Human rights impact assessment in Sápmi: a methodological framework

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Abstract

Emerging due diligence laws aim to ensure a just energy transition but leave companies with considerable discretion. In this paper, we explore the role of human rights impact assessment (HRIA) as an arena for clarifying corporate accountabilities – interpreting and synthesizing international law standards on Indigenous rights, international guidance on HRIA, methods for community-based impact assessments, and research about the impacts of competing land uses. We focus on Indigenous Sámi reindeer herding in the Nordics – a high-risk context for human rights violations seeing growing mining interest in relation to the energy transition. The criteria-based framework defines six preconditions that must be protected to ensure that herding communities can enjoy their collective rights to land and culture – notably the cultural practice of natural grazing-based herding and its seasonal migration. As case study we examine Swedish state-owned mining company LKAB's proposed project 'Per Geijer', i.e., the application for a concession permit on the traditional lands of Gabna reindeer herding community – with analysis demonstrating how LKAB's project entails a significant risk of violating the Indigenous rights of the members of Gabna. We conclude with reflections on the incompatibility between Indigenous ontologies and colonial licensing regimes, and the need for critical and engaged research together with Indigenous rights holders. Our final argument is about how improved industry performance must be accompanied by proactive government policy, addressing the root failures in land use planning and licensing regulations.

Keywords: Mining; human rights; Indigenous; Sámi; Sweden.

ACKNOWLEDGEMENTS

This paper is an output from two research programs: The Mistra Mineral Governance program, funded by Mistra – The Swedish Foundation for Strategic Environmental Research, and Energy Transition and Democratic Engagement in Sápmi, funded by Nordforsk/Formas (grant no. 2024–01188). We direct a warm note of gratitude to the members of Gabna herding community for the trust and collaboration that made this study possible, especially chairperson Lars-Marcus Kuhmunen and board members Karin Kvarfordt Niia and Anna-Karin Niia. We also thank Ragnhild Nilsson (Mid-Sweden University) and Maria-Therese Gustafsson (Stockholm University) for valuable comments on the underlying project report.

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1. INTRODUCTION

Mining is a well-known cause of human rights risks for Indigenous Peoples, globally [1]. Whereas this is nothing new [2], several human rights bodies have in recent years flagged how risks are accentuated by the growing minerals demand for the energy transition [3]. The mining industry has been resistant to acknowledge its responsibilities regarding human rights [4], but recent years have seen some movement due to mounting expectations from customers and investors, e.g., through voluntary sustainability standards. Meanwhile, as noted by various UN expert mechanisms, such voluntary measures remain insufficient to prevent human rights violations [5].

As discussed in a growing scholarly literature concerned with a just energy transition, one political response to the lacking efficacy of corporate social responsibility comprises of new, binding human rights due diligence rules (see review in Schilling-Vacaflor et al. [6]). As a case in point, inspired by legislative action in individual member states such as France and Germany, the EU passed its corporate sustainability due diligence directive (CSDDD, Dir. 2024-1760). Despite subsequent weakening through the EU's so-called Omnibus package, this directive establishes a new obligation for the largest companies to avoid or mitigate risks for human rights as well as a new civil liability that can be activated in cases of violations. This is important, inter alia, since the European Union (EU) is one of the advocates of mineral extraction for energy purposes, notably through the Critical Raw Materials Act (Reg. 2024/1252, CRMA). A central mechanism in the CRMA is the European Commission's designation of so-called strategic projects for energy and security purposes, with fast-tracked licensing and easier access to financing.

Recent research has shown, though, how these new due diligence laws still leave companies considerable discretion and limited accountabilities [7, 8, 9]. From this view, new rules on due diligence risk remain half-hearted attempts to compensate for more fundamental failures in land use planning and project licensing, including asymmetries in power and resources between companies and Indigenous groups. The corporate discretion

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in new legislation also pertains to significant room to interpret international due diligence guidance [e.g., 10,11,12] that by nature is generic and must be adapted to local cultural contexts.

One central tool for the operationalization of these due diligence responsibilities is human rights impact assessment (HRIA) – one of the central steps in a due diligence process [13,14]. In contrast to earlier waves of impact assessment, e.g., environmental and social impact assessment, HRIA explicitly focuses on human rights rooted in international human rights law. HRIAs comprise, hence, an important arena for clarifying the expectations placed on mining companies in the energy transition, especially if given weight via government guidance, court jurisprudence, and branch standards. Meanwhile, for many Indigenous contexts internationally, there remains a lack of understanding about how international standards and scientific knowledge shall be interpreted and applied (see also Cambou & Buhman:156, [15]). Previous research on impact assessment has shown how such ambiguity feeds uncertainty and/or controversy in licensing decisions, including on mining [16].

1.1 Objective

In this paper, we develop and pilot a new framework for rights-based risks assessments intended to help address ambiguities in corporate due diligence processes for energy related projects on Indigenous territories. The overarching purpose is to contribute new understanding about how emerging global norms on corporate accountability in the mining sector, notably on human rights due diligence, can be interpreted and applied through HRIA. As we elaborate below, we focus on an indigenous Sámi reindeer herding context in the Nordics – a high-risk context for human rights violations that is seeing growing mining interest in the large mineral resources located on traditional Sámi lands yet with a pertinent knowledge gap about how to conduct HRIAs.

The study had two objectives:

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i. To develop a new method for HRIA in Indigenous contexts, focusing on Sámi reindeer herding.

ii. To contribute, through testing this method, new empirical insights on the risks of human rights violations for mining projects as part of the energy transition.

As case study we selected Swedish state-owned mining company LKAB's proposed mining project 'Per Geijer', including the application for a concession permit on the traditional lands of Gabna reindeer herding community, in an area known in the northern Sámi language as *Luossavári duohkin* (with proposed concession area Luossavaara K nr 2, Kiruna, Norrbotten County). Focus was on the proposed project's risks to the Indigenous rights of the Gabna reindeer herding community (hereinafter: Gabna).

2. REINDEER HERDING AND MINING GOVERNANCE IN SWEDEN

Sámi reindeer herding developed prior to the large-scale industrialization of northern Fennoscandia in the 20th century when the landscape was relatively unaffected by competing land uses [17]. Although the landscape has since changed drastically due to industrial encroachments, the main coping strategy remains, namely, to navigate unpredictable and often difficult environmental and climatic conditions through seasonal semi-nomadic migration and flexible land use [18]. Natural grazing-based reindeer herding – where reindeer can freely drift and graze through the landscape on natural pastures, with varying guidance from the herders – is thus a cornerstone in Sámi culture. Crucially, this herding tradition includes a host of practices, customs, and place-based knowledges that all are essential ingredients in Sámi culture (with legal protection as described below, section 3).

Escalating land dispossession and cumulative effects of multiple encroachments pose threats to this cultural practice of natural grazing-based herding. In one estimate, only 15 % of the reindeer herding area in Fennoscandia is unaffected by disturbances while 60 % of the same area is affected by at least two competing land uses [19]. As research has shown,

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the combined pressures from mining, wind power, hydropower, forestry, infrastructure, urbanization, tourism interact to provoke extensive cumulative effects on reindeer herding communities, only exacerbated by climate change and predator populations [20,21,22]. In addition to the direct land dispossession, developments and human activities generate so-called disturbance zones, resulting in significant indirect losses of pastures – the scale of which depends on the type of activity, location and season [23]. To fully assess the consequences of individual projects, a broad perspective, both spatially and temporally, is therefore required – considering previous encroachments, ongoing land use across sectors, and likely future changes in the entire reindeer herding community.

Whilst, as reviewed below, Sámi rights have strong protection on paper, in practice Sámi self-determination as recognized under international law does not enjoy much acknowledgement in Sweden [24]. There are many well-documented gaps between Sweden's international obligations to protect Sámi rights and commitments (including as enshrined in the constitution) and the sectoral legislation that *de facto* steer land use planning and licensing through the Minerals Act [25]. A particular problem is the lack of land use planning and impact assessment procedures that take a landscape perspective and consider the cumulative effects on reindeer herding [20]. As is often the case for Indigenous peoples, globally, this allows companies to impose their priorities in Sápmi, in turn denying Sámi rights holders the opportunity to contribute their visions for sustainable futures [26].

Whereas this problematic governance context is well-known, limited research has explored the actual practice of mining companies from a Sámi rights perspective let alone in relation to emerging due diligence requirements. To date, focus has been on – voluntary – corporate social responsibility (CSR) efforts (see e.g., Beland Lindahl et al. [27]). Several studies have, however, pointed to gaps between such corporate policy commitments and actual practices [28, 29]. As a case in point, in an interview study with representatives from several mining companies in Sweden, Lawrence and Moritz [29] found a lack of operational routines on Free and Prior Informed Consent (FPIC).

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Judging from publicly available information, mining companies have no established practice of conducting HRIAs in the Nordics (see also NHRI [31]). While we have evidence from information shared in confidence by actors close to the industry that some companies are undertaking HRIAs without disclosing them, we find only one example of a published mining HRIA from the Swedish side of Sápmi [32]. In contrast, over the past two decades, mining companies have started to develop relatively extensive so-called reindeer herding analyses. Like other CSR work, this is a voluntary effort not required under current legislation, likely due to growing demands from herding communities and scrutiny from licensing authorities and/or courts. Although such analyses might suggest steps in the right direction, research has previously found them lacking in scope and quality, especially as regards assessment of cumulative effects [28,33].

2. HUMAN RIGHTS LAW: INDIGENOUS RIGHTS TO LAND AND CULTURE

The two most important sources of Indigenous rights are the ILO Convention No. 169 concerning Indigenous and Tribal Peoples (1989) (ILO 169) and the United Nations Declaration on the Rights of Indigenous Peoples (2007) (UNDRIP). Although Sweden has not ratified ILO 169, the Supreme Court has ruled that at least parts of the convention apply in Sweden, by referring to ‘principles of international law’ in relation to Indigenous customs and customary law [34]. UNDRIP is not legally binding in its entirety, but large parts of the declaration have attained the status of international customary law, binding states regardless of ratification [35,36].

UNDRIP clarifies that Indigenous rights includes both collective and individual rights (Art. 1). Collective rights include the right to self-determination, the right to participate in decision-making, and the rights to lands, territories, and natural resources. The right to cultural identity exists at both collective and individual levels, as does the right to non-discrimination (UNDRIP, Art. 2).

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All rights under the UNDRIP are indivisible, interdependent, and grounded in the right to self-determination, which is an overarching right encompassing all other collective Indigenous rights [37, para. 8]. A central aspect of the right to self-determination is the right of Indigenous peoples to effective participation and a genuine ability to influence decision-making processes relevant to them. To meet the requirements of international law, consultations with Indigenous Peoples must be conducted in good faith and with the aim of obtaining free, prior, and informed consent (FPIC) (UNDRIP Art. 19, ILO 169 Art. 6, [38]).

2.2 The rights to land and culture

The importance of lands, territories, and natural resources for the culture, identity, and survival of Indigenous peoples cannot be overstated. The right to land has a central role both in UNDRIP and ILO 169, and human rights bodies have consistently emphasized that the relationship between Indigenous peoples and their lands often is crucial to their cultural survival [39,40,41].

Land rights in UNDRIP (Arts. 25–27) make clear that Indigenous peoples have the right to control their traditional lands, territories, and waters, including natural resources found there. The right to use traditional lands includes the right to employ the methods that Indigenous Peoples themselves identify as most culturally appropriate (UNDRIP Art. 26, Art. 27 of the UN International Covenant on Civil and Political Rights (ICCPR), as interpreted by the UN Human Rights Committee (HRC)). This should not be understood to mean that only traditional methods are protected. In light of the right to self-determination, the Indigenous group decides what practices they find most appropriate and consistent with their culture and the state cannot impose either ‘modernization’ or ‘traditionalization’ against their will [42]. Indigenous peoples also have the right to protection against the cumulative effects of multiple encroachments on their lands, considering historical impacts (UNDRIP Art. 26, [43]). Land rights include the right to exercise significant control over the natural resources associated with traditional lands, both above and below ground, flowing from the right of

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Indigenous Peoples to determine the priorities and strategies for the development of their own lands (UNDRIP Art. 32 in conjunction with Arts. 3 and 4).

Indigenous peoples' land rights are closely linked to their right to cultural identity, which is most clearly articulated in Article 27 of the ICCPR, in addition to UNDRIP. This article stipulates that minorities must not be denied the right to enjoy their culture, religion, and language. International and national case law demonstrates that this provides Indigenous Peoples with strong protection for the lands necessary for the survival of their culture [44,39].

Indigenous peoples' right to culture also includes the right to pass on knowledge, spirituality, and their relationship to the land to future generations (UNDRIP Art. 25), as well as the right to practice and develop their cultural and religious traditions, customs, and ceremonies (UNDRIP Arts. 11 and 12). In a 2025 decision, the UN Committee on the Rights of the Child emphasized that children's cultural rights have a transgenerational dimension that is fundamental to the cultural identity and survival of Indigenous Peoples, and because children represent the continuity of their people, their cultural identity is particularly central [45].

2.3 The rights of reindeer-herding Sámi under international law on Indigenous Peoples

The Sámi are a recognized Indigenous People, and their rights are therefore covered by Indigenous Peoples' rights. Sámi land rights are closely tied to reindeer herding, a fact that has been established by several human rights bodies and courts [44,45,46]. Of particular interest is the Norwegian Fosen case, in which Norway's Supreme Court concluded that two wind farms had such serious impact on reindeer herding that they reached the threshold for violating the Sámi People's right to culture under ICCPR, Art. 27 [44]. The decisive question, the court noted, is whether the measure entails a 'substantive negative impact' on the Indigenous People's ability to enjoy their culture. It is thus not necessary for the practice of the culture to be at risk of complete extinction [44, paras. 119, 144]. One key factor is the

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extent to which the Indigenous group has been able to effectively participate in the decision; another is what mitigation measures have been proposed. Extensive winter feeding within fenced enclosures constitutes such a significant departure from traditional reindeer herding methods, the Court ruled, that it is questionable whether such methods are consistent with the reindeer herders' right to culture under Article 27 [44, para. 149).

In Sweden, the Sámi were recognized as an Indigenous People by Parliament in 1977 and in the Constitution in 2011. The state has a duty to promote the Sámi People's ability to preserve their cultural and community life; this includes the right to reindeer herding. Reindeer herding is also considered a matter of national interest—alongside, for example, mineral extraction, cultural heritage preservation, and outdoor recreation. Many of the most important areas for reindeer herding, such as migration routes, gathering places, and special grazing areas, have been designated as matters of national interest (however, on the limitations in this planning instrument in Swedish law, see Torp [47]). Importantly, reindeer herding is also recognized under Swedish law as a civil right in the form of a right of use to real property (land and water) based on time-honored custom. In this paper, though, we focus on the protections owed under international human rights law (for more on reindeer herding as a property right, see, e.g., Brännström [48]).

3. DEVELOPING HUMAN RIGHTS IMPACT ASSESSMENT FRAMEWORK

The starting point for the new risk assessment framework we present below is international law standards on Indigenous rights and existing international guidance on HRIA (see review above in section 3; specifically [49,13]). Moreover, we draw on prior research into how rights-based risk assessments can be conducted with concerned Indigenous groups [50,51]. In the Nordics, it is still uncommon for researchers to collaborate in impact assessments together with, or led by, Indigenous groups – here, too, our study hence has novelty [52,53].

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For HRIA in an Indigenous context, our review identified a set of key principles that we used to guide our method development:

i. *Influence*: Concerned Indigenous rights-holders are entitled to influence both the design and implementation of the HRIA. This entitlement can be considered to flow directly from the right to FPIC [49, see also ILO Convention 169, Art. 7.3).
ii. *Cultural adaptation*: An important part of Indigenous People's right to self-determination is the right to define their own culture and the preconditions that must be protected to enjoy their right to culture [13,52]. HRIA must hence adapt both the analytical methods and data generation to be culturally appropriate, centering the concerned Indigenous group's current situation, history, and future visions [54].
iii. *Holistic view of the land*: Indigenous cultures are intimately intertwined with the land. Impacts must hence be understood from a landscape perspective, considering cumulative effects of historical, existing and possible future encroachments [20,11].

3.1 HRIA assessment framework

In response, we designed an analytical framework consisting of a matrix with criteria that support a transparent risk assessment with regards to a set of preconditions identified as crucial to a Sámi herding community's ability to enjoy its rights (Table 1). Criteria-based frameworks are rarely used for HRIAs but are common in assessments of environmental, social and cultural impacts. The purpose is to highlight possible causative relationships between an expected effect, such as land encroachment, and impact on community rights.

On this basis, we interpreted – in dialogue with Gabna as concerned rights-holder in our case study (see below on case methods and materials, section 4) – how their rights to land and culture should be understood. It bears repeating that, following international law on Indigenous Peoples, it is the rights-holders themselves who must identify what practices are consistent with their culture. As we outline below, natural pasture-based reindeer herding and the free roaming of reindeer is of paramount importance to Gabna and its preservation

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of Sámi culture. These aspects have therefore been given weight in this version of the assessment framework.

The matrix uses a linear scale to assess impact. The scale describes the severity of the risk for each precondition, graded 1 (minor impact) to 4 (serious impact). We draw here on common international practice, where the severity indicates a combined judgment of the risk, based on the potential impact's scope, degree, and (ir)reversibility (see Danish Institute of Human Rights [49:89–92]). A disadvantage of this approach is that it is static and simplifies otherwise complex causative relationships. Still, we use it to help clarify the proposed links between various effects of an industry project and the possible impacts on Sámi rights.

The framework focuses on risks for Sámi herding communities' *collective rights to land and culture*. We refer to the underlying project report (in Swedish) for complementary insights about how the project planning already has jeopardized the community's procedural rights to effective participation and influence as well as the risks to individual rights of community members, e.g., as regards health and livelihood, and the right to non-discrimination both of individuals and the community as a whole ([Authors 2026, insert after review]).

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273 *Table 1. Matrix for risk assessment.*

Preconditions for the community's ability to enjoy its rights	1: Minor impact	2: Moderate impact	3: Major impact	4: Severe impact
A. Grazing areas are interconnected and allows for both migration on foot and for reindeer to freely drift and graze through the landscape.	Despite some disturbances there are multiple alternative migration routes that allows grazing areas to be used under varying conditions (e.g., due to weather, reindeer health, anthropogenic disturbances, etc). The landscape remains interconnected and allows for reindeer to freely drift and graze through the landscape, only with limited number of animals scattered into neighbouring communities or remaining on winter grazing areas due to migration challenges.	A few functional migration routes remain. Migration with the herd on foot is difficult because of disturbances but remains possible for the siidas (winter groups) that can muster sufficient resources. The landscape remains interconnected but with difficulties for reindeer to freely drift and graze through the landscape between seasonal lands. A larger number of animals drift into neighbouring communities and remains on winter grazing areas.	Only one functional migration route remains. Multiple siidas (winter groups) must refrain from migrating to winter grazing areas. Several siidas must increasingly use lorries or trailers for migration between grazing areas. The possibility for reindeer to freely drift and graze through the landscape is severely limited and only a few animals can migrate between seasonal lands, with significant loss of animals drifting into neighbouring communities.	No functional migration routes remain. Migration is only possible with the use of lorries or trailers. Reindeer can no longer freely drift and graze through the landscape between seasonal lands. Pastures along migration routes are therefore left disused.
B. The community has access to traditional winter grazing grounds, that can be used based on the norms of the community.	Winter grazing grounds can be used without unreasonable stress on reindeer or reindeer herders, despite some disturbances on winter grazing grounds from other competing land user.	Extensive encroachments and disturbances occur at times. But the community can nevertheless still use winter grazing grounds, with limited adaptation or coping strategies.	Encroachments and disturbances are so severe that some part of winter grazing grounds completely lose their functionality and are difficult for the community to use.	Large parts of the community's winter grazing grounds cannot be used, e.g., due to encroachments, disturbances and/or impacts on the migration routes.
C. Year-round-pastures and the various seasonal lands can be used with the traditional practices in reindeer herding throughout the seasons.	Land dispossession mean that year-round-pastures and various seasonal lands must be used longer, both during winter and earlier in the spring, than desirable according to the communities customs and practices.	Some siidas (winter groups) must remain on year-round pastures over the winter due to mounting pressure from encroachments and disturbances. First signs of overgrazing are observed by the community.	Most siidas must regularly remain on year-round pastures over the winter. Imminent risk for unsustainable grazing pressure.	Virtually the entire community must remain on year-round pastures over the winter every year. Signs of overgrazing is apparent on large tracts of year-round pastures.
D. The reindeer herd has grazing peace and can freely graze on natural pastures.	Grazing areas are in essence free from reoccurring disturbances with limited impact on grazing peace. Natural pastures generally cover the need for grazing and supplementary feeding is only used for shorter periods during certain events like extreme weather conditions.	Grazing areas are regularly impacted by reoccurring disturbances and grazing peace is affected. Such impacts on grazing peace mean that the reindeer avoid some pastures. Some siidas must actively stay away from disturbed pastures. Supplementary feeding is often needed, but only during limited	Grazing areas are constantly impacted by disturbances and there is rarely grazing peace. Due to the negative impact on grazing peace some pastures are regularly avoided by reindeer and siidas must stay away from them. Supplementary feeding becomes an integrated part,	Grazing areas are impacted by disturbances to the extent that there is hardly any areas left with grazing peace. This leads to reindeer completely avoiding disturbed areas and siidas not utilizing large, disturbed areas. Supplementary feeding must be used regularly every winter by the whole, or most, of the reindeer

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		periods during the winter and only for some siidas.	i.e., with several siidas having to resort to supplementary feeding for a significant part of the winter season every year because of loss of grazing areas or poor grazing conditions.	herding community to ensure the survival of the reindeer herd.
E. Traditional Sámi knowledge and reindeer herding practices are kept alive and can be transferred to younger generations in the community through the active land use.	Encroachments and disturbances require minor adjustments, but the reindeer herding community can continue to preserve and develop traditional knowledge, practices and customs.	Substantial knowledge about places and reindeer herding practices are lost when lands cannot be utilized or specific traditional tasks in reindeer herding cannot be practiced.	Important customs and traditions are no longer practiced or risk ceasing to exist in many siidas.	Important customs and traditions cease to exist in the entire reindeer herding community. Knowledge connected to large parts of the community's lands is lost over time, for example when traditional reindeer migration on foot is no longer possible.
F. Generational renewal in the reindeer herding community is ensured, with younger generations having a belief in the future and enabling conditions to continue reindeer herding.	Younger community members exhibit some concerns but generally show commitments to continuing reindeer herding. Despite some encroachments there are possibilities for new reindeer herders to establish themselves and take over or build a reindeer herd.	Encroachments and loss of pastures make it difficult for the community to maintain herd size. First sign of a weakened rejuvenation in the community; for example, only a few young members are active reindeer herders.	Widespread worries among the younger generations in the community hold them back from engaging in herding. Significant decrease in the number of reindeer and herd structure that is perceived as unsustainable.	No one in the younger generations in the community wants, or has required conditions, to continue traditional reindeer herding. Rejuvenation in the community ceases. Even currently active reindeer herders may cease to practice reindeer herding.

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4. CASE STUDY MATERIAL

The chosen case – LKAB's proposed Per Geijer project on Gabna territory – is about a highly profiled, and controversial, mining project with great societal relevance but also allowing generalizable insights for scholarly literature:

- LKAB is, with its about 5 300 employees and net turnover of 33 billion SEK in 2025 (LKAB, 2025), in-scope for the EU's CSDDD. The case thus indicates the types of risks that big companies with operations in the Nordics must look out for in enacting the new mandatory due diligence obligations in context of the energy transition [55].
- It is one of the two first proposed mineral extraction projects in Sweden accredited as so-called strategic project under the CRMA. The case hence sheds light on the risks that the EU's new strategic mining projects present to Indigenous Sámi rights.
- Moreover, LKAB is, as a fully state-owned company, endowed under international law with some of the state's obligations to not only respect but also protect human rights [56]. Following the Swedish state's ownership policy, it is also expected to be a frontrunner in business and human rights [57].

The research in this case study was guided by principles from participatory action research and Indigenous methodologies [58,59]. We also followed ethical principles for research in a Sámi context, facilitating comprehensive Sámi and rights-based perspectives [60,61]. The planning of the study began in June 2024, with several meetings (both physical and digital) between the researchers and representatives of the board of Gabna. The collaboration between the authors' research institution and Gabna was regulated in a Research Agreement and the research methods approved by the Swedish Ethical Review Authority (case no. 2024-05935-01).

Two site visits were conducted to meet community members and see the area subject to LKAB's proposed plans. Interviews with community members were conducted through physical meetings in June 2025 in Kiruna and Rensjön. Prior to the interviews, a letter was

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distributed to community members, via the board, with information about the research and an open invitation to participate. We sought to engage as many winter herding groups (siidas) as possible, across genders and age groups.

Interview were semi-structured, with questions focused on the following key themes:

i. the community's current land use and relationship to the land, including health, social affairs, and economy;
ii. changes to land use and culture, including historic and cumulative effects on both individual and collective rights;
iii. views on the LKAB's Per Geijer project, notably risks to both collective and individual rights.

In total, 25 people contributed to the case study. 18 people participated in interviews (either individually or in smaller groups). This meant representation from all siidas (family-based winter groups) and most of the active reindeer herders, who hold the authority in operational decisions regarding reindeer herding in the community. To protect personal integrity, contributions from community members have been anonymized.

Preliminary results were discussed at a digital meeting with the community board and, subsequently, in an in-person community meeting in Kiruna (November 2025). The community meeting convened 17 people, half of whom had previously contributed through interviews. Following the Research Agreement, the board subsequently reviewed the project report prior to publication and approved the use of the community's data and knowledge (now used in this paper).

A considerable challenge has been the lack of access to LKAB's strategic project application for the Per Geijer project (see also [Authors, insert after review]). Similarly, despite repeated requests, LKAB refrained from contributing to the study. A second challenge concerns an agreement between LKAB and Gabna. During 2013 – 2025 the parties regulated their negotiations concerning LKAB's existing activities in a collaboration agreement (in Swedish:

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samverkansavtal). Gabna terminated this agreement on 1 Dec. 2025, citing a lack of influence and lack of actions from LKAB to prevent or mitigate impacts [62]. However, as is often the case for such company-community agreements, it contains a confidentiality clause preventing the community from sharing many of the experiences from its dealings with LKAB. This, in turn, imposes limitations on the findings we can convey in this paper.

5. CASE STUDY: LKAB'S PER GEIJER PROJECT ON THE LANDS OF GABNA HERDING COMMUNITY

5.1 The Per Geijer project

On 12 June 2024, LKAB applied for a mining concession for the Luossavaara K No. 2 site in Kiruna, Norrbotten County, referred to by the company as the Per Geijer deposit – stating that the project is of the utmost importance for the company's future operations [63]. On 25 March 2025, the European Commission approved the company's application to designate this project as strategic under the CRMA. LKAB is the largest producer of iron ore within the EU, shouldering more than 80% of the union's own production. Besides apatite iron ore, the Per Geijer deposit is rich in phosphorus and rare earth elements, including lanthanum, lanthanides, scandium, and yttrium.

LKAB intends to carry out underground mining at Per Geijer using the same sub level caving method that is used in the Kiruna mine (other methods, such as open-pit mining and cut and fill mining have been ruled out for practical and/or economic reasons). Mining using the current sub level caving method means that, although it is an underground method, the ground surface above the ore body will eventually subside and crack, resulting in ground deformation. An area must thus be fenced off for safety reasons and will become inaccessible for other land uses, such as herding – with the company's environmental impact assessment citing an area of approximately 3 km² (290 ha) once the mine has been fully excavated [64].

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The company states awareness that the project poses significant risks for Gabna [64]. However, it claims, the impacts can be sufficiently mitigated [65:68, our translation]:

> *If priority is given to [mining]… this will not result in the cessation of reindeer husbandry within Gabna or neighboring Sámi communities. Reindeer husbandry will be able to continue, albeit under changed conditions.*

In its application for a mining concession, the company proposed the following mitigation measures [64,65]: i) Rerouting of parts of the community's reindeer migration route; ii) increased road transport of reindeer passed Kiruna; iii) compensatory measures in other locations, such as fencing and enclosures; iv) financial compensation for additional work and increased costs; v) restoration work to compensate the community through alternative grazing lands. LKAB also emphasizes that further planning of such measures should be done together with Gabna.

After the conclusion of this study, and publishing of the underlying project report in Swedish, LKAB submitted its full reindeer husbandry analysis – a supplement that the Swedish Mining Inspectorate had demanded. This study reiterated the arguments from LKAB's first analysis described above but expands son the proposed mitigation measures. This includes the proposal for creating enabling conditions for an alternative migration route to replace the route that would be blocked by Per Geijer, and ways to reduce or regulate other encroachments and disturbances. It is outside the scope of this paper to analyze this consultancy study in detail, but the summary provided by LKAB [66] suggests that the company has somewhat broadened its risk perspective, recognizing the need for more substantial actions aimed at addressing land use planning issues and the combined cumulative pressures experienced by Gabna.

5.2 Gabna community: Sámi reindeer herding on fragmented lands

Reindeer herding has been practiced, as an integral part of Sámi land use and culture, in the Kiruna area since the 16th century – by Gabna (formerly known as Rautasvuoma) together

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with neighboring communities Talma, Laevas and Girjas [67] (Fig. 1). Gabna's recognized territory covers an area of 3,666 km² and counts around 100 members, including adults and children. It has ten group leaders, who are responsible for the daily reindeer herding activities that, depending on prevailing grazing conditions, are organized in five to six siidaas (winter groups).

Following The Reindeer Husbandry Act (law no. 1971:437) the local county administrative board sets the maximum permitted reindeer population in each reindeer herding community, which in Gabna's case is a maximum of 6,500 animals in the winter herd (hence, a figure dating from before the advent of much of the industrial land encroachments). According to the community itself, they have for many years only been able to maintain about half this herd size, given cumulative land dispossession. These impacts derive from the combined pressures of multiple competing land uses, including LKAB's exiting mining operations, the ongoing move of Kiruna city (because of the ground deformations caused by the Kiruna mine), other recently licensed mining operations (Viscaria, Talga), forestry, tourism, power lines, infrastructure such as roads and railroad (including the transport of ore).

The implications of these cumulative effects come to the fore especially in the impacts on the community's possibilities to practice its traditional migration between seasonal pastures. Gabna has its winter grazing lands east of Kiruna, where the siidaas (winter groups) would traditionally be located during the winter (Fig. 1 a). Calving grounds and summer grazing lands are situated in the mountain areas west of Kiruna (Fig. 1 b). To make use of the seasonal grazing areas, they must be sustained by continuous and interconnected pastures, including migration routes and corridors with resting grounds. Whereas the community previously had access to four different migration routes for both coordinated movement of the herd and free drifting of animals, today only one remains, namely the route through Luossavári douhkin now threatened by LKAB's Per Geijer project (Fig. 1 c).

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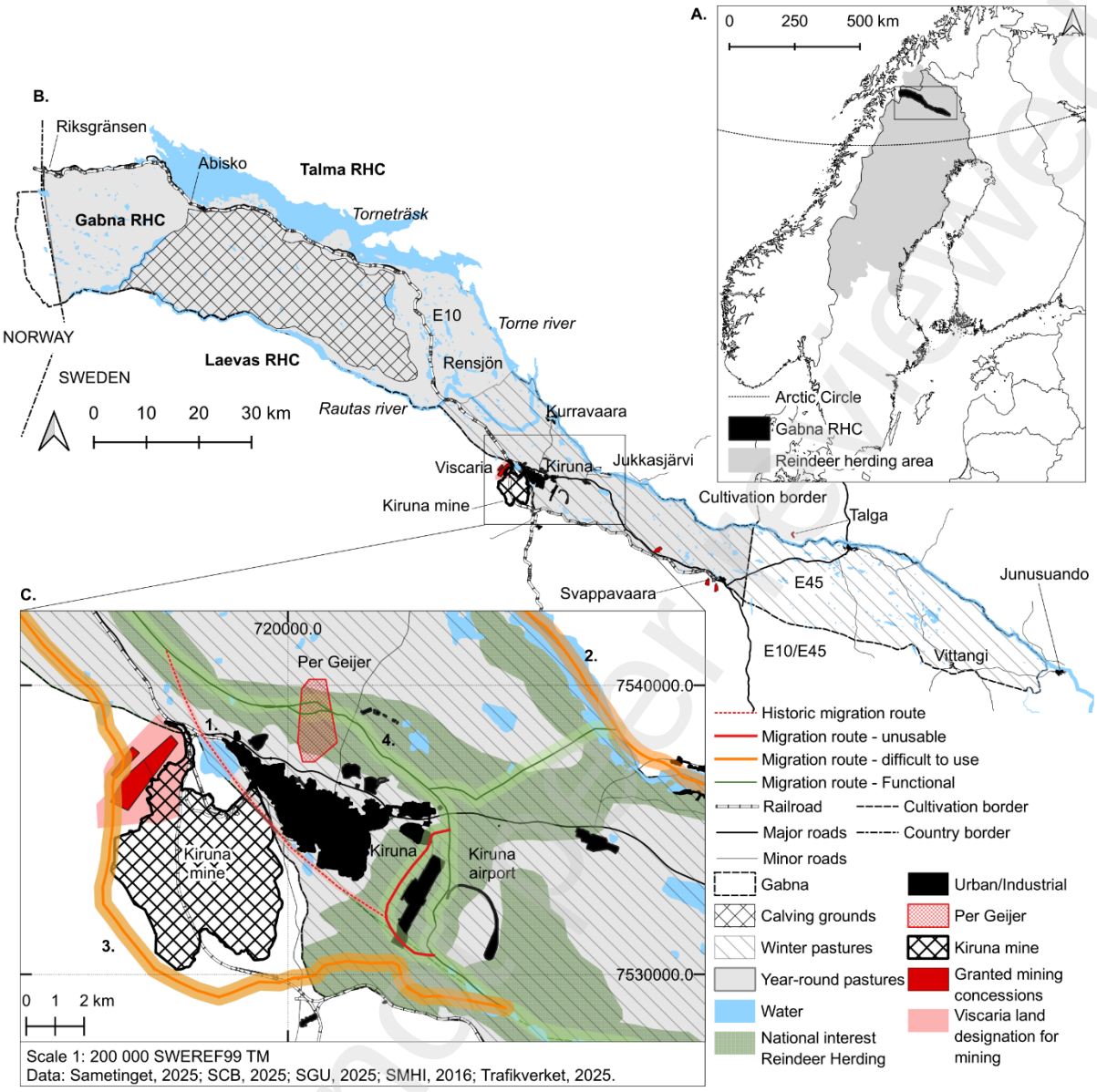

403

404 *Fig. 1. Case study map. A:* The location of Gabna in Fennoscandia and the reindeer herding
405 area in Sweden. *B:* Overview of Gabna. *C:* Detailed view of Kiruna area with the proposed
406 Per Geijer project, areas of national interest for reindeer herding and migration routes. The
407 historical migration route (dotted line) has been drawn up using map data from Niia [67] and
408 information provided by community elders during interviews.

409 The lands around Luossavári duohkin offers not only vital grazing lands but also comprise
410 the only remaining migration corridor allowing the community to uphold their cultural semi-
411 nomadic tradition characterized by natural-grazing based herding customs. The community
412 is taking proactive steps to maintain this route, e.g., clearing and fencing a 2,5 km corridor

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between Luossavári in the south and Nukutusjávri in the north. Yet, considerable disturbances impact the area already today, including ski trails, the Sakkaravaara shooting range, human settlements, and significant disturbances from dog sledding, snowmobile use and dogs running loose. Moreover, passing Kiruna at Luossavári with a reindeer herd requires significant resources, careful planning, the involvement of many herders, and often police supervision to halt traffic. Taken together, this means that this migration corridor is already heavily impacted – with further impacts likely to break what is in effect a final artery for an essential part of the Sámi community's custom.

6. ASSESSMENT OF THE RISK FOR RIGHTS VIOLATIONS

Here, we demonstrate how a risk assessment can be carried out, based on the new analytical framework presented above – focusing on the community's collective rights related to land and culture. We start by reporting the findings for each of the six preconditions in the framework (Table 1). We then provide the combined assessment and discuss LKAB's proposed mitigation measures.

6.1 Continuous and interconnected pastures

As described above, and in earlier reports [68,69], competing land uses are already having a *major impact* on the Gabna's access to contiguous grazing lands (see Table 1, precondition A, risk level 3 – henceforth simply A3). The seasonal migration past Kiruna is particularly problematic, as evidenced by many testimonies from community members. As a case in point, only a handful of siidas have managed to practice the traditional migration with their winter herds past Kiruna over the last ten years; others have been forced to move the animal by truck/trailer or must refrain from using the winter pastures altogether.

Community members unanimously state how the Per Geijer project would block the only remaining migration route, resulting in the end of both collective herd movements past Kiruna and the reindeer's free roaming between seasonal pastures. Following our

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framework, this would mean a *severe impact* on this precondition (Table 1, A4). We exemplify with comments from three different siidas:

'If Per Geijer happens, there will be no possibility of moving there at all. That would effectively close off the last route available.'

'…and that would mean that traditional reindeer herding would no longer be possible in Gabna. After all, [it] depends on the reindeer being able to move freely as well as in herds between these different lands. And that won't be possible then.'

'I'm not quite sure how one would get past… if the mine is built here, then we'll have no migration route.'

6.2 Access to traditional winter pastures

As regards the winter grazing lands, the community is already experiencing a *major impact* – with disturbances and encroachments so extensive that parts of the seasonal grazing lands have partly lost their functionality (Table 1, B3). LKAB's existing operations play a significant role, but impacts also stem from forestry, tourism and recreational activities, urbanisation, the move of Kiruna city, and infrastructure – notably the E45 road as well as the railroad that both are used for heavy iron ore transports. As one herder stated:

Because of all the traffic… ore transports, the use of road salt [which attracts the reindeer to the road], nobody wants to move anywhere near the E45… Well, we'd like to move down there, but we don't dare go there.

The Per Geijer project would inevitably lead to increased losses of winter grazing lands and disturbances. Community members estimate that the direct land dispossession, from the mining area itself and its disturbance zone, would occupy a significant part of at least one siida's customary seasonal winter grazing grounds. If outdoor recreational activities continue at current levels (and most likely they will increase, if they follow national trends) these disturbances would be pushed to affect lands further away from Kiruna, towards the Torne

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River. We did not examine such potential cascading effects on the winter grazing lands, and we therefore only posit the conservative estimate that the severity of the impact, with a new mine, would remain at least at the same level as today, i.e. *moderate impact* (Table 1, B3).

Traditional use of seasonal pastures in the year-round grazing lands

The community is currently experiencing a *moderate impact* (Table 1, C3) on the use of year-round grazing lands, evidenced, e.g., by the fact that some siidas are pushed to remain in the mountainous area west of Rensjön during the winter (see also Fig 1B). This is partly a consequence of the difficulties they experience in moving past Kiruna and the loss of functional winter pastures. Siidas who remain on spring and autumn pastures during winter state that this is neither a desirable measure nor a long-term solution, witnessing early signs of overgrazing. This is problematic, e.g., since the year-round pastures serve as a vital reserve during years with harsh climatic conditions when winter pastures are inaccessible (see more in Rosqvist et al. [22]). Two herders describe their predicament:

So it's these areas above Lake Rensjön and towards Abisko that are bearing the brunt of it, because we can't get past Kiruna the way we'd like to...

And it's short-term right now… It will be overgrazed. In the end, it will be overgrazed.

In a scenario with a new mine, if – as we assess – the opportunities for migration and free roaming of reindeer past Kiruna are significantly impeded or obstructed – all the siidas will eventually be forced to remain on the year-round grazing lands throughout the year. Such an outcome would have a *severe impact* on this important precondition (Table 1, C4).

Grazing peace and access to natural grazing

Here, the community is currently experiencing a *moderate impact* (Table 1, D2), with a deterioration in grazing conditions caused by encroachments and disturbances. The herders strive to avoid supplementary feeding, as far as possible, since their cultural practices are based on natural grazing as a cornerstone of Sámi culture, but also because reindeer thrive

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best when grazing on their natural food (see also Horstkotte et al. [18]). Whilst some siidas typically manage to avoid supplementary feeding – except during extreme weather events – others explain how they are forced to provide supplementary feeding for long periods almost every year. Some herders must also use supplementary feeding as means to gather and hence keep a minimum level of oversight over the herd on fragmented lands or in areas where there is no grazing peace. As one herder says,

> *It's these roads, like the E45 with Kaunis Iron's ore transports... That* [supplementary feeding] *makes it easier to keep them* [the reindeer] *together. They stick to the food. So we've tried to solve it that way…*

The Per Geijer project would undisputably further increase the need for supplementary feeding, both due to the direct loss of grazing land and the disruption to the migration past Kiruna and the reduced access to winter lands east of Kiruna. Should certain siidas, reluctantly, be forced to transport their herds via truck and trailers, they will also likely need to increase their use of supplementary feeding to keep control over the animals on the highly impacted winter grazing lands. Furthermore, the loss of the seasonal lands that the community has traditionally used for slow migration and grazing between winter and year-round pastures will also result in a loss of grazing resources. Taken together, our assessment is that the project would likely have a *major impact* on this precondition (Table 1, D3).

Preservation of traditional knowledge

The community is currently experiencing a *major impact* on its ability to keep traditional land-based knowledge alive (Table 1, E3). A clear example is, as mentioned above, that several siidor have been forced to cease their traditional practice of migrating past Kiruna, which to large extent owes to LKAB's operations. Community members also describe how the extensive encroachments and obstruction of other migration routes have led to a loss of knowledge about these places. Elders testify to how the younger generations lack in-depth

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understanding of these places' function and how to manage the reindeer herd there. Several community members also highlight how all stressors linked to encroachments and associated administrative tasks 'steal' time from reindeer herding and from the active practicing of their culture on the land (for related discussion see, e.g., Ellingsen [70] and Österlin & Raitio [21]).

An instructive example was shared by one elder about the disruption of a tradition with a spiritual connection to the land, with regards to the impacts on the migration route along the Torne River:

> *We always used to stop there. Earlier, the cemetery was right opposite Jukkasjärvi. That ordinary cemetery. Where most Sámi, virtually all Sami, are buried. Back then, you'd always stop the herd there, by the cemetery. Just out of custom, you'd think, "Right then, old men and women, now you get to see the herd…". Then we'd tell the elders lying in their graves, "Come and have a look, see the herd…". So, we'd let the herd rest there for an hour or so before moving on. [B]ut it doesn't work. It just doesn't work… So, these days, there isn't that peace and quiet where the reindeer can lie down there….*

In a scenario where a new mine obstructs both the final route for free drifting of reindeer and coordinated herd movements between seasonal pastures, the preservation and transmission of important place-based knowledge will be further impeded. Likely, this means that key parts of Sámi spirituality, customs and cultural practices will, over time, be lost within the community. Following our framework, this can only be interpreted as having a *severe impact* on this precondition (Table 1, E4).

Sámi youth can continue traditional livelihood

As regards the Sámi community's prospects for generational renewal, we assess that the community is currently experiencing a *moderate impact* (Table 1, F2). Young community members expressed a strong commitment to continuing their family's reindeer herding

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traditions, including hopes to engage full-time in the business when the time is right – for example when older relatives retire and hand over the herds. As two of the youth stated:

Why is it so important to me? It's because it defines my identity – that is, who I really am, what I essentially live for…

Yes, now it's [name] *who's the reindeer herder, but the whole family helps out, and I'm involved as much as I can. So, I have a regular job… But it* [herding] *occupies a lot of weekends and a lot of my free time… It's not a chore, though; it's what one might actually want to do.*

According to the community board, however, today, only one young person is engaged full-time in herding. A disabling factor is the shrinking herd size, since a steady decline in animals constrains the total space for active herders. In parallel, the growing need for investments in equipment and costs for additional labor – notably in connection with the seasonal migration past Kiruna – also constrain Sámi youth, who aspire to start own reindeer herding businesses. Furthermore, young people are aware of the often very challenging working conditions and the psycho-social stress that follows.

As described above, the Per Geijer project would likely cause a chain of events where the undermining of the reindeers' migration past Kiruna leads to the siidas finding it difficult to utilize the winter grazing lands. They will then be forced to rely primarily on the year-round grazing lands. In such a scenario, we posit, reindeer numbers and herd size in most siidas will be negatively affected, further constraining generational renewal. Despite the Sámi youth's commitments to continue traditional livelihoods, if the size of the reindeer herd is further reduced and the conditions for natural-grazing based herding are significantly impeded or even completely undermined, the conditions for generational succession within the community will suffer at least a *major impact* (Table 1, F3).

6.7 Combined assessment

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564 Applying the criteria-based framework shows, hence, that the Per Geijer project would likely
565 result in a severe impact (the most detrimental outcome in the framework) on three
566 preconditions and a major impact on the other three preconditions (Fig. 2). When drawing
567 conclusions from this criteria-based analysis, the risks for each of the six preconditions must
568 be assessed in a holistic manner. Put simply, the more each of the preconditions are
569 affected, the greater the risk of an infringement on the community's rights as a whole.

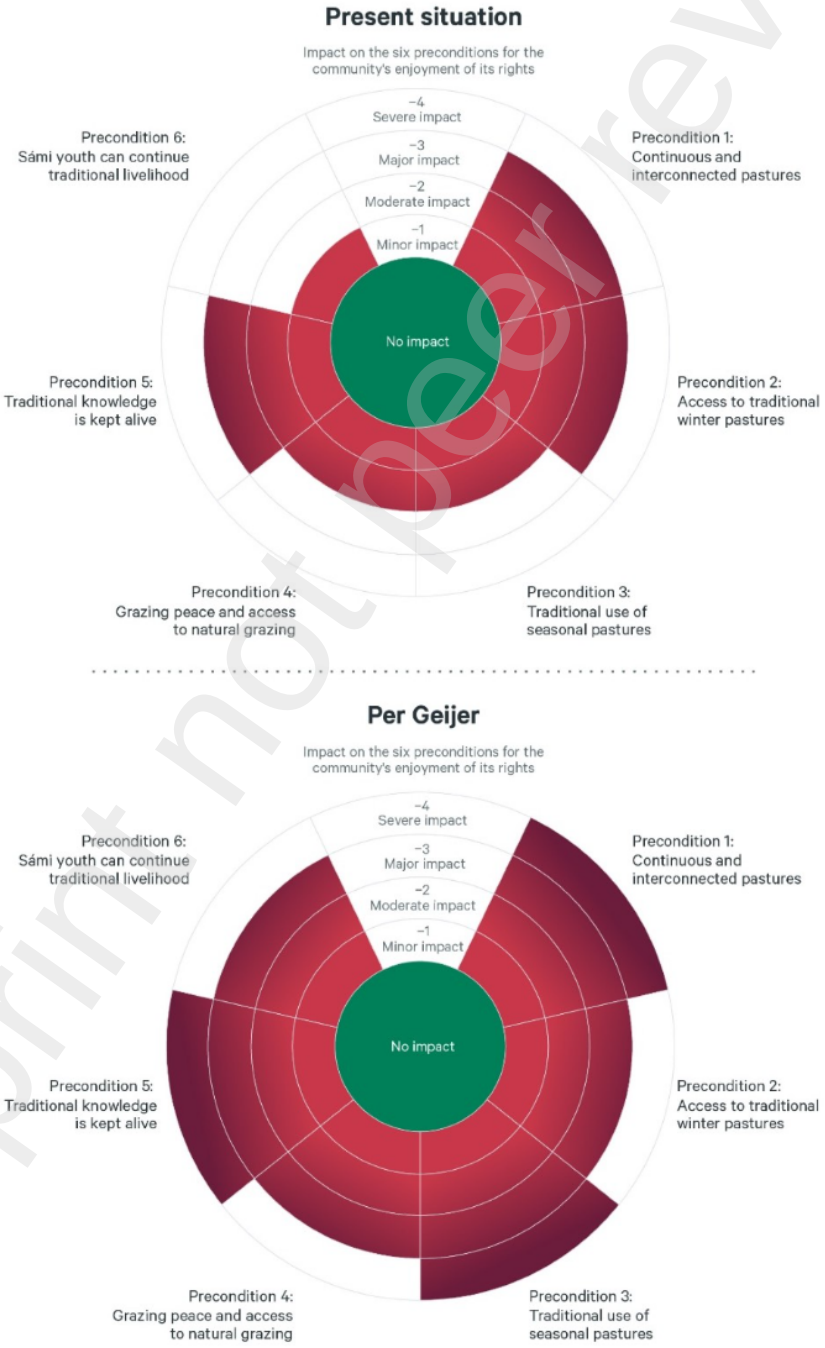

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Fig. 2. Results of the risk assessment. Qualitative assessment based on both the current impact and the risks arising from LKAB's proposed Per Geijer project.

As noted by the Norwegian Supreme Court, in the Fosen judgment, ICCPR art. 27 does not permit a proportionality assessment, i.e., a harm cannot be justified on the grounds that there are other positive aspects related to socio-economic outcomes or climate change mitigation [44,39]. Similarly, in *Ågren v. Sweden* [45], the UN CERD Committee underlined that whereas the extraction of natural resources may be a legitimate state interest, this does not exempt the state from its duty to enact positive measures to prevent discrimination of an Indigenous group that holds rights to, and depends on, traditional lands for cultural survival [45, paras. 6.7, 6.20; see also Åhrén [72]).

As noted above, LKAB claims that impacts can be mitigated to render the project permissible [64,65]. Meanwhile, it is the Sámi herding community – as concerned rights holders – who have the primary competence under international law to assess which measures are compatible with their own culture (UNDRIP art. 3, 4 and 26(2); ICCPR art. 27; [72]). Put simply, the question at hand is not about whether LKAB can ensure that a (further reduced) reindeer herd can survive in Gabna, but about how the community will be guaranteed the preconditions for their cultural survival, compatible with Sámi culture and aligned with Gabna's right to self-determination [44,46].

In this light, we argue, the proposed measures set out so far by LKAB are unlikely to ensure the protection of the community's rights. Rerouting the migration route is neither a realistic nor – from a Sámi cultural perspective – desirable alternative, given the topography and the extensive encroachments, disturbances, and general land fragmentation in the area. Nor does rerouting of the migration route address one of the major risks of the Per Geijer project, namely the likely undermining of the free roaming of reindeer between winter and summer pastures, including their grazing peace. Similarly, increased use of road transport and/or artificial feeding are not compatible with reindeer herding as traditionally practiced in Gabna and may, in themselves, constitute potential infringements of rights. The Fosen judgment is

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also relevant here, as the court found that imposed artificial feeding within an enclosure may constitute a violation of reindeer herders' rights under ICCPR art. 27 (44, para. 149).

Overall, hence, our analysis can only be interpreted as meaning that LKAB's project entails a significant risk of violating the Indigenous rights of the members of the Gabna. These rights form part of the binding human rights that Sweden, as a state, has a duty to respect, protect and promote – and which LKAB, especially as a state-owned company, has a responsibility to respect. The risk of violation is largely due to the unfortunate location of the proposed mine in the middle of the last remaining functional link between year-round pastures and winter grazing lands.

7. CONCLUSIONS

This study has developed and tested a new framework adapting international Indigenous rights law and HRIA standards – with support from previous research on rights-based risk assessments with Indigenous groups – to a Sámi reindeer herding context. The framework is, we suggest, applicable to other situations where Sámi herding communities face major industry projects, provided that the identified preconditions and criteria are adapted in dialogue with each community (on the diversity found both between herding communities and within Sámi society, see more in [Authors 2026, insert after review]).

The new framework has not only scholarly but also practical value in that it helps clarify the expectations that new human rights due diligence laws pose on companies engaged in land-based industries as part of the energy transition. Previous research has shown how factors typically creating uncertainty in risk assessments relate to disputes over the assumptions about which cultural values are important, what constitutes relevant knowledge, and how the evidence should ultimately be interpreted [73]. These assumptions are typically made from the perspective of developers, not rights holders – particularly, as is the case in Sweden, when impact assessments are controlled by mining companies themselves. Here, the new

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framework offers a more explicit and transparent assessment tool – grounded in the right of Indigenous Peoples to define their own culture.

As we are pertinently aware, it is only with greatest abstraction that HRIAs can help facilitate cross-cultural understanding between Indigenous and settler societies. Tools, such as the one presented here, are hence characterized by inherent contradiction. Whilst they can help re-center the perspectives and knowledge of Indigenous rights holders, they are typically applied within a larger colonial regime purposefully developed to suppress rather than respect Indigenous Peoples. Clearly, this poses great risks for abuse and cooption. For the Sámi, as other Indigenous Peoples, the relation to land is simply ontologically different from the standard Western scientific conception [74]. Communities have – both historically and today – organized their land use practices based on their own legal concepts, norms and site-specific knowledges, which are rarely respected by, let alone reflected in, state regulations [75,26]. We have no simple answers to this dilemma of inherent incompatibility, other than call for continuously critical and engaged research together with concerned Indigenous rights holders.

In conclusion, we are acutely aware of the risk that companies adopt new due diligence process – including HRIA frameworks – to continue a trend of minimalist or instrumental compliance, with a narrow focus on gaining acceptance for their proposed projects rather than genuinely identifying and addressing human rights risks in the energy transition [13,52]. Our final argument must be a reminder that heightened engagement from industry be accompanied by proactive government policy, addressing the root failures in land use planning and licensing regulations. As a case in point, our study has aptly posited the urgent need for more comprehensive and integrated spatial planning in Kiruna [20,21,26]. Indigenous Peoples, globally, testify to an urgent need for legislative and policy action to ensure proactive land use planning in which concerned rights holders are guaranteed effective influence *before* companies plan and seek licences for projects likely to violate Indigenous rights. Only with such a coordinated approach – guided by respect for self-

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determination and a holistic landscape perspective – can a more just form of mineral extraction and energy transition policy become a reality.

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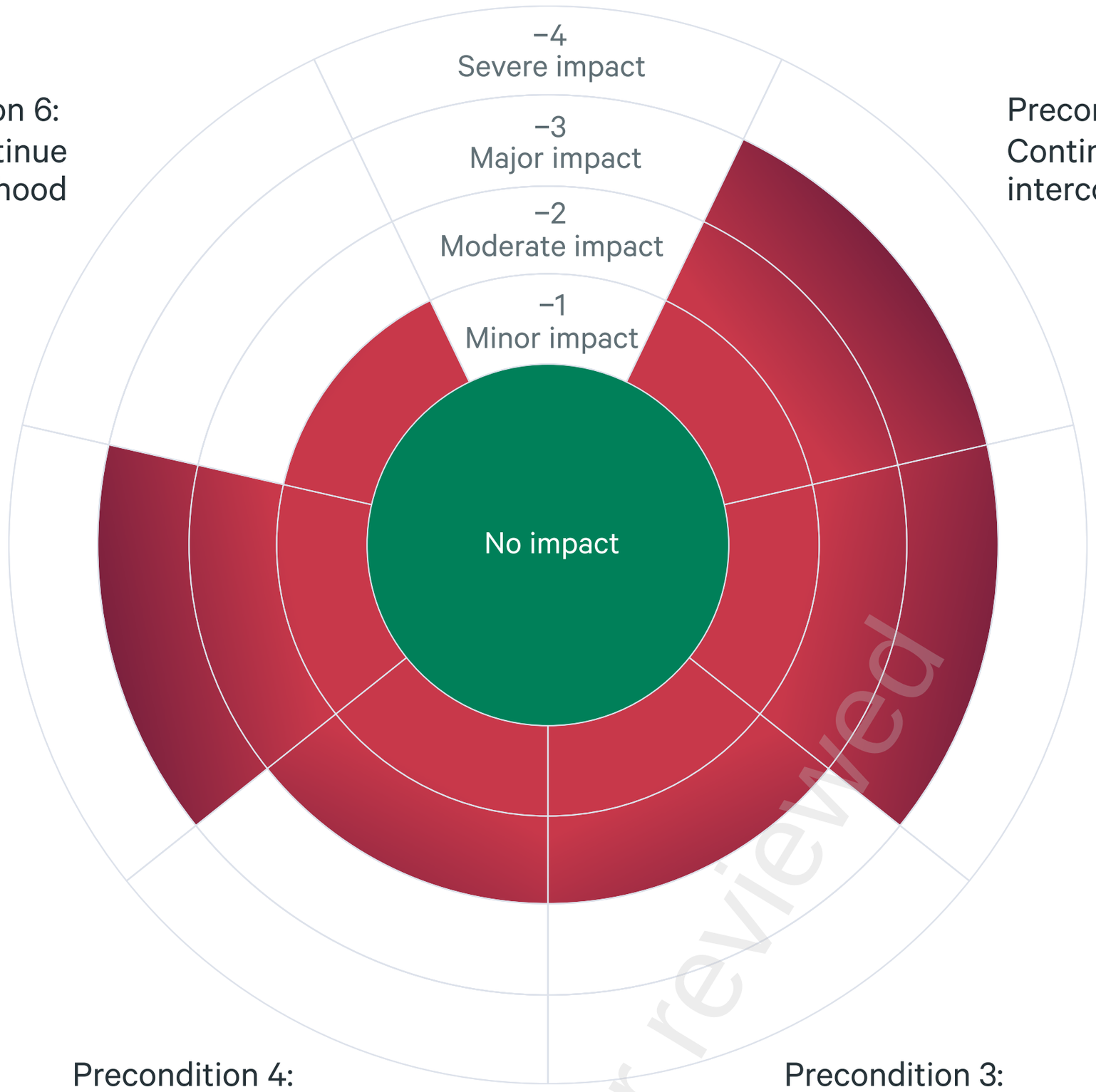
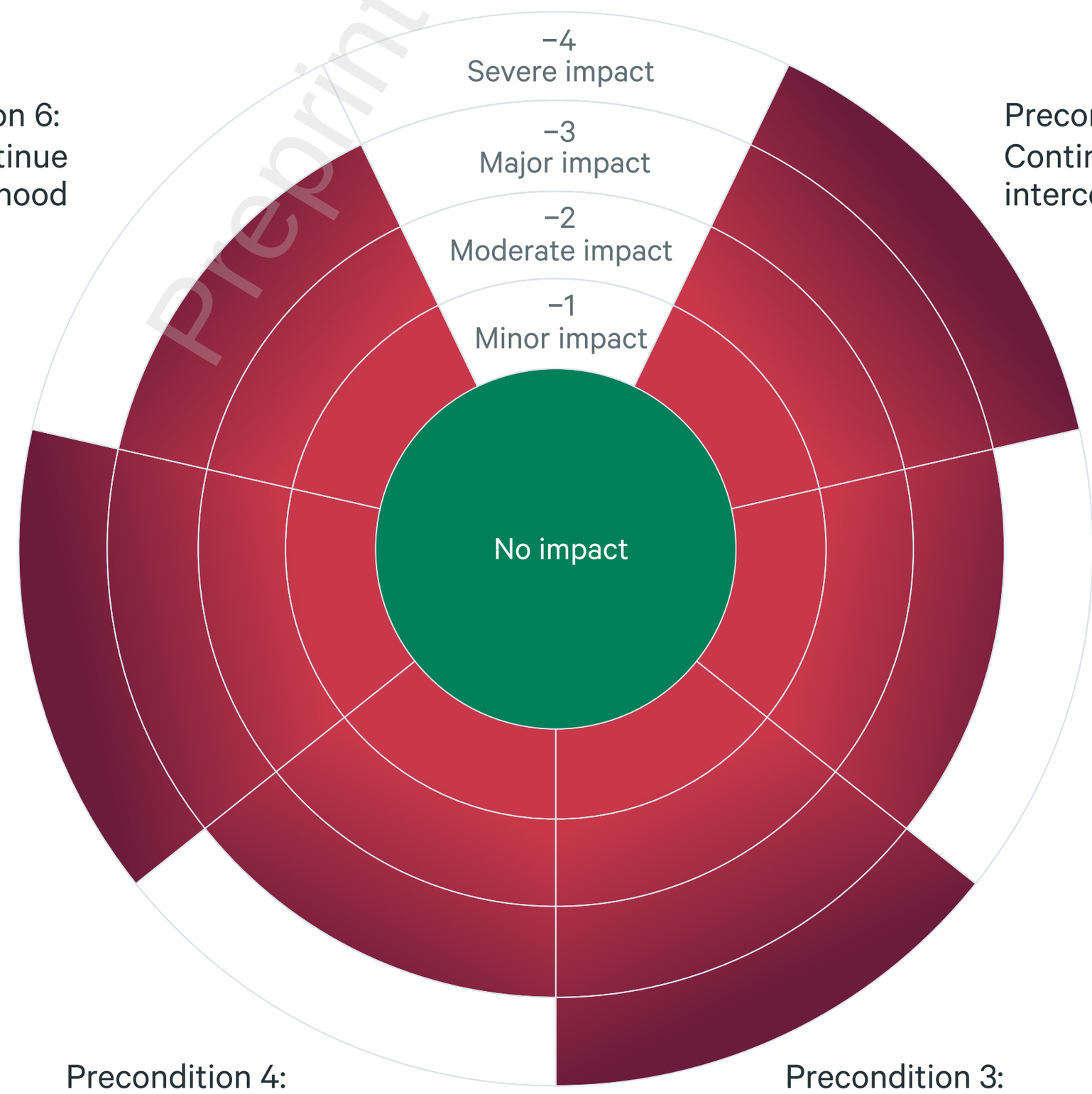
Present situation

Impact on the six preconditions for the community's enjoyment of its rights



Per Geijer

Impact on the six preconditions for the community's enjoyment of its rights



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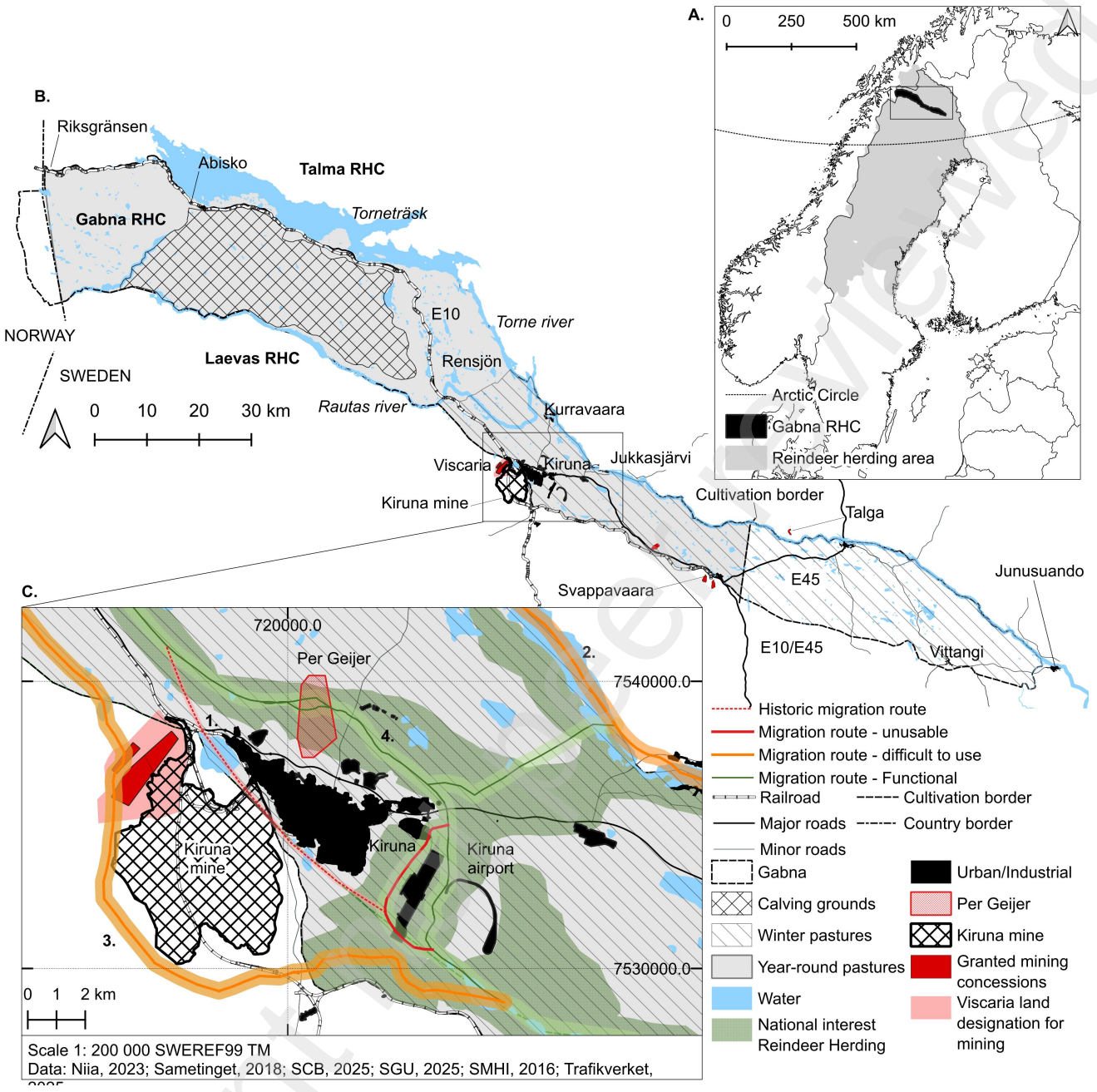

Scale 1: 200 000 SWEREF99 TM
Data: Niia, 2023; Sametinget, 2018; SCB, 2025; SGU, 2025; SMHI, 2016; Trafikverket,

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