Tree Stands Between Forest and Plantation

Evolving Practices for Northern Sweden's Boreal and Industrial Landscapes

Luis Berríos-Negrón [1], Cornelia Redeker [1] and Toms Kokins [1]

[1] Umeå University School of Architecture (Sweden)

Abstract

By contrasting three ongoing research projects along with complementary arguments, this paper explores mediating practices from environmental art and architecture perspectives in the context of industrial forestry and Sweden's 'green transition'. The general discourse on 'green transitions' significantly amplifies the cultural and economic values of forests within and beyond Sweden. This amplification turns forests into reflexive entities that compel broader value revisions, challenging the extractivist character of modern urbanism. An example is the recent public debate in Sweden about what distinguishes a 'forest' (skog) from a 'plantation' (plantage). The debate does not reinforce the binary divide between the terms. Instead, it is prompting renewed, if overdue, attention to suppressed Indigenous and rural ancestries, as well as to alternative narratives and techniques that rethink industrial forestry tropes. From that context, our arguments position our respective research works—regarding 1) tree nurseries and climate injustice, 2) the transnational timber industry, and 3) new resource economies for the built environment—in ways which form and encourage research intersections that recognize ancestral, physical, and temporal scales as a potential for enriching the model that is the Swedish 'green transition'.

Keywords

Ancestral knowledges, architecture, boreal forests, decolonization, environmental art, forest urbanism, green transition, landscape, Sápmi, self-sufficiency.

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From Urban Forestry to Forest Urbanism – Creating Regional Agency

For several centuries now, over half of the world's forests have borne the bulk impact of extractive practices as global industrialization has fragmented and reduced many of these natural, self-sustaining environments and their communities to resource commodities. This fragmentation and reduction took full effect in the late nineteenth and into the twentieth centuries, when disproportionate commercial, national, and transnational attitudes and policies led to, and continue to lead to, alarming trends in global deforestation and biodiversity loss (Holm, 2015, pp. 358–359).

Departing from this global context, we will here outline the current discussions on forestry and the industrial development of the 'green transition' in northern Sweden, while contextualising our respective, ongoing research projects within these discussions. Our projects investigate (1) the transhemispheric roles of 'tree nurseries' between the Caribbean and Fennoscandia that challenge colonial legacies of Western forestry and remediation; (2) architectural perspectives on the impact of transnational timber industries on landscapes—the case of Swedish forests in Latvia; and (3) an activation of the built environment to become more self-sufficient and reduce resource and landscape depletion in the context of the 'green transition' of northern Sweden.

Through our projects, we seek to address how current industrial policies—where forests are still defined as scaleless, endlessly regenerative resources at the service of modern urbanization—exacerbate attitudes that have largely ignored ancestral and Indigenous values, attitudes that still seem to apply to the boreal forests of Sweden. We present the research summaries together with these ancillary arguments to challenge the correlation between industrial practices, building developments, and climate injustice, while seeking to contribute to the broader, evolving 'green transition' of Sweden from the perspective of environmental art and architecture.

We begin by recognising that, while many sections of the Swedish Sápmi and northern Swedish cities have been exposed to mining and energy development, most have not yet turned to urban forestry and other nature-based solutions to mitigate and adapt to the impacts being ushered by this renewed demand for energy resources. What appears to be a vast boreal forest made up of Norway spruce, Scots pine, and some deciduous trees—mostly birch—standing mixed or alone, with lower vegetation of dwarf shrubs, ferns, and grasses, and a bottom layer of lichens and mosses (Arnborg, 1990), feels omnipresent in northern Sweden's built and largely unbuilt environment. It conveys a sense of bucolic abundance that allows many to overlook the difference between man-made and natural forests, the severe fragmentation that clear-cuts, mines, industrial developments, waterpower plants, and wind farms—and all of their supporting infrastructure—are currently producing, with significant impacts both above and below ground.

Expectations of urban and industrial growth, enabled by international investment, to create thriving communities are high. However, they often leave municipalities and other local actors in accommodating rather than negotiating or integrating roles, leading to a loss of areas with high ecological value, as in the case of the recent Facebook data centre development on Natura 2000 land on the outskirts of Luleå (see Ramos Caceres, 2024, p. 64), or the underperformance of wind park developments on reindeer grazing land (Björklund, 2024). Beyond the loss of forest, and thus the loss of CO_2 sequestration, biodiversity, and habitat, potential or expected (compensatory) benefits for those providing these lands often remain marginal or even fail to materialize, due to a variety of factors as diverse as wind conditions, lack of integrated planning capacity, return on investment, and so on.

By setting centre stage what is often coined the hinterland, we advocate for expanding the scale of urban forestscapes within the given boreal context of northern Sweden to a regional reading and, ideally, a propositional practice that enables stewardship rather than merely accommodating external demands. This is where forest urbanism—where the actual habitability of the built environment should be 'understood as a symbiotic form of settling within forests', as per Kelly Shannon, Chiara Cavalieri, and Cecil Konijnendijk (2023)—can be productive in offering an alternative perspective to the ongoing discourse of the 'green transition' as a primarily extractive practice of northern Sweden's rich natural resources. This requires a multi-layered, multi-scalar approach defined by different systemic boundaries to enable an integrated practice. Thus, inherent conflicts become entry points to a regional logic that incorporates the territorial dimension of forests, watersheds, and habitats, giving them agency beyond the anthropocentric and towards a more sovereign position to cope with the uncertainties of both climate change and market dynamics. The interfaces that define these negotiations as liminal and political spaces can be read metaphorically as in-between the forest and the plantation: not only as a common thread of our current research efforts but as a larger, shareable space for exploring the difficult contradictions between growth, resilience, and survival—a manifold challenge we face, and will continue to face, with the difficult legacies of colonialism and into the present future of global warming.

Standing between Forest and Plantation

Despite the increase in the general area of tree cover since the late 19th century, the area of old-growth or natural forests continues to decline at a high rate. For instance, in Sweden, depending on species and location, industrial thinning for bioenergy and other wood by-products can start as early as 25 years, followed by clear-cutting that can start at 60 years, with rotations of up to 120 years, with an average area of 4.3 to 5.2 hectares per clearing (Ramage et al., 2016), resulting in a total felling of 12.8 million cubic metres in 2022 (see Swedish Forest Agency, 2023). This is in contrast to Germany where the size of clear-cuts was limited to 0.5 to 1 hectare per clearing by 1999 (Röstlund, 2022). Such trends have led Sweden to a loss of 18.7% of old forests predating 1880 (>140 years old in 2020) between 2003 and 2019, implying their total disappearance by 2070 if this rate continues (Ahlström, 2022). Such industrial practices not only continue to fragment, damage, and scar the remaining natural and near-natural forests—with clear and irreversible impacts on greenhouse gas containment and sequestration (Mo et al., 2023)—but also significantly reduce the biodiversity of these lands, all despite policies advocating for increased forest conservation rates (Svensson et al., 2018). At the same time, climate change is affecting the Arctic, which is warming up at an unprecedented rate (Rantanen et al., 2022). These trends are causing concern and forcing public and private sectors to recognize both the scale of climate and hemispheric injustice as well as the wider conflict of interest that these extractive practices represent.

One effect of this recognition is the development of 'just-' and/or 'green transitions' designed to make core, economic-based improvements to present and future hemispheric, civic, and environmental policies with the aim of overcoming the challenges of global warming (see EU Green Deal, 2020). What has ensued, among other impacts, is a speculative increase in the market and ecosystem values of Fennoscandian forest lands. For instance, a recent assessment from the European Union states that for every €1 invested into land conservation and restoration, a return yield of €8 to €38 is to be expected (Niranjan, 2023). This kind of capital gain logic seems desirable at the outset. But there ought to be other ways of quantifying the values of living environments, especially when concepts such as urban forestry are commonly defined by often unquantifiable social and ecological benefits (Helms, 1998), rather than by monetized gains.

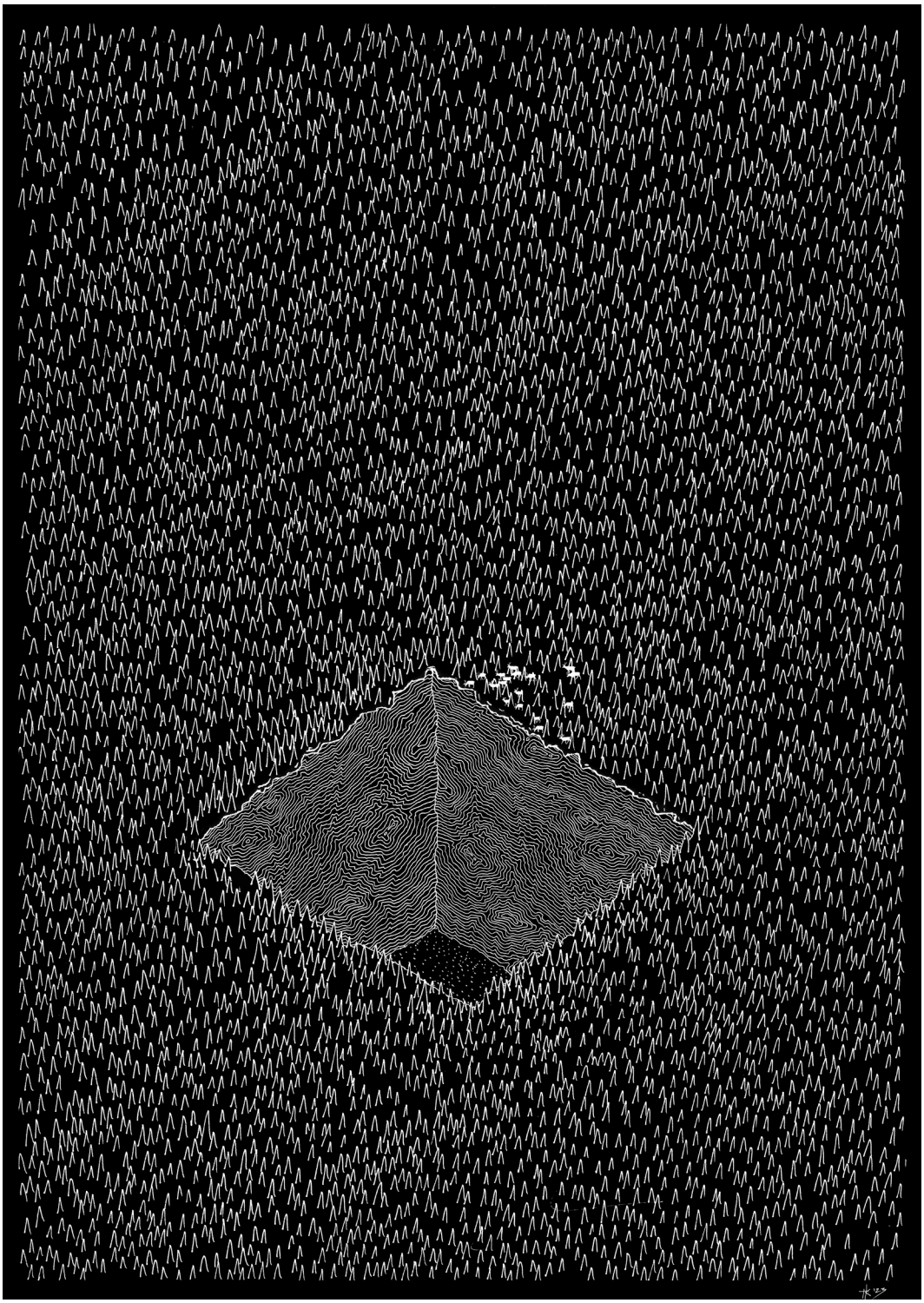

FIGURE 1 Landscape fragmentation in Norrland 1/3. Resource extraction in the form of mines and clear-cuts, energy and transportation infrastructure, farming, and urbanization all contribute to increased fragmentation of the landscape, hindering its ecological and cultural performance. From an Indigenous landscape-dependent practices point of view, they might be seen as large holes within our common asset—the forest. (Drawing by T. Kokins, 2023)

In northern Sweden, this heightening of values could be interpreted as one that is turning the boreal forest into a reflexive entity that is both: the initial landscape to be conserved while accommodating its current industrialization [fig. 1].

The inherent tensions are driven by the urgency—or, depending on whom you ask, the guise—of northern Sweden's so-called 'green transition'. In this urgent context of differing and disparate perspectives, the 'forest' becomes a physical and metaphorical emblem that simultaneously signifies various contradictions. Perhaps the most prominent of these contradictions is how forests (and the act of afforestation and reforestation) embody the broader aspiration to foster biodiversity as the only 'natural mechanism' with the scale and scope to mitigate the impending tipping points of global warming (Isbell et al., 2015; Steffen et al., 2018). Meanwhile, forests are also being exploited to increase the production of wood-based consumer products, building materials, and combustible biomass (see Sveaskog; Swedish Forest Agency).

One strong, contemporary example that encapsulates this contradiction is the public debate in Sweden about what is a 'forest' and what is a 'plantation' (see contrasting views in references to DN.se & SVD.se). In recent public debates, the way in which the state-owned forest industries and their ancillary businesses define a 'forest' has been confronted with arduous responses from Indigenous communities, scientists, and environmentalists, who hold up the term 'plantation' as a mirroring image and colonial object for self-reflection (Westberg, 2021). They argue that the promotion of 'managed-' or 'cultural forests', i.e., plantations, is not only misleading but historically toxic to the attitudes and understandings, as well as the techniques and policies—particularly in relation to Indigenous rights, labour, biodiversity, and bioenergy—required for their primary and proportional role in mitigating climate change (Moriggi et al., 2020).

Now, of course, each of these two terms—forest and plantation—represents multiple subcategories, with loaded hybrid definitions depending on the audience, discipline, or governing body. But for the purposes of this text, 'forest' here includes 'natural', 'old', 'ancestral', 'primary', 'continuous', and 'dynamic' forests. This refers broadly to self-generating environments where plant, animal, and human cultures have coexisted and continue to coexist in ways that respect the mutual timescales of entropy and renewal, carbon sequestration, and habitat, all inherent in biodiversity and large-scale planetary dynamic equilibria.

In contrast, 'plantation' refers specifically to the practice of segmenting and fragmenting productive forest or agricultural land into tree stands according to privatized and state interests. Plantations appear under the categories of 'cultural', 'managed', 'rotation', or 'multifunctional' forests which, in most cases, represent the systematic planting-to-harvest monocultural tree products within market-driven—as opposed to self-generative, evolutionary—timescales. The standardization of these management practices largely ignores the greater proportional complexity of biomes. This is driven by the conventional use of clear-cutting techniques, which, although advertized as innovative and efficient technologies, have led to increased degradation, scarification, and extinction. This is not only limited to the impacts on land, river, plant, and animal life, but it is also unjust and even traumatic for those who are unwittingly and/or forcibly drawn into industrial forestry systematization, severely limiting the prospects and urgency for increased biodiversity and equity.

Admittedly, these two definitions are neither technically hermetic nor are they limited to the Nordic region. And there are certainly many subcategories that stem between them, not least more recent and promising practices in agroforestry and regenerative forest management. Yet, Sweden's longstanding and increasingly influential role in forestry and the timber industry (regionally and globally), deeply linked to colonial histories of injustice to Indigenous First societies and regional nations, as well as the recent rush for—and unprecedented energy demands from—mining minerals and their coupling to emerging green industries in the northern counties, need to be taken into consideration. It therefore seems appropriate to actively stand and sense the forest and the plantation in the Swedish context. Such an active stance can offer a more informed analysis of the relationships and modes of representation between the rural and the urban, and the built environment and forests, and foster future cultural engagement that challenges the toxic legacies of industrialized landscapes in subarctic Sweden and beyond.

Perspectival Changes—towards a Forest Urbanism

Prominent examples from New Zealand, Brazil, India, Colombia, and Puerto Rico offer applicable insights into the values of ancestral knowledge for affirming life. These examples offer guidance for following Indigenous legacies that treat natural entities and deities, such as rivers and forests, just as any other living human being, under analogous jurisprudence of 'rights of nature' (see International Rights of Nature Tribunal). From an institutional perspective, one way to do this is to categorically include the Indigenous perspective in all research projects with a required role and percentage of funding, as New Zealand has done (Vince, 2006).

Across Fennoscandia (including Norway, Finland, and Russia), governments have slowly begun to develop policies that address the history and presence of the Sámi peoples of the region. In Sweden, the Sámi Parliament (Sámediggi) was established in 1977. In November 2021, the Swedish Sámediggi and the Swedish government agreed on a directive to create a Truth Commission. In the spring of 2022, the members of the Commission were appointed and are working according to the directive to '…identify, make visible, analyse, and highlight the consequences of the policies the Sámi people were subjected to. The Commission shall also disseminate knowledge about and raise the general awareness of Sámi history and how historical abuses affect the conditions for the Sámi today, participate in the general debate, and participate in different forms of education and information activities.' From these mandates within the directive, the key initial outcome of the Commission's work will be 'to propose measures that shall lead towards amends and change, to be presented by the latest on 1 December 2025' (see Truth Commission in Sweden, 2022).

And while we await these new, needed measures, it seems necessary to actively learn from what the Sámi communities have done over millennia to live and thrive in harmony with the boreal environment (Tunón et al., 2016). For instance, a better understanding of pre-colonial resource management in Sámi households (Norstedt et al., 2014) could be a meaningful component to initiate perspectival changes. Such knowledges and practices—for instance, the semi-nomadic coexistence of mountain communities with reindeer—remained a discrete, living material economy for centuries. But now, because of the intensification of industrial resourcing in response to accelerated climate change, these seasonal migratory herding practices are becoming more palpable and vulnerable, particularly in the northern counties (Län) of Västerbotten and Norrbotten (Sandström, 2016). Superimposed and delimited over Sápmi territories, these counties have become the focus of attention given their resource-rich environments, particularly in terms of wood for timber, pulp, and combustible bioenergy, for mining iron ore, and rare earth materials for batteries, as well as the rivers, where existing hydro and forthcoming wind power projects are expected to meet what is becoming an unprecedented increase in energy demand (Mueller, 2023).

These trends in resource extraction impacting Indigenous societies [fig. 1] are by no means unique to Sweden in the global context. However, the evolving discourses that recognize the cultural, and therefore the environmental values of ancestral, pre-colonial understandings and epistemologies of forest life (Kohn, 2013; Santos, 2016) seem to serve broader, applicable models of coexistence. By entrusting ancestral knowledges with long access to life with native and endemic species is a process that supports what can be characterized as a move towards a more-than-human nature (Haraway, 2016), yielding a kind of ontology for forests and their soils that supports fresh understandings of the personhood, inalienable rights, and life-affirming agency of natural entities (Cadena, 2018; Stengers, 2018; Puig, 2014).

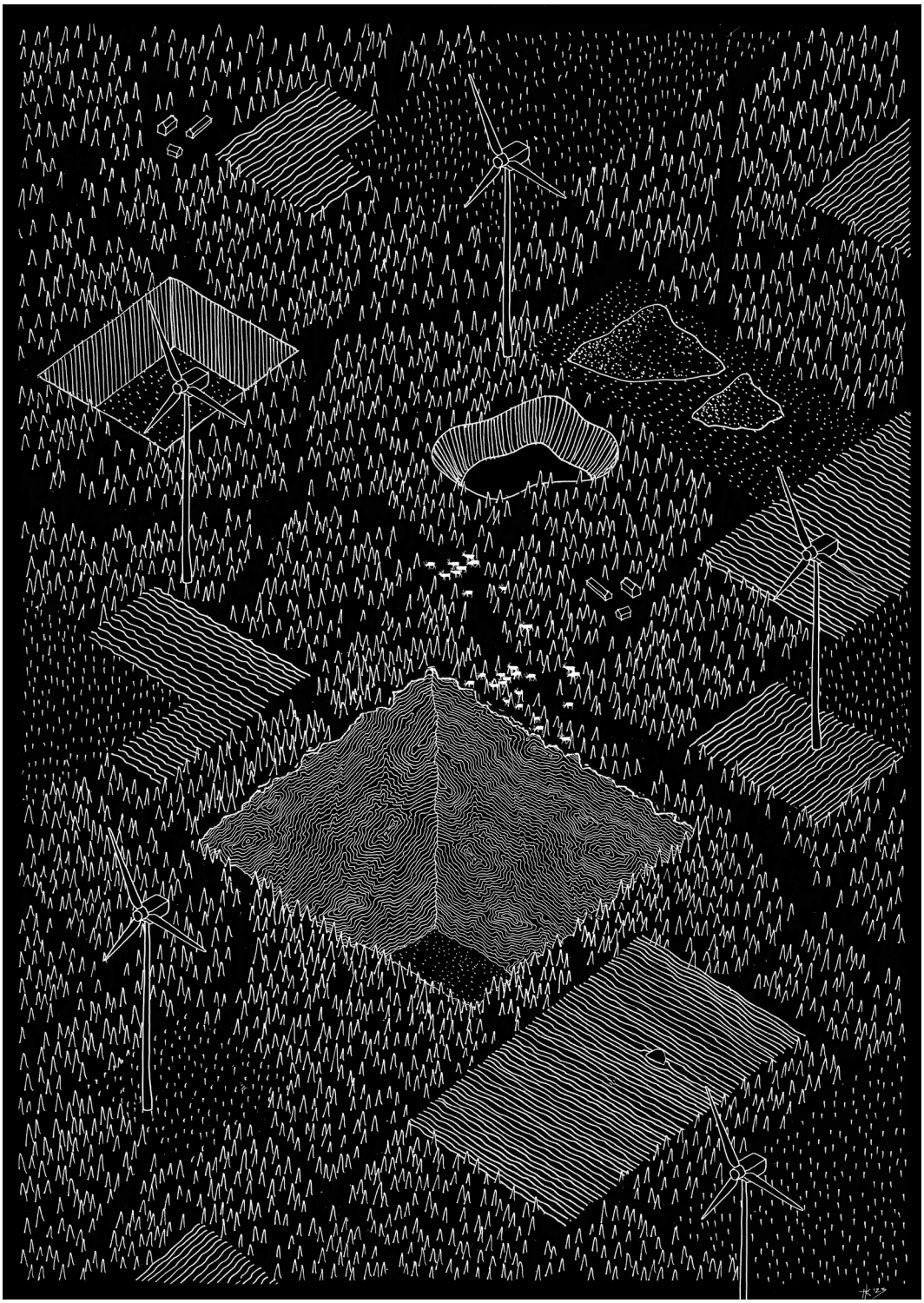

FIGURE 2 Landscape fragmentation in Norrland 2/3. As the pressure mounts on extracting more resources, the spatial and programmatic complexity of the multilayered landscape increases. Increasingly difficult to navigate for the reindeer herders and increasingly complex to plan and manage. While in cities we dedicate significant resources to planning, designing, and public participation, the question remains– who gets to plan the increasingly complex landscape of the North? (Drawing by T. Kokins, 2023)

Addressing development in the context of climate change and industrialization at this scale demands a regional perspective. So far, our research shows that northern Sweden does not have a collective regional plan (whereas other regions such as Skåne and Stockholm do). For now, it relies on the municipalities' comprehensive plans (which are not legally binding) and the individual region's sectoral responsibilities. The resulting territorial divisions create a need for comprehensive regional maps that visualize the landscape and its fragmentations through the industrialization of the land—from above and below—as a tool for negotiating development [fig. 2].

Modern, Western urbanization is a political, economic, and ecological complex that extends far beyond the boundaries of the literal 'walled city' (*urbus*). It is crucial to recognize that every building project is enabled by a distant landscape of material and labour economies that is largely invisible to the urban dweller. Every material element that makes up a building, including timber and steel, is extracted or harvested in a territory that lies beyond the view of those responsible for its development, from the architect and the client to the developer and the politician. In fact, every urban development project kickstarts a chain reaction of blurred social, material, and economic interdependencies and misunderstandings that profoundly destabilize what forests and the land can actually provide. The so-called walled city, or more precisely the compact city, becomes relevant as a counter-model to urban sprawl and further fragmentation of the landscape if we are able not only to reduce our demand for energy and resources but also, through self-sufficiency, to relieve the pressure on landscapes at large, which in the case of northern Sweden are the forests, the rivers, and the Baltic Sea into which they flow.

It is this reconfiguration of the urban that places northern Sweden in a precarious space between global warming and its third industrial transition. The inherent uncertainties about the achievability of the green transition call for a cogent and conscientious increase in resilience. Its heavy dependence on global markets and labour forces has already shown the capacity to halt planned developments in the 1970s and 1980s, with often detrimental effects on small cities (Mueller, 2023). These questionable dependencies, combined with the overwhelming energy needs being projected for the industrial sector, demand we take potential failure and consequential adaptation into account, raising the questions: what is Plan B? How can we buffer uncertainties associated with the highly ambitious yet fragile developments that lie ahead?

For instance, between now and 2035—according to Peter Larsson, the national coordinator for industrial development in northern Sweden—there will be a need for around 60,000 new housing units as a consequence of the projected influx of 100,000 new inhabitants to Norrbotten and Västerbotten (ibid., 2023). The capacity for this new built environment to reduce its significant production of CO_2 emissions and energy demand offers enormous potential and opportunities to rethink how we live and build (see IEA).

It is here that forest urbanism can become a productive term to reduce compulsive land use by giving agency to more-than-human perspectives, where forest landscapes are carefully re-envisioned as highly vulnerable spaces that can also continue to provide resources within a global economy in transition. By carefully speculating on future subarctic urban space through the notion of forest urbanism (Shannon et al., 2023)—where habitation is less a shelter and more a support structure for affirming life—we intuit that applicable notions and representations of non-monetized ecosystem services and of dynamic urban growth models can thrive, leading to cultural and climate resilience—less in the logic of financial growth—but in their ability to embrace the mitigating capacity of forests for resilience and survival (Skytt et al., 2021). With this reflexive horizon, three ongoing research efforts are summarized below.

Three Alternative Perspectives on Boreal Forests

To explore the contradictions between growth, resilience, and survival in global warming, three strands of research address the 'radical redefinition of settlement structures in relation to forests' (Shannon et al., 2023, p. 10).

I. Tree Nurseries—from Geoengineering to Environmental Remediation

It is increasingly obvious that the impacts of colonial and climate injustice are directly related to drivers of global warming. By experimenting with the 'tree nursery' as space, metaphor, and action, this arts research project looks to the shaping of pre-colonial imaginaries as forms of environmental and hemispheric remediations. Rooted in decolonial theoretical and sculptural approaches to the technological history of greenhouses (Konstfack / KTH, 2015–2020), the project is a continuation to an 18-month art and science research residency at the invitation of the local NGO Para La Naturaleza (PLN, 2021–2022), investigating the role of tree nurseries in the national, post-hurricane reforestation project in Puerto Rico (PLN 2021-22). With a network of five sites across the island, PLN uses tree nurseries as the main component of its conservation and reforestation efforts. The aim of PLN is to plant, condition, and propagate native and endemic seedlings to reintroduce species that either have been eradicated or are threatened with extinction due to the island's difficult colonial and industrial history, and the related detrimental traumata of recent unusually powerful hurricanes. In other words, the organization recognizes the need to process the trauma of slavery, mining, and subsequent agro-industrial expansion, while simultaneously pointing to them as driving forces of climate injustice. As a result, the tree nurseries and their respective biomes become spaces for re-imagining what these landscapes might have been like before European and North American colonization, all as a process of nursing and nurturing forth a proportional form of biodiversity.

From this material, and through the continued purview of the 'tree nursery', the current research will be processed through decolonial methods (Petti & Richardson, 2021; Cadena et al., 2018), where the reforestation of Puerto Rico may have relevant intersections with the ancestries, histories, and practices of forestry in northern Sweden. These will be explored and differentiated both through careful readings of the Sápmi territory and its forest communities and knowledges to learn alternative cultural practices and forms of forest stewardship (Sköld et al., 2015), as well as through river ecosystem restoration practices (Polvi et al., 2020). Here, the temporal and spatial scales between the aforementioned ancestral knowledges and the current industrial development tools and techniques—such as tree genetics and industrial seed and tree propagation operations—are set as cultural and technical values to be reviewed on various sites in Umeå and in Västerbotten county.

These materials will be set to challenge geoengineering as a last resort to environmental remediation. 'Geoengineering' (Demos, 2016; Kolbert, 2021; Malm, 2022) is defined here as the vast, scaleless technology to mitigate global warming. 'Remediation' is then treated as an index of multiple, transdisciplinary meanings pointing to conserving, nurturing, and challenging assumed knowledges and meanings. By discursively associating these terms through the tree nursery—as a potent metaphor, action, and space for recalling forest imaginaries (see Made You Look, 2022) and transhemispheric remediations (Berríos-Negrón, 2020)—multiple perspectives (Adamson, 2016) on landscape may be defined and redefined. The aim is for the act of tree nursing to see through the eyes of the forest, to culturally and scientifically explore the racialized framings of landscape (Yussoff, 2018; La Cour, 2022) inherent in the disproportionate logics of geoengineering that are currently exacerbating climate injustice.

II. Making Sustainable Forestry and Related Urban Resource Management Part of the Architectural Agenda

Since the fall of the Iron Curtain, Nordic forestry and timber companies have expanded their procurement of forest to the Baltic states and beyond. There are indications of land-grabbing by Swedish forestry companies in Latvia (Viesturs et al., 2018). Research by the authors (Kokins & Brown, 2023) reveals that 12% of all privately owned forest land in Latvia is now owned by Swedish stakeholders. The presence of Swedish forestry actively impacts local economic, cultural, and biological landscapes and fosters debate about what constitutes sustainable forest management.

This research aims to extend the debate on the impact of Swedish forest management culture beyond its national borders and to contribute to the development of a holistic, transnational perspective on timber resource accumulation and its short- and long-term implications. The project will produce a series of interviews, exhibitions, articles, events, spatial interventions (Kokins et al., 2024), drawings, and maps, both as experimental acts of dialogue and as printed media, including the drawings for this paper.

Architecture and the building industry can be viewed critically as contributors to extensive timber consumption, not only in terms of the physical use of wood but also as a driving cultural force influencing the demand for and perception of wood as a sustainable and green material. Yet, any built form—built in timber or otherwise—is part of a larger process of urbanization that drives the accumulation and consumption of forest resources nationally and internationally, with its ecological, economic, and social implications. The current discussions around Sara Kulturhus in Skellefteå, as one of the tallest timber buildings built with locally sourced wood, has created nothing less than the Bilbao effect of timber architecture for Skellefteå. However, it fails to incorporate in its narrative the void created by the clear-cutting of the adjacent forest [fig. 3]. A missing link that needs to be acknowledged and included in architectural and urban design methodologies, curricula, and evaluations.

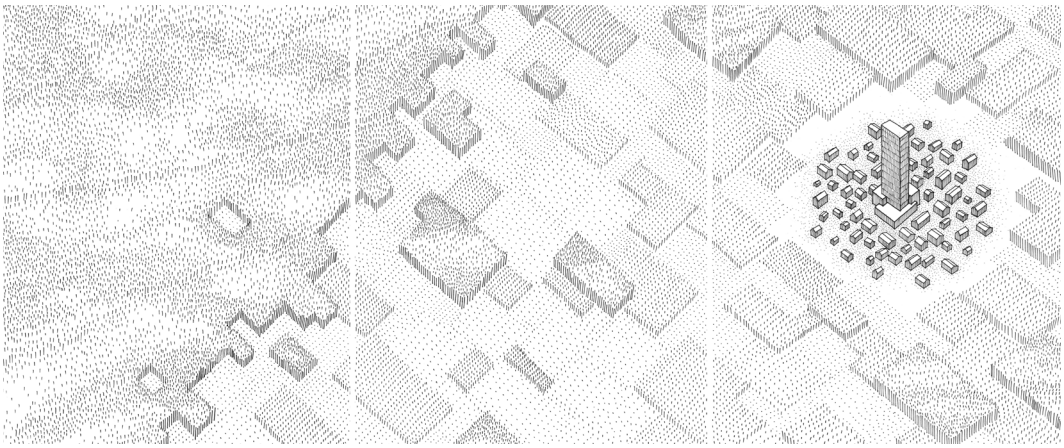

FIGURE 3 Forest urbanism of Norrland. The drawing calls for critical design methodologies where timber architecture is not only seen as a vessel of stored CO_2 but considers its embedded cultural and ecological impacts, such as the landscapes it produces. The tall tower may or may not resemble one of Europe's tallest mass timber buildings—the 20-storey high-rise Sara Kulturhus in Skellefteå, Sweden, promoted as built from locally sourced wood without showing the clear-cuts this has produced. (Drawing by T. Kokins, 2022)

By critically engaging with the Swedish forests in a wider Nordic-Baltic region, this research aims to contribute to and serve as a contextualized platform for discussion of the global trend of resource accumulation, which often neglects the urge to preserve biodiversity, cultural identities, and economic independence in the affected territories. It seeks to identify what is and what can be the role of architecture in its wider cultural sense in these processes.

III. Circling Back to the City—Reducing Pressures on Landscapes at Large by Increasing Self-sufficiency on the Building Scale

To explore how architecture and the built environment can contribute to reducing our overall ecological footprint by limiting our demand for resources and actively contributing to their direct production, the UMA lab *Designing Cycles at 64° - Interior Landscapes and the Water-Energy-Food Nexus*, a platform for research and education on circularity, explores how we can increase self-sufficiency at the building scale to cumulatively increase overall resilience within the given climate zone of the subarctic. In order to become more resilient to the inherent impacts of climate change, global crises, and resulting market volatility as repeatedly proven risk factors, there is an urgent need to become more self-sustaining, as well as the overarching need to reduce our energy and related resource demands. Therefore, the hypothesis of increased resilience through increased self-sufficiency can be applied to both scenarios: to the so-called 'green industrial transition' of Norrbotten and Västerbotten, and to its potential failure. This makes it a no-regret solution.

Deforestation, and its subsequent impacts on soil and water, can be seen as the initial failure modes of human civilization (Diamond, 2011). Activating the built environment by transforming buildings and their inhabitants from consumers to producers aims to reduce our multiple dependencies and thus extractive pressures on the surrounding landscape through circular models (Redeker et al., 2022). Using Bengt Warne's *Naturhus* model as a starting point (Fredriksson & Warne, 1993), greenhouse envelopes and extensions (GEEs) enable an extended growing season to reduce the heavy reliance on and impact of food imports (Yang et al., 2022), and passively reduce energy demand. Combined with snow- and rainwater harvesting, treatment, and reuse, and other approaches to resource recovery through nature-based solutions within buildings and in their immediate surroundings, a model of engagement and stewardship strives to reconnect with a vernacular practice.

Decentralized models of provision reduce costs, vulnerabilities, and the dependence on centralized infrastructure networks. This approach can be applied in both rural and urban contexts, both for the retrofitting of existing buildings and for new, ideally collective housing developments, cumulatively enabling a positive systemic impact. It is coupled to the urban model of compactness. GEEs can be realized with reused materials, linking to Umeå municipality's current establishment of a hub for reused building materials as part of its circular economy initiatives (see Umeå Kommun, 2022). Ideas around the region's abandoned timber buildings as a potential material storage outline another strategy to reduce the need for further deforestation. It offers a way forward from the built environment perspective to become more resilient to an increasingly fragile future, also for northern Sweden.

Forest Urbanism as an Action-oriented Response

Assigning conflicting roles to the forests of northern Sweden—where on the one hand forests must serve as carbon sinks and habitats, while also providing wood and minerals as key industrial-scale renewable resources on the other—is an ill-advized precondition for a green transition. This is highlighted by the fact that the European Green Deal still relies on the Swedish reforestation model to generate more so-called financial 'growth', while relying on more conventional infrastructure expansion and urbanization, which together will increase energy demand to unprecedented levels (Booth, 2020). These contradictions add

to the urgency of climate action. Again, it is understandable that short-term action is needed to develop key technologies to help create more efficient sources of energy and materials that could truly usher in an unsustainable transition. And even from a global, hemispheric perspective, it may seem reasonable to use wood and minerals in the Nordic regions as a responsible action to reduce the exploitation of land, resources, and labour in colonized and oppressed nations.

Yet it seems increasingly clear that these short-term tactics are directly counterproductive to the kind of emissions reductions needed to meet the targets of the Paris Accords. Moreover, these tactics only seem to import and promote the dysfunctional attitudes of extractivism and of financial growth. These conflicts of interest stand out as glaring blind spots in the bucolic and technocratic narratives being shaped by involved economic development conglomerates, no less for the northern Swedish Forest (see *More of Everything*, 2021), building on what has been coined as factoids 'which are notoriously multidimensional and scaled to all kinds of temporalities and all kinds of scenarios' (Morton, 2018). In these guiding narratives, space for criticality is often overwritten by urgency.

Recognising the specific development dynamics of northern Sweden, with its natural and near-natural landscapes currently transforming at an unprecedented rate, urgently calls for new practices. These demand cultural shifts that emphasize more-than-human perspectives and response-abilities to recognize, proportion, and make-real the kinds of transitions within the built environment that are needed for amending human relationships with nature. If we are to embrace a kind of 'forest urbanism', we might begin with a remediation of what biologically and culturally distinguishes primary forests from industrial plantations, to then include an understanding of the landscapes impacted by our resource extractions in the scopes of our architectural practice. Ultimately, this may enable us to reduce our overall impact on the landscape by changing the way we build and live.

For forest urbanism to become transformative as an action-oriented professional response to the academic perspectives developed in this paper, it is crucial to formulate a comprehensive regional framework and corresponding local competence. This needs to be based on a vision and mission formulated from within the region, which thrives on building communities that are increasingly resource-aware and self-sufficient, while giving agency to both human and non-humans most affected in their livelihoods and habitats.

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