing district, off-road vehicles are used for transport and passenger transport along the following routes:

Route	Description	Time period	Comments
	East siida*		
1	From Åkervika, - Åkervikfjellet	01.05-31.12	Fixed installations, relocation / marking
2	Vesterbukt – Durriesjohka Grunntjønna - Geittindskardet	01.05-31.12	Fixed installations, relocation / marking
3	Vesterbukt - Jamtvollan	01.05-31.12	Fixed installations,
4	Vesterbukt - Raudvatnet	01.05-31.12	Fixed installations,
5	Tvildal - Appfjell	01.05-31.12	Fixed installations, relocation / marking
6	Svartvassgården-Storvatnet	01.05-31.12	Fixed installations, relocation / marking, transports
	West Siida*		
7	Grottekiosken - Øvre Gåsvatn	01.05-31.12	Fixed installations,
8	Dempa - Svenningskardet	01.05-31.12	Fixed installations,
9	Stavassgården-Feitskardet/Langskardet	01.05-31.12	Fixed installations,
10	Eiterådalen - Måsskardet	01.05-31.12	Fixed installations,

* Based on future operations, there may be a need to add new routes, especially in the western side, but also in the eastern side when picking up previous marker fences / pliers.

However, there will be driving outside these routes if there is a need for it during natural reindeer husbandry work.

Main routes for reindeer husbandry work - protected areas included

Within the Jillen-Njaarke reindeer grazing district, off-road vehicles are used for gathering, moving and edge herding in connection with marking and slaughter in the area listed below. Helicopters will also be used for reindeer collection if needed.

It is difficult to determine the main routes for herding / gathering the reindeer in the district. During practical reindeer husbandry work, quick decisions must most often be made during the work. Reference is therefore made to the chapter on grazing, section 2.

Area	Description	Time period	Comments
1.	Jillen-Njaarke grazing district	01.01-31.12	The whole district

Protected areas

In the resource accounts for reindeer husbandry, the area of the Jillen-Njaarke reindeer grazing district is stated as 4162 km2. Within this area, a national park, one landscape conservation area and 17 nature reserves have been established, occupying 1226.5 km2 approx. 29.8% of the district's area.

Reindeer husbandry is an area-intensive industry that depends on all the grazing areas in the district in order to operate an economically, ecologically and culturally sustainable reindeer husbandry. In the western part, the national park and the Straumen landscape conservation area coincide with the reindeer husbandry's most central grazing areas. As there has been a good dialogue between the administrative authorities and reindeer husbandry, the protection provisions do not particularly impede reindeer husbandry. This also applies to the Strengivatnet nature reserve. In many protected areas, however, the regulations place restrictions on the use of reindeer husbandry in that a grazing permit must be applied for, and that motorized traffic is prohibited both with snowmobiles and especially bare ground vehicles. The positive thing about a protected area is that they are not exposed to major physical interventions such as power development or mining.

The district relates to the conservation intentions and is in favor of good co-operation with the administrative authorities so that the regulations now and in the future will not place restrictions on the reindeer husbandry's daily activities. Routes and driving with open-field vehicles will be described in the district's rules of use and district plan in accordance with the Reindeer Husbandry Act.

Overview of protected areas in the district

Administrative authority: Lomsdal / Visten National Park Board.

Municipality	Protected area	Link	Area km^2
Brønnøy, Vevelstad, Vefsn, Grane	Lomsdal/Visten nationalpark	https://lovdata.no/dokument/MV/forskrift/2009-05-29-553?q-lomsdal	1102
Vevelstad	Straumen landskapsvernområde	https://lovdata.no/dokument/MV/forskrift/2009-05-29-552?q=straumen	32,4

Administrative authority: The county governor of Nordland.

Municipality	Protected area	Link	Area km^2

Grane	Fisklausvatnet nature reserve	http://faktaark.naturbase.no/vern?id=vv00000129	38,5
	Raudvassåsen nature reserve	https://lovdata.no/dokument/MV/forskrift/2011-02-25-22	24,5
Bindal	Eidsvatnet nature reserve	http://faktaark.naturbase.no/vern?id=vv00000259	19.1
	Reppen nature reserve	http://faktaark.naturbase.no/vern?id=vv00000210	0,21
Bindal/Brønnøy	Votnmyra nature reserve	http://faktaark.naturbase.no/veern?id=vv00000175	0,6
Brønnøy	Strengivatnet nature reserve	http://faktaark.naturbase.no/vern?id=vv00002489	2,2
	Mosaksla nature reserve	http://lovdata.no/dokument/MV/forskrift/2000-12-15-1469?q=Mosaksla	0,3
	Storhaugen nature reserve	http://faktaark.naturbase.no/vern?id=vv00000227	0,2
	Grønlidalen nature reserve	http://faktaark.naturbase.no/vern?id=vv00000226	0,5
	Bøpøla nature reserve	https://lovdata.no/dokument/MV/forskrift/1997-12-19-1374?q=Bøpøla	0,2
Sømna	Gjerdevatnet nature reserve	http://faktaark.naturbase.no/vern?id=vv00000156	0,2
	Teisdalen nature reserve	https://lovdata.no/dokument/MV/forskrift/2000-12-15-1468?q=Teisdalen	0,2
	Amundgjerdslia nature reserve	http://faktaark.naturbase.no/vern?id=vv00000181	0,08
	Skårfjellet nature reserve	http://faktaark.naturbase,no/vern?id=vv00000209	0,4
Vefsn	Herringbotn nature reserve	https://lovdata.no/dokument/MV/forskrift/1983-12-16-2002	2,0
	Andås nature reserve	http://faktaark.naturbase.no/vern?id=vv00000183	0,05
Hattfjelldal, Grane	Salomonbergan nature reserve	http://faktaark.naturbase.no/vern?id=vv00003162	2,8

Relationship to adjacent reindeer husbandry.

To the north, Jillen-Njaarke borders the Røssåga / Toven reindeer grazing district, to the eastByrkije reindeer grazing district and in the south towards Voengelh-Njaarke reindeer grazing district.

Challenges

There is no natural border with Røssåga / Toven in the north and Voengel Njaarke in the south, so that mixing of herds during summer and autumn occurs. Reindeer herding takes place in the autumn, before and after heat when the flocks are gathered for slaughter or before Christmas when the flocks are moved to the coast for winter grazing.

Revision and decision of the district plan

The district plan is revised and approved by the district board every 5 years. However, the plan can be revised more often if special considerations or needs should indicate that this is necessary.

Cf. Reindeer Husbandry Act § 62, 4th paragraph:
Municipalities, county municipalities and county governors should be informed about the planning work and be made aware of the main content of the plan before it is adopted.

Municipalities, county municipalities and county governors as well as affected neighboring districts shall be sent the adopted plan.

Special tasks in relation to land management

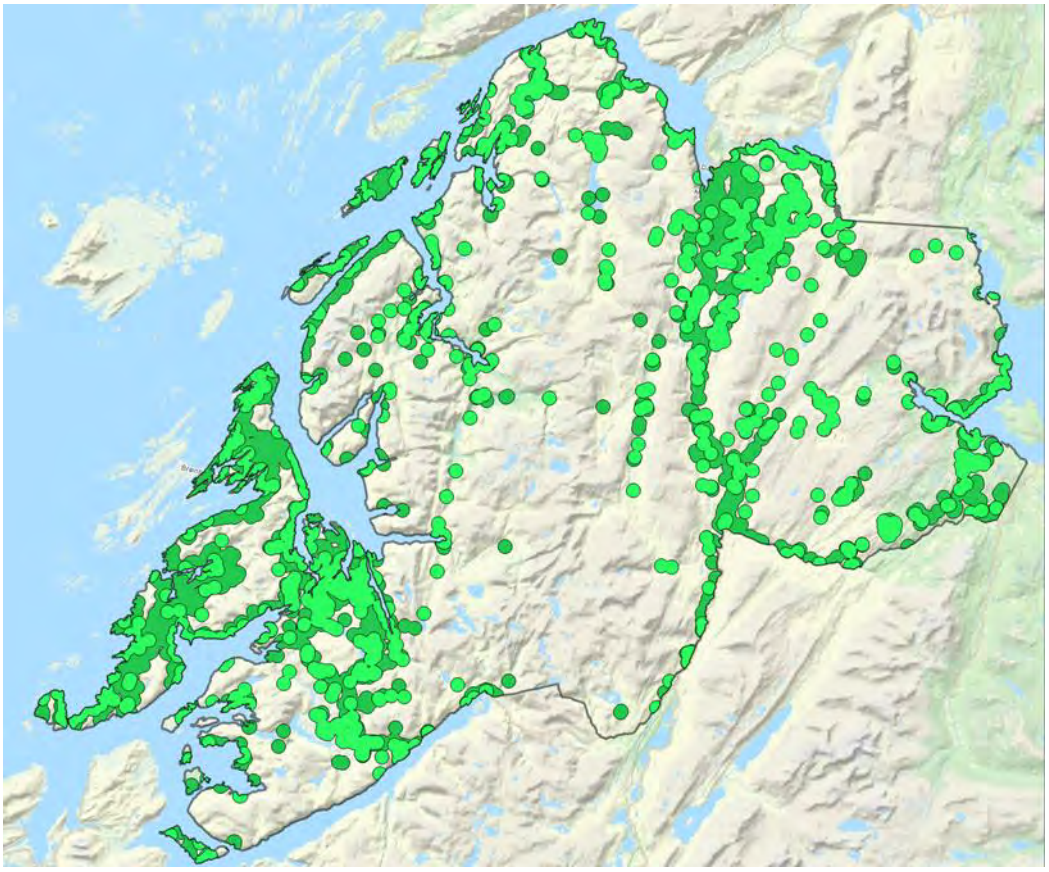
The administrative tasks are handled by the board of the reindeer grazing district. In relation to area issues, the work consists of, among other things:

- Case and board processing, preparation of consultation statements and conduct of meetings in connection with. individual cases within affected municipalities and in relation to the county governor, the Norwegian Directorate of Agriculture and other authorities
- Review and case processing of area sub-plans and municipal plans
- Meetings and inspections with i.a. municipalities, the Sami Parliament, commercial actors, impact assessors and others in land matters
- Preparation and conduct of court cases and hearings on land issues
- Establishment of protected work schemes in relation to infield and train
- Other administrative tasks.

The pressure on reindeer husbandry areas has been increasing in recent years, and has increased the board's administrative tasks within land management. Today, the district does not have sufficient finances to ensure administrative capacity to follow up on all new and old cases involving land encroachment and its consequences.

Cumulative analysis of land encroachment - secondary objects

The pictures below show the current intervention situation for Jillen-Njaarke sijte, sorted by different types of intervention.



Picture1: Dwellings with attached buildings (dark green) and holiday homes (light green), 750m impact zone.

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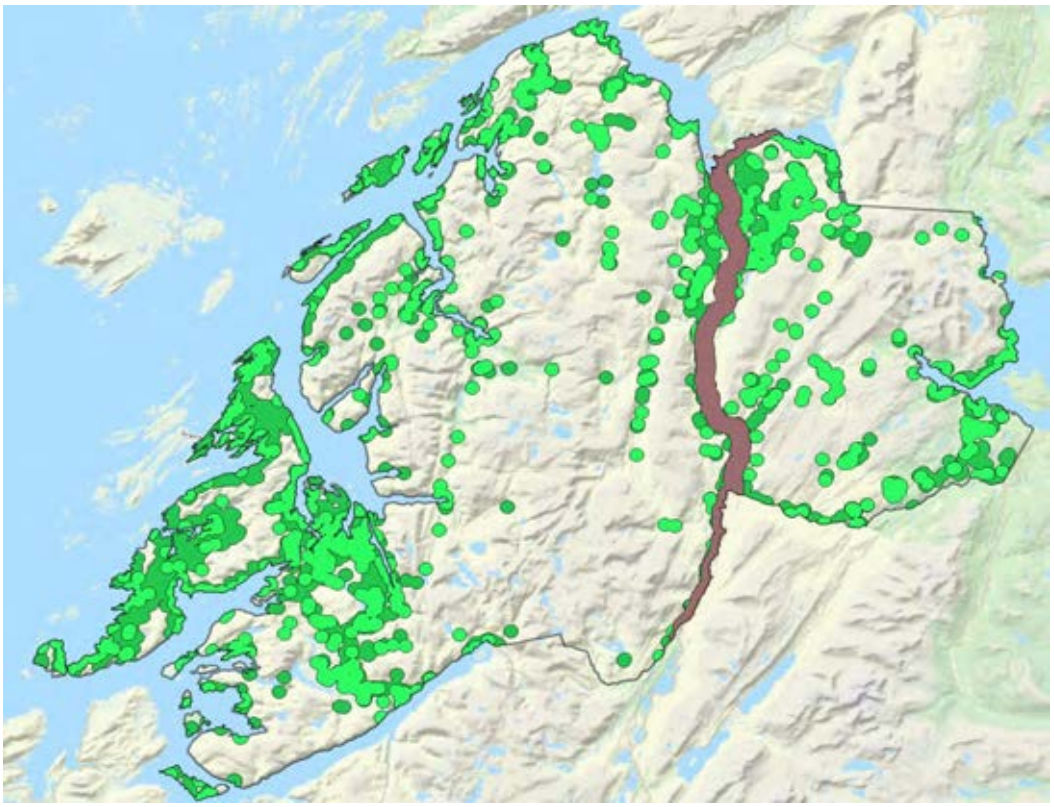
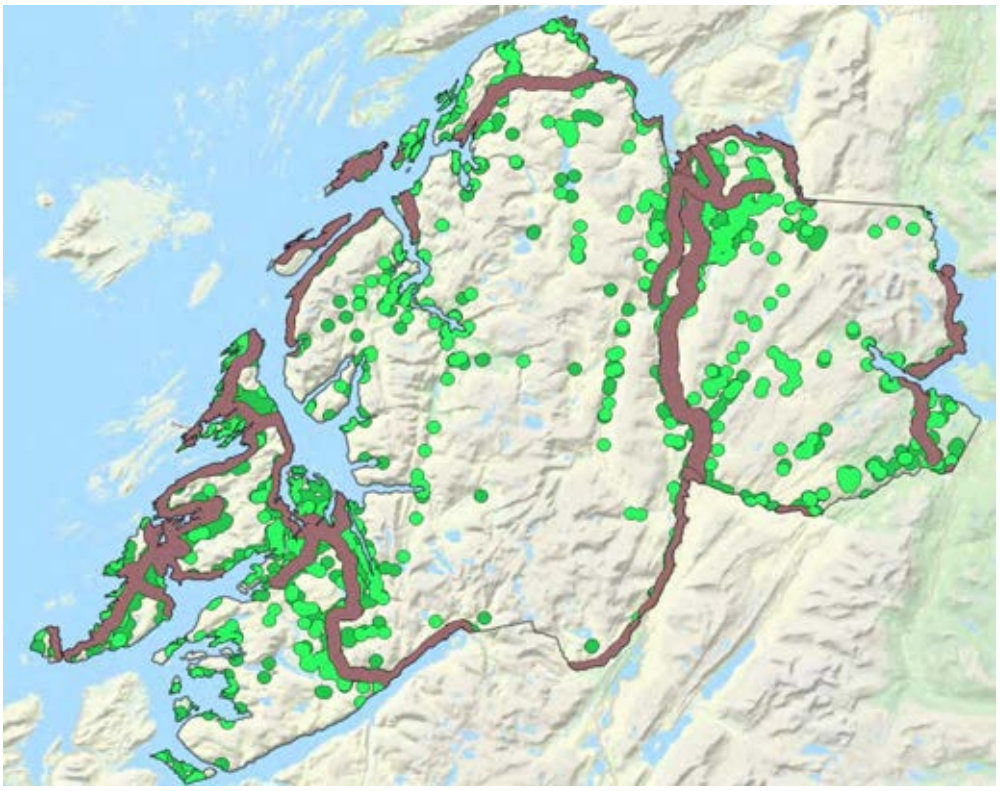
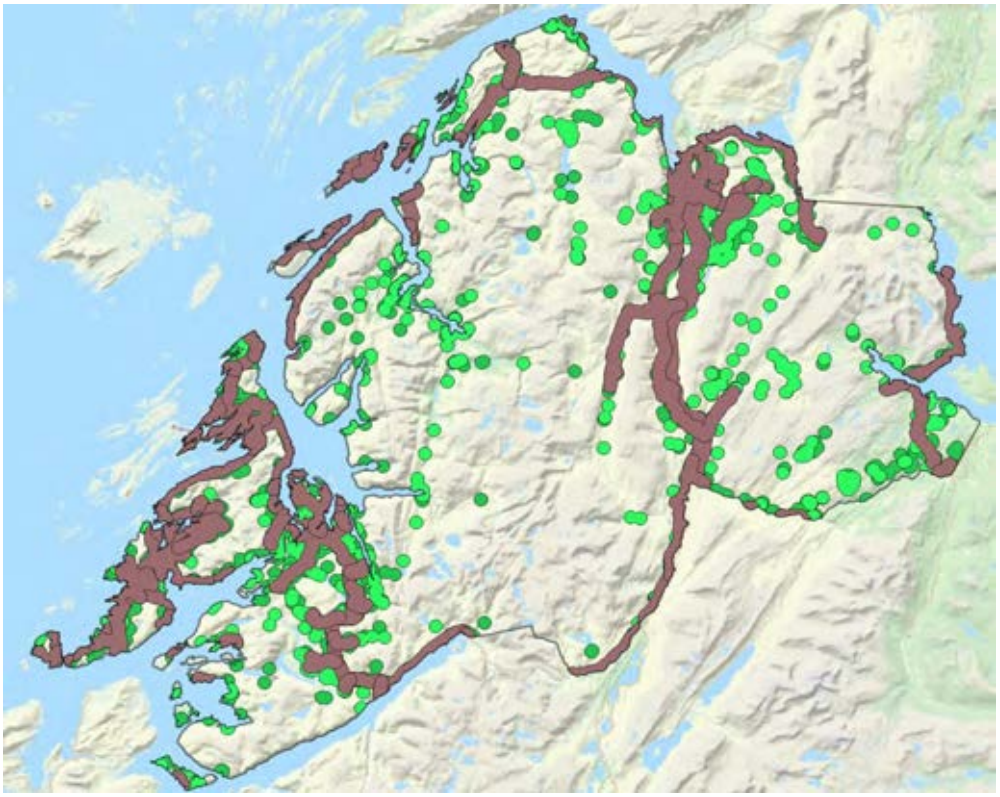


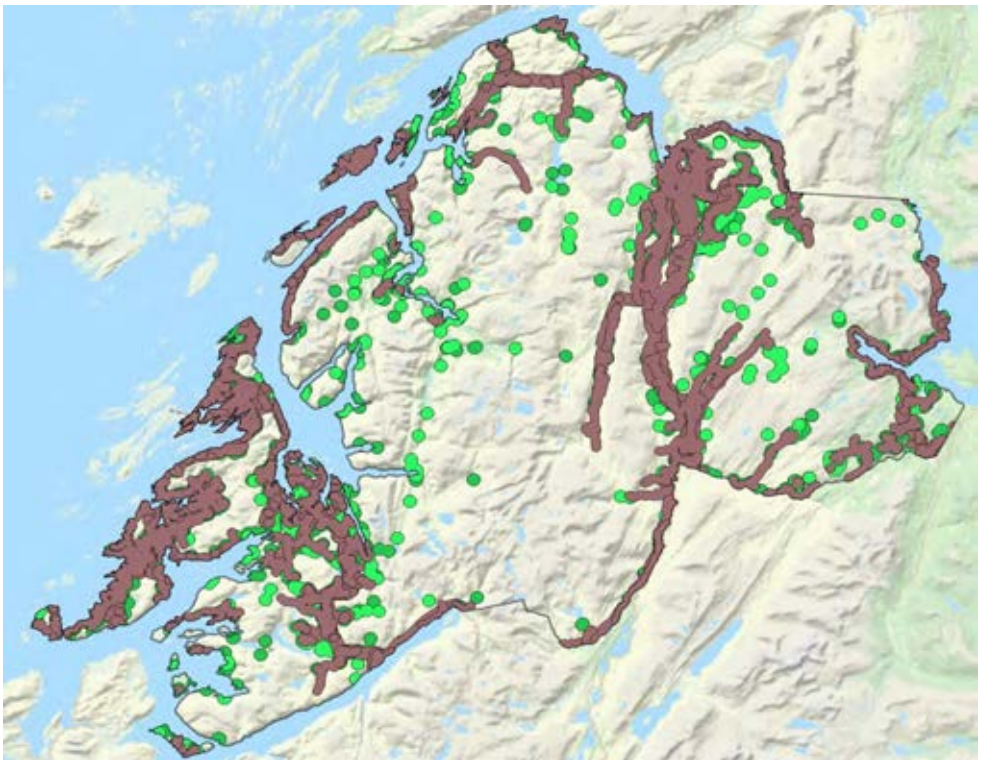
Picture 2: Impact from E6, up to 1000m zone. Source: Protect Sápmi.



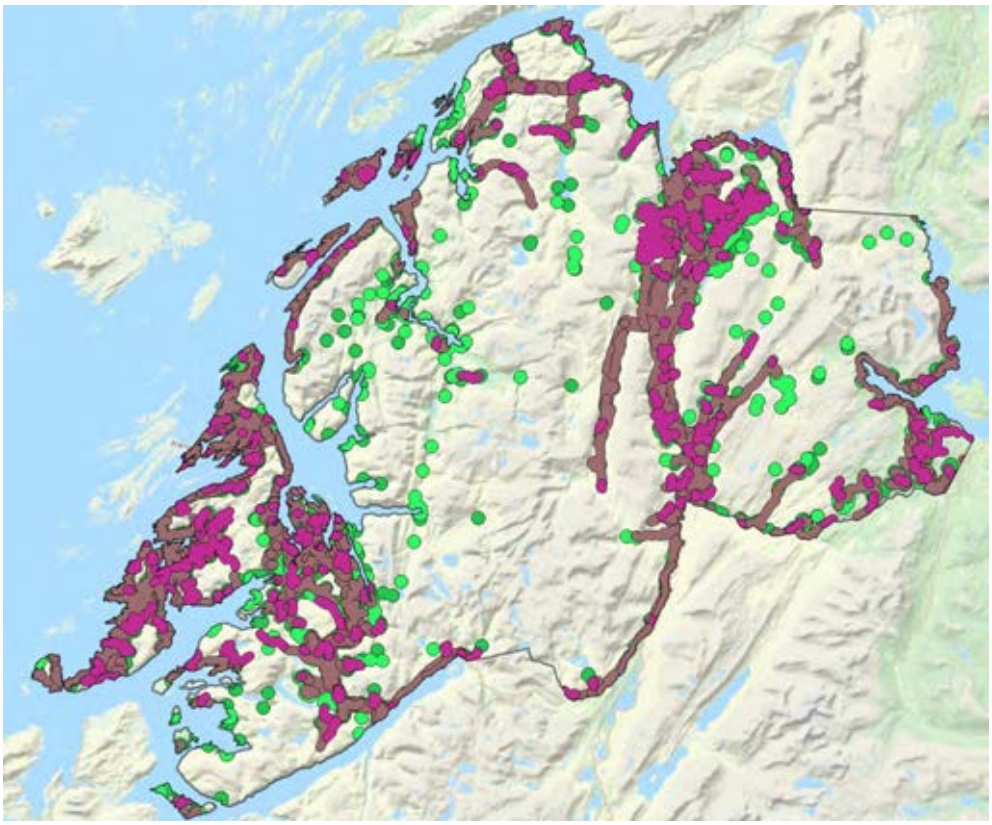
Picture 3: Although most county roads have less traffic than E6, they have a distribution value and affect grazing patterns in reindeer, 750m avoidance zone. Source: Protect Sápmi.



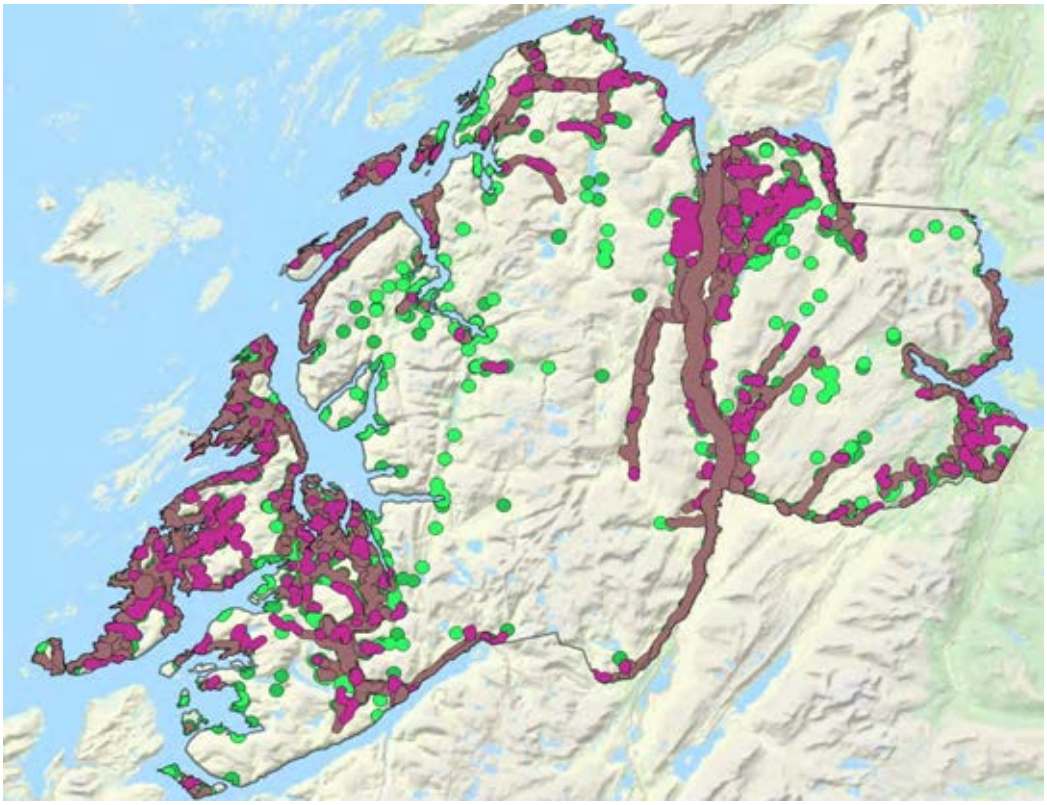
Picture 4: Municipal roads are often parallel to national or county roads and contribute to larger barriers, 750 m avoidance zone. Source: Protect Sápmi.



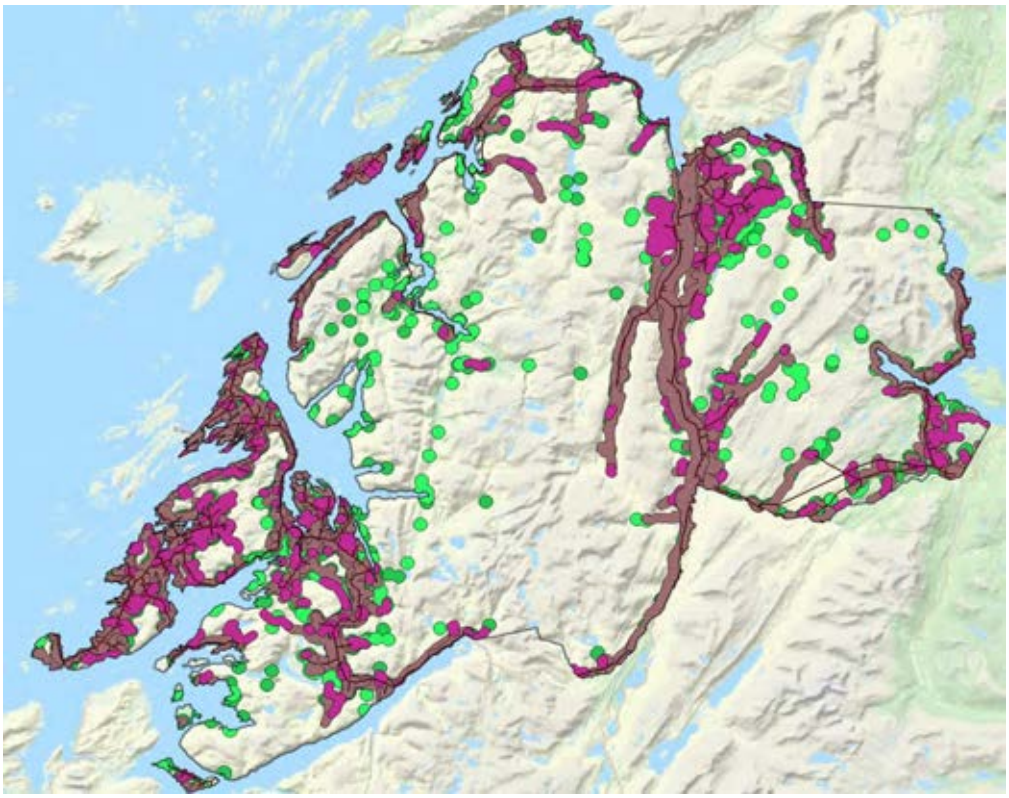
Picture 5: Private roads are smaller, but often the first roads into non-invasive areas. Impact zone 500 m. Source: Protect Sápmi.



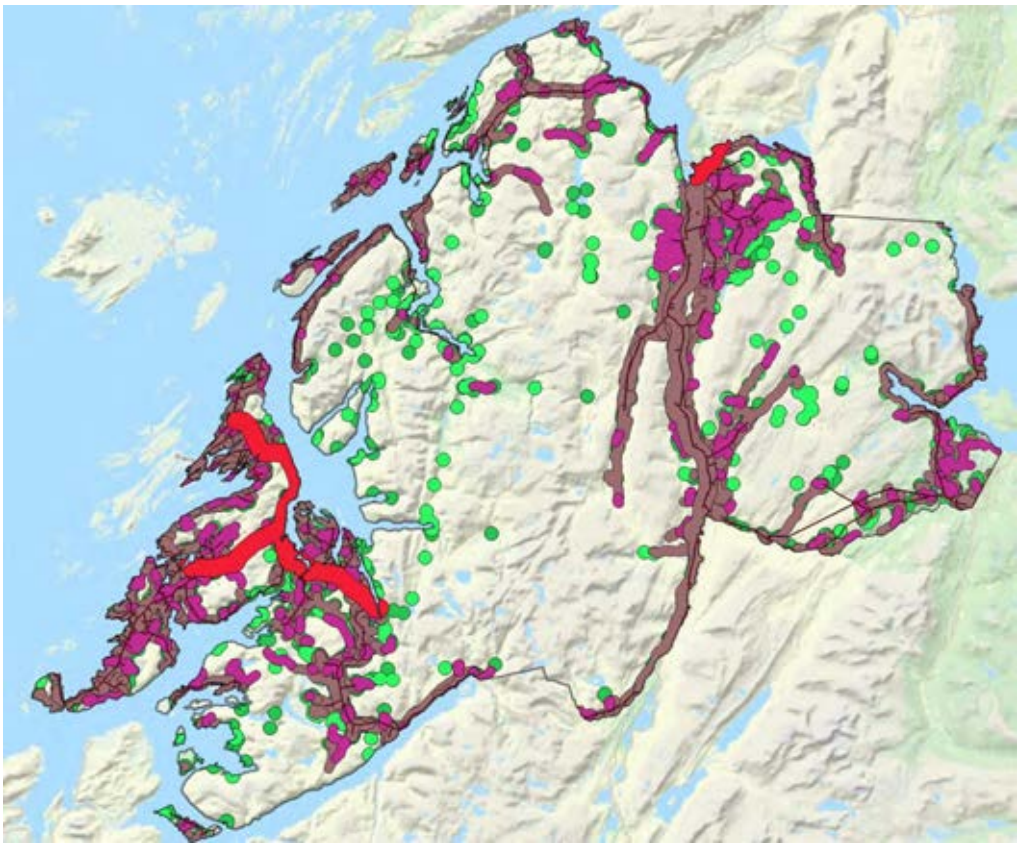
Picture 6: Cross country trails are rising sharply in number. Trails are often used with dogs, which are scary for reindeer. Zone 500 m. Source: Protect Sápmi.



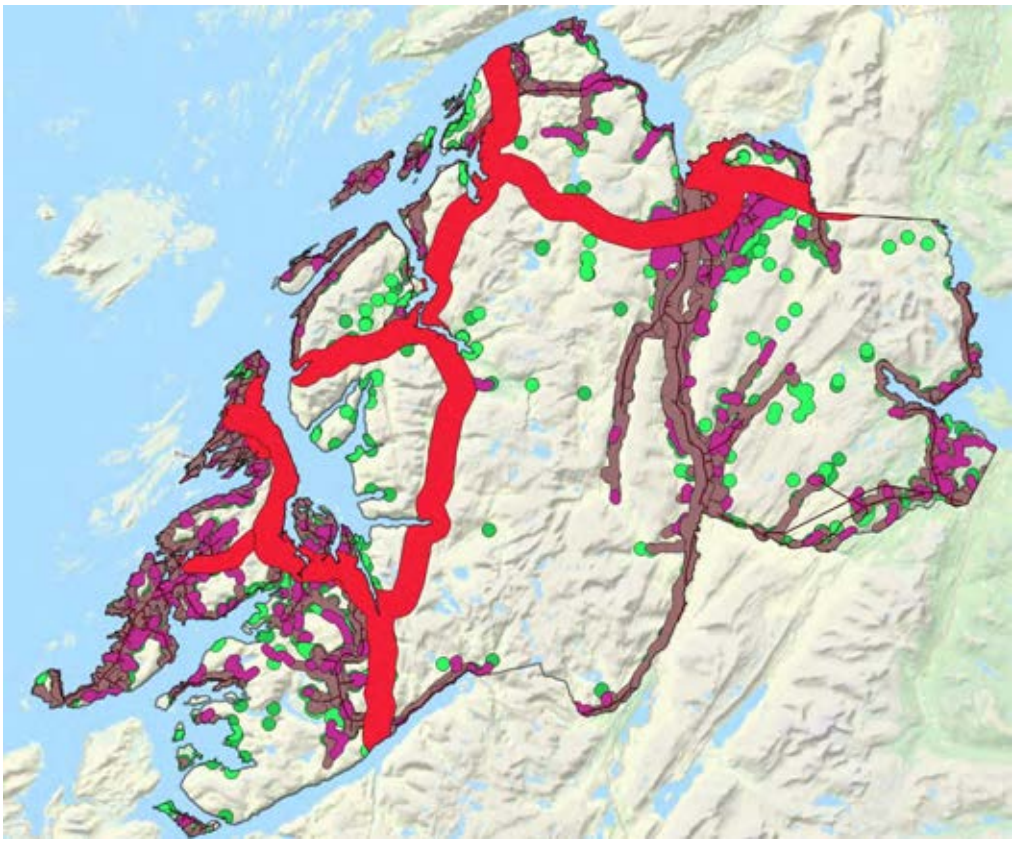
Picture 7: The railway runs parallel to the E6 and creates large barriers in places that pose a danger to both people and animals. Influence Zone 1000 m. Source: Protect Sápm



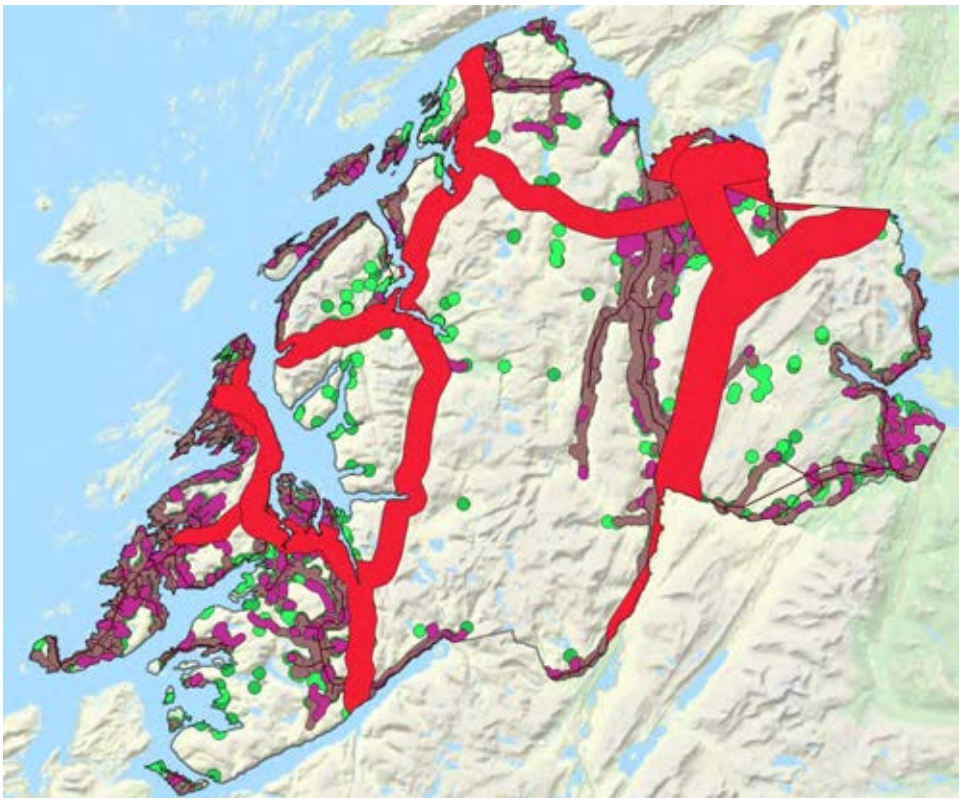
Picture 8: Black lines show 22 kV power line. 50 m impact zone. Source: Protect Sápmi.



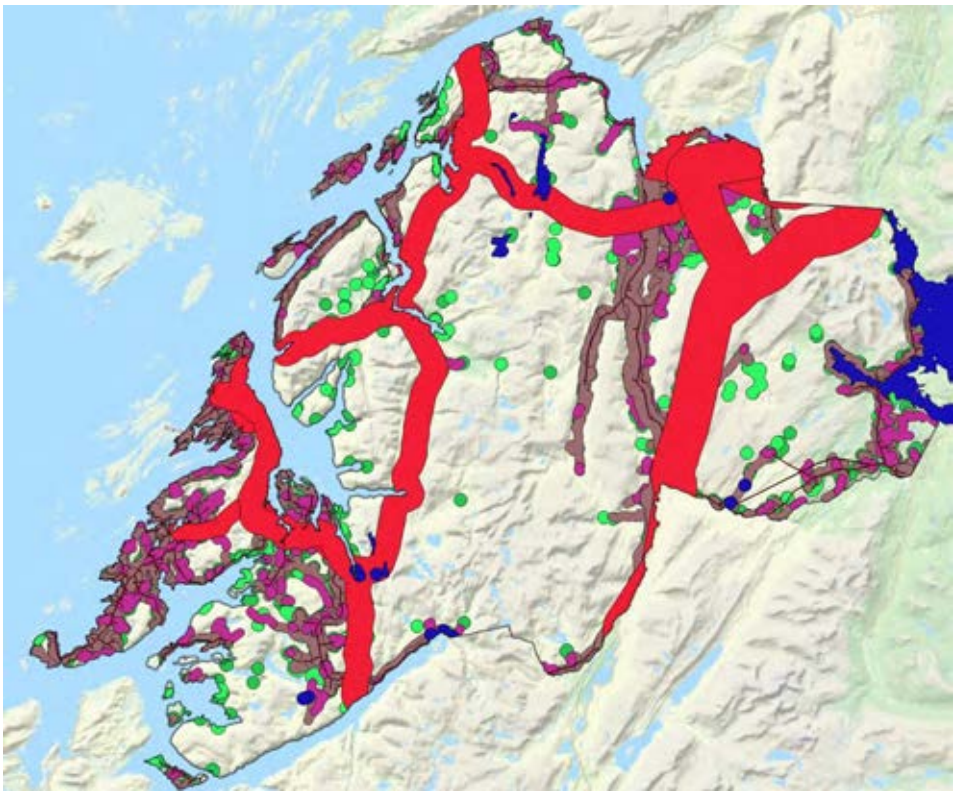
Picture 9: Red shows 66 kV power line. 1000m impact zone. Source: Protect Sápmi.



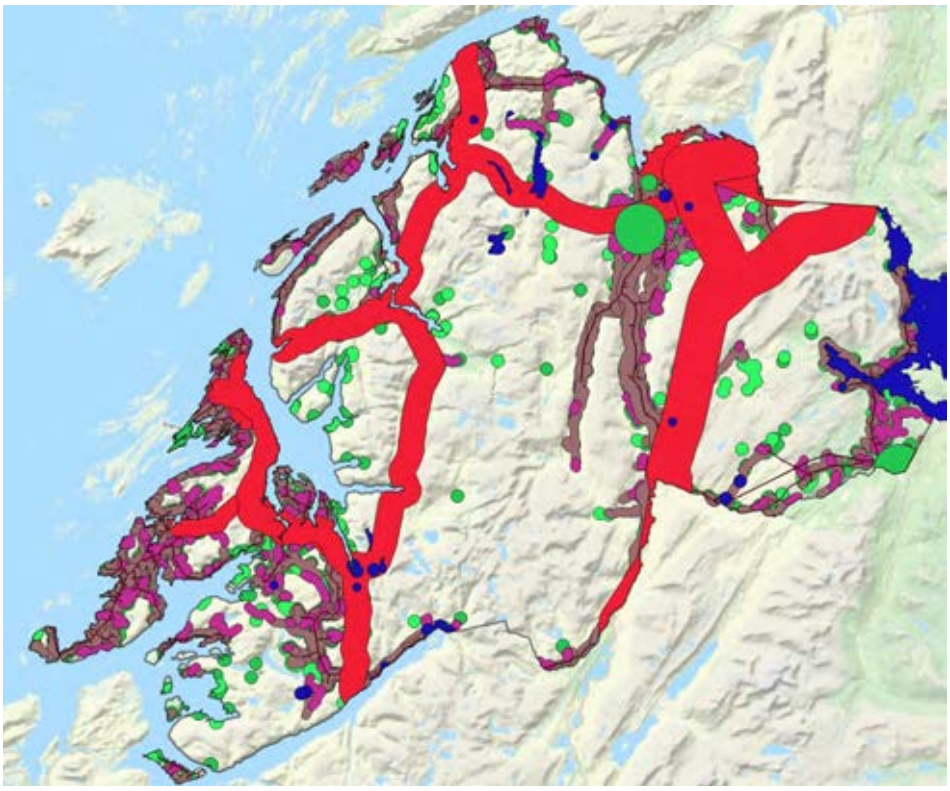
Picture 10: 132 kV power line. 1500m impact zone. Large lines require larger tools, often in the form of a helicopter for maintenance. Source: Protect Sápmi.



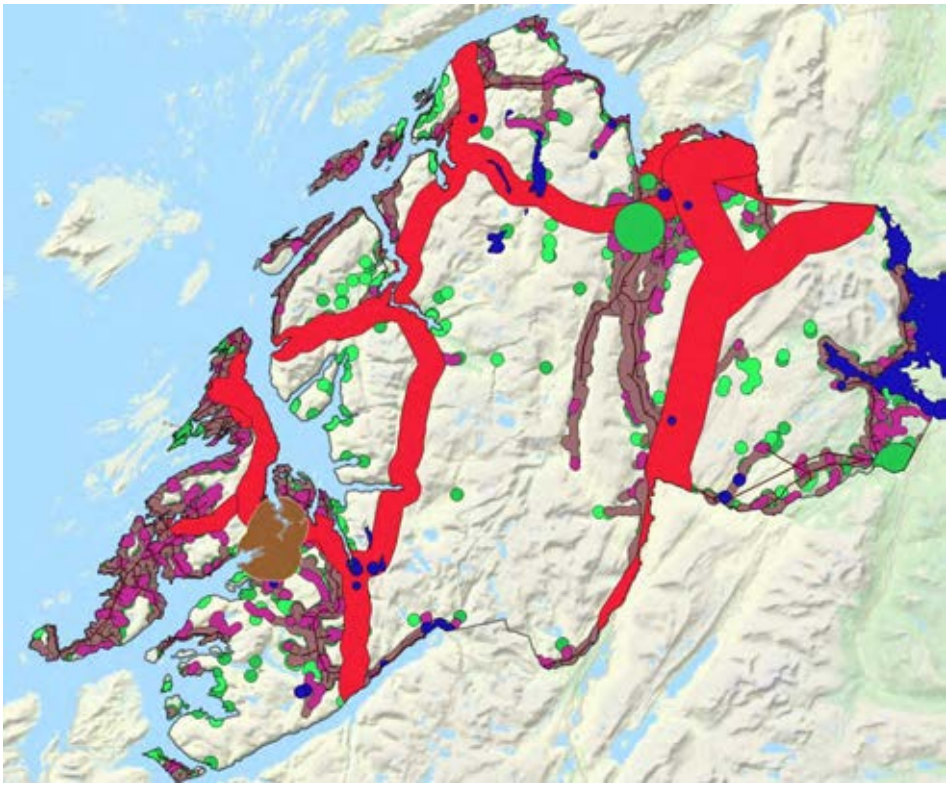
Picture 11: 420 kV power lines. 2500m impact zone during operating period. Source: Protect Sápmi.



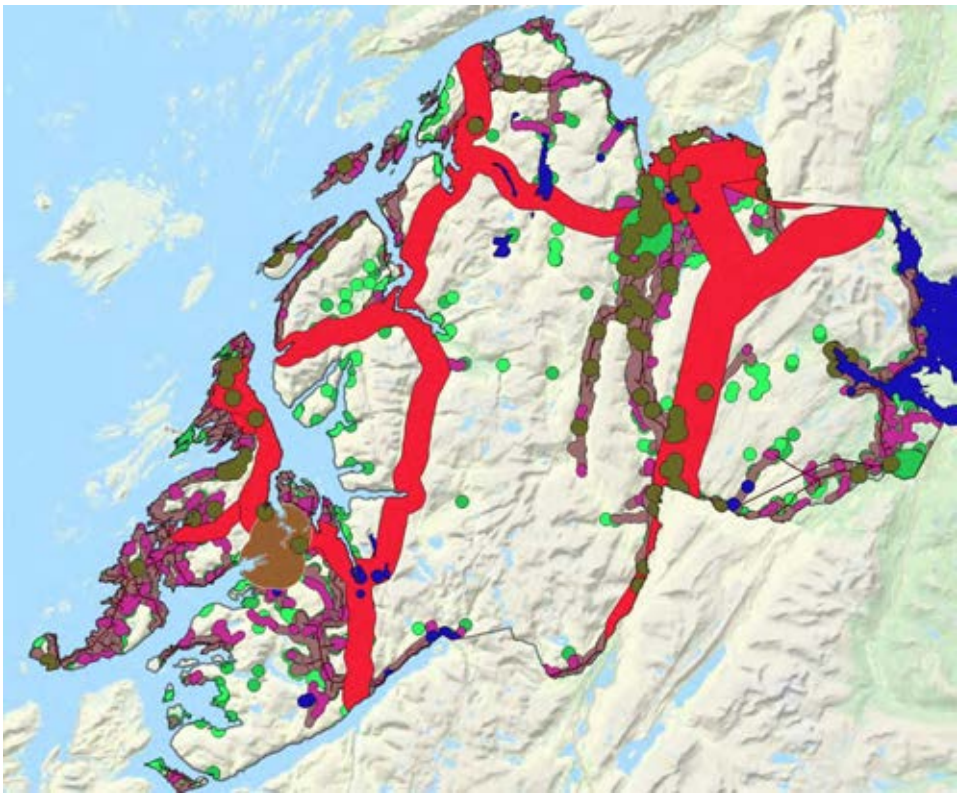
Picture12 Blue color shows hydropower plants. Water reservoirs affect in the form of lost reindeer husbandry land and unsafe ice with increased risk to people and animals. Zone for dam: 0 m. For power plant buildings 750m (as for other buildings). Source: Protect Sápmi.



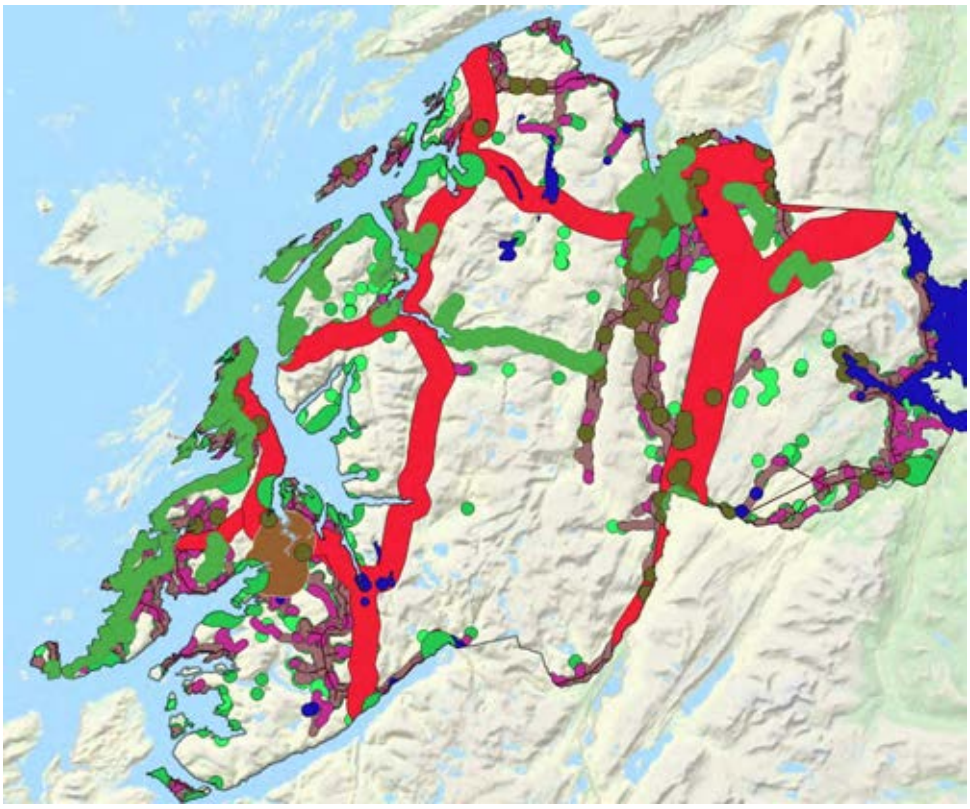
Picture13: Airport affects in a zone of 3000m. In addition, flying, especially low-flying such as small planes and helicopters, can affect reindeer husbandry. It has nevertheless been chosen to consider the airport only in this case. Source: Protect Sápmi.



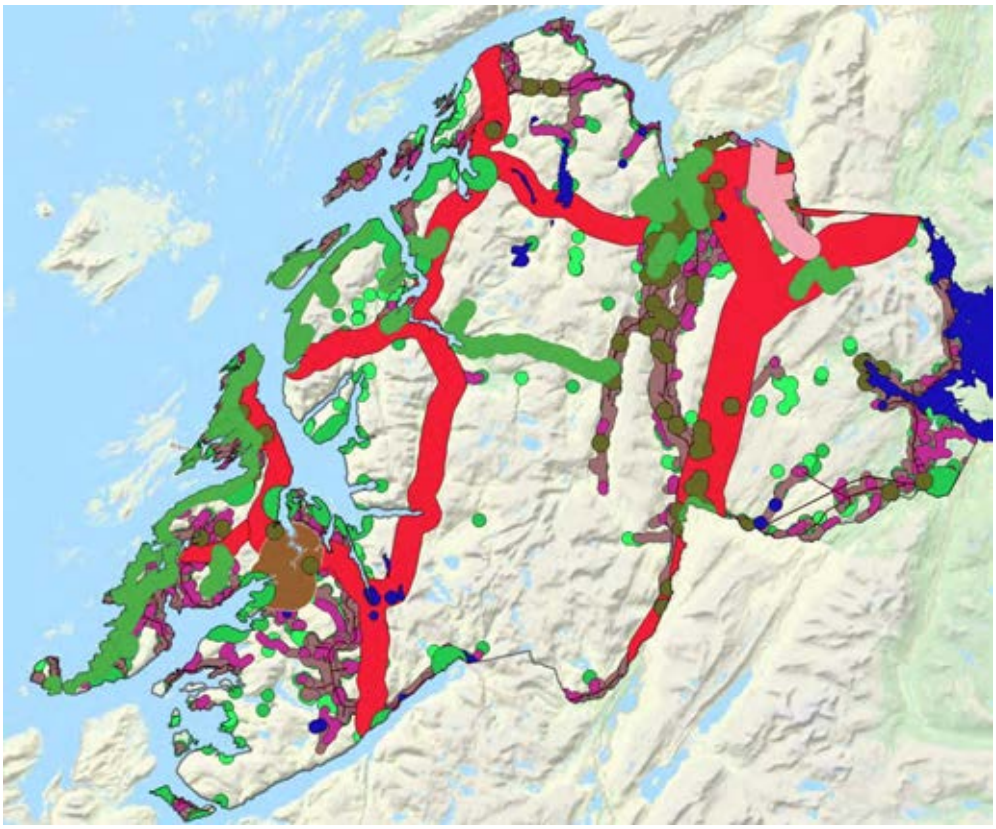
Picture14: Brønnøy Kalk's open pit at Akselberg is a barrier in the relocation route to Sømna. Marked brown. Source: Protect Sápmi.



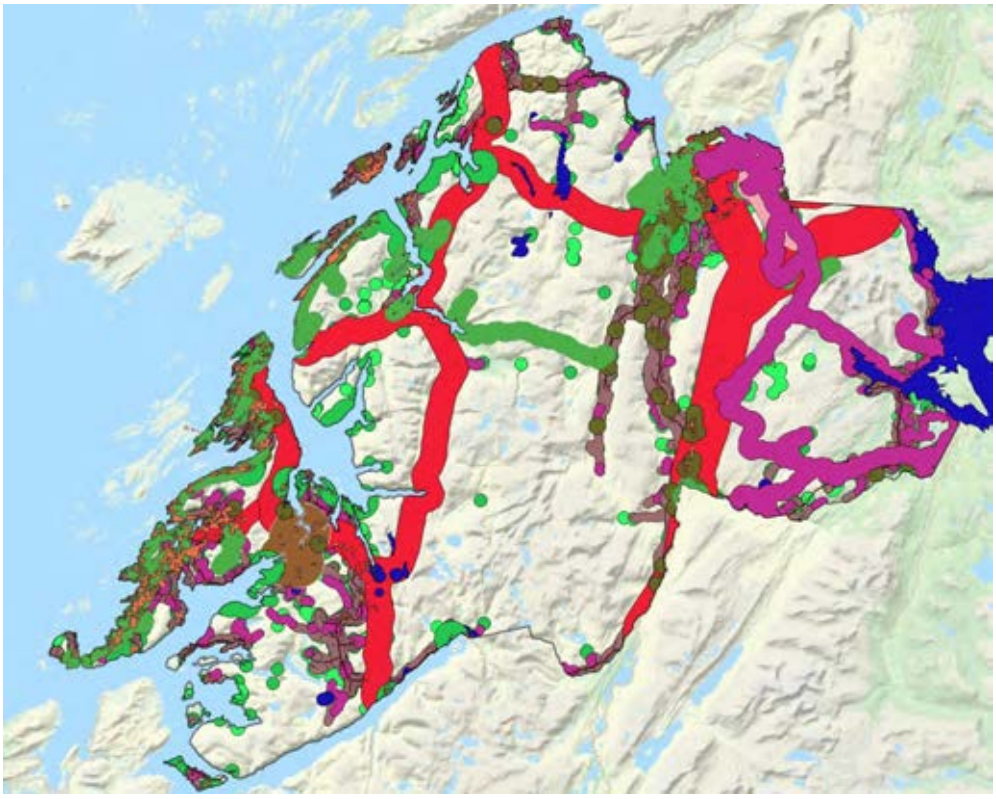
Picture15: Gravel and crushed stone extraction with its stone crushers create a lot of noise. Impact zone 1000m. Source: Protect Sápmi.



Picture16; Hiking trails for recreation for humans can also have adverse effects on e.g. wildlife. Zone 1000m. Source: Protect Sápmi.



Picture 17: Dog sledging track in pink. Reindeer pulls away. Zone 1500m. Source: Protect Sápmi



Picture 18: Snow mobile trail in purple. Zone 1000m. Affects only during the period these are open. Source: Protect Sápmi.

In addition, there are other activities such as. fish farms that can affect reindeer from staying in the beach zone. Agriculture largely coincides with other encroachments, such as buildings and roads. In relation to agriculture, there are schemes for preventive measures, e.g. fencing of infields and agreed herding schemes. The sale of cottage plots and the establishment of cottage fields involve significant interventions, these are shown in the first map above. Other activities are ski resorts, hunting, fishing and skiers / trails which in isolation do not mean much, but which together and in combination with each other and with other interventions make it increasingly difficult to find areas where reindeer can find grazing and stay undisturbed.

Cumulative situation 2019

The map below summarizes the cumulative area encroachment situation in Jillen Njaarke reindeer grazing district per today.

Picture 19: Cumulative land encroachment situation Jillen Njaarke in 2019. Source: Protect Sápmi.

Future land encroachments, secondary object.

What the investigators know about possible planned, future interventions, besides Øyfjellet wind power, is primarily within hydropower. The following applies:

- Neverdalselva power plant
- Grytåga has a license for major regulation
- Day-turned small power plant
- Ådalen small power plant
- Fjelldalselva small power plant
- Vikdalen small power plant
- Stikkelvika power plant

The mentioned power plants appear to be largely within existing areas of influence, which means that the cumulative effect will increase further in these areas. A closer analysis of future objects as primary objects will reveal these consequences, but it is beyond the scope of this report.

In addition to the power plants, the district has stated that there may be plans for more cabins and extensions of cabin fields within the reindeer grazing district, as well as a possible expansion of Brønnøy lime. The consequences of these possible expansions have also not been thoroughly analyzed. But we see that these will increase the effects further, in combination with already established interventions

Area encroachment in relation to seasonal pastures

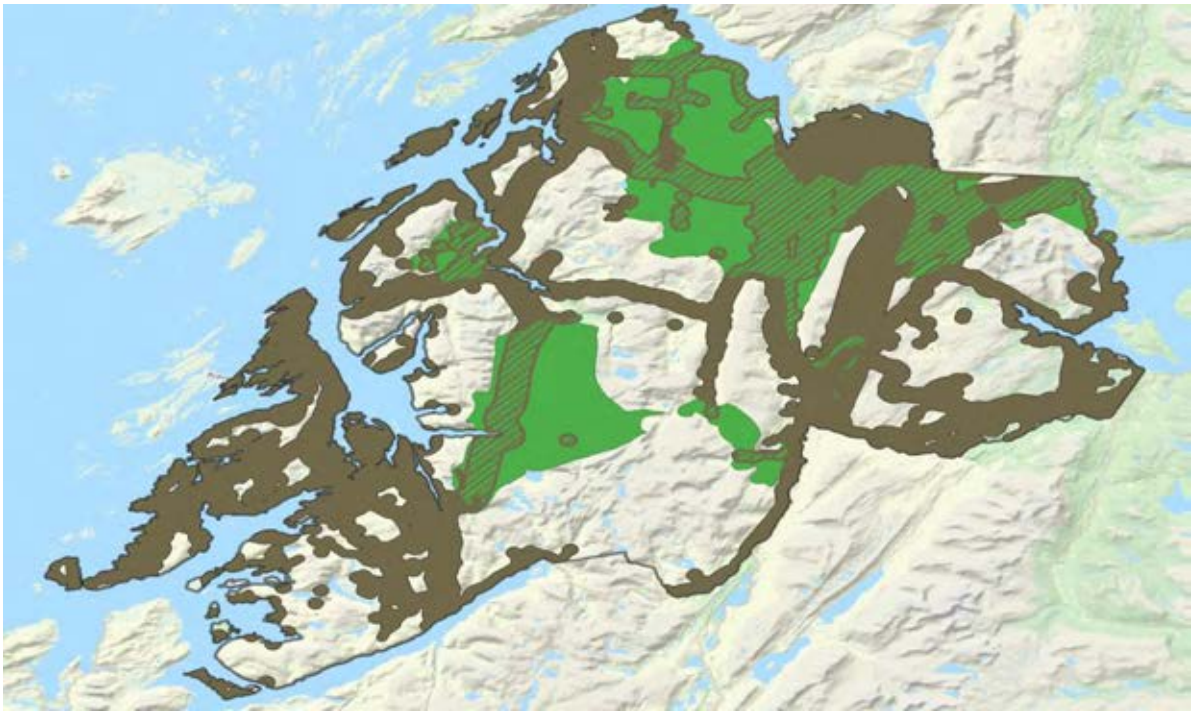
In the district plan, seasonal pastures and migration patterns are described, cf. the district plan chapter above. The district's reindeer husbandry professional group has also provided supplementary information, especially about the impact of the area interventions and about structural changes in the district. An important structural change is that several siida shares were terminated up in 2012 in the west side. This does not mean cessation of the district's grazing rights and grazing use in the area. Such internal structural changes and the amount of land encroachment are often linked because reindeer husbandry is forced to adapt. Nevertheless, the fact that it is the district as a whole that holds the grazing and operating rights, and which still uses and manages the areas, does not change.

Sami reindeer husbandry is based on reindeer living all year round on open pasture. The reindeer herd is at the mercy of unpredictable weather conditions and variations in access and quality of pasture, between seasons and between years. During the most critical periods, the reindeer have a tight energy budget for the basic life processes, and then calm is very important. The reindeer are adapted to the changing environment in that grazing uptake alternates with the variations in the plant cover throughout the year. Appetite regulation, fat storage and the ability to utilize different types of landscape also vary. The variations in habitat are related to the reindeer's migration between different grazing areas, both in the form of regional migration between seasonal pastures, intermediate migration and local migration within the same grazing area.

Despite the adaptability to a changing environment, the reindeer are still very vulnerable to environmental changes such as physical encroachment, disruptive activities and climate change. Reindeer husbandry has traditionally operated with 8 different seasonal pastures; winter, spring winter, spring, early summer, summer, autumn, rut period and autumn winter. Each period is equally important. In summary, it can be said that in the winter, peace of mind is important to save energy storage, in the spring undisturbed landscape is important with regard to calving, the cows must gather energy to suckle the calf through spring, summer and autumn. In the summer, new energy storage facilities will be built and in the autumn, reproduction will be ensured.

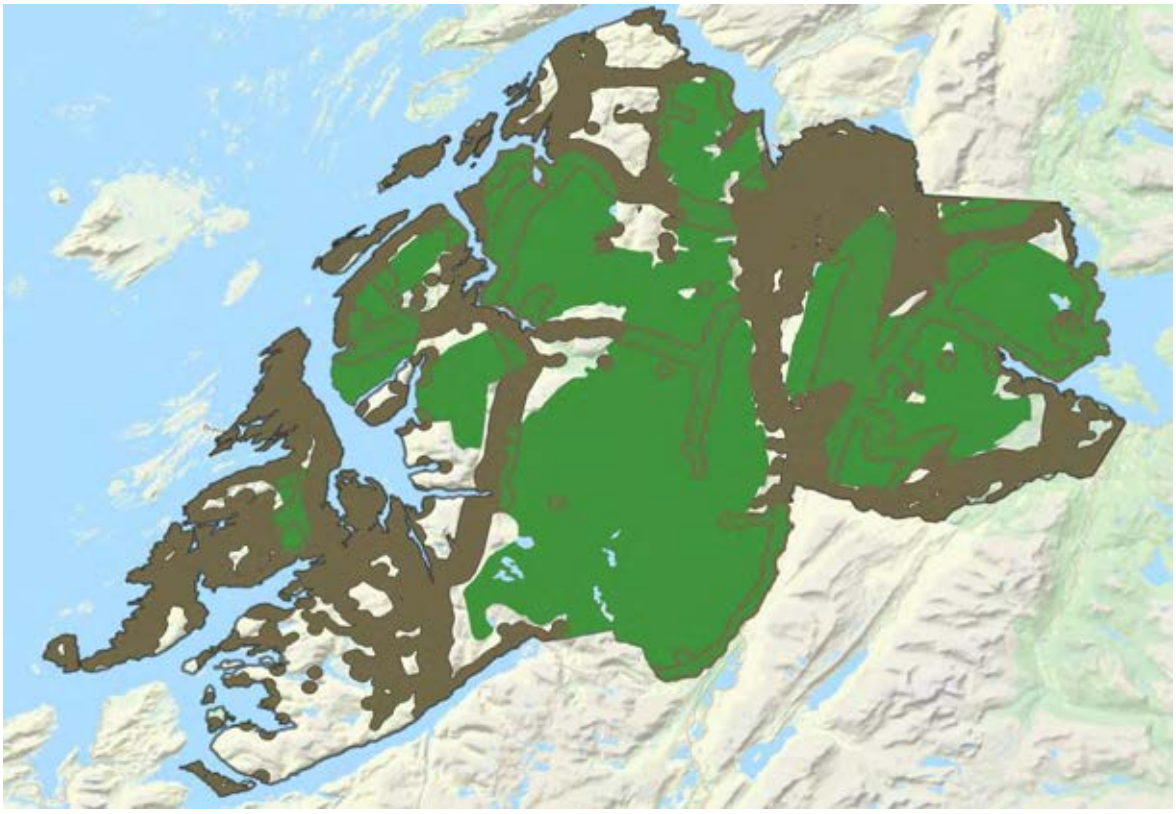
Therefore, it is professionally interesting to see the cumulative area encroachments in relation to different seasonal pastures. In the maps, eight seasons have been merged into four. It does not give as detailed a picture as a more fine-grained analysis would give. A merging of seasons entails a risk that the consequences are underestimated, because reciprocal complementary niche pastures - and land encroachment in these - are not reflected. But you still get an impression of the main challenges, and where any more specific grazing and seasonal analyzes should be done:

Spring pasture



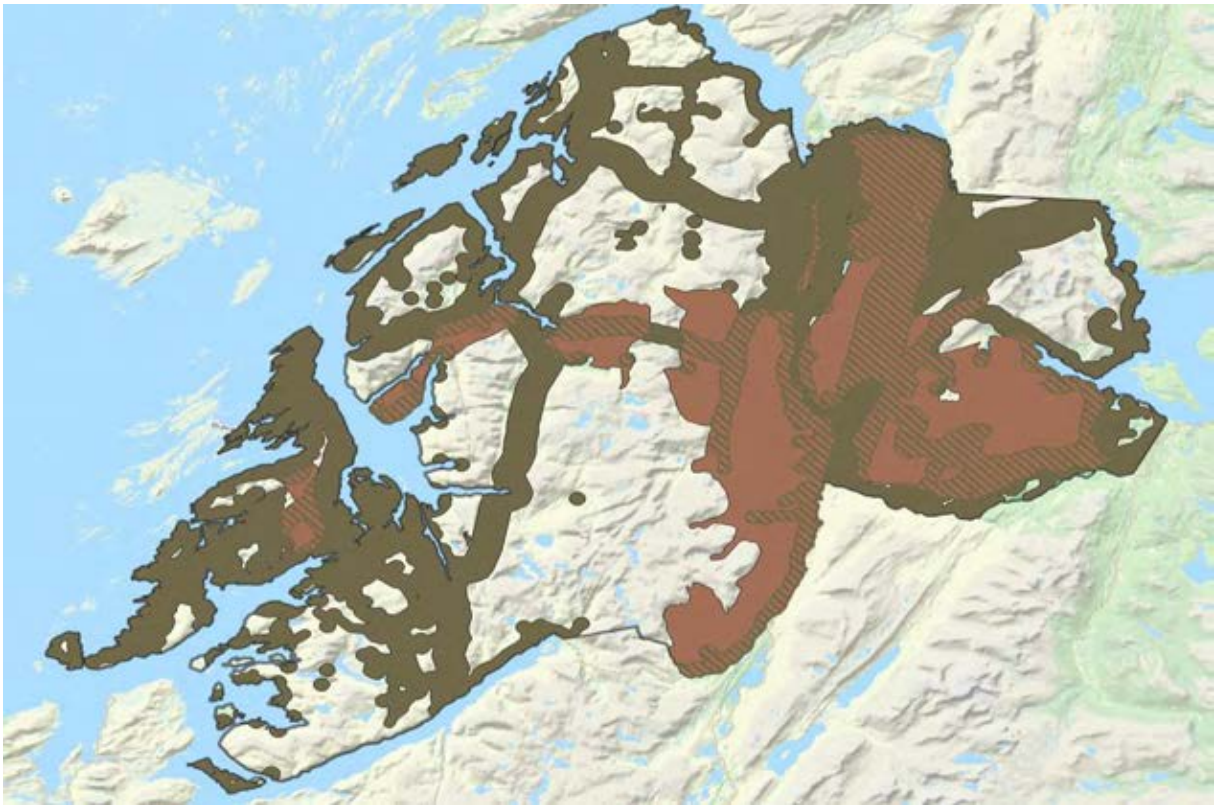
Picture 20: Cumulative situation 2019 in relation to spring. Source: Protect Sápmi.

Summer pasture



Picture 21: Cumulative situation 2019 in relation to summer. Source: Protect Sápmi

Autumn pasture



Picture 22: Cumulative situation 2019 in relation to autumn. Source: Protect Sápmi.

Winter pasture

Picture 23: Cumulative situation 2019 in relation to winter. Source: Protect Sápmi.

From the maps, we see that the intervention pressure is highest in the winter areas and spring areas, even before the Øyfjellet development. The autumn areas are affected somewhat less, and the summer areas are least affected. In general, the level of intervention is still high in the district.

Relocation routs, ie access between the different seasonal areas, are also basic. In particular, the migration routes on and the moving routs to / from the minimum areas are important in the context of analysis, ie how the wind power plant - which comes on top of the above-mentioned area intervention - affects these. In addition, living areas and collection areas are important. This is discussed below.

Analysis of the primary object - Øyfjellet wind farm

Description of the wind farm

In the MTA[26] plan for the Øyfjellet wind farm, the description is as follows:

«Øyfjellet wind farm is located in Vefsn municipality in Nordland, just west of Mosjøen. The concession area covers an area of 48.1 km2. Following a change license on 11 October 2018, a wind power plant with an installed capacity of up to 400 MW can be established, with two associated transformer stations inside the license area.

[26] Environmental, transport and construction plan with detailed plan for Øyfjellet wind farm, Multiconsult 6.5.19

This MTA is written before the final selection of the turbine. MTA therefore assumes a maximum turbine outlay. The final turbine layout will either be as described here or somewhat reduced for one or more factors such as number, physical size, noise and more. Only installed power per turbine may be slightly increased, but within the external limits specified here. MTA describes a turbine layout with 75 pcs. 5.3 MW turbines with 120 m hub height and 160 m rotor diameter, total installed capacity 400 MW.
The access road comes up in the area from the south. A separate sub-MTA has been created for the access road. 10 km 132 kV grid connection from Tverråga / access road to the existing Marka transformer is also covered by the license for the Øyfjellet wind farm. A separate sub-MTA has been created for the network connection. "

In general about migration routes and moving routs

Assessment of reindeer husbandry areas and seasonal pastures alone does not provide the overall picture. One must also consider where land encroachment is planned in relation to relocation routs, because these are central to how different landscapes are linked together and used. Relocation is one of the most important foundations for maintaining a traditional, nomadic industry and way of life. The movements both between different area units in landscapes that are used in context and not least between different seasonal pastures, are central. Reindeer and reindeer herds are very careful to follow established migration routes that the animals have become accustomed to using. If these are to be changed, one must spend many years weaning established moving behaviors and getting the animals used to new moving routes. It goes without saying that this is very time and resource consuming. It is often not possible to change moving routes in an area at all, because these are adapted to nature, the terrain and the climate.

Often there can be several moving routes in an area. These complement each other and the use can vary from year to year, depending on e.g. weather, wind and ice conditions. Moving routes are central to understanding the operation and land use, especially how the different landscapes are used in a holistic context.

Critical success factors and reindeer husbandry challenges in using the various relocation rotes are usually identified through experience in different seasons and in different weather and climate conditions. The effects on light conditions, snow and grazing conditions are often central.

Most relocation routes are old and established according to the reindeer's natural movements in the terrain in question in the season in question. In many ways, it can be said that the reindeer themselves have chosen their moving routes.

In relation to the land use maps, it is important to know that moving routes are schematically drawn and are not an actual description. Moving path ways vary in width from year to year and are used in connection with collection areas and transitional pastures between the seasonal pastures. Relocation normally takes place in combination with grazing and rest, often - but far from always - marked as extensions of the relocation route. The migration rate will

vary, and can take up to several weeks depending on weather, conditions, snow conditions, grazing conditions and the herd's degree of collection. By degree of assembly is meant how united the herd is before moving. It is not always possible to collect the whole flock before moving, so some flock parts are moved later. The degree of aggregation depends on the operating conditions in the different years.

Herd size is not the most relevant factor for moving speed, it is often the case that smaller flocks are more time and resource consuming to move. Management in particular is more difficult with a smaller herd, especially in demanding terrain with valleys, passages and barriers. It shows the reindeer husbandry experiences.

More about moving routes in the area

In the map below, taken from the land use maps, the migration routes are marked in yellow, the moving routes in red and the concession area in green.

Figure 24: Migration routes and moving routes through the concession area.

There are two migration routes through the concession area and a third on the southwest side over Hundålvatnet. Hundålvatnet(lake) is regulated, cf. secondary object no. 2, see appendix. Adjustment height is 25 m, which is very high and strongly affects the ice conditions at the time of moving.

The analysis of this secondary object shows that there is a great risk with regard to moving due to bad ice. Unsafe ice makes it difficult to move from autumn grazing to winter grazing. Bad ice can lead to drowning of the reindeer herd if panic occurs in autumn-winter. The climate changes we are experiencing will increase these problems in the years to come. The

investigators see it as doubtful that this relocation rent can be used at all in the years to come, based on a risk assessment.

In terms of reindeer husbandry, we see that moving along the water is not possible because transverse valleys on both the east and west sides of the water force moving out on the water in the pre-Christmas winter. With less and less snow, the ice will not only be more uncertain, but more often also shiny, which gives problems with getting the reindeer herds out on the ice at all. In relation to the spring, the experiences are that cracks form and submerged shiny, ice on Hundålvatnet. This is very dangerous, especially if the cracks are covered by thin layers of snow and are not visible.

This means increased dependence on the two relocation routes over Elvdal, Heifjellet and Sørgardsfjellet - that is, the areas where Øyfjellet wind power is planned to be built. The reindeer grazing district has managed to handle the development of Hundålvatnet, because they had alternative relocation routes over Øyfjellet in those years when the routes over Hundålvatnet could not be used. With development on Øyfjellet, the alternative relocation routes will disappear. **The cumulative effect of hydropower development and wind power development in this area is that normal relocation can no longer be carried out.**

Modern research indicates great avoidance in normal grazing situations, up to 5 km in both the construction and operation phases when it comes to wind turbines. The question is whether it is possible to move through the wind power plant in the relevant time periods, if appropriate mitigating measures exist. According to the investigators' reindeer husbandry professional assessment, there is great uncertainty as to whether this can be done. Firstly, when the reindeer herds come up the mountainside on the southeast side of Øyfjellet, where the topography is already demanding, there is a high probability that the sight, sound and shadow cast and light from the windmills will scare the reindeer into turning.

If the reindeer turn around, they will quickly get out on the railway. The risk of collision will increase dramatically. Sami language as traditional knowledge has its own concept called *spálkat*. In this lies that the reindeer, due to an incident, permanently begins to avoid certain areas. If this reindeer husbandry phenomenon known to occur should occur, a habituation will be almost impossible and the relocation will be ruined for this generation of reindeer.

If, against all odds, the herds were to be moved to the area, the wind turbines would mean that the area's collecting function for reindeer, as it is today, would cease. One must keep in mind that the reindeer herds have already passed three critical obstacles; E6, railway and the river Vefsna. After such stressful passes, the herd needs to calm down, rest and graze before moving further. Rest breaks and collection capacity also apply to people who work with reindeer. Collection is important not only because of the need for rest and grazing, but because of the rear troops of the reindeer herds that can be several days away - depending on the initial degree of collection.

With the wind farm, the critical area is extended to a long continuous distance. There is a great risk that the distance will be so great that it will be unmanageable in terms of reindeer

husbandry. It is doubtful that one manages to keep control of the herd and the herd part, and it is very likely that some reindeer herds turn or pull in inappropriate directions.

Already today, the intervention situation is problematic in connection with this area, as evidenced by the large number of collisions with reindeer on the railway and E6. Problems arise especially when climatic conditions lock the pastures further up in the mountains on the east side of the railway in the autumn-winter. This happened, for example, in the pre-Christmas period in 2017.

The Øyfjell area's collecting function

Due to varying degrees of collection in different years, well-functioning collection areas of different sizes, close to the relocation routes, are crucial for a successful relocation. Particularly for this district, such areas are critical, because when moving to the winter pastures, life-threatening encroachments must be passed on for reindeer that run parallel in the north-south direction. From nature's side, there is also a natural obstacle in the form of the river Vefsna, as mentioned above.

Based on discussions with the district's reindeer husbandry professional committee, in particular the description of the reindeer husbandry work, the investigator concludes that in terms of reindeer husbandry, **Øyfjellet also has a more extensive, collecting function (*"čoahkkananbáiki"*)**. When using reindeer husbandry terminology, such functions appear as self-evident, the phenomenon has its own, associated Sami concept set. This type of collection function is not marked on the land use maps, although these are central to Sami, nomadic reindeer husbandry.

Only igration routes, moving routes, small collection points ("*bisanansajit")* and seasonal pastures are marked on the maps. Probably "*čoahkkananbáikkit"* is missing on the maps because these are more specific reindeer husbandry phenomena, a type of "compromise area" between landscape, reindeer and man, which no one has asked the districts to specify. It is probably the case that the reindeer have themselves chosen such collecting landscapes, in the same way as man has adapted his work with the reindeer to this. Such landscapes have, for example, a “calming” effect on the reindeer, almost semi-domesticating effects under given conditions on some animal categories, although grazing conditions can be scarse at times. for the rest of the year, also for the further relocation.

When moving to winter grazing, Elvdal and Elvdalsfjellet, as well as Heifjellet and Sørgardsfjellet are especially important. In the spring you first come to Sørgardsfjellet and then to Heifjellet, before you get to Elvdalsfjellet. However, the grazing conditions are good, especially on the west side towards Vikdal, there are very good conditions for grazing both in early winter and in spring. These are also important collection areas because the herd is rarely moved completely together during this period. The mountain areas control the herds there, but due to hilly terrain and good grazing utilization, the herds will naturally not be moved completely together.

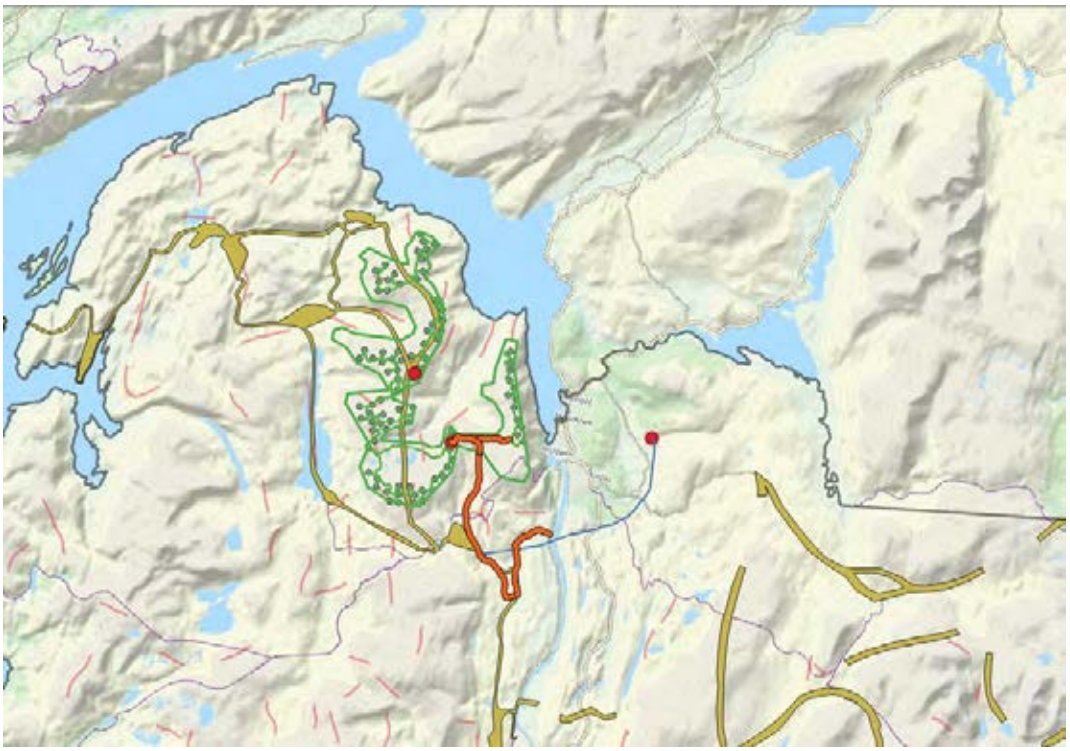
An area that today has a unifying effect, ie an area that "holds on" to the reindeer herds, will thus have a dispersing function. In terms of reindeer husbandry, this is catastrophic. During

autumn-winter migration, there are short days due to the dark time in the northern parts of the country. In addition, the weather conditions at this time of year, especially in these higher-lying windy areas, can be extremely demanding for both reindeer and humans.

The main question, however, is whether it is at all possible and advisable to travel with reindeer within the wind power area during the construction period and the operating period. The investigator doubts that this is advisable, especially when ice formations occur.

Barrier effects and avoidance effects

Below is a map image of the planned area intervention:



Picture 25 Blue line to the east is a new 132kV power line Middagseidklumpen - Kleivan - Marka. New access road to the wind farm is marked with a red line. Green lines show internal roads and green dots mark wind turbines. Red dots mark transformer stations. A double 132 kV switch field will be installed in the existing Marka transformer station.

The connection line will have a certain barrier effect in an area that is already heavily loaded with land encroachment, including the railway and the E6. With appropriate measures, the investigator considers that the consequences of the connection line in connection with the reindeer migration can be manageable for the district. Among other things, an underpass under the railway is being planned, but relocation here requires helicopter use. However, the power lines will obstruct the helicopter on parts of the propulsion. Here, supplementary measures are needed to ensure a safe crossing with the reindeer herd, e.g. extra ground crew in addition to helicopter.

The power line runs in an area where there are important features for animals and reindeer. The question is whether the route can go further north, closer to the city, and not along the existing route. Such a change of route would help reindeer husbandry.

From the map, we see that the access road partly coincides with the relocation route and living area, marked with an extension. The investigator's assessment is that the road does not prevent the relocation from stopping at traffic, but will limit the area's function as a living area. The precondition for the road not to prevent relocation is that the area retains its status as a relocation even if a road is established. The area is a forest area. It may be necessary to make some physical adjustments here, it must be agreed with the reindeer grazing district.

An internal road network established in the wind power area could have two effects, in addition to an avoidance effect;

- Leading effects

- Barrier effects

By leading effect is meant that the reindeer can to a certain extent follow the road network, but since the roads spread to each individual wind turbine, the guiding effect will give a spreading effect for the reindeer herd. Road construction in rock areas often involves blasting, which results in sharp stones at the roadside and spread out over the area. In addition to the stone lichen being lost, sharp stones can be dangerous for reindeer, at the same time as it makes it difficult for reindeer herders to drive to stay in control.

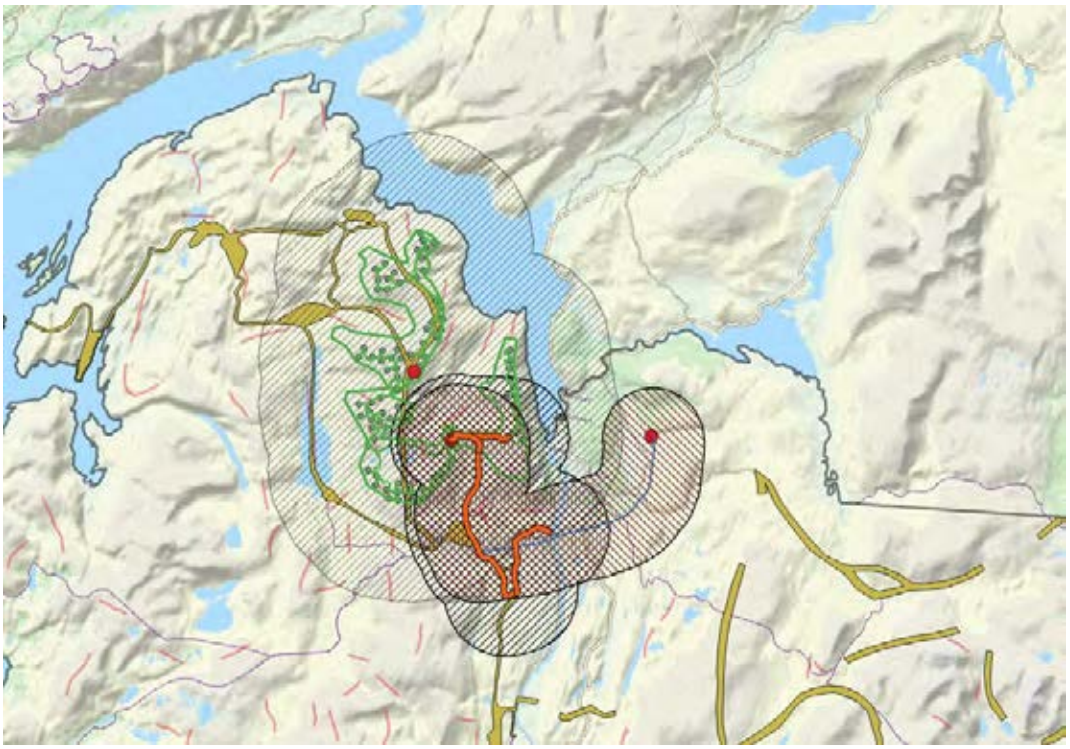
By barrier effects is meant that in some places the road will have high edges, either up to or down from the road. This makes natural crossing difficult. In the spring when the roads are plowed, there is a risk of large plowing edges up to several meters. These have major barrier effects, but also inappropriate leadership effects.

One transformer is, as we see, located in the middle of the moving path. It will help to stop the reindeer and / or lead the reindeer the wrong way, if you should try traditional movement through the area.

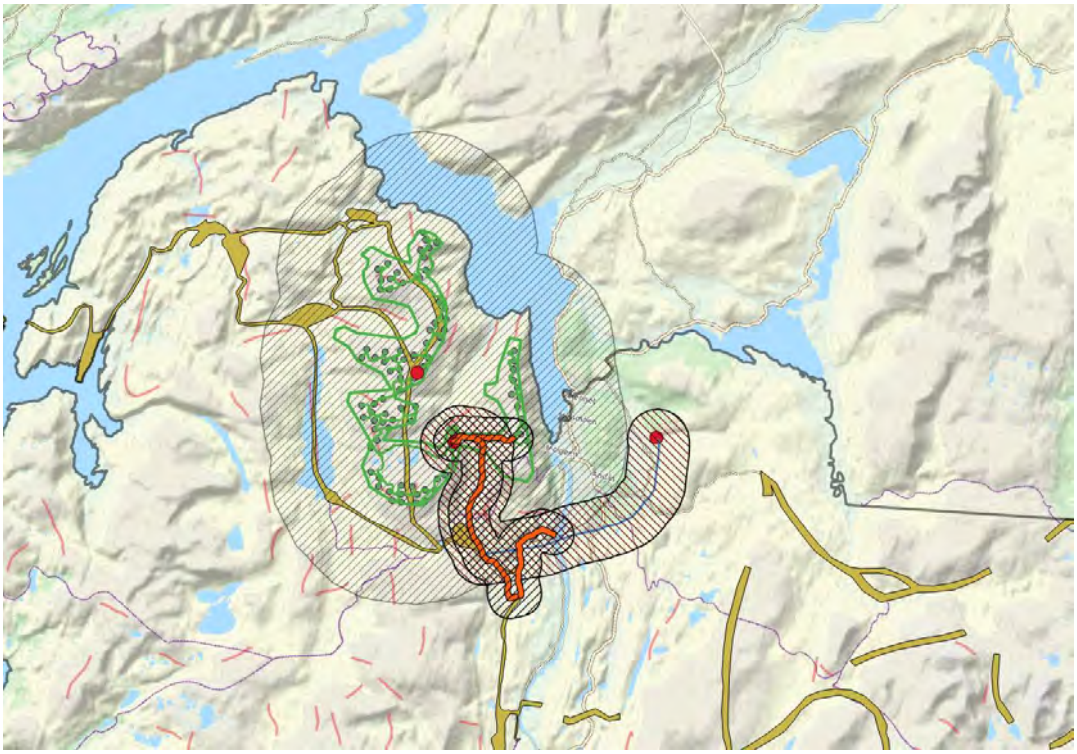
The area of influence of the primary object

The impact areas, shaded fields, during construction period and operating period are shown below. Both reindeer, reindeer migration and other work with reindeer will be directly affected. The work with reindeer can, for example, also be affected in an even larger zone, as a result of domino effects. It is not illustrated on the map.

Impact zone on road and power line does not mean that there will never be reindeer within the zone, the most tame bucks can e.g. stay along roads. In modern, structured reindeer herds, however, the proportion of bucks has been pushed down.



Picture 26: Shaded fields show the wind farm's impact area on reindeer husbandry during the construction phase. Zone 5 km on wind turbines, zone 3 km on construction road and zone 2.5 km on line.



Picture 27: The wind farm's impact area in operation phase. Zone 5 km on wind turbines, zone 1 km on connection road and zone 1.5 km on power line.

Recent research [27]shows that the effects for the construction phase and the operating phase do not change for the plant itself. On wind turbines, this indicates that the impact does not decrease during the operating period. The wind turbines will rotate and be very visible from a long distance, especially in clear weather. In addition, there are shadows in the sun, light when it is dark (flashing due to propeller rotation) and sound from the turbines. The door opener effects will also be greater during the operating period than during the construction period.

For roads and connection lines, however, the effects will diminish somewhat during the operational phase. It shows both research and traditional knowledge. Although avoidance decreases, it does affect the landscape, work with reindeer and production. Declining avoidance is often associated with a large herding and hunting effort (towards the lines), which must be entered.

Based on discussions with the board in reindeer grazing district 7 Rákkonjárga, which has relatively long experience with wind turbines, the impact will also be a result of the topography around the facility. Their experience is that avoidance is largely linked to visibility. In clear weather the avoidance is greater, while when there is fog the avoidance seems to decrease somewhat. In some cases the impact can be more than 5 km, while e.g. in valleys and in dense coniferous forests, the visibility - and thus the impact - is somewhat less. The picture above does not take that into account.

There is not much experience with traditional relocation through such areas, as the investigator knows. But reindeer owners who the investigators have spoken to and who have experience with wind turbines both in County Finnmark and in County Troms, say that they do not think such a relocation is possible.

Based on a reindeer husbandry professional assessment, based on own experience with reindeer migration both spring and autumn and conversations with reindeer owners in other districts that have wind turbines, the investigator assumes that if relocation routes near wind turbines go through dense coniferous forest areas, often combined with a special snow quality (« *sievlla* ») in the forests at the time of moving, a move with a lot of mechanical effort can be carried out closer than 5 kilometers.

However, this presupposes that the herd is made to "*ruvgalit",* ie that the reindeer go "by train". To achieve this, several peculiar conditions must agree at the same time. In addition, an unfortunate "turn" in the front, e.g. a sensitive individual animal, in such a herd could destroy for a controlled past movement, and it is easy to lose control of the herd. This is partly due to mentioned snow conditions not so easy to get around with e.g. snowmobile rather, to steer the herd.

In the autumn, on bare ground and in periods with little snow, such an overall relocation, according to the investigator's reindeer husbandry professional assessment, will be difficult to

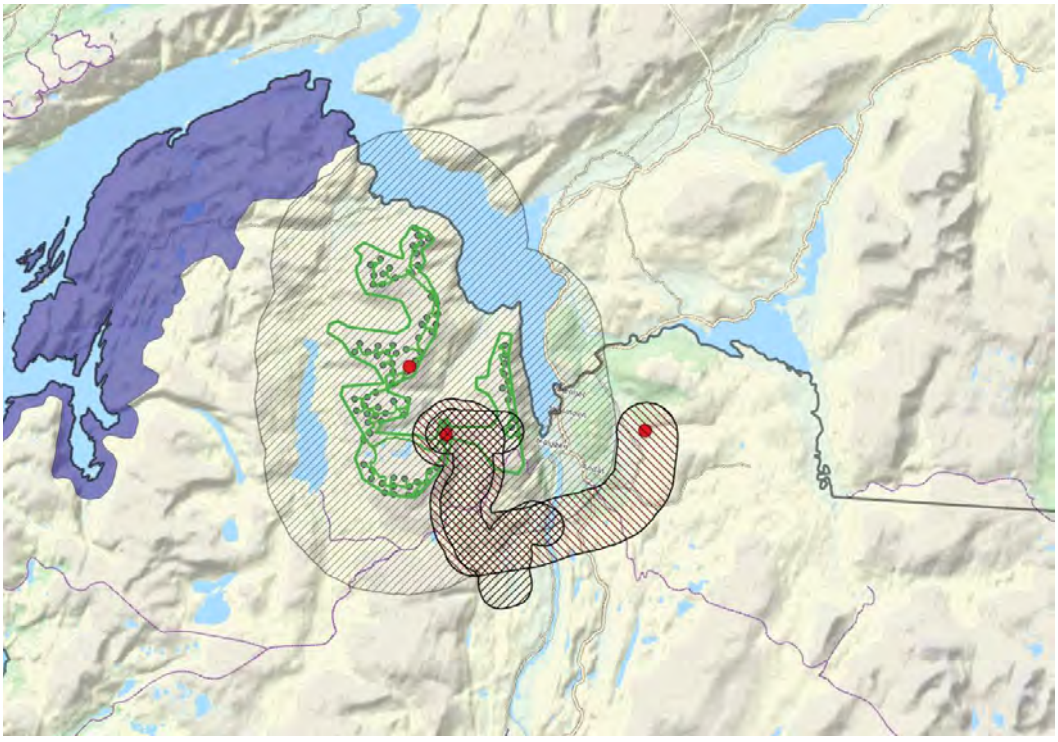
[27] https://doi.org/10.1002/ece3.4476. Publication from the Swedish University of Agricultural Sciences (SLU) 4.9.18 by Anna Skarin and Per Sandstrøm, SLU, and Moudud Alam from Dalarna University.

implement in this wind power area. Then the snow conditions are not "facilitating", and the reindeer also have a different, slightly "wilder" behavior at this time of year. Control over reindeer and reindeer herds on bare ground is also generally much more difficult than on snow-covered ground. Even without encroachment, it is demanding to control the reindeer herds at this time of year. The topography will also have a lot to say, and what the reindeer are used to in this area. Difficult topography makes control and management difficult, and so does the reindeer. On Øyfjellet, there is no such dense forest, which will be a necessary condition. The topography is also demanding. There is also uncertainty about snow quality and snow depth with a view to ensuring the above-mentioned behavior. On inspection by helicopter, on the contrary, it was found that this is an alpine mountain landscape, with no forest up that can impede visibility to the mills. The area is also windy, which indicates that here the wind will have blown away a lot of snow. Thus, snow as a "taming factor" in this area will be limited by nature.

This means that reindeer migration here will probably be associated with almost unmanageable challenges, if it is to be carried out as it is today with a wind power plant in the area.

The primary object in relation to different seasonal pastures

Impact of winter grazing



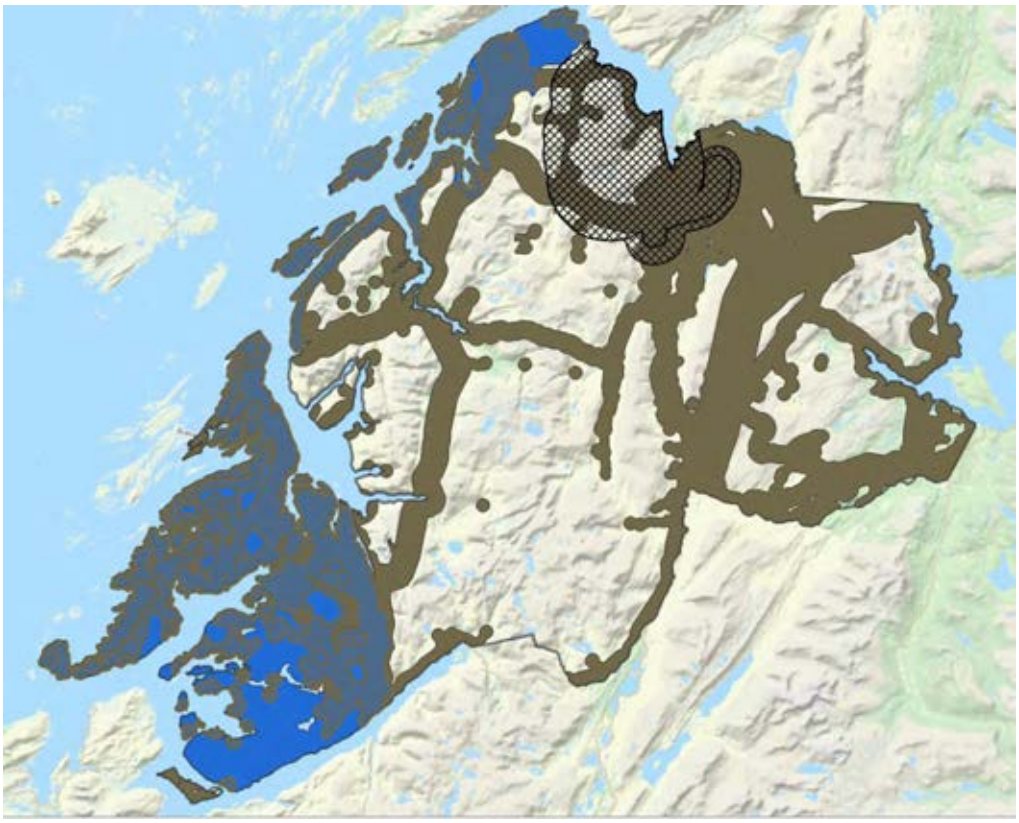
Picture 28 Winter grazing area zone 5, which the migration routes lead to / from.

The relocation routes mentioned earlier, lead to a winter grazing area with relatively little disturbance compared to the other, four winter grazing zones, cf. the cumulative analysis. An estimated 20-30% of the real winter grazing will be cut off if moving to and from is made

impossible. At the same time, this winter pasture (zone 5) is an area where there is little conflict with agriculture and the rest of the local population because there is relatively little encroachment there. The cumulative effect of not being able to utilize this area is that the other areas must be used more. There is a greater potential for conflict with agriculture and the local population. In addition, these will wear out to an excessive degree, which over time means that this is no longer sustainable, cf. the model of sustainable reindeer husbandry in the reindeer husbandry theory part initially

The district's reindeer husbandry professional committee has also stated that in recent years they have started to use Øyfjellet with associated areas also as winter grazing. It is related to land encroachment in winter zones 1 - 4 and structural changes in the district. The district is divided into winter grazing zones, as the only district in Nordland. The division came through the new district division in 1999, following a decision by the Reindeer Husbandry Board. That was when the old Brurskanken reindeer grazing district and Brønnøy / Kvitfjell reindeer grazing district were merged. The idea was a distribution of winter pasture between the two original districts.

But in the rules of use, this division has been abolished, the pastures must be able to be used by everyone in the district and is now incorporated.



Picture 29 The cumulative area encroachment situation as of today, brown color, seen in relation to total winter grazing resources, blue color. Light blue is remaining, pristine winter pasture. The shaded field shows the Øyfjellet wind farm during the construction and operation period.

We see from the cumulative analysis that large parts of the winter pastures are loaded with area encroachment, see the dark blue part of the map. In the southwestern parts, there is

greater conflict with agriculture. Winter grazing zones 1 and 3 are the largest agricultural municipalities in northern Norway. In addition, moving from zones 1 and 3 in the spring around 15 April requires winter grazing zones 2 and 4 to be available. The move must take place through 2 and 4, and the snow conditions are crucial for the adaptation.
A situation where the district is cut off from using zone 5, which is furthest north, will not be sustainable in the long run. A relocation solution to and from must therefore be ensured. Climate change means that Øyfjellet and the associated mountains can to a greater extent also be used for winter grazing in the future, which is already a minimum factor. In the technical report reproduced in the MTA plan for the planning area from, the assessment is that "*It is first and foremost the winter pastures that are the minimum factor in the district and thus attractive to use*." We share this assessment with regard to winter grazing.

Since winter grazing is the minimum factor, we would like to point out that the subsequent spring grazing becomes even more significant based on a minimum factor approach based on a reindeer husbandry professional assessment. In years with demanding snow and ice conditions, the herd must enter spring pastures earlier, and with increased climate change, the need for this increases.

The possibility of using Øyfjellet and associated landscapes for early winter grazing and late winter grazing, and that moving routes to and from zone 5 is cut off by the development, is dramatic. Less spatial flexibility arises and this gives a significantly higher operational and climate risk. The investigator has also assessed whether the land use can be changed so that other areas can be used as winter grazing, for example by grazing on the east side of Vefsna. However, snow and ice conditions and varying temperatures that lead to icing of the pastures make this completely irrelevant.

In addition, the district is dependent on "time" arrival there, ie to the areas east of the railway and E6. You should not use the calving area before calving, the wear and tear on pasture, animals and people, ie the operating conditions in total, becomes too demanding.

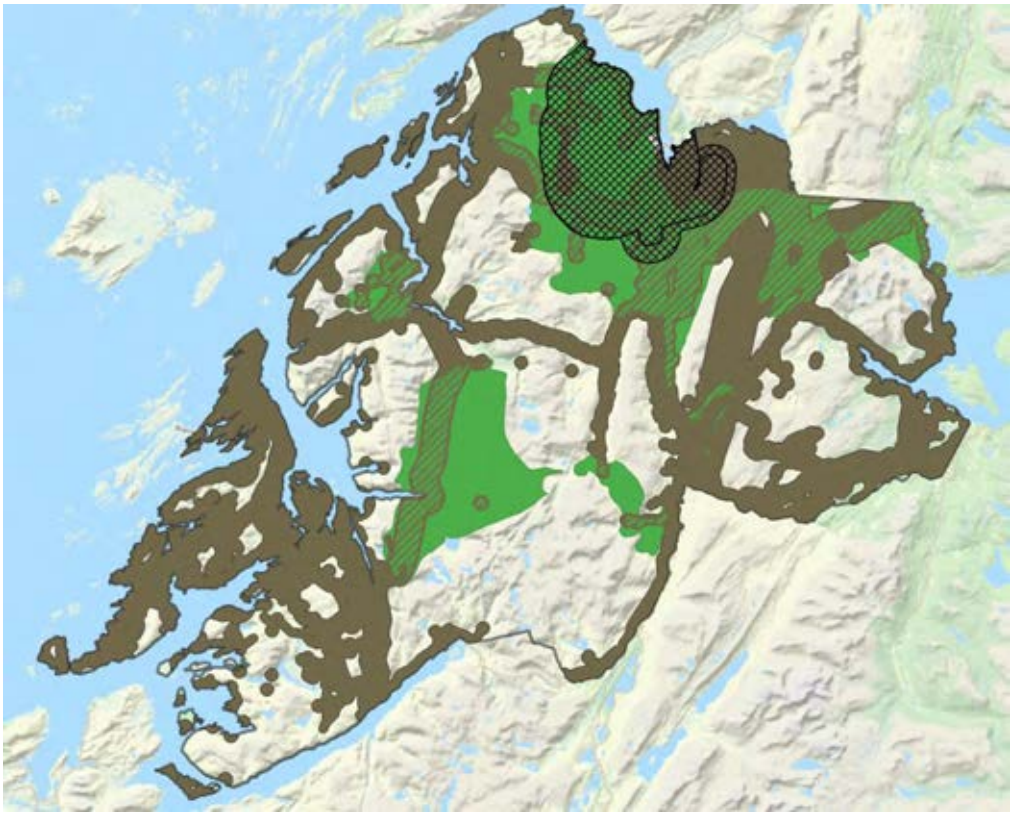
An important principle for optimal grazing in this area is, according to the district leader, who has extensive experience with reindeer husbandry in this area, that you should save the best pastures until they are actually needed. By best pastures is meant that snow conditions and other conditions are least risky. This means keeping the herd on the "second best pastures" for as long as advisable - so as not to get into the best pastures too early and "eat from the safe stock" ahead of time. It is especially important to save the grazing stock until the grazing conditions become particularly demanding.

An important point according to the district leader is that the climate change that is being experienced makes it even more important to use the second best pasture, and save the best ones until they are really needed. In Sami philosophy, the reindeer husbandry year is divided into 8 seasons, so that the transitions between these become even more important to focus on in the practice of reindeer husbandry.

According to the assessor's reindeer husbandry professional assessment of the area, and the district as a whole, there is no doubt that such grazing as the district leader describes is the most rational for a long-term survival for reindeer husbandry.
On snow, "trampling damage" can also occur, ie that trampling in mild weather ("*njáhcu*") can make the snow hard as asphalt ("*čiegar, čiegarduvv*o") when it gets colder. With insight

into snow qualities through professional concepts about these in connection with reindeer husbandry, it becomes even more obvious that the district leader's description is very precise.

Impact of spring grazing

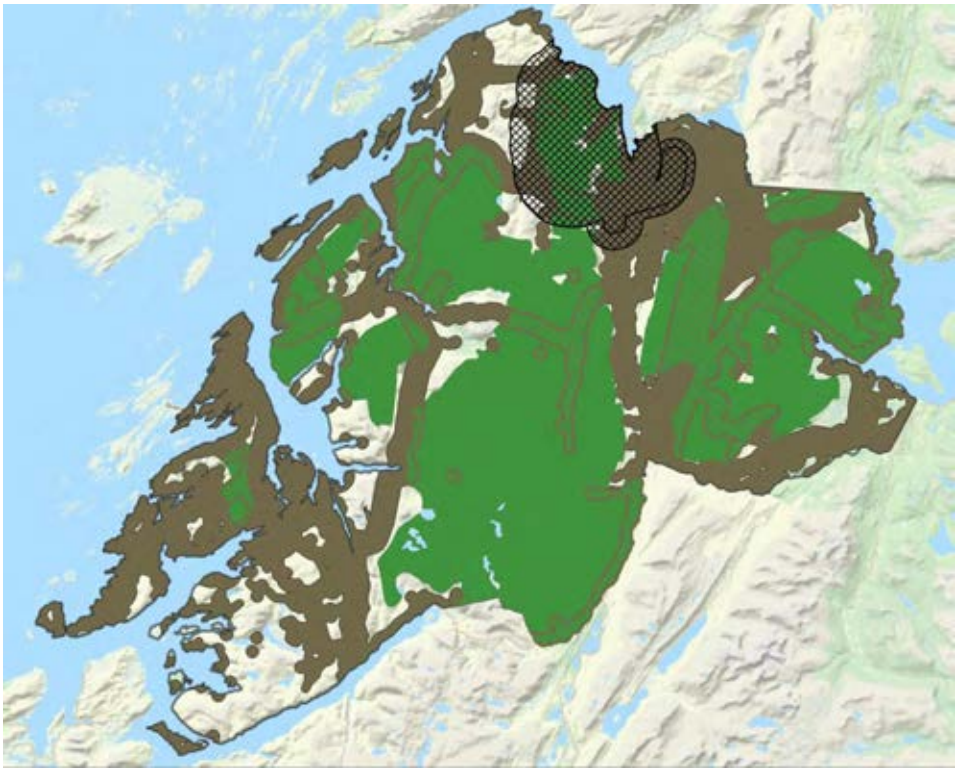


Picture 30 The cumulative area encroachment situation as of today, brown color, seen in relation to spring grazing resources, green color. The shaded field shows the Øyfjellet wind farm during the construction and operation period.

From the map, we see that development goes far beyond the critical spring grazing. After a long winter, the reindeer are normally drained of energy reserves, so the spring pastures are of extreme importance. The reason for this is that the females must have good conditions to be able to produce milk and prepare for calving. Oxen and last year's calves are also at their weakest after the winter, especially if the grazing conditions have been demanding and the herd has been much disturbed by encroachment and predators. The consequences of the developments will be particularly visible in relation to the spring grazing. The question is whether the negative consequences are so great that they destroy the district's seasonal grazing balance.

The spring grazing is adapted to the climatic situation with a focus on grazing availability as a result of snow quality, snow melting and where it gets bare and green at the earliest. Thus, this is a minimum factor in nature that can not be controlled by man. The size of the factor will vary from year to year as a result of the above conditions. In poor grazing years (in terms of snow and ice conditions) this factor can be even smaller than winter grazing, and is therefore more critical than a pure calculation of numbers can show.

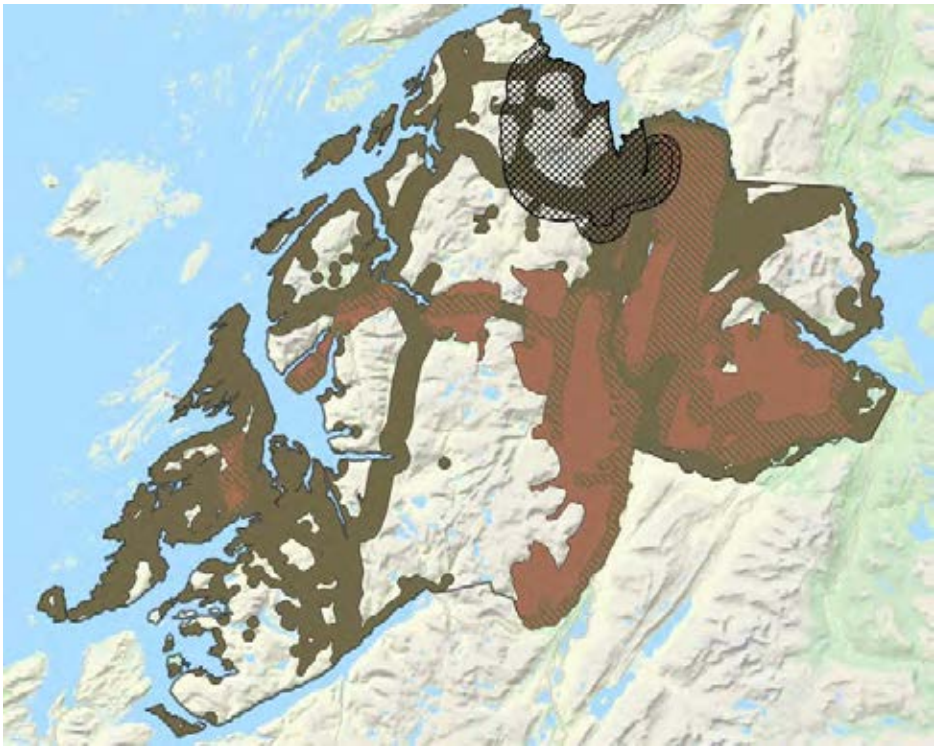
Impact on summer grazing



Picture 31 The cumulative area encroachment situation as of today, brown color, seen in relation to summer grazing resources, green color. The shaded field shows the Øyfjellet wind farm during the construction and operation period.

The map and the reindeer husbandry professional assessment show that even if the development deteriorates Øyfjellet and the associated mountains in and near the planning area as summer grazing, this is not decisive for the reindeer grazing district in the future. However, the development will limit the flexibility of the district's land use, and the development opportunities will be limited. This means that the potential for flock and production increase in the summer is reduced. According to the assessor, there is room for far more pure summer time than the district has today, but winter grazing and spring grazing are limited. An area intervention on these two factors will thus also limit the real summer grazing potential. The seasonal pastures are connected as a whole.

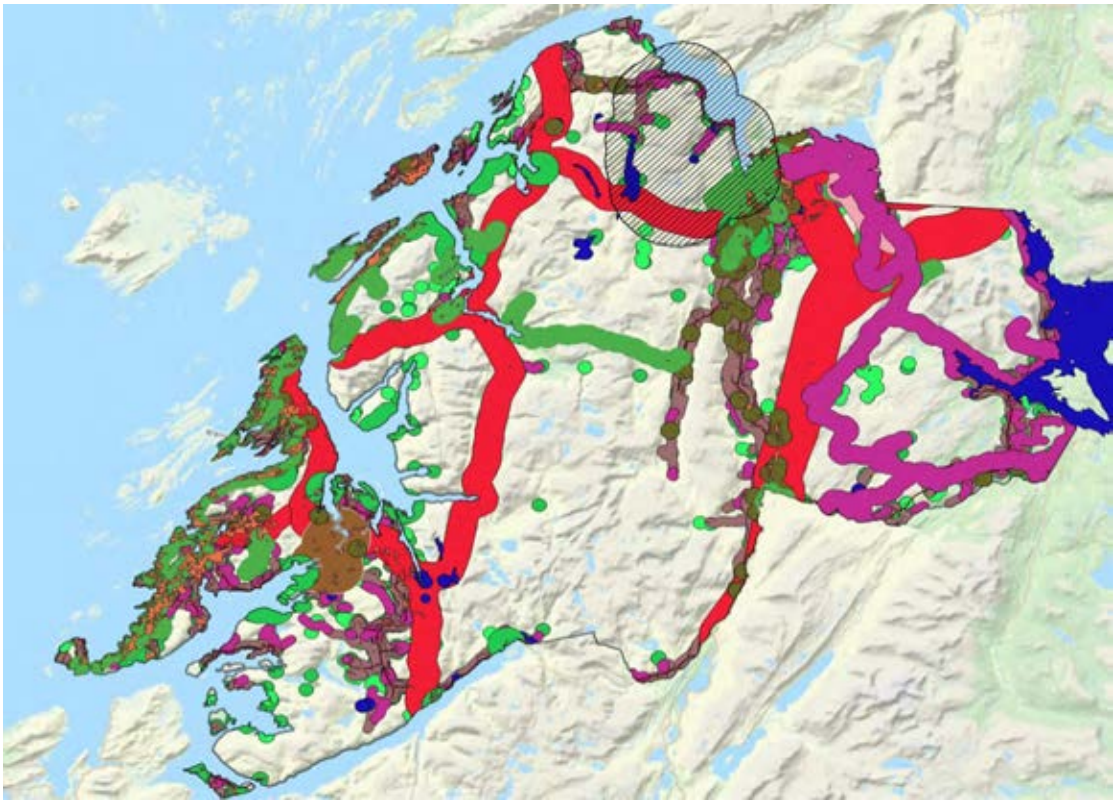
Impact on autumn grazing



Picture 32 The cumulative area encroachment situation as of today, brown color, seen in relation to the autumn grazing resources, reddish brown color. The shaded field shows the Øyfjellet wind farm during the construction and operation period.

The map shows that the development does not have such a great direct consequence for the autumn pastures. The load on these is mainly due to other land encroachments

Cumulative area intervention situation divided into different types of intervention



Picture 32 Intervention today, with the impact area for the planned wind farm in the shaded field, excl. connection line and connection path. See object journals in the appendix, for further details

The cumulative land encroachment situation today, with different types of encroachment, is shown above.

The impact zones in relation to different types of intervention are summarized below:

Impact zones	
Type	N20 - Jillen Njaarke (m)
Buildings populated centers	1000
Buildings outside centers	1000
Rural buildings	1000
Industry	3000
Fields of cabins	1000
Camping and ackomodation	1000
Airport	3000
Helicopter landing	1000
Mining of gravel	1000
Mining in operation	3000
Dog sledge	1500
Hiking trails	1000
Snowmobile trails	1000
Cross country trails	500

22kV power lines	50
66kV power lines	1000
132kV power lines in operation	1500
132kV powe lines - construction	2500
420kV powe lines in operation	2500
420kV power line - construction	4000
Hydro power – under construction	500
Hydro power and dams	0
European motorway	1000
County way	750
Private way	500
Municipal way	750
Wind power	5000
Railway	1000
Construction road construction period	3000
Construction road in operation	1000

Area calculation affected and unaffected area

Below is the calculation of affected area versus unaffected area in total in the district, and in relation to four seasonal pastures.

Seasonal grazing, cumulative situation incl. Øyfjellet	Km2	Share
District	4213	100 %
Total area affected	2254	54 %
Total area of winter grazing	949	100 %
Impacted winter grazing	688	72 %
Total area og spring grazing	948	100 %
Impacted spring grazing	487	51 %
Total area of summer grazing	2065	100 %
Impacted summer grazing	601	29 %
Total area of autumn grazing	1095	100 %
Impacted autumn grazing	559	51 %

We can see that when Øyfjellet is fully developed, 54% of the total area in the district will be affected. But this does not tell the real grazing situation, because the pasture is divided into seasonal pastures. One seasonal pasture can not replace the loss of another. Therefore, area encroachment must be considered in relation to different seasons.

Then you see the severity, especially the unaffected winter grazing is missing in this district. As many as 72% are affected. **If winter grazing zone 5 is cut off due to Øyfjellet wind power, reindeer husbandry will not be sustainable in the district.** Therefore, this is marked in red.

Spring grazing is also critical, but here the impact percentages do not tell "the whole story". The snow and grazing conditions vary greatly from year to year, and an unaffected proportion of 49% is out of an assumption that the entire spring grazing area is available. This is not the case in the real world. The situation is that only parts of the spring grazing will be available, especially in the initial spring grazing period. In terms of reindeer husbandry, spring grazing is therefore much smaller than the plotted area, and it would require a more thorough analysis to calculate the exact, real spring grazing. It falls outside this report. However, we note that there is also relatively little spring grazing in the district, even though in isolation it is a somewhat smaller minimum factor than winter grazing. An important fact, however, is that the two minimum factors are chronologically in succession. This means that in years where both winter grazing and the spring grazing situation are difficult, and these difficulties often coincide, the district has major challenges when it comes to grazing access. Øyfjellet wind power makes this combination of minimum factors even more restricted, and increases the risk dramatically. The fact that such a large part of the spring grazing is on Øyfjellet and in the associated landscape, where there are more and more reindeer left until calving, is seriously affected for the reindeer grazing district. **In the worst case, this means that one of the siida shares must be terminated.** If they still choose to continue, there is a high risk that the proportion of surviving calves will be reduced, with consequent loss of income for all reindeer owners. Therefore, this is also marked with a reddish color, despite the lower proportion of influence.

The district still has plenty of summer pasture, where the color is set to green. There is less autumn grazing, as a percentage on a par with spring grazing. But still it is set to yellow color (and not red color) because it comes after summer grazing, which is not the minimum factor in this district. In the autumn and autumn-winter, the problems that the wind farm creates are not primarily of a grazing nature, but of an operational nature - as described earlier.

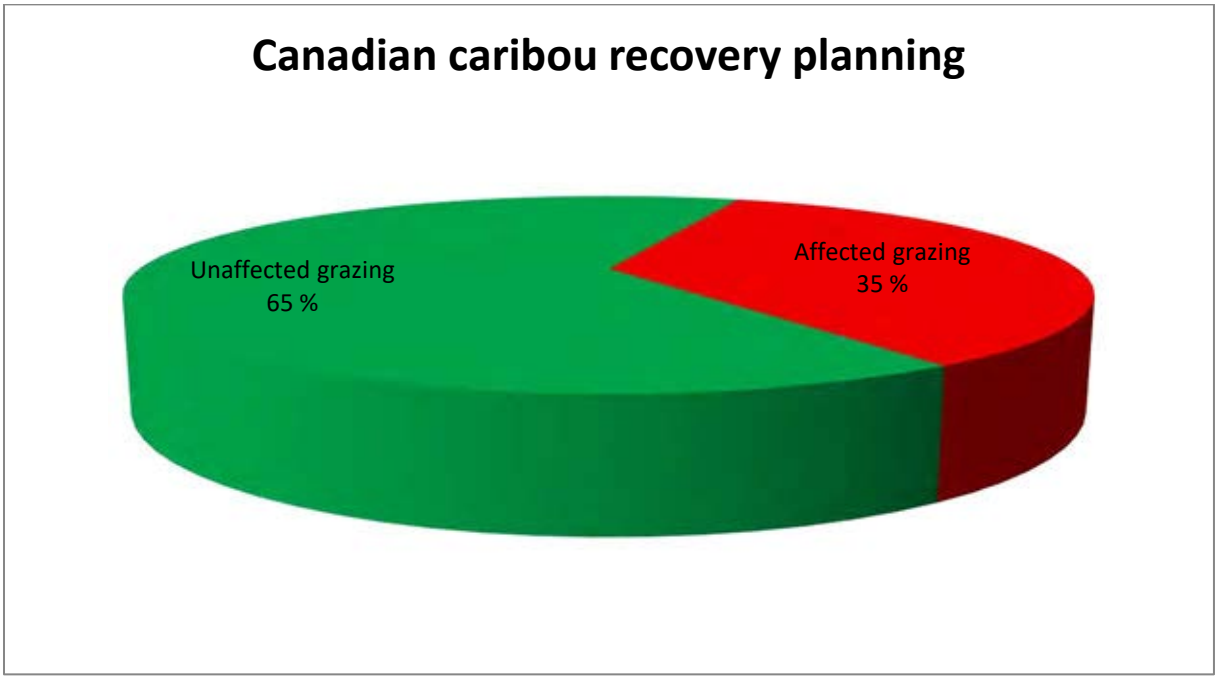
Ecological requirements for non-invasive zones

The question is whether the encroachments on the various seasonal areas are so large, with and without wind turbines, that the limit for normal, ecological requirements for non-invasive zones is exceeded. There is no agreed limit value in Norway or Sweden for the proportion of a reindeer grazing area that should be unaffected by disturbances in order to maintain the tolerance limit.

In Canada, the state Environment Canada in its Canadian Caribou Revocery Plan from 2012 has assumed that a grazing area, in order to be considered undisturbed including the impact areas, must be at least 65% undisturbed area for the reindeer herd to develop naturally . Now, it can not be said with 100% certainty that the conditions in Caribou reindeer herds in Canada are fully comparable with reindeer herds in Norway, but research shows that it is possible to compare the experiences from Caribou with the experiences from semi-domesticated reindeer at regional level. It provides a basis for comparison, even though Sami reindeer husbandry is governed by people according to inherited knowledge, patterns and traditions.

In Norway, it is consequently not only the reindeer herds and the landscape that are affected by land encroachment, but also the reindeer husbandry families.

For caribou, the ecological requirements are as follows:



Justification of the need for intervention-free zones

The reason for such requirements for intervention-free zones is that total cumulative effects of loss of grazing areas, documented by a number of research studies, according to the researchers Vistnes and Nellemann (2004) include:

- Loss of load-bearing capacity of the grazing areas
- Loss of reindeer herd production
- Increased predator loss when both reindeer and predators are squeezed together in smaller and smaller areas

The cumulative effects mentioned in more detail are described below, with reference to both research and traditional knowledge:

1. **Loss of load-bearing capacity of the grazing areas**

   There will be more reindeer in fewer grazing areas and thus increased competition for the pastures, increased congestion in the remaining grazing areas, which in turn leads to overgrazing in some areas (Cameron et. Al. 1992, Helle and Sarkela 1993, Smith et al. 2000, Vistnes and Nellemann 2001)
   the reindeer leave the areas if there are alternative grazing areas (Nellemann and Cameron 1998, Vistnes et. Al. 2001). This means increased and longer time use of other seasonal pastures (Vistnes and Nellemann 2004). barrier effects are formed

on the reindeer's natural migration routes, which cuts off access to certain areas (Dyer et.al. 2002)

Sami traditional knowledge about loss of bearing capacity on grazing areas[28]

From the side of nature, the reindeer is such that if it is allowed to graze scattered in peace and quiet, and move undisturbed from landscape to landscape, it will rarely or never destroy the grazing land. The reindeer graze in different periods on different grazing types, and thus the minimum grazing is saved for the critical phase when the snow conditions make fewer areas available. In summer, the reindeer graze on different grass types and leaves. In the autumn, it also grazes on grass, leaves of various types, fungi and eventually also something leaves. When the snow comes in the dark, then the reindeer mostly choose to graze on flat areas, in pits and areas with tufts, dwarf birch areas, around trees and bushes, in forest areas, in steep but shallow valleys with dense forest, deeper wooded valleys and lower lying, hilly terrain with elements of bogs, small streams, rivers, ponds, forests and small heights. During this period, reindeer graze less on treeless plains with forests or mounds around, flat mountains and mounds, palsy areas, elongated treeless ridges and other areas where reindeer will survive and graze when snow conditions become more difficult.

If the reindeer for various reasons have to change their natural grazing behavior, then the reindeer can contribute to wear and tear and trampling damage and temporarily change vegetation in shrub areas. In the reindeer husbandry's technical language, specific definitions are used for the extent and load on reindeer grazing and trampling, divided into levels and types based on traditional terminology:
Nivåinndeling på barmark og under snøsesongen:

- *Doldi* - roughly means that reindeer have grazed in the area during the bare ground season or on the bare spots this season, and the reindeer steer away from the pastures as a result of these being contaminated by the reindeer's own faeces, urine and trampling.
- *Duolmmastuvvan* - used especially when describing low grazing areas in bare ground time. This roughly means that the soil is contracted flat and no longer has the airy, porous consistency. The effects of compacted soil are that the growing conditions too low will be worse. *Duolmmastuvvon* occurs especially in low-grazing areas where there are long-term and repeated accumulations of large reindeer herds, such as. if the reindeer gather against physical barriers such as fences, large rivers etc. *Duolmmastuvvan* also occurs in cases e.g. if a reindeer herd "*bálgala*" (shuns insect pest in a group) or is frightened and hunted together in dry dry pastures (*jaŋas eanan*), especially in July / August. In such cases, it will have a double negative effect on the low-grazing areas

[28] Isak Henrik Eira in a report on the Halkavarri shooting and training field, March 2017. Based on interviews with holders of traditional knowledge, John Mikkelsen Sokki and Mikkel M.I. Buljo and notes from Marit Sara Eira.

and future growth conditions, namely that the land will be compressed flat and the crush-dry layer will crumble into small pieces. This form of "*duolmmastuvvan*" constitutes long-term damage to the low pastures.

- *Čilvi* - means strongly trampled pasture in bare field time. Čilvi occurs especially in areas where large herds of reindeer (or flocks of sheep) pass a passage in rows, such as. crossings on river beds or along the barrier fences.
- *Guorban* - used especially to describe the low grazing areas and roughly means that the grazing land has had extensive, long-term grazing load so that there is little reindeer lichen. In the context of bare ground, a situation with guorban often arises in connection with *duolmmastuvvan*. During the snow season, on the other hand, it is often the areas that are most often accessible during minimum grazing that can have such extensive "*guorban*". It can be noted that the term "*guorban*" has several scales*,*
  - *i. "guorbagoahtan"* - starting to get too low
  - *ii. "Guorban"* - almost completely free of lichen, but on closer inspection you can still find lichen under the heather
  - *iii. "Oalat guorban"* - completely free of lichen, even under the heather
- *Fieski* - defined in Sami "*varas guđohagat gos sáhtta ain leat guohtun",* which means areas where reindeer graze or have recently grazed during the snow season, and where grazing is still available.
- *Čiegar* - defined in Sami as "*boares guđohagat mat leat galbmon ja dákko ii leat šat oppas"*. In English, this can be translated as a description of areas where reindeer have grazed during the snow season, and where the grazing area on the snow has frozen again so that there is no longer grazing access in the area.
-

2. Reduced production in the reindeer herd as a result of

- reduced access to seasonal grazing (cf. the above-mentioned studies)
- that the reindeer are compacted in less productive grazing areas (Cameron et. Al. 1992, Helle and Sarkela 1993, Smith et al. 2000, Vistnes and Nellemann 2001),
- that the reindeer are more restless, move more in the terrain and thus consume more energy during grazing (behavioral study by Maier et. Al. 1998, Bradshaw et al. 1997).

Research studies further show that reduced production comes from that;

- The reindeer have both a reduced opportunity to build up body reserves and / or have a higher consumption of body reserves intended for minimum grazing in the winter, which in turn leads to lower meat density, fat mass and body weight, reduced pregnancy, lower calving percentage, reduced condition, lower survivability, and thus lower production in the long run (White 1983, Skogland 1985, Gerhart et al. 1997, Kinley and Apps 2001).

However, this applies to a lesser extent to adult bucks in time periods when these are separated from the rest of the herd (spring and summer), as several studies show that bucks more often ignore developed areas if there are no barriers that limit accessibility and that the area has good grazing areas (Dau and Cameron 1986, Pollard et al. 1996; Maier et al. 1998)

2. Increased predator loss when both reindeer and predators are squeezed together in smaller and smaller areas

- Research studies have shown a certain connection between predator density and predation pressure on domestic and wild prey. When areas decrease, it means both increased predator density and increased concentration of reindeer in the same area. The result is increased confrontation between reindeer and predators.

Climate change and cumulative consequences

In the climate research project «Ealat» on reindeer husbandry and climate change from 2008 - 2014, a collaborative project between Sami University College, International Center for Reindeer Husbandry, NASA, University of St. Petersburg, University of Tallinn, Norwegian University of Environmental and Life Sciences, University of Tromsø, Norway The Norwegian Meteorological Institute and others, the forecasts show that the average temperature will increase towards the year 2100. This means a significant change in the climate.

The EALAT project concludes that climate change will have the greatest impact on the reindeer husbandry industry in the Sami areas. The conclusion is based on the effects that warmer climates will have on snow conditions and other changes in nature. The effect on snow and icing will be greatest when the temperature begins to vary around 0 degrees for longer periods. It will happen in the winter, you will start to experience plus degrees in the winter in the years to come.

For reindeer husbandry, this means significantly greater unpredictability with regard to weather, wind and climatic conditions. Then more flexibility is needed in land use, no less, to be able to handle climate change and its effects.

This means that climate change is exacerbating the cumulative consequences of land encroachment.

Corona effects from power lines

Wind turbines require connection with a new power line, which affects reindeer husbandry.

The question of the reindeer's sensitivity to power lines has long been a topic of discussion. Many reindeer owners can testify that their animals, under certain circumstances, avoid power lines and do not pass them. A distinction must be made here between avoidance effects and

barrier effects. A barrier effect means that few or no animals pass. Avoidance effect means that a number of animals will pass the disturbance object while a large proportion of the herd abstains.

Research[29] has provided an explanatory model for this phenomenon, and shown that there is a high probability that reindeer avoid power lines due to corona light. The reason is that the reindeer's eye, unlike the human's eye, is of such a quality that it sees ultraviolet (UV) light.

Corona light is an electrical discharge caused by ionization of the air layer surrounding an electrically magnetized wire. This is common on power lines, especially lines with 132 kV or higher, but can also occur on smaller lines under certain conditions.

Image is from wikipedia, shows corona effect.

The coronal light is experienced by the reindeer as flashing in varying places. The light is transmitted at a wavelength that is not visible to humans, as a rule. The reindeer have large eyes compared to humans. The pupil of a human can be enlarged to 50 mm2, while the pupil of reindeer can be enlarged in the dark to approx. 350 mm2, ie 7 times more than for humans. This means that the reindeer's eyeball (retina) receives 7 times more light than the human. In addition, the retinal sensitivity of reindeer increases in the dark, especially in relation to UV light. The sensitivity is increased as an effect of changes in the so-called tapetum lucidum (a tissue found just behind the retina that amplifies the light for the reindeer and thereby improves the night vision for the reindeer). There is currently extensive research of approx. 400 animal species in relation to these problems - the reindeer is one of these species. In the

[29] Nicholas J.C. Tyler et al (2014), Ultraviolet Vision and Avoidance of Power Lines in Birds and Mammals, Conservation Biology

north, the dark season is long and the reindeer herds are in the same area as the power lines for large parts of the reindeer husbandry year, also in the dark season.

Cumulative assessment in relation to different seasons

All available reindeer husbandry areas within the reindeer grazing district are currently used as part of a comprehensive land use, even though there have been structural changes. New land encroachments will mean that the production base is reduced, with effects described above.

The high mountain areas with associated landscapes

The wind turbines are planned to be built on the high mountain areas. In these areas there are several of the district's relocation camps at the same time as the areas are central reindeer husbandry areas. The area in question with the associated landscape is a locality where the herds naturally gather and where they are actively gathered. When the herd is in this area, it is safely and stably preserved until further movement is initiated. In the area it is relatively easy to "store" the reindeer herd, the area is deserted and undisturbed. There are no houses or roads, and human activity is limited. For that reason, this is an area with several qualities for reindeer husbandry today.

Winter and springwinter

Establishment of the planned wind farm will close the relocation of the routes that run through the concession area. Only the alternative migration route over the water will be left, but it is not available every year due to ice uncertainty. The water is regulated to hydropower, with varying water levels, see object journal.

The reindeer herds are used to today's migration patterns and migration routs, and reindeer husbandry and reindeer husbandry work are again adapted to this. It is very time-consuming and resource-intensive to accustom entire reindeer herds to changing land use, and can not just be done within a year or two. Change is costly, both for reindeer and humans - and it must be considered whether reorganization is possible at all. An unpredictability and uncertainty is created regardless of when well-functioning, tested solutions are to be rejected. Alternative solutions have so far not been chosen by those who have run and run reindeer husbandry here. That tells quite a lot.

Changed movement means that the herd can not walk wide and calm, adapted to the animals' condition, endurance and the situation before arrival. The reindeer are much more enduring and there is less strain on animals when they can walk, graze and move at a pace that is adapted to the conditions.

Additional fencing work will be a consequence of the wind farm. Chasing in fences, reindeer herding and loading on transport vehicles are extra stressful, and there is a risk of injuring animals.

The planned area is high mountains. There comes the precipitation like snow. Therefore, there are often good snow and grazing conditions here. The areas will be lost as grazing land if the wind turbines are built.

In foggy and hazy weather the avoidance will be somewhat less, but as soon as there is clear weather the reindeer will dodge the area. The mills will be visible from a long distance. Traveling in areas that reindeer avoid can be more dangerous for shepherds. The terrain is hilly and steep, with transverse gorges and dangerous ice conditions in water and rivers nearby. In addition, there is varying telephone coverage in the area.

Spring and calving time

The flock of calves still calves mainly east of the E6 and the railway, although land use has changed somewhat in recent years. The changes have taken place gradually, i.a. as a result of a combination of land encroachment and structural changes. The merging of the districts has also contributed to change.

An important, influencing factor is that human activity has increased dramatically in these areas, disrupting reindeer herds. Developments and roads have opened up areas for public traffic, summit hikes and outdoor life have increased. The possibility of having separate flocks undisturbed has become less and less, and herding requires more and more effort because the flocks are disturbed.

Today, the herds can still move freely in the planned development area, graze, disperse and gather at their own discretion and according to the grazing and weather conditions in the area. An encroachment on this pristine area will therefore have far-reaching consequences. On top of the encroachments, climate change makes conditions even more unpredictable from year to year. Therefore, it is important to have flexibility and adaptability in the district's land use, which untouched areas give rise to. This spatial room for maneuver that untouched areas provide is thus the reindeer husbandry's long-term insurance scheme.

If the wind turbines are built, a larger part of the herd will probably have to go earlier to the calving areas on the east side. Then the pastures will be loaded in a way that in reindeer herding Sami is described as *"čilvi"*. A larger proportion of the flocks will also migrate to the areas that should actually be used somewhat later, so that the flock can also stay longer there throughout the summer. Then the phenomenon of "*doldi*" occurs earlier than normal. The result is that the herd must be released correspondingly earlier into the autumn areas. Such areas can take one or more years to "recover", provided that normal land use can be reintroduced next year. If not, an unfortunate land use will be cemented.

"Čilvi" and "doldi", combined with and as a result of the evasive effects that the wind farm will cause, will have a negative domino effect that strains the reindeer herds both in spring, summer, autumn and in the dark. This would be very unfortunate, considering the reindeer husbandry year as a whole.
One of the most important moments to be aware of when the herds have to enter the spring pastures too early with a limited number of bare spots in the beginning, is that these will wear out and overload quickly, and the herd will consequently move much more. It will no longer

remain stable in the area. The herd spreads over a larger area, and to areas that are not so favorable for calving. The work and herding effort must be increased, which entails additional costs and extra work. At the same time, it is unfavorable for the reindeer herds, especially the females, to have to be disturbed and relocated by shepherds to maintain control. Both milk production and calf growth are reduced. The quality of the calf becomes poor or mediocre, at the same time as both the number of calves and weight are reduced. Both the birth rate and the survival rate will fall.

The researcher will estimate that total calf production in the autumn will be reduced on a permanent basis, compared with today. When the weights are reduced too much, there may be reduction demands from the authorities in relation to reintall. Another factor is that land encroachment causes disappointment among reindeer herders, the people in the district feel overwhelmed. It can go beyond motivation, job satisfaction and recruitment.

Early summer, midsummer and autumn summer

The flocks migrate to high mountain areas on hot days and when there is a lot of mosquitos and other insects. In the afternoons and evenings, the flocks drop further down to river valleys and lower-lying areas with good grazing conditions.

It is important to note that the high mountain areas not only function as areas that the reindeer attract to avoid insects and heat ("*bálgat*"), but these are also important grazing and living areas. Deductions for rent and rest areas ("*livvasajit"*) show where the flocks migrate and stay both in spring, summer and autumn and at different times of the day.

High mountain areas can also have snow patches longer, which melt day by day on hot days. Along these snow patches, there is continuous growth of nutrient-rich, fresh grasses and herbs throughout the summer. The grass is short and extremely nutritious and the reindeer are very fond of this particular type of pasture. At the same time, there are also grassy areas immediately below the high mountain areas. This means that in such areas you have a unique combination of good aeration sites and grazing sites in the immediate vicinity of each other.

Towards the autumn, the flocks gather again a little more. Has the herd started to gather too early due to. encroachment and disturbance, the herd must enter the autumn pastures ahead of time. If this happens, one must ask oneself whether the autumn area can get sufficient rest. If not, it will go beyond the reindeer herd, the rut and the production.

In this way, wind turbines on other, former seasonal pastures will expel the reindeer to the next seasonal area prematurely, and also have a negative impact on the landscape far beyond the local and intermediate scale.

Autumn and heat

After the slaughter has been completed, the herd must be moved to winter grazing. Then the river Vefsna, E6 and the railway will be crossed. This is a demanding reindeer husbandry operation before reaching the high mountain areas on Øyfjellet, where the landscape has a facilitating effect so that the herd is normally under control. This high mountain area is a very good area, it "holds on" to the flocks. Especially when you gather on the east side, you lead

the flocks to the high mountain areas. Today, the landscape leads the flocks in the right direction, if they were to move. This is predictable and beneficial.

A wind power development will mean that the flocks will not stay here, and will most likely spread. If it happens during this period, in the dark, one will lose control of the flocks. This risk arises already during the construction period, the herd will already then start to adopt an unfortunate behavior. Then it takes at least one reindeer generation to wean the flocks again - if at all possible anymore because the landscape will be permanently changed.

The time of darkness until the reindeer herd separation

Land encroachment on the east side of the E6 and the railway has led to an increased door opener effect in recent years. The herd no longer has the peace to stay to the same extent where it used to. The increase in human activity frightens the herds and has made it difficult to collect reindeer in recent years. Climate change has also made snow conditions more demanding, and the risk of the herd spreading has increased considerably. Some years the snow and grazing conditions push the animals down into the wooded lowlands, towards the railway. It goes beyond the degree of aggregation before moving and increases the risk of collisions.

The district has also used helicopters to gather flocks to the west. But the days are short during this period, and the weather varies with both precipitation and fog. This makes the work demanding. One can not e.g. fly days there is a lot of fog, and even if you can fly e.g. in the lower-lying areas, the collection effect will be limited due to that it is difficult to see reindeer in such weather. Helicopter flying is also not without risk.

Before the reindeer move, the herd must gather north on Reinfjellet, and drive through the fence. Slaughter animals are separated here. From the fence there is a guide channel to the loading ramp by the road.

The high mountain areas in and around Øyfjellet function as mentioned above, as a collection area during relocation - after the E6 and the railway have been passed. The area does not currently have interventions that scare reindeer. Precisely for this reason, the area works very well for this central part of the reindeer husbandry work and in the herd's land use. There you gather the herd before further moving. The high mountain areas have such a character that they attract, stop and hold on, at the same time as they lead the flocks in such a way that the land use and reindeer husbandry work works well together in the relevant time period.

The high mountain areas keep the reindeer in a favorable way. Water and rivers must freeze before moving, especially over water so that both reindeer and humans can cross. After the flocks begin to arrive in the area, crews must be sent out to collect the flocks that have been left on the east side of the railway. There can sometimes be several hundred animals left and collection can take several weeks.

A particularly demanding barrier here is the railway, where reindeer are hit annually. In the worst years, over 200 production reindeer are killed by the train. When Øyfjellet is lost as a collection area before further relocation to the winter pastures, a collection solution must be established that is reindeer husbandry sound.

The area in which the wind turbines are located, where the flocks will no longer stay. The area will scare away the reindeer instead of attracting them. The herd will then spread, and entail a lot of extra work. Then you will no longer have the capacity to herd and work with the remaining flock parts on the east side. It goes again beyond i.a. the district's fencing work in connection with. slaughter, and will greatly reduce the possibility of a favorable and overall slaughter. The herd will simply be too scattered. This can lead to large loss of income.

What is a probable scenario is that the main flock leaves the development area completely and permanently. The herd will then relocate both on the south side, but not least to the east and west. This means that the herd will enter other seasonal pastures prematurely. An unfortunate land use occurs, and gives a domino effect.

The area as winter pasture

The area can also serve as a grazing area for parts of the winter. In such areas with slopes, the reindeer can more easily dig grazing pits, the snow "rolls" away more easily. This makes it easier for the reindeer. Snow quality is also more stable, partly due to high altitudes with relatively stable temperatures. Therefore, this type of area also works in the winter, at least for parts of the herd.

In recent years, the district has also used the area in the winter. This is due to the fact that there have been poor snow conditions as a result of the weather, which results in demanding grazing on the winter pastures in zones 1-5. The district has left part of the herd here, this has been opened up for in the rules of use, even though the land use maps do not show that the Øyfjell area is also used as winter pasture.

In the higher areas and on the barren mountains, there are plenty of lichen, and between the rocks a type of mountain grass that the reindeer is particularly fond of; *sitnu.* In such mountain landscapes there are often small water springs, around which sitnu often grows. Some of these can be open all winter, then the reindeer have the opportunity to graze around these.

If the wind turbines with associated infrastructure and installations arrive, these areas can no longer be used for winter grazing.

The relationship to predators and other effects

The district has problems with predators. As encroachment increases, reindeer herds must more often and to a greater extent gather and concentrate in the remaining, untouched areas. The predators do the same, naturally enough. Restricted areas provide less escape for reindeer, so it is considerably easier for predators to kill reindeer.

This high mountain section holds the flock, making the flocks more predictable and thus easier to find over several seasons. If the wind farm is established, the function of the area will change to the opposite of today. The area will then start to scare and spread reindeer, rather than "holding on" to the herd.

The associated power line and roads divide the landscape both physically and visually, and provide an avoidance effect, barrier effect and dispersal effect. These effects divide and disperse the herds, and mean that the reindeer do not get pasture rest as they do today. The reindeer will leave the area. The barrier effects will be particularly relevant in spring and autumn.

Categorization of consequences

Consequences local scale

Local scale	Landscape	Reindeer	Man
Direct	The wind turbine plant with other infrastructure changes and fragments the landscape. Barriers are established both physically and visually. In addition, wind turbines will give a continuous sound when they spin around. Avoidance effects occur. If, against all odds, reindeer herds enter the area, the internal roads will have a fragmenting, leading effect. Rocks from blasting will be scattered along the roads and wind turbine foundations. The relocation routes through the development area will be destroyed for traditional relocation. The activity during the construction period will have a disruptive effect in the landscape, the disruptions will persist permanently during the operating period. The landscape's function for	Reindeer and reindeer herds will dodge the areas. The effect is particularly negative for migration routes both in spring and autumn, and for the reindeer's migration routes in connection with. stay and grazing in summer, early winter and late winter / early spring. Winter grazing in teams with the subsequent spring grazing is minimum grazing. The reindeer's use of the area as a collection and grazing site will cease due to avoidance effects. Mills with internal roads and power lines are barriers to the reindeer's migration routes, migration and grazing patterns. Road establishment up to Øyfjellet provides a door opener effect for other users, which further disturbs the reindeer.	In the spring, more concentrated migration must be carried out, the barrier effect also entails an increased risk of reindeer remaining or spreading. Closing migration routes has effects far beyond the local ones. Additional work occurs and the operational risk increases dramatically. Reindeer herders can no longer use the area. this will mean that the herd can no longer be released south from Demmerdalen as the district usually does. The reindeer will pass the wind power area far too quickly, and you will lose control of it. A danger of uncontrolled crossing of the railway will arise. The part of the herd that turns around will have to consume more of the winter grazing resources at the same time as such a spread will entail a

	reindeer husbandry will disappear, the changes are so serious that the area can no longer be used for reindeer husbandry. The loss of unaffected landscape with both living and grazing land as well as migration routes, also has consequences for access to the necessary use of the landscapes in winter grazing zone 5 further northwest in the area.		relatively large amount of extra work. If a single reindeer enters the planning area, it must be retrieved. It is uncertain whether this can be done. Prior dialogue and planning with the wind power company will be necessary to stop the turbines during collection, which makes the work cumbersome. Damage killing of predators within the field will also not be possible, it is uncertain whether it is allowed to shoot within the area.
Indirect	Increased affected area results in increased grazing load and wear on other, unaffected grazing areas. The landscape's flexibility is reduced, the action alternatives with regard to overall land use is reduced. It is unclear which landscape will be used as a collection area if Øyfjellet wind power is built, no alternatives within reach.	Disoptimal grazing utilization in the form of a dramatically lower degree of utilization locally in the development area and higher grazing load in other areas increases the reindeer's energy consumption, lowers energy uptake and increases the need for mobility. Increased mobility as a result of avoidance results in poorer condition and lower production.	Less room for maneuver in reindeer husbandry work arises, which makes the implementation of grazing adaptation and relocation considerably more demanding. Blue. this means more capture, calming down and relocation of hurried and frightened reindeer herds as a result of evasion effects, barrier effects and door opener effects.

Cumulative	The landscape will have a barrier effect visually, physically and by sound on migration routes and moving routes. Fragmentation of the grazing area results in a permanent landscape change that reduces access to and quality of critical collection areas. The landscape can no longer be utilized as flexible grazing, ordinary reindeer grazing,	The landscape will have a barrier effect visually, physically and by sound on migration routes and migration routes. Fragmentation of the grazing area results in a permanent landscape change that reduces access to and quality of critical collection areas. The landscape can no longer be used as flexible pasture, ordinary reindeer grazing, , as well as hearing	Increased operational risk business and human, lost revenue, increased costs. Will provide a more stressful work situation for the reindeer husbandry families during the periods when this area is normally used for reindeer husbandry. The change will place an

	collection area and moving and grazing area in the autumn and just before calving. The dependence on other areas will increase.	the sound, at a very long distance. Provides extra large distances for the reindeer, especially in clear weather.	additional burden on the seasons in which the work takes place here

Consequences intermediate scale

Intermediate scale	**Landscape**	**Reindeer**	**Man**
Direct	An increased degree of concentration results in a disproportionately high grazing pressure in some grazing niches, especially on minimum factors such as winter and spring winter. Infrastructure and activity cut off the landscape in question as a reindeer husbandry area that today has various, complementary functions that complement other areas in the district. In summer, the qualities of this important landscape have deteriorated. In the autumn-winter, the natural, reindeer-collecting functions of this landscape are destroyed. The landscape's facilitating effect for the use of winter grazing zone 5 is destroyed. The value of the landscape as a reindeer husbandry area is devalued. The area's function as an area for dealing with climate change is disappearing.	Disoptimal grazing adaptation for the reindeer, especially if access to winter grazing is cut off. An increased degree of concentration in the reindeer herds on other winter pastures will over time lead to the condition of the animals and production being weakened to a stable, lower level. Less winter grazing and lower flexibility in the grazing transitions between autumn and winter and winter to spring will result in significantly poorer animal welfare. A direct consequence of a cut-off will be that rotational grazing in winter is no longer possible, which means that winter grazing zones 1-4 will no longer be able to rest. This is not sustainable land use for the reindeer herd in the long run. Although zone 5 can still be used, provided that relocation solutions are established, there will be a significant grazing loss that will have two effects, either	There is a high probability that the mitigating measures will not work well in that the use of these presupposes more planning and coordination than one is able to implement. The threshold for actually being able to use zone 5 can be exceeded, and thus one will not have the working capacity to utilize zone 5. The other zones will in practice be more accessible, and easier to choose. Individual animals can get lost in the planning area, and this will involve an additional stress factor because staying for reindeer in such an area is not considered safe. And if the reindeer passes the wind power area, it must be turned over to keep the herd together, and then you have to move the reindeer several times over the most risky area. This will be a huge, added stress for reindeer husbandry on top of the natural stress factors such as bad weather, bad ice,

		winter grazing must be used longer than normal and / or the remaining spring grazing must be loaded harder since this transition area is lost. Both will have a negative impact on the reindeer's production.	poor driving, varying grazing conditions and not least the fear of having the reindeer herd hit and killed by the train, as has happened every spring and autumn. In recent years.
Indirect	The remaining minimum pastures in spring, winter and spring, as well as the remaining summer and autumn areas will be increased. The landscape thus provides less food per. reindeer through the reindeer husbandry year. Increased disturbance in the aeration landscape causes trampling damage in more vulnerable landscapes. Disturbances and changed landscape use result in shorter productive grazing time in the summer grazing area.	Increased grazing competition between individual animals and herds of animals occurs when the grazing areas become smaller. This especially applies in relation to winter grazing, which is already the minimum factor. Poorer winter grazing increases the risk for last year's calves and bulls, but also for sims and spring calves. A significantly higher calf loss can be expected. Less land access and calf loss results in lower production on all animals. Increased concentration of both reindeer and predators on the remaining untouched areas, increases the confrontation rate because the escape possibilities become fewer. This provides less living and grazing peace, and thus lower animal welfare. The pressure on other areas is increasing.	Operational adjustments as a result of other land encroachments and climate change have already led to more demanding reindeer husbandry. Adaptation options have already been exhausted, especially in relation to winter grazing and especially moving rents to and from. Operations have become more tiring, more expensive and the operational risk will increase further as a result of the development. The risk of conflict will increase with changed grazing behavior, especially the potential for conflict with agriculture in zones 1-4 will increase dramatically. This is demanding to deal with. Increased predator losses, calf losses, lower animal welfare and production losses place both financial and human burdens.

Cumulative	Disoptimal land utilization due to land encroachment means that a natural grazing load is not ensured. In this landscape there will be too low grazing load, while in other parts there will be an overload. In the long run, the vegetation's total grazing value changes negatively. The cumulative effect of past, present and future land encroachments / disturbances on the landscape is increasing. The relative value of the relevant, undisturbed wilderness landscape has therefore increased significantly in recent years.	Negative behavioral changes in reindeer, including an increased degree of concentration in other areas, result in increased calf and predator losses, as well as increased mobility. The animals must be exposed to more intensive herding and repatriation, especially to the impact zones for the various encroachments. Provides less muscle building, bone structures fat stores in all animal categories, as well as declining milk production in sims. Provides lower survivability and production on all animals in the herd.	The move through the area is made impossible due to. the cumulative effect of both hydropower and wind power. Alternative relocation solutions are uncertain whether they can be implemented. Moving across Hundålsvannet is in all cases associated with extremely high risk, both for reindeer and humans. Increased stress occurs because the uncertainty is now great for the affected reindeer husbandry families.

Consequences regional scale

Regional scale	**Landscape**	**Reindeer**	**Man**
Direct	Increased preasure in the other areas results in vegetation changes in the landscape. This is especially true in low-growing areas. In addition, the flocks are pushing to a greater extent against the areas that are still untouched by encroachment, which gives increased impact in the form of trampling and grazing in this landscape. The cumulative grazing value of the landscape falls dramatically.	Disoptimal flock behavior, larger concentrations of reindeer herds to the east and west. Charges the reindeer and contributes to the establishment of unfortunate behavior. There is a great danger that the reindeer's addictive behavior together with the herd instinct will cement an unfortunate herd behavior, which in the long run results in significantly lower	Extra work and additional costs undoubtedly arise. It is uncertain whether the district will be able to handle this if the economic base is so reduced that the number of reindeer must be reduced. Climate challenges have increased and the need for flexibility in land use has become more critical. At the same time, real action alternatives have been reduced, and especially in seasonal grazing after the critical minimum factor for winter grazing. Provides increased uncertainty and less faith in the future. Today's use of winter grazing zone 5 can not continue

		production for all animals.	if the migration breaks down. Use of the spring pastures in the Øyfjell area can not continue.

Indirect	Decreases in the landscape's total grazing value result in shorter grazing time. In this case, an alternative is earlier moving in to the next season grazing, but that will only postpone and accumulate the problems later in the season. The rest of the remaining landscape is thus exposed to a longer and more intensive grazing and trampling load, which goes beyond the landscape's reproduction. Even if human activities in other areas are limited, for example the closure of scooter tracks is of course necessary because the land on Øyfjellet has been lost, this will still not be able to offset the loss of this landscape.	Lower utilization of the high mountain areas with their surrounding area within the summer grazing area and the other seasonal pastures, and correspondingly increased utilization of other grazing areas, especially the winter areas and calving areas, results in lower survivability and increased losses. The probability of an unfortunate herd behavior being established is high. Earlier arrival in the calving country means that the reindeer graze on the best bare spots too early, and this year where the snowmelt is slower, the reindeer will need absolute grazing peace. Then other activity in the area must be restricted, for animal welfare reasons. If grazing is not ensured, the survival rate will fall dramatically.	Extra work causes increased stress and wear and tear on operating equipment. It will be impossible to run reindeer husbandry at the same level as today. Reduced calf percentage results in fewer slaughter animals and loss of income. Business risk increases, as do costs while revenues fall. Provides an operational basis for fewer people. Opportunities for further development and growth in reindeer husbandry are effectively cut off with this area intervention. Demand for reindeer meat is growing, as are prices. In the last 3-4 years, the reindeer meat price has increased by 30%. Being able to extract an excess return during normal operation in the reindeer grazing district is destroyed by the encroachment on the area. Ie. reindeer husbandry families lose income increases.

Cumulative	An enormous wind turbine power plant, together with associated roads and power lines in the landscape, provides an overall non-optimized grazing adaptation within the individual seasonal grazing. It also provides disoptimized transitions between the seasonal pastures and associated landscapes. A negative domino effect in overall landscape use arises and is cemented. Landscape destruction weakens the ecological basis for reindeer husbandry. Further optimization of land use is made impossible.	Disoptimal herd behavior results in unfavorable land use. The avoidance effects result in a lower growth rate and lower total production on all animals. The need for reindeer herd adaptation can arise when there is less and less remaining untouched reindeer husbandry area. Smaller wilderness area also provides fewer escape opportunities for reindeer, and results in increased predator losses. The reindeer can avoid other encroachments, which can be very risky. For example. train track, road, steep mountain sides where reindeer end up in avalanches, regulated waters with dangerous ice m.m.	The cumulative effect results in lower profitability at the same time as the business and operational risk increases because the intervention increases barrier and avoidance effects and reduces the industry's area base, flexibility and resilience to climate change and new area interventions. The district's resilience is severely weakened, the district must reduce its reindeer husbandry and the South Sámi culture is weakened. A weakened ecological basis has both economic, social and cultural implications.

Risk and Vulnerability Assessment (ROS)

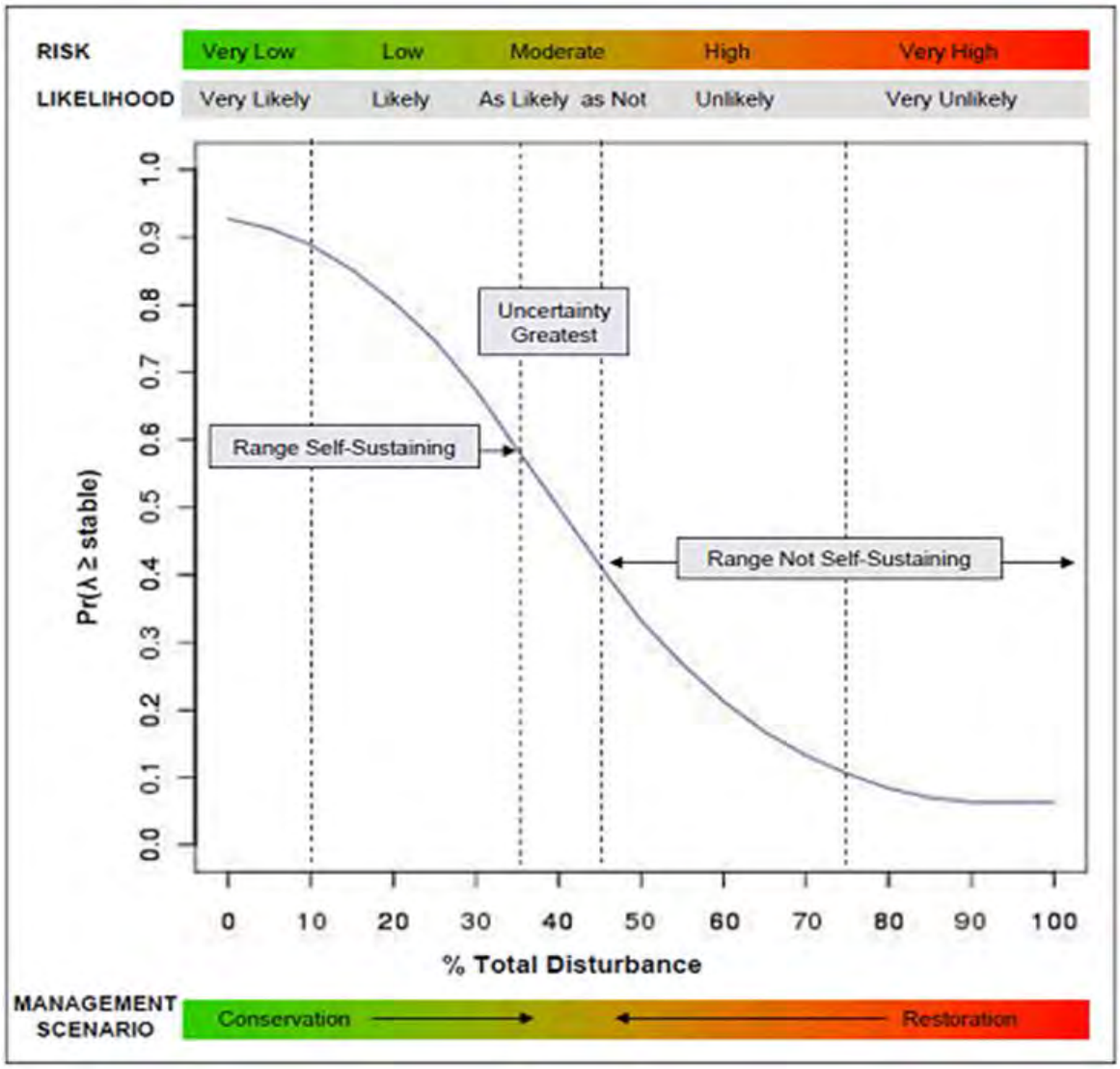
The risk and vulnerability analysis (ROS) is summarized below with regard to the degree of impact locally, intermediately and regionally and is presented in a risk matrix in relation to the most critical reindeer husbandry variables in this case. It is based on a probability model.

Probability model

As no limit values have been set in Norway for the proportion of a grazing area that can/ should be unaffected by land encroachment / disturbance, as previously mentioned, we have looked more closely at the probability assessments in the Canadian State Environment Canada in its *Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal population, in Canada - 2012.*[30]

[30] http://www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=33FF100B-1

As is well known, 65% of untouched area is defined as a limit for when a population has a sufficiently high probability of being sustainable by itself. In their research, Anna Skarin and Birgitta Åhman have shown that it is possible to make comparisons between wild reindeer and domestic reindeer on the intermediate and regional scale. When linking tolerance values to probabilities, it looks like this:



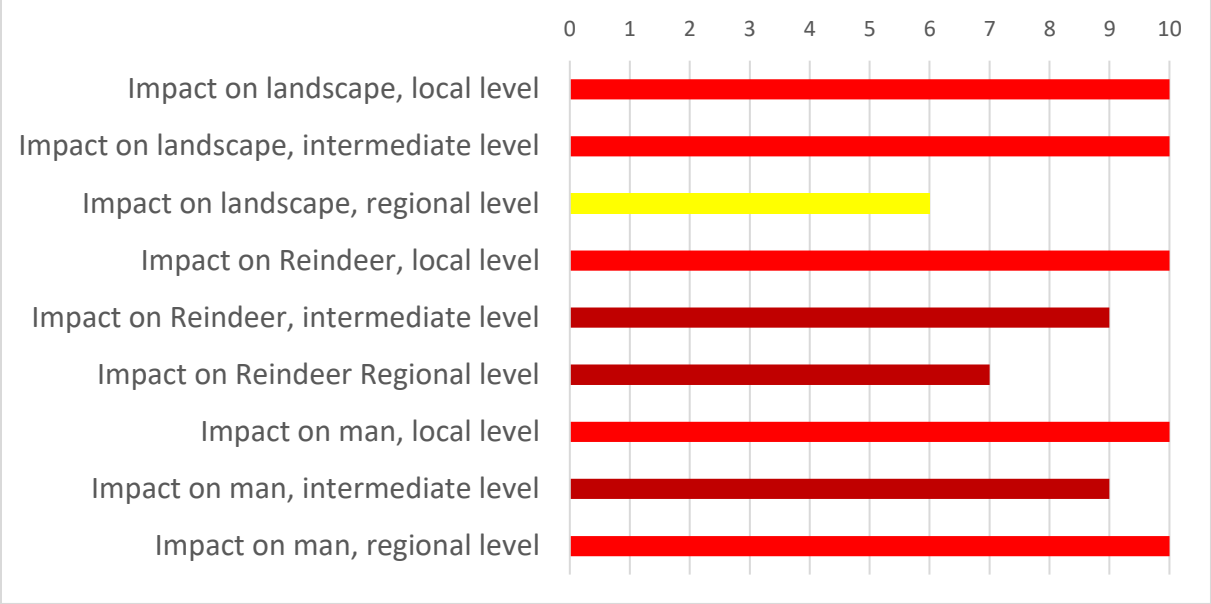
The picture shows how the probability of a viable population is an inverse function of increasing influence. We see that when the impact is on 45% of the area, it is approx. 40% probability that the population is sustainable by itself. This probability decreases in step with increasing land encroachment.

In practice, this means that more effort is needed, in working hours and machine effort, to compensate for the area loss initially. Eventually, however, such efforts will not be enough. We see that if the impact is 75%, there is only a 10% probability of sustainability.

This increases the need for measures and compensations, e.g. for the increase in risk means loss of area for the population of reindeer.

The degree of influence of the primary object – Øyfjellet wind park

Impact in relation to local, intermediate and regional level.



Risk matrix

Risk matrix in relation to the influence of a selection of critical factors revealed in the reindeer husbandry professional assessment, with a focus on the landscape, the reindeer herds and the reindeer husbandry work (the people)..

	Landscape			Reindeer			Man		
Impact	**Local**	**Inter-mediat**	**Regional**	**Local**	**Inter-mediat**	**Regional**	**Local**	**Inter-mediat**	**Regional**
Degree of impact on reindeer husbandry	10	10	6	10	9	7	10	9	10
Loss of grazing and living land									
Loss of relocation route or other infrastruct									
Grazing wear									
Noise, disturbances									
Loss of reindeer, production, income									
Extra work, additional costs									
Risk change									

The colors indicate the need for mitigation measures and other measures, ie are an important starting point for part 2 of the report, see the explanation below:

Legend				
Actions	**Not necessary**	**Should be considered**	**To be considered**	**Necessary**
Scaling consequences	1-3	4-6	7-9	10

Summary assessment

Relocation/migration routes are strongly affected by the wind farm and there is a high probability that the relocation routes through the licensed area for the wind farm will no longer be usable. The alternative relocation route over the regulated Hundålvatnet is fraught with such great uncertainty with regard to ice conditions and safety for both animals and humans, both spring and autumn. The uncertainty is so great that it cannot be used every year. This is supported by experiential knowledge. The reindeer grazing district has managed to handle the development of Hundålvatnet, because there were alternative migration routes over Øyfjellet in the years when the rout over Hundålvatnet could not be used. With development on Øyfjellet, the alternative relocation routs will also disappear. Climate change will further increase the risk. The cumulative effect is that normal relocation cannot be carried out.

Of the seasonal pastures, the development is hardest beyond the spring pastures. In reindeer husbandry, spring grazing is particularly important, after winter which can be both long and climatically demanding for reindeer. From before, spring grazing is considered a minimum factor so that the intervention reduces the minimum grazing.

The second minimum factor is winter grazing. If the closure of the migration opportunities to and from winter grazing zone 5, which is furthest northwest, occurs, the reindeer grazing district will lose an estimated 20% of winter grazing.

Consequences for summer and autumn grazing are considered to be easier to handle. Here, it should be possible to compensate for the losses via compensation for production and turnover losses and by compensating for additional costs for increased human and mechanical work effort in full.

The cumulative area encroachment situation shows that winter grazing and spring grazing are the minimum factors, and that these are right after each other in time. The encroachment affects the access to and from winter grazing, and affects spring grazing directly. In this sense, the intervention has a negative effect on the minimum factors.

The additional function of the concession area today as a unifying area for reindeer is changed to have a dispersing function with the addition of barrier effects. Visuality, rotation, light, shadow cast, sound noise and the internal road network contribute to it. The reindeer's extremely good eyesight and hearing combined with a sensitive behavior from nature, will create great evasive effects.

When the temperature varies around 0 degrees Celsius and under certain weather conditions, icing occurs from nature's side, and it is probable that there is also a risk of icing from the propellers at this altitude. The period of moving from autumn to winter grazing often

coincides with this. Establishment of connecting roads and internal roads will contribute to increased human traffic in the concession area. In addition to inspection and maintenance work, this will have a door-opening effect on outdoor life. The access road in particular opens up the mountain areas in and around the concession area. Increased human activity means increased disturbance to reindeer. A roadblock will help against legal, motorized traffic. However, it will not have an effect on non-motorized traffic and any illegal motorized traffic that also occurs from experience when construction roads are established in pristine wilderness.

Procedural costs are high for a district, which already has many other land issues to deal with. Dialogue and cooperation in both the construction and operational phases require large administrative resources from the district. The district already lacks the capacity for this type of work.

Summary shows that reindeer owners are strongly affected by the fact that the wind power plant entails additional work and additional costs, as well as higher reindeer losses and lower production in the reindeer herd. The result is lower profitability in the industry. When it comes to extra work, it gives increased wear and tear on people in the form that the work becomes heavier through increased number of miles on ATVs and snowmobiles, it must be herded more, because must be transported, etc. The number of field days and the number of people in the field increases significantly. The risk of accidents also increases dramatically, because operations must be carried out more frequently in more dangerous areas as a result of the displacement of the animals. In particular, the risk of train collisions increases as long as there is no fence on both sides of the railway. The wind farm is being built in an area that the reindeer come to, right after the reindeer have crossed the railway in the autumn and winter.

An indirect consequence is that the pressure increases on other grazing areas within the same seasonal grazing, and that this pressure gradually propagates to other seasonal pastures. An unfortunate domino effect with regard to grazing occurs. It causes increased wear not only on humans and reindeer, but also on landscapes.

As the study has revealed, reindeer husbandry is dependent on flexibility to be able to parry the weather, wind and the outside world. Flexibility is the reindeer husbandry insurance scheme. Cumulatively, we see that this land encroachment alone reduces the reindeer husbandry's flexibility in land use, the choice and adaptation possibilities are constantly reduced. With regard to moving the routs, we consider that the opportunities have already been used up. Seen in connection with other land encroachments, we see that the problems are accelerated and the risk becomes very high.

Less flexibility in grazing use makes it even more difficult to deal with climate change, both those that are already being experienced and those that will come. We see this from the fact that the temperature variations during snow-critical periods will to a greater extent be centered around 0 degrees in the near future. In total, the increased, overall uncertainty gives significantly higher operational and business risk for reindeer husbandry as a whole. This is perhaps the biggest problem in the long run. The question is whether the increased risk can be compensated at all, and if so, how.

As is well known, high risk must, in accordance with common financial theory, be followed by a higher required rate of return from production. It is challenging, and almost impossible for reindeer husbandry alone, to ensure a higher return as a reflection of the increased risk that this development gives the district. And such a higher risk-taking, even if it should give a slightly higher return - is hardly desirable. Operating in a high-risk industry is stressful for people, because the probability of unfortunate situations increases. It provides increased stress levels, which no one wants.

A highly probable cumulative consequence of the intervention is that reindeer husbandry's primary production and net income are reduced due to the area intervention. Net is reduced both through a decrease in turnover (volume and quality reduction) and an increase in costs. **The risk of one or more members of the dustrict having to close down operations is imminent**. And should that happen, fewer reindeer owners will lead to reduced access to skilled labor, which is a problem especially in smaller reindeer grazing districts such as Jillen Njaarke.

In addition, of course, the opportunities for the remaining reindeer husbandry companies to be able to increase profitability, possibly maintain the same operating level and profitability with an acceptable level of risk, will be effectively cut off from the encroachment on the area.

Further process

The developer's time and activity plan, cf. MTA plan / detailed plan for the line network between Kleivan and Marka transformer station, Norconsult 4.3.2019.

Spring 2019: Tender process - contracting with contractor for line construction.
Autumn 2019- spring 2021. Construction process
2021 - 1st quarter. Voltage setting of line
2021 - 3rd quarter. Operation of the wind turbine.

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