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We belong to the land: review of two northern rewilding sites as a vehicle for equity in conservation

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The current planetary shifts and the redistribution of species require us to rethink nature conservation, both from the viewpoint of forming novel ecosystems and in relation to issues of diversity, historical conservation practices, as well as historical and current injustice. Mainly, this reorientation needs to address the historical errors of mainstream societies that promoted nature conservation for their own benefit, at the expense of Indigenous societies. The article explores two Finnish and Sámi rewilding cases of community-led action. In the end, the research seeks to answer how to negotiate a new co-existence with rewilded sites to achieve a better future.

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Introduction

In this paper, we position the need for planetary shifts underway (IPCC, 2022) as well as the enduring injustices (Crosby, 1986; Harvey, 1996; Rechtschaffen and Gauna, 2003; Schlosberg, 2007) and equity issues (Kelleher, 2018) to be central issues, if humanity and the Earth are to survive the “wicked problems” of the present. In order to achieve this, we position recent, new models of conservation (ICCAs—indigenous and/or community-conserved areas) as solutions. In summary, we ask—*how can conservation be equitable?* And perhaps as a follow-up—*What are the new “maps” and pathways forward in a world of simultaneous and complex problems?*

We move to review this question and associated issues in novel and new solutions for Finnish and Sámi communities currently rewilding their landscapes (Perino et al., 2019). We offer a re-thinking of place, space, and agency (Huntington et al., 2017) in the Northern rewilded locations, and position such an approach as one that addresses the needs for our survival—system shifts in both understanding and doing.

We report results from the Landscape Rewilding Programme, initiated in Finland in 2017, to provide a mechanism for restoration, conservation, and ultimately equitable community-maintained biodiversity hotspots. It combines the action of rewilding (Perino et al., 2019) in practice with Indigenous-, traditional knowledge- and community-relevant conservation (Mustonen, 2021). Overall, we use Ostrom’s notion of a summarized analytical context of the action arena (e.g. 2009) to point to shifts in the local agency. “Action arena” here draws on several understandings (McGinnis and Ostrom, 2014; Mustonen, 2017; Ostrom, 2009) to see how, where or if at all, local communities are participating in decisions regarding their lifeways and resource-making.

Recent academic works on ecosystem change (Bonebrake et al., 2017; Pecl et al., 2017) and planetary atmospheric systems (IPCC, 2022) imply that the climate-driven redistribution of species and their impacts on human systems are already underway. They are also developing in speeds and scales previously unheard of, as demonstrated by recent Antarctic ice melt events and the high temperature of over 49 °C in boreal Canada in the summer of 2021.

This paper builds on the need to assess dominant global human systems’ capacity—and failure—to respond to the degradation of ecosystems, biological and cultural diversity, and carbon sinks, with a particular focus on nature conservation. The focus is on traditional Finnish and Sámi Indigenous contexts from Finland—a nexus of climate and biodiversity changes in the Boreal and Arctic with implications for the more extensive global system.

The implications of the current global crisis both for human well-being and natural systems, and their very survival, are profound and must be discussed. Perhaps ironically, in recent decades, the understanding of natural systems and their interconnectedness with social systems has considerably widened (Ostrom, 2009; Pecl et al., 2017).

This new appreciation has made redundant the older deductions of the binary ‘development’ versus ‘preservation/conservation’ approach. There is now a clear recognition that several agencies and actors are involved (McGinnis and Ostrom, 2014; Ostrom, 2009). There are few moral and contextual maps to guide us in these new, unstable futures. We can draw on literature, for example, through Alexievich (2006), McGinnis and Ostrom (2014), Ostrom (2009), and Soudakova (2020) in their respective ways (exploring the environmental and human systems). They point to the cascading legacy of past problems, which have resulted in present-day wicked problems.

Nobel laureate Alexievich (2006) illustrates that the defining event of the Chernobyl nuclear disaster of 1986 was not only a

technical–environmental crisis but the context-shifting result of human use of natural resources to which we have not yet found a permanent solution. Therefore, we need a reformative approach to planetary ecology that would be able to meet and understand entirely new realities. At the same time, we are attaining greater awareness of the complexity of natural systems and the extent and scale of the damage that humanity is causing.

Tracing the human experience of similar seismic events and taking the Chernobyl event of 1986 as an example, we should pay particular attention to the words and discoveries of Alexievich (2006), who underlines the fact that humanity has not yet been able to comprehend, nor come to terms, with the implications of this disaster. Chernobyl was a shock to Europe without precedent.

Nature returned in the form of radioactive rains, ecosystem degradation, and new health risks. It had been relegated to the back bench of European realities as the focus was post-WW2 on economic growth and social development. Chernobyl, if we are to believe Alexievich, was a civilizational watermark. We note that the current war in Ukraine, in 2022, has raised the specter of the impacts of the 1986 crisis.

Soudakova (2020), in her turn, offers us a rich history of the Soviet and post-Soviet memories of terror and, more precisely, the legacies of such terror that transfer across generations, countries, and cultures if they are not addressed. We position her work alongside Alexievich’s in framing our need for reforms. Both women provide a central statement onto which we build our present paper. If we don’t first understand, interpret, and ultimately learn from the past drivers of damages, disruption, and violence, no solution can be just or equitable (Soudakova, 2020).

We treat Alexievich’s (2006) and Soudakova’s (2020) central wake-up calls as a point of intellectual departure—we are using them to argue for the need for a reformative approach to conserving nature and natural resources. Realizing the moral-imperative directions that these two authors point to has never been more relevant than today. We argue that it is actually from the traditional, sometimes Indigenous knowledge and practices that solutions can emerge and the novel new policy–action–rights nexus can surface. Hence, as Ostrom (2009) and McGinnis and Ostrom (2014) point out, there are novel importance in better understanding this knowledge, the positions, and contexts in research, policy, and practice.

Methods

Our overall methods and understanding of *rewilding* follow Perino et al. (2019)—here, a landscape-wide assessment leading to the restoration and renewal of natural socio-ecological systems (which are deeply integrated) is seen as a critical action of maintaining ecosystem services, healthy villages, and resilience.

Applying this, we use case studies to demonstrate the added value of equitable conservation, including restoring habitats with the local communities as key agents of action (Huntington et al., 2017). We position this into the understanding that the conventional conservation approach of state-led protected areas, taken by the dominant global systems, is not enough to address these challenges (Ostrom, 2009).

The materials of this research work are derived from existing materials in local languages (e.g. Feodoroff, 2021; Huntington et al., 2017; Mustonen 2017, 2022; Snowchange Cooperative, n.d.) summarized in our case studies.

The first case is a Finnish peatland ecosystem, Salojenneva, a treeless wet bog located in the municipality of Karvia, Western Finland. It remained relatively untouched until the 1970s. The area sheltered, among other central keystone species, the southernmost stock of willow ptarmigan (*Lagopus lagopus*). It was

subject to peat mining between the 1970s and 2018, which physically altered the whole habitat. Between 2018 and 2021, Salojenvea was rewilded and emerged as a protected, communally relevant bird sanctuary and wetland.

The second case is an Indigenous Sámi home river in Northeastern Lapland, Finland—Vainosjoki. It is part of the Näätämäo catchment and used to be a habitat for Grayling (*Thymallus thymallus*) and Brown trout (*Salmo trutta*). Between 1968 and 1972, the river was dredged and altered for timber floating by the state company Metsähallitus. Between 2015 and 2020, it was fully restored and rewilded using Indigenous knowledge and science, and subsequently protected and maintained by the local Skolt Sámi.

Most of the global protected areas reported to the World Database on Protected Areas are government-led protected areas (WDPA, 2020). With roots in African colonial history (Kelleher, 2018), this now almost globally uniform model of nature conservation placed governance into the hands of solid and centralized authorities. This enabled governments to acquire land for conservation. Historically and to this day, it has been done via a “command and control” approach, established through top-down imposition and excluding pre-existing rightsholders and custodians. As Ostrom (2009) points out, the need to understand a broader landscape of stakeholders and actors is central to finding new solutions.

Top-down agencies often completely restrict natural resource use and are held *in perpetua*, set aside indefinitely. But most of all, they remove areas from the governance of local actors, who are often best placed to steward these lands (McGinnis and Ostrom, 2014). Therefore, a reformative approach needs to fulfill simultaneous aims rapidly. Given the shifts in planetary ecology (Pecl et al., 2017) and the emergence of novel ecosystems, solutions might also be something we have not yet seen. Such solutions include resilience corridors and amorphic territorial shapes (Mustonen, 2017), which challenge the existing delineation of protected areas.

We use a historical and geographical case study approach to the transformation of both traditional Finnish lands and Sámi indigenous *siida* territories into natural resource extraction or nature conservation zones. Salojenvea and Vainosjoki emerge as hotspots of primary habitats lost to state-led extractive actions and then rewilded by local communities. In both cases within Finland, the state and state agencies (the VAPO company for peat mining, Metsähallitus or post-2016 Metsätalous Oy for timber resources) are the central institutions that essentially have had a monopoly of land uses and decision-making in these individual cases.

We discuss the actions needed in the present context to offer survival potential and the implications for both an internal view and outside benefits. More clearly, we point out how the local context in our cases can better integrate the communities into solution spaces and stakeholder approaches (Ostrom, 2009). Firstly, this approach will help situate the usually absent indigenous peoples and local communities into the story and evolution of nature conservation (highlighting how their values and ways of life ensured that lands were taken care of). Secondly, we document and discuss moments of state intervention in each case, acknowledging the dramatic and violent impact on their ways of life and the enduring effect on people and the earth.

We finally seek to deduct and investigate a renewal and dialogue potential of how to interact with the landscape, moving beyond the binary approach towards recognizing cultural diversity and rights. This may imply negotiating new symbiotic relationships between people and nature in restored landscapes, in short, “to re-belong to the land.” Ostrom (2009) highlights a theoretical approach to the need to recognize all stakeholders in such processes.

This geographical methodology with case studies allows for a discussion on achieving biodiversity conservation through or via the recognition of rights, cultural diversity, and governance diversity. It acknowledges historical injustice while also contemplating recognizing a more culturally diverse society, which redresses the imbalance of dominant systems over the past centuries.

Dynamic conservation sites may reflect cyclic events of nature, seasons, and temporal variation (Mustonen and Kontkanen, 2019). For example, flocks of birds define feeding and resting areas during their migrations—what could be the status of those sites outside the primary abundance? At other times such a site could be managed for lesser conservation value as long as its key components were preserved.

Secondly, Indigenous rights and equity in conservation (Schlossberg, 2007) are needed to realize stable and persistent governance and land uses. One avenue lies in registering these areas as ICCAs, also called Territories of Life. This places the governance away from centralized agencies and back into the hands of those living closest to the resources.

ICCAs are recognized globally as conservation areas (CBD, IUCN) and embody a dynamic and rights-based approach (Farvar et al., 2018). ICCAs, therefore, form a crucial component of “equitable nature conservation,” as articulated in the global targets under the CBD, and are likely to appear in new international policies on climate change and biodiversity conservation. The word “equity” denotes fairness and comprises three aspects: recognition of actors, their diverse knowledge, culture, and governance systems; procedural rights, including access to justice and conflict resolution; distributive equity, the fair sharing of costs and benefits of conservation (CBD, 2018; Ostrom, 2009).

The ICCA Consortium has developed a typology that can be used as a theoretical framework to define ICCAs. An ICCA is where there is a close association between a specific indigenous people or local community and a specific territory (Ostrom, 2009), area, or body of natural resources. When this association is combined with effective local governance or decision-making, and the effective conservation of nature, it qualifies as an ICCA. These are self-identified and reported globally via the ICCA Registry (WDPA, 2020).

The ICCA Consortium has further distinguished defined, disrupted, and desired ICCAs (Farvar et al., 2018). This definition offers an interpretative assessment scale for our paper in the Finnish and Sámi contexts. Conceptualization must be refined and completed, and a Northern view of ICCAs must be developed. For instance, in Finland, there are no specific rights per se for local communities, and the indigenous Sámi groups are still struggling for governance over their ancestral lands (Joonas, 2020; Mustonen, 2017).

A discussion should now be started to introduce the concept of ICCAs to raise awareness on the rights of indigenous peoples and local communities in Finland, intertwined with rewilding. As of August 2022, three areas in Finland have the official “ICCA” registry status. Ostrom (2009) provides a change in perspective for these conservation targets.

Results

As the number of rewilding and restoration projects increase in Finland to bring ecosystems back to health and recreate a link between nature and human communities, the review of historical Sámi *siida* territories and Finnish *erämaa* lands (Jutikkala, 1942) constitutes a pertinent argument to explore the concept of ICCAs—Territories of Life in the country (Mustonen, 2017).

Private land ownership is often a necessary legal mechanism to implement effective restoration measures in Finland. The successful

examples of the Linnunsuo wetland (Mustonen and Kontkanen, 2019)—one of the first ICCAs in Finland—and the Skolt Sámi co-management of the Näättämö river (Mustonen and Feodoroff, 2018) also show that cultural revival is possible when ecosystems are restored and species return.

In Finland, both the traditional Finnish villages and the Sámi Indigenous peoples have maintained wilderness economies to this day (Mustonen, 2017) in the boreal and sub-Arctic, i.e., the trades of fisheries, hunting, and reindeer herding along with gathering economies and other small-scale harvests.

The industrial and modern land use in the Finnish Boreal is a relatively recent historical event—only a century ago, a large portion of present-day Finland could be considered to be able to maintain the socio-ecological systems of the rural and Indigenous communities. While there is no space here to go into detail about how the ecological and natural resources impacts evolved, they can be summarized as being extreme in their transformative capacities to:

1. Convert boreal ecosystems into economic, natural resource areas as state-led actions;
2. Diminish the capacity of local communities to maintain their endemic time spaces, building on the life in the boreal, by not granting them any rights;
3. Contribute to the loss of rights and customary governance of these territories by outside and partially internal forces. In short, this constitutes the process of disrupting the ICCAs in Finland.

Case study 1: Salojenneva former *erämaa* peatland. Our first case study deals with Salojenneva, a former peat mining site in Karvia, Western Finland. It is located in the lake Kuivasjärvi catchment in the Province of Pirkanmaa. Ethnically the residents are Finnish villagers who have been inhabiting the area at least since 1300–1400 AD through the *erämaa* presence. Peat mining and state-led extractive forestry industry have been operating with a heavy hand in the lake basin since 1945. In 2013 a public movement arose to oppose peat mining and organized into an association in 2015, Pro Kuivasjärvi (Mustonen, 2022).

Between the 1980s and 2018, the state company VAPO operated the mining in the area. The site was restored and rewilded into a wetland for birds and carbon sequestration in 2018–2021 (see Fig. 1), a project led by the local association Pro Kuivasjärvi (Mustonen 2022). Incidentally, the site was linked with and formed a part of one of the central ICCAs that used to exist in boreal Finland. The whole territory of Salojenneva, as of now, is 30 ha.

The traditional land use form of the “forest Finnish” life was the *erämaa*—a wilderness land used for hunting, fisheries, and to some extent, small-scale slash-and-burn economies in the Boreal. Salojenneva is located in the lake Kuivasjärvi catchment area (16,000 ha, see Fig. 2 for the historical distribution of the *erämaa* sites) in Western Finland as it belongs to one of the historically known and rather well-described sites of *erämaa* systems (Salo, 1984). Pro Kuivasjärvi association has enabled a co-management approach on the rewilded site (Mustonen, 2022), enabling hunting and nature protection, building on the *erämaa* model.

Erämaa is central to discussions on the applicability of the ICCA concept in the Finnish context, as these community sites, lands and waterways were governed using endemic social self-organization. Koivunen (1992) linked the traditional Finnish land uses to the broader boreal context and said that the diversity of social organization is remarkable. According to him (Koivunen, 1992), the “core” village was linked with the *erämaa* hunting territories and was similar to the seasonal territoriality



Fig. 1 Salojenneva peatland site is a rewilded peatland area in the Lake Kuivasjärvi catchment area. It is also an *erämaa* cultural landscape. Photo: Snowchange, 2022. Used with permission.

better known from the Indigenous land uses of Central and Northern Siberia. Additionally, *hiisi* has been mentioned as one cultural concept for smaller individual forest ICCA sites - meaning a sacred grove or a significant cultural site in the Baltic-Finnish languages.

Koivunen (1992) and Salo (1984) define the extent of the *erämaa* sites to be even 120 kilometers from the central village. Over time these distances shortened, and the driver of this development was the advancing switch to farming as opposed to hunting as the primary survival strategy—a significant change in objectives of the use of a territory (Ostrom, 2009). Salo (1997) also documented these systems but could not solve their origin point.

Beginning in the 1500s and increasing in the 1600s, the last *erämaa* sites were annexed to Sweden’s crownlands by the Wasa kings’ decision. They decided that the “unoccupied” (unsettled by farmers) lands were outside legal ownership and could be included as state assets. This marked the end of the capacity of the local community to maintain their whole endemic and customary ways of life in the boreal. Additionally, it made it hard for these communities to be recognized in the action arena (Ostrom, 2009). The intervention extinguished customary use, bottom-up land management, governance, traditional justice, and traditional knowledge. Ostrom (2009) has framed such processes as a lack of stakeholdership—bearing in mind the distant historical context.

Furthermore, an annexation by the Swedish Crown, followed by Russian rule and ultimately a modern independent Finnish state since 1917, pointed to a path where nature and land were seen and defined using outside terms and values, resulting in the ultimate present-day natural resource and conservation land uses (Mustonen, 2017). Salojenneva, however, remained in reasonably pristine condition until the 1970s.

Beginning with the energy crisis of 1973, Finland and its state companies (VAPO) sped peat mining to increase domestic energy production (Mustonen, 2014). This transformed Salojenneva as well. It was mined from the early 1980s to 2017. In 2018, a large-scale rewilding (Perino et al., 2019) process installed three large wetland units in the former industrial location. A local lake organization and community members supported the rewilding actions (Mustonen, 2021). Pressing water pollution impacts stimulated the support.

After 2018–2021, the restoration actions in this former industrial peat mining area started to demonstrate rapid recovery.

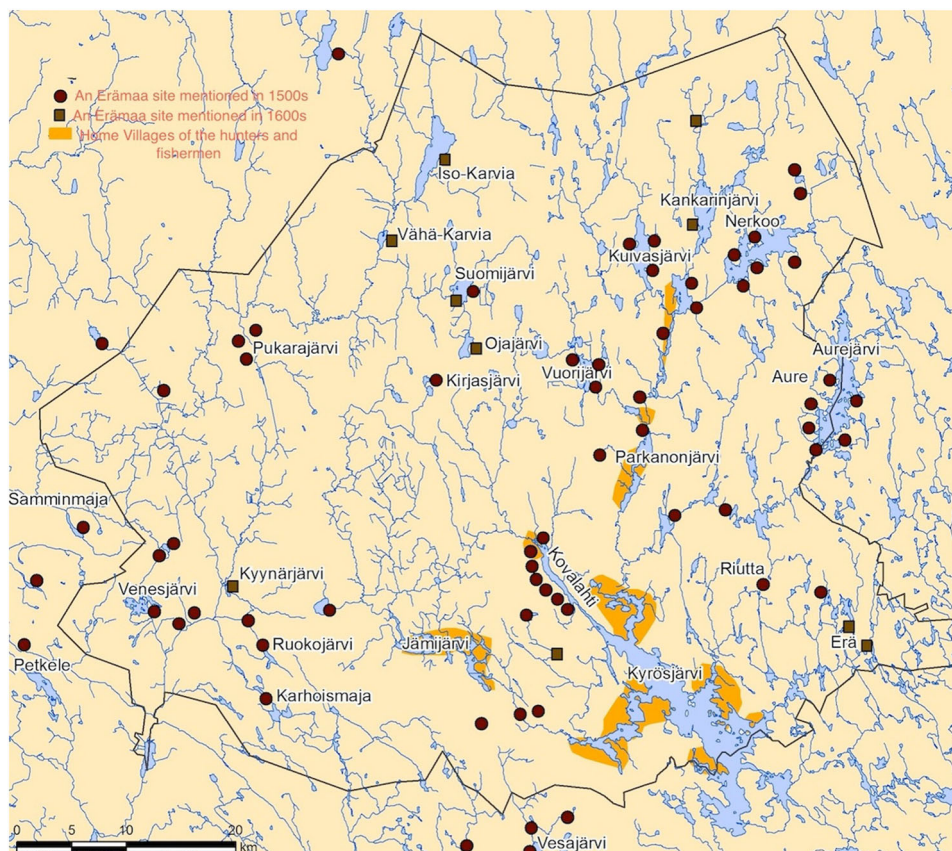


Fig. 2 A map detailing examples of erämaa sites from the lake Kuivasjärvi area from 1500s and 1600s in Western Finland. Map: Snowchange, 2022. Used with permission.

Rewilding also addressed loading issues into downstream waters. Lastly, rewilding prevents soil-based carbon dioxide emissions from peatlands (Scherer, 2022, in press). Based on returning bird species as indicators of restoration, a recent summary demonstrates this recovery (Kontkanen, 2019):

- Little gull (*Hydrocoloeus minutus*), 90 visiting pairs
- Dunlin (*Calidris alpina*), visiting individuals
- Goldeneye (*Bucephala clangula*), 5 breeding pairs in 2019
- Teal (*Anas recca*), 5 breeding pairs in 2019
- Common greenshank (*Tringa nebularia*), a nesting couple in 2019
- Meadow pipit (*Anthes pratensis*), 2 nesting couples in 2019

In 2021, while staying under the co-management of land-owners and other local actors, Salojenneva was formally protected due to the returning biodiversity values. The rewilding of abandoned and “lost lands” such as Salojenneva can create safe havens and recovering carbon sinks, at a time when emission cuts and economic shifts may prove inadequate for effectively combatting climate change. For the local community, the direct benefits are, in short, improved water quality on-site and downstream, providing better fishing and aquatic resources, recreational values, local management, and pride and hunting capacity that has returned to the wetland. Above all, the local community and members have been able to feel agency (Huntington et al., 2017) in land use decisions.

They also contribute to restoring the self-esteem and identity as recovering Community-Conserved Area sites after decades of top-down natural resource governance (Harvey, 1996). Yet, these “Western” words and concepts may not fully answer a

central internal cultural question—*what is the identity of these “rewilded” and restored sites?* We return to this notion in the end.

Case study 2: Sámi River Vainosjoki. In this case study, we review the situation and events of river Vainosjoki, a five-kilometer river system located in the Näätamö catchment (Mustonen, 2021). Vainosjoki, a sub-arctic river, was altered between 1968 and 1972 for timber floating. The state of Finland, through its Metsähallitus forestry company, decided and continues to decide on all land use and resource questions in these areas. The state considers these areas “state land.”

The river suffered from completely losing fish habitats and spawning sites and altered hydrological conditions from 1972 to 2015. Between 2017 and 2020, the river was completely rewilded and restored by a set of local Sámi Elders led by Risto Semenoff and the Skolt Sámi Council (Mustonen, 2021). Skolt Sámi Council, representing the village’s Indigenous peoples, enabled and continues a co-management approach on these restored sites.

Vainosjoki is situated in the traditional home areas of the Skolt Sámi. The Sámi, as Indigenous peoples of Finland, are the traditional owners of the land and waters (Aikio, 1977; Alanen, 1931). Vainosjoki is located in the traditional territories of the Skolt Sámi, a community of approximately 800 people, of which 500 live in the closeby village of Sevettijärvi.

Aikio (1977) calls this the “Sámi ecosystem,” where nature and humans live in a long continuum of reciprocity. Sámi and Finns have had a complex set of relations even though these languages were deeply related in pre-historic times. Some of the coercive actions the Sámi had to endure in early historic times included:

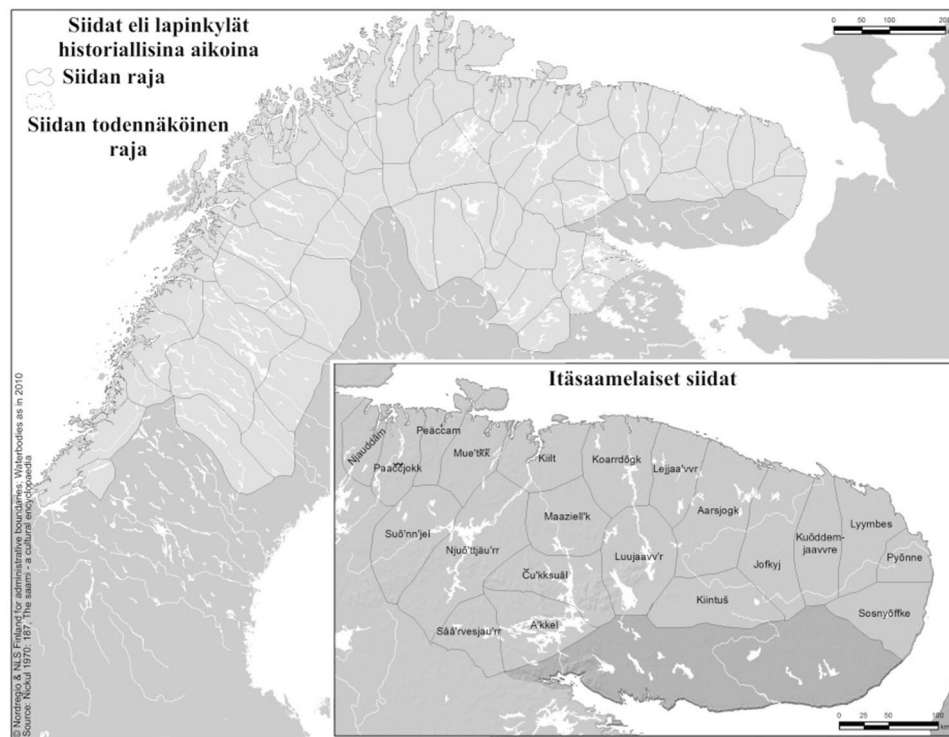


Fig. 3 Sámi historical *siida* territories on a map. Map by Johanna Roto/ Snowchange, 2022. Used with permission. The larger map conveys all these sites across present-day Norway, Sweden, Finland, and NW Russia. The inset map points to the Eastern Sámi *siida* territories, which are the subject of the case study, especially the westernmost, Njauddam—Näätämö *siida*, the location of the rewilding sites.

- Slavery and submission in the form of Finns having unconsenting Sámi in their communities
- Assimilation, which sped up in the 20th century (Aikio, 1977)
- Withdrawal and migration colonization (Itkonen, 1948a, b; Vilkuna, 1971)

The State of Finland assumed the responsibility towards the Sámi at independence (Aikio, 1977). Three Sámi nations exist in Finland—the Inari Sámi, the Skolt Sámi, and the North Sámi, the latter of which are the most numerous. The Sámi land use and occupancy can be linked to the pre- and early-historic Sámi *siida* territories shown in Fig. 3 (Vilkuna, 1971), which were in operation in part as governing units for the communal land and water use at Finnish independence in 1917 (Aikio, 1977).

Changes during the 20th and 21st centuries have fundamentally altered the Sámi society (Mustonen, 2021). We can summarize the negative and inequitable experiences the Sámi have faced in Finland, with, for instance:

- Industrial logging on traditional *siida* land without consultations,
- The proliferation of mining in the Sámi and neighboring ecosystems, in scales that cover hundreds of square kilometers,
- The construction of the largest hydropower reservoirs in Europe on Sámi and local community lands in Lokka and Porttipahta, as well as on lake Inari,
- The development of unmitigated tourism and infrastructures on Sámi lands,
- The inability to ratify land or water rights of the Indigenous communities in the region (Aikio, 1977; Kauhanen, 2014; Lehtinen, 2009; Nickul, 1982; Vilkuna, 1971).

The Skolt Sámi (Itkonen, 1948a), who have maintained the *siida* governance (Vilkuna, 1971) despite the loss of rights and

lands, are living through the warmest and most extreme temperatures ever known there, with 30 °C and beyond lasting for weeks (Mustonen, 2021). The Skolt Sámi have decided that those fish, such as Trout, Grayling, and Salmon, which are in immediate danger of dying from the direct impacts of climate warming, might have a better chance of survival if their past life ranges and habitats are restored (Edelenbos et al., 2015; Mustonen, 2021).

Therefore, the Sámi installed a co-management system for their main catchment area of the Näätämö river and chose those sites which had been altered and damaged by past human actions as vehicles of increasing human and natural resilience. The central location to start the work was the Vainosjoki sub-catchment area (Mustonen and Feodoroff, 2018). Edelenbos et al. (2015) offer a similar context on water restoration, highlighting the urgent approach where problems have been detected.

The Vainosjoki river rewilding project was initiated in 2017 in practice. The restoration of the river flow by relocating rocks and boulders in the river was carried out by both Sámi and Finnish teams collaboratively. The concept was to actively restore the elements of the river ecosystem and then allow for rewilding (Perino et al., 2019), i.e., the natural functions of the aquatic ecosystem, to start functioning again.

Spawning gravel was distributed at suitable locations. The restoration work covering the length of the Vainosjoki was completed in October 2019 (see Fig. 4). Monitoring (2018–2021) has detected spawning events in the restored areas and has demonstrated the approach's applicability in addressing aquatic rewilding. Grayling (*Thymallus thymallus*) and Brown trout (*Salmo trutta*) have successfully reproduced in the restored spawning areas.

Community benefits from the actions first and foremost derived from the actual fish stocks recovering, which ultimately support food security, cultural fishery, and clean waters.



Fig. 4 Restored gravel area and river site in the Skolt Sámi home area. On the right restoration gravel for fish spawning areas is still visible. Photo: Snowchange, 2022.

Additionally, restoration and rewilding have enabled the Sámi to be agents of change (Huntington et al., 2017) by being able, for the first time, to address long-term damages for the better of their home areas.

Discussion

If we apply Alexievich's (2006) and Soudakova's (2020) thematic approach and solutions to the Vainosjoki river, we can see how a few central components of novel solutions emerge as viable vehicles for change. First, Indigenous memory carried the need and action space for over 40 years, from 1968 to 2013, to realize the rewilding of the river as a means of unlocking solutions to environmental problems and climate change challenges.

Second, the State ignored and dismissed the disruptive and altering actions from the 1970s onwards and paid no heed to changes that were causing problems even in 2013 (lack of water on the stream, loss of high-value salmonids, development of algal blooms, see more in Mustonen and Feodoroff, 2018). Ostrom (2009) sees this as a not-a-part of the "action arena" of the stakeholder approach. To the state, Vainosjoki was seen as a pristine wilderness. By challenging these narratives, new and novel solutions could be found that fit the local cultural and Indigenous framing and produced solutions; and ultimately, most importantly, a life that returned to the stream.

In summary, both the Salojenvea peatland and the Vainosjoki river, boreal and sub-Arctic community sites, were heavily altered by state-led extractivism. Decades passed, but the local communities preserved agency (Huntington et al., 2017) and natural site knowledge (Mustonen, 2021). They acted using restoration and rewilding methods (Perino et al., 2019) to achieve an ecological renewal. They point to the understanding that to negotiate a new coexistence with rewilded sites to gain a better future local knowledge, agency (Huntington et al., 2017), and memory are central to enabling such actions.

The state agencies have accepted the approach, which is the first step in recognizing the analytical stakeholder approach (Ostrom, 2009). Both sites are now recovering and demonstrating success in the comeback of species, function, and resilience (Mustonen and Kontkanen, 2019; Mustonen, 2021). They are both ICCA sites despite not yet being registered in the WDPA (2020). They summarize the prioritization from Alexievich (2006) and Soudakova (2020) that new approaches require an understanding, a memory if you will, of the past, to have the capacity to navigate the new present and challenges.

Conclusions

Some Finnish and Sámi communities have, together and separately, decided that the survival of their human and non-human neighbors is possible if past damages are addressed, and new spaces and territories are maintained through traditional customary land use and food security. This provides relevant examples of how conservation equity, including rewilding (Perino et al., 2019), realizes itself on the ground.

The communities described in this paper have been able to define what Ostrom (2009) calls an action arena. In short, they wish to "re-belong to the land" as a historical continuum from the *erämaa* and *siida* land use to the present day. This is built on assessing the disrupted ICCAs and rebuilding them in scale and quality (Farvar et al., 2018).

This article has demonstrated two cases as examples of rebuilding traditional minds, memory, land, and health in a complex interrelationship. These actions rest on the argument that when ecosystems heal, the people living there will also. This points to at least a level of recovery of disrupted ICCAs as a vehicle for reconnecting and re-building socio-ecological systems.

We can review both the Finnish and the Sámi cases as disrupted ICCAs. They constitute essential examples of renewed connections and territories of life for the Sámi and point to the potential of using rewilding on Indigenous lands as a vehicle for recovery and resurgence.

A scientifically and ecologically restored wetland or river is not the original as it developed in the post-Ice Age context of the boreal and the Arctic (see Perino et al. (2019) for a discussion on the ecological implications of rewilding). Restoration, especially, is always a form of biomanipulation. In this way, restoring such sites does not seek to return to a previous known or understood phenomenon, rather a restored area is a novel ecosystem following the path of:

natural state --> degradation by human actions --> novel ecosystem as a restored site

(Bonebrake et al., 2017)

If we then position the restored and rewilded sites into a cultural perspective and as action arenas (Ostrom, 2009), an even more complex context emerges. As Feodoroff (2021) states:

"Indigenous knowledge and Western Science offer us concepts and possibilities to reflect on those changes that the waters in our bodies have known and reminded us of what has happened already much earlier. Changes in temperature, pain, and the gradual passing of pain, waves, and intrusions within our bodies are knowledges that are difficult to communicate. It seems that women are especially more sensitive to receiving messages from their home environments. And, thus, our Indigenous conservation work ends up being no longer a choice but a bodily commitment."

Documenting such rewilding work in two locations, several new openings emerge, which may put them further into action arenas (Ostrom, 2009). Future questions may include the following:

Who are you? What is your identity?

How can we co-exist with you?

How can we ever apologize or provide redress for the past damages?

How can we co-exist in this tumultuous time?

Should we "manage" these spaces or stay away and not intervene?

While some of these questions will be answered and discovered only in the local context, they point to the deep and multi-layered elements of converting disrupted ICCAs back to health. Lippard (1983) provides in her breakthrough work the need and appreciation of artists, marginal and creative approaches to solving wicked environmental problems in a similar way. Therefore, a transfer into the rewilding programme implies that there is a very significant symbolic environmental justice act in addition to ecological restoration. After 400 years of outside ownership, action arena (Ostrom, 2009), and governance, the Salojenvea wetland is emerging as one of the first reborn *erämaa* lands. It was also formally protected in 2021 as a nature conservation area due to the comeback of bird life post-rewilding. Therefore, the Landscape Rewilding Programme contains a vital element of social justice and operationalizes the recognition of rights and governance, as called for at the international level. It also confronts a new symbiotic relationship between people and their natural surroundings.

Lastly, we need to address the issue of degraded lands, driven and sped up by land abandonment and urbanization. These can often be considered disrupted ICCAs. The restoration and rewilding of these sites are essential because the proposed emission cuts will not be sufficient to avert the climate crisis, as the Glasgow COP demonstrated meaningfully.

There is no denying that we are witnessing one of the most turbulent eras for humanity. Responses and actions need to be equally wise, and “deep”, and address the multiple wrongs that have taken place against people and nature herself. We would also need to find ways of reintegrating the people who have been left out of the action arena (Ostrom, 2009).

As discussed above, current planetary shifts and species redistribution require us to rethink nature conservation from the viewpoint of forming novel ecosystems and about issues of historical equity (Mustonen and Feodoroff, 2018).

In particular, this reorientation needs to establish remedies for the historical errors of mainstream societies that promoted nature conservation for their own benefit and assumed governance of these areas at the expense of Indigenous societies and without incorporating local governance systems and traditional practices (Farvar et al., 2018; Kelleher, 2018).

Our cases presented above offer distinctly “endemic” solutions to be reintegrated into the action arena (Ostrom, 2009). Further, if recognized as ICCAs globally, if the custodian communities wish, they will count towards Finland’s meeting their Aichi Target 11 and the post-2020 Global Biodiversity Framework targets, which are widely expected to increase in ambition.

The article has demonstrated that a reformative science-Indigenous-rewilding interface is possible. The cases point to four options for nature conservation approaches that may address the conservation of biodiversity, social justice issues, and recognize the rights and governance systems of local actors such as indigenous peoples and local communities.

The Finnish *erämaa* territories, as illustrated, have the potential to be a model for a renewed dynamic approach, as they allowed for sustainable use and management that led to positive outcomes for both the natural environment and people. This historical perspective offers an example of bottom-up and customary governance systems that still resonate today.

Sami *siidas* can still be traced back to their historical roots. They can, in some ways, as the *erämaa* territories, constitute a framework for Indigenous and community rights, the rebuilding of governance, and rewilding. The unbroken family engagements in some parts of Sápmi, the Sámi homeland, serve as a mechanism for this.

In the Sámi context, ICCA sites may be as wide as the whole former *siida* or point-specific, recovering, and Indigenous-

managed sites and systems like in the case of the Vainosjoki river. Scales and metrics depend on Indigenous evaluation and decisions on the context (Mustonen, 2021).

The realization of *erämaa* and *siida* lands is also central to revitalizing and maintaining traditional knowledge in the Boreal and the Arctic. Living knowledge requires territories that are still functioning. This is lost when local communities are not integrated into the action arena (Ostrom, 2009). Dynamic conservation (Bonebrake et al., 2017), which may include innovative demarcation tools responsive to the changes underway, is much needed, especially as a response to the ongoing emergence of novel ecosystems.

Indigenous and Community-Conserved Areas (ICCAs), which are recognized at the global level, should be utilized as a tool (Farvar et al., 2018), enabling the emergence of endemic mechanisms to address past grievances and displacements caused by conservation. Lastly, community-guided and owned rewilding, especially in disrupted ICCA sites, rebuilds social and ecological resilience and demonstrates in very concrete steps the power of change in situ for these affected communities (McGinnis and Ostrom, 2014).

Further, taking a historical perspective (Salo, 1984) allows for the “re-situating” of indigenous and local communities into the modern history of nature conservation. This is a critical step to understanding the historical and cultural traits of land management, which also brings in the vital role of customary knowledge, practices, institutions, and values that constituted conservation in the past and has the potential of bringing them back to the action arena (Ostrom, 2009).

We should not rule out the possibility that some endemic arrangements (Mustonen, 2017) in the Indigenous and local cultural and conservation fields may have no formulation in the global nature conservation discourse. As we can see from the Salojenvea case, there may be practices and ways of co-existence still present that have not been discussed at all.

These approaches, we argue, will ultimately move more effectively toward achieving the three aims: to respect and redress the rights of indigenous peoples and local communities, to achieve long-term conservation outcomes that are both effective and equitable, and to tackle climate change by mainstreaming it across the mosaic landscape. These actions would be able to address both environmental (Crosby, 1986; Harvey, 1996; Tonra et al., 2015) and social (Toivanen and Fabritius, 2020) legacies affecting the present.

Data availability

The primary maps and data quoted in the article (biodiversity) are accessible through the Landscape Rewilding Programme, administrated by the Snowchange Cooperative.

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Author contributions

TM designed the main framing of the article and conducted data analysis and map production. AS contributed to scientific and conservation writing. JK reviewed the conservation policies and the ICCA-related positioning. TM, AS, and JK contributed to the analysis and all of the aspects of the article. All authors agreed and consented to the publication.

Competing interests

The authors declare no competing interests.

Ethical approval

This work has followed the research ethics principles of the Academy of Sciences in Finland and the ethical research standards of the University of Eastern Finland. All authors consented to participation. This article does not contain any studies with human participants performed by any of the authors.

Informed consent

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