Dụhụ asɪ k'ëch'á — Things Are Changing: Climate Change, Afforestation, and Indigenous Economic Opportunity in Northern Saskatchewan

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AUTHOR'S NOTE

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sustainable pathways toward self-determination and economic sovereignty.

ABSTRACT

Indigenous communities in Northern Canada face rapid climate change that threatens their local ecosystems, food security, cultural ties to the land, and connections to the rest of Canada. Participating in climate adaptation efforts is crucial for Indigenous well-being, self-determination, and economic involvement amid a changing climate. We interviewed a total of 11 people drawn from the Elders, land users, community leaders, Indigenous business owners, and nonprofit staff at Black Lake, Fond du Lac, and Hatchet Lake Denesųłiné First Nations in Northern Saskatchewan. For over 40 years, these knowledge holders observed how climate change threatened their communities' traditional practices and the Denesųłiné way of life. They also discussed various adaptive measures that could bolster local economic development. In this paper, we present community perspectives on one specific climate adaptation action: high-latitude tree line afforestation. While community members are concerned that afforestation could harm wildlife (especially barren-ground caribou), be undertaken without local consent and control, and facilitate the spread of invasive species, they also hope that an afforestation project could create jobs, involve youth, support the local economy, and contribute to fighting climate change.

KEYWORDS: afforestation, climate impacts, Northern Saskatchewan, barren-ground caribou, Indigenous economic development

This article is the first in a series exploring the economic and business opportunities for northern Indigenous communities through climate change adaptation and mitigation. Climate change is impacting Northern Saskatchewan (and Canada) more rapidly than the global average, with environmental, cultural, and economic effects (D'Orangeville et al., 2023; Gauthier et al., 2023). Temperatures are rising, wildfires are becoming more frequent, and animal migrations are shifting. These changes influence road and air travel, air quality, hunting and gathering practices, the northern economy, and Indigenous relationships with the land (Clark et al., 2022; Council of Canadian Academies, 2014; Fauchald et al., 2017). Indigenous communities—who make up the majority of Northern Saskatchewan's population (Beatty et al., 2013)—depend on the environment for their food, cultural identity, and more, making them particularly vulnerable to climate impacts (Council of Canadian Academies, 2014).

Across Northern Canada, various strategies are being adopted to address these climate impacts, including developing renewable energy (Natural Resources Canada, 2025), community-led food production (Inuit Tapiriit Kanatami, 2025), and enhanced environmental monitoring (Thompson et al., 2021). Efforts are also being made to improve transportation, strengthen emergency response systems, and support education and training related to climate adaptation (Environment and Climate Change Canada,

2023). In this context, our research team is studying afforestation along the tree line in Northern Canada as a Natural Climate Solution (NCS). Guided by our scientific expertise, we seek to understand not only the potential climate benefits of afforestation but also Indigenous perspectives and the related economic and business opportunities that could arise for Indigenous communities.

Afforestation is the process of planting trees in an area that was not previously forested. The trees capture carbon from the atmosphere and have potential climate benefits related to albedo (i.e., reflectivity of the earth's surface), soil dynamics, and hydrology (Dsouza et al., 2025). While offering potential climate benefits, afforestation also presents risks and unintended consequences depending on how, where, and by whom it is implemented. These risks include increased wildfires and invasive species, loss of soil carbon and biodiversity, and interference with local and Indigenous land use (Kristensen et al., 2024; Moyano et al., 2024). Local knowledge, cultural values, land use practices, and community priorities must be considered to ensure that climate initiatives support local contexts and do not impact Indigenous rights or access to important land-based resources (Intergovernmental Panel on Climate Change, 2022; Simba et al., 2024). Our research recognizes the importance of local and Indigenous perspectives and seeks to better understand how afforestation is viewed at the community level so that approaches are respectful, informed, and responsive to local needs and worldviews.

As researchers contributing a business and economic lens to a predominantly science-focused team—composed of experts in soil science, forestry, and climate systems—we draw on early insights from 11 interviews conducted with Indigenous knowledge holders in Nuhenéné, the traditional territory of the Athabasca Denesųłiné. While deep thematic coding is still underway, early patterns reflect community members' aspirations and concerns. This work is grounded in a commitment to respect and honour Indigenous voices through the application of Indigenous research methodologies and relational accountability (Wilson, 2008). This paper will first discuss local observations of climate change, then share community perspectives on afforestation as a climate solution.

Overview of Study Communities

Black Lake Denesųłiné First Nation, Fond du Lac Denesųłiné First Nation, and Hatchet Lake Denesųłiné First Nation are located in Nuhenéné—the traditional territory of these First Nations—within the Athabasca Basin region of Northern Saskatchewan. The communities are at the southern boundary of the Taiga Shield ecozone, and their traditional territory extends into the Northwest Territories and Nunavut. Each community has 1,000-1,500 residents living on reserve, with four nearby municipalities housing an additional 400 people. The Athabasca Denesųłiné continue to maintain traditional practices such as hunting, fishing, and gathering, which remain central to their food systems, cultural identity, and relationship with the land. Primary sources of protein include barren-ground caribou, fish, and grouse. Food from grocery stores is expensive and generally low in nutritional value. Dene is the first language for 77-95% of the populace, and most also speak English (Statistics Canada, 2025). Winter roads connect the communities seasonally, but air travel remains the primary means of transportation.

Each community has essential services, including a school and a health centre; the only hospital in the region is in Stony Rapids, adjacent to Black Lake.

Nuhenéné is one of the world's most significant sources of high-grade uranium, and as a result, many Athabasca Denesųłiné are employed in the mining sector. The First Nations have developed collaborative relationships with mining and exploration companies: for example, Athabasca Basin Development is an investment corporation established in 2002 to deliver services such as transportation, security, and construction to the mines (Athabasca Basin Development, 2025). Likewise, Ya'thi Néné Lands and Resources coordinates Exploration and Collaboration Agreements with mining and exploration firms and oversees natural resource management in the region (Ya'thi Néné Lands and Resources, n.d.). Finally, each First Nation has a development corporation that generates revenue, creates training opportunities, provides employment for its members, and supports community projects.

Literature Review

Climate Change in Northern Canada

Climate change is increasing temperatures and altering precipitation patterns in Canada's North, posing serious risks to communities and ecosystems. Since 1950, the average temperature in North American boreal forests has increased by 2 degrees, nearly twice the global average (D'Orangeville et al., 2023). Large-scale extreme wildfires are occurring more frequently and changing ecosystem compositions (Phillips et al., 2022). Another impact of climate change is that vegetation is growing faster and spreading into more northerly areas due to increased temperatures, greater access to soil nutrients, higher atmospheric carbon dioxide levels, and shorter winters (Pappas et al., 2023). Plant and animal species are expanding their ranges northward; boreal climate zones are expected to shift five to ten times faster than the natural range expansion achievable by most tree species, potentially leading to species extinction (Price et al., 2013). And certain cultural keystone species, such as barren-ground caribou, are experiencing disrupted migration patterns, changes to food supply, and parasites (Beverly and Qamanirjuaq Caribou Management Board, 2023).

These climate change impacts directly affect people living in the north. Remote locations, high poverty levels, and limited access to health care, transportation, and supplies make northern communities vulnerable to climate impacts. Many communities lack year-round road access and rely on air and water transport, as well as winter roads, to obtain supplies. Winter roads are built from compacted snow and ice during the winter months and facilitate the delivery of supplies, including fuel, construction materials, fire trucks, drinking water, sewage treatment chemicals, and more. These supplies would cost two to three times more if flown into communities, and some materials would be too large or dangerous to fly. Warmer weather delays the opening of winter roads, and warm spells can close roads mid-season (Rutgers, 2024). In 2024, five First Nations across Canada declared States of Emergency, as roads had not opened by February and some communities had less than a week of fuel remaining. This problem will only

become more severe: by 2050, more than half of winter roads are predicted to become unusable, with almost all winter roads unusable by 2080 (Rutgers, 2024).

Locally, changes to plant and animal communities affect food security and are impacting access to healthy, culturally appropriate food in the north (Shafiee et al., 2022). Harvesting food facilitates connection to the land, which in turn supports nutrition, learning, food security, family relationships, mental and spiritual health, and individual and collective well-being. Because of this, limited access to traditional foods is a threat to northern communities (Kendrick, 2013). While the impacts outlined here are already placing immense pressure on these communities, they represent only part of a broader and accelerating climate crisis. These interconnected challenges underscore the urgent need for adaptation and mitigation strategies and for examination of how northerners might respond to rapidly changing ecosystems.

Natural Climate Solutions (NCS)

NCS mitigate climate change using natural means: for example, planting trees, restoring wetlands, and transitioning to regenerative agriculture. Canada has announced support for NCS through the Two Billion Trees Project and the Natural Climate Solutions Fund. These support Canada's goals to conserve 30% of its lands and oceans by 2030 and reach net-zero greenhouse gas emissions by 2050 (Environment and Climate Change Canada, 2024). The remainder of this literature review explores afforestation as an NCS.

Afforestation

Afforestation involves planting trees on land that has not supported trees in recent history, typically the last 50 years (Schirmer & Bull, 2014). Most projects occur on agricultural land, grasslands, degraded areas, or in alpine regions, and they target carbon storage, biodiversity, and local livelihoods.

Afforestation projects at high-latitude tree lines (i.e., in the far north) were not studied until the early 2010s. Scientific interest was sparked by the projection that increased temperatures and atmospheric carbon dioxide, access to additional soil nutrients, and shorter winters could cause above-ground biomass in boreal forests to rise by 13% by 2100 (Larjavaara et al., 2021; Pappas et al., 2023). Researchers drew on technical knowledge from afforestation efforts at mountain tree lines, although with the goal of carbon storage for climate change mitigation rather than avalanche protection (Gibbon et al., 2010; Grätz et al., 2023). However, as more research has been completed, some scientists suggest that net gains in carbon storage via trees could be offset by melting permafrost, loss of soil carbon, decreased albedo, and increased wildfire activity (Dsouza et al., 2025; Hansson et al., 2021; Lemprière et al., 2013). Other members of our research team continue these studies to determine high-latitude afforestation's potential climate impacts.

Furthermore, around the globe, many afforestation projects face criticism for being imposed without community input, and this is a risk for high-latitude afforestation as well. A common critique is that community voices are not heard, and locals feel a

loss of control over their environment (McFetridge & Collins, 2021; Trottier, 2024). Successful projects depend on community engagement, local management, and support like training and economic investment (Ojuok, 2020). Our research acts as a first step to involve communities and understand their views on whether afforestation fits their landscapes and aligns with their values. To our knowledge, this study is the first to explore Indigenous community perspectives on high-latitude afforestation, as previous studies have only focused on scientific and technical aspects. This study is a preliminary report that focuses on early understandings of the local Indigenous communities' attitudes towards afforestation.

Methodology

This study employs a qualitative, community-engaged approach rooted in Indigenous research methodologies. Our methodology emphasizes relational accountability, community benefit, and respect for Indigenous ways of knowing (Chilisa, 2012; Wilson, 2008). We are dedicated to ethical research practices that uphold the principles of OCAP®—ownership, control, access, and possession of data—as outlined by the First Nations Information Governance Centre. We also focus on building trust and capacity with local communities. These principles are incorporated into our research agreement with Ya'thi Néné Lands and Resources, a regional nonprofit organization representing the three First Nations communities and four municipalities in Saskatchewan's Athabasca Basin.

Data collection involved semi-structured interviews with individuals from Black Lake, Fond du Lac, and Hatchet Lake Denesųłiné First Nations. We have been honoured to gather stories from 11 knowledge holders: Elders, land users, community leaders, Indigenous business owners, and staff at nonprofit organisations in Nuhenéné. Most storytelling took place in person within participant communities and as coordinated and attended by a local community assistant. Additional interviews and community visits are ongoing.

The results below come from the stories we heard: we intentionally use many quotations. This approach shows our commitment to keeping Athabasca Denesųłiné voices central in how we interpret and present findings. Finally, drafts of this paper were shared with Ya'thi Néné Lands and Resources and other knowledge holders for review and validation before publication.

Results

The following section presents initial findings from our ongoing research on how northern Indigenous communities are experiencing climate change and how they might benefit from economic opportunities related to climate adaptation and mitigation efforts. First, we discuss the Athabasca Denesųłiné understanding that air, water, and land are changing due to climate change and significantly affecting life in Nuhenéné. We then examine community perspectives on afforestation, sharing members' concerns and hopes.

"We Knew It a Long Time Ago": Community Knowledge of Climate Change

"We knew it a long time ago," explained Ray when we asked him about climate change. Ray listed numerous climate impacts ranging from weather changes to when to hunt geese and noted that "things are changing." This sentiment— *Dụhụ ası k'ëch'á*—was repeated throughout our interviews.

The people of the Athabasca Basin are already witnessing the tangible effects of climate change in their homelands. These experiences, rooted in daily life, are deeply informed by traditional knowledge and land-based observation. As Ray shared, "From what I've seen and heard from the Elders, they were the ones who noticed back in the '80s. And slowly, they said, things are changing." This type of intergenerational knowledge transmission provides a framework for understanding climate change, one that existed long before media brought news of a changing climate into the communities. All knowledge keepers we spoke with identified local impacts of climate change, particularly in the northern region of their territory. For some, naming the specific changes was easy, but for others, the changes were intuitive. Rosalie, for example, highlighted the intuitive connection that land users hold with their environment: as a fisherwoman, "When I go out on the lake, I just know." Such observations are not only about what is visible, but also about what is felt—a form of knowledge grounded in lived experience and deep relational understanding of the land and deserving equal respect as scientific monitoring (de Echeverria & Thornton, 2019). In the Dene language, these changes can be organized into air, water, and land.

Dụhụ́ yázı k'ëch'á: the air is changing. Many knowledge holders described changes in temperature and weather. Winter is arriving later, and lake freeze-up has shifted from early November to mid-November. Winter temperatures have become colder, and summer temperatures have become warmer. As Terri-Lynn explains, "Thirty years ago the wood stove was able to heat the whole house, but now you need the wood stove and you need the electric heat and everything now because of the climate change." Climate change has also affected how sunsets look, how weather forms, and how much snowfall is received each year. These changes have led to uncertainty about access to ice roads. Ice roads are vital for delivering fuel, food, and other supplies, and Derek described how "sometimes [the ice road] would be open till May, but last year they shut it down early, like end of March." Rosalie echoed this concern: "There was one year we couldn't transport more than 20,000 pounds" due to poor ice conditions. Ice safety is also an increased concern in the communities. As Rosalie explains, "Back then when the winter sets in, it gets cold and the lake freezes. Everybody's been told please do not go on the lake now." She also shared that community members have passed away because of unsafe ice conditions.

Dụhụ́ tu k'ëch'a: the water is changing. The north is experiencing drought, and community members have noticed its impact on local areas. David explains that "our rain is dying," and has observed sloughs and ponds drying up. He additionally describes a significant drop in Black Lake's water level:

> We're losing humongous, lots of water, we're losing. In Black Lake here, I built that dock. When I built it, I left it about, I think it was about 16 inches above the water when I built it. And now when you look at this dock, it's just sitting mostly on the ground… See how much the water dropped? I would say about 5-6 feet… That's in the short time, within probably about four years. And before that it's been changing.

Fish are affected by changes in the water. Lower water levels and warmer temperatures have altered spawning and migration routes, and fewer fish are spawning. "The taste of the fish is changing, due to all this," says David.

Dụhų́ nih k'ëch'á: the land is changing. Changes in temperature, weather, and water are leading to increased extreme forest fires and altered animal behaviour. Knowledge holders have observed increased wildfires since the mid-1990s in the Northwest Territories and, over the last 15 years, in Northern Saskatchewan. Athabasca Denesųłiné communities have been evacuated numerous times. Traplines have been lost to fire, and, at times, campfires are prohibited. The extreme fires have particularly impacted barren-ground caribou, which are closely tied to Dene culture. Caribou from the Beverly and Qamanirjuaq herds migrate south into Nuhenéné during winter and spring to feed on lichens that grow on the tundra and in mature forests. When the forests burn, we were told, the caribou starve and stop migrating to that area. Ray argued, "It's like burning [caribou] food, starving them so they stay away from us." Climate change also affects caribou's ability to traverse the changing landscape. Derek explains how fluctuating temperatures affect migration:

> For example, last year… they couldn't come down to their winter habitat areas because the snow had to like, you know, deal with the hot weather, the warm weather, you know, up in the north, the mild temperatures, and then in the night, it freezes up and the caribou can't walk on the ice. It hurts their front legs.

Between climate change and disturbance from airplanes, exploration, and mining, barren-ground caribou are less likely to visit Saskatchewan than in the past. "They were moving into our area every year, 1980s or '90s," Freddie, from Black Lake Denesųłiné First Nation, said. "I think '85 is the last time I seen them in the area." Caribou have, however, been observed in northeastern Saskatchewan in recent years. Due to the added distance, hunting trips now require more time, money, and risk. Athabasca Denesųłiné culture relies on caribou for food, hides, and identity, and community members expressed concern over their continued access to caribou. Ray explained, "If there's a big climate change, the caribou and that is going to be further and further and further and it'll be even harder to get. And the lifestyles will have to change with it too. And slowly we'll be losing our identity as Dene people." Ray and five other community members specifically named decreased access to wildlife and its effects on Dene identity as their biggest concern about climate change.

While community members easily recounted the local effects of climate change, few could identify community initiatives addressing these changes without prompting. Additionally, most had not considered that climate change could also present economic opportunities. The following section examines one of these opportunities, afforestation, in more detail.

Community Perspectives on Afforestation

This paper focuses on afforestation, as it was our initial entry to climate-related economic opportunities in the north; future papers will explore other economic opportunities. To elicit conversation about afforestation along the tree line, we explained the natural northward movement of the tree line and the opportunity to accelerate it. This could mitigate climate change, although the climate benefits or disadvantages of afforestation remain unclear. We learned from community members that the natural northward movement of the tree line is not common knowledge or experience. Most community members are not yet noticing increased plant growth or greening of the tundra, partially because northern travel occurs in winter, when vegetation is buried by snow.

Nonetheless, planting trees brought up concerns, the biggest being interference with animals. David expressed concern for the muskox, grizzly bear, polar bear, caribou, and all of Mother Nature. He said, "And all these wildlife live in there and they're born and used to it. And when we start planting trees there, we're growing vegetation, trees and all that, right. And they're going to change their behaviour." Residents were especially concerned about effects on barren-ground caribou migration. "Why would we choose to plant in that area when the caribou migrate in that area?" asked David. Ray added that if tree planting is going to change his culture's hunting ways, he's not going to like it. He says, "I'd rather have it the way it is now because we're not losing anything, the way it is now. We're just gaining by having this caribou coming to us. But if all this grows in, we might be losing it forever." These concerns about caribou and the Dene way of life raise questions about the impacts of natural greening and tree line movement. Given that the landscape will naturally green due to climate change, would it be beneficial for caribou and Dene culture to remove vegetation to keep the landscape as it is? Could removing vegetation also be beneficial for carbon storage, as it helps maintain soil carbon? Perhaps a vegetation-removal approach would better align with local interests and the maintenance of land-based lifestyles.

Another major concern community members raised about afforestation is that tree-planting projects could proceed without First Nations' consent, participation, leadership, and economic benefit. The communities have had negative experiences with outsiders advancing their agendas at the expense of community and ecosystem well-being. For example, tourist camps have relied on local guides to get started, then stopped hiring locals. "They used us and then they left us, kind of thing," said John. At other times, communities only learn about plans for their traditional territory by reading news or journal articles. David discovered research about the feasibility of gas and water pipelines in this way and was dismayed. He worries that if scientists or the government see an opportunity for economic growth, or even climate benefit, planting

will commence, no matter what locals think. “It’s going to be backlash on us at the end regarding this tree planting in the tundra,” he worried.

Having learned from previous negative experiences, communities have been asserting their rights and successfully fending off projects that are not in their best interest. Mining and exploration projects have been rejected, and cleanup of mine tailings is mandatory. “More and more people are beginning to understand that they have a say. Government can’t just come in and do what they’ve done before,” said Rosalie. “If the government wants to really have a way of setting up this project, they also need to consult with the Elders who’ve been there for thousands of years.” This consultation occurs at all levels of planning, from feasibility and baseline studies to project design and completion. During the process, the First Nations advocate for economic benefit, leadership roles, local employment quotas, and local sourcing of catering, transportation, and other needs.

Final concerns about afforestation focused on the types of trees planted and the presence of invasive species. Ricky emphasized the importance of paying attention to invasive species, being cautious about importing vegetation and associated insects and receiving consent and knowledge from community members. He said,

> There’s like that Dutch elm disease and all that, but we don’t have these kinds of trees up in the area here. Maybe different species of, you know, different types of trees may bring different species up here, or insects. But that’s something that needs to be investigated more. What would be safe to grow up in our region? And at the same time, it should be consulted with our members, membership, you know, bringing in something that’s like an import into the north.

If tree planting takes place, scientists must work closely with communities, not just for the physical labour of planting trees but also for integrating local knowledge with Western science, educating locals, and collaborating on which tree species and genotypes to plant.

Assuming issues of wildlife, sovereignty, and ecology were addressed, some community members could imagine benefits in jobs, the economy, youth engagement, and climate mitigation. “There’s money in there… we could affiliate it with the [Black Lake Ventures] business,” said Freddie. Ricky added, “I think it would be a good opportunity for our local people in terms of jobs… and good for the environment.” One knowledge keeper, Billy, had spent two weeks in Ontario planting trees in 2019 and remembers being paid well for the work at $285 per day. He believes a tree-planting program would be a good opportunity for the community, especially for youth: “I did that in Ontario, and this is going to be the first time they see it. How it’s done. And it will be a good opportunity for students. And that way, they could learn the science too.” Planting trees would provide summer jobs for youth and other community members, and the science of tree planting could be integrated into schools. Billy also added that having a job would help youth stay away from drugs and alcohol. All other community members who were asked agreed with Billy that youth would be excited about jobs in

land management. Rosalie reported that youth responded eagerly to the prospect of land management work associated with the North of 60 Agreement:

> The youth, it's unbelievable. They like going out on the land… I see a lot of young people who are out hunting. They're really excited about being on the land. And when I told them about this North of 60 project, you know, one day you're going to go on the land, you're going to manage it, you're going to patrol our land. You could just see it in their face, right? They're all excited about it because it's monitoring our own backyard.

Given the youth's enthusiasm for working with North of 60, a similarly Indigenous-led tree-planting and monitoring program would likely garner interest and participation.

Discussion

The most prominent theme related to climate impacts was how climate change affects wildlife, especially barren-ground caribou. Community members described various climate-related changes that are disrupting wildlife cycles—migration, mating, and behaviour. This disruption does more than affect northerners' diets: it challenges fundamental ways of life and intergenerational teachings. Ray powerfully expressed this connection: "Caribou is like medicine to us." For Athabasca Denesųłiné communities, caribou are vital for food security, cultural identity, and spiritual practices. So far, the communities have taken limited action to address climate impacts, but community members expressed openness and a desire to participate in activities that would benefit both the climate and the northern economy.

Although community members can see benefits from afforestation projects related to jobs, the economy, youth engagement, and climate, they also have concerns about the impacts on wildlife, Indigenous consent and control, and invasive species. We repeatedly heard that a holistic approach to climate mitigation is preferred over individual projects like afforestation. Community members understand the negative effects of extreme wildfires on the climate, ecosystems, and themselves, and they hope that wildfire prevention and firefighting are prioritized as a climate solution. Wildfires are a much higher priority for the community than tree line afforestation, and some community members would be disappointed if afforestation projects proceed without accompanying wildfire mitigation efforts. The climate benefits of afforestation are still uncertain, while other solutions are known to positively impact the climate.

Based on the experiences and insights shared by community members, future climate initiatives in Northern Saskatchewan must be rooted in respect, partnership, and cultural survival. Examples of ongoing colonialism emerged throughout our interviews with community members, highlighting the need for strong relationships and trust-building for successful projects in the north. First and foremost, Indigenous knowledge must be recognized as a valid and crucial form of expertise—on equal footing with Western science—and Indigenous leadership should be central to decision-making. Avoiding top-down approaches is essential; communities must be fully consulted and

empowered to shape climate actions that impact their lands, wildlife, and ways of life. Any initiatives, including afforestation projects, must prioritize the economic well-being of local people by creating jobs and opportunities that reflect local economic goals, values, and stewardship practices.

Furthermore, climate strategies must be directly connected to protecting cultural identity and ensuring survival. Efforts to combat climate change should also safeguard wildlife, such as barren-ground caribou, whose well-being is closely linked to Athabasca Denesųłiné cultural life, and preserve the integrity of northern ecosystems. Additionally, investments are necessary to build local capacity for climate action, providing communities with the tools, training, and resources they need to lead and sustain their own adaptation efforts over the long term. Some community capacity exists through institutions such as Ya'thi Néné Lands and Resources, the Prince Albert Grand Council, and Athabasca Basin Development, but more capacity-building is required. Through these principles—respect, partnership, cultural preservation, and capacity-building—climate action can bolster both environmental resilience and the ongoing strength of Indigenous cultures in Canada's North.

That said, the results of this study should be viewed in the context of the 11 knowledge holders who shared their stories. The findings may not fully represent the Athabasca Denesųłiné population due to the small sample size and the fact that the two nonprofit staff members are not members of the Athabasca Denesųłiné First Nations. Conducting additional interviews would help achieve greater representation of the population. Furthermore, these results are specific to Athabasca Denesųłiné communities. A further limitation is that other First Nations with traditional territory in north-central Saskatchewan experience different climate change impacts, maintain different relationships with barren-ground caribou, are located farther from the tree line, and may hold different perspectives on afforestation. Consequently, the findings of this study may be more relevant to distant communities along the Canadian tree line that depend on barren-ground caribou than to nearby north-central Saskatchewan communities that do not.

Conclusion

The next steps in the project are additional community visits and a deeper analysis of interviews. We will return to Northern Saskatchewan to chat with initial participants, engage with youth, and conduct additional interviews. In the meantime, additional analysis of all 11 interviews will be completed, and we expect to publish future papers about community perspectives on land management, the climate movement in Nuhenéné, the potential for climate mitigation activities to support the rural economy, and how colonialism and land appropriation continue to impact First Nations decision-making.

The voices captured in this research make one thing clear: climate change is not a distant or future concern for northern Indigenous communities. It is already transforming the land, the seasons, the caribou, and by extension, the culture and identity of the Athabasca Denesųłiné people. Afforestation, like many climate strategies, carries

both promise and peril. It may offer a path toward economic participation and climate resilience but only if done in true partnership with Indigenous communities—led by their priorities, informed by their knowledge, and respectful of their lands. As Terri-Lynn reflects, "People are changing with the seasons… events and activities are changing due to the seasons changing." In that transformation lies both loss and possibility—and the need for climate action that is relational, respectful, and rooted in place.

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