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Article

Dispatches From Eeyou Istchee: Cree Networks, Digital, and Social Inclusion

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Abstract
This article offers a fragmentary, partial history of the successes and challenges the Cree of Eeyou Istchee have encountered as they've developed the capacity to offer their region and communities a range of traditional, analogue, and digital services through the development and maintenance of different yet interconnected networks. Using social construction of technology (SCOT) and social shaping of technology (SST) theories as a framework, these dispatches offer a glimpse of the complexity and layeredness of two Cree networks as they come into contact and/or overlap with those of extractive colonialism, Canadian settler policies, and traditional Cree law and policy.

Keywords
digital inclusion; digital inequity; Indigenous networks; settler-colonial communications policy

Issue
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1. Introduction

The following article offers a partial and fragmentary narrative of the successes and challenges the Cree of Eeyou Istchee have experienced as they've developed the capacity to offer their region and communities a range of traditional, analogue, and digital services through the development and maintenance of a number of different yet interconnected networks. We trace the development of two networks that have become important in the everyday lives of the Cree, which are enmeshed in complex ways with the networks of Canadian settler-colonial policies, infrastructural intrusions, and large-scale terraformations, as well as traditional Cree policies and laws.

The James Bay Cree Communications Society (JBCCS) began as a network of loosely connected radio stations in the Cree communities of Eeyou Istchee in the early 1980s. Today, as a non-profit radio network operator with nine licensed radio stations through the James Bay Eeyou Istchee territory, it delivers daily news and information programming in the Cree language. It also offers a range of digital, cultural, and social services including live-streaming Chief and Council meetings, local and regional elections, and children's Christmas concerts. This digital capacity is due to the development of an Eeyou Communications Network (ECN), a not-for-profit, Cree majority-owned fibre optic network. Conceived in the early 2000s, the network today offers broadband services to 14 communities including nine Cree communities and five Jamesian (Québec francophone) communities, as well as to anchor institutions such as health boards, hospitals and clinics, schools and school boards, and band and municipal offices. The following offers a series of dispatches that seek to represent the many complex layers of infrastructure, policy, social and political histories, and relationships, as well as the culture and ecologies in which these networks were conceived and developed. Using social construction

of technology (SCOT) and social shaping of technology (SST) approaches as a framework, we consider the adoption of digital technologies in Eeyou Istchee and what digital inclusion might mean and might not mean for the Cree communities.

2. Networks in Eeyou Istchee: A Case Study

This article is co-authored by Scott Forward and Tricia Toso. Scott lives in Mistissini, Eeyou Istchee, and is of Cree and European descent. Scott is the executive director of JBCCS and sits on the ECN board of directors. Tricia is a settler of European descent and a PhD candidate and policy researcher living in the traditional unceded territories of Haudenosaunee peoples. She has worked with ECN and JBCCS on a volunteer basis since 2018 on policy proceedings with the Canadian Radio-Television and Telecommunications Commission (CRTC) and Innovation, Science and Economic Development (ISED). Both authors have worked with and interviewed the founders of JBCCS and ECN, including Luke MacLeod, Edward Georgekish, Ted Moses, Hyman Glustein, and Alfred Loon, over a period of many years. This has informed our account of communications history and present in Eeyou Istchee.

To develop this case study we've used a range of methods, including interviews, archival research at the CRTC and the Aanischaaukamikw Cree Cultural Institute, the production of video and audio translations of Cree elders' narratives and histories, and our own experiences participating in government agency policy proceedings. Committed to anti-colonial and Indigenous methodologies, we understand that research isn't something that happens outside of the political and social conditions of which it is a part (Smith, 2012); rather, it emerges in relation to a range of institutions, infrastructures, and actors. Many of the following stories have been recounted, documented, and shared in the context of developing policy recommendations for CRTC and ISED proceedings by the authors, as well as the work Scott does at JBCCS. We understand our research and the development of policy recommendations as a form of participatory research and advocacy for Cree and other Indigenous networks in Canada. We've advocated for Indigenous-owned and operated networks, as well as issues such as spectrum sovereignty through our contributions to policy proceedings, including the Government of Canada's *Broadcasting and Telecommunications Review* (Government of Canada, 2019), the CRTC's co-development of a new Indigenous Broadcasting policy (CRTC, 2019), and the ISED policy proceedings *Spectrum Outlook 2022–2026* (ISED, 2022). We understand our work in the policy realm as part of a long and complex history of Cree and settlers working respectfully in collaboration and friendship to advocate for Cree self-governance, self-determination, and control over development in Cree territories.

Kretchmer (2017) proposes that the SCOT and SST approaches prove useful frameworks from which to explore questions of digital inequities and inequalities without repeating misperceptions and assumptions about internet use. She notes these theoretical approaches provide the means to explore how technologies have emerged from particular cultural circumstances, and thus are inscribed with values and priorities that correlate with that particular culture's mainstream and are subsequently culturally interpreted, modified, and altered by users. The interpretative flexibility of SCOT and SST allows for an interrogation of how various forces have interacted within the context of a settler-colonial state to produce inequities and inequalities. Researchers have demonstrated that colonial-settler discourses create and perpetuate profound digital inequities and equalities in First Nations communities (Philpot et al., 2014), but research has also shown that Indigenous communities have also successfully navigated obstacles posed by settler-colonial policies and practices, and built their own networks (First Mile Connectivity Consortium, 2018; McMahon et al., 2010). SCOT and SST theories offer ways to study digital inequities and inequalities without flattening the geographies of the places where policies play out, or simplifying the relations between these entities and forces. The following dispatches represent our attempt to address the complexity and multi-layeredness of networks in Eeyou Istchee while exploring how a range of forces including Cree community communications practices and aspirations interact with Canadian policies—sometimes at odds, other times in agreement with it; as they entangle in unexpected and unruly ways, offering lessons and potential futures.

3. Traditional Networks and the Cree Radio Network

In an interview, Grand Chief Dr. Ted Moses speaks of both Cree and American networks coming into contact, (Glustein & Bernard, 2008):

> In the 50s I spent my early childhood on the trapline in the bush with my family from September until June. My father was a trapper and a hunter. The way it works was, people would leave the community in September; in earlier days they would paddle, but when I was young we used to take a plane. I used to get a kick out of flying. It was an hour and a half flight to my father's trapline. First, we would build a teepee and stayed in the teepee until the winter lodge was built, which was made out of sod and wood and very well insulated. We would use the snow as part of the insulation. We'd stay there all winter, and then, in March, we would move to another location and stay in a teepee, and lived a real nomadic life. When we would arrive at a certain place, we would leave with a canoe and paddle down the Eastmain River, back to the community in the middle or end of June. I was with my family: my parents and my siblings. It used to go down to −50 Fahrenheit for about four weeks, and when the temperature went up to −25, we'd say:

> "Hey, it's warmed up; you can actually feel the change in the weather." Life could continue even at that temperature, such was the life of a hunter and trapper. We worked everyday except Sundays. Sundays were a day of rest and you would stay in Camp with the family and we'd have a cookout. My mother would prepare a big meal for the whole family. We basically took in just the staples: flour, baking powder, salt, sugar, tea. I think we even had a little bit of coffee…and milk, but in powder form…otherwise we would rely on what my father brought in on the hunt: beaver, ptarmigan, porcupine, moose, and fish. My father used to have an old radio with an antenna. It had a battery that was about twice the size of a car battery, and the radio itself was wood. It was quite a big radio, but it never worked during the day, but in the evening we would be able to catch programs from the US. One of the stations that we used to like to listen to, especially in the morning when it was still dark (when the sun rose, we lost the airwaves) was WWVA from West Virginia with this guy, Lee Moore, the Coffee Drinking Nite-Hawk. It was quite something to hear the music. I never understood the lyrics because I didn't understand English. This was before I had gone to school and spoke only Cree.

We understand networks as "patterns of interconnection and exchange that organize social and aesthetic experience" (Levine, 2015, p. 113); they're separate and have their own logics, but they also overlap and allow for different forms to come into contact. Ted Moses' story of listening to a West Virginia radio broadcast in the early hours of the morning from his family's traditional trapline in Northern Québec illustrates the overlap of several different networks: those of the Cree network of oral history, traplines, and winter camps with that of an American commercial radio broadcasting network.

The Cree began their own radio broadcasting network in the early 1980s, and since then have developed programming in the Cree language that specifically addresses community issues and interests, as well as serves as an important cultural and social lifeline. Radio broadcasts provide critical information to communities, including emergency messages, municipal and regional news in the Cree language, advertising programs and events, sharing shout-outs to family and loved ones, and the words and language of elders. Alia (2010) notes that radio is particularly well adapted to oral cultures and remote community life by providing a sense of interconnectedness. The Cree have developed networks and technology practices that reflect their needs and endeavours, whether issuing weather warnings or using tracking devices and satellite imagery to record the negative impacts of extractive colonialism on the land (Mark et al., 2019, p. 7).

Edward Georgekish, radio station manager of Wemindji, produces recordings that are broadcast over the Cree community radio network and share elders' stories and Tallymans' observations of changes in the land, including legends; the correct Cree terminology for words that have particular contemporary relevance (like "vaccine" and "face mask"); warnings about the ice conditions and where to be careful on the trails; admonishments for over-harvesting game; words of caution about leaving children unattended on skidoos, no matter how quick the errand; and pleas to watch out for other hunters and those checking snares. These transmissions also included mandatory Covid-19 updates and reminders of good hygiene practices during the Covid-19 pandemic (Georgekish, personal communication, January 15, 2021). The use of radio, digital devices, satellite, and fibre optic technologies have been adapted to meet the particular realities, geographies, social relations, and rhythms of the Cree communities. Their adaptation and use of these networks and devices support the Cree language, ways of knowing, and living, and remain grounded in the everyday lives and worlds of the Cree.

4. A Struggle for Land and Sovereignty

> On April 30, 1971, we were stunned to hear a radio announcement that the Province of Quebec was planning to build three hydroelectric complexes on our lands in James Bay. We were not given any advance warning of the proposal. Sure, we had picked up the possibility that something was coming, as we had seen the exploration crews for a few years. But Premier Robert Bourassa's public announcement of the project of the century was made as though we did not exist, or had never existed. (Moses, as cited in Gnarowski, 2002, p. 26)

On June 28, 1971, a number of Cree leaders gathered to discuss a response to the Hydro-Québec project (Carlson, 2008). With hopes of protecting their ancestral lands, trap lines, and hunting grounds, the Cree, together with the Inuit, filed an injunction in the Supreme Court of Québec in 1972 and declared all development in James Bay unconstitutional (Niezen, 1998, p. 48). They testified that neither they nor the Crown had ever extinguished their rights to the land. On November 15, 1973, the judge issued a court order to halt construction on the dams, ruling it violated Aboriginal rights and threatened environmental damage (Desbiens, 2013, p. 44). Declaring the project had not been properly evaluated, the decision read: "Cree and Inuit rights were being infringed and their cultures were potentially threatened" (Reynard, 2000, p. 216). The Quebec government appealed the decision and it was overturned in the Quebec Court of Appeals a week later on the basis that it was in the public interest that the project continue and that any losses or damages to Cree territory would be compensated (Desbiens, 2013, p. 44).

The court, however, recognized that Cree had rights concerning these lands which constituted their "rightful owned territory," and urged the Quebec government to

negotiate with the Cree and Inuit to reach an agreement (Desbiens, 2013, p. 44). Through the Court's process of discovery and deliberation, the Cree became a political and legal people, developing new negotiating power to protect their lands (Carlson, 2008, p. 205). The James Bay and Northern Quebec Agreement (JBNQA) differs from previous historical numbered treaties in its complexity and modernity; it involves settling issues as varied as land use, resource extraction, taxation, language, culture, heritage, health, education and social programs, eligibility, and enrolment, and has the legal certainty of self-government (Penikett, 2006, p. 87). The JBNQA has been followed by over eighty subsequent agreements that extend the scope of self-governance of Cree communities (Cree National Government, 2020). It also sets out the policy that determines the establishment of organizations like the JBCCS and community radio stations as a right (Crown-Indigenous Relations and Northern Affairs Canada, 1975, Sections XII-164 and XIII-133).

5. The Beginnings of JBCCS: Laundromats and Bingo

In 1981, the Grand Council of the Crees in the James Bay Area formed JBCCS as a means of keeping people informed of developments with the JBNQA (MacLeod, personal communication, December 15, 2020). The organization began with the publication of a monthly magazine and the production and circulation of videos that were to share information among the geographically distant Cree communities. The first radio station in Mistissini was set up in an abandoned laundromat with a waterlogged roof and an old UHF tower strapped to the building (Glustein, personal communication, November 24, 2020). CBC provided minimal equipment, offering only a few consoles and microphones, but the community was able to round up the necessary turntables, vinyl records, cassette machines, and other essential technologies and furnishings. Georgekish remembers being surprised at the conditions of the operation when he visited in the early 1980s. The Canadian government's funding program, the Northern Native Broadcast Access Program, offered established communications societies in northern Indigenous communities funding for radio and TV programming, but there was nothing for emerging communications entities. Georgekish began looking into ways to fundraise; monthly bingo tournaments initially brought in enough funding for the network station to build a new network station, providing safe working conditions and establishing more regular services to the community. Furthermore, it gave the organization the means to incorporate and become eligible for federal funding.

6. Where Is the Cree? CBC in Eeyou Istchee

The 1957 *Report of the Royal Commission on Broadcasting* (known as the Fowler Report) introduced a concerted effort by the CBC to extend its services to the North (MacLennan, 2011). Radio service in northern Quebec, northern Labrador, and the Northwest Territories depended on shortwave until the late 1970s, and at that time CBC Northern Service transmitted 18 hours a day, including three hours of Inuktitut programming, one hour of Cree programming (from Ontario), and one hour of French programming (Hudson, 1977, p. 131). The claim of multilingual programming by CBC was understood as an overstatement for many northern Indigenous listeners; control over the content and broadcasting network remained largely in the hands of the CBC (MacLennan, 2011).

When CBC started Cree programming, there was a concern by the Grand Council that none of the programs were produced locally, and that CBC was merely translating their own news into Cree. In 1985, JBCCS was mandated to offer daily programs, but the CBC allocated only four hours a week to Cree programming. The CBC insisted the programs be recorded on reel-to-reel and air shipped every day for play the next morning; many shows were never broadcast because they didn't arrive on time, or they were bumped by the CBC for their own reasons (Glustein, personal communication, November 24, 2020). Luke MacLeod, executive director of JBCCS, felt that this was not a meaningful way to participate, and proposed to the CBC that the programs be phoned in at nine each weekday morning over a dedicated phone line. The CBC agreed and, after negotiating with Télébec for enough bandwidth, JBCCS was able to offer live programming. The sound was tinny at best, and often one the lines failed. Meanwhile, a disaster was brewing, the community had only been assigned four outside lines on the Télébec phone system, so when JBCCS took half the capacity of the community and did a live interview over the phone, almost all of the phone capacity was tied up. This method of transmission virtually depleted phone service, leaving the community without telephone service. Some time later, Telesat launched its first satellite and JBCCS was able to secure a small space for a signal to provide CBC with a clearer connection.

7. Dark Fibre and the Beginning of ECN

In a 2015 CRTC hearing on basic telecommunications services in Gatineau, Québec, Moses told a story of how ECN was founded. Addressing the Commissioners he explained:

> I discovered fibre optic without knowing it. When I was a Grand Chief, as part of my duties, I traveled extensively and I traveled a lot with my family, driving up to Eastmain, several hundred kilometres away. And on the way I crisscrossed the high-tension 750 KV lines with a line going on top. It always intrigued me: What was that line for? It was not one to transport 750,000 volts of electricity. (CRTC, 2015)

He went on to explain that after some investigation they found it was a fibre optic line, and that it was used by Hydro-Quebec in the operation of their powering generating stations in James Bay. He continued: "It dawned on me that having fibre optic could mean a big advancement for the Cree Nation" (CRTC, 2015). This story is notable not only because it speaks to the conception of the fibre optic network in Eeyou Istchee, but it also evokes the long and complex history of the relationship of the Cree with Hydro-Québec. If we follow the high-tension line Moses spoke of through space and time, it leads us to the La Grande generating station in the very north of Eeyou Istchee and back in time to the signing of the JBNQA. The story of ECN is embedded in complex geographies of pre-existing networks and infrastructure, colonial-state politics and policies, and technologies.

In the mid-1990s, a number of Cree communities began to experiment with internet service provision; community members in Chisasibi had built a cable TV plant with a satellite internet connection (actually the first small cable internet service in Canada) and offered better service than dialup, but not much. Once everyone in the community signed up, the service slowed to a crawl (Glustein, personal communication, December 11, 2020). In Wemindiji, the business development agency set up a trunk line with a dialup Internet provider a thousand kilometres away, offering telephone internet service by local and long-distance dialup throughout the Cree communities, but again demand soon exceeded the capacity of the system. Meanwhile, in Mistissini, JBCCS was distributing its programming to all community radio stations by satellite and began looking into internet service provision. It tried promoting a convergence approach by adding TV and the internet to its offerings, but it proved too costly. These projects created interest in the communities and brought awareness to the potential internet connectivity could have for Cree.

An important impetus for ECN came from an unexpected turn of events in a 1998 CRTC policy proceeding on the telephone service to high-cost serving areas in Val D'or, Québec. Jimmy Neacappo, councillor for the Cree Nation of Chisasibi, Raymond Menarick, the station manager of Chisasibi Telecommunications Association, and Hyman Glustein, consultant to the Association of Broadcasting and Communications gave a presentation to the Commission in which they argued that Télébec, the licensed provider of telephone services in Eeyou Istchee, had been giving preferential treatment to Hydro-Québec. They presented the results of tests they had run from Télébec phones located in Chisasibi, four different Hydro facilities in the region, and Radisson, a non-Cree community located 84 km from the Grande-1 Hydro facility. They found that calls from Chisasibi to anywhere outside of the small community were long-distance, thus subject to Télébec long-distance rates, whereas, calls from Radisson to any of the Hydro stations, as well as between the four stations, despite being up to 335 kilometres apart, were local, thus not subject to long-distance rates. Neacappo observed that Télébec had two types of local service, one for Hydro-Québec workers and another for the Cree communities.

Menarick argued that as the licensed provider of telephone services in the James Bay area, Télébec had an obligation to assure that any other telephone system operating in its area, and accessing its network for interconnection, follow the same rules as any other user (CRTC, 1998). If the phone company didn't take action against Hydro-Québec and oblige them to pay long-distance charges, Télébec would be accepting their service and, therefore sharing their licence. This was in contravention of CRTC regulations. Télébec denied preferential treatment, but the CRTC wouldn't make a decision, shuffling the issue aside. Glustein realized that the CRTC wasn't going to act so he had the Cree legal department send a letter to Hydro-Québec addressing the issue, pointing out that this practice was in contravention of the JBNQA. Sometime after, Glustein received a call from a hydro company staffer; keen on having the legal case dropped given the current litigious climate, he said he would offer Glustein proof that they were not getting local rates from Télébec. Glustein received maps and technical manuals for their telecom service. He couldn't believe it: In his hands was a map of fibre optic lines transversing Eeyou-Istchee, the key to beginning the Cree network. Soon after he met with Moses and a team of people began to coalesce, and plans for the network were developed and implemented.

8. FM Radio

In Eeyou Istchee, there are still a number of monolingual Cree who continue to depend on regional and local radio broadcasting for news, information, and entertainment. The need to support traditional forms of broadcast shouldn't preclude the support for development and innovation. With the ability to connect comes the capacity to enable broader participation within the broadcast ecosystem; multiple streams can be absorbed directly into the broadcast facility, and distributed to different stakeholders within or external to that system.

FM Radio is the primary activity of JBCCS and Cree media, but there is an increasing expectation that all Cree media content be searchable and available on a range of platforms. Outdated and customized studios, analog equipment and weak transmission equipment in community broadcast operations are currently being replaced, and broadcast facilities and systems modernized. To build an interconnected network, this project requires the interconnection of broadcast stations and systems that allow for common tools to be used to distribute and manage content. It creates an incentive for all stations to adopt a common protocols such as audio-over-IP (AOIP), as management of remote facilities is greatly improved through ECN's network. JBCCS has worked with ECN to connect its stations and towers to the fibre optic network, while developing its own

systems that allow for a range of new services that are specific to the Cree communities and their needs. JBCCS has developed the capacity to digitize, ingest from discrete systems, index, and catalog materials, so that they can be searched throughout the territory, as well as deployed out to web applications. This type of broad access is important, as many people within Eeyou Istchee (students and workers) are forced to make the choice between seeking opportunities outside their communities and maintaining access to their culture.

With access to ECN's reliable high-speed broadband access, JBCCS offers services that facilitate participation in public and cultural life. For example, in recent years, JBCCS has regularly live-streamed Chief and Council meetings, general assemblies of the Cree School and Health Boards, funerals of important figures in the Cree communities, and consultations on a lithium mine in Cree territories, to name a few. These services are an important component of both keeping Cree community members informed of what is happening in their nation and territories and allowing Cree to participate in real-time through chat, messaging, and call-in features. These broadcasts challenge conventional ideas of digital inclusion and exclusion, as non-adopters of digital technologies can still participate in the live-streamed event through the use of analogue media. JBCCS's use of both analogue and digital media complicates the traditional distinction scholars have drawn between users and non-users. Kretchmer (2017, p. 98) points out, "digital social equality is not synonymous with everyone conforming to the mainstream," rather true equity asks that technology be infused with diversity from the first stages of design to end use. JBCCS faces a range of constraints and challenges in regard to infrastructure, hardware and software, broadcasting, and telecommunications policy that have all been designed for mainstream settler society and are not easily translated into services that meet the needs of diverse communities. However, the Cree organization has proven itself capable of appropriating a range of technologies in order to further the Cree peoples' participation in social, cultural, and political life, regardless of whether community members are adopters of digital devices or not.

Reisdorf and Rhinesmith (2020) argue that digital inclusion doesn't necessarily translate into social inclusion, rather initiatives that seek to understand and increase digital inclusion should develop more refined understandings of internet use and non-use. The definition of digital inclusion most cited is that of the National Digital Inclusion Alliance (NDIA) which defines it as users having reliable access to high-speed Internet with digital devices that meet the needs and skills training of users and with tech support and software that are "designed to enable and encourage self-sufficiency, participation and collaboration" (NDIA, 2017). We contend that how JBCCS and other Cree have integrated broadband services into the everyday lives of Cree community members offers another version of digital inclusion. That is, the assimilation of the allowances of ECN's network and JBCCS's services into a range of public health, education, cultural, and social institutions includes everyone, even non-users, in a digital ecology. One example is the interactive virtual landscape the Wemindji Eeyou knowledge centre is creating through experimentation with new media and different modes of documentation and presentation (Mark et al., 2019, p. 8). The new media installation cannot replace the experience of living in hunting and fishing camps, but it can communicate and cultivate forms of knowledge among both its developers and users. Non-adopters of digital technology such as elders are involved in various levels of development and engagement as knowledge-keepers of place-names, the Cree language and traditions, or Tallymen advising on changes in the land and water. The ways we might understand digital inclusion are challenged by these kinds of collaborations, but perhaps even more salient are the ways in which digital IT projects like this bring different networks together, those of kin, traditional and new knowledge, trap lines and hunting grounds, radio, and fibre optic. We might think of this as network inclusivity—social and digital inclusion through engagement with any in a number of established Cree networks.

9. Community Practices and Aspirations: The Revitalization of Cree Language and Culture

These were the words of Sanders Weitsche (Cree National Government, 2018):

> Many old, old Cree words are being lost; they are leaving us. It is true that we must try not to let this continue to happen; for our language to leave us. There are other first nations who weep because they have lost their language.

The 2018 *Eeyou Istchee Language Engagement Sessions Report* identified Cree as currently undergoing a shift from a stable to a threatened language. Concern over the decline in the use of Cree by children and adolescents has led to a number of recommendations including the development of radio broadcasts with Cree language instruction and elders' stories. Other recommendations include broadcasting home-made programs, having Cree language lessons using Facebook, and using cellular phones or tablets to record elders and other family members telling stories in Cree (Cree National Government, 2018).

The JBCCS has undertaken several projects that are oriented toward sustaining and improving Cree language skills and fluency, including broadcasting radio programs entirely in Cree, repatriating Cree language audio and video materials held by non-Cree institution, coordinating the maintenance of repositories for Cree language video and audio recordings, and recording and preserving elders' stories to create an online archive. MacLeod has developed techniques to ensure

broadcasters use the highest quality of Cree possible in their radio broadcasts and actively endeavours to ensure the correct terminology. Emphasizing the importance of documenting elders, MacLeod reports that they offer older and more complex forms of the language that are being lost. Working closely with elders, staff announcers verify terminology, and work on a daily basis to improve the quality of their Cree language skills.

The use of these media and technologies in the preservation of "old, old Cree" speaks to both a strong desire to safeguard the language, but also a willingness to experiment with a range of media and create new ways of documenting oral histories and traditions. A scroll down through JBCCS's Facebook feed gives a sense of both the vitality and the threatened state of Cree. Recently, JBCCS aired its fifth episode of *Speak Cree to Me*, a series designed to document the Cree language and local knowledge. Two community members, John P. Bosum and Glenn Longchap discuss traditional Cree uses of trees in the Cree language, noting the proper Cree terms for things like what to say when you retrieve wood for making snowshoes (Psesamanu), and joking that the Cree tradition of leaving markings on trees over portages to communicate with the following canoeists was an early form of Facebook (JBCCS, March 29, 2023). The comments on the posting reflect both appreciation for the production, as well as questions about whether the Cree terms used are inland or coastal Cree, and testimonies that teachers and parents use the JBCCS videos to teach children Cree. The concern expressed in both video and comments is less about digital inequalities or lack of inclusion, and more about the threat of losing Cree traditions and language. Access to digital technologies may offer more tools for dissemination and documentation, but these concerns create tensions that deny easy conclusions about how we might define social and digital inclusion in the context of a culture facing the loss of language and living traditions.

10. Colonial-Settler Policy and Spectrum Licence Auctions

The natural resource known as electromagnetic spectrum in Indigenous territories is administered by ISED through spectrum license auctions or other assignments. The Canadian ministry is governed by the 1993 Telecommunications Act, and lists among its policy goals the development of a telecommunications system that protects and enhances Canada's social and economic fabric (sec. 7(a)), to enhance the efficiency and competitiveness of telecommunications services (sec. 7(c)), and the availability of reliable and affordable communications services for all Canadians (sec. 7(b)). Allocation of spectrum through licensing mechanisms is one of ISED's most important policy tools and is governed by the objectives set out in the *Spectrum Policy Framework for Canada* (Government of Canada, 2007), which include deriving economic and social benefits from the radio frequency spectrum resource. Since 1999, ISED has used auctions for spectrum allocation (Taylor, 2013, p. 123) and generated billions for the general revenue pool (Longford & Wong, 2007, p. 3). In the case of spectrum bands that are useful for services like cellular or broadband services, large for-profit commercial telecommunications service providers tend to be the only entities that have the resources to participate in ISED's spectrum license auctions. As a result, they often own spectrum licenses that cover Indigenous communities and territories but don't deploy mobile and fixed wireless broadband infrastructures and services, citing little to no profit motive given the large territories and relatively small populations.

The current spectrum licensing regime has led to a situation in which, as of 2023, no Indigenous entity in Canada has ever successfully bid on and attained a licence for the provision of mobile and/or fixed wireless broadband services from an ISED spectrum auction. There are a number of obstacles for Indigenous entities seeking a spectrum license, including tier size, high licence fees, and an overly complex licensing system. While the negative impacts of a lack of access to spectrum for Indigenous peoples across Canada have not been studied, we know that digital exclusion has been correlated with detrimental health outcomes (Sieck et al., 2021), lower educational outcomes (Drossel et al., 2020), and it has been demonstrated to exacerbate economic disadvantages and levels of poverty (Warschauer, 2003; Wilhelm, 2004). On the other hand, digital ICTs have been demonstrated as effective tools to support cultural resurgence and self-determination (Beaton & Campbell, 2014; Perley et al., 2016).

11. Eeyou Mobility Inc. and Traditional Cree Lifeways

In 2018, ECN began to work with SSi Canada, an ISO in Nunavut, to develop a plan to offer cellular coverage to the communities and major transportation routes in the territory Eeyou Istchee/James Bay. A joint venture between ECN, Eeyou Companee, SSi Canada, and Eeyou Mobility Inc. was founded. Through pooled resources, SSi obtained a subordinate license through an agreement with one of Canada's big telecommunications corporations (Loon, personal communication, January 31, 2023), and Eeyou Mobility Inc. began offering cell service to all nine Cree communities and the five Jamésien municipalities in November of 2021. Coverage of 1,750 km of roadways with the deployment of an additional 80 cell towers is expected by March of 2025. Many of these sites are energy-autonomous, off the Hydro-Québec grid and producing their own clean energy. This project will increase road safety and emergency response times, and complement a long-standing two-way radio communications network developed by the Cree Trappers Association (CTA).

As evidenced by Moses' story, two-way radio has been a critical mode of communication for the Cree for decades. It is the primary medium for diverse

applications, including: ambulance and emergency response units; first responders for triage responses as well as the fire and police departments; the Cree School Board uses it for internal services; road and maintenance crews for remote management; trappers use it for re-supply requests and emergencies; an early warning system for extreme weather events; and family communication. It is even integrated into Cree social media. Unique to the northern and isolated community experience, two-way radio serves as a lifeline for those in the bush, on the roads and highways throughout the year. It is a basic utility in Eeyou Istchee, common in homes, businesses, and services.

Over the past few years, two-way VHF radio has undergone significant improvement; with the integration of digital technology, handsets have become more powerful with more features and services have expanded to allow IP integration and merge with cellphones, cameras, and GPS systems. Two-way radio can now be used for text messaging, tracking and monitoring, and connecting to data systems, Wi-Fi, and external telephone systems. These affordances are important for a range of services including emergency notification services for community emergency services and travellers along the remote highways of Eeyou Istchee. Cell towers and service along major roadways will increase the capacity of existing networks, as well as support environmental impact assessments and give the Cree better capacity to be "the eyes and ears" of Eeyou Istchee (Mark et al., 2019, p. 7; see also https://www.creegeoportal.ca).

12. Spectrum Sovereignty

Electromagnetic spectrum is a natural resource and, under JBNQA, the Cree, Inuit, and Naskapi are guaranteed levels of harvesting equal to current levels of harvesting of all species in the territory (Crown-Indigenous Relations and Northern Affairs Canada, 1975, para. 24.6.2). It reserves exclusive rights in certain land categories; Native people have exclusive right to establish and operate outfitting facilities within Categories I and II and have a right of first refusal to operate as outfitters in Category III (Crown-Indigenous Relations and Northern Affairs Canada, 1975, para. 24.9.3). Philip Awashish, one of the JBNQA signatories explains that as a document, the JBNQA is fixed in its time, thus it can be difficult to reconcile particular terms and social, technological, and environmental changes; however, if all parties are genuine and willing to see the document as such, thus adopt broad interpretations, it can be understood to include digital services and spectrum (Awashish, personal communication, April 8, 2023). We argue that Cree have the right to harvest electromagnetic spectrum in their territories as they do with wildlife; establishing the right of first refusal to electromagnetic spectrum for the Cree by ISED would be consistent with the JBNQA and subsequent agreements.

The Canadian government, its ministries, and agencies haven't explicitly recognized Indigenous rights to spectrum, and thus licenses remain in the possession of large Canadian telecommunications companies and their subsidiaries. In recent proceedings, ISED acknowledged policy developments in the US, New Zealand, and Mexico that have prioritized Indigenous access to spectrum. The Federal Communications Commission (2020) introduced a 2.5 GHz Rural Tribal Window that allowed more than 400 Tribes to deploy services in their territories, while in New Zealand, the Māori Spectrum Group will receive 20 percent of future national commercial spectrum allocations at no cost, as well as NZ$57 M of funding to develop a range of digital enterprises and jobs in healthcare, education, and rural businesses (Clark, 2022). These are positive developments, but ISED has yet to announce any new programs specifically for Indigenous communities and ISPs.

Access to spectrum is a key component of the CTA project, and their proposal to maximize two-way radio coverage for their members living and hunting on their traditional territories should be understood as a critical aspect in the maintenance of the Cree language and culture. The CTA is bound and guided by the Traditional Eeyou Hunting Law (TEHL), a body of laws founded in the knowledge, beliefs, and customs associated with the traditional Cree practices of hunting, fishing, and trapping, and continually evolves to adapt to changes in society and technology. The TEHL offers an interesting model from which we might think about how spectrum is allocated in Indigenous territories. As it suggests, it has the adaptability to respond to changes in social, technological, and environmental changes:

> Eeyou law can be regarded more as a continuing process of attempting to resolve the problems of a changing society, than a set of rules. It is not the heedless reproduction of outmoded practices that makes an effective Eeyou law and a vigorous tradition, but a strong connection with the living past especially a strong and living connection with the land—Eeyou Istchee. (CTA, 2009, p. 2)

This expression of law is grounded in "a living connection with the land" and remains open and flexible to respond to the changing conditions, needs, and demands on the land. This includes the development of digital technologies and programs that require access to spectrum, as well as innovative infrastructure—hardware and software. The Cree have a long tradition of managing the resources of Eeyou Istchee and, as Blackwater (2020) has pointed out, spectrum is a natural resource that has been on the land since time immemorial.

13. Conclusion: Eeyou Istchee Media Futures

The report *Connectivity in Rural and Remote Areas* (Auditor General of Canada, 2023) indicated that, in

2021, only 42.9% of First Nations reserves had access to minimum 50/10 Mbps speeds. First Nations communities are lagging in terms of access to broadband, and this is consequence of inequities and inequalities including profound infrastructure disparities, sparse and overly complex (and competitive) funding programs, lack of policy support, and limited access to electromagnetic spectrum. The stories of JBCCS and ECN reveal a number of points of contact between networks of community knowledge and practices, and those of settler colonial government agencies and extractive colonialism. We've offered an account of the importance of spectrum to shortwave and FM radio, cellular coverage, and broadband services in the communities, and argue that the need to support traditional forms of broadcast doesn't preclude support for developing innovative approaches to the changes the social, environmental, and technological aspects of modern Cree everyday life. With the ability to connect comes the ability to enable broader participation within the broadcast and digital ecosystems, allowing people to participate in a range of activities, whether they are digital device adapters or not. The challenges the Cree face is not necessarily digital exclusion, but a loss of language and culture that can put networks of social inclusion at risk. As Marisa Duarte points out, Indigenous youth are increasingly comfortable with digital technologies and navigating cyberspace, but their challenge is how to apply these tools along with their own forms of knowledge and expertise toward retaining traditional values, histories, languages, and philosophies (Duarte, 2017).

The Cree word *Eeyou Istchee* translates into something like "the living land" in English and this understanding is threaded through the laws that govern traditional and current Cree practices on the land. The TEHL and those responsible for its interpretation and implementation are responsible for the *Anaacatawaayiitaacanouch*, or conservation, of wildlife and other resources of Eeyou Istchee (CTA, 2009). We argue that radio spectrum is an important resource for the continuation of Cree traditional lifeways, as well as for adapting to the challenges posed by settler-colonial policies, extractive colonialism, climate change, and a threatened language and culture. A radio station can—and, in the case of Eeyou Istchee, does—play a significant role in cultural, technological, and spectrum sovereignty. Canada acknowledges the risk of cultural imperialism that can result from not having a vibrant broadcast ecosystem—similarly, the inability to exist and speak to people in a traditional broadcast or digital space carries the very real risk that connection to a culture is damaged or lost.

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Conflict of Interests

The authors declare no conflicts of interest.

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